Compendium of Climate and Hydrological Extremes in Bhutan since 1968 from Kuensel

National Centre for Hydrology and Meteorology
Royal Government of Bhutan

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Foreword

Bhutan is situated in the eastern Himalayas which is highly vulnerable to disasters particularly from hydro-meteorological and geological hazards. As the country lies in one of the most seismically active zones of the world, flash floods, GLOFs, landslides, windstorm pose an annual threat to human lives, properties and livelihoods- especially people who are settled along with river basins. GLOF and flash floods are the most common flooding problems in Bhutan, which generally occur due to intense rainfall, failure natural or artificial dams. More than 70% of Country's settlements are along the river valleys, recurrent flash flood/GLOF have high impact not only to life and livelihood of the people but to the national economy as a result of damages to hydropower facilities, agricultural land, roads, bridges, buildings and other infrastructure. For instance, a record rainfall in May 2009 brought by Cyclone Aila has left 12 people dead and damages to infrastructure, which cost Royal Government of Bhutan (RGoB) US$ 17 million (GNHC, 2013). The 1994 GLOF occurred in October 1994 from the partial burst of the Luggye Tsho in eastern Lunana caused loss of 21 lives and extensive damage to property along the Punakha- Wangdi valley.

National Centre for Hydrology and Meteorology (NCMH) is mandated to undertake scientific and technological services in hydrology, water resources, meteorology, climatology, and cryosphere to ensure the safety and socio-economic well-being of people and to support national and international needs. This documentary publication title ***"Compendium of Climate and Hydrological Extremes in Bhutan since 1968"*** was done to document and the pasts hydro-met extremes to learn and prepare for present and the future.

As the data and record of the past pertaining to extremes weather and flooding in Bhutan are limited, NCHM requested the Kuensel- National Newspaper to provide access to their avaibale archived to make an inventory and carrying out long-term analysis of flood occurrence, temporal and spatial variations of flood events and their underlying meteorological causes over time. This publication aims particularly at providing information about the historical occurrence of floods in Bhutan, their meteorological and geological causes and severity of the flood events through documentary data from archival of Kuensel reports from 1968 to 2017. Hence, it is hoped that this information are useful and invariably improve the understanding of flood risk analysis and flood hazard mapping in Bhutan.

I would like to take this opportunity to express our gratitude and appreciation to Hydrology and Water Resources Services Division (HWRSD), National Centre for Hydrology and Meteorology (NCHM) for their hard work in initiating the publication of this book.

We are grateful to the World Bank for providing the financial support to publish this book through the project "Hydromet Services and Disaster Resilience Regional Project".

Our sincere thanks go to Research and Publishing Division of Kuensel Corporation for exceptional archiving, and their assistance in designing and printing this document.

(Karma Dupchu)
Director

Summary Table- Flood Events

Year	Date/month	Flood event	River/basin	Dzongkhag	Page
1968	**October 3-15**	Punakha flood	Punatsangchu	Punakha	1
1968	**October 3-15**	Phochu and mochu flood	Sunkosh	Tsirang	2
1982	**10-Aug**	Thungti flood	Thungti river	Trashigang	3
1987	**10-Sep**	Mochu flood	Punatshangchu	Punakha	4
1990	**4-May**	Mithidang flood	Mithidang river	Trashigang	5
1990	**2-Jun**		Duti khola	Chhukha	6
1991	**May**			Trashigang	6
1991	**June 12-14**	Haa chu flood.	Haa chu	Haa	6
1991	**July 2,3 and 5**	Duti khola flood	Duti khola	Chhukha	7
1992	**14-Jul**	Flood		Samdrup jongkhar	7
1993	**5-May**	Flash flood		Trashigang	8
1993		Flashflood		Chhukha	8
1993		Flash flood	Chamurchi river	Samchi	9
1993	**11-Aug**	Flash flood	Paro basin.	Paro	10
1994	**30-Jul**	Flash flood	Mithidang stream	Trashigang	11
1994	**7-Oct**	Glof	Phochu	Punakha	12
1995		Obstruction of the stream cause flash flood.	Tonga rongchu	Lhuntse	15
1996	**July 12 and 13**	Flashflood caused landslide.	Sarpang khola and kharkhola.	Sarpang	17
1996	**13-Jul**	Flashflood		Trashigang	18
1996	**13-Jul**	Flashflood.	Barsachu river.	Chukha	
1999	**August**	Sethey kherey flood.	Sethey chu.	Sarpang	22
1999	**2-Sep**	Stream catchment flood	Kuktorgangchu	Trashiyangtse	22
2000	**August**	Flashflood	Barsa river	Chhukha	
2000	**August**	Flashflood	Dhuti khola	Chhukha	24
2000	**3-Aug**	Flashflood	Toorsa river	Samtse	27
2000	**3-Aug**	Flashflood		Trashigang	27
2003	**September**	Bareykang river caused flashflood	Kholongchu	Trashiyangtse	34
2004	**9-Jul**	Flashfloods and landslides		Eastern dzongkhag	36
2004	**September**	Flashflood	Small stream flooded	Trashigang	40
2005	**May**	Flooding	Amochu	Chukha	42
2005	**23-Aug**	Flooding	Kholongchu	Trashiyangtse	43
2007	**4-Jul**	Flashflood	Sangmari and pasadangdri stream	Trashiyangtse	46
2008	**18-Jul**	Flooding	Yakchu river	Haa	50
2008	**September**	Flooding	Amochu	Chhukha	51
2008	**September**	Landslide and flooding	Dhaukhola river	Samtse	51
2009	**25-26 May**	Heavy rainfall and flood	Olaronchu stream	Thimphu,	55
2009	**25-26 May**	Flooding	Haa chu	Haa	56
2009	**25-26 May**	Heavy rainfall(aila)	Darachhu	Dagana	56

Continue...

Year	Date/month	Flood event	River/basin	Dzongkhag	Page
2009	**25-26 May**	Heavy rainfall(aila)			56
2009	**25-26 May**	Heavy rainfall(aila)		S/jongkhar	56
2009	**25-May**	Landslide or snow avalanche cyclone aila.		Gasa	61
2009	**June**	Flooding	Genekha rongchu (stream)	Thimphu	60
2010	**July**	Flood water	Singye river	Chukha	63
2010	**28-Jul**	Flash flood		Thimphu	64
2010	**27-Aug**	Flash flood	Sarpang river	Sarpang	65
2012	**June**	Fash flood		Gasa	68
2012	**27-Jun**	Flash flood	Korongchu	P/gatshel	70
2012	**July**	Heavy rain cause flash flood.	Setikarey river and other small streams. Paitha khola (river).	Sarpang	72
2012		Flooding	Paitakhola and sethikarey (stream)	Sarpang	73
2013	**June**	Flash flood	Swelling streams (jechulum).	Punakha	74
2013	**10-Aug**	Flooding	Yudhiri river	Trashigang	75
2014	**17-Jun**	Flash flood	Sengphug rongchu	Trashiyangtse	76
2015	**28-Jun**	Flood or glof	Lemthang tsho outburst	Gasa	79
2015	**30-Jun**	Flash flood	Amochu	Chukha	82
2015	**8-Aug**	Flash flood	Nahi stream	Wangdue	93
2015	**18-Aug**	Flash flood	Sethikhari river	Sarpang	83
2015	**August**	Flash flood		Samdrup jongkhar	83
2016	**20-Jun**	Fash flood	Sarpang river	Sarpang	84
2016	**23-Jul**	Flash flood	Amochu	Chukha	85
2016	**24-Jul**	Flash flood	Setikharay seasonal stream		86
2016	**27-Jul**	Glof	Chamkhar basin	Bumthang	90

His Majesty visits flood affected areas

His Majesty the King flew over the flooded areas at Paro and Wangdiphodrang in a helicopter and gave instructions for carrying out relief work. His Majesty personally went to different places in Thimphu to see the relief work and consoled the people who had lost their property and relatives in the flood. Flood victims were given food and shelter in the Dzong.

His Majesty gave Rs. 20,000/- for the people of Chhubachu area alone. Shri N.B. Menon, Political Officer of India and Shri B. S. Das contributed Rs 2,000/- and 1000/- respectively.

10/15/1968

Continuous rains bring unprecedental floods causing heavy loss to life and property

Reports are pouring in from different parts of the country about loss of life and property caused by the continuous, torrential late monsoon rain and consequent floods in the beginning of the month. It is feared that damage may be very great. In addition to loss of life and animals vast areas of paddy have been washed away and large numbers of landslides have resulted in roads blockade, disruptions of communications, electricity and water supply.

Under Royal Command, all the Dzong authorities are collecting information about loss of life and property, damage to crops are land. This work is being expedited by the Home Ministry.

Thimphu hit badly

It is learnt that above the road leading from town to the Dzong the culvert was blocked by jungle scrub, tree roots and stones brought by the water. Thus a lake was formed, and under the increasing pressure of water the retaining walls, culvert and a portion of the road gave way. The roaring water in a fifteen feet high wave came rushing down, washing away the houses, roads, tents and shops that came in its way. Screaming in panic, men, women and children ran out of the houses for shelter, only to be swept away and silenced for ever by the roaring waters. About 75 houses and shops have been washed away by the flood waters.

The flood in the Dradul Imtrat Camp damaged petrol-pump, vehicles and other machineries. All the bridges on Thimphu river including one near Hospital and other leading to Dradul Makhang area have been washed away.

Due to flood and landslides, the Power House has been damaged, some electric poles have fallen, electric and water supply has been cut off and city has been plunged into darkness. Telephone communications have been disrupted.

Lives lost

It is said that seven persons have lost their lives and property worth several lakhs have been damaged or washed away. Immediate relief and rescue operation were carried out by the Royal Bhutan Police, Royal Body Guards, Royal Bhutan Army, Imtrat and Civil authorities.

Flood havoc in Paro

Water level in Paro river rose on the night of 4th October, 68. The roaring waters of the river overflowed its bank, washed away Hydel Bridge and entered Bazar area. Very soon the water was more than knee deep inside the shops and a few houses. Stocks of rice and wheat, other food stuff, cloth and other merchandise worth lakhs, kept in the shops have been spoiled.

Ten lives lost

Three bridges namely Hydel Bridge, Dzong bridge and Bongdi bridge have been washed away. Dzong bridge, the gateway to the Paro Dzong, had with stood the onslaught of floods for a long time. This bridge was decorated with beautiful paintings. The bridge at Isuna Confluence have been damaged. Ten persons were swept away in the flood. The flood waters have inundated big areas of paddy near the river bank. The standing crop was washed away and instead a layer of sand and small stones has been left in these fields by the flowing waters. Particularly heavy damage to paddy land has taken place at Shaba and Wangthanka. Due to landslides vast paddy areas in Dobshari and Juka-thang have been covered with sand and pebbles and stones.

Continue...

Continuous rains bring unprecedental floods causing heavy loss to life and property

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Agriculture farm hit badly

The Government Agriculture Farm at Bongde has been hit badly. New office-cu-laboratory building, temporary residential accommodation and road leading to the farm have been washed away. Sand has been deposited in about 3 acres area and standing crops have been damaged. This loss is estimated to be worth Rs. 2.5 lakhs. But for very effective and expeditious rescue operations and protection works, carried cut under the leadership of Acting Thrimpon and Nyerchhen, Civil and Development staff and officers, members of Royal Body guard, Imtrat and Dantak, the losses would have been huge.

Many bridges washed away

Reports are pouring in from different places about loss of life and property caused by incessant rains for three days and subsequent floods. It is learnt that besides Thimphu and Paro, bridges have been washed away at Wangdiphodrang, Bumthang, Tongsa and Shemgang causing disruption in traffic.

The Royal Family helps in rescue work

At the instance of Her Majesty, the Queen, Royal Princesses and guests joined hands with others in rescuing people and constructing bunds for protecting the bazaar. Royal Family served tea to the public and gave them solace and encouragement to face situation boldly.

The Ministers visit flood areas

The Hon'ble Home Minister, Lyonpo Tamji Jagar hastened to Paro on 11th by helicopter to study the extent of havoc caused by the recent flood and to verify the loss of life and property and suffering caused to the people. Mr. B. S. Das the Special Officer of India in Bhutan accompanied the Home Minister.

The Hon'ble Finance Minister, Lyonpo Chhogyel also left for Wangdiphodrang under Royal Command to supply ration to the flood affected local people and road labour of Dantak and to study the extent of damage done by the floods in this area.

Flood relief contribution by Police Training Team

As a gesture of sympathy with the victims of recent floods and landslides in Bhutan who suffered heavily due to natural calamity, members of Indian Police Training Team and Police Accounts Team have made a humble contribution for the relief of the victims. The Hon'ble Home Minister was requested to utilize the amount in any manner thought fit by His Majesty's Government of Bhutan. The purse was presented on 15.10.68. by Shri K. P. Medhekar, Police Adviser Accepting the purse, the Hon'ble Home Minister expressed his thanks and appreciation for the generosity shown.

10/15/1968

Flood damages in southern Bhutan

Whereas complete pictures of damage caused by the recent floods and landslides will be available only when the members of National Assembly submit their reports, but from the information already received by the Home Ministry, it is evident that the losses to property and life are heavy.

In Kalikhola, the Sunkosh (Puna Phochhu-Mochhu) overflowed its banks, entered the township and swept away many shops and 10 persons including Shri Dhan Bahadur Sherpa (Member National Assembly).

From Sibsoo report of the death of one person has been received. In Chirang 16 lives were lost and many others injured. In Dagana, irrigation channels of Ninthukha area, one of the richest and the most developed places, have been washed away and the entire area has been isolated from other places. It is said that the irrigation channels of this area were developed by the mystic powers of the walking stick of Lama Dukpa Kunley. Due to lack of water the standing crops in the fields have not matured well. The prospects of Cultivation of wheat season crops are gloomy as the water channels have been damaged.

10/31/1968

Paro Flooded

The recent heavy rainfall on October 12 and 13 flooded Paro extensively and forced the people to take refuge in the B.G.T.S. garage and the P.W.D. Club House, it is reported.

Early in the morning of October 13, flood waters from Kyichu Lakhang swept away the main road at Kyichu. The bundhs at the Dopshery Zam (bridge) leading to the Paro Hydel Station were completely damaged and the swollen river was diverted towards the town which was subsequently flooded, forcing the evacuation of the population by IMTRAT vehicles. Most of the shops were swamped under water and several persons were seen on rooftops shouting for help.

Flood waters rushed into the Royal Palace grounds in a veritable deluge. Her Majesty the Queen Mother requested the police personnel to dig a diversionary channel towards the rear side of the palace. The staff of the P.W.D., under the Chief Engineer, also came to complete the emergency task. Her Majesty is said to have expressed sincere appreciation of the help given by all.

The main bridge on the road leading to Rinpung Dzong was damaged due to cutting away of the embankment below by the heavy currents. The staff quarters at the Paro airfield are also reported to have been flooded out. The main road from Paro to Confluence was also damaged, the culverts at the Bongdey approach road being washed away. Transport communications to Thimphu was temporarily disconnected. Repair operations are already underway.

In Thimphu, a temporary diversion and a small wooden bridge has now facilitated the passage of vehicles below the damaged Chhubachu bridge on the road to the Dzong and the P.W.D. has already made much progress in the repair of the bridge. Near the B.O.D., the debris, which at places stands at some 10 feet high, brought by the flood waters from above, is being cleared away and the road opened for vehicular traffic. After the heavy rainfall, Thimphu-Phuntsholing National Highway, which was temporarily closed due to landslides at various places, was again opened to traffic on October 15.

10/21/1973

Flood Control team In Bhutan

A flood control survey team from the Government of India consisting of 13 members will be visiting Bhutan from October 15 to November 18. The team led by Mr. N. R. Pande, Executive Engineer of North Bengal Investigation Division, is expected to survey that catchment areas of Raidak and Santosh rivers with a view to erect dams and control floods in the planes of North East India, particularly areas in Assam and North Bengal. The region is threatened by floods every year during monsoon causing a lot of damage to the crops, property and disruption of communication. An Officer from the Directorate of Trade and Industries, Government of Bhutan is accompanying the team as Transport Officer cum Interpreter.

Among other places, the team members will makes trekking to various places in Chirang , Kalikhola, Ha, Paro, Punakha, Wangdiphodrang, Thimphu and Tala areas surveying and taking a numbers of photographs. After completion of their tour, the team is expected to draw up a master plan for further consideration before final implementation.

10/10/1976

Flood affects four families

Thungti river washed away shops and houses of four families at Thungti, Trashigang at 3 p.m on August 10, 1982 following a sudden flood due to heavy rainfall. However, there was no human casualties.

The flood eroded dry lands and damaged paddy fields belonging to 7 small farmers About 200 ft of road was destroyed and Thungti Motorable Bridge was also partially damaged.

On enquiry, it was revealed that gold and silver ornaments, old silver coins and many valuable things were washed away in the flood, and though relief work was undertaken the next day, no properties could be retrieved. It was assessed that the value of properties lost in the flood may go as high a Ngultrum two lakhs.

The Dzongkhag officials are seeking relief fund from the Ministry of Home Affair to rehabilitate the unfortunate and affected families.

8/15/1982

Flood hits Punakha

Punakha town is recovering from last week's flood in the market which caused damage estimated by the dzongkhag's emergency committee at more than Nu. 300,000/-.

Two shops were carried away, and three damaged by boulders, other drift material, and flood water.

On September 10, between 10.00 and 11.00 pm, the valley experienced an unusually heavy downpour from a cloud burst. Fast downhill streams were created, and these were diverted into the market area when the drainage system carrying water into the river was blocked by rough materials carried by the flood.

According to a report from the dzongda wogma, the Punakha business community started evacuating their shops and homes immediately.

Salvage work began the next day with help from the dzongkhag administration office and the staff and students of Punakha High School. The Royal Bhutan Police were put on duty.

The Mochu, which is normally feared, was reported to be normal on the night, and the disaster was confined to the Punakha market area, with the rest of the valley untouched.

9/19/1987

Bhutan and Bangladesh discuss floods

A Bangladesh-Bhutan joint team held its first meeting on flood control in Dhaka last week.

The Bangladesh-Bhutan joint team was set up after a meeting held in Paro on October 12, 1989, between His Majesty the King and President Ershad of Bangladesh.

Bhim Subba, Director, Department of Power, who headed the team of three members, from Bhutan, said that the meeting addressed various issues on flooding and possible flood control measures.

It was agreed that while total control would neither be possible nor desirable, flood mitigation and an effective warning system would bring tremendous relief to Bangladesh.

Four possible areas for joint efforts were identified at the meeting. It was agreed to explore the possibilities for establishing a system for exchange of data and information on afforestation and to improve flood forecasting and warning systems.

The delegation discussed broadly the possible areas for co-operation to be further amplified in the next round of meeting to be held in Thimphu in March.

1/21/1989

Flood control meeting held

The third meeting between the governments of Bhutan and Bangladesh on flood control and mitigation ended in Dhaka recently.

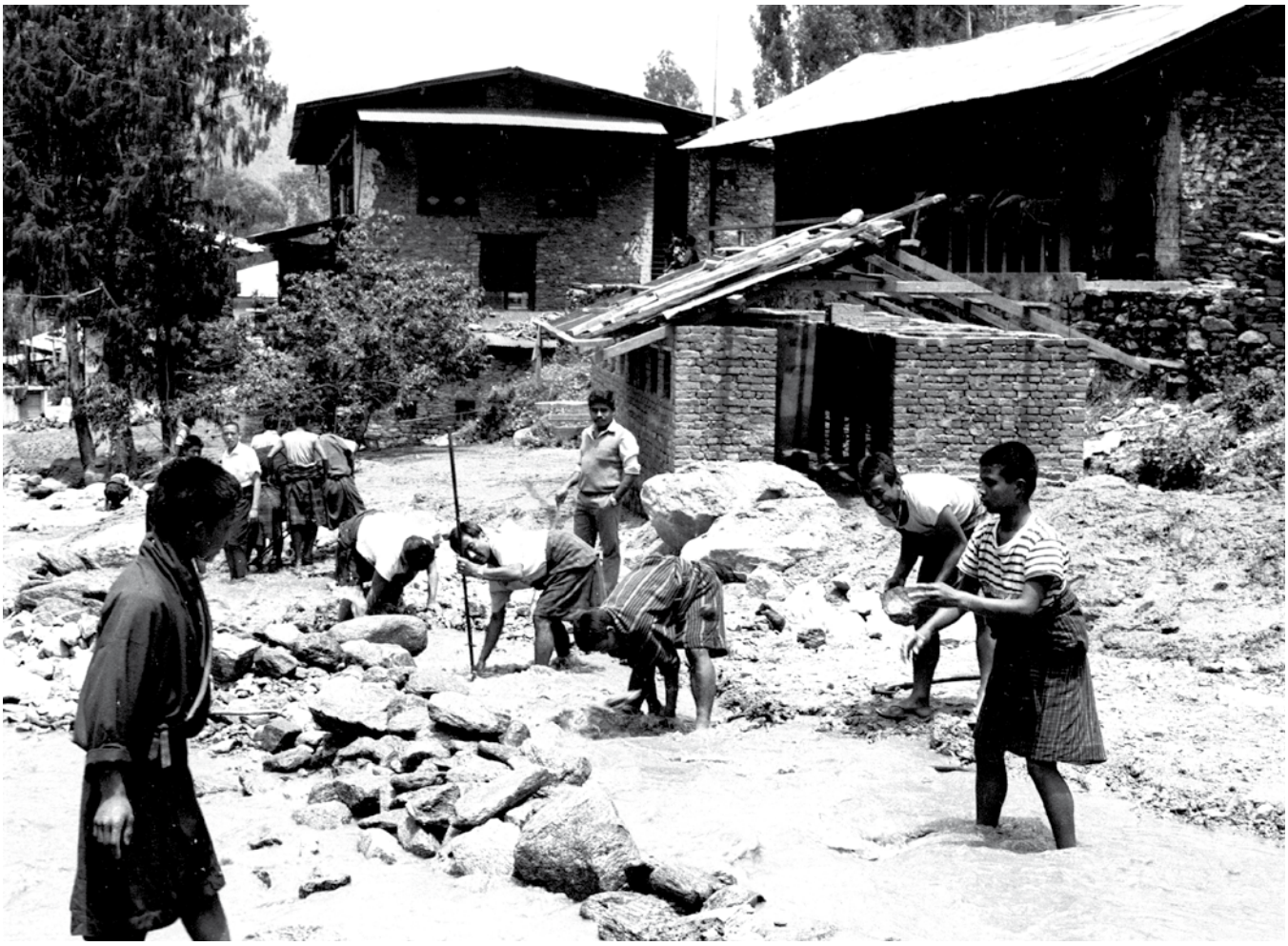
The five member Bhutanese delegation was led by the Secretary of the Ministry of Agriculture, Dasho Leki Dorji, who was also the chairman for the meeting.

According to sources from the Bangladesh Embassy in Thimphu, the delegations from the two countries finalised a paper which will be presented to the respective governments shortly.

In the earlier meeting held in Thimphu last August, the two sides discussed factors such as rainfall, earthquakes and snow melts which affect the ecological balance.

1/6/1990

Mithidang fiver overflows and floods town



The flooding or the Mithidang river flowing through the heart of Tashigang town on May 4 at 2 pm proved most unexpected and unfortunate for the people or Tashigang town.

It was beyond any ones imagination that an hours feint drizzle could cause such a heavy flood that wrecked havoc on the town and panic amongst the inhabitants.

The pandemonium was complete, with people running away with their valuables. people running around shouting frantically for their children while others still ran around trying to be of help.

The rainfall also became steadier alarming the people with premonitions of impending disaster. Fortunately everything subsided to reveal a few temporary toilets missing and some huts with minor damages. There was also no casualties, only a mess all through the town that would take some doing to cl-up.

It is assumed that some pond or lake situated above the town had overflowed resulting in the flood below, however there is nothing substantial to affirm this belief.

There had apparently been a big flood forty four years ago in the town according to the older people. His Holiness the Dudjom Rimpoche had visited Tashingang after the flood and upon requests from people fearing another such debacle, had instructed them to build a statue of Dupthop Thangtong Gyalpo facing the area of flood and also a chorten on top of the hill.

A statue was built and installed on the roof top of a house but no chorten followed. The people felt that the statue was enough protection and in course of time the whole incident was forgotten. However the past has been delved into once again and the four decades without anything unnatural existence of is now attributed to the the statue.

The next day was bright and sunny as thousands people from the town and schools cleant the debris left behind by the flood. All blockages were cleared and protection walls built. The NUDC managed to restore drinking water which had also been damaged. This saves the towns residents from walking five kilometres just to fetch water.

3/19/1990

Floods scare Phuntsholing residents

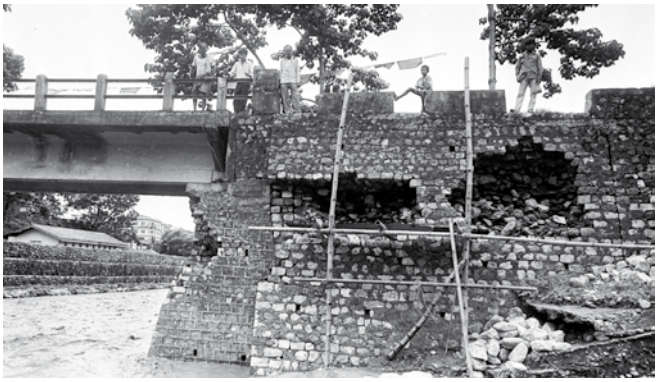
About 10 hours of incessant rain from 6.00 pm on June 2 caused the Duti Khola to flood its banks, leaving Phuntsholing town in a plight that most residents called "unbearable".

The flood originated from the river's source near Sorchen, carrying down huge trees and boulders, and destroying fields and houses, and disrupting the water line for Phuntsholing.

The town was without lights and water, and some parts also without telephone lines. All efforts were being made to restore these facilities temporarily, though the actual repair was expected to take some weeks.

A deep rumbling in the river at about midnight became frighteningly louder, and struck panic among people living alongside the river in the RICB and Chukha colonies, forcing them to abandon their apartments with their families and valuables.

People living in a shanty settlement near Norgay Cinema Hall were awoken frantically by the watchman and rushed outside to see huge surges of water cutting two concrete



units in half and carrying away two small shacks.

Logs, boulders and various other debris struck the Norgay bridge with tremendous impact, damaging the bridge quite severely and also flooding two shacks occupied by staff of the Central Water Works Commission.

"By the time I got my family to a safe distance, the water was already waist-high and the sound so thunderous that I could not even stay at a safe distance," said N.K. Rai, a staff living in one of the shacks.

Some people said that the water touched the bottom of the bridge, which is about 30 feet from the river bed. The worst hit area was the Bhutan Oil Distributors, located opposite the Chukha colony, where the flood broke a portion of the wall and entered the pump, sweeping away many oil drums and leaving behind about two feet of silt covering the entire area.

At about 12.30 am, Mr. H.V. Puri, Assistant Managing Director of Tashi Commercial Corporation, sensed some danger from the intensity of the rain, and went down to the pump to see the river slowly entering the pump.

"We tried to shift the barrels but it was useless," he said. He called the fire engines to attempt pumping out the water but that too proved unsuccessful.

"It was unbelievable," Mr. Puri said. The damage has been estimated at a few hundred thousand so far, and a bulldozer was hired to remove the silt.

Some of the victims feel that, though the flood could not have been averted, the direction taken by the river was affected by protective work done near the Norgay Cinema.

But the Thrompon, Pema Dorji, said that the channels built by Yarkay Constructions on that side had been done with proper studies and that "the channels made no difference, when such a force of water was involved."

The City Corporation had also constructed gabion walls along some of the vital areas, which were also washed away.

"With the rains continuing, we are unable to do anything concrete, but protection will be constructed on all the main areas," said the Thrompon.

6/16/1990

Flood kills two school girls in Bartsam

Two young girls died at Ramjar under Bartsam gewog in Tashigang when their house was washed away recently due to heavy rainfall.

According to kuensel's correspondent in Tashigang, the two girls Chekey Wangmo, aged 7 years and Tenzin Dema, aged 6 years, had just come back from school and were in their house when it got washed away. Their dead bodies were later recovered by the villagers.

In Ralung village, also under Bartsam gewog, the rural water supply benefitting 12 households was also partially damagedA heavy hailstorm has also destroyed the maize and potato crops in the fields.

5/18/1991

Ha Chu in flood

The Haa Chu, in spate because of consistent rain from June 12 to June 14, has caused heavy damage along its banks.

The wooden bridge near the Haa Junior High School, belonging to Lukha village, was washed away on June 13. The people said this was happening every moonsoon and was creating a big problem for them as they had their fields and cattle grazing pastures on the other side. The construction of a more permanent structure is in progress which will solve their problems, reports Kuensel's correspondent in Haa.

In Katsho, the river flowed over the embankment till the fencing of the school while in Ingo village, some vegetable fields were flooded and some temporary structures in the upper bazaar nearly swept away.

The people of Ingo village said their houses and fields had also been damaged earlier in 1989 by the river, said the report.

6/22/1991

Water pipes washed away

The water supply pipes at the Duti Khola source in Phuntsholing have been washed away by heavy rainfall on July 5.

As a result, the water supply in Phuntsholing has been disrupted. However, the City Corporation of Phuntsholing is trying to provide temporary supply of water as soon as possible. Meanwhile, the residents of Phuntsholing are collecting water from the river and streams, reports Kuensel's correspondent in Phuntsholing.

7/13/1991

Flood causes damage in Phuntsholing

The five days of rain In Phuntsh oling resulted in a heavy flood In the Chuka Hydro-power Corporation (CHC) colony on the midnight of July 2.

The Duti Khola, which was in spate from the continuous rain, had washed away the barrier walls and the spurs at different intervals, thereby diverting it's course towards the CHC colony.

The small huts around the colony were all swept away and the diesel generator, the station transformer and the station power supply plant were all disrupted. M Machineries inside the. workshop were also washed away and the store house damaged. The residents of the colony had to flee at midnight to save their lives and most of their property have been

damaged by the water.

A sweeper and his daughter were rescued by collegues after they were nearly swept away by the flood on July 3.

On the same day, the Thrompon of Phuntsholing and other officials visited the affected, site and discussed measures to be taken.

Also on the same night, another flood occurred near the Phuntsholing lower BOD but no major destructions were reported.

The flood had reportedly caused major damage in many villages in Toribari.

Residents have appealed for measures to control the flood should be taken as this was not the first time that Phuntsholing has suffered damage from floods, reports Kuensel's correspondent in Phuntsholing.

7/13/1991

Flood claims six lives

The monsoon has made itself felt in Samdrup Jongkhar when the culling houses below the vegetable market were swept away by the swollen river on July 14.

Six people were killed.

It has also been reported that the road between Deothang and Samdrup Jongakhr has been blocked by landslide.

7/18/1992

Ranjung bridge washed away

A bridge near Ranjung, 14 kilometres from Tashigang, was washed away by a flash flood In the early hours of May 5.

As a consequence, the Tashigang-Ranjung road is closed to traffic.

Besides affecting large tracts of land, the flood also carried away seven cows from the area.

Kuensel's correspondent reports that the survey camps located close to the bridge were fortunately left intact.

According to the Department of Roads in Tashigang. the bridge will be reconstructed as soon as materials arrive from Phuntsholing.

5/8/1993

Floods cause major damage in the south

At least two people were killed, many others injured, and vital infrastructure destroyed on a large scale in the south-western parts of the kingdom after about a week of continuous rain which took a massive toll in the region.

A major landslide washed away two houses in Genju village in Chukha dzongkhag, killing a 65-year old woman and a 26-year old man. Several others, who were injured in the disaster, could not be given immediate health care because the road between Genju and the basic health unit in Tala was also blocked.

Meanwhile, Gomtu and Samchi remant practically cut off from the rest of the country. The patients at the. Penden Cement Authority Ltd. hospital were evacuated before two buildings of the hospital were completely buried in a landslide.

Talking to Kuensel on an emergency wireless system, the PCAL Managing Director, Nim Dorji, said that work at the cement factory had come to a standstill and the entire population of Pagli was involved in emergency work. Damage on the factory is estimated at about Nu. 30.00 million.

Gomtu has been deprived of all basic services and communication facilities by the floods. With three transmission towers washed away, power is cut off and trucks are being used to fetch drinking water from nearby streams for the local residents. According to reports, nearby villages and communites have also been severely affected.

The Gomtu school is closed because students from Pagli could not attend classes, and the customs checkpost in Pagli was also washed away.

Sarmchi has reported that paddy fields, feeder roads. orange and betelnut orchards have suffered severe damages in the floods and a large number of livestock has been washed away, Some houses are buried under landslides and water supplies in several villages have been cut off.

An official of the dzongkhag told Kuensel that the side abutment of the Dumzang (Chamurchi) Bridge has been washed away and a 20-foot gap created between the road and the bridge. He reported that the river itself needed to be diverted from the pillar on the Chengmari side or the entire bridge would be damaged.

"We could see trees and animals being carried by the swollen Chamurchi river," he told Kuensel.

The Animal Husbandry farm in Samchi has also been cut off and several machines destroyed. Logs which were stacked at the forestry depot were also carried away by the flood.

In Chengmari, four irrigation canals were washed away along with large areas of cardamom and paddy fields. Besides numerous landslides, a UNICEF drinking water supply has been damaged.

Sibsoo also reported that all the bamboo bridges connecting the villages have been washed away. Communication to the Dorokha dungkhag is cut off.

Meanwhile, with three bridges on the Siliguri-Gauhati highway also washed away, Samchi dzongkhag and Gomtu have been cut off from Phuentsholing. The Samchi Dzongda, who had been attending the National Assembly in Thimphu, was sent by His Majesty the King to supervise emergency and relief work in the dzongkhag in the aftermath of the floods. The members of the security forces have also been mobilised to help restore normalcy in all the affected areas.

Many parts of Northern India have been severely affected by the floods, and the Indian army was called out to help repair many railway lines, highways, and bridges.

Elsewhere in the region, Kathmandu was cut off after several bridges around it and parts of a major highway were destroyed. News reports said that more than 500 bodies were fished out of the rivers in the region. Bangladesh also reported more than 80 deaths in the floods.

7/24/1993

Flood causes extensive damage in Samchi

Samchi district suffered damages worth more than Nu.60 million in the recent flood, according to the reports of an inspection team commissioned by His Majesty the King and led by the Minister of Trade and Industries, Lyonpo Om Pradhan.

The team visited all affected areas in the district from July 30 to August 3.

The Penden Cement Authority Limited (PCAL) in Pagli suffered damages valued at around Nu.30 million, according to the PCAL Managing Director's report submitted to the Minister of Trade and Industries.

The Managing Director, Nim Dorji told the visiting officials that power supply from Chukha via Phuentsholing had been disrupted because of the damage caused to three towers in Pagli by landslides. The problem was further compounded by the damage of the road used for transporting limestone from Pagli to Gomtu. Nim Dorji reported to the Trade Minister that the minimum restoration of services would cost around Nu.20 million.

Lyonpo Om Pradhan said that work to restore. the transmission line from Chukha had been undertaken on a 'war footing' and that power would be restored to Gomtu and Samchi within the next 10 to 12 days if heavy rain does not occur again. "All out effort is being made by a team of officials of the Department of Power who are working around the clock," he said.

The officials inspected the site in Gomtu where the twin hospital buildings had disappeared under sand and other debris brought by the landslide. They were informed by Nim Dorji that it would be less expensive to construct new buildings than to dig out the submerged ones. Lyonpo Om Pradhan was happy to note that a medical set-up had been established in a nearby building and that all medical supplies were available.

In Samchi town Lyonpo Om Pradhan, accompanied by the dzongda, Jigme Tshultrim, inspected the newly constructed Nu.3.5 million water supply scheme which had been damaged. A part of its pipeline had been washed away disrupting the supply of water. The dzongda told Lyonpo Om that the damage to the UNICEF-assisted water supply scheme was a big disappointment to the people of Samchi. With the new supply scheme residents had been getting water 24 hours a day as compared to two hours before the construction of the new scheme and one hour after the damage.

The dzongda informed the visiting officials that the repair of the scheme will cost upto Nu. 300,000 while another Nu 3.5 million will be required to repair the water supply schemes damaged in other gewogs of the dzongkhag.

A building of the Bhutan Fruit Preservation Factory was also affected by landslides. The management reported that around Nu. 1. 1 million may be incurred in repair and future protection works.

The Army Welfare Project Distillery was also damaged. 'The management was asked to undertake some minor protection work to save the area from further slides. The dzongda also advised protection work at the river gorge near the National Institute of Education which was partially washed away.

The visiting officials were relieved to find the Chamurchi bridge still standing because of the prompt action taken by personnel of the Royal Bhutan Army. Stone sausage walls had been erected in dangerous conditions and some of the water diverted to reduce the impact on the foundation pillars of the bridge on the Chamurchi side.

An engineer from the Department of Works and Housing assured the minister that the foundations of the bridge were intact and safe for traffic. Lyonpo Om Pradhan congratulated Lt.Colonel Singhey and his staff for ensuring the safety of the bridge.

Besides structural damages. Lyonpo Om Pradhan was informed that so far 173 families have been affected while reports of other families affected are still trickling in. Altogether 30 houses were washed away.

Dasho Jigme Tshultrim said that His Majesty the King had sanctioned generous assistance to families affected. The families have been given "army scale rations" on an individual basis. All food ration including 27 kgs of rice a month per person is being issued in the district.

The dzongda, gups and other representatives expressed their deep gratitude to His Majesty the King for the kind and generous gesture in looking after the welfare of the affected families.

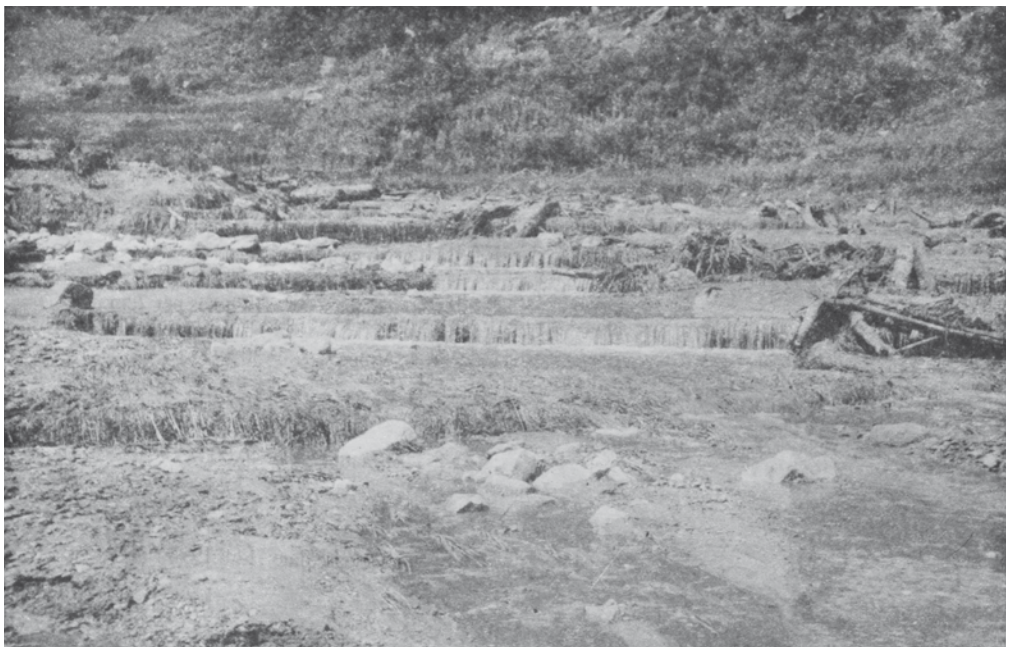
Elsewhere in the area, the officials found that the Gomtu-Pagli area was cut off from Phuentsholing because of the collapse of a bridge in Hasimara. Travellers had to be transhipped. Five transmission towers between Phuentsholing to Birpara had also been damaged disrupting power supply from Chukha to India from July 20 to August 4.

The Managing Director of the CHPC, Mr. G.N.Rao informed Lyonpo Om Pradhan that the 15-day power failure will cause an unavoidable revenue loss of Nu.30 million.

The Power Grid Corporation has been taking urgent measures to repair three transmission towers on the Indian side which were uprooted during the flood.

8/7/1993

Flash flood kills four and destroys fields



The dead bodies of three persons swept away by the flood that savaged part of Damchuna, near Drugyel Dzong in Paro, on the night of August 11 have been found.

Four persons and two bullocks had been carried away by the stream in spate which also destroyed more than eight acres of cultivated field. The search for the last body that of a 19-year-old girl, still continues.

The stream flooded its banks after an incessant downpour caused landslides at the source in Khenphu. Two huts on the bank were completely washed away along with some of the occupants. Three members disappeared from one house and a young boy from the other. The surviving members were admitted at the Paro Hospital with minor injuries.

According to survivor Gyem Tshering; " I heard a sound like thunder and the next thing I knew, me and my wife were being carried away by the stream. We were saved because I was able to cling on to the branch of a tree with one hand and to my wife with the other."

Gyem Tshering and his pregnant wife were carried several hundred yards down stream towards the Paro Chhu when he managed to grab the branch of a floating tree. They lost their only son. Of the family's five heads of cattle 'three sustained serious injuries while two were washed away.

In the other house three of four occupants, a 60-year-old man, a 19-year-old girl and a nine year-old boy, were swept away. Only a 16-year-old girl survived with a fractured leg.

The dzongda, dzongkhag officials, medical staff and personnel from the RBP and RBA rushed to the spot to help victims. An assessment of damages revealed that the flood had destroyed three acres of paddy field, four acres of dry land and one acre of potato field. A suspension bridge to Zamsa village was also washed away along with bags of potatoes kept ready for transportation.

Villagers of the area expressed concern about the bridge, the destruction of which has affected the transportation of their potatoes. They said that this was the biggest and most destructive flood that has ever

8/14/1993

Flood wrecks parts of Tashigang town

Sudden rain in the eastern dzongkhags, still reeling from a near drought situation, caused the Mithidang stream in Tashigang to flood the town on July 30 leaving in its wake damages estimated at more than Nu.10 million

According to residents, the small "devilish stream" thundered through the town in spate a few hours after midnight tearing shops and buildings and littering the lower part of the town with the dislodged debris.

The water level rose by 15 ft submerging the bridge and entering houses and buildings. By the morning, 14 buildings were damaged, 11 of them irreparably. The brunt of the onslaught was borne by the building closest to the bridge, more than half of which collapsed. All the way down to the houses alongside the dzong, the damage was severe as kitchens; verandahs and other additional structures were wrenched away from the main houses. A godown of the Army Welfare Project was also inundated and about Nu. 500,000 worth of liquor swept away.

The greater damage was inflicted on the service facilities depriving the town of water, electricity and communication. While the water tanks installed upstream had already been busted in an earlier surge, the alternative connections were washed away or buried. Electricity supply was out with the feeder channel to the generator in Chenangri damaged at its source in Bomridrang by another stream between Kanglung and Tashigang, which also flooded simultaneously. A few telephone poles were also toppled severing connections to some parts of the town.

According to Dasho Lhakpa Dorji, the Mongar Dzongda who led the rehabilitation team, the future of the town was "bleak." "One whole row of the town cannot be inhabited and the buildings are ready to fall any moment. People have shown their extreme enthusiasm to put back their town into shape but there cannot be any normalcy from now on." he said. He also expressed the people's hopelessness that none of the buildings are insured against flood.

The Secretary of Public Works Division, Dasho Dorji Tenzin, who was sent by His Majesty the King to assess the situation, was no less pessimistic. A whole hillock on the right flank of the town, he said, is in danger of failing necessitating a geological survey to determine soil formation as soon as possible.

Dasho Dorji Tenzin said that it was fortunate there were no human casualties. "The volume of the Mithidang stream rose gradually first before the main flood came thus enabling the residents to evacuate their houses."

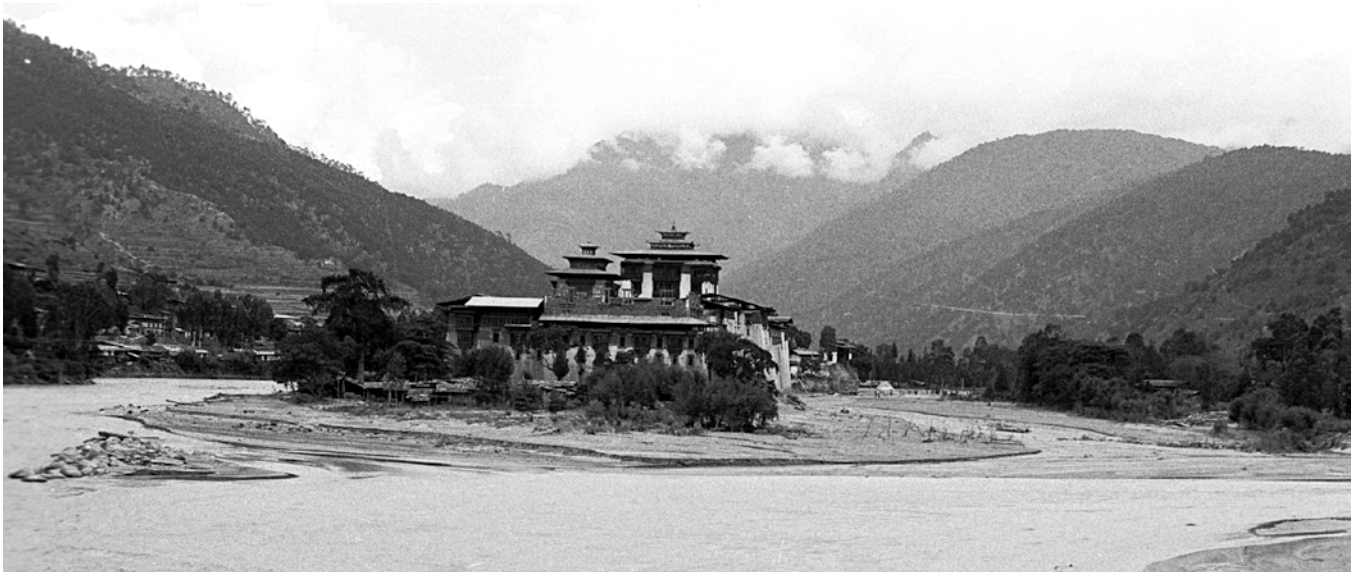
Families who were made homeless were assisted by those spared by the deluge. In a generous gesture, the project manager of the Nippon Electric Corporation, Mr. Hiroshima Nakamura, who was in the area during the flood, donated Nu. 10,000 to the flood victims.

By midweek, most of the services were restored temporarily. The road between Kanglung and Tashigang, disrupted when a bridge in Rongthong was washed away, was repaired. Bulldozers and other road equipment were deployed to remove sands and boulders from the street and to dredge the clogged basin of the stream.

His Majesty the King sanctioned Nu. 10 million for relief work in the town and for Kidu Soilra to those severely affected by the flood.

8/6/1994

Glacial flood hits Punakha



The body of a man was found and 16 people were still reported missing last evening after a sudden flash flood caused the Phochhu river to take a disastrous change in course early yesterday morning.

The Punakha Dzong escaped damage but the eastern wall of the 500-year old Dzongchhung Lhakhang, constructed by Dupthop Ngagi Rinchhen, was affected after the retaining wall fell under the force of the river. Some statues and religious objects are reported missing but the main images of the "Jhou" and Dupthop Ngagi Rinchhen are still intact.

The Tshennyi Lopon of the Central Monk Body said that this was the first damage to the Dzongchhung since its construction. The last flood in the 1950s had left it untouched.

The flood partially damaged the police complex at Dzong Phakha, the dzong's solar bathing house, the renovation camp of the dzong, the Phochhu suspension bridge,

forest plantations opposite the dzong, and paddy field along the river banks.

Eyewitnesses described the flood as a huge wall of water, loaded with boulders and trees, which crashed down the valley, uprooting and washing everything along the way. "At first, when I heard a big bang, I thought an aeroplane had crashed," said a Punakha High School teacher, "then I looked up and saw the Phochhu coming down in full force."

Punakha students who were at morning study saw a woman who was crossing a small wooden bridge near the dzong suddenly washed away. She was carried, with the bridge, to the confluence of the Phochhu and Mochhu where the bridge turned in the churning water and she disappeared.

The flash flood was believed to have been caused by a glacial outburst higher up in the mountains. According to eyewitnesses in Punakha a large pile of logs had blocked the river at the confluence and this had caused the river to rise as high as the Mochhu bridge. This made the Phochhu smash the river protection embankment above the dzong and change course.

The Punakha dzongkhag formed an emergency committee to look into the situation. The Home Minister, Lyonpo Dago Tshering, Planning Minister, Lyonpo C. Dorji, and the Deputy Minister for Environment, Dasho Paljor Dorji, rushed to Punakha yesterday to study the situation and help with relief work.

"The damage was terrible," said Dasho Paljor Dorji, "It was an incredible volume of water, and we are lucky it did not do even more damage." With the high level of water, the shops in Punakha town were seen evacuating their belongings.

With the Punakha population volunteering help, His Majesty the King commanded the Royal Bhutan Army and Royal Bhutan Police to assist in the relief work.

10/8/1994

His Majesty visits flood disaster site

On October 26, the Descending Day of Lord Buddha, His Majesty the King offered butter lamps in Punakha Dzong for the victims of the recent Punakha flood disaster. His Majesty also met with the affected families and granted them kidu soera (welfare grant) amounting to Nu. 800,000.

After visiting the damaged area around Punakha Dzong, His Majesty commanded the construction of a motorable bridge over the Mochhu to speed up work in the flood affected areas. According to the Punakha Dzongda, Dasho Thinley Yoezer, the 100-metre bridge will be constructed at Changyul, about 800 metres upstream from the present dzong bridge. It is estimated at about Nu. 12.5 million and is expected to be completed by May next year.

Inspecting the temporary protection for the Dzongchung, the river training work, and the embankment of the Phochhu, His Majesty commanded the Public Works Division to start the construction of a permanent protection for the Dzongchung and a natural barrier to prevent the Phochhu from changing its course. Instead of an artificial embankment, a landfilled hillock, with trees planted on it, will be developed in the area between the Phochhu and the Dzong to form a natural protective barrier.

His Majesty the King met with the soldiers of the Royal Bhutan Army and commended them for their role in the relief work after the flood. His Majesty said that the Royal Bhutan Army had always come forward to assist the people in emergency relief work.

The Phochhu was diverted to its original course on October 25 with the use of bulldozers and strenuous labour, according to the Punakha Dzongda.

10/29/1994

Experts recommend flood-prevention measures

After a month-long preliminary survey of the Lunana lakes, a team of Bhutanese geologists, environmentalists, and officials from several government organisations have recommended measures to avoid flood disasters like the recent flood in Punakha caused by a glacial outburst.

The report pointed out that, out of five glacial lakes surveyed, two on the sources of the Phochhu - Raphsthreng Tsho and Thorthormi Tsho - were "vulnerable to instability" and "seem very dangerous at the moment".

Measuring 2,500 metres by 1,300 metres with a depth of 90 metres, the moraines damming the Raphsthreng Tsho, which contained about 123.8 million cubic metres of water, was drastically weakened. The southern flanks of the Thorthormi Tsho was also eroded by the recent flood.

The report suggested several preventive measures. A glacier expert and a hydrologist to conduct a detailed investigation of the two lakes; two watchmen to be appointed to monitor the lakes and to provide advance warning of danger. A wireless system has already been installed at Thanza village linking Punakha, Wangduephodrang and Thimphu.

The report stated: "The wireless stations at Punakha and Wangduephodrang should remain open round the clock, especially between May and November, for instant communication from Lunana since any lake outburst would take about seven hours before the flood reaches Punakha and Wangduephodrang."

Other recommendations included efforts to release the hydrostatic pressure on the weakened dam of Raphsthreng Tsho by siphoning out its water, building appropriate river protection work in Punakha and resettling some Lunana villages to safer areas.

The last flood had affected 91 households in Lunana. Twelve houses were damaged and 964.74 acres of pasture lands covered with sand and silt or washed away together with 816 acres of dry land. Yaks, grains, bridges, water mills, chortens and a temple were part of the toll.

The report pointed out that the cause of the last flood was a partial outburst of Lugge Tsho, located on the eastern tributary of the Phochhu. Its morainic dam reportedly had failed because of powerful hydrostatic pressure exerted as the melting of the ice increased the water column in the lake.

Continue...

Experts recommend flood-prevention measures

Continue...

When Lugge Tsho gave way it had also washed away another lake called Tshopdak Tsho which was lying immediately below. The total depth of water discharged from Lugge Tsho on October 7 flood was calculated at 23 metres.

The report pointed out that the existence of risky lakes in Bhutan was known for quite some time.

Joint studies of the Lunana lakes by the Geological Survey of Bhutan and Geological Survey of India in 1984 and 1986 had recommended "photogrammatic surveys" to be conducted to record the annual glacial retreat and monitor seepage after every two to three years. In 1993, some geologists from the Division of Geology and Mines had also highlighted the risks of glacial lake outbursts in the major rivers of Bhutan.

The present survey was conducted by a multi-disciplinary team consisting of representatives from several government divisions, environmental experts, and the Punakha dzongkhag, between October 10 to November 8.

11/26/1994

Geological expedition

The government has launched a special expedition of Bhutanese and Indian geologists to assess the threat of another flood from lakes and glaciers in the Lunana mountains.

The expedition comes in the wake of the flash flood in Punakha last October when melt water from glaciers caused one of the lakes in Lunana, the Lugge Tsho, to burst its natural seams. The flood washed away 12 houses and left nearly 1,800 acres of pasture and agricultural land covered in sand and silt. Yaks, grain, bridges, water mills, chortens, and even a few human lives, were other casualties of the flood which swept down river, along the Phochhu, into Punakha.

The expedition, which includes eight other members representing Bhutan, was seen off on June 15 by the Home Minister, Lyonpo Dago Tshering.

"The Lunana lakes have a history of causing occasional flash floods down into Punakha," said Lyonpo Dago Tshering, "We feel there is a need to learn and understand more about the region if we are to live harmoniously with it."

Members of the expedition told Kuensel they will camp around the glaciers for a month carrying out technical studies to determine the stability of the barriers around the lakes, the slope of the river valleys, and the general movement of the glaciers in the area.

"The objective, eventually, is to come up with proposals designed to reduce the danger of another flood from the region," said the leader of the four-member Indian team, Mr. Deepak Shrivastava.

Senior Geologist Yeshey Dorji, who heads the Bhutanese team in the expedition, said two lakes in Lunana were potentially dangerous, the Rakshathreng Tsho, and the Thorthormi.

The natural barriers of the two lakes had been partially weakened by last year's flood, he explained.

Water had also been seeping gradually out of the Rakshathreng Tsho, which, at 2,500 meters long and 1,300 meters wide, was much bigger than Lugge Tsho.

While the geologists will present their formal recommendations only after their return to Thimphu, a similar expedition of Bhutanese experts last year has already suggested that excess water could be artificially siphoned out of the lakes to ease the pressure on their natural barriers.

The earlier expedition also suggested establishing a wireless link between Lunana and Punakha as an advance warning system in the event of another flood.

The Lunana glaciers have caused two other floods in recent memory, both along the Phochhu. The first, lasting about 24 hours, in 1950; and the second, for five days in the summer of 1960.

Experts have pointed out that such floods are a natural phenomenon for Bhutan's geographical and climatic set up, describing it, even, as a "fixture of Himalayan history."

6/17/1995

Punakha flood caused by 2 lakes, say geologists

The Indo-Bhutan expedition of geologists to the Lunana glaciers returned to Thimphu last week after completing a two-month study to assess the risk of another flood from the lakes in the region.

While the details of the study are to be submitted later in a formal report to the government, the members of the expedition spoke to Kuensel about their general findings.

The team found that last October's flood in Punakha had been caused not by one but two lakes. They found evidence that while the flood had started from a breach in one of the larger lakes in the area, the Lugge Tsho, a considerable amount of water had also come from another lake downstream, the Tshopda Tsho.

The geologists found fresh deposits of sand and silt at the rim of the Tshopda Tsho indicating that the lake had accumulated a depth of about 10 meters before the force of the water from the Lugge Tsho broke it open. A seasonal lake, the Tshopda Tsho was reduced to a dry basin in the aftermath of the flood.

The geologists also studied the movement of the glaciers in the area, comparing their observations with data collected from a previous study in 1984. They found that the glacier body around the Raksha Threng Tsho, the largest of the Lunana lakes, had receded by about 200 meters over the last decade. The team said this indicated that much of the ice had melted into the lake, increasing its volume.

The team also found exposed "dead ice", large chunks of unmelted ice that have broken loose from glaciers and settled among moraines- the rocks, boulders and general debris typical of glacial regions.

The geologists explained that such ice usually posed little risk of a flood. However, if the dead ice lay buried under the moraines that formed the lake barriers, there was a danger that it could melt beneath the rocks causing the barriers to "slump". Such a lowering of the lake barriers could release a large volume of water from the lakes, which could cause a flood.

Making an overall assessment of the region, the geologists pointed out that the risk of another flood in the near future seemed improbable even though conclusive predictions could rarely be made for such studies.

"There appears to be no immediate danger of a flood if the weather and other natural conditions in the area remain stable," an expedition member said. "However, floods can also be triggered off by natural disturbances like avalanches, heavy and incessant rain, severe earthquakes, or the erosion of the barriers around the lakes by water from other lakes upstream."

The government launched the expedition in June in response to the flash flood which hit Punakha last October after melt water from glaciers caused the Lugge Tsho to break its natural dams.

The Bhutanese team in the expedition was headed by Senior Geologist Yeshey Dorji of the Division of Geology and Mines. The Indian team was led by a glaciologist from the Geological Survey of India, Mr. Deepak Shrivastava. Mr. Shrivastava was a member of the fifth expedition of Indian scientists to the Antarctic.

8/26/1995

Flood forecast

A three-member delegation for the Central Water Commission, North East Regional Office, India, met with officials of the Hydromet Division under the Telecommunications in a coordination meeting on October 19.

"With the assistance of the Indian Government, about 13 hydrological stations have been constructed in the country along different river banks," said the Acting Director for the Telecommunications, Sangay Tenzin.

The objective of the scheme was to have a common information network for flood forecasting and hydrological data.

"The advantage is that, because Bhutan and India share many rivers, flood forecast could be intimated to India 12 to 24 hours earlier, thereby saving millions in lives and property," said the Chief Engineer, of the Central Water Commission of the North East Region, Mr. S. B. Bhargana

10/21/1995

Flash flood in Lhuntsi

Three irrigation channels were washed away and several acres of wet and dry land and three houses damaged last week when a flash flood hit Changzam village in Dungkhar gewog, Lhuntsi.

No people were harmed.

Heavy rain over seven days caused landslides along the course of the Tonga Rongchu obstructing the flow of the stream.

The water overflowed down the steep incline of the source causing the flash flood, said a dzongkhag official.

"A team from the dzongkhag had gone to the site of obstruction to inspect further calamities, and found no danger," he said.

7/15/1995

Preventive measures against flash flood

After a thorough study of the lakes in the Lunana area following last year's flash flood, the joint Indo-Bhutan geological team has, in a report, suggested future control measures.

Engineering Geologist, Yeshi Dorji, who headed the Bhutanese team said, "We surveyed the depth of the lakes, mapped the barriers and its rate of permeability to hold water, assessed the hydrostatic pressure (water pressure on the walls of the lake) developed behind the barriers and fixed stakes to measure the rise in water level."

A comprehensive report by the team suggests short term measures like the management of active landslides in the Tshopda Tsho - Thorthormi Tsho complex; construction of dykes, check dams; partial draining of the Raphstreng Tsho; and the construction of dykes and check dams in Thanza-Tshoju area.

Yeshi Dorji said the aim is to allow a free and steady flow of the water downstream through small outlets and to restrain hydrostatic pressure within safe limits. The dykes will prevent erosion in the surrounding barriers and channelise the waterway.

"Raphstreng Tsho has an extremely dangerous volume of water measuring up to 26 metres from the river bed to the lake surface, which we are hoping to bring down to about 15 metres by resorting to the different measures," he said.

According to reports, Raphstreng Tsho is prone to ice avalanches, the surge of which could damage the rim and cause spill-over of water.

Plantation along the slopes, regular monitoring of the lakes, seismic and micro-climatic observations are recommended as long term measures.

Relocation of human settlements have also been suggested to avoid the likely dangers of floods.

However, the Punakha Dzong, which cannot be relocated because of logistics and its historical significance, required special protective methods like embankments and dykes along the river bed.

The team has also suggested that the closest wireless station in Lhedi, which is a five-hour walk from the lake area, be relocated to Thanza.

"The wireless station in Thimphu is also kept open 24 hours to receive reports on the situation," said Yeshi Dorji.

The joint team of 13 members were in the Lunana area conducting the studies in July-August this year. They submitted their findings in a report this week.

12/9/1995

Bhutan reduces risk of floods

The risk of flash floods in the Punakha-Wangduephodrang valleys and their impact on the Indian plains from glacial lake outbursts in Lunana, will be greatly reduced, according to the Home Ministry.

An Indo-Bhutan team of geologists, engineers and hydrologists from the Geological Survey of India (GSI), the Water and Power Consultancy Services India Ltd., and the Divisions of Geology and Mines, Public Works, and Survey of Bhutan will leave tomorrow for Lunana, along with about 300 workers, to carry out flood control work on the Rakshathreng Tsho.

The team will be in Lunana until early October to drain water from the lake using 30 pumps and to construct auxiliary spillways for water to flow out, said senior geologist Yeshey Dorji. There will also be survey work done simultaneously.

The project is a follow-up of recommendations by a joint expedition of Bhutanese and Indian geologists last year. ***Continue...***

Bhutan reduces risk of floods

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Measuring about two kilometres long, one kilometre wide and 107 metres deep the Rakshathreng Tsho is seen as a potentially risky lake. A 1994 flood weakened the natural barriers of the dam which are likely to burst open in the event of an earthquake or high pressure, Yeshey Dorji said.

He added that there was no imminent danger of bursts in the other lakes in the area, the Lugge Tsho and the Thothormi, but constant monitoring was needed.

As a precautionary measure wireless equipment has been installed in nearby Lhedi from where warnings can be sent if at all there is a flood.

The lakes are located at an altitude of about 4,500 metres above sea level but work is expected to run smoothly as temperatures in summer range from near 20 degrees Celsius during the day to just a few degrees below zero at night. Yeshey Dorji claimed the thermometer had once peaked at 31 degrees one July afternoon last year.

However, by late October the whole area will probably be ice-bound.

A news release from the Home Ministry said phase two of the project, during which speed-breakers will be built and constructions reinforced, will begin in April or May next year.

6/22/1996

Floods wreak massive destruction in the southern dzongkhags

The security forces in the southern dzongkhags were mobilised into intensive rescue operations this past week as massive floods and landslides claimed the lives of at least 14 people, damaged crops and property, killed livestock, and washed away roads to all other parts of the country.

Sarpang town was devastated by the rain which, according to the Meteorology Division in Thimphu, was the heaviest rainfall recorded since 1974. A spokesman for the Division said that Sarpang and Gelephu recorded rainfall of 234.3 mm on July 12 and 393 mm on July 13.

In the early hours of July 13, nine members of a family and a pujari (Hindu priest) were buried alive in a landslide in Kharkhola village. The family of Dhambar Singh Tamang had invited the pujari from the neighbourhood to perform a ceremony for a sick child. The ceremony was in progress when the landslide struck the house at about 7.00 am in the morning. While four of the guests and some of the family members escaped the victims, mostly children and women, were caught in the slide.

Meanwhile, Sarpang town has been surrounded by water as the Sarpang khola changed course and surged towards the town, washing away 18 wooden structures, a Hindu temple, and an Army Welfare Project office and bonded warehouse.

Security troops worked round the clock to evacuate people and protect the abandoned property on the "island" town from looters and other miscreants. According to a security officer people had to be physically restrained to stop them from trying to swim back for their belongings.

With the town cut off, more than 340 people have been evacuated to the RBA club house where they are being provided with food, shelter, and medical treatment. The number of people rendered homeless increased over the days, said a security officer.

From the morning of July 18 local businessmen and security forces were able to cross the Sarpang khola and remove all the belongings from the shops in Sarpang town.

Supplies were reported to be running short with the dzongkhag cut off from Gelephu by the swollen Bhur khola and Dol khola and from Thimphu because of landslides along the highway.

Houses in the lower parts of Gelephu were also flooded and Dhanabari was the most affected area as the Mao khola and Kali khola rivers overflowed, destroying fields and property. Security troops rescued a stranded family of five members by boat.

The town's water source was disrupted, causing a shortage of drinking water, a dungkhag spokesman told Kuensel.

In Phuentsholing, the Bhutan Ferro Alloys and the Bhutan Chemical and Carbide Ltd. factories in Pasakha were shut down while security forces evacuated residents of the area to a temporary camp nearby. The Pasakha bridge was washed away and the flood also destroyed power and telephone lines and other infrastructure, according to reports.

"His Majesty the King himself commanded that the security forces be responsible for rescue and relief operations," the Chief Operations Officer of the RBA, Goongloen Lam Dorji, told Kuensel. "The troops have done everything they can, even risking their lives to save people, livestock, and property."

His Majesty also instructed the dzongkhag officials and the security forces in the affected areas to help flood victims and to provide them with all necessary assistance.

From other dzongkhags

Other dzongkhags around the country also reported damage as a result of heavy rain. ***Continue...***

Floods wreak massive destruction in the southern dzongkhags

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A man was buried and killed on the spot when his hut collapsed under a landslide in Bartsham, Trashigang, on July 13. According to a health worker at the Bartsham Basic Health Unit, the man had died from suffocation and head injury. His 50-year old wife sustained some broken ribs and serious head injury while another 16-year old boy fractured a thigh bone.

On the same day, a 26-year-old woman in Orong gewog of Samdrup Jongkhar was swept away by the Remung stream. The woman had been on her to way to the maize field when she slipped off the bridge and fell into the stream.

The drinking water supply in Mongar town was washed away and that of Pemagatsel damaged.

Road report

Besides damage to life and property, most of the roads have been badly damaged by numerous landslides, according to a report from the Public Works Department.

The Tshokhana road block, on the Sarpang-Wangduephodrang highway, was cleared yesterday and the blocks at Dil khola and Bhur, between Gelephu and Sarpang, will be cleared by July 21.

A PWD spokesman said that the road blocks between Sunkosh and Dagana, however, would take a minimum of three weeks because a bridge was washed away at Ambikha. The road is blocked between Phaparkheti and Pana khola, between Khagochen and Daga Dzong, and several other places.

The Zhemgang-Gelephu highway was also blocked in several places. A landslide at Wangdigang and another between Mangdechu and Zhemgang have been cleared and a third at Kartigang will be cleared today.

The PWD announced that light vehicles can move on the highway between Ura and Mongar, the landslides between Mongar and Trashigang were cleared yesterday, and the Mongar-Lhuntshi highway will be clear from today. The road from Duksum to Trsahiyangtsi is now open to heavy vehicles.

The Thimphu-Phuentsholing highway, the busiest in the country, saw intensive repair work during the past week. The landslide near Chasalakha has now been cleared and the more serious block at Sorchen was open to light vehicles yesterday and will be open to heavy vehicles on July 22.

The Deputy Minister for Communications, Dasho Leki Dorji, told Kuensel that the Roads Division had mobilised machinery and manpower and every effort was being made to clear all landslides and other road blocks on the highways and district roads for the convenience of the general public.

7/20/1996

Flash flood shuts down major industries in Pasakha

After a flash flood washed away more than Nu 30 million worth of raw material and landslides damaged parts of the factory complex on July 13, the Bhutan Ferro Alloys Ltd. (BFAL) in Pasakha is well on its way to normalcy.

Power lines to the factory have been restored, a temporary water supply installed and the road to the factory cleared, according to the management. Employees, who had fled from the housing colony after the Barsachu river, in spate, flowed over the Tala Bailey bridge, have also returned.

The Barsachu river has been diverted to its original course through the construction of temporary bunds and two high tension towers, which were under water, now stand on dry land. The power cables from the Chukha sub station, on the opposite bank of the river, have also been fixed.

A temporary bridge connects the partially washed away factory bridge, near the sub station, and a temporary 900 metre road now extends upto the part of the road towards the housing colony that was not washed away. A deep gap of 100 metres still remains.

"Mopping" operations within the factory have been underway since July 18 and 1,500 metric tonnes of the factory's finished product, Ferro silicon, is being carried out manually through the 900 metre road.

Despite the progress, which a senior executive said was the result of close cooperation and combined effort of the Tashi Group of employees, BFAL still has a long way to go.

Two acres of its surrounding complex still remains buried under sandy stone debris, ranging from four feet to 40 feet, which has covered the main raw material feeding point. The inner hall housing the main furnace is also submerged under two feet of alluvial slush.

Continue...

Flash flood shuts down major industries in Pasakha

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Six contractors have taken up the restoration work while the company staff are working day and night shifts on the mopping.

The BFAL's Executive Director, Tobgyal Dorji, said that ten key affected areas of the factory were being looked into. These involve the strengthening of power cable towers, the building of bunds and the removal of tonnes of debris. A dirt track road, less than a kilometre, is also nearing completion. This road, towards the Tala bridge, will make the factory completely accessible.

"Damage to the machinery, under the debris, will be difficult to estimate now, but much of the imported machinery has a warranty period, which means some of the machinery may get replaced. We also have back ups and spares in stock," said Tobgyal Dorji.

Besides the cost of undoing the damage, the factory is also suffering heavy losses because of the disruption in operation.

BFAL, which produces about 41 tonnes of Ferro silicon a day, loses approximately over Nu16 million in backlog production in a fortnight. This excludes a by-product, micro silica, about 10.5 tonnes of which is produced a day and is valued at an average of Nu 900 per tonne. Also, 200 tonnes of micro silica, used as an additive in the manufacture of concrete, was carried away by the river.

The Bhutan Carbide and Chemicals Ltd. (BCCL), was also affected in the nine days it was shut down. It suffered losses of Nu 0.4 million a day in profits. Of this Nu 120,000 goes to the government as corporate tax, according to a senior BCCL manager. BCCL produces about 75 tonnes of carbide a day.

Although water did enter the BCCL factory, damage was minimal and it switched on its main furnace on July 22. The management claims it has furnace oil and other essentials to last for 12 days.

As immediate preventive measures at the BCCL, three temporary walls of sand bag bunds protect the factory, with one wall separating BFAL and BCCL which share the same complex. "The idea is to protect BCCL, lest another flood comes," said a BCCL employee.

Both the BFAL and the BCCL cannot make claims for insurance although the BFAL pays an annual premium of Nu 3.6 million and BCCL, 1.7 million. "The two factories are insured only against fire, earthquake, riots, strikes and security but not against floods," said an RICB officer.

7/27/1996

Maokhola poses threat but river protection is difficult

The National Assembly debated the feasibility of river bank protection work for the Maokhola river in Gelephu, highlighting the need and the difficulties for such a massive project.

The Gelephu chimi reported the views of the people of Gelephu and Sershong that Gelephu, with its fertile fields, could become the rice bowl of the country. But much of this land had been rendered barren by the river.

"The Maokhola has damaged extensive portions of arable land," he said. "About 1,000 acres have been lost this way. Without protection work it could even head towards the town."

The Sarpang Dzongda agreed that a large stretch of fertile land was being ruined by the river. He said that the monsoon rains left tracts of land covered by stones and debris. The threat to Gelephu town was very real, he said.

A reforestation programme by the forestry sector and some flood control measures had protected the fishery project and the town in the past, he added. Last year two water pumps had also saved valuable land in Lodrai.

The PWD Secretary, Dasho Dorji Tenzin, said that although the river did destroy much of the agriculture land in Gelephu and Sershong and posed a greater threat in the future, it would be too expensive to control the river. "The area receives between 4,000 to 5,000 mm of rainfall, most of it in July and August," he said. "But data on hydrology, river flow characteristics, and processes of mass movement of sediments and siltation are not available."

He said that such data and geological mapping of the area was necessary to form a long term river protection plan.

The Deputy Minister for Agriculture, Dasho Khandu Wangchuk, informed the Assembly that Sarpang dzongkhag had proposed two river protection works: two kilometres along the Maokhola and one kilometre in Deorali gewog, estimating a financial outlay of Nu. 450,000.

He said that the Ministry, with considerable experience in irrigation and river protection work, had decided that it was futile to make "piece-meal" efforts at river protection for a number of reasons.

Dasho Khandu Wangchuk said that, because the volume of water was increased dramatically by the rain, causing flash floods and changes in the course of rivers, even river protection work was buried during the monsoons. He pointed out that a pump house of the Area Development Project had been buried under debris by a normally small stream.

When the river changed course, the protection work was useless, he said. It was because of this that the Taklai Irrigation Project had to construct new intakes and protection work every year.

The Deputy Minister said that it was true the river had damaged agriculture land, but not 1,000 acres as reported by the Gelephu chimi. Currently the Maokhola had a wide bank and was not a major threat to agriculture land which was at a higher elevation.

For river protection work to be effective on the Maokhola, Dasho Khandu Wangchuk said that the proection was needed for 10 kilometres, on both sides, up to the Indian border.

The Deputy Minister quoted the Area Development Project and the Taklai Irrigation Project as examples of major projects which did not work. The former was taken up in 1978 and terminated in 1986 after a total expenditure of Nu. 25.11 million. The Taklai project was taken up in 1983 and terminated in 1990 after spending US $ 4.2 million.

"As all the members are aware, the Taklai project was severely damaged by the local people of Taklai, Lalai, and Dhanabari in 1992 before they emigrated to Nepal," said Dasho Khandu Wangchuk.

The Deputy Minister also pointed out that numerous institutions and experts who studied the behaviour of the Maokhola had said that it was, technically and economically, not possible to control the river and its tributaries.

"When so much financial and technical imputs from the government of India and the UN agencies could not protect irrigation channels from small streams, it would not make any sense to try and harness the Maokhola river," he added.

Summing up the discussion the Speaker, Dasho Kinzang Dorji, said that because of the difficulties in trying to control Maokhola, it was more practical to continue the reforestation programmes in the catchment areas and along the banks of the river. The issue should be taken up in detail in the Eighth Plan discussions for the dzongkhag, he said.

6/28/1997

Flood control

As part of the flood preventive work in Lunana, water is being released from the Rakshathreng Tsho into the Pho Chhu to facilitate widening of the canals between the lake and the outlet.

The project has warned that this is likely to increase the river level. The Home Ministry is, therefore, discouraging people living downstream from attempting to cross the Pho Chhu until mid-October.

The first phase of the project was completed last year at a cost of about Nu 25 million.

8/30/1997

Second phase of flood preventive work at Lunana underway

A 400-STRONG labour force set to work on the second phase of flood preventive work at the Raphstreng Tsho (lake) in Thanza, Lunana, on August 10.

According to an official of the Home Ministry the main task during this phase is to reduce the water level by a metre and widen and deepen the canals between the lake and the outlet to protect the lives and property of people downstream, in Bhutan and in India.

The work is supervised by a Project Engineer from the Public Works Division while geological aspects are being looked into by experts from the Division of Geology and Mines. Labour camps have been constructed and communication links installed.

Wireless stations have also been set up at the site, at Gasa and at Laya, according to the official, Dechen Tsewang. The project is making use of an army wireless station at Taktsimakhang with two-way radio communication facilities at the site.

"Unlike other projects that can be implemented at any time this project has had to wait for the sumner months," said Dechen Tshewang. "At an altitude of 4,500 metres above sea level, subzero temperatures and glacial freezing make the entire area ice-bound by late October."

He also pointed out that another major constraint was that tonnes of equipment and material for the 400 workers, who worked almost always in kneedeep water, had to be carried uphill for 10 days from the nearest motorable road.

The "mitigatory work project" is funded by the government with a budget of more than Nu 10 million and with labour contribution from the various dzongkhags including Punakha, Gasa, Wangduephodrang, Thimphu and the east.

The first phase of the project was completed last year at a cost of about Nu 2.5 million.

Measuring about two kilometres long, one kilometre wide, and 107 metres deep the Raphstreng Tsho, otherwise called the Rakshathreng Tsho, is considered a potentially dangerous lake that could cause flash-floods in the event of excessive pressure on its natural barriers.

8/23/1997

MTI takes over Lunana flood project

HAVING completed the Lunana flood mitigatory project that stretched over more than two years, the Home Ministry officially handed over management of future works in the area to the Ministry of Trade and Industry (MTI) on November 24.

Flood control measures at Lunana started in July, 1996, had been implemented in two phases with technical support and financial assistance of about Nu 50.0 million from the government of India.

Within this time the water level of the Raphstreng Tsho, the largest of the Lunana lakes, was lowered by four metres while the lake's outlet was broadened and deepened.

According to the MTI's Division of Geology and Mines (DGM), the transfer, of work had been necessary because the DGM was felt to be the most qualified government agency to take up future technical work and geological surveys.

Also, following a "desk top" study of the Raphstreng Tsho area by two Austrian consultants in March this year, a recent proposal by the Austrian government for additional studies in Lunana was felt to be mostly geological in nature.

The DGM's immediate plan is to implement a Glacier Lake Monitoring Programme that will study and collect data in Lunana and monitor the area to suggest mitigatory measures. The Austrian government has pledged about Nu. 8.0 million for the monitoring programme.

Foremost in the programme agenda is a study to determine if there is any seepage of water from the Thothormi glacier into the Raphstreng Tsho below and to study the behavioural pattern of the glacier, according to Dorji Wangda of the DGM. If increasing global warming succeeds in melting the glacier wholly it would form a lake twice the size of the Raphstreng Tsho.

"The natural barrier between the glacier and the lake could then burst forth," said Dorji Wangda. "Consequently, the barriers of the Raphstreng Tsho would burst as well, resulting in a GLOF (glacial lake outburst flood)"

Hence the data collected from the monitoring programme over the next one year will be studied by experts in Austria before preventive measures can be recommended.

11/28/1998

Flood damages paddy fields in Gelephu

With the Sethey Chhu in spate because of the heavy rain and substantial paddy land washed away farmers in Sethey Kherey, Gelephu, are now looking at prevention measures upstream where stone quarries might have exacerbated the risk of floods.

In June floods damaged a part of the road to Lodrai and an estimated 50-60 acres of paddy land has now become a river bed of sand and gravel. Sethey Chhu has diverted from its original course and moved about 100 yards towards Lodrai, flowing right through the damaged area.

Sand and gravel debris carried by the river has affected stretches of paddy land on either side. "It is getting worse and, if nothing is done, the future will be disastrous," said one farmer.

Farmers in the area believe that the extraction of boulders from the catchment area upstream since 1996, which has been stopped for the past year, is the cause of the problem. A privately-run stone quarry, shut down two years ago, had also operated in the same area for two years. Farmers say that a river training wall they had built years ago had been destroyed and the stones taken out.

"Without stones loose sand and gravel raised the river bed, leading to floods," explained one local resident.

Dungkhag officials, however, explain that the last season's unusually heavy rainfall, which continued for six months, and this year's heavy showers led to the floods. "But the extraction of boulders could have made the area more vulnerable," an official said.

Older residents recall that Sethey Kherey has always been prone to floods. "At one time I remember evacuating people from the area because of a flood," said a retired dungkhag official.

Officials and farmers are now looking at the prospect of building protection walls upstream and reforestation of the flooded areas.

8/28/1999

Five feared dead in Trashiyangtse flood

Trashiyangtse dzongkhag officials, police and the public were still searching yesterday for the bodies of a mother and her four children who were washed away by a flash flood around midnight on September 2.

The flooded Kuktorgangchu (also known as Tshalingchu), an otherwise small stream on the way to the Bumdeling Black-Necked Crane Sanctuary, washed away one house and two huts, some cattle and destroyed about 11 acres of land, including nine acres of paddy field belonging to farmers in four villages.

Forty-eight year old Choeki Wangmo of Gongsaphangma village in Trashigang, and her two sons and two daughters, studying from classes II to VIII at the Trashiyangtse Junior High School, were apparently asleep in their one-storey house, a kilometre from the Trashiyangtse town, when the flood struck.

The husband, a forestry employee working at the Bumdeling park, was away in Phuentsholing on official work.

The occupants of the nearby huts, farmers from nearby villages who were tending to their paddy fields, were able to escape after they heard "thunderous" sounds of the oncoming flood.

The Trashiyangtse dzongkhag, assisted by local businessmen, people from nearby villages and the Trashigang police, launched a search for the missing persons starting early morning on September 3.

The banks of the Kholongchu at Tsarzam, Tsergom, Doksum, and the Dangmechu at Chagzam and Sherichu, 45 kilometres downstream, were combed for nearly a week only to find broken furniture and pieces of cloth.

Back at the ravaged site of the flood, the course of Kuktorgangchu was diverted and the site of the house stood excavated for four days.

"Although we're not expecting much, we have not given up," said Trashiyangtse Dzongda, Lham Dorji. "Maybe we'll be luckier when the water level recedes."

Meanwhile Choeki Wangmo's husband and four surviving children, who live outside Trashiyangtse, are conducting death rites for the lost family. The dzongkhag organised butter lamps and prayers for the deceased and gave Nu. 1,000 each to the hut owners. The Forestry Services Division gave Nu. 20,000 to the husband.

While the property loss is yet to be assessed the Trashiyangtse dzongkhag estimated the value of the huts at Nu. 90,000.

The Kuktorgangchu had flooded twice in the past, the one in 1986 washing away a bridge in its wake. Villagers in the locality reported that the present flood had begun from the stream's catchment area among the fir forests, not by the bursting of an irrigation channel upstream as initially feared.

"There is nothing but boulders the size of houses, uprooted trees and pebbles in the huge path carved out by the flood," said Chado Tshering, the Bumdeling park manager.

9/11/1999

Flood victims not found

More than two weeks after a flash flood in Trashiyangtse swept away a 48-year-old woman and four of her children, the bodies of the victims have still not been found.

Although the search continues for the bodies of Choeki Wangmo, as well as her two sons and two daughters, officials said expectations were not high. Jamba Tshetim, administrative officer in the dzongkhag, said various geogs along the Kuktorgangchu had been alerted to notify dzongkhag officials if any of the bodies are discovered.

The family was swept away around midnight on September 2 after the Kuktorgangchu, an otherwise small stream on the way to Bumdeling Wildlife Sanctuary, washed away the victims' one-storey house, located a kilometer from Trashiyangtse town, while the family apparently slept.

"We did find a few clothes during our search," Jamba Tshetim told Kuensel. But, noting the heavy floodwaters, he speculated that the bodies could be under up to 30 meters of debris or buried near the riverbanks.

Surviving family members of the victims, including Choeki Wangmo's husband, a forestry employee at the wildlife sanctuary, are continuing to perform death rites.

Meanwhile, reports have been received of flood damage to mule tracks in the district and the Bursum Zam bridge in Bumdeling geog, Jamba Tshetim said. Members of the public have already begun repairs.

9/18/1999

Natural disasters and being prepared

The wet spell over the weekend - 72 hours of incessant rain - took many of us back to 1968 when floods wreaked havoc in the region. Bhutan then suffered major damage to livestock and property and the loss of several lives.

While Indian states near the Bay of Bengal were severely hit by the cyclone, which caused serious losses in life and property last weekend, Bhutan experienced only the persistent rainfall from the fringes of this much-feared natural phenomenon.

Many of us were starting to feel slight pangs of depression by the end of the third day and news of a flash flood which claimed three victims was, indeed, a shock. A police officer was carried away in the line of duty.

Druk Air was, perhaps, the greatest victim of the rain which came during the peak tourist season. The two aircrafts, laden with passengers, were stranded in Kathmandu and Calcutta. In real terms the cost incurred for 500 stranded passengers must have devoured the earnings accrued over months of commercial activity.

But this is a problem we must learn to live with unless the long term plans to seek another airstrip on the broader southern plains become feasible. Druk Air's estimated losses from flight disruptions amounted to Nu. 22 million between 1994 and 1998. Its 87 percentage flight reliability is, apparently, far below international standards.

Meanwhile, we are relieved that, once the sky opened, the backlogs were immediately cleared and life returned to normal.

The clear blue sky on Wednesday morning also brought the good news that, country-wide, we had escaped relatively unscathed. The damage was not as serious as we feared. It was not as painful as it could have been.

Although the crop losses in parts of east India was substantial Bhutanese farmers in most parts of the wetland region appear to have made a near-miraculous escape. The grain would have all been lost if it was harvested and left to dry or partially damaged by the heavy rain even if it was stacked. But most of Bhutan's paddy was ready but not yet harvested in most fields.

The remote dzongkhags, where road blocks are not unusual, were practically untouched by the three-day rain. The shops around the country were adequately stocked. Even the dreaded Sorchen hillslope appears to have withstood this prolonged shower.

The rain, coming just as we bid the monsoons farewell, struck us with the two old issues we can never forget. As a landlocked mountain nation we will always face severe challenges, both man made and natural. At the same time, our determined efforts to preserve the ecological balance has been worth all the short term economic gains we might have sacrificed.

It is becoming increasingly clear that Bhutan's rich natural environment is an effective protection against the inevitable natural calamities which hit us time and again. This is greatly strengthened by four decades of planned development which has seen the construction of firm roads and bridges with work teams standing by for calamities.

The weekend rain was not our first experience of its kind, but there was one difference this time. Many people around the country were following the cyclone through the audio visual media which was introduced just four months ago. Which means that, with the further development of the electronic media, we should be prepared for the next disaster and suffer even less damage.

Editorial
10/23/1999

43 missing, factories devastated in Pasakha

Search is on in Pasakha for more than 40 people who went missing after the industrial town was struck by a "devastating" flood on Thursday.

The flood, caused by the swollen Barsa river, ruined 10 concrete buildings at the residential colony of the BCCL and BFAL factory staff and left more than 400 families homeless.

According to reports from Pasakha, the Barsa river turned towards the residential colony after a landslide dammed its natural course. It washed away a 150-foot Bailey bridge, the newly constructed BCCL tower, the power transformer, and the CHPC sub-station. The submerged administration building of the BCCL is reportedly on the verge of collapsing.

The missing people were reportedly working at the BCCL plant when the flood hit it. A 30-year old man in Chamkuna saw his wife and children washed away in front of him. A 28-year old man, Chaturman Rai, was rescued from the river but died in hospital.

"Five or six men climbed a tree as the level of the water rose," an eyewitness said. "I watched these people get washed away as the tree was uprooted. It was a nightmare that I will never forget in my life."

"I thought I would die until I was rescued by the army," said a 27-year old man, Wangchuk, who had been carried away by the river.

About 1,000 people from Pasakha were evacuated to Phuentsholing and kept in three camps established in the police mess, dungkhag office, and the high school.

Food and blankets are being distributed by the Tashi Commercial Corporation. Two doctors are treating and examining victims, many of whom are suffering from fever, cold and diarrhoea.

"The people are completely disoriented with fear and uncertainty," explained a volunteer worker. "They have lost all their belongings and have been rendered homeless."

Pasakha is the home of Bhutan's major industries such as the BBPL, BCCL, BFAL, Namgail Cement and Tashi Carbon.

8/5/2000

Phuentsholing affected by unprecedented flood

In the worst flood disaster in the history of Phuentsholing town, peaking at about 7.00 am on Thursday, a swollen Dhuti Khola changed its course and unleashed havoc on a large part of the country's economic hub.

As the lower market streets became rivers, 17 huts were washed away in the vegetable market while the BOD fuel station, a private sawmill, and the city corporation water supply office were submerged. An automobile workshop and the city corporation's staff quarters were severely damaged.

Trucks, buses and other vehicles in the area were submerged, and two main water pipe bridges burst, cutting off the town's water supply.

RBA, RBP and civilian volunteers rescued more than 40 people trapped in their houses by pulling them out with whatever they could find, including floating tyres. Many families were left homeless.

Upper Phuentsholing was an expanse of potholes and rubble with traffic brought to a halt.

The flood came after non stop torrential rain which began on Monday evening with the Central Water Commission office recording 416.40 millimetres of rain. The highest recorded rainfall in Phuntsholing was 394.6 millimetres in 1996.

"It was like someone up in the sky opened a huge tap and let it run," a 94-year old woman told Kuensel. Another resident said that most of the town's population was in a state of shock from the unexpected flood. "It was simply devastating," he said.

Rescue work is on round the clock with the municipal authorities trying to restore normalcy in the town. Authorities are hopeful that, if the rain stops, they will be able to divert the river back on its course.

But the residents will remain wary of this prominent feature in the town's landscape, sometimes a great asset, occasionally a nightmare.

8/5/2000

A week after the floods : 31 still missing

Pasakha, a thriving industrial colony, remains deserted a week after the devastating floods last week. It will take some time for the people to get over their shock and losses.

Phul Maya Tamang, 55, and her 60-year old husband are in shock having rushed over from their home Gelephu. "The flood has swallowed my son," she mutters again and again.

Nineteen-year old Ram Chander Tamang, a Class IX student of Phuentsholing High School had escaped the initial flood and, when it subsided, he had run back to retrieve his books. Moments later, a massive wall of water engulfed him along with the entire Bhutan Calcium Carbide Ltd. (BCCL) and BFAL housing colony, flattening the buildings.

"We saw him running back and forth trying to escape," said an eyewitness. "Then he vanished from sight when the building caved in."

The body was not recovered last week and BCCL has paid the family compensation but his parents still cling to the hope that he might be alive.

Meanwhile, the six-month pregnant widow of 28-year-old Chaturman Rai, who died at the Phuentsholing hospital a day after he was rescued, is also in a state of shock.

For about 1,000 people who lost all their belongings, the greatest consolation is that their lives were spared.

"Never in my life did I ever imagine that I would experience death so close," said a survivor. For 25-year old Tandin Zangmo, it was especially unnerving since she had delivered a baby just five days earlier and was still convalescing. She had

been carried, along with her baby, to safety and was bleeding heavily by the time she reached the make-shift camp in Phuentsholing. Another six-month pregnant lady was admitted in the hospital suffering stress and tension, according to a friend.

The victims of the Pasakha flood are being accommodated in six make-shift camps in Phuentsholing. BCCL and BFAL officials and staff are working round the clock with local authorities to ensure that food, medical attention and necessary items like mats, blankets, pillows mosquito nets and utensils are being provided to the victims. The factories have also made an ex-gratia payment of a month's salary to each affected employee.

A BFAL worker said that it was not possible to take their families to their villages because all roads in the region were blocked.

Government officials in Phuentsholing said that the students of the Pasakha school will be accommodated in the government schools.

According to a spokesperson for a committee established to look after the flood victims, the Indo-Bhutan friendship organisations based in Jaigaon have helped with essentials including water.

The Chairman of BFAL and BCCL, Dasho Ugyen Dorji, told Kuensel that the government has been kind in providing immense support and help whenever needed. He expressed his appreciation for the help given to the victims by the various organisations in Jaigaon and to the health officials for their services.

Lyonpo Khandu Wangchuk, the Trade and Industry Minister, who was coordinating the relief efforts, said that the death toll had been highly exaggerated in the foreign press. He said that in Pasakha there were two deaths and 31 labourers and family members missing. The exact number of deaths is yet to be established because the search is still on.

According to Lyonpo Khandu Wangchuk, the torrential rains in the upper catchment areas over the past weeks, coupled with global warming, had caused the disaster. He said it was unprecedented and that such a scale of devastation had never happened in the history of the country.

Meanwhile, life in the BCCL/BFAL housing colony at Pasakha has come to a grinding halt. With 11 of its buildings fully destroyed and another 4-5 on the verge of collapse, the former thriving colony now resembles a ghost town.

Death toll

Reports from different parts of the country estimate the death toll from last week's flood at 49, including the 31 missing in Pasakha.

Apart from two confirmed dead in Pasakha, Samtse has reported five deaths, Trashigang one, Sarpang two, two in Mongar and six in Tala.

With all major highways still blocked and municipal infrastructure damaged in several towns, the government has released Nu. 42.5 million and approved another Nu. 41 million for restoration work.

8/12/2000

In response to a disaster

It was inevitable that Bhutan made it into the international headlines this week.

The kingdom experienced perhaps the worst flood disaster in its recorded history with more than 40 people either dead or missing around the country, 31 in Pasakha alone. And, as a German radio station told Kuensel, Bhutan's exoticism makes anything which happens here particularly newsworthy. As heavy rains caused severe floods in Pasakha and Phuentsholing last Thursday, the news flashed around like a wild rumour, carried by electronic news services which compete by the second. By Friday, the exaggerated death toll had reached 250.

There are a number of reasons for the confusion of facts, especially with the numbers. Reporters sometimes do not cross check facts because of deadline pressure and competition among themselves, and carry rough estimates if there are no figures available. The confirmed figures from Bhutan took several days to emerge.

Last week the floods severely affected several parts of north-eastern India so international agencies also confused reports of the damage in Bhutan with reports from different parts of Assam and Bengal.

Public relations has never been a priority for Bhutan and the relief committee was too busy with damage control to issue press releases. More concerned with obtaining an accurate picture, relief workers decided to first conduct a detailed search and a complete literal count of missing persons.

Given the difficulty in assessing damage in such a situation, observers must marvel at the efficiency of international relief organisations or question the accuracy of the figures when they announce estimates totalling hundreds of thousands within hours of a disaster. But, as we learned, the figures will be made up if they are not announced. And often they will be believed.

It is more important, however, that we come to grips with reality so it was reassuring to see a fast response from the government and the spontaneity from all sections of Bhutanese society. Local officials, security personnel, and volunteers rushed to the rescue of flood victims and were quick to stem the damage. A Cabinet Minister was in Phuentsholing on the second day after the flood to coordinate relief efforts.

It is characteristic of the Bhutanese government that it decides on a fast and effective response rather than appeal for external assistance.

Within one week, the government had released funds totalling 42.5 million and approved another 41 million for both emergencies and for the restoration of normalcy, especially on the roads. The actual requirements are expected to be far more.

The authorities of the two main factories at Pasakha - BCCL and BFAL - took immediate care of their employees and workers who were left homeless by the flood. Families of the bonafide workers are to be compensated according to the existing chhathrim and compensation is being considered for bonafide workers who have lost family members.

Bhutanese students overseas, in regular contact with each other on the Internet, have also made a collection to help the flood victims and their families.

While the news may be exaggerated, the disaster cannot be under-estimated. The loss of 40 lives is a tragedy of unprecedented proportions in Bhutan, property damage amounts to millions of Ngultrums, and the destruction of infrastructure will have an accumulative impact on the country.

The more positive side of international attention to such disasters is that there are well meaning donors and international agencies whose main intention is to help, although the actual assistance takes time to move through the formalities. This week several organisations are coordinating emergency assistance.

While standard emergency relief is offered in the form of immediate basic needs like blankets, tents, food, and medicine we hope that international assistance will be directed more towards important needs like the restoration of vital infrastructure which has been destroyed.

Today, Bhutan's main transportation lifelines - the highways - have been cut at numerous places. Apart from landslides which are too many to count, several important bridges have been washed away. Phuentsholing has been deprived of water, giving rise to major health risks. Most municipal infrastructure has been severely affected.

These are the areas where resources would make the best impact, both in terms of immediate and long term needs.

As the Bhutanese system is mobilised to normalise the situation, we are left with lasting memories of a powerful natural calamity and realisation of the need for precautions, as rare as such disasters may be.

If the lucrative factories at Pasakha have been reminded of the need to divert funds towards stabilising their immediate natural environment, we have all seen the greater risks of upsetting the balance in our natural ecology. Although Bhutan suffers far less damage than most places because of its pristine environment, there is no escape from disasters.

It is a good time to reflect on this lesson from nature because we are still in the middle of the rainy season.

Editorial
8/12/2000

Five killed in Samtse floods

Three persons were buried by a flood in Noonpani village and two school children of the Sengdhyen Primary School were washed away by the Toorsa river in Samtse on August 3.

According to the Samtse dzongkhag, seven bridges - the Jitti bailey bridge, Daina bridge, the suspension bridge in Chengmari, the Kuchi-Daina bridge, the Jogitar suspension and the Namchu suspension bridge - were also washed away, cutting off Sibsoo and the aligning geogs.

In Samtse town, 17 electric poles were uprooted and the water sources of the town damaged, disrupting the water and power supply.

The Singye dolomite and the Jigme dolomite industries at Daurpani and the hydrometer station in Samtse were severely damaged, and a Khair plantation was washed away.

A dzongkhag spokesperson said that the Damdum river had changed its course and flooded the Samtse jail while the Pugli river overflowed its banks and entered a village. But there were no reported casualties there.

The road between Sibsoo and Tendu is blocked and the new road between Dorokha and Shangnay is damaged. The Damdum-Chamurchi bridge is also at risk, the spokesperson added.

According to the Samste dzongda, the rains have caused extensive damages throughout the dzongkhag. A six-member emergency committee has been formed to restore normalcy in the dzongkhag.

8/12/2000

Monsoon damages in other dzongkhags

BY WEDNESDAY this week at least five persons were reportedly killed by flash floods and landslides in other parts of Bhutan besides the flood ravaged Phuentsholing, Pasakha, Tala and Gedu areas.

A number of houses were also destroyed.

Under Wamrong dungkhag in Trashigang, a 40-year old man from Nanong geog was killed by a flash flood which also destroyed four houses. A one-storied house was damaged in Khaling.

Two persons from Kengkhar geog were killed besides 15 houses that were destroyed in Mongar dzongkhag. Five of the houses destroyed were in Kengkhar, one in Saling, two in Ngatshang, three in Thangrong, two in Drametse and two in Balang.

The Zangtopelri Lhakhang in Lajab village, built by the former Lam Neten and the people of Chaskhar and Thangrong villages, was partially destroyed by a flash flood. The Mongar crematorium which is under construction was damaged and three traditional bridges in Silambi and Gongdu villages were washed away. School staff quarters were damaged in Silambi, Wangmo and Drepong villages.

To add on to the havoc created by the slides and floods, an "unusual" wind blew off the roofs of four houses in Drametse.

Reports from the Pemagatsel dzongkhag said that seven houses in Shumar and Dungmin geogs sustained severe damages while the orchard lands of three households in Shumar and Chongshing geogs were ruined. The intake structure of the rural water supply scheme in Khangma and Yurung geogs and the new completed water supply scheme for Khangma Community School were washed away.

The officiating dzongda of Pemagatsel, Rinchen Wangdi, said that the damages occurred because of the continuing heavy rainfall which has resulted in landslides since July 31 to August 4. "Investigations are still going on and reports are still coming in," he said." There has been no reports of casualties so far."

One house, several acres of maize fields and 480 citrus mandarin trees were damaged in Martshala, Samdrup Jongkhar. The Martshala suspension bridge over the Bangtsho-chu was washed away and the drinking water supply at the Martshala primary school, junior high school, and Daling and Kharpandi villages under Bangtar geog disrupted. Three houses in Bakuli geog and one house in Kuwapani bazaar in Bangtar were damaged.

A house each in Khamdang and Tongshong villages, Trashiyangtse, were also reported to have been partially damaged by landslides.

Lhuntse was the only eastern dzongkhag where, so far, no major damages by landslides and floods were reported.

A flood on August 3 washed away four houses in Sarpang. Two persons reportedly were also killed.

In Panbang dungkhag, Zhemgang, a flash flood in Pantang village swept away about four houses.

The road blocks continue to disrupt normal lives of the people. Eleven students and a teacher of the Drametse Junior High School helped carry a teacher, who was afflicted with typhoid, to the Trashigang hospital, covering about 40 kilometres its six hours.

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Monsoon damages in other dzongkhags

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A student of Sherubtse College and an Indian construction worker were similarly carried to the hospital, 22 kilometres away from Kanglung, while two women w it delivery cases were brought on a stretcher for about 15 kilometres from Rangjung.

According to Dr. Kashinath Sharma, the district medical officer (DMO) of Trashigang, only "severe life threatening cases" were being brought to the hospital. "We have medicines in stock, but, could face a shortage of IV fluid," he said.

"We are trying to get some medicines by helicopter, most importantly the IV fluid," said Dr. R. R. Kole at the Imtrat hospital at Yonpllula which is faced with a similar situation.

In the last one-month, 40 percent of the patients admitted at the Trashigang hospital were related to contaminated water. The figure is reported to be much higher at the Imtrat hospital.

The contractors had their own woes to tell. "The trucks carrying my building materials have been stranded midway," said ex-Drimpon Naku of the Lhawang Norbu construction company in Kanglung.

"There were around 20-30 vehicles stranded at Wamrong (78 km from Trashigang)," said Sherub Dorji, a grocer in Trashigang Meanwhile, for the farmers, a threat to damage one of their main cash crops looms large. Ex-Drimpon Naku, who owns about five acres of potatoes, said that the farmers have to start digging potatoes for export to India irrespective of whether the road is blocked or cleared.

He explained that if the potatoes are not dug out in time, the crop would be damaged by the rain. "Even if dug out the rain would rot the crop if was not stored properly, especially if the road block continued for another three to tour weeks," he added.

The rainfall measured an unprecedented 237.3 milimetres in the last five days in Trashigang.

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8/12/2000

Businesses suffer massive damage

The worst flood ever to hit Phuentsholing and Pasakha has left several Bhutanese business houses nursing serious injuries and, while rough estimates of the damages to property are beginning to surface, it is expected to take several months before the situation normalises.

Companies based in Pasakha and the lower market of Phuentsholing were physically the hardest hit.

The Singye Engineering Workshop was completely washed away, losing Nu 15,000 to Nu 20,000 a day in revenue, according to a company spokesperson. Nine to 10 vehicles that are waiting for repairs but, with no electricity to run the workshop, the machines are lying idle.

A spokesperson for the Evergreen Sawmill said that the business would lose about Nu 40,000 to 50,000 a month in revenue. The sawmill, still covered in a thick layer of mud, lost much of the timber and furniture stock in the flood.

At Chodden Engineering, an effort is underway to clear away the huge amount of debris brought in by the flood, costing the company Nu 30,000 and the cost is likely to escalate.

According to a company spokesperson, about 10 vehicles at the workshop were also completely submerged in mud and the total destruction amounted to roughly Nu 420,000.

Timber worth Nu 284,000 and furniture worth Nu 32,000 were washed away by the flood, he said. Damages to the workshop machinery and the sawmill equipment amounted to Nu 70,000 and apple boxes worth Nu 30,000 were washed away, he told Kuensel. The business is incurring a monthly expenditure of more than Nu 50,000, he added.

At Jigme Sawmill, another factory that was hit hard by the flood, the destruction is almost total. The company has yet to compile estimates of total losses on property and stock.

The Druk Chholey Construction Company was also hit hard. The company's hollow-block cum fabrication unit, situated at the Toorsa river adjacent to the THPA, was completely washed away along with installed machines, equipment, tools, other accessories. The total damages amount to about Nu 1.6 million.

The Yarkay Construction Company, with its Basochhu project office situated near the Phuentsholing City Corporation, was also affected by the flood. The immediate storage facilities like the warehouse, stores, transit camp and guest house were damaged and official documents and construction materials were destroyed, according to a company spokesperson.

The Druk Penden Companies reported losses totalling Nu 1.441 million. Their warehouse suffered extensive damages in the flood and cement stocks worth Nu 935,410 was destroyed.

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Businesses suffer massive damage

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The Druk Penden Petroleum Corporation incurred losses of about Nu 56,180.40 and the Druk Penden Transport Corporation incorporated damages estimated at Nu 450,000.

The satellite veterinary laboratory has been submerged in mud along with all equipment. The government sector was not spared the wrath of the flood.

The Phuentsholing City Corporation suffered extensive damage to buildings and other physical assets. The City Corporation's water supply office, the water supply and electrical stores, the staff quarters, and four to five vegetable sheds in the vegetable market were completely destroyed.

About eight vehicles, office equipment, computer-billing programmes, documents, survey and lab equipment were damaged.

A City Corporation spokesperson said that a rough estimate of the damage to the water supply and the sewage system would be in the region of Nu 40 million to Nu 50 million.

"The PCC's priority, however, is to make available municipal services with temporary arrangements so that it reaches the people in the earliest possible time," said the spokesperson. "The task of restoring normalcy will be initiated once the situation stabilises."

The lower market BOD is almost a total write-off, according to a spokesperson for the company. The infrastructure is totally destroyed and the entire stock of diesel, petrol, kerosene were either washed away or contaminated.

Lubricants, worth about Nu 3.2 million, were washed away. At least nine fuel tankers were damaged and four were washed away. According to a spokesperson, loads of the lubricants were retrieved downstream by the public who then sold the products at throw away prices.

At Pasakha, the BCCL's housing colony suffered extensive damage, with seven buildings completely destroyed. Of the remaining buildings, a few are still considered dangerous to live in but all those that withstood the flood need renovations in one form or the other. The buildings were worth Nu 21.5 million.

With no road and bridge connection, transformer and transmission lines washed away, the BCCL and BFAL factories have been completely paralysed.

According to a spokesperson for BCCL, the company had a turnover of Nu 45 million a month. They are now losing roughly around Nu10 million a month in profits. The company also has fixed costs of Nu 6.00 million to Nu 7.00 million a month.

Total damages to the company have not been estimated as yet.

The Bhutan Ferroy Alloys Limited are working on the damage estimates. According to a company official it would take at least another four months to start operations, which means that the company will be losing roughly around Nu 160 million, or Nu 40 million a month, as production loss.

The fixed cost (cost of administration expenses, interest and depreciation) for the company in four months time is expected to be about Nu 68 million while the loss of profit is Nu 25 million.

The two companies are also incurring huge expenses to clear and re-route the road and to dredge the river back to its original course.

Meanwhile, the RICB has received claims to damages of buildings worth Nu 10 million and Nu 6.00 million for about 41 damaged motor vehicles in Phuentsholing.

A RICB spokesman said that a rough damage assessment conducted of the transmission tower and raw materials of BFAL, at Pasakha, amounted to Nu 10 million.

The Tala Project has assessed damages roughly worth Nu 12 million on buildings and Nu 150 million on engineering businesses including contract work and equipment. A spokesperson said that the figure was minimum since the exact damages are not known because some sites have not yet been assessed.

Meanwhile, the BOD has engaged nine trucks to supply 3300 litre of petrol, 51,000 litres of diesel and 10,000 litres of kerosene to Thimphu and other interior parts of the country through Gelephu.

According to an official, about 1,450 gas cylinders have already been delivered so far and another five trucks of cooking gas have been kept in Gelephu for refilling.

The supply will be increased within one week, he said. "We want to keep up a regular supply so that people do not suffer," he added.

Most of the flood damage has not been insured. According to the Managing Director of RICB, Lamkay Tshering, flood and landslide insurance is an optional coverage and one has to have a fire insurance to be able to opt for either or both.

He said that some people had come to RICB for the flood coverage at the onset of the monsoons but they were denied because "we didn't want to burn our fingers." According to the company's policy people should insure at the time of the policy renewals and not when crisis is at their door step, said the Managing Director.

8/19/2000

More than Nu 40m lost in floods

The recent floods caused damages estimated at Nu 43.49 million on the urban infrastructure in Phuentsholing, Samdrup Jongkhar, Gelephu and Samtse, according to assessments carried out by the Urban Development and Housing Department (UDHD).

According to a report by the Head of the Urban Infrastructure Division, Kinzang Norbu, the damages in Phuentsholing alone amounted to Nu 37.267 million. Samtse suffered damages estimated at Nu 3.168 million, Gelephu at Nu 1.674 million, and Samdrup Jonkhar at Nu 1.379 million.

Most of Phuentsholing's water supply infrastructure was destroyed while major damages were inflicted on its sewerage system, urban roa-ds and drains, the Dhuti Kho-la river training work, office equipment, plumbing tools and vehicles.

As in Phuentsholing the water supply systems in the three other southern towns had sustained the most damage. In Gelephu, the Indo-Bhutan boundary wall was also damaged.

The UDHD attributed the cause of the maximum damage to the water supply systems to the long pipe lines drawn on hill slopes from distant sources.

According to Kinzang Norbu, given the present experience, the need to explore other means of water supply had become very important to ensure undisrupted drinking water during monsoons and floods. The pipe length had to be shorter and landslide-prone areas avoided along the pipe routes.

Preliminary assessments and the ongoing field studies carried out by the department indicate a good possibility of tapping ground water sources through deep bore hole drilling along the southern foot hills.

"Ground water, as an alternative source for the longer term, has become imperative," said Kinzang Norbu who added that, although the recurrent costs may be slightly high, the overall annual expenditure would be lower.

In Phuentsholing the city corporation staff had installed temporary water supplies from two streams originating from the Dhuti river. In the lower market, the hardest hit area, moderate water supplies had resumed on August 20 through stand pipes.

"Emergency maintenance of the water supply has been a chronic problem and its magnitude increases every year," said the director general of the UDHD, Tshering Dorji. "The problem has become more complex due to very weak and extremely unstable geological soil conditions of the local areas prone to landslides."

In his meeting with town officials, the UDHD director general stressed the paramount importance of the sanitary conditions of the lower market and coordinated the clean-up of debris and mud to facilitate the permanent restoration work of the roads and water supply as soon as possible.

9/2/2000

Health facilities damaged

The floods last month has damaged health facilities worth about Nu 7.00 million, according to the Department of Health which has conducted a preliminary assessment of the damages.

"There has been some loss but the impact of the flood is still to be seen," said Dr. Rinchen Chophel, the officiating director of the health department. "A lack of proper sanitation and water supply to the general public has risen concerns about the chances of unexpected out-breaks of epidemics."

He added that as reports on the damages from the dzongkhags were still coming in a detailed estimate would be worked out only later on.

In Mongar the floor and walls of the Thangrong BHU building and the staff quarters of the Chaskhar BHU were damaged. A retention wall collapsed and affected the main building of the Martsala BHU in Samdrup Jongkhar. Studies found that the BHU was located in an unsafe area and re-location had been proposed.

In Samtse strong winds during the heavy showers blew off the roof of the Nanital BHU while in Trashiyangtsi 11 deaths occurred out of the 307 cases reported of "loose motion and vomiting". A health spokesman said that the Trashiyangtse health authorities were investigating the cause of the out-break.

In Zhemgang the floods destroyed the Langdorbi BHU and its re-construction is expected to cost Nu 24,60,000.

In Chukka one of the three staff quarters of the Bongo BHU was damaged by the seepage of water through its walls. The roof of the Getayna BHU has been extensively damaged. In Haa the river washed away the retaining wall of three staff quarters of the Sombekha BHU.

In Lhuntsi no damages to health facilities occurred but an outbreak of fever was reported in the Wambur Primary School in Tshenkhar Geog caused by contaminated water source.

9/9/2000

Flood forecasting

A Joint Expert Team, constituted to oversee and review a comprehensive scheme for hydro-metereological and flood forecasting network on rivers common to India and Bhutan, will hold its 13th meeting in Thimphu from December 4 to 6.

A hydro-metereological network of 34 sites maintained by the Flood Warning Unit, Department of Power, and funded by the government of India supplies data which is used to issue flood forecasts for the states of Assam and West Bengal.

In addition, the data recorded and stored for various rivers is being utilised in planning hydropower and irrigation projects.

12/2/2000

Flood warning discussed

Using modern technology to warn the Indian plains of potential flood from the mountains in Bhutan was discussed at a recent meeting of the Joint Expert Team (JET) in Thimphu.

The JET, a flood-warning unit, comprises of experts from India and Bhutan.

"With the use of technology like VSAT, the message can be passed on faster and more lives in the plains would be saved," said the director of the department of power (DOP), Sonam Tshering.

One of the decisions that came out of the meeting was the removal of "duplications" in the JET work function. Integration of flood warning station in Lunana with the 13 stations in the country and removal of some like Shingkhalouri in Samdrup Jongkhar were also decided.

The meeting held after every six months was led by the trade and industry secretary, Dasho Karma Dorjee, and M.L. Goyal, the commissioner of the ministry of water resources, India.

The flood-warning unit, previously known as the Hydro-met under the department of telecom, was transferred to the DOP in July last year and renamed as JET.

In the 8th FYP, the budget for the flood warning activities was Nu 39 million, all funded by the government of India. "It is an important area of cooperation between the two countries," said Sonam Tshering.

9/29/2001

Flood protection works completed in Phuentsholing

The river training works along the Dhoti and Toorsa khola banks in Phuentsholing have been completed bringing relief to the residents who went through a devastating flood at about the same time last year.

"Everyone said that it was an impossible job (to complete the work on time) but the results are there for everyone to see," said the visibly relieved Phuentsholing Thrompon, Jochu Dorji.

The river training work started in early February but was soon bogged down with delays making most residents think that the job would not be complete before the onset of the monsoon.

"Sincerely speaking, I thought they would never complete the river training works before the monsoon," said a RICB resident. "But they have proved me wrong."

The embankment walls along the Dhoti stream are about three and a half meters high with about two and a half meter deep foundation. Both sides of the embankments have footpaths with railings and steps have also been built at appropriate places for the pedestrians. The retention wall is about two kilometers long and runs through the length of the Phuentsholing town.

The rush to complete the job within the time frame also pushed the six national contractors to employ as many as 2,000 labourers daily during the peak time. The cost, initially estimated at about Nu 67 million, climbed as much as Nu 77 million due to unforeseen additional works. The funding was provided by the royal government through the Asian Development Bank (ADB) loan.

The only worry left is the old bridge which is not likely to withstand a flood like last year's. According to Mr. Hans Bergman, the municipal advisor in Phuentsholing city corporation, as the old bridge had a span of only 11 meters, the stream had been "squeezed" through the newly built retention walls giving it more velocity and power.

"The retention walls are designed to hold any floods similar to the previous one but I have doubts for the weak and old bridge," he said.

But Prem Gurung, the executive engineer at the municipal office, said that the government has already floated tenders to construct a 25-metre span new concrete bridge with walkways on both sides for the pedestrians. The bridge could be ready for use by mid 2002.

8/18/2001

24 glacial lakes in Bhutan identified as "potentially dangerous"

Eight years ago a glacial lake in Lunana region burst, wreaking havoc down the Punakha-Wangduephodrang valley. After several forays in the area by experts there is still no hope of a permanent solution and the government is making attempts to reduce risks.

According to a report published by the International Centre for Integrated Mountain Development (ICIMOD) and UNEP, 24 out of 2,674 glacial lakes in Bhutan are "potentially dangerous", meaning that they could burst. Of these eight lakes are in the basin that feeds the Pho Chu which flooded in 1994, five in the Mo Chu basin, seven in the Mangde Chu basin, three in the Chamkhar Chu basin and one in the Kuri Chu basin. They are all fed by glaciers which are reported to be melting because of "accelerating global warming".

Covering an area of 1,317 square kilometers most of the 677 known glaciers in Bhutan have spawned "many dangerous moraine-damned lakes" which are "increasing in size at a very fast rate". These natural dams may, because of huge amount of accumulated water, suddenly break like the Lugge Tsho that caused the Punakha flood, discharging large volumes of water and debris. Some glaciers, the reports say, are retreating by about 20 meters to 30 meters every year.

While most of the lakes that lie in the Lunana region do not pose an immediate threat, two glacial lakes, Raphstreng Tsho and Thorthormi Tsho, both at the source of the Pho chhu, are considered risky, with the latter predicted to burst in 15 to 20 years.

The findings were made by numerous expeditions in the Lunana area after the 1994 flood. The flood from the Lugge Tsho had apparently damaged the dams of the Raphstreng Tsho and mitigation work on it was undertaken by an Indo-Bhutan team to reduce the "hydrostatic pressure" on the weakened dam in 1996. The depth of the lake was also partially lowered. However, this particular lake seems to have drawn considerable attention from experts since the 1980s and long after the Lugge Tsho burst in 1994. Later, in 1999, a joint study by Austrian and Bhutanese experts concluded that the risk of an immediate outburst from the lake was "low" compared with the Thorthormi Tsho.

Lying to the east of the Raphstreng Tsho, the Thorthormi Tsho and its off-shoots at the moment is considered "very dangerous" by experts after its southern flank was eroded by the 1994 flood and recommends close monitoring all summer till November every year. Outbursts from the main lake's dam would have similar impact downstream as the Lugge Tsho flood.

To contain the lake, the department of geology and mines plans to open an outlet from one of its dam's side.

"This will be done to channel excess amount of water when glaciers melt," said the director of the department, Dorji Wangda. Other than that the department has carried out "hazard zonation map" where to-be affected areas along the Lunana valley have been identified and settlements cautioned from starting any constructions. Re-settlement of villages affected by the 1994 flood was also recommended but officials say farmers were reluctant to move because of sentimental attachments. As a result pictorial manuals are distributed to help villagers evacuate in case of an impending flood. Satellite Phones were installed and a wireless station set up along with two watchmen to monitor the lakes.

Moreover work at the site, which is above 4,000 meters above sea level, is aggravated by the harsh climate. Dorji Wangda said that the rough terrain to the site, which takes more than 11 days to walk, is also proving difficult, "especially when you have heavy equipment to carry." Last year 150 mules were used. Researchers plan to use helicopters.

In 1994 the partial outburst from the Lugge Tsho caused the Pho Chu flood which claimed 23 lives in Punakha valley and damaged a part of the Punakha dzong. The flood relief measure cost the government Nu. 43 million. In Lunana 12 houses were damaged and 964.74 acres of pasture land wiped out. Yaks, grain, bridges, water mills, chortens and a temple were part of the toll. Two major floods in the past, both from the Pho Chu, are also remembered - one in the summer of 1950, lasting about 24 hours, and another in 1960 that lasted for five days. They are known to have caused by glacial lake outbursts.

Meanwhile, the chances of a near-future glacial outburst from Lunana seem to pivot on the rising global climate and the toil of geologists.

8/3/2002

Watching the lakes

Of the four major lakes in Lunana experts have identified the Thorthormi as potentially the most dangerous because of some weak points along its natural dam. They have also identified the safe and unsafe areas in the region, in case of a flood.

An Austria-Bhutan geological team which finalised its study this month pointed out that the Thorthormi glacier was melting and the lake, situated more than 4,500 metres above sea level, was growing.

If the lake did burst, perhaps in 10 years if preventive measures were not taken, it could also create a "cascading" effect and also pressure the Raphstreng lake, about 50 to 60 metres below it, into bursting, according to the department of geology and mines.

The result could be a flood with a downstream impact volume of 17-22 million cubic metres.

Thorthormi and Raphstreng, both sources of the Phochhu, are divided by a moraine dam which has risky segments. The Throthormi lake's southern flank was eroded by the 1994 flood.

"Furthermore, a physical risk assessment of the Thorthormi supra-glacial lake is difficult because of the extremely dangerous crevices on the surface," said Dorji Wangda, the director of the department of geology and mines (DGM). "We cannot even carry our geo-physical instruments there."

A 13-member Japan-Bhutan survey team of glacier-microbiologists, glacio-ecologists and geologists recently

reported that the potential of an outburst of the Throthormi lake was higher since the 1994 Luggye lake flood had made the left lateral moraine unstable.

As preventive measures, Dorji Wangda said that the DGM, with its international partners, would create outlets so that the water will flow naturally. The Austria-Bhtuan team had demarcated safe and unsafe zones for settlement in Lunana and the need for infrastructure between Tami Damchu and Khuruthang in Punakha valley.

The team coordinator, professor Hermann Hausler, told Kuensel that if the lake burst the people along Lunana valley might have only 20 minutes to move out. Thenza, Denji, Tshojo, Lhedi, Shangsa and others villages were most risk prone areas. "We have identified the places where people could go for safety in case of a flood," he said. "We have also identified emergency helipads for rescue operations."

Some of the other risk prone areas are the settlements along the river bank which are on the lower terraces. "The schools and resort in Khuruthang could be flooded and washed away," professor Hausler said. "The Punakha dzong will be safe although the dzong premises could be flooded."

Parts of Wangdue-Punakha road lying on low terraces will also be completely washed away, paralysing the rescue operations. The study team has recommended that these parts of the road be relocated to higher terraces.

According to Dorji Wangda, the demarcation represented a worst flood scenario. The department, with assistance from the flood warning unit and funds from the government of India, has installed two technical early warning systems in Lunana to warn the people downstream in time on the impending danger.

"What we expect in the future is very realistic," the scientists said. "We are not panicking people, we are rather creating an awareness of the worst situation that might happen within next decade or so."

The 1994 flood took seven hours for the flood to reach Punakha, a distance of 90 kilometres from the Luggye lake. Scientists predict that if there is a flood this time it will take less time since the earlier flood had made the track for a smoother flood clearing the debris away.

"But we cannot say which lake or when that lake will burst since we don't have strong data," Dorji Wangda said. "All we can do is keep on monitoring the areas and at the same time be prepared for the worse. We cannot fight nature."

5/17/2003

Establishing a flood information network

Bhutan, India, Bangladesh, China, Nepal and Pakistan fall under the Hindu Kush Himalayan (HKH) region is annually affected by to floods.

But countries in this region suffer from inadequate warning systems of impending floods and lack the resources to respond and recover from flood disasters.

A regional information network among the countries in the HKH region could, however, help prepare to manage floods better.

This week a national consultation meeting was held in Thimphu to establish a regional flood information network in the Hindu Kush Himalayan region.

The two days meeting looked into developing a procedure for sharing information related to flood, assessing funding requirements in each country to be a part of the network and access to timely regional hydrological and meteorological information.

The meeting also assessed the human resources, technical know-how and communication and equipment required within the country and outside for a regional flood information system.

The meeting was organised by the hydromet services division, department of energy in co-operation with the international centre for integrated mountain development (ICIMOD) and world meteorologicial organisation (WMO).

7/26/2003

Floods destroy Bomdeling crops

Farmers in Bomdeling in Trashiyangtse have resorted to using boulders and bamboo mats to build embankments in a desperate attempt to check the overflowing Kholongchu from flooding their paddy fields.

The Kholongchu, which overflowed two weeks ago, has damaged about 25 acres of fields. Paddy stalks that were ready for harvesting lie buried under silt and debris measuring one to two feet and, in some areas, a part of the river is flowing through the paddy fields, dzongkhag officials said.

"There has been major damage," the Bomdeling gup, Sangay Dorji, told Kuensel on the telephone. "About 60 to 70 percent of the paddy crop in the affected area has been damaged and about 15 households have lost all their paddy land."

Gup Sangay Dorji said that the farmers were frustrated that the floods came just before the harvest.

The Kholongchu, which began flooding four years ago, has damaged about half of the 200 acres of paddy fields in the area belonging to about 75 households. The flooded area is spread over five kilometers, starting from Kanteng to Dungzam where the Kholongchu meanders along the flat valley.

Bomdeling villagers and dzongkhag officials said that the root of the problem was at Bareykang, a two-day walk from Bomdeling. The division of geology and mines (DGM), which did a study last year, found out that a portion of Bareykang mountain was eroding and depositing huge amounts of boulders, debris and silt into the Bareykang river which is a tributary of the Kholongchu.

The Bareykang river, which carried the huge deposits downstream had raised the river bed of Kholongchu causing it to overflow in the flat Bomdeling valley.

"To solve the problem permanently we need to build concrete walls near the sliding area of the mountain to prevent debris and boulders from rolling into the river," a dzongkhag official said. The dzongkhag estimates that it would cost about Nu 20 million to check the slide at Bareykang.

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Floods destroy Bomdeling crops

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"As immediate preventive measures, the dzongkhag has not been able to do much because there is no permanent bridge across the river from the dzongkhag headquarters that connects to the farm road to Bomdeling," said the dzongkhag planning officer Saha Dev Thapa. "We can not move heavy machinery needed to construct river training works." An 8.5-kilometre farm road has already been constructed to Bomdeling from the other side of the river.

This year the dzongkhag received about Nu 1.9 million from the global environment facility for the river protection work. The Bomdeling wild life sanctuary has also made some donations.

"Until the bridge is built and more funds are available nothing much can be done to assuage the problem," the planning officer said.

The flooding Kholongchu is also damaging the feeding grounds of the endangered black-necked cranes that come to roost in the Bomdeling valley during the winter. But it was not a major problem at the moment, said the assistant manager of the sanctuary. "But it can become a major problem for the birds if the flooding is not checked because the cranes mainly feed on the rice grains fallen on the valley floor during their stay in Bomdeling."

The Trashiyangtse dzongkhag and the Bomdeling wildlife sanctuary have formed a community to undertake the flood protection project.

10/4/2003

Preparation of national adaptation plan of action begun

Bhutan's 24 glacial lakes could burst their banks in the next 10 years and cause flash floods similar to the 1994 Punakha flood according to a recent study done by the United Nations environment programme (UNEP).

According to the study, the glacial outburst would be triggered by the changing air temperature which is estimated to be rising at a rate of about 0.06 degrees Celsius a year. As a result glaciers in Bhutan were retreating at a rate of 30 to 40 meters a year and icy waters were rapidly filling the lakes.

Besides destroying settlements, infrastructure and agricultural lands, human life and the country's rich bio-diversity, the floods would hamper the quality of river water used for hydropower generation, a major source of income for Bhutan.

Drastic climatic changes would also result in increased rainfall, which means that landslides would be very common. Since Bhutan's economy is dependent on road network for transport and trade.

These findings and more were presented at the inception meeting for the national adaptation plan of action (NAPA) among relevant government ministries, non governmental organisations and the private sector in Thimphu on May 20.

Least developed countries (LDC) like Bhutan are expected to be worst affected by climate change because they are "least able to cope with it" mainly in terms of technology and resources.

Preparing adaptation programmes in advance is expected to make it easier to deal with climatic changes. NAPA, approved by the 2001 conference of the parties to the united nations framework convention on climate change (UNFCCC), is to serve as a simplified and direct channel of communication relating to the urgent and immediate adaptation needs of the LDCs.

The NAPA inception meeting organised by the national environment commission (NEC) formed a NAPA task force consisting of representatives from the government and private sectors and NGO's and officially began the process of preparation of NAPA for Bhutan.

According to an NEC official, the task force members over the 12-18 month project will do a rapid vulnerability assessment of urgent priorities to deal with the impacts of climate change. An action plan will be drawn out and proposal on adaptation strategies prepared.

The action plan, which will be a national document will be presented to the UNFCCC when it is finalised.

Going by past assessments, NEC officials said that water and hydropower, change in water flow, flash floods, glacial lake outburst and health could feature as urgent priorities for Bhutan.

10/4/2003

Lives, property lost in floods and landslides

Flashfloods and landslides claimed three lives, damaged infrastructure and property, cut off the power supply, and disrupted road links to eastern Bhutan since July 6.

On July 9, a 49-year old man from Melphey village was buried in a mudslide while returning home from the town. On the same day, a 38-year old man from Trashiyangphu in Wamrong dungkhag, died on the way to hospital after he managed to pull himself out of a landslide. On July 10, a nine-year-old was carried away by a flash flood that hit a labour camp at Moshi, near Resirbu on the Samdrup Jongkhar-Trashigang highway. It was not known whether the child was a boy or girl.

The death of a Class IX student of Trashigang junior high school who had gone home for the midterm break in a landslide in Uzorong geog remained unconfirmed.

Flashfloods and landslides have also damaged highways and properties in Khaling, Kanglung, Rangjung and Wamrong.

Lower Lungtenzampa under Samkhar geog on the Trashigang-Rangjung highway was the worst hit. On July 10, a flood carrying mud, rocks and uprooted trees, starting at about 7:30 am, washed away six houses and three shops, giving the victims no time to salvage anything. The two main bridges, Lungtenzampa and Thuendayzampa, were also washed away.

"I didn't pay any heed when people called out my name," said shopkeeper Ugyen Tshering. Minutes later he had to climb an electric pole near his shop, hang on it and jump to safety. Another shopkeeper, Phuntsho Wangdi, said he just managed to get to the other side as the flood washed away his shop.

A taxi, a road roller, a mobile hot mix unit, a lemon grass distillation unit, 108 bitumen barrels, a motor bike, a power tiller and a saw mill at Lungtenzampa were also washed away. The flood destroyed paddy fields stretching from Shongphu geog till Samkhar geog. Several chortens in Kanglung, Bartsham, Bidung, Yangneer and Thungthi have been destroyed.

On July 9 the Bambridang bridge and the recently built Bodidrang permanent bridge in Rongthong, on the 22-kilometre highway between Trashigang and Kanglung, were also washed away.

All roads leading to Trashigang have been blocked by landslides. Road officials said 30 metres of the road on the Trashigang-Samdrup Jongkhar highway has been washed away, besides numerous other landslide blocks. Stretches of the road have been washed away on the Trashigang-Mongar highway and Trashigang-Trashiyangtse highway. On the Trashigang-Rangjung highway, about five kilometres of roads between Godhi and Thungthi have been washed away and road officials are uncertain when they will be able to clear the highway.

Meanwhile, the Trashigang dzongkhag officials have formed a committee to control prices of essential commodities. With the rains continuing, dzongkhag officials expect the roads to remain closed for sometime.

The business community, dzongkhag officials, Throema Tshogpa and other offices mobilised a fund amounting to Nu. 49,000 to help the flood victims. Trashigang town is without water and electricity.

7/17/2004

Amo chhu changes course, worries residents

Residents of Bangay Bazaar in Phuentsholing are moving away from the banks of the Amo chhu with the swollen river having changed its course and moved about 300 metres inland.

Though it does not pose any threat to Phuentsholing town, forest officials have alerted residents of Bangay bazaar and the lowlands as there are no river protection works in that area.

The swollen Amo chhu has washed away the dirt road along the river bed used for boulder collection very close to the cluster of huts that make up Bangay Bazaar. The makeshift shops of Bangay bazaar depend on travellers from the five surrounding geogs to Phuentsholing town.

Muku, 50, remembers her shop being washed away last monsoon in Changkuna- about a kilometre upstream from Bangay bazaar. Today, she has dismantled her makeshift hut that housed her shop. "The river course is direct and I can't effort to lose my shop for the second time," she told Kuensel.

Shopkeeper Norbula, 41, told Kuensel his family would have to move anytime. He is extremely worried about his children who prefer playing by the river all the time.

Bangay Bazaar residents say the removal of boulders from the river bed and construction of feeder roads for boulder collection has contributed to the river changing its course during the monsoons.

Namgyel Chhewang of Petro village claims that the swollen Toorsa river has moved landwards and washed away about eight meters of his land. "It is mainly because the boulder collectors do not take any measures to protect the private registered land and the environment," he told Kuensel.

Forest authorities however say that the course of the Amo chhu has always been unpredictable. "It changes every year and we cannot attribute it to a single reason," said ranger Pema Namgyel. He added that there are no quarries along the toorsa river bed and no mechanised boulder collection is taking place. "There is only surface collection of boulders and more on the opposite bank of the river," he added. The collection along the affected side began only recently."

Most of the effected stretch of land is government owned and does not fall under the Phuentsholing municipality. "But it does come under the extended boundary of the town," said Phuentsholing Thrompon Jangchub Gyeltshen.

7/24/2004

Flood damages assessed

Eleven lives have been lost to floods in the eastern dzongkhags, 29 houses have been totally washed away, about 26 have collapsed, and 107 were partially damaged, according to the agriculture minister, Lyonpo Sangay Ngedup, who returned to Thimphu on Thursday after a 10-day tour of the places most affected by the floods since July 9.

Speaking to BBS yesterday, the minister said that about 160 acres of wetland and 500 acres of dry land were totally washed away or damaged, about 350 metric tonnes of maize and 126 metric tonnes of paddy were lost. About 2,000 orange trees were affected and 21 metric tonnes of potato were damaged or washed away, affecting almost about 1,437 households.

A total of 39 irrigation channels were either damaged or washed away and 22 bridges had been damaged.

"One of the first things that I noticed in terms of damages was the serious damage to infrastructure like roads, bridges, power facilities, irrigation channels, feeder roads, farm roads," said the minister. "These I would say are very costly damages which need to be restored as soon as possible so that economic life can begin. But there is no dire situation. People have food to eat and shelter. This is because of good social safety networks as well as whatever has been salvaged in terms of maize and paddy."

The team of officials from ministry of agriculture started the review in Trashigang, considered the worst-hit district, on August 1 and began the assessment from Lungtenzampa where floods had destroyed about nine houses including three shops.

Lyonpo Sangay Ngedup visited the Buna vocational training institute where the foundation had been shaken by the flooded Gamrichhu. The team reviewed other affected areas in the dzongkhag including the Rangjung mini hydel station and the Chenary micro hydel, where intake canals had been damaged, and Bodidrang and Bamridang on the Trashigang-Samdrup Jongkhar highway where two bridges had been washed away.

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Flood damages assessed

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Lyonpo Sangay Ngedup told the communities in affected places that he had been directed by His Majesty the King to assess the damages.

At Tshogonpa in Wamrong landslides and floods had also damaged some houses. Besides severely damaging a feeder road, a suspension bridge connecting Thungkhar with the rest of Thrimshing dungkhag had been washed away. The school at Thungkhar remained cut-off.

Trashigang had lost over 53 acres of wetland and about 113 acres of dry land, affecting some 594 households, according to the latest statistics from the district agriculture office. Apart from 10 bridges, most of the farm roads and feeder roads had been damaged. According to dzongkhag officials, flood and landslides still continued.

Seven people died in Trashigang.

The dzongkhag administration officials said that the dzongkhag had formed a committee to reach relief measures to most severely affected households. Among others, food and clothing was provided to affected people at Lhungtenzampa.

The team toured the severely damaged Rotpashong stretch on the Mongar-Lhuentse highway and Autsho where the Tsatichhu lake had breached and 21 shopkeepers had to be evacuated to a safer place. At Rotpashong about 600 metres of road had been washed away at the chronic landslide zone.

Junior engineer Kinley Dorji of the department of roads in Autsho told Kuensel that the road was cleared during the day but continued to be blocked at night.

According to the Lhuentse dzongrab food and non-food commodities were getting scarce in the dzongkhag, especially in Autsho, Rewan, and Phaling. Fuel like petrol and diesel had run out two weeks ago. "We are planning to tranship essential commodities by cutting a mule track or a footpath," said the dzongrab.

Lhuentse lost some 4.12 acres of wetland.

In Trashiyangtse the review team visited the Bomdeling plains where 19 acres of rice fields had been destroyed by the Kholongchhu and erosion was still continuing. The river protection work carried out since last year had also been washed away. Other places like Jamkhar, Tetsho and Yalang had lost both wetland and dry land.

The Trashiyangtse-Trashigang highway blocked at Burbula for more than two weeks has been cleared.

Owing to unstable boulders perched above Duksum town 15 registered shopkeepers were evacuated to a safer spot at Khetshang. Water, electricity, and other services had been provided by the dzongkhag.

Dzongrab Karma Jamtsho said the people were being given what they wanted. Poles and bamboos had been supplied for temporary makeshift camps at Khetshang and the dzongkhag administration had provided vehicles and men for shopkeepers to shift to the new location, which was 15 minutes away from Duksum. Agencies like the FCB and post office were being moved to a safer location with facilities like electricity, telephone, and drinking water.

In Samdrupjongkhar, the monsoon had destroyed houses, farmlands, and bridges.

The team led by the agriculture minister visited Samdrupcholing where about 15 acres of wetland was damaged apart from some illegal settlements. In Wooling village some 10 houses were on the verge of collapse and 32 houses affected by a crack in the ground were to be shifted to a safer place. Ten households were putting up in makeshift tents, according to Samdrup Jongkhar dzongrab.

Orong and Martsala geog also suffered damages. Six suspension bridges had been damaged, four at Orong and two at Phuntshothang. Villagers had set up temporary crossings so there was no dearth of food and other necessities, according to the dzongrab.

In Mongar, two people had died and only one of the 16 geogs was spared. The 15 geogs suffered the loss of houses, farmlands, irrigation canals, farm and feeder roads, chortens, transmission towers, and water tanks.

The assessment team also visited Dramitse and Chaskhar in Mongar.

7/26/2003

Two students killed, two missing

Two students of Phongmey Lower Secondary School in Trashigang were killed and another two were still missing when a flash flood washed away a temporary boys' hostel on Wednesday night.

The stream near the hostel had flooded, carrying sand, boulders, and debris at around 10:45 pm, wiping away the thatched bamboo construction that housed 33 Class VII and Class VIII students.

The body of Dorji Sangay, a Class VIII student, was found buried in the debris and Jigme Dorji, a Class VII student, was found the next day in a rice field about a kilometre downstream.

Cheda Jamtsho of Class VIII and Ugyen Thinley of Class VII were still missing. Five students were admitted to Trashigang hospital, two of them seriously injured.

"A thunderous sound woke me up and, hearing screams, I went out to check," said hostel warden Sher Bahadur Tamang. "I saw students being washed away as they tried to get out of the hostel. The flash flood hit just after the children had gone to bed at 9.30pm."

Four students had clung on to a small tree and several others were washed to rice fields nearby.

In the other hostel block, an old mud and stone two-storey structure, 61 pre-primary children who lived on the top floor were rescued. The flood had submerged the ground floor that was partly used as a WFP store.

"Fortunately the electricity supply was not disrupted that night and helped us locate the children," the hostel warden told Kuensel.

A rescue team lead by the Trashigang dzongrab, comprising sector heads, police, teachers from neighbouring schools and villagers combed the entire stretch for the two missing boys without any success. The search will continue for a week, dzongkhag officials said.

Eyewitnesses told Kuensel that two streams which were almost unnoticeable during dry season had come crashing down carrying boulders, logs and debris. "We couldn't help immediately because it was impossible to cross the stream," said gup Pema Thinley of Phongmey who lives nearby. "In just half an hour everything was over."

The flood also damaged school toilets, the dining hall, farmland, about four houses, two Maruti vans and a scooter.

The head teacher, Tenzin Dorji, told Kuensel that parents of the Class VII and VIII students had come to collect their children. Other students from nearby villages had also gone home and the remaining few from far-flung villages were now living in classrooms that were considered safe.

The school was closed and will reopen on Monday, August 23. The school has 348 children and 12 teachers with 148 children as borders, including 54 girls.

A team from the education ministry in Thimphu led by the education secretary is expected to reach Phongmey today.

Meanwhile, people owning houses and shops nearby and teachers are living in a lhakhang and in houses that are located a safe distance away from the streams.

8/14/2004

Bhutan India discuss flood management issues

Meeting in New Delhi on August 2, a high level technical delegation from Bhutan and India discussed forming a joint group of experts to tackle flood management issues that affect the Indian states of Assam and West Bengal every monsoon.

All rivers from Bhutan flow into the plains of Bengal and Assam adjoining the foothills of southern Bhutan.

The director of the Department of Energy, Sonam Tshering, who led the Bhutanese delegation to the meeting told Kuensel that the meeting drew up a terms of reference to discuss the recurring floods and erosion problems in the southern foothills and adjoining plains of India to find remedial measures acceptable to both countries.

The joint group of experts after a study would put forward recommendations, agreeable to both the neighbouring countries.

The meeting also agreed the two countries should meet twice a year, before and after the monsoons.

The proposals of the first round of meetings will have to be submitted to the two governments for approval according to Sonam Tshering.

He told Kuensel that during the meeting he informed the Indian delegates that Bhutan, despite an intact environment, was also facing major problems because of heavier rainfall.

The Indian delegation to the meeting was led by Commissioner of Eastern rivers.

According to the Department of Energy the government of India had proposed forming a group of experts more than a year ago to look into the reoccurring flood situation in the Indian states.

Recently, the government had instructed the department to form a multisectoral team of nine members for the purpose.

The August 2 meeting was the first round of meetings to tackle the flood issue in the neighboring Indian plains.

8/14/2004

Flood warning system

The International Centre for Integrated Mountain Development (ICIMOD) member countries of Bangladesh, Bhutan, China, India, Nepal and Pakistan are meeting in Thimphu to discuss the establishment of a regional flood information system in the Hindukush Himalayas.

The three-day meeting which began yesterday is being organised by the hydro-met services division of the Department of Energy and ICIMOD together with the World Meteorological Organisation.

5/18/2005

ICImod countries to establish flood information network

After a series of discussions and meetings over the last few years the International Centre for Integrated Mountain Development (ICIMOD) member countries, except for India, endorsed a project document to establish a flood information network during a two-day meeting held in Thimphu which ended on May 18.

The project aims to reduce flood vulnerabilities and save lives and infrastructure in the Hindu Kush Himalayas region of Bangladesh, Bhutan, India, China, Nepal and Pakistan which share the major river basins of the Ganga and the Brahmaputra.

The first phase of the project, will test the feasibility of the hydrological and meteorological systems in each country," said Dr. Wolfgang Grabs from the World Meteorological Organisation adding that the network has been designed and defined by the countries and two hydrological and two meteorological stations have been identified in each country. "Data and information will also be shared through the existing systems," he said.

Based on the result of the first phase, the identified stations will be upgraded according to their needs and data collected will be sent to the project centre at ICIMOD in Kathmandu, Nepal and the final phase will see the full implementation of the project.

According to officials from the Hydro Meteorological Service Division (HMSD) hydrological stations and meteorological stations have been identified in Kurichu river basin in Mongar and Pochu river basin in Punakha.

"The benefits that can be accrued from the project is a win-win situation for all countries," said Mandira Shrestha, water resources specialist and project coordinator from ICIMOD. "It provides an opportunity for technological and knowledge transfer helping to strengthen institutional capacity and creating public awareness in flood management, the needs and its benefits and helps improve national flood forecasting systems."

"From a regional point of view it is possible through the project to develop a regional flood outlook," said Dr. Grabs. "Bangladesh would see how a situation is developing in Nepal and anticipate better what is happening," he said. "The immediate benefits are more with the low appearing countries but this is done as a sign of good neighbourhood in a regional framework," said Dr. Grabs.

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ICImod countries to establish flood information network

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While countries like India and Bangladesh lying in the lower part of the Ganga and Brahmaputra river basins can improve their forecast on floods based on the information shared countries like Bhutan and Nepal lying on the upper side of the watershed can build up their capacities according to experts.

The problem in Bhutan is not major river floods compared to higher priorities like flash floods, glacial lake outbursts, landslides and debris flow, said Dr. Grabs. "Indoor flashfloods are not dealt with in this project but the instrumentations, the telecommunications infrastructure, the warning mechanism are very similar and in this Bhutan gets access to expertise and equipment."

Stating floods to be a major threat to Bhutan the superintending engineer of the Hydro Meteorological Service Division, Karma Chophel, said that the infrastructure development and capacity building would help in better flood management. "Although floods cannot be stopped people living downstream can be warned on the probability of a flood occurring and lives and property can be saved," said Karma Chophel adding that a dramatic change, a gradual increase in the water level or heavy rainfall were some of the indicators of the probability of flood.

According to HMSD officials hydrological and meteorological information is transmitted through a wireless network and in some places telephones were kept as back up.

"Among the member countries, Bhutan and Nepal are still in the early stages of infrastructure and technological development," said Madira Shrestha.

The project is supported by the ICIMOD in collaboration with the world meteorological organisation and until now about US $ 2.2 million has been invested in the project.

5/21/2005

Swelling Amochhu drives people inward

With the Amochhu that flows past Phuentsholing town swollen to its fullest, following incessant rain for the past week people living near banks have begun shifting inward to safety given its unpredictable nature.

"The Amochhu has just begun to swell and with more rain it will swell again for the next two months," says Choki Wangdi, 41, from Trashigang who has lived along the riverbank for the past two decades. "The river swells every year but it never looked so angry and dangerous."

With the river nearly covering the whole stretch of the riverbed "it is probably the largest flow since the flood of August 2000," states an inspection report of the river prepared by the Phuentsholing City Corporation on July 18.

The report states that the river has penetrated most of the dry lands that become temporary godowns during the mandarin season in November.

The first swell of the river has also covered the road leading to Bangay Bazaar, a settlement of about a dozen makeshift shops upstream, washing away two measuring gauges installed along the riverbank.

The report states that the adjacent areas are safe at the moment "if there is no further increase in the flood level."

The only protection works that stands today along the left bank of the Amochhu are the gabion walls, built in 2001 after the 2000 floods, that are on the verge of sinking.

Local authorities agree that the walls are not strong enough to contain a further rise in the river level. "If the river level rises and floods there are chances the whole area along the river bank could be washed away," said Phuentsholing thrompon (mayor) Jangchub Gyeltshen.

But there are no plans either to build river protection walls in that area as the land along the Amochhu bed does not fall directly under the present municipality.

"As the Amochhu basin is to be reclaimed, all works along the left flank of the river has to comply with the reclamation project plans," said Thrompon Jangchub Gyeltshen. The project is still at a draft stage.

Many residents also believe that the collection of boulders from the Amochhu basin has exacerbated the river changing its course landward.

But forest ranger Pema Namgyel said that the collection would not have any affect on the river course as no mechanised collection was done. "Only manual and surface collection is done and collection is more on the opposite side bank of the river," he explained. However, boulder collection was also stopped from July 17 because of the rise in the river level.

Last year, the Amochhu caused a similar commotion when it changed course and penetrated landwards washing away about 400 metres of dry land along its left bank. Though no loss of human lives was reported, local authorities did lose their sleep.

5/21/2005

Bumdeling's Kholongchu floods yet again

With the gabion wall built in 2003 completely washed away, the swelling Kholongchu river in Trashiyangtse is now flowing into the paddy fields of Bumdeling valley.

According to the Bumdeling park ranger, Ugyen Tshering, the flooding river, has washed away more than three acres of paddy fields.

Even the roosting grounds for the cranes have been affected more this year said Ugyen Tshering.

"There hasn't been much damages to the fields and crops as of now," said Ugyen Tshering. "But if the rain fed Kholongchu continues at this pace, more paddy fields and flat lands will disappear."

The park ranger said that the Kholongchu keeps changing its course every year. "Boulders, uprooted trees and debris brought by the river filled the riverbed and this causes the river to change course," he explained.

With only two months before the black necked cranes come to the valley to roost, the Bumdeling park officials are worried if they can clear and rehabilitate the roosting grounds on time. The park ranger said that Kholongchu affected the roosting grounds every year and rehabilitating the roosting ground had become an annual task for them.

"The rehabilitation works are going to be more difficult this time because there are huge boulders, uprooted trees and logs to clear," Ugyen Tshering told Kuensel. "Digging channels to create an artificial island for the cranes to roost is going to be even more difficult."

Meanwhile, Nagpolachu, which flows through Bumdeling village has also changed its course and continues to flow inland.

According to Bumdeling gup Sangay Dorji, this was the second time that the village was threatened by a flash flood.

The river brought the first flood on August 19, which didn't cause much destruction to the fields, but the second flood on August 23 continues to ravage the fields.

"The flood hasn't done much damage as last year," said gup Sangay Dorji. "But our flat lands are all forming deep canals."

8/27/2005

Glaciers are retreating

On a clear blue morning of October 7, 1994, Dechen Tshering, a Class X student of Punakha High School, was standing at the confluence of the Pochu and Mochu rivers when he heard a rumbling sound.

He didn't give it a second thought assuming that convoys of trucks was passing by but when the water level of the Punatshangchu touched the stones where he had positioned himself he literally flew to safety.

"All I could see was a river of logs, boxes, haystacks," he recalled. "In minutes the river ravaged everything on its way. It changed course, destroyed parts of the dzong, and flooded the school soccer field and ripe paddy fields with fish," he said.

The October flood had claimed more than a dozen lives, damaged acres of farmland, and government and private property worth millions of ngultrums.

The flood was caused by a glacial lake that had burst high up in Lunana nine days walk from Gasa dzong.

Since then several attempts have been made to reduce the risks of another glacial lake outburst flood (GLOF), but geologists say the dangers are far from over with changes in climate.

Since the last inventory of glaciers and glacial lakes in Bhutan by the International Centre for Integrated Mountain Development (ICIMOD) in 2001, 106 new glaciers and 120 glacial lakes have formed in the mountains.

In the past 15 years, 16 new glaciers and 82 glacial lakes had formed in the headwaters of the Phochu alone.

About 140 glaciers and four new glacial lakes had also formed in the headwaters of the Mochu, according to Glaciologist, Karma Toeb, who presented the impact of climate change on glaciers and glacial lakes in Bhutan Himalayas on Thursday.

"If the present trend of climate change continues, there is a possibility of another GLOF," the glaciologist said. "It is difficult to say when, but the glaciers are melting at an alarming rate."

According to geology experts, the number of lakes posing dangers had increased from 24 to 25. Karma Toeb, who has visited Lunana eight times said that they have identified nine potentially dangerous lakes in the Phochu sub basin, seven in Mangde chu, five in Mochu, three in Chamkhar, and one in Kuri chu.

The more impending dangers could come from fast retreating glaciers.

Karma Toeb said that the glacier retreat rate in Himalaya of Bhutan was more rapid than the retreat rate in Nepal. "Glaciers are retreating at a rate of 7.36 metres in a year," he said. "There is an average of 10.7 percent shrinkage in glacier area and 3.28 percent increase in the lake area," he said.

According to geology officials, the Thorthomi lake, 4,500 metres above the sea level, has become critical and poses potential dangers. "The debris covered glacial lake is expanding because the glaciers are melting," Karma Toeb said.

The Thorthomi lake is located between the Luggye lake that flooded in 1994 and the Raphstreng lake. "The moraine dam between Thorthomi and Raphstreng is not thick," the glaciologist said. "There is ice core in the moraine and the moraine will become weak with the ice melting."

The Thorthomi lakes left lateral moraine was eroded during the 1994 flood. "The Raphstreng lake where artificial canalising had been carried out would not be able to hold the water from the Thorthomi lake incase the lake leaks because of the melting moraine," said Karma Toeb. ***Continue...***

Glaciers are retreating

Continue...

According to geomorphologist Deo Raj Gurung, in a worst-case scenario, there could be a chain reaction if one of the lakes burst in Lunana. "The volume of water in the reservoir is about 18 million cubic metres, therefore it is only wise to secure the downstream now," he said.

A hazard zonnation for GLOF along the Puna tsangchu from Khuruthang in Punakha to Kalikhola is among various mitigation and risk management measures, the department of geology and mines (DGM) with the Netherlands Climate Assistance Programme (NCAP) had prepared.

The project, which would begin soon, is one of the adaptation methods to climate change according to the director DGM, Dorji Wangda.

"A base map on the hazards related to GLOF along the Puna tsangchu can be used as a tool by policy makers and planners in taking decisions, designing and planning developmental activities along the river," he said.

Presenting the project to stakeholders on Thursday, Deo Raj Gurung said that many important installations and monuments lie along the Puna tsangchu like the Punakha dzong, new Wangduephodrang township, Basochu project, Puna tsangchu project besides thousands of settlements.

The hazard zonnation map along the Puna tsangchu would delineate areas along the river into different zones of different degrees of hazards from GLOF in future.

Meanwhile, the Global Environment Fund had agreed to fund US$ 3.5 million for hazard zonnation map in Chamkhar chu in Bumthang, establishment of an early warning system along the Punakha-Wangdue valley, and artificial lowering of the Thorthomi lake.

12/2/2006

Tsatichhu lake poses no flood hazards

Following an assessment of geographical condition and impoundment behind the dam, a joint Indo-Bhutan team has derived that the Tsatichhu lake in Jarey gewog, Lhuentse, poses no flood hazards to downstream areas including the Indian territory.

The team comprising of Indian officials from the Central Water Commission, Geological Survey of India and Water Resources Department of Assam and Bhutanese counterpart from departments of energy, roads, forest, and geology and mines had reached the conclusion following a six-day hazard potential assessment tour of the lake that ended on December 23.

According to a press release from hydromet services division of department of energy, the present water volume was only about 0.56 million cubic metres, about 5 percent of the original volume, and the maximum depth was 24 metres.

In September 2003, a massive landslide had blocked Tsatichhu tributary forming a large water body, about 35 kilometres upstream of Kurichhu dam and power station. The lake was initially estimated at about 117 metres in height and had accumulated about 12 million cubic metres of waste posing an immediate danger to Kurichhu Power Project downstream.

A portion of the dam slid in May 2004 displacing about 10 million cubic metres of mud and stone debris.

Following a heavy rainfall, the landslide dam finally burst in July 2004, and besides shutting down the power generation from Kurichhu hydropower plant a transmission tower 15 kilometres down stream of Kurichhu which carried power to the Indian grid was washed away. The Kurichhu Hydropower Corporation suffered a loss of about Nu. 52 million in revenue.

But due to the established early warning system by the department of energy, the Kurichhu Hydropower Corporation and the plains in India received timely warning of the flood minimising the flood damages and no human life was lost, according to the head of hydromet services division, Karma Chhophel.

Fearing such losses during the impending monsoon in 2005, a manual breaching of the lake was also attempted.

12/30/2006

Flash flood destroys paddy fields

As many farmers across the country wait for rain to hurry the paddy cultivation for the season, farmers in Toetso gewog in Trashiyangtse are reeling from the destruction of a flash flood that destroyed about four acres of paddy land in the gewog.

A heavy downpour for about 15 minutes on July 4 caused the Sangmari and Pasadangdri stream to swell beyond its course and destroyed the paddy cultivated land belonging to about 16 households in Dung and Gongza villages.

A damage assessment team comprised of dzongkhag officials headed by the dzongrab said that the swelling stream also washed away 59 metres of the Kesheri irrigation canal and destroyed the Samthang irrigation canal.

"The newly constructed Beli suspension bridge was also damaged," said a dzongkhag official.

With paddy fields buried under sand and debris farmers said that they are left helpless. "I don't know what to do," said a farmer. "The stream had never flooded even when we experienced bad monsoon."

The dzongkhag agriculture officer said that farmers would not be compensated because the crops are not insured.

Meanwhile, on July 10, a landslide on the Trashiyangtse-Trashigang highway, about a kilometer away from the Trashiyangtse town, cut off Trashiyangtse for two days. The road was cleared for traffic on July 12.

7/14/2007

Rain disrupts life in southern region

The heavy downpour over the past week disrupted roads and flooded urban centers in several dzongkhags in the southern foothills.

A concrete bridge on the Samtse-Sipsoo highway was washed away on Thursday at around 8:30 by the damdum river bringing vehicle movement to a standstill on the highway and preventing students living across the river to reach their schools.

The Samtse dzongda, Tashi Gyaltshan, said that school children who live across the river were transported home via a route through Nainital, India. "It could take about three days to arrange for the river to be diverted and allow the movement of vehicles, if the rain stops," said the dzongda. "But if rain continues changing it will be very difficult."

In Sarpang, people living close to the Sarpangkhola have moved to a safer location with the river continuing to swell. "All personal belongings and stocks were shifted to Sarpang tar and other safer places," said Sarpang dzongda Sangay Thinley. "Even shops that were located in the risky zones have been shifted temporarily to safer places with the help of armed forces, civil servants and the public."

On July 20 and 25, the rise in the drain water level at the border check post in Gelephu posed danger to the nearby offices of the police, immigration, customs, and the people residing nearby, dzongkhag officials said.

All the office equipment and personal belongings had to be shifted, according to the dzongda.

The road between Jigmecholing (Surey) and Gelephu town on the Gelephu-Zhemgang highway was also blocked and there were no vehicle movement.

"My two daughters were unable to attend school for two days," said Tsheten, 34, a resident of Lodrai in Gelephu. "It was difficult even for the vehicles to ply."

In the Samdrup Jongkhar dzongkhag heavy downpours damaged a part of the river protection wall of Dungsam chhu that flows on one side of the town.

The Dewathang-Samdrupchoeling road was also blocked at several points, which according to dzongda Sangay Dorji, would take about four days to get cleared.

"Here it didn't rain continuously but whenever it rained it was very heavy," said the dzongda adding that although there were no serious damages, the dzongkhag was constantly monitoring all the areas.

In Dagana the continuous downpour for about a week, led to the intermittent opening and closing of roads, according to a road engineer.

He also said that the roadblock in Nimdokha, about 75 kilometres from Sunkosh was being cleared. "On July 26 around 4.00pm the road at Khagochen was sinking."

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7/28/2007

Pasakha industries shut

Activities at the Pasakha industrial estate in Phuentsholing has come to a standstill after incessant rain in the last few days caused massive landslides in Bhawanijhora, 6.5 kilometres from Rinchending, Phuentsholing.

According to Karma, the deputy engineer of the road department, the area had been always vulnerable to landslides during heavy rains, and road officials were in the process of studying the area to carry out preventive measures soon. "We have deployed manual labour along with earth excavators to clear the road, but we fear more slides if it rains heavily", she said.

Rainfall records with the water and power consultancy services, showed that the highest rainfall for the week was recorded yesterday as 309.4 mm followed by 152.6 mm on July 25.

The disruption has created a major panic and chaos among industrial workers who travel daily to and from the Pasakha industrial estate. "The workers couldn't cross the landslide and all industries had to be shut till the slide got cleared," said Tandin Wangchuk, a Trade official.

The managing director of Mega Private Limited, Ugyen Samdrup, said that although people could cross the landslide without the vehicles it was very risky. Road workers hope to fully clear the area by evening today.

7/28/2007

Flash flood raises relocation issue

A flash flood that hit Lhuentse town's upper market on May 1, after a small stream burst its banks following a heavy downpour, washed away a temporary wooden toilet and inundated a hotel and a store.

"The flood was so sudden we didn't know what to do," said Dechen Wangmo, who runs a general shop. Her wooden toilet, located right behind the stream, was washed away. Dechen, her four children, and 86-year-old father put up with her friend that night.

The owner of Shangrila hotel, Karma Choden, said that her three-storey wooden house was filled with water and sand particles. "We stayed till midnight to clean up," she told Kuensel.

According to some old residents of the town, a similar flood occurred 12 years ago.

The flood has brought to the fore the issue of relocating Lhuentse town's upper market, which consists of about 20 makeshift settlements above the road to the dzong. The upper market faces the Lhuentse dzong and sits on a gentle slope.

Lhuentse dzongda, Tshering Kelzang, told Kuensel that the dzongkhag administration is seriously looking into matters. Regarding the new town, basic infrastructural development like wall and step constructions were already over with the World Bank funding of Nu 32 million.

Dzongda Tshering Kelzang said that the 28 shopkeepers of the upper market, who were allotted plots in an area 50 metres away from the present location, would soon be allowed to start construction because the dzongkhag had received an approved map from the department of urban development engineering services (DUDES) in Thimphu.

5/7/2008

The tenacious ten of Lungtenzampa

When a flash flood hit Lungtenzampa in 2004, causing large-scale destruction to basic infrastructure and property, the 30 households that made up the thriving town were cautioned to move out to a safer area.

While a majority of the residents, from this town near the banks of the Gamrichhu, 10 km from Trashigang, returned to their villages, and some settled in neighbouring Rangjung and Trashigang town, ten households stayed back, saying they had nowhere else to go, having invested their lifetime earnings in the present settlement they had no means to restart all over again.

The flood had uprooted electric poles and washed away water sources and, since they were advised to move out, the dzongkhag has not replaced those facilities. Until last year, they had stowed their electronic appliances and lived without electricity.

After numerous requests by the residents, power supply was resumed. Since then, rumours have floated that the water supply would also follow and the families would, after all, be allowed to stay there.

Today, residents are anticipating formal approbation from the dzongkhag but, at the same time, living in fear of being driven from the place.

Tashi Tshering, who has lived here for more than 40 years, said that the people had had informal talks with the previous dzongda, who had indicated that, while new settlements would not be encouraged, those who were there would be allowed to stay.

"But nothing's being done at the moment," he said, adding that the place was gradually becoming a neglected area, although the supply of electricity had reduced wildlife encroachment in their fields.

The place had earlier served as a shopping centre for gewogs of upper Trashigang, mainly Shongphu, Samkhar, Bidung, Phongmey, Radhi, and even Merak and Sakten.

A bridge link to Bidung gewog was also washed away, thus disconnecting the place. In addition, the coming up of farm roads in villages had completed destroyed the business prospects of the area.

"Now we're in the middle of nowhere," said a mother of two, who preferred anonymity. She said that her children walked about nine kilometres to schools, either in Rangjung or Bikhar. "Those are the nearest schools. We can't even request for one since they keep reminding us to leave the place," she said.

Samkhar gup, Sonam Dorji, said that, once there was an order for them to vacate the place but after a few of them stayed back, there was no proper instruction from the dzongkhag.

He said that there were development activities to be initiated under the Ninth Plan but after the flood they were all shelved.

Dzongkhag officials, however, confirmed that, while electricity was provided for the residents' temporary convenience, the settlement would not be encouraged.

"We still consider the place unsafe and such incidents can happen at any time," said dzongda Dorji Norbu. "Besides, there are no business opportunities there and even if there was, we'd prefer to have them moved to some other place."

He said houses were located without any protection and some houses were in fact situated below the water level.

"We respect their sentiments but they might have to consider their future. They can live there but they need to think about their children," said dzongda Dorji Norbu.

6/21/2008

Phongmey's flooding problem doubles

Every monsoon, people in Phongmey, about 35 km north of Trashigang, have a special reason to worry. Yudiri, a nearby stream, floods the area, washing away the only road link to the gewog and choking traffic.

This year, their concern has shifted a kilometre and a half closer to home and it is another stream, Dungjuri, which is proving to be more hazardous and troublesome.

According to Phongmey gup Dorji Wangchuk, Dungjuri has swelled ever since the 2004 flash flood, which washed away property and claimed lives. "But this year, it has become more severe," said Dorji Wangchuk.

Besides causing landslides, it also creates water logging, consequently making the area marshy. Earlier, the stream fed six irrigation channels, all of which were flooded in 2004. "We couldn't repair it since then and now the stream not only blocks the road but also floods the paddy fields below," said the gup.

The flooding of Yudiri stream, about three kilometres before reaching Phongmey, had posed immense problems in the past, leaving shopkeepers, villagers from Phongmey, Merak and Sakten, and government officials stranded.

While it has almost been a month since both streams caused slides, most villagers and shopkeepers began stocking rations and essentials well in advance.

Continue...

Phongmey's flooding problem doubles

Continue...

Jigme Choden, a shopkeeper, said that every year they suffered because of Yudiri, but the Dungjuri stream was going to be an additional headache henceforth if nothing was done about it. "We noticed the area becoming muddy during monsoons for the past two years but never thought it would become this serious," she said. There are a total of 14 shops in Phongmey, four in Sakten, three in Merak, and seven in Khardung.

Meanwhile, road officials have already mobilized manpower at the site and will soon deploy a machine at Dungjuri. "There's no feasibility of constructing bridges over both streams, so the only immediate solution is to deploy men and machinery and make it possible for vehicles to cross," said the executive engineer, Tseten Dorji.

Earlier, a log bridge, costing more than Nu 700,000 and suitable for light and medium vehicles, was constructed across Yudiri but was washed away in the same year.

Plans are underway to introduce a ropeway over Yudiri this monsoon as an alternate measure. "We've already asked for material and will construct it as soon as possible," said Tseten Dorji, adding that the ropeway would be operated mechanically and have a capacity of carrying two persons or one person with belongings.

Trashigang dzongda Dorji Norbu said that the dzongkhag was very much aware of the problem and had gone to investigate before the monsoon began. "We noticed that Dungjuri posed more problems but there's no alternative unless we divert the road," he said. He said that construction of causeways would not solve the problem, as it would be difficult for smaller vehicles to ply, and construction of bridges was impossible as both sides were unstable.

"Rerouting is the only option but it's going to be very lengthy and expensive," he said. "But, for now, we don't have any immediate solutions."

6/25/2008

Haa flood washes away four cows

Four cows have gone missing and two houses were filled with debris by a flood that hit Haa on July 18 at around 12 am.

According to the Haa dzongda, Pemba Wangchuk, the flood from the Yakchu river, located 12 km from Haa town towards Damthang, had initially washed away seven cows tethered in a shed.

"One cow was already rescued at the beginning of flood, two other cows were found alive but four cows are still missing," he said via telephone yesterday afternoon.

The floodwater had also entered a two storied traditional house and a mud house and dumped sand and gravel.

Dzongkhag officials were still investigating the cause of the flood. However, they suspect that an artificial lake could have formed from soil erosion and landslide, that might have blocked the river and caused it to flood.

7/19/2008

From flood rumour to damp squib

At approximately 4:30 pm on Thursday, Thimphu residents, particularly those residing near the Thimchhu, fled to higher ground not knowing what to expect as word spread among friends and family, confirmed by a warning over Kuzoo FM, about a flash flood heading towards Thimphu town.

According to an eyewitness, the Thimchhu had risen above the bridge on the way to Tango Cheri. "We were told to get to higher ground as there was a flood coming," said Dophu, a farmer, who had come to sell vegetables in Thimphu.

Another person told Kuensel that he had heard of the flood from a friend and immediately called his family to warn them. There were more than 30 vehicles parked along the Riverview hotel road as well as the Zilukha area, with people waiting and watching anxiously for the flood. While many people were in a state of panic, many remained calm while some were unaware of the flood warning.

A source told Kuensel that, while many were running towards higher ground, some curious onlookers headed towards the river wanting to get a glimpse of the so-called flood. "Some people were closing their shops, carrying their belongings and running towards higher ground," said Ugyen, a student who lives near the vegetable market. "I wanted to get a closer look. I personally feel that the radio contributed to the panic. They didn't know what to expect."

The water level did not rise too much but it had turned muddy and there was no damage except for a little debris, which was thrown onto the road to Tango Cheri, but it was taken care of by villagers who helped clear the debris. The water level returned to normal by evening. The last flood Thimphu experienced was during the late 1960s.

An official from the department of energy told Kuensel that the flood originated from Dodena and was not part of the main Thimphu chhu tributary. Officials noticed landslide scars and attributed the flood to those landslides. According to energy officials, the findings were based on a visual assessment as the actual site was inaccessible.

7/19/2008

Rising waters down south

Gabion Walls – One, partially washed away, the other eagerly awaited

Phuentsholing

The gabion (river protection) wall, built to resist the Amochhu river in Phuentsholing in spate of summer, could not withstand the pressure of the swollen river after continuous rain for almost a week.

A part of the wall, along the left bank, built by Phuentsholing city corporation (PCC), was washed away last week when the river increased its volume and flow. The PCC assistant engineer, Varghese, said around 20 percent of the wall, adjacent to the sewage treatment plant, had gone.

He said that the walls, measuring 24 m long and 3 m high with a foundation that ran two-and-a-half metres deep, was erected to train the river and protect the sewage treatment plant nearby.

The walls were washed away once in 2006 and re-

constructed and completed last year in June at a cost of about Nu 3.6 m.

"We can't do anything at present with the river swelling, but once the river volume subsides, we'll rebuild it," he said.

The gabion wall of 'mecca feri' wire mesh, which is machine woven and much stronger, was part of the river training project to protect parts of Phuentsholing town located on both sides of the Amochhu.

Residents near the sewage treatment plant said that the collection of boulders from the Amochhu basin had diverted the river, changing its course landward and that boulder collection had also stopped because of the rise in the river.

Samtse

In Samtse, continuous rainfall set off landslides that destroyed several paddy fields. In Sukrutey village under Samtse gewog, five households residing near the Dhaukhola river lost more than half their paddy fields.

A resident, Purna Bhadur Pradhan, who lost about 40 decimals of farmland, said that landslides and crops getting washed away are common every monsoon. "Farmers have been living in fear every monsoon," he said.

Last year, about 12 acres of paddy fields were damaged and farmers had appealed to the dzongkhag administration for retaining walls. Dzongkhag officials told Kuensel that the affected site had been surveyed and reported to the home ministry for constructing the retaining walls.

9/13/2008

Panic in Punakha

Residents in the low-lying areas of Punakha and Wangduephodrang spent a panicked and a hectic day yesterday after receiving reports of an impending flood along the Phochu because of a natural dam burst below the Lunana area.

There was, however, only a slight increase in the water level of Phochu, which had turned muddy. No casualty or loss of property was reported.

"The water level had risen by 2.1 metres only as compared to six metres to which Phochu can rise in summer," said the Prime Minister Lyonchhoen Jigmi Y. Thinley, who had rushed to Punakha after early reports.

"People are not worried even after being informed because they were running towards the river to see. Thousands of lives would have been lost if this was a real flood," Lyonchhoen told the people.

It was 3.30 a.m. when a Basic Health Unit staff in Heidi near Lunana heard a loud rumble in the Gotuchu river. He saw that the water level in the Gotuchu, which is a tributary of Pho Chu, had increased three folds.

Gotuchu river is formed by the Tshojo glacier, which is below Lunana, and has many moraine dams and ponds.

The BHU staff immediately informed a Lunana outpost 4 hours upstream watching over the big lakes. ***Continue...***

Panic in Punakha

Continue.

Seeing that no lakes in his area had burst, he relayed the BHU staff message to the two dzongkhags below - Punakha and Wangduephodrang. People were informed and a message sent to Thimphu. **..**

Dzongkhag officials sent out messengers and called people on cell phones warning them of a possible flood.

Panic spread as students, farmers, business people, civil servants and monks left their homes, offices, farms, and monasteries to head for higher ground.

Meanwhile rumours spread like wildfires that three Lunana lakes had burst causing more panic and mayhem.

People had packed their valuables in bags and bundles, some even had brought along their furniture and utensils. They were huddled on hills expecting the worst.

"I had a difficult time getting my nine children together and then packing and running for the hills," said Punakha farmer Sangay, 49.

"As soon as we heard the news at around 9.30 am. all the monks rushed out of the dzong and headed for the hills," said monk Rabgye, 17.

But with no flood in sight and water having risen only a bit, officials called off the emergency at 12.15 p.m. Some farmers, however, were not in the mood to take any chances. "I will sleep out here on the hill tonight. I don't care," he said.

A flood warning section official said: "The melting of some of the ponds in the Tshojo glacier had caused a sudden rush of water, which caused the Pho Chhu to rise."

The Gotuchu burst had, however, washed away several footpaths and a footbridge upstream, said local officials who had hiked towards the Tshojo glacier.

His Majesty the King, the home minister, Goongloen and Police Chief were also present in Punakha to assess the situation.

Eye witness account from the 1994 flood

It was a Friday, I was in class IV, the river had swelled and came rushing down, I saw a man struggling to fight the river, at one moment he looked like he was going to survive, when he managed to catch on to a tree but then we saw a log come down with the flood and hit him on the head, he then disappeared.

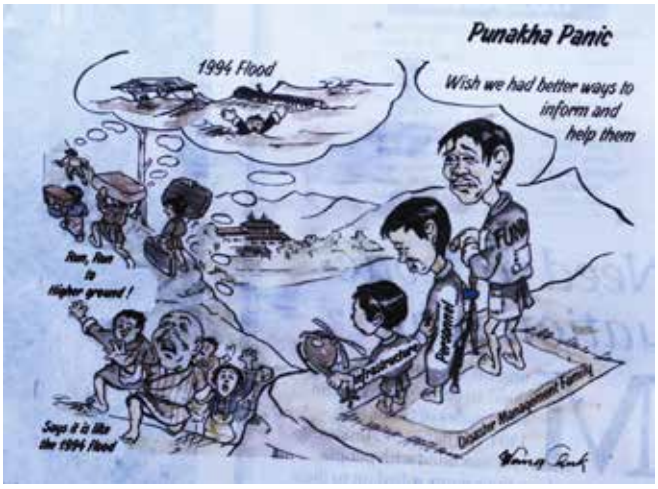
4/30/2009

Getting readier for GLOFs

To be better prepared, government plans to set up automatic sirens in the villages down Lunana area, which will go off, warning people, at the first hint of any impending floods in the area. The sirens will be linked to automatic sensors that will measure water pressure of the lake, say officials.

These steps are a series of action plans being studied by the department of disaster management (DDM) of the ministry of home and cultural affairs.

"We've just set up a direct information system, in which the station at Lunana will directly inform the dzongkhag authorities and DDM, instead of routing through the department of energy and others," said senior DDM program officer, Karma Doma.



DDM had recently distributed around 20 mobile phones to 17 vulnerable communities in the Punatsangchu region. The phones came into use on Wednesday but evacuation plans were a mess. But the department would work on evacuation drills and a disaster management act has been drafted.

The department aims to train teams at the gewogs to identify risks and action plans. "We're working on early warning systems, information sharing, evacuation and after-disaster preparations" said Karma Doma. She said, however, that one of the biggest problems with disaster management in Bhutan was that there were no specialised emergency services or dedicated paramilitary forces trained in disaster management, and also funds.

5/1/2009

Moraine dam threat looms large

Potential problem at the source of the flood in Tshojo glacier

Bhutan's glacial flood problem just got bigger with two new developments.

A geology study published this year has revealed that the natural dam in Lunana, separating the glacial lakes Thorthormi and Rapstreng from each other, is today only 32.5 m thick. Five years ago, in 2003, the wall was a solid 74 m thick.

Second: yesterday's sudden rush of water down the Phochhu is attributed to a 13-km long Tshojo glacier, located half-a-day's walk down from Lunana and three times bigger than any Lunana glacier.

Continue...

Moraine dam threat looms large

Continue...

Mitigation works have so far been focused on the upper Lunana area.

An initial survey after the flood has found seven new ponds on the surface of Tshojo glacier. Geologists suspect that the rush of water in the Phochhu on Wednesday might have come from unseen and undetected underground lakes or ponds in Tshojo glacier.

"We're running against time," said Bhutan's only glaciologist, Karma Toeb.

In June 2009, Karma Toeb will head a 400-member mitigation team of labourers, geologists and engineers to Lunana to try and drain Lake Thorthormi. They will study Tshojo glacier on the way. Costing Nu 130 million and spread over three years, the team will aim to reduce Thorthormi by five metres.

In 2008, an engineering survey was done of the area with a smaller team. It was found that several glacial ponds of the Thorthormi glacier have also linked with each other and formed a separate lake. "The melting seems to have accelerated since 2005," said Karma.

Experts say that, if the natural wall separating lakes Thorthormi and Raptstreng gave way, Thorthormi, being on higher ground, would flow into Raptstreng and cause about 53 million cubic metres of water to flow down the valleys of Punakha, Wangduephodrang and Tsirang and Dagana as well.

The 1994 Punakha flood contained 18 million cubic metres of water and killed 22 people and damaged 1,700 acres of agriculture and pastureland, and public infrastructure.

Karma Toeb said that Thorthormi lake was 79 m higher than Rapstreng and the present rate of melting ice could pressurise the walls and lead to its bursting, if adequate mitigation measures were not taken soon.

Experts say the challenge for Bhutan, however, is the shortage of manpower, poor funds and low technology, with only one glaciologist for instance.

5/1/0209

Flood kills 4

Bhutan hit by record rainfall and floods

Bhutan experienced record-breaking rainfall in the last three days as numerous streams and rivers in the country surged to dangerous flood levels, killing two students, a soldier, and a road construction employee from India, as well as cutting off several places as roads and bridges were damaged.

Tne casualties were two students from Thimphu washed away, a soldier in Dewathang hit by a falling tree, and an Indian labourer in Takti while clearing a landslide area.

The average rainfall in the last 24 hours – from May 25, 9:00 a.m. to May 26, 9:00 a.m. - was recorded at around 76 mm, which, Thimphu meteorology department says, is the highest in the last five years.

However many observers said that they had not seen such a volume of water in the last 40 years.

The continuous rainfall in the country is because of the cyclone 'Aila' from the Bay of Bengal, which hit Bhutan on May 24, said the head of meteorology, Kunzang Sonam. Cyclone 'Aila' has so far killed 115 people and displaced half a million in West Bengal and Bangladesh.

"All ministries, sectors and dzongkhags have been put on red alert and the armed forces have been mobilised," Lyonchhoen Jigmi Y Thinely told Kuensel. He said the police in particular has been mobilised at all danger zones. "His Majesty the King, who is very concerned, has also been informed," he said.

Continue...

Bhutan hit by record rainfall and floods

Continue...

In Thimphu, residents braced for the swiftly rising Wangchu and the capital's numerous streams to spill their banks. Many did. Worries of major flooding extended well beyond Thimphu. Residents along the banks of the rivers in Punakha, Ha, and Thimphu left their homes for higher ground. Bridges were washed away and several places flooded. Panicked residents in Thimphu rushed to fuel stations anticipating a shortage.

According to the latest data, as of 4:00 p.m. yesterday, major rivers like Wangchu, Punatsangchu, Kurichu, Mangdechu, Chamkarchu, and Parochu had either doubled in size or, in most cases, had swollen to a record 5-6 times their size.

"The Punatsangchu has increased to levels higher then the 1994 floods this evening after 4:00 p.m. and later went down a bit," said Lyonchhoen.

The Thimphu Phuentsholing highway has been washed away at many places. By last evening, about six landslides had been created between Chukha and Takti. The highway was shut down by the road safety and transport authority. Dantak officials said that it may take 72 hours to build a new road through the Tanalung slide, where about 40 m of road had been wiped away.

Hydropower projects were forced to close down. The 336 MW Chukha hydropower was shut from 12 noon till 3:45 p.m. Basochu remained shut and Kurichu reduced production from 50 MW to 26 MW. Kurichu is the sole station that supplies power to the eastern dzongkhags. Tala is operating at 935 MW, with one of its six turbines under regular maintenance.

"The problem is with heavy debris like logs and mud in the Chukha dam and plus this is the highest volume of water we've seen since the project was commissioned in 1988," said Druk Green Power Corporation managing director Chhewang Rinzin.

"Our local forecast says that the situation should get better from tomorrow onwards, but external forecasters have predicted two more days of the (Aila) cyclone affecting us," said Lyonchhoen. He said that, so far, there was no serious damage to property, but this could change.

LYONCHHEN

"All ministries, sectors and dzongkhags have been put on red alert and the armed forces have been mobilized"

5/27/2009

Flood news from across the land

As rain beat down on the country, lives and belongings were lost

Thimphu: A Thimphu student died yesterday when a bridge he was crossing at Semtokha collapsed into the Olaronchu stream, which had swollen because of the rain. His body is yet to be found.

The class six student was on his way to the Loselling lower secondary school, located near the Changjiji complex, along with two other schoolmates. The time was 7:00 a.m.

An eyewitness said that the swiftly rising Olaronchu had already weakened the makeshift bridge, below the Thimphu workshop. Two students managed to jump to safety.

Swollen up streams also washed away a student in Hongtsho.

As rivers and streams in Thimphu surged to potentially perilous flood levels, they set off waves of anxiety among the public. The Wangchu threatened to send water spilling over its banks. Residents living along the banks packed up their valuables and headed for higher ground.

Kuensel found Ugyen Lhaden, 38, who lived in a building below the sewage office in Babesa, crying beside the expressway. The rain had formed several streams of water, from higher ground, and washed away her belongings. "I thought of going back to save some clothes but I wasn't allowed," she said. A police rescue team said the water level around her building had risen to dangerous levels.

The centenary farmers' market was a pool of water. Most of the stored vegetables were damaged. A vegetable vendor, Dorji Rinchen, 72, said the design of the market was flawed. Water from upper ceilings was leaking into the floors below.

Ha: The Ha-chu washed away four labour camps and a workshop in Ha town, flooding the town and forcing residents to evacuate their homes and live in hospital and guesthouses. No casualties were reported.

The road between Ha town and several places was blocked.

Dzongkhag officials helped people carry their belongings. Nine vehicles, including a tractor, have been deployed for the purpose.

Dagana: The swollen Darachhu washed away the Dagachu bridge at around 11:20 am yesterday, cutting off Dagana dzongkhag from the rest of the country.

It also washed away 20 m of the Dagana-Sunkosh road.

Dagana dzongda Tashi Gyaltsen said that the dzongkhag was paralysed as there was no electricity and road. The generator is also out of order, he said.

Mongar: The Kurichu hydro project has shut down two of its four turbines after heavy rainfall deposited huge debris and silt in the dam.

The project recorded the highest inflow of water at 2,900 cu m/sec yesterday. Last year's highest inflow was 1,500 cu m/sec. The 60 MW project now generates only 26 MW.

A massive landslide in Rotpashong on the Mongar-Lhuentse highway and two others in Sengor and Thrumsengla have cut off Mongar from both Thimphu and Lhuentse. Machines have been deployed in the area to clear the blockage.

Bumthang: Bumthang dzongkhag officials said they were draining water from the Chamkhar ground flooded by the Chamkhar chu. A falling retaining wall damaged two alto cars and a hilux near the Jakar dzong.

Paro: Dotey rongchu, a tributary of the Parochu, submerged two bridges.

The motorable bridge, leading to the gup's office near Shaba, was washed away. The Dantak camp in Bondey was also flooded with water.

By late evening, the Parochu was spilling on the road near the Paro dzong. A swelling stream from Gyenekha damaged a bridge in Charkilo (about two km from Chunzom).

Chukha: As of 4:15 p.m. yesterday, the Phuentsholing-Thimphu highway was blocked at three places. One at Wangkha, another between Tanalum and Tshimasham, and a third at Taktikothi. One Dantak labourer was killed while clearing a landslide area.

Punakha: The Phochu level was increased by nearly 50 percent and the Mochu level had reached a nearby village Changyul.

The Mochhu had brought with it boulders and trees and was hitting the new baazam (traditional bridge), say officials. Dzomithang was submerged. Officials and monks were evacuated.

5/27/2009

Rain wreaks havoc in east

Parched regions of Trashigang welcomed the early monsoon showers on Monday. By Tuesday evening though, farmers were praying for the rain to stop as the deluge caused havoc in the dzongkhag, especially in Merak and Sakteng gewogs.

Heavy rainfall on Tuesday washed away two kangzams (bridges) between Sakteng and Merak. Several metres of the Merak to Chaling mule track along the Merakchhu were also washed away. "Merak is almost cut off from Sakteng and Trashigang," said a resident of Merak, Dawa. Around noon yesterday, there was no sign of the rain stopping. The rainstorm in Merak also damaged roofs of several houses.

Sakteng dungkhag officials said that a bridge connecting the Sakteng community primary school to rest of the villages was washed away.

In Trashiyangtse, the embankment built to divert the Kholongchu in Bomdeling was washed away. The embankment project started about three weeks ago with financial assistance from WWF to protect the paddy lands in Bomdeling, which are also the feeding grounds of the black-necked crane.

An excavator had worked for 280 hours and diverted the river to its original course, but the raging Kholongchu flooded the paddy fields.

The rain also disrupted the Trashigang municipal water supply. Municipal officials said that they were maintaining the intake at the source. "If the rain continues, the water supply could be disrupted," said an official.

Dzongkhag officials from the four eastern dzongkhags said that they have informed all the gups to stop movement or travel in groups in case of emergency. They said that gewog officials have also been asked to evacuate people from low-lying places under threat from rivers.

Meanwhile, in Samdrupjongkhar, the Merak Ama river, which flows through Wangphu gewog, had washed away two kangzams and a tazam (bridge for mules), mainly used during the orange season.

5/27/2009

Counting the cost

With six dead in Bumthang - two women and four men, who were washed away while collecting cordyceps (see story) - the number of lives claimed by the recent floods in the country now stands at nine.

Two school students, Nar Bahadur Subba, 16, of Loselling school and Tandin Wangmo, 8, of Hongtso community school - both in Thimphu - and a dantak labourer in Chukha were killed yesterday.

Updated reports from across the country show large-scale damage to highways and bridges. Schools, RNR agriculture offices, private houses and labour camps have either been washed away or incurred heavy damages. Irrigation channels, drinking water supplies, power lines, and paddy field and crops were also destroyed.

The weather today was clear in most parts of Bhutan except Lhuenste, which got rain. The river levels across the country fell slightly compared to yesterday, say officials. The head of the meteorology department, Kunzang Sonam, said that the next two days would have improved weather, with a possibility of light drizzle today. He said that there was a 70 percent chance of light rain on May 29.

Highway and Roads

Around 10 highways, 7 feeder roads, and other smaller roads have been blocked or washed away, some at multiple points, posing a huge transport challenge to the people.

The Phuentsholing-Thimphu highway still remains blocked in three places, with around 200 m of damaged and washed away road at Tanalung, around five landslides between Chukha and Takthi, and landslides in Wangkha. Clearing the damage could take several days, according to officials.

The Sunkosh-Dagana road is blocked at one place and the Dagachu bridge washed away, cutting Dagana dzongkhag off from the rest of the country.

Other blocked highways are Sarpang-Darachu, Gelephu-Darchand, Yadi-Mongar, Mongar-Ura, Jakar-Ura, Mesina-Punakha, Wangdue-Chanchey and Gelephu-Trongsa (3 places).

Bridges

Forty-nine bridges have been washed away, of which five are steel bridges, three permanent bridges, 14 bazam or traditional bridges, 12 temporary bridges, five wooden bridges, and 10 suspension bridges in 13 dzongkhags.

Among the permanent bridges washed away are Dagachu bridge, the bridge on Yurme highway in Trongsa and in Haa. Trongsa, Bumthang and Haa have seen the most bridges damaged.

Continue...

Counting the cost

Continue...

Structures

The floods have washed away or damaged 10 government structures, 18 houses, 1 shop and 24 huts.

The schools damaged are the Kamji lower secondary and Phuentsholing middle secondary in Chukha, Katsho and Ugyen Dorji school and Jenka primary school in Haa, Dungmang school in Zhemgang and Shingeer primary school in Bumthang.

The Khuruthang vocational training institute has been completely flooded. RNR centre in Wangdue and Mongar have also been covered in landslide and flooded.

Paro

Agriculture has taken the hardest hit, with most irrigation take-off points from the river destroyed. A power transformer at Shaba has been submerged and transmission poles in some gewogs damaged, water supply pipes and tanks washed away, with severe damages to river embankments.

Haa

Check dams in several gewogs have been damaged, 1.5 acres of forest plantation wiped out, and workshop below town fully submerged.

Wangdue

Paddy fields in Bajothang have been submerged, along with a sawmill and five vehicles, a 11 KV line of Basochu has toppled and DNC store and machineries also buried under water.

Bumthang

Urban water supply in Chamkhar is damaged, cultivated fields in all four gewogs buried under water, horse farm pasture and playground at Gangrithang primary school also submerged.

In other dzongkhags, the Phunechu irrigation channel has been damaged in Tsirang, water supply pipes in Trashiyangtshe washed away, 12 areas of Khair plantation washed away in Zhemgang and also river protection works in Ranjung VTI in Trashigang.

5/27/2009

9 - People dead
49 - Bridges damaged
10 - Highways blocked/washed
6 - Schools, 2 VTI, 2 RNR, 18 houses & 24 huts

Cut off Dagana must make do

The weather has cleared the sky over Dagana dzongkhag, but memories of the past haunt the remote town's residents as they remain entirely cut off once more.

In 1980, heavy rainfall isolated Dagana from the rest of the country for months on end, driving residents and students to survive on maize soup for days.

Last Monday's deluge caused the Dagachu to flood again and the raging river washed away the bridge. About 30 m of road was washed away too at Darachu, 9 km before Dagana town. The dzongkhag is also without power as the mini hydel is filled with sand and the generator out of order.

There is no water supply in the town.

Residents are worried that the essentials in shops will run out. "We already have shortage of cooking gas and I'm worried even the ration we've in store won't be enough," said a businesswoman.

Former councillor and a businessman, Sonam Dorji, however, is optimistic. He says the situation is far better this time. "The dzongkhag has already asked the authorities to deploy a excavator to clear the Darachu block," he said. 10 trucks of rice, meant to compensate farmers, whose maize crop was wiped out by hailstorm last month, could be used if the dzongkhag run out of stock, he added.

Dagana dzongda, Tashi Gyaltsen, told Kuensel that the dzongkhag surveyed the stock of essential commodities in town. "Taking into consideration the monk body and school students, along with town residents, stocks will last a week," he said.

In Dagapela, which is also cut off, a businessman said that the whole town has stock enough to last for about a fortnight only. "A temporary bridge is a must over Dagachu," he said, adding that they can transit the rations if there is a temporary bridge.

Meanwhile, the dzongkhag has deployed all dzongkhag officials, police and corporation employees at the affected areas to restore their lifeline.

According to the dzongkhag's planning officer, Dorji, rehabilitation work, like creating temporary passage over the 30 m of road washed away by the rain at Darachu and cleaning the mini hydel, are in progress. "We have to do this since official work can't resume without electricity," he said.

The dzongkhag has also asked shopkeepers to ration goods and not raise food prices.

Officials from the department of roads (DoR), who are exploring means to provide a temporary bridge over Dagachu, said that it might take about two weeks.

"However, we're hopeful that a gabion wall, similar to a mesh wall, will be constructed and, within two weeks, a bailey bridge should be completed," said engineer C B Mongar.

5/29/2009

Mounting storm damage

His Majesty the King yesterday visited villages in Ha dzongkhag to inspect damages caused by last week's flood and to assess Kidu.

With four new deaths reported in the last three days, the death toll caused by last week's storm and flood has now increased to 13 from 9.

Two of the deceased, Gem Dorji, 37, and Tshewang Dorji, 25, were collecting cordyceps at Tangchulay, a four-day walk from Dangchu gewog. The third was a 26-year-old cattle herder, Narim, from Chukha, who was washed away when she was taking the cattle to graze. A soldier in Dewathang was also reportedly killed when a tree hit his head during the storm.

Daily reports now indicate that the damage was bigger than once thought and has touched many rural communities across Bhutan.

Summing up the daily disaster report updates since May 25, Prime Minister Lyonchhoen Jigmi Y Thinley said, "The loss of life and property is very serious and it's serious enough to be worried what impact it will have on our limited resources."

He also said that it would have an impact on the normal developmental plans of the government.

The prime minister said that priority was being given to damaged drinking water pipelines and irrigation channels, especially in Paro, where most damage has been done and the river is critical to irrigation. The transplantation season for rice has already started in the country where large amounts of water are needed.

Lyonchhoen said the government was also concerned about communities and areas being completely cut off and efforts were on to restore communication. "I've been assured that the Dagachu will get a bailey bridge in 14 days." He said that efforts were also on to reconnect Lhuentse.

Meanwhile, Laya has been completely cut off, with mule tracks from Laya to Gasa, Lunana and Lingzhi covered by landslides. The villages of Yangthang, Tangto Goenpa, Talung and Jamtoe Goenpa in Haa are also totally cut off.

The home minister Lyonpo Minjur Dorji said, "We're very concerned about reports of loss of many cattle heads." 35 cattle were washed away in Chukha along with Narim. In Gasa, 40 to 50 yaks were buried under a snow avalanche caused by the snowstorm. 15 horses were also washed away. 24 day-students at Goenshari school in Punakha are still stranded in school after a suspension bridge was washed away. The school is currently hosting these schools in their classrooms and ORC unit.

The Prime Minister also expressed concern over the loss of agricultural land across the country. Fresh reports from Haa said that agriculture and pastureland in four gewogs of Bjee, Katsho, Isu and Sama have been submerged or washed away. Eight traditional houses were submerged in sand and debris or blown off by strong winds.

Nu 1.3m worth of damage has been reported to the Gayzor-Resinang farm road in Pemagatshel. Another recently completed farm road, Ngangshing-Wongchiloo, was blocked at both ends. Nu 5m worth of government drilling equipment was lost at Rotpashong.

6/2/2009

Gené farmers in a fix

Lush green fields of potato adorn the two villages of Zamtong and Tshochekha, located at the foothills of the Dagala. Harvest is around the corner and farmers are worried.

The recent flooding of the Genekha rongchu (stream) washed away about 2.3 km of the 4.350 km long farm road. All the farmers, who owned horses and mules, sold off their beast of burden after the farm road made accessibility easier in 2005.

"This season will be a back-breaking one," said a farmer. They will have to carry their farm produce to the road head near the gewog centre.

"The potato auction season is very near and we're anxious," said the farmer, adding that much of the profit from their year round toil will be spent on shifting the cash crop.

"I've about a truckload of potatoes and it'll be difficult to carry that to the road," said Nim Dorji.

Another farmer said that she was worried her potatoes might rot at home. "Even if the people are willing to carry potatoes, I must pay them. Not to mention the time taken," she said.

Gené gup Karma Gyeltshen told Kuensel that the heavy rainfall also destroyed irrigation channels and a suspension bridge in the village. The irrigation channel was repaired soon after, since the Changla (rice transplantation) season had started.

He said that the ancient trail linking Gaselo in Wangduephodrang to Genekha was also destroyed. The trail was used by farmers for seasonal migration of their cattle.

Thimphu dzongda Lhab Dorji said that the gewog suffered badly from the recent flood and it would take time to restore the road. "We've approached the disaster management for an estimated amount and we'll start the work as soon as the fund's released," he said.

The road, however, can't be restored before the auction time.

6/16/2009

Laya – The hardest hit dzongkhag

Two hundred and thirteen yaks, 45 horses, 19 mules and one cow are believed to have been washed away, or buried by landslide or snow avalanche in Laya, Gasa, making it one of the worst affected dzongkhags from the recent heavy rainfall from Cyclone Aila.

"This is a major economic loss for Laya, which has more a hundred households with yaks as their main source of income and livelihood," said Gasa dzongda Sonam Jigme.

A yak costs anywhere between Nu 18,000-25,000, a horse around Nu 18,000, and a mule about Nu 30,000.

Yaks are also of key importance to the survival of Layaps during the winter months, when Laya is cut off for months on end from other parts of the country. "They provide milk, butter, cheese, meat, leather and warm fur," said the dzongda.

The dzongkhag has already dispatched a team to Laya to study the situation and confirm the figures.

Laya received both heavy rain and snowfall on May 25 and was cut off completely. Landslides also destroyed mule tracks from Laya to Gasa, Lunana and Lingzhi. Three bridges - Koina zam heading to Laya, Mentahgang zam to Lingzhi, and Lunhku zam to Laya - were all also washed away, say dzongkhag authorities.

"During the recent heavy rainfall, Laya experienced heavy snowfall and probably snow avalanches might have killed these animals," said dzongda Sonam Jigme.

The dzongda said that his team was still in Laya studying the matter and inflated figures of dead animals could not be ruled out. "Once we confirm the figures, then we'll submit them to the department of disaster management and then the government can decide on what needs to be done, including compensation and help."

6/8/2009

Tragedy despite precautions

Wangchu incident

A question still lingering in many minds is what caused the Wangchu to rise and eventually take the lives of seven boys in the early hours of July 27.

Speculation and rumours are rife on the rescue operation that went on for almost six hours and the last gush of water that took the boys away.

Although some members of the rescue team said that it might have come from the flooded Tichalum chhu, a tributary of the Wangchu, just after the Chukha hydropower dam, other speculate that it might have been the dam waters.

The chief engineer and head of plant at Chukha, Lam Dorjee, said all necessary precautions had been taken as soon as they received information on the boys around 11 pm on July 26.

"The dam in-charge was briefed about the situation and all hydrology data of the catchment area and weather conditions at Haa, Thimphu and Paro were collected," said

Lam Dorjee.

A report prepared by the chief engineer states that the Wangchu river inflow recorded at the dam at 11 pm was 144.88 cubic metres per second (cusec). The dam water level maintained at elevation level (EL) was 1839.7 m while it had a capacity to store water up to 1842 m. "Beyond 1842 m, the dam will collapse," said Lam Dorjee.

Additional engineers were deputed at the dam to assist the shift in-charge to regulate the water in the dam, said Lam Dorjee.

The inflow record shows that water from the dam was regulated and released gradually. For instance, at 11 pm, the time they were informed, the water discharged was 41.2 cusec, while the river inflow was 144.882 cusec.

At 4 am on July 27, after the boys were washed away, water discharged was 52.01 cusec, while the river inflow was 177.369 cusec. Water to be discharged was regulated at 9.62 cusec at around midnight, while inflow was 149.854 cusec.

The report states that operators found no room to further regulate water in the dam, after the level had reached its maximum design flood reference level (FLR). The time at which the dam was filled to danger level is not mentioned in the report, but Lam Dorjee said that it was around 4 am.

When the river flow exceeds 400 cusec and is muddy and swollen, the water level in the reservoir operates between EL 1837 m and 1838 m.

On the day the incident took place, the dam water level was monitored between 1837.5 m at 9.00 pm on July 26 and 1841.5 m the next morning around 3 am, around the time when the boys were washed away.

On June 8, CHPC issued a public safety notification, regarding the discharge of excess water from the dam during monsoon to the dzongkhag, police, army, district medical officer and other concerned agencies. It was also sent to the broadcast media for advertisement.

7/29/2009

Operation Thorthomi

Water level lowered by 86 cm

The water level of the Thorthormi lake, which has the potential to cause glacial lake outburst flood (GLOF) if not mitigated, was reduced by only 86 cm in two months during the operation Thorthormi.

Glaciologist Karma Toeb, leader of the team to Thorthormi, said that initial target for this year – from July to September - was to reduce the water level of Thorthormi by 1.67 m. "But the Cyclone Aila in May hampered the mitigation work and the target was brought down to one metre," he said.

"We could have brought down the water level to more than one metre had we worked for three months as planned. But the actual excavation work went on only for two months," said Karma Toeb.

The team, comprising 309 people from lower altitudes and villagers from Laya and Lunana, including about 20 women, had to walk for more than an hour from the camp to reach the site. There were 12 officials from the department of roads, park, health, Gasa dzongkhag and royal Bhutan army. Most of the workers were high school dropouts. These workers are paid Nu 15,000 a month and provided insurance of Nu 108,000 for each one of them.

The project began with site development till the first week of September, clearing the boulders. The team had to drain water from the lake by digging a path towards two subsidiary lakes of the Thorthormi, which feed the Punakha Phochu. The operation was to prevent water from flowing down to Rapstreng, which is on the other side and at a lower position, 74 m below Thorthormi.

Bad weather was the major setback, apart from other difficulties, said Karma Toeb. "Daily rainfall hampered the work," he said.

Thorthormi lake is ranked as one of the most dangerous in Bhutan, with a size of 3.42 sq km, thrice the dimension of Lake Lugge that burst in 1994. The massive ice surrounding Lake Thorthormi is found to be melting fast at 30-35 m a year, filling up the lake quickly.

Geologists say that the natural dam walls between the lakes Thorthormi and Rapstreng is only 32.5 m thick at the crest and is getting thinner every year. If the wall separating the lakes gave way, Thorthormi, being on higher ground, would flow into Raptstreng and cause about 53m cu m of water to rush down the valleys of Punakha, Wangduephodrang, Tsirang and Dagana.

The project, spread over three years, is worth Nu 130m and funded by global environment facility (GEF). The target is to reduce the Thorthormi's water level by 5m within three years to avoid its combination with lake Rapstreng and prevent glacial lake outburst flood.

Meanwhile, despite the harsh weather, workers said that working in Lunana was an unforgettable experience. Tenzin Dorji, 25, from Paro, a class 10 dropout said that it was a good experience. "Walking for more than one hour every day back and forth from the site was really tiring and, that apart, it was a learning experience," he said, adding the amount he was paid was satisfactory.

The team will work on the lake for three to four months every year till 2012.

10/28/2009

Three lives lost to fury of rain

Pasakha factories under threat from flood waters

Three people have been killed and five others injured in Pasakha and Phuentsholing by landslides and heavy rains, which also damaged a bailey bridge and flooded some areas of the industrial estate.

In Pasakha, two boys aged 6 and 15, of Singye village were killed around 2 am, when the room they were sleeping was buried under a mudslide. Singye village is a half hour uphill climb from the Pasakha industrial estate.

The mother of the six-year old boy, who was also sleeping in the same room, was saved by her parents and sisters, who were sleeping in the two other rooms of the single storied cement house.

The body of the six-year-old was dug out half an hour later. However, the family could not find the body of the 15-year-old. Police and neighbours helped retrieve the body at around five in the morning.

A 62-year old non Bhutanese, who worked as a caretaker of a building in Kabreytar, was also killed when his house was buried under a huge tree that came down in a mudslide around 2.30 am. His body was retrieved at around 6 am.

A couple residing at the the Bhutan carbide and chemicals ltd colony in Pasakha were injured, while crossing a stream to escape from a mudslide.

A hut, where a security man and the store keeper of Bhutan Bricks pvt ltd stayed, along with their families, was completely buried under a mudslide around 5 am. The two families lost all their belongings. "We ran for our lives after waking the children and left behind everything," said Dechen Pem, wife of the storekeeper, as she tried to salvage belongings from the mud.

Many Pasakha residents were awake until morning with houses flooded with knee-deep and waist-deep water.

Many factories at Pasakha were also flooded with the water entering the plants and damaging boundary walls. Some boundary walls surrounding the factories, including the Bhutan-India boundary marker, had collapsed.

The secretary general of the association of Bhutanese industries, Letho, said that they are yet to assess the damage. "At the moment we're trying to divert the swollen Singye river next to the industries with an excavator that has been deployed by industrialists," he said. "It's a threat to the industries."

The old Pasakha bridge over the Padazekhachu, on the Pasakha-Manitar road, was washed away; and the Pasakha-Manitar road after the Pasakha bridge was temporarily blocked. Farms roads in Wangdigatshel and Pachutar were also damaged by the rain, according to Phuentsholing dungpa, Tenzin Thinley.

Meanwhile, with the Phuentsholing-Thimphu highway being blocked at several points, with a massive blockade at Ganglakha, about 32 km from Phuenthsholing, vehicles were not allowed to ply yesterday.

Sampheling gup, Mani Kumar Rai, said that damage to crops was reported in Pakchina and Dungayna villages.

No major damages were reported in Samtse dzongkhag as of yesterday.

7/22/2010

Fingers at quarry

Namseling, Mewang

The torrential rain on the night of July 28 set off a flashflood that washed away culverts and damaged crops and houses along the stream flowing beneath the sharp bend near a small automobile workshop in Namseling.

The former Paro dzongrab Dawa's building was severely affected, as the floodwater entered the ground floor of his building.

It housed a bar and restaurant and the water damaged food stocks and other commodities belonging to the restaurant.

"Commodities worth of Nu 70,000 was damaged," Dawa said. "Our house filled with water and we went sleepless that night."

Ground floor shopkeeper, Sonam Lhamo, said the water that soared above the four-foot retaining wall surrounding the house, gushed into the house, damaging all her rice and flour stock and soaking her clothes.

Outside, the flood damaged the sewage tank along the road and filled the septic tank with sand and stone.

The flood also damaged machines of the ND auto workshop below the road.

Mewang gup Chencho Tenzin said the flood probably started from the Bhutan Store and Aggregate Factory quarry site, located about 3 km above Namseling village.

He said the quarry's sediment tank might have burst and let loose the flood.

Villagers alleged they began experiencing flashfloods ever since the quarry was established sometime in 2007.

"This is the third time we're experiencing such a flood," a villager said.

The company promised to build retaining walls along certain sections of the stream posing threat downstream, but the gup said they had never seen one being erected so far.

The quarry was allowed after Namseling villagers were promised of the necessary safety measures the owners would put in place.

However, the company manager challenged the villager's allegation saying the two sediment tanks were still operational and that they had built a retaining and a gabion wall.

"I agree some sand and stones were beside the stream," he said. "It was saved for road widening work."

Geology and mines officials said the flood caused by the heavy rainfall. "Although the damage was caused by sand and stones saved for road widening, it has nothing to do with the quarry," an official said.

Thimphu dzongda, Lhab Dorji, said he was awaiting the report of the damages. "Compensation or further assessment requires systematic work," he said.

7/30/2010

Two flashfloods within a week

Residents reel from double blow, which damaged houses and fields

Barely three days after they were surprised by a flash flood, another one on Saturday woke up the residents early and kept them busy for hours channeling the stream from damaging their crops and houses on July 30.

Nobody was hurt.

Carrying his belongings, Gyembo, 55, who lives in a one-storied house with 11 family members, was shifting to his cousin's place. "My house would have been washed away, had the villagers not reacted at a time," said Gyembo. The usually small stream swelled, flooding paddy and chili fields and food stock, as water entered the ground floor of a building on July 28. The Friday night rain again caused the stream to swell and caused another flood in the early hours of Saturday morning.

The flood damaged the foundation of Gyembo's house, chili garden and a portion of his paddy fields were flooded with sand. "Since my house is made of mud, it will collapse if the stream swells again," said Gyembo, adding that the dzongkhag had not send help to divert the stream after the first flood.

"We didn't sleep the whole night," said Gathey. "My paddy field and crops were damaged," he said.

Continue...

Two flashfloods within a week

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The flood has also damaged an electric pole cutting off power supply. Former Paro dzongrab, Dawa, whose house is located next to the stream and suffered damages, accused Bhutan power corporation officials of not assisting them. "An official said that they don't work on weekends and slammed the phone," said Dawa. Dawa said that about 30 of them wanted to appeal to His Majesty, but were stopped by the gup and the dzongda. The villagers, who blamed the Bhutan stone and aggregate factory (BSAF), whose factory and quarry are located upstream, on Saturday said that the management were helpful after the first flood, by deploying two excavators to clean the stream. "We've been working for more than 48 hours, but there's no sign of government aid," said a BSAF official. "Government officials have only came to see the situation, but there is no response yet."

Meanwhile, the national council member from Thimphu, Sangay Zam, who visited the affected area, said that the aftermath of flood was reported to works and human settlement minister, Lyonpo Yeshi Zimba. "Since it was a holiday yesterday and without appraisal report, the dzongkhag will discuss on next step today only," she said.

8/2/2010

Trying to tame a river

Reinforced Cement Concrete Walls

With the completion of a 384 m-long reinforced cement concrete (RCC) walls on the banks of Omchu river, Phuentsholing city corporation (PCC) officials are confident that the river will be tamed.

The Omchu, popularly called the Dothi khola, dries to a small rivulet in winter, but it is during monsoon that the river creates havoc in the city. Residents say the Omchu is more of a threat than the big Amochu.

"The walls will channel the water flow and stop the river from breaking its banks," said an official from the engineering division of PCC. "It'll also prevent enormous scoring and erosion of banks that takes place every summer, because of the turbulent river flow."

The new RCC walls, according to city officials, were built in the critical areas, like in places where the old wall, made of plain cement concrete, and gabion walls (boulders put together with wire mesh) were damaged by previous floods.

The construction of Nu 20M additional RCC river protection walls of about five metres height, upstream and downstream along the banks of Omchu, which began in December last year, is a part of the river training project that first started through an Asian development bank (ADB) loan.

The river training project started after the August 2000 flood in Phuentsholing, where several lives and property worth millions were lost, when Omchu flooded.

A proposal will be put up to the works and human settlement ministry to carry out construction of such additional RCC embankments in the current financial year, said officials, prioritising on the areas near the Omchu bridge.

Officials say that, for sustainable management of river Omchu, even in the years to come, an appropriate study should be carried out at the catchment area, from where a lot of debris, especially during summers is carried downstream, affecting the river flow.

8/2/2010

Out of homes and into the huts

Flashflood that washed away five huts and damaged nine renders residents homeless

It is an unusually hot sunny day in Sarpang, with temperatures soaring over 30 degrees, and residents prefer staying indoors with a fan to keep them cool.

But 20-year old Amritey squats in a corner of the temporary hut built of bamboos, tarpaulin sheet and CGI roofing. She has been living there since August 27, after a flashflood partially damaged her house.

About 15 people including two Bhutanese families, affected by the flashflood in Sarpang town that washed away five huts and damaged nine others, live in this temporary hut.

According to Amritey, all 10 people, her uncle, aunt and seven younger brothers and sisters, who go to Sarpang school, live there.

"Their family of five stays in that part," Amritey said, pointing to the other side of the room filled with household necessities. A cupboard and sofa set separates the two rooms. Gas stove and cooking utensils of the family are on either side of the room.

Continue...

Out of homes and into the huts

Continue...

Amritey stays in the hut, guarding the little they salvaged from the flood, while her paternal aunt, who ran a bar before the flood, goes out to learn of the possibility of reopening her bar.

"I approached the town representative, asking him whether the government could provide us a piece of land, where we can construct temporary huts and operate our business again," Sun Maya, 34, said, adding that she earned enough from the bar to feed her brother's children and manage their school expenses.

Pema, 40, complained about the inconveniences she had to put up with, living in such temporary huts.

"We have to endure the scorching heat during the day and, when it rains, the entire hut turns into a puddle and slush," she said.

Her husband and brother-in-law, who were in Thimphu for the apple trade, returned to fix a temporary hut.

"But, without a land, where do we go and what do we do?" Pema said.

Without drinking water supply, the two families walk about a kilometre away to fetch water from Kamikhola.

"I wonder how long we'll have to put up like this?" Pema said.

Of the 12 other shops affected by flashflood, 10 belonged to business people from across the border, while two are owned by Bhutanese, but run by people across the border.

Sarpang town representative, CB Chanda, said it was time the government did something with the town.

"This isn't the first time the town has been hit by a flashflood," he said. "This is the fourth. The first occurred in 1996."

A speedy shift of the town to Ranibhagan, 2 km away towards Tsirang, is the only solution, according to the town representative. "Or the government should construct concrete walls near the bridge to divert the river."

Sarpang dzongrab, Phuntsho Gyelchen, said the two families might have to stay in the temporary hut till the monsoon ended.

He said shifting the town to a new location was unlikely, because the town planning was yet to be finalised.

"But we have submitted a proposal to the government to construct gabion walls worth Nu 345M for river bank protection," the dzongrab said.

So far, the dzongkhag has deployed four machines to divert the river to its original course.

Meanwhile, heavy rainfall also damaged roads between Sarpang and Gelephu at numerous points.

9/1/2010

War not over

Operation Thorthomi has come to an end, though the overall mission remains incomplete

Operation Throthomi is over, but the mission, to artificially reduce the lake water level by five metres in three years, has not been accomplished.

The team has returned on November 6 from the third and last phase of the project, after lowering the water level by 1.45m. Since actual excavation work began on the lake in 2009, the water level in the largest glacial lake in Bhutan, measuring 3.42sqkm was reduced by 3.68m,1.32m short of the target.

Funded by the Global Environment Facility, the United Nations Development Programme and the Austrian Coordination Bureau, the mission to artificially lower the water level began in 2009, to mitigate risk of glacial lake outburst flood in the Punatsangchu basin.

Sunburnt, but still fresh, team leader of the project, glaciologist Karma Toeb of the geology and mines department said the team this time couldn't work on all the three sites.

The projects, which recruit about 300 men, including a few women from Lunana, work on the main lake and two other subsidiary lakes. "When the project started this year, only 131 people workers reported to the site," Karma Toeb said. The team targeted to lower the level by 1.4m in all the three lakes and, when they recruited locals from Sephu and Lunana, they lowered by 1.45m on the main lake, and by 1.1m in the subsidiary lake two, within a period of two and half months.

The team leader said, despite not having the full team, it was an achievement, and attributed it to the better working conditions this year. "Last year it rained until September 24, which hampered work," said the glaciologist. "It didn't rain much to disrupt work this year."

With the work site impossible for transporting any machines, all work was manually done with the help of only a rock driller and silent explosives to break huge boulders.

Dangers

The Nu 130M project has come to an end, and an extension is uncertain without funds. Karma Toeb said that it does not mean there will be no GOF after the project, even if the water level was reduced by five metres. "It's a risk mitigation project and not risk elimination," he said.

But risk from GLOF is looming large high up in the mountains. Karma Toeb, who has been to the glaciers 13 times, said the Thorthomi lake is expanding every year. The team witnessed huge ice blocks, as big as four-storey buildings, detaching from the main glaciers and plunging into the lake. Throthomi lake is identified as the most dangerous lake among the four main lakes. "When the lake (Thorthomi) expands, it'll increase the hydrostatic pressure, which in turn will exert pressure on the moraine dam," he said.

The moraine wall too, at the thinnest point, has shrunk by four metres in three years, according to the geologist. It was 45m in 2008, and on the same point it is now 41m. The risk from Thorthomi is that of the moraine dam burst; Thorthomi, being on higher ground, would flow into Raptstreng and cause about 53 million cubic metres of water to rush down the valleys of Punakha, Wangduephodrang, Tsirang and Dagana. Geologists have said the massive ice surrounding Lake Thorthomi is melting fast at 30-35m a year, and filling up the lake fast. The natural dam holding the lake can withstand only so much volume of water, say geologists.

11/12/2011

An embankment that's built and broken every year

Deepening the base before monsoon turns the Shetikhari stream into a roaring river

For Gelephu residents, to witness the ongoing embankment work as temporary flood protection mechanism at Sethikhari stream, a tributary of Maokhola, is irksome.

This is because the villagers saw similar temporary embankment work being washed away in less than a month's time after its completion last year. During monsoon the stream swells and floods the area.

The embankment was made from the sand and debris collected from the stream's bed and deposited on the banks.

Dungkhag engineers said about 90 percent of the Nu 6M embankment was washed away by the monsoon rains last year. It is 3.5km in length.

Hari Chandra Kaflay, 49, from Sethikhari village, said the construction works were a repetition of what was done last year. "It's a wastage of government money," he said. "We understand that government is spending a lot of money for people's safety, but it's futile when local leaders fail to implement it in an fruitful way."

"We're not sure if it would last even for two weeks," another resident, Jigme Tenzin, said.

Residents also said they approached local leaders several times to raise the issue during dzongkhag tshogdue, and to propose construction of a permanent structure at Sethikhari stream instead.

Gelephu dungpa, Pema Wangdi, said officials too wanted a permanent embankment instead of a temporary one. "But there were complications in the system, and we weren't sure whether it was the responsibility of dzongkhag, thromde or dungkhag," Pema Wangdi said.

"But from July, when the new financial year begins, we've decided that the dungkhag office will take up the responsibility."

Dungkhag engineer, Kesang Dorji, said this year, so far, Nu 2.5M was spent on the embankment works.

"Sethikhari is a critical stream, in the sense that it dries up in summer, and in monsoon it swells," he said. "When it dries up, a lot of sand and debris is deposited in the bed, and in monsoon because of the deposits, the stream floods."

For this reason, the dungkhag engineer said, permanent structures were not built. "Use of excavators to remove deposits on the bed can damage the permanent embankment," he said.

To help avoid temporary embankment from being washed away in monsoon, bioengineering works like planting and growing grass has been initiated. "We've completed about 100m," the engineer said. "We're also looking at the possibility of placing gabion wall, a wall of rocks held by wire mesh."

06/16/2012

Flashflood, mudslides cut off Gasa

With power lines and communications down, the district is effectively on its own

Four days of gentle rain towards the evenings that culminated in a heavy downpour yesterday have cut off Gasa from the rest of the country.

Almost two hours' drive from Punakha, along the cold sludge the feeder road to Gasa has begun to resemble, and the road comes to an abrupt end at Kabina.

It's another hour or so's drive to Damji from there, but the rain has washed away some 100 metres of the road thereon, and a massive block, comprising boulders, uprooted trees and other debris, has made it impossible not just for vehicles but people to travel.

According to some villagers, the flood, which started around 3am yesterday, washed away, without trace, two concrete bridges, one at Phuntshogang Jab near Damji, and another about 2km away from there.

Apart from that, a suspension bridge, Gethena zam, two-km downhill from Damji, was washed away totally.

In a brief interview with Gasa dzongda Sonam Jigme on his mobile phone, just minutes before it was cut off, he said one village was cut off from another within Gasa.

Earlier that morning, the dzongda, in the midst of his field visit to affected areas, said he could not tell whether it was a flash flood or a mudslide that brought the dzongkhag to a standstill.

Sangay Lhamo, 46, a shopkeeper at Tashithang, on the highway by the bank of the Mochu river, said she was worried, because her husband, who went home to Khamoed gewog, about a day's walk from the area where the road block was, had not returned.

Continue...

Flashflood, mudslides cut off Gasa

Continue...

"He said there were several blocks along the way," she said, adding she told him to return only after things stabilised.

Khamoed gewog administrative officer Tshering Pelden said Damji high school was closed in the midst of their exams, because a small stream flowing near the school washed away walkways.

Although no casualties were recorded so far, a cowshed was reportedly washed away, along with a cow, at Damji.

Concerned officials could not be contacted for further details, because power lines were reportedly disrupted, after a couple of poles fell on the ground, before mobile networks also began to fail.

06/22/2012

Fishes perish in untold numbers

More than a truckload of fishes was killed, while a thousand were rescued, when the swollen muddy Punatsangchu flowed downstream with debris and sand yesterday.

Punatsangchu hydro project authority's senior environment officer Sangay Dorji said a truckload of fishes must have drowned in the muddy water, because their respiratory organ gets clogged with sediment during floods.

According to the Flood Warning Station's report, the river swelled by 3.80m between 7 and 8 in the morning, and subsided later in the evening. "This level of rise is normal in monsoon," said a technician Wangdi. "But the rise came with a flash food, killing thousands of aquatic life."

A team of 15 people caught around 200 fishes weighing between 500g to 1kg, and released them into the Dangchu, a stream that flows on the other side of the Wangduephodrang dzong. They also saved around eight buckets of fingerling fishes, and a few buckets of fires, smaller than fingerlings.

"Our focus was to save these smaller groups, as people were catching only the bigger ones," Sangay Dorji said, adding that many were interested in catching but not rescuing. "Although nothing happened to the projects, it was a huge ecological loss."

Brown trout and snow trout are the main types of fishes found along the Punatsangchu stretch, he said.

Continue...

Fishes perish in untold numbers

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A private construction company also saved another 200 to 400 fishes and released them into a swimming pool, located by the riverbank. The fishes are surviving in the pool because of the oxygen that its water pump produced, an expert said. The fishes will be released into the river after it calms down.

A group, led by the dzongkhag range office, also rescued more than 100 fishes from the basin. Ranger Chencho Dendup said around 400 to 500 people were lined up on both the sides of the river to catch the fishes.

Apart from saving the fishes, the team was also monitoring those attempting to fish illegally. "But those attempting to fish outnumbered our team, and it was very difficult to trace them," Chencho Dendup said.

06/22/2012

Ground floor offices waterlogged (as usual)

The immigration, BAFRA, forestry, customs and police offices at the Gelephu town border check-post were flooded with water on the afternoon of June 23, following a heavy downpour.

But this is not the first time these offices, which are on the same elevation as the road, have been flooded during the monsoon.

"Such flooding is a normal occurrence and we experience it every year," Gelephu's immigration director Sonam Gyeltshen told Kuensel.

"Whenever it rains continuously for some time, water starts flowing through their offices, and the ground floor of some homes," Sonam Gyeltshen said. "The water even fills the roads and fields, creating difficulty for pedestrians, travellers and farmers."

Official documents are normally stacked high up when it appears that a flooding is imminent.

"Even the drainage becomes useless, when it rains heavily, as the water tends to overflow," Sonam Gyaltshen said. "The only option is to wait for the rain to stop."

Meanwhile Tsirang dzongkhag has been experiencing a power shutdown for the past two days from 8:30am until 6-7pm in the evening. Dzongkhag officials said office work would be hampered if it continues.

06/25/2012

Sleepless nights over a raging Korongchu

That is how residents of this small settlement have been kept on tenterhooks by a river in spate

Spending the day lazing around their shops from fatigue, having kept watch the night before over the swollen river below, and the night inside their cars, with most of their select belongings, still keeping watch over the river.

This is how the owners of some 20 shops of Chengkhar, adjacent the Dungsam project site, and about a five-minute drive from Nganglam town, are living today after the artificial lake, as they had always feared, burst, fed by incessant rain, and caused the river below their shops to swell.

Residents said two shops (makeshift houses) were already washed away, although its owners had already evacuated, along with their belongings from the shop without any harm.

Some of the Chengkhar town residents, who make up around 40 of them, said they spent sleepless nights for about a week because of the river.

"We've been keeping our bags all packed just in case," one of the residents, Pema, said.

Norbugang gup Karma Rabten, however, said there was nothing to worry for Chengkari residents, because the river volume had subsided, and the threat from artificial lake was also no more.

"But again, we really can't say, if it rains heavily again," he said.

Apart from the threat the roaring Korongchu poses the shopowners, so far, their water supply and electricity have not been affected, although their communications facilities have proven to be rather erratic.

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Sleepless nights over a raging Korongchu

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"For the time being, we only return indoors to cook and eat," one shopkeeper said.

For Dungsam Cement project, the heavy downpours in the last few days have held up fabrication works at the site for the last week.

Dungsam Cement officials said an underground electric cable was also washed away by rainfall, when a portion of the Nganglam-Gyalpoizhing highway was washed away on June 27.

Dungsam Cement's managing director Dorji Norbu said, on June 14, there was about 470mm of rain, and on June 24, about 440mm rainfall that caused the artificial lake to burst and wash away the road.

Re-installation of the electric cable is ongoing, with five of the project's engineers supervising some 50 labourers hired from a contractor, as all the project's workers left on holiday yesterday.

"We had to put in new cables and bury them in another safe place," he said. "Earlier also, the cables were at a safe distance from the river but, when the river suddenly swelled, it was washed away, along with the road."

He also said that construction materials, like two short gallons, two small ducting and 10 barrels of gradation media were washed away from the construction site, although they were fished out at a safe point.

"As for the rest, we managed to evacuate them immediately," he said. "We now have to assess their cost correctly, and put up to claim insurance."

Meanwhile, he also said that, because of the electric cable being washed away and fabrication work being held up, the project would be delayed by another month.

The project was supposed to start clinker production by end of July, after it missed its earlier deadlines thrice.

"If fabrication works are delayed, we won't be able to erect structures; not erecting structures means delay in project completion," Dorji Norbu said.

Project officials have deployed three excavators to help divert the Korongchu that has changed its course after the artificial lake between Nganglam town and Dungsam cement project site burst open.

Officials said, although the lake has burst and river diverted to its original course, heavy downpour makes it change its course, causing threat to the project.

06/30/2012

What the flash flood left behind

and continuous rainfall is hampering reconstruction works

The heavy rains that led to a flash flood on June 21 in Gasa has damaged paddy fields, irrigation channels, farm roads, drinking water supply schemes and crops in Khamey gewog, besides washing away three bridges and roads.

An assessment of the damages has found that the flood has caused minor cracks to a house in Gathana, buried a year old calf, destroyed two cowsheds along with almost 12 acres of wetland belonging to 48 households, 5.1 acres of dry land, several fruit trees, 15 irrigation channel schemes, two farm roads and nine drinking water schemes.

The flood also damaged 11.71 acres of paddy and 1.18 acres of potato field 22 fruit (pear, peach, apple, walnut) trees in Damji village.

The 15 irrigation schemes that was benefiting 364 households and nine drinking water schemes benefiting 30 households, a Basic Health Unit, the Khamey gup office, a school and labour camps were also damaged. It also caused major damages to farm roads to Barsha and Jabesa villages.

A two-storied traditional house in Gathena village suffered minor cracks on the floor and its surroundings while another two-storied traditional house at Sisibara village is reported to have a major crack.

As immediate relief measures, the dzongkhag had provided pipes and restored drinking water supply to the affected households, dzongkhag officials said. The entire Khatey gewog and Damji village under Khamey gewog has now been restored with power supply after it lived with power cuts for more than 10 days.

The roads department is working on the reconstruction of the Punakha - Gasa highway but road officials said, works have not moved much from the first bridge point at Phuntshogang to the second bridge point where two bridges were washed away.

"A whole stretch we reconstructed was washed away again and it's hampered the work progress," the road department's deputy executive engineer at Damji, Pelden Wangchuk said.

As for the reconstruction of concrete bridges, he said the foundation they had dug remained covered by the debris from continuous landslides. Three excavators are deployed at the site and a backhoe to clear minor blocks at Damji. "We can't say when the restoration works would come to an end," he said.

07/14/2012

Widespread flooding in Gelephu

Rivers in spate have disrupted vehicular traffic and many homes have been submerged

Incessant rainfall in the last two days has left various parts of Gelephu flooded; while swollen streams and rivers blocking roads at different point.

The Setikarey river in Pelrithang, about three kilometres away from Gelephu town, has branched into two, surrounding about 12 households in between. The river's increased volume and current have restricted vehicle movement towards Pelrithang from Gelephu town.

Residents in those 12 houses said they were stuck between the river. "We're surrounded by water, which has flowed into our homes and is knee deep," an 82-year-old resident said. "It's impossible to cross the swollen river."

Another farmer, Bhanu Bhakta Dhaurali, said the river has washed off part of his land, and deposited huge boulders and sand on some parts of his land.

Pelrithang gup Tashi said although the situation has not been critical, many houses are at threat if the downpour continues. "We need to worry more during the night, with the rain heavy at that time," he said. "Two excavators have been deployed to control Setikarey river from flowing into the village."

"But with the water level rising, it's difficult even for machines to control the flooding," he said. The rain water has also entered the Pelrithang jail and family quarters.

At the Gelephu border gate, the royal Bhutan police family quarters that house about 15 families are also partially under water.

Gelephu's officer incommand, Capt. Nima Tshering said overflowing water from the adjacent drainage has entered the cottage structures, where police personnel families live. "Their belongings are under water, but nothing has been washed away or lost," he said.

The workshop area on the right side of the road towards the border gate, and nearby houses, are also flooded; while places like Jigmeling are also likely to be flooded, if the rain continues, gewog officials said.

The swollen Paitha khola (river), about six kilometres away from Gelephu town, towards Sarpang, has also stopped vehicle movement. Dungkhag and gewog officials have alerted residents, and those homes under threat have been asked to spend the night at their relatives' or friends' places that are safe from the flood.

07/14/2012

Gelephu continues to be plagued by floods

About 15 families living in the Gelephu Royal Bhutan Police family quarters near the border checkpost have moved to a new location, with rainwater flooding their homes upto the window sill.

The families moved last week to a new location, about 50 metres away from the border check post.

The regional offices for immigration, revenue and customs, forest, RBP, department of geology and mines (DGM), BAFRA and three clearing offices near the border checkpost, officials said, are still flooded with water.

"The surroundings of the offices are filled with water, and the muck has been deposited inside," A DGM official said. "If we clear it today, it'll be the same next day with rainfall

at night."

The office furniture are all in water, but no documents have been damaged, he added.

Traffic between Gelephu town and Pelrithang (Lodrai) has also been disrupted for about a week with sand and boulders strewn across the road.

About 12 households that were encircled by the swollen Sethikharey river have dug small drains to drain out water accumulated in front of their houses.

Lodrai gup, Tashi, said, although rainfall has been continuous, they have not yet planned what to do about the 12 homes threatened by the swollen Sethikharey river.

"We don't have budget to arrange them a temporary accommodation, but we've been telling them to go and stay with friends or relatives," he said, adding that farmers have lost about 10 decimals each of their paddy fields.

While the DGM regional coordinator in Gelephu, Phuntsho Namgay, said though they have not done a study to measure rainfall this year that flooded most part of Gelephu, rainfall this year was 'very heavy'.

"Heavy and continuous downpour for a week caused more water accumulation, compared to past years," he said.

07/17/2012

Swollen rivers wash away two cars

Along the Gelephu-Zhemgang highway but no casualties reported

The current of a swollen Paitakhola washed away a van while another river at Sethikarey washed off a Toyota car in Gelephu when the vehicles were crossing the road that was overflowing with water yesterday morning.

Gelephu's chief regional transport officer, Lok Nath Sharma, said there were no casualty and that the cars were recovered the same day.

Works then started to clear the road at Paitakhola and Sethikarey that had remained blocked for a day following incessant rain on Thursday. It was for the fifth time this season that workers had cleared blocks on the Gelephu-Zhemgang stretch.

"The two major road blocks has been cleared as of now," he said. "We were also able to clear the road until Chisopani gate, nine kilometres away from Gelephu towards the border."

Paitakhola is about six kilometres away from Gelephu towards Sarpang while Sethikarey is about two kilometres away from Gelephu towards Zhemgang. The block at Paitakhola was cleared around 10:30am and the block at Sethikarey was cleared around 11:30am yesterday.

"After the clearing, vehicles including passenger buses travelling towards Thimphu that were stuck between Sethikarey and Paitakhola have been able to pass through," he said.

But the road from Gelephu to Jigmecholing, 34km away from Gelephu, and the road from Gelephu to Zhemgang are still blocked. "From the information we have received so far, few vehicles are still stranded between these places but we are not sure how many," he said.

The workers would take few more days to completely clear the Gelephu-Zhemgang road. "From Gelephu to Zhemgang, there are still five places that are blocked and yet to be cleared," he said.

09/01/2012

False alarm fails to alarm

Ice caused a rise in water level, which activated a sensor and caused the alert to go off

At 7:15 yesterday morning, when a strange alarm rang across Punakha and Wangdue valley, Dechen, who stays close to the Punatsangchu riverbank, called her friend in Bajo town to find out if there had been fire.

"I thought the sound was from police fire brigades," Dechen said "I couldn't figure it out until one of my neighbours told me that the sound was from flood early warning siren."

Except for a few, many people like Dechen in the two dzongkhags could not identity the sound, while those, who knew, deliberately didn't bother to respond, convinced that the alarm had no message of danger. "I knew there won't be flood in winter, so I didn't run out of my house," a Punatsangchu employee, Tenzin, said.

The sound, which indicated flood from Phochu in Lunana was put off within 15 minutes, after hydro-met officials at Glacial Lake Outburst Floods (GLOF) early warning control centre at the old Bajo town realised that it was a false alarm.

Chief hydrology officer Karma Drupchu, with the Department of Hydro-met Services, said because of ice there was a rise in water level, which crossed the alert and alarm set for early warning system at Thangza stream, the main confluence of potentially dangerous lakes - Lugi tsho, Thorthormi, Rapstreng and Baytsho.

He said a sensor, which is placed in the river to indicate flood was exposed, creating a false alarm.

The early warning device at Thangza stream would send signals to the centre, if the water level at the source reaches 8.7m. Experts would then study the data and re-confirm before informing people at the risk zones.

Part of the blame went to people at the centre, whose responsibility it was to analyse data sent by the sensor at the source. "The alarm should have rung, if there was really a flood," Karma Drupchu said.

The team would do a study to find out what went wrong in the system.

In case a GLOF occurs in upstream Phochu, three sirens in Lunana would send signal to 14 sirens installed along the Punatsangchu, which would then ring for an hour every three minutes. "Within this period, people in danger zones should evacuate," Karma Drupchu said.

On the tone, he said, it would be better if there could be a unique tone for early warning system. "Common tones may confuse people," he said.

Many said the tone for ambulance, fire brigades and flood early warning system are similar. The early warning system was set up in 2011 to avoid risks from floods and GLOF.

09/01/2012

Flash flood damages 6 acres

Farmer Kinley Pem will have nothing to harvest from her two langdo (area ploughed by an ox in a day) of paddy fields this season.

The fields on which she had just transplanted paddy, was covered with sand. The flash flood also washed away more than six acres of paddy fields at Kabjisa valley in Punakha yesterday morning.

Kinley Pem's paddy field was left buried under sand and boulders. "Since it wouldn't be easy to remove the sand, plantation won't possible this season," Kinley Pem, 22, said. "What a bad year!"

She said the flash flood started as early as 3am. "On hearing a strange sound, we came out of the house and saw a raging flood spread all over the fields," Kinley Pem said.

Slowly, a group of village men had gathered to stop the water from entering their houses, as women guarded their children and animals.

Like Kinley Pem, more than six acres of paddy and chili fields belonging to some 16 households of Betakha and Wakhuna villages were either washed away or buried under sand and boulders.

The flash flood was confirmed to have occurred from swelling streams like Jechulum.

"Many streams have swollen to cause a flood," a villager said.

The dzongkhag administration is in the process of assessing the damage and will come out with a concrete report today. Dzongkha's disaster management focal person, Tshewang Phuntsho, said, given the large damage caused by the flood, it was not easy to give an accurate figure until the assessment was over.

Apart from paddy fields, the flash flood has also caused a block at Punakha-Gasa road, after a small culvert bridge got washed away. Several farm roads in the villages have also been damaged.

The dzongkhag administration, police, army, desupps and department of road personnel are involved in relief work.

06/05/2013

Yudhiri in spate cuts off Phongmey and Sakteng

The flooded river has washed away both road and ropeway

Monsoon: Movement of both people and vehicles has been completely stopped with the swollen Yudhiri river washing away the only road to the Phongmey gewog since August 10.

The river also washed away the ropeway installed as an alternative for human movement. The ropeway's container snapped from its hinges.

Phongmey mangmi Namgyal Wangdi said that the bloated water from Yudhiri river washed away both road and ropeway on July 10 afternoon.

"The heavy downpour has led to sudden surge in the water level and its rapid current," he said.

The ropeway is believed to have snapped after its dangling rope entangled with some heavy objects like logs from the debris in the gorge.

Only the two cables with the remains of its hinges are left of the ropeway.

Meanwhile, until yesterday afternoon, the river remained swollen, with rocks of massive sizes and numbers strewn on the road. The road on the right bank has been eroded to a ditch.

People from Sakteng and Merak gewogs would also remain cut off, for

Phongmey feeder road is also a lifeline to these places.

Until, the weather clears up, people will be prevented from crossing over to either side of the river.

"For safety reasons, well restrict movement of both people and vehicles to either side until the cessation of the rain," Phongmey gup, Palden Dorji said.

The gewog would also refrain from constructing temporary bridge because of impending danger from the abrupt rise in the volume of the river water.

"Except for ferrying sick across the river, we won't align a temporary bridge, for crossing the river jeopardises lives," Palden Dorji said.

The clearing of massive blockade is expected to take weeks.

"If department of roads (DoR) has no excavator, it might also be a month before the blockade is cleared to mend the road to its pliable state," Palden Dorji said.

Meanwhile, Sakteng gewog officials said that the road damage and washing away of ropeway would have some impact on the movement of both its people and civil servants.

"Everyone, including visitors, would be affected if Phongmey road is washed away, for that road is also our lifeline," Sakteng mangmi,

Yeshey Tshering said.

The 15 officials on tour to Sakteng, planning to return in a few days to Trashigang, are likely to be affected too.

The gewogs also pleaded with DoR to allocate an excavator for prompt action during such road damages.

"Since Phongmey road is lifeline to entire Sakteng dungkhag, government ought to allocate an excavator until the rainy season ceases," a shopkeeper from Sakteng, Tshering Drakpa, said

08/12/2013

Flash flood leaves trail of disaster

The swollen Sengphug Rongchu has washed away bridges and irrigation channels

Three suspension bridges and two irrigation channels were washed away, when the swollen Sengphug Rongchu burst its banks and caused a flash flood in Toetsho gewog, Trashiyangtse, on June 17 evening.

Toetsho gup, Dechen Wangdi, said, the flashflood washed away the 28m Phatsabrag bridge and the 24.8m Shenakang bridge.

"A six-metre-long Shabrag concrete bridge, connecting Ombanye and Jangphu and Sechiphu villages, was washed away," the gup said. Ngalakang's suspension bridge also suffered major damage and could collapse anytime, he said, with the flood washing away part of the bridge's foundation.

Villagers said the flood damaged some 100m of Kheshingri irrigation channel, which had benefited about 300 households.

Gup Dechen Wangdi, who was accessing the damages in the gewog, said Rabkhar irrigation channel near Shenakang Bridge was also damaged.

"The irrigation channel catered to the people of Khamdang and Toetsho gewogs," the gup, adding that the irrigation water source for Gongza destroyed between 600 and 700 acres of paddy fields.

A villager said the mule track running through two chiwogs was also washed away. "People can't pass through the track," the gup said.

Ramjar-Khamdhang's National Assembly member Sonam Dondup Dorjee said he immediately followed up with agencies concerned and received good response. "I'll do what I can to address the problem," he said.

MP Sonam Dondup Dorjee said his priority was to make it safe for students from Sengphu village to cross the swollen stream to go to Tsangpochen school. "I'll also try to make it possible for people to cultivate paddy by repairing irrigation channels. There shouldn't be any risk to the people, he said.

The gup said the flood has caused huge problems to the people and that they are hopeful the government will help address it.

A team from Tashiyangtse, headed by the dzongdag, is in the field to assess damages since yesterday

06/19/2014

Village at GLOF ground zero

Thanza's dwellers will be the first in the line of flood and they live under constant fear

The vast floodplain above Tshojo village in Lunana is endless. The sand bed is so immense it can easily fit seven Thimphu cities, maybe even ten, and it goes on, further on. At the far end, a thin mule tack snakes up a mild crest. Far above, on the golden plains that stretch further up until the base of the Table Mountain, is a cluster of small houses. This is Thanza, a village at the foot of looming lakes.

The small village of about 35 households was deep in slumber when Lugge tsho broke through with violent force on October 7, 1994.

There were no glacial lake outburst floods (GLOF) early warning systems in place then. When the village awoke, the flood had left Lunana, taking along with it a woman and her two sons, and a good chunk of village pasture, and reached Punakha.

Today, there are many flood warning sirens along the Tsangmichu, the river that flows below Thanza village, but people's fear of GLOF here is greater than ever. Snow on the mountains is melting, and lakes are swelling at their base. If there is a GLOF, people of Thanza will have little time to escape. Probably the flood will not leave even a trace of this village. GLOF experts says that if the fast-narrowing moraine ridge between Thorthormi and Rapstreng breaks, there will be a flood that is at least five times bigger than the one from Lugge tsho 20 years ago.

Towards the end of September, when the wheat is ripe and ready for harvest, villagers are in the fields, lending each other a helping hand. Soon the snow will come and they will migrate to Punakha. But they are never certain if they will see their homes again when they return.

Nim Dorji, 33, has a shop in the village. He is constantly worried about the possibility of a flood. Moving higher up to the mountains for safety makes no sense to him, because the mountains remain under the cover of snow for the better part of the year.

"If our homeland is washed away, what's the use of going higher up the mountains? Farm roads are the priority of our government. I think that if a road comes to Lunana, lowering works at the lakes can be done," says Nim Dorji.

Like Nim Dorji, 34-year-old Khandu Dorji is always worried. He has just returned from a hillock over Tsangmichu. He goes to that hillock once a day to see if there is a flood coming.

"We're in a difficult place, both in terms of GLOF and economy. We're always worried, especially during summers," says Khandu Dorji. In summer, when Tsangmichu grows big and rumbles down, it is a dangerous sight. Houses in Thanza shake.

It is not only Thorthormi and Rapstreng that threaten the people of Thanza. Betsho, a supraglacial lake, sits on the head of Thanza village.

Continue...

Village at GLOF ground zero

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When Khandu was a kid, many years ago, where Betsho is today used to be a vast meadow where they used to go to collect incense with yellow flower called Sangzey Karchu that belongs to family of Asteraceae.

"Thorthormi back then was a vast plain where thorny stunted bushes grew," says Khandu. "It's a very worrying sight today."

Because the lakes are forming very fast at the head of the village, some people here see relocation as the only option. But, where will they find a place like their homeland, a place they can adapt to?

Dorji Gyem, 34, is harvesting wheat at the back of his house with a group of women. Betsho is not very far from where she stays.

"It will be nice if we can go to a place like Dochula or Phobjikha. We're not cut out for a warmer weather," says Dorji Gyem. "We have few options. We're at the verge of losing our homeland."

Come October, the passes between Laya and Lunana will be blocked by heavy snow. There is not much time to lose. The people of Lunana are stocking food items that will last until summer comes. Houses are filled with bags of rice, oil, salt and milk powder piled high up to ceiling.

As sun goes down the mountain west of the village, all is quiet except for the noise from a runoff from Betsho that joins Tsangmichu. That could be the mouth of the ridge from where a flood will come, if and when it ever does.

10/4/2014

After the flood ...

A day set aside once a year to commemorate how communities respond to disasters

Pema Dorji, 64, vividly remembers the 1956 river Phochu flood. He was a nine-year old student sleeping in a makeshift hostel in Thanzana, near the Punakha dzong.

When he was awakened by people screaming at the top of their voices, he found knee-deep water around the hostel. With their hostel surrounded by water, Pema Dorji and his friends were left without food for two days. They survived the flood.

The survivor from Guma gewog shared his story with officials of Punakha dzongkhag, disaster management department, and students of Punakha higher secondary school, as the International Day for Disaster Risk Reduction (DRR-Day) was observed.

Pema Dorji then witnessed two more floods, the recent one in 1994.

There was nothing we could do, said Pema Dorji. "The flood washed away people, crops, houses and livestock. All that people could do was call unaffected households for Woola and build bridges and help restore flood victims' homes," he said.

As a means of adapting to disasters, many people, who owned houses on the banks of the Phochu started constructing houses on higher grounds, and children were scolded whenever they went to the riverside, said Pema Dorji. "That was the risk management part then."

Local elders said, unlike in the past, today people could build houses near the river and sleep peacefully, as there are early warning systems all along the Phochu.

The international DRR Day is a day set aside every year to celebrate how communities respond to disasters and also to sensitise the masses on the importance of DRR. Assistant programme officer with DDM, Thinley Pelden, said the theme of the event this year, "Resilience is for Life" focuses on elderly people in the community.

"We're counting on elderly people as they've lots of experience and faced various disasters in their lives, living in the community for so long," he said. "If we're to build resilience in the community, we have to count on elderly people."

Disaster management officials said, with two glacial lakes situated at the river's source, Punakha dzongkhag is at high-risk from glacial lake outburst flood (GLOF).

Continue...

After the flood ...

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Officials said there are 2,794 glacial lakes in the country, of which 25 are potentially dangerous.

As per the official records, Bhutan has experienced 21 outburst cases, of which 17 happened between the 1950s and 1970s, and four in the last 40 years.

They said the disaster management department is carrying out advocacy and awareness programmes to reduce climate-induced risk and vulnerabilities from glacial lake outburst floods. The Department of Hydro-met Services has set up an early warning system, and geology and mines department carried out artificial lowering of Thorthormi Lake.

Officials also told locals and students to take early the warning system seriously, and not confuse it with the siren of the garbage truck, which some villagers misconstrued during a mock drill not long ago.

10/14/2014

EWS in Mangdechhu and Chamkharchhu by yearend

10 out of 25 dangerous glacial lakes are located in the Mangdechhu and Chamkharchhu basins

A fully operational early warning system (EWS) each will be in place in the Mangdechhu and Chamkharchhu basins by the end of this year that will give the residents sufficient time to evacuate in case of a flood.

The project is funded by the Japan International Cooperation Agency (JICA), which held its annual seminar in Thimphu to share the project's progress, yesterday.

The Mangdechhu and Chamkharchhu basins were chosen for the project as 10 of the 25 potentially dangerous glacial lakes in Bhutan are located in the headwaters of the two rivers - seven in the Mangdechhu and three in the Chamkharchhu. The EWS will provide a real time or near real time warning to notify the people of approaching floods.

Six sirens and three automatic water level stations (AWLS) are being installed in the Chamkharchhu basin. Similarly, the Mangdechhu basin will have three sirens and two AWLS.

"Most of the works have been completed and the system will be operational by the end of 2015," project manager Karma Dupchu said. "Probability of flood events are constantly increasing, thus resulting in increased flood risks," he said.

A Japanese meteorological satellite "Himawari 8" will be installed to receive data from the AWLS and transmit them to the national weather flood forecasting centre (NWFFWC) to be based in Thimphu. The centre will be operational by early next year.

"The centre will be the hub for information dissemination related to all hydro-met events in Bhutan," the project manager said. However, the project's cost has not been revealed as most of the inputs come in the form of technical expertise and equipment from Japan.

The risks of glacial lake outbursts flood (GLOF) were also highlighted in the seminar, describing the hazards from GLOFs as an urgent environmental and economic issue. However, according to officials, there are presently limited or no climate monitoring stations in the northern region where the disasters have its roots.

The current observation network in Bhutan, it was said, was inadequate in terms of spatial coverage and representatives.

The project manager said the EWS was necessary as most fertile agricultural land, infrastructure such as hydropower plants, roads and airports are located along the valleys. Over 70 percent of the settlements, he said, was along the main drainage basins and is therefore at high risk to flooding.

Speaking at the seminar, the chief guest, economic affairs minister Norbu Wangchuk said that disasters are going to be part of life and that the only way to confront them is to be prepared.

"We never know that disasters can strike tomorrow or in twenty years," he said. Lyonpo said that the climate change is making the GLOF situation worse every day.

A recent study shows that glaciers in the Chamkharchhu basin have decreased by 28 sq. km over a period of 30 years from 1980 to 2010. This decrease is even more dramatic than the 23 percent total glaciers area decrease observed in the country.

A similar system has been in place in the Punatshangchhu basin with help from the United Nations Development Programme (UNDP).

10/14/2014

Lake burst forces evacuation in Punakha-Wangdue valley

Mochu swells but no major flood reported as of midnight

Residents of Punakha and Wangdue valley, who were evacuated to safety were asked to remain at higher grounds as of late night yesterday with impeding dangers from a possible flood after the Lemthang Tsho in Laya burst around 6.30pm yesterday.

Around 11pm, Lyonchoen Tshering Tobgay cautioned the residents to not return home before dawn, or unless the disaster management department declares it safe given the chances of multiple flash floods, caused by debris blocking the river and in forming artificial lakes.

Khuruthang residents were moved to Woolakha and Bajo residents to Gangtey Thangkha, the old Wangdue town. All patients of Bajo hospital were also moved to Tencholing military hospital. After more than an hour, the sirens, which created panic among residents, were also turned off.

Gasa dzongkhag officials, who moved to Gasa Tshachu since 6.30pm were still at the tshachu monitoring the water level when this paper went to print at 11.50pm.

A state of panic washed over the people of Punakha and Wangdue valley yesterday evening as word of incessant rain over the last three days caused Shinchila Tsho (lake), also known as Lemthang Tsho in Laya to burst.

Within hours, early warning sirens went off down stream, putting residents on alert to be ready for evacuation any time.

At 9.37pm, Prime Minister Tshering Tobgay tweeted saying that the first possible of two floods on Mochu reached Tashithang in Punakha. "Water level is dangerous. Immediate evacuation along Mochu and Punatsangchu compulsory," he tweeted.

By 10.30pm, disaster management director Chhador Wangdi, who was at the early warning control room at the hydro-met office said all residents of the two dzongkhags were evacuated to safety.

Along with him, the prime minister, economic affairs minister and hydro-met officials were also at the control room last night monitoring the situation.

"The second flood was expected to reach Punakha by 11.30pm," he said. "Rain has subsided in Laya and by the time the water reaches downstream, the current would have subsided but we are still monitoring."

Laya Gup Gyem Tshering said it was the cordycep collectors in Laya who first called him to inform about the outburst of Lemthang Tsho, one of the many sources for Mochu.

The lake, according to gup Gyem Tshering is about three hours walk from Laya gewog. "We have alerted everyone including Punakha and Wangdue district officials, police, hospital, town representatives and Punatsangchu project officials," he said.

Continue...

Lake burst forces evacuation in Punakha-Wangdue valley

Continue...

Around 10.30pm, home minister Damcho Dorji informed on Facebook that the lake at Shinche La, which takes about 45 minutes to walk around, has burst totally emptying all its water into the Mochu.

There are about 40 temporary settlements near the lake currently with people collecting cordyceps as well as yak herder camps. "No human casualty has been reported but there may be animal deaths, especially yaks and horses grazing downstream in the plains," he said.

Early last night, the flood siren system at Taktsi Makhang recorded 6.5 metres. The alert level there is 7.5. Only when the water level crosses the 'alert' mark will the machines read the threat as 'alarming'. However, not all siren systems will have the same alert and alarm levels due to gradient and topography of places.

The system at Tashithang, had however, crossed the 8.5 metre alert level. Engineer with the hydro-met services department, Sangay Tenzin, said people along the Mochu have been alerted and all the siren systems activated.

There are three flood siren systems along the Mochu– one in Taktsi Makhang, and other two in Tashithang and Yebesa.

Environment officer with Punatsangchu project, Sangay Dorji said the height of the water at the diversion tunnel measured at more than 8 metres and 3.4 metres at Wangdue bridge.

"We have been informed about the outburst at 6:35pm, and we have already alerted our contractors and labours at the project site," he said, adding all people have been mobilised and on detecting the slightest danger, an evacuation would proceed.

The officials were expecting the first flow of the burst to reach Wangdue by 9.30pm. "However, since we don't know the intensity of water we are going to receive, we don't know the amount of risk we are going to face."

06/29/2015

A good lesson

The Monday evening "lake outburst flood" fortunately didn't cause any damage to life or property along the Punakha–Wangdue valley although it did wash away some bridges high up in Gasa and Laya.

With the news of a possible flood spreading like wildfire abetted by social media, panic caught people living in the low lying valleys. This became worse when the early warning sirens went off. People in the hazard zones were briefed several times in the past that the eerie sound of the sirens would mean danger and they should get to higher grounds.

The memories of glacial lake outburst floods are vivid among those living in the valleys. And they take it seriously. By late evening, most residents in Khurthang were moved to Woolakha, Bajops to the old Wangdue town. These were the two places heavily populated. Some even spent the night in the forest.

When people woke up to a clear bright morning yesterday, they were relieved that except for the swollen muddy Punatsangchu meandering its way through the valley, nothing had happened.

However, looking back, the Monday night incident did us good than harm even if it had caused some inconvenience. Some people in Bajo town were convinced that it was another drill. Even it was a drill, it worked. People on hearing the siren left what they were doing and moved to safer places. That is exactly what they are supposed to do.

It was also an opportunity to test our early warning systems. The systems are working well. It was a good decision to change it to satellite-based, as mobile communications was jammed last night. It would have taken time to trigger the sirens.

The best lesson it taught was that we still lack better coordination in dealing with disasters. Not to deride the good work of the people involved, staying up late, to ensure safety, there were still a lot of things to do.

First still is the information, which is most important during a disaster. We cannot prevent disaster but with reliable and timely information, lives and properties could be saved. Everybody becomes the source of information creating confusion. Facebook and Twitter are not helping. Last night, with everybody on social media, varied information was disseminated prompting a user to accuse media for creating more harm than good.

We still need to coordinate this. The disaster management department should be the source and centre of information. All information could first go to them and then disseminated through media. Sharing information through twitter is limited only to followers and to friends on Facebook. Those with quick and easy access, like ministers, could relay it to a common centre to avoid creating confusion and panic.

This makes the need for a national emergency respond centre more pressing. We are often being tested by nature and we can only prepare well to face it.

It was a good drill yesterday; hopefully it will not be like the story of a boy who cried wolf when a disaster really happens

Editorial
06/30/2015

Assessment on lake outburst begins

An expedition from department of hydro-met services will be fielded soon to study the outburst and ascertain the lake's name

Flood: The Lemthang tsho (lake) outburst on June 28 evening in Laya washed away six wooden bridges (bazams) including the only bridge that connects Laya to the rest of Gasa dzongkhag.

Gasa dzongdag Dorji Dhradhul said a team of three groups were sent to various locations to find out if there were any signs of formation of artificial lakes. "Locals confirmed yesterday morning that the lake had emptied by last night," he said.

The dzongdag's report to the department of disaster management stated that the plain area in front of the lake is covered in sand and debris that the outburst left behind.

As it gushed downstream, it washed away Bazi zam, which is two hours from Laya towards the lake, Pazi zam, which is 15 minutes from Laya village, Lhupja zam, which is 30 minutes from Laya village and Baru zam, which is an hour away from Laya and near Tashi Makhang.

The outpour also washed away the Tongchudrak zam, which is three hours away from Laya towards Gasa and the Lemthang zam near the lake.

Dzongdag Dorji Dhradhul said although they were small wooden bridges, they were important in connecting the dzongkhag and with the bridge at Tongchukdark gone, no one could either travel to or from Laya.

A team of park officials and local leaders of Laya were sent to check from Laya to Tashimakhang, while another team of army personnel was deputed from Tashimakhang to Tongchudrak. A third group including army, police and dzongkhag officials inspected from Gasa towards Laya.

"We were trying to physically verify existence of artificial lakes and other damages along the river," the dzongdag said.

Park officials said around 300 cordycep collectors are also stranded on the other side of the lake. "No casualty has been reported so far but given the intensity of the outburst, we are expecting some livestock casualty," Jigme Dorji National Park manager, Lhendup Tharchen said.

Since June 28 night, he said, park officials on duty in Laya have been monitoring the situation. The team left early morning for the burst site yesterday but with the Bazi zam washed away, they had to return to Laya.

"The team will again try to visit the site today to assess the damage from the outburst and see the situation of the cordycep collectors," he said.

Meanwhile, the Department of Hydro-met Services (DHMS) will soon depute an expedition to Laya to confirm which lake had breached and study how it had occurred.

Of the 25 lakes that are potentially dangerous, five are in the Mo Chu basin. "Only a physical verification would confirm if the lake that had breached was among the five," the chief of hydrology division Karma Dupchu said. "Until and unless we go there, we will not know if the rain or earthquake or both triggered the flashflood because we don't have any details about that lake."

Records from the GLOF early warning system in Wangdue, which is manned round the clock, showed that although the outburst was reported around 6.30pm, the first flood peak arrived at Taktse Makhang, Laya station at 7.30pm.

"The first time, the lake may have partially breached and the highest water level recorded at 7.30 pm was 6.660m," Karma Dupchu said. "Then the water level receded and the second flood peak arrived an hour later at 8.30pm."

Members of the GLOF Management Oversight Group (GMOG) who were informed immediately after receiving the information on the breach monitored the early warning system from Thimphu until 1.30am yesterday morning. Some 30 officials in Gasa were also monitoring and updating the status of flood from Gasa Tsachu until the disaster management department declared the situation safe.

"We were monitoring the flood downstream, and in one hour 45 minutes, it reached the next station at Trashithang, which is about 45 km downstream," Karma Dupchu said.

The flood took almost two hours, 45 minutes to reach the third station at Yebesa, which is about 75 km from Taktsemakhang. The stations record the water level every 15 minutes.

Although the water level observed at Taktsemakhang was below the alert level of 7.5m, Karma Dupchu said the sirens were manually activated at 8.48pm to warn people downstream because of the information that the lake had completely breached and that there were two impeding floods.

He said the other reason to activate the sirens was because the water level downstream were already high from the incessant rainfall. "There were high chances that further floods from the outburst would increase the water level downstream," he said.

On June 27 night and 28th morning, Gasa received heavy rainfall. It recorded 3.75mm of rain on the 27th. With monsoon still on, the early warning systems would continue monitoring the water levels.

"But we are not sure if the lake has emptied," he said. "The good thing was we could test our early warning system and confirm that all sirens worked."

Meanwhile, the two drinking water pipes connecting Bajo town that was washed away in Wangdue was fixed yesterday evening.

The environment officer with Punatsangchu project, Sangay Dorji said the highest water level was recorded as 1,198 cubic meters per second. The environment team was monitoring the water level until 4:30am yesterday.

In Punakha, no major problems were reported after the floods and after more than three weeks of rain, the sky cleared in Gasa yesterday. By afternoon, the dzongkhag's power supply was also restored.

06/29/2015

Amochu flood leaves seven families homeless

No help has come from the authorities so far

The Amochu, which flooded the Bangay Bazar area yesterday morning in Phuentsholing, left behind seven families with no homes.

While sweeping away their homes, the floodwaters also flooded a brick factory and submerged two excavators and three school buses downstream.

As the water level started receding through the evening, worries engulfed the seven families who lost their makeshift houses and shops at the embankment near Phuentsholing's Youth Development Fund building.

While some had found refuge at their friends and relatives' houses, some were still strolling the area in disbelief and without a place to go.

A woman who lost a shop to the floods, Samten Pem, said she has no house to stay. "I am still trying to find a place to settle tonight," she said. "I lost everything with the house."

The flood that was triggered following a heavy downpour since June 30 also left Yeshey Tshomo, a mother of a five month old child homeless. In the rush, she could only secure a cloth, a powder, and a cream of the toddler.

Yeshey Tshomo was waiting for her husband, a driver, who was in Thimphu when the flood hit the Torsa embankments early yesterday.

Residents living at the Torsa embankment said the river water started seeping into their homes from 3am.

Lobzang, 55, a security guard with Druk Punjab Bank said he was on duty when the flood hit his home.

"I got a call from my brother who is in Dorokha," he said. "I called my family and asked them to inform others as well."

Although no casualties were reported, a man from Gelephu, who was marooned over a bus roof, was also rescued. A team of police personnel, Desuups, and other officials had to use an excavator to bring him to safety.

Residents in the embankment said the man had slept in one of the school buses.

But what has left the members of these families aghast was when they received no help from authorities.

Thromde officials had visited the place and taken records of the damages. Officials from dungkhag also visited the place early morning and advised the residents to refrain from going close to the river.

A high school student, Tshering Dema said the officials had advised them not to stay too close to the river, but did not render any help to the affected. Half of what her family owned, she said, was washed away.

A commuter, Phub Dorji, who was on his way to Lokchina to meet his brother, was surprised when he saw no one helping the families.

"I had to stop here and help an old man who was trying to find his belongings," he said, adding that he was unhappy with the crowd just taking pictures and not helping the neighbours during such emergencies.

"Officials from relevant agencies should have helped the people, who had lost their homes," he said.

If officials from relevant agencies cannot help in such disastrous moment, Phub Dorji said, it was no use having them.

However, words of these families being illegal settlers on government land have begun to go around the town.

Phuentsholing Thromde had also notified the settlers to vacate the land but for the last four years, notices have not worked.

The case is similar with the settlers in the main Bangay bazaar, which was not affected by the flooding.

The flash flood has also damaged properties. While two excavators surfaced as the water level dropped, another two excavators were still under water yesterday evening.

A workshop and a brick-manufacturing factory were also affected when the water gushed inside. Three school buses were also flooded but residents said the buses were of no use and that the vehicles had remained there for more than two months.

Due to heavy rainfall, the road from Bangay bazaar to Lokchina gewog and other villages of Phuentsholing gewog has also been cut off.

The point at Chamkuna on the Samtse - Phuentsholing highway, near Bangay bazaar, which is yet to complete has also been severed.

Meanwhile, the seven families, who have settled illegally for more than four years now are hopeful that the government would come to their help soon

07/02/2015

Incessant rain floods and blocks road in Gelephu

Incessant rain since August 18 night caused the seasonal Sethikhari river to swell and flood the road while also triggering landslides to block the road at Box cutting in Gelephu.

On August 19, dzongkhag officials along with police personnel, road officials and locals came together at the site to help divert the floodwater.

A police official said that two excavators were deployed to help divert the floodwater and prevent it from entering the houses.

"There are lots of houses we focused on river diversion," he said. "We also managed to clear traffic for light vehicles by 10:30am, " he said.

He added that they did not allow heavy vehicle to ply through because some parts of the road were washed away.

Police officials said that some people and an excavator were also deployed at Box cutting on the Gelephu-Zhemgang highway to clear the blocks.

While the floodwater was diverted as of yesterday, Gelephu residents said the flood at Sethikhari occurs almost every year and the authority should look into it to prevent similar events in future.

"We had to pass the flood area with help of police personnel and volunteers to reach our office in Gelephu but its risky for students who have to cross that area everyday," a corporate employee said. "The authority should look into this for the safety of people and the settlement."

Sethikhari is about five kilometers away from Gelephu town towards Lodrai.

Regional transport officer Kinga Gyeltshen said they have stopped public transport buses from plying to Zhemgang and Trongsa. As of yesterday, the roads were still being cleared and buses were not allowed to ply.

"If it stops raining, vehicles might be able to ply since the department of roads is already clearing the road blocks," he said.

08/21/2015

Powerful flood renders school inaccessible

A flashflood triggered by persistent rain washed away a suspension bridge and a truck in Samdrupjongkhar yesterday.

The police said that effort was made to alert the driver of the truck when they saw the river swelling but be was nowhere to be found. Soon the flood washed broke the retaining walls, damaged the parking lot and carried the truck away.

With the bridge that used to connect Samdrupjongkhar Primary School with the town now gone, the school remains totally cut off. No damage has been done to the school, however.

Sonam Tshering, the school's principal, said the school might remain closed until further notice and that immediate measures must be worked out to connect the school with the town.

"We haven't found any solution yet. There is an old footpath from the other side of the river, but it is thickly forested and is difficult to use," Sonam Tshering said.

The bridge was constructed in 2008. The school's request for a concrete bridge was turned down because the school was not eligible for a concrete bridge.

The school management has asked for prompt assistance so that sessions are not disturbed.

Flashfloods like this occur every year in Samdrupjongkhar. Townspeople said that it is high time a permanent solution was sought, especially near the bus terminal.

The school has 547 students from Pre-primary to Class VI.

Thromde's education officer, Dorji Gyalpo, said that a meeting will be convened today to discuss the possibility of laying a new bridge over the river.

There have been reports of several roadblocks in many gewogs. However, no casualty has been reported as yet

08/31/2015

Flood destroys Sarpang town

Parts of the Thimphu-Sarpang highway also washed away

Disaster: Nothing remains of Sarpang town, except for a watch tower, after a swollen Sarpang river washed it away early yesterday.

His Majesty The King arrived in Gelephu yesterday, to personally inspect the damage and the ongoing relief efforts at the Sarpang market.

No casualties were reported as of yesterday.

Loss of property was also minimised as the goods of all 52 shops were relocated to higher and safer grounds on July 20.

Rescue and relief work began, after immediate Royal Command, to evacuate the area.

Sarpang went through an intense situation yesterday. Teams of Royal Bhutan Army (RBA) soldiers helped relocate the remaining goods from the shops above the highway without rest.

Under continuous rainfall, RBA personnel helped shopkeepers transport areca nut products that were buried in 20 large pits above the highway.

Residents of the town could be observed feverishly loading the last of their belongings onto vehicles when it became clear that the town would not be spared by the river.

Residents watched helplessly as the river broke its banks and washed away the town.

CGI sheets and wooden planks now litter the banks of the river downstream. Sarpang town was made up of temporary make-shift structures that housed the shops.

The Gelephu-Sarpang highway that is located above the town was also washed away. All vehicular movement has come to a stop.

More than 200 vehicles have lined up on either side of the town. Let alone vehicles, there is hardly any land remaining for even people to cross the town on foot to go towards the Helay check-post.

This is not the first time Sarpang town faced such destruction. The town was also wiped out after an overnight flood in 1996.

Mon Maya Subba, 68, one of the oldest residents of Sarpang town vividly remembers that night when she ran for her life. She recollected that the town was also completely razed to the ground by a fire around two decades before the 1996 flood.

Three years later when people had just begun rebuilding from the flood, the town was again partially razed by another fire.

In February last year, the town experienced another fire disaster. However, 52 of the 82 shops escaped the fire because a parking space separated them from the row of shops that caught on fire.

Yesterday's flood completely washed away the remaining shops as well.

Mon Maya Subba said that every time Sarpang was hit with a disaster, the people somehow rebuilt it but this time the destruction is beyond repair. "When there is no land in the town area there is no hope for it to rise again there," she said. "Sarpang town is completely destroyed."

Following several disasters only about 2.5 acres of land had remained below the highway that served as the town that housed 81 shops before the fire last year. Two people owned that 2.5 acre land.

One of them, Jaganath Pradhan, who owned 89 decimals said that although he did not reside in the town, he is worried because more than half of his property has been washed away. "I don't know what will happen or if I'll ever get land replacement or compensation," he said. "I could do nothing but watch my property being washed away."

The other landowner, Choden Dukpa, owned 1.6 acres. She along with her family are now living at the vegetable market following their home being washed away.

Choden said that although she owned land in the town, she has nowhere to go now that it has been washed away. Unless she gets land compensation or replacement she has no choice but to continue living in the vegetable shed, she said.

Meanwhile, of the 52 shopkeepers in the town, 16 of them do not have a place of residence because they lived in the town.

The dzongkhag administration has made temporary arrangements for them at the Sunday vegetable market. Homeless residents were provided with tarpaulin sheets, mosquito nets, water, electricity and meals for two days.

Sarpang Dzongdag Dawala said that for now all necessary temporary arrangements have been made for the people who have no place to live. Other shopkeepers have their place of residence at Sarpang Taar, which is about a five-minute drive away.

On road connectivity nothing can be confirmed until the rain subsides, the dzongdag said. The water volume in the Sarpang river remains high.

Two excavators were deployed in the river below the Helay check-post to divert the river's course.

The Sarpang river has swollen as a result of incessant rain for the past few days.

07/22/2016

Rain, flooding cause more damage down south

But mitigation teams working on reinforcing Amochhu embankment play big part in minimising flood impact in Phuentsholing

More people living near the banks of the Amochhu in Phuentsholing were evacuated to safer ground yesterday.

Most of the evacuees consisted of those owning shops and working for businesses located along the river.

The Amochhu, fed by continuous rainfall over the past few days, continued to erode land and also flooded workshops and warehouses located along its banks.

Some of the workshops still had heavy machinery and other smaller equipment inside their compounds. Teams comprising of army and police personnel, Desuups, thromde and dungkhag officials, and other volunteers are working on mitigation works to prevent further flooding along the river.

Prime Minister Tshering Tobgay, who had been visiting Lingzhi in the north of Thimphu, headed straight to the Amochhu flood area on the evening of July 23. He joined the team helping to fill sand bags to strengthen embankment walls until the early morning hours yesterday.

Lyonchoen again visited the site during the day yesterday after visiting other affected areas towards Pasakha.

Expressing his gratitude to the mitigation and safety team, Lyonchoen said the mitigation work near the Rigsar Construction company looked simple but was crucial in preventing more flooding and destruction.

Hundreds of sand bags were placed along this stretch. Later in the afternoon, mitigation works were initiated downstream and continued

throughout the evening despite rain.

Meanwhile, business establishments in the high-risk zones were able to shift their necessary machinery and vehicles to safer grounds.

Some heavy equipment, located near Bangay Bazaar, and destined for hydropower projects across the country were also affected by the flood.

Thimphu-Phuentsholing highway

The Thimphu-Phuentsholing highway was further damaged yesterday. A portion of the road at Kamji was washed away.

There was only enough space left over for one person to cross over the washed away stretch.

Lyonchoen Tshering Tobgay told Kuensel that everything would be done to solve the problem.

An official with the Department of Roads (DoR) in Phuentsholing said that a 100-foot stretch had been washed away.

DoR, the Construction Development Corporation Ltd, and DANTAK are involved in launching a 110-foot bailey bridge over the washed away portion.

As of last evening, 80 percent of preparations had been completed with most bridge parts reaching the site.

Launching of the bridge is scheduled to begin by 11am today and the bridge is expected to be completed by tonight. However, traffic is likely to be allowed to cross the bridge only by tomorrow afternoon.

Meanwhile, several other landslides were reported along the highway, some of which have already been cleared.

Phuentsholing town

Continuous rain triggered a flood in the town submerging the border gate area. Similarly, drains in the Kabreytar and Dhamdara areas also overflowed and roads were damaged.

The Omchhu had also swollen into a massive river and the construction site for a bridge located at the confluence where it meets the Amochhu was affected.

Protection walls have collapsed in several areas.

Pasakha

Vehicle traffic between Pasakha and Phuentsholing was not possible for the third day yesterday.

People walked to their offices in Pasakha. However, police have been advising against using the Bhalujhora bridge in Pasakha as its deck slabs had cracked and broken, risking collapse. With the water level rising, the bridge's condition had worsened by yesterday evening.

A flash flood also occurred at Toribari between Rinchending and Pasakha early yesterday but it was eventually cleared.

Lhamoizingkha cut off

Lhamoizingkha dungkhag has been cut off for six days. The Kalikhola river on the border has swollen making it impossible for vehicles and people to cross. The dungkhag has also been experiencing frequent power cuts for the last five days. The dungkhang's B-mobile network is also down.

Another bridge collapse in Buduney, Samtse

Another bridge collapsed into the Buduney river in Samtse yesterday morning.

In total, two of the four interconnected bridges over the Buduney have now collapsed. One bridge collapsed on the morning of July 22. The second collapsed in the early morning hours yesterday.

"As of now there is no connectivity," a DoR official said. "The alternatives can be worked on only when the rain stops."

07/25/2016

Gelephu flooded

Following the swelling of the seasonal stream, the Setikharay, the occupants of 22 houses were evacuated to higher ground in Gelephu yesterday.

Incessant rain caused the Setikharay stream to divert and flood Pelrithang village, threatening lives and property.

Of the 22 houses affected by the flood, 18 were located near the Gelephu border gate.

The residents of these 18 houses were evacuated to the Royal Bhutan Police (RBP) campus inside the thromde after floodwater swept muck and debris into their homes located by the RBP camp near the border gate.

The entire border gate area was flooded from the gate towards the Dadgari market in Assam.

The Setikharey had also swollen massively towards Pelrithang, which is around three kilometres away from Gelephu town. The increased water volume from the stream entered nearby settlements in Pelrithang following which residents of at least four houses were evacuated to safer grounds.

Royal Bhutan Army, police, Desuups, officials, and other volunteers helped families move their belongings including cattle and furniture.

Though there are 16 houses below the highway where the stream has diverted, Gelephu gewog administrative officer Kinley Wangdi said only four of the houses were at risk and were evacuated immediately. But the areas around these houses however remains flooded with floodwater from the Setikharay.

Kinley Wangdi also said that though these houses are located at a safer distance, the occupants could also be in danger if it continues to rain through the night.

Floodwaters have also partially washed away walls of one of the houses.

"People living little farther are refusing to move out leaving their homes and belongings though it's not safe for them to stay overnight," he said.

Although rainfall slightly abated in the afternoon, it started raining heavily towards the evening in Gelephu.

While RBA, police, Desuups, government officials and volunteers managed to divert the stream back to its original course, it was feared that the incessant downpour would cause the Setikharay to flood again.

The relief team helped evacuees cross towards Gelephu town through the floodwaters on the highway by forming human chains on the flooded road.

Meanwhile, it has been three days since the Gelephu thromde was cut off from drinking water supply. The water treatment plant supplying water to the core town, the hospital area, a guesthouse and two schools is still covered in muck and turbid. The water treatment plant currently submerged in floodwater was also under threat of being swept away by the Maukhola river.

07/24/2016

Monsoon causes damage across country

The works and human settlement ministry is monitoring the flood situation across the country.

Works and human settlement minister, Dorji Choden, said that in some of the affected places the situation has gone from bad to worse. She said that the road at Sorchen was washed away and that a temporary bridge is being built and is expected to be completed in two days.

"We are preparing and hoping to get a temporary bridge at Sorchen in about two days," Lyonpo Dorji Choden said. She added that the Construction Development Corporation Ltd (CDCL) and the Department of Roads (DoR), along with other agencies, are engaged in getting the bridge erected.

Project DANTAK is also involved in constructing the bridge.

The Tsirang-Sarpang highway has also been cutoff as the bridge near the Sarpang checkpoint was washed away. She said work to reestablish the link will start as soon as the river subsides.

"We can divert the river as soon as the rain stops," she said. The rain was continuing as of yesterday afternoon. The meteorological division has also forecast heavy rain in Samtse, Sarpang and Phuentsholing for today.

The situation at the Dzongkhalum bridge near Trongsa town has gone from bad to worse. She said the bridge was further damaged yesterday, totally cutting off the road. The Dzongkhalum bridge is located on the Trongsa-Zhemgang highway.

"It will take sometime to get traffic moving on the road," she said, adding that it is difficult to provide an estimate of by when. There is no alternative route to the bridge. "We will have to find an alternative although it is difficult," she said.

Lyonpo Dorji Choden said another pillar of the Buduney bridge in Samtse has been damaged making it more difficult to repair the bridge. "We haven't been able to do much due to continuous rain. We can deploy our machinery as soon as the flood water subsides," she said. "Works to restore the bridge is not possible unless the rain stops," she said.

Meanwhile, the minister said no loss of life was reported due to the flood situation as of yesterday. The minister said except for some workshops in Phuentsholing and the makeshift Sarpang town, no major properties were damaged.

Citing hydro-met officials, Lyonpo Dorji Choden said the rain was expected to continue for a few days. One of the major facilities at risk, she said was the water treatment plant in Gelephu.

She said some of the gewog roads have also been blocked. "But efforts are in full swing to clear them all as soon as possible," she said.

Prime Minister Tshering Tobgay was in Phuentsholing and Sarpang yesterday, while information and communications minister DN Dhungyel was in Samtse to monitor and help the relief efforts.

Home minister Dawa Gyaltshen was also in Phuentsholing.

Gelephu cut off

The only link remaining to the town is from Dadgari in Assam, which is also flooded

Continuous rain in Gelephu yesterday caused more damage threatening settlements between Setikharey and Dhawlakhola.

Twelve more houses from Pelrithang were evacuated to safer ground yesterday.

The relief team, consisting of Royal Bhutan Army, Royal Bhutan Police, Desuups, government officials and other volunteers, assisted in the evacuation and to set up temporary accomodation, while some families went to live with their relatives.

As of yesterday evening, some villagers were still salvaging belongings from their homes.

Consisting of 16 households, the villages of Dhaurali and Katel in Perlithang of Gelephu gewog, remain partially submerged by the swollen Setikharey stream. The swollen stream had changed its course and flooded the villages.

One of the evacuees, Pushpa Lal Katel, said they had been living in their house for decades and having to evacuate all their belongings in a few hours was a difficult experience.

"It is continuing to rain and the little damage that the flood has done to our houses will now worsen overnight. It might be completely washed away," he said. "We've made temporary arrangements elsewhere for now," Pushpa Lal Katel added.

The villagers were struggling to evacuate their livestock.

Traffic came to a halt after the culvert on the Gelephu-Perlithang highway, above the flooded village was completely washed away yesterday morning. The road connected Zhemgang with Gelephu.

Just few metres away, a swollen Dhawla stream also has made it difficult for vehicles to cross. ***Continue...***

Gelephu cut off

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About two kilometres further, the Perlithang river was flowing over the Passang bridge near the Radha-Krishna temple.

Six families living in the Department of Road's labour camp below the road, had to be evacuated to a guesthouse belonging to the Deparmtent of Geology and Mines. Three more families living in the camp went to live with their relatives.

The swollen Taklai river in Umling also submerged more than 60 acres of cultivated paddy fields belonging to at least 30 households of Gaden chiwog. The paddy fields were located adjacent to the Taklai river, about 3km from the gewog centre.

Large walls protected the fields but the swollen river broke 500 metres of the wall inundating the paddy fields.

But Umling Gup Ugyen Norbu said that there was no damage to human settlements located further from the field at a higher ground. "These damaged paddy fields consisted of more than 50 percent of the cultivable land for Gaden chiwog villagers," he said.

Gewog officials were still accessing other damages as of yesterday evening.

In Jigmechholing gewog several villagers reported damage to their crops. At least two acres of cardamom fields were reportedly eroded in Gongdegang village.

Gelephu-Zhemgang highway

More than 100 metres of the Gelephu-Zhemgang highway near Chisopani bridge were washed away. Further up towards Jigmechholing, the Department of Roads has not been able to clear the roadblock at box cutting.

At least 250 metres of the highway was washed away on July 23 at box cutting. Assistant engineer Kishore Chhetri said that it would take another week before all the blocks along the Gelephu-Zhemgang highway would be cleared, that is, if it does not keep raining.

"The damage is severe. It is difficult for machinery to work as it continues to rain here," Kishore Chhetri said.

Another massive roadblock occurred three kilometres before Jigmechholing. More than 100 metres of the road's foundation was eroded. DoR site engineer, Wangchuk, said that to clear the road machinery will have to be mobilised from Gelephu, which is impossible at the moment.

The block here will be cleared only after the box cutting block is removed.

Several farm roads in Sarpang remain closed to traffic following heavy landslides. It has been almost a week since there was no vehicle movement on the 43km Gelephu-Dovan road.

Gelephu, meanwhile, remains cut off from rest of the dzongkhags. The only entry into the town is from the Dadgiri market in Assam, which currently is also flooded.

07/26/2016

PHPA-II dam construction site flooded

However, the project's managing director says there will be no delay or extra expenses incurred.

A swollen Punatsangchhu spilled over the Punatsangchhu Hydropower Project Authority (PHPA)-II coffer dam and flooded the main dam construction site yesterday.

The river began flowing past the project's diversion tunnel and over the coffer dam by around 9am.

While sources said that it could take more than a month for the project to pump out the water from the construction site, PHPA managing director, RN Khazanchi, said that the overflow or spillover is expected during the monsoon season for PHPA-II, and it would result in no delay or extra expenses.

However, sources said that the already delayed construction of the dam is likely to face more delay as it could take more than a month to pump out the water from the dam-construction site. Further more, this process can begin only after the water level goes down.

However, RN Khazanchi said that each spillover could be addressed within seven-ten days.

He said unlike PHPA-I, the PHPA-II diversion tunnel is not designed for the monsoon season. It is designed to adjust only half the discharge as that of PHPA-I, which has two diversion tunnels.

The PHPA-II was designed to have only one diversion tunnel because of costs, said the managing director. "In our time schedules the spillover of cofferdam is allowed," RN Khazanchi said.

The top of the cofferdam is 811 metres above sea level and when the water level reaches 808.5 metres, all heavy machinery is relocated to safer grounds, he said.

The height of the cofferdam was increased following a spillover, last year, sources said.

In an earlier interview with Kuensel, RN Khazanchi said concreting of the dam's foundation would be complete by mid-June. However, this is yet to be completed. The managing director said the "share zone" excavation is still in progress at the dam site.

Prime Minister Tshering Tobgay also pointed out on social media, that the coffer dam is designed to withstand "over topping" or spill over, and therefore, no damage had occurred to the coffer dam, diversion tunnel or dam site.

Meanwhile, the river broke its banks in some areas along the Wangdue valley, flooding roads and fields surrounding a hotel, located 1km away from Bajo town. The river also submerged an area used for mining sand.

The river also washed away embankment walls at Kamichu opposite the small temporary town, leaving families in fear of being flooded.

Sonam Choden, a Kamichu resident who has started constructing a two-storey house opposite the Kamichu bazaar said she is worried about a flood.

She was one of the seven residents of Kamichu bazaar who were provided with substitute land by PHPA-II, last year.

The retaining walls have been washed away and the water level is rising with every rainfall, she said. "This is leaving us sleepless and concerned about the danger it might bring to us."

07/25/2016

PHPA-II dam construction site flooded

Gomtu

A 11-year-old boy was washed away by the Sukti river in Gomtu yesterday. The incident occurred at around 2:30pm. The class IV student had gone swimming with his friends in the river.

The boy was not found as of yesterday.

Thimphu-Phuentsholing highway

DANTAK is working to connect the washed away portion of the road at Kamji with a bailey bridge at the earliest, according to a press release issued by the organisation.

No time frame was provided.

The portion, located 22km away from Phuentsholing, was partially washed away on July 22 and then completely the following day.

While DANTAK had initially planned to launch a 110-foot bailey bridge, with a carrying capacity of 40 tonnes, over the washed away portion, more rain and further sinking of the road has caused the length of the bridge to be expanded to 160 feet. The 160-foot bridge will be able to carry only 24 tonnes.

The construction of the bridge is a joint effort between DANTAK and the Department of Roads but DANTAK is constructing the bridge, according to the press release.

Limited space, continuous rain and limited visibility is hampering the launching of the bridge,

says the press release.

DANTAK has also asked that authorities restrict traffic from Gedu towards Sorchen so that restoration works can be carried out smoothly.

The organisation also points out that the stretches from Phuentsholing to Sorchen, and from Gedu to Thimphu was kept open by DANTAK despite numerous recurring slides.

Phuentsholing

It was a better day yesterday with less rain in Phuentsholing.

Mitigation works continued on both the Amochhu and Omchhu.

Flood water in most of the flooded areas had receded and dried by the evening yesterday. Army and police personnel, desuups, officials of the thromde, dungkhag and government, and other volunteers were able to initiate mitigation works in other risk zones.

A retention wall for the Omchhu that had collapsed was reinforced to prevent water from entering the town.

07/25/2016

Flood alarm in Chamkhar sends people running

Early warning sirens that went off at around 1:30am yesterday sent the people of Chamkhar town in Bumthang scurrying about, trying to reach higher ground.

The road towards Lamaigonpa was jammed with vehicles.

Police and dzongkhag officials were engaged in managing the traffic and the crowd. Police were seen at the bridge in Chamkhar monitoring the water level. Panic spread as the raging river brought along with it the smell of fresh earth.

Lhawang Dema, 46, was sleeping when her neighbours woke her up, banging her door. It was 12:30 am. She ran with her neighbours to inspect the water level at the river. It was all muddy and roiling.

"I came back and was leaning on my bed. Then I heard the alarm. It was 1:30am," said Lhawang Dema. Along with her family members, she rushed towards the dzongkhag court and remained there until 5am.

Continue...

Flood alarm in Chamkhar sends people running

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Dendrup Wangmo thought it was another fire in Chamkhar town again but realised that it was the noise of the swollen river.

"I took my mother and children to Jakar Higher Secondary School and returned home with my husband to save our belongings," she said.

A technician with hydromet department in Kurjey, Dungchu Wangdi said the water level reached the alert level of three metres, at 5:45 am the day before and decreased gradually. By 9pm the water level rose again. "It kept on increasing until it hit the alarm level. It was 4.10 metres," he said.

He added all six early warning alarms along the Chamkharchhu went off.

Bumthang Dzongdag Phub Tshering said the residents of Chamkhar town have been advised to move to safer ground.

"We have been actively involved in cautioning and managing them and no damage has been caused," said the Dzongdag.

07/27/2016

Anxiety of lake outburst grips Wangdicholing village

People living within the glacier lake outburst (GLOF) hazardous zones in Bumthang are still anxious following a July 26 incident where flood sirens went off.

Naleymo, 42, from Wangdicholing village, who lives right below the Wangdicholing foot path, said she slept in a friend's house for four days following the incident. "Now I live in my house but with a lot of fear," she said.

Karma, 54, who lives in a two-storey traditional house near the Chamkhar-Dekiling bypass said they are warned about GLOF every time it rains. "We know that we are under threat but no one knows when the GLOF will occur," he said.

Karma said the government has constructed retention walls along both sides of the river which are now damaged. He said the highest risk is in an area below Chakar Lhakhang where there is no retention wall.

The river recently washed away even the traditional trail towards Chakhar from Dekiling. "The river could change its course and flow through the area where my house is," he said.

Nima Sangay, 68, said the river has already washed away some portion of hill below Chakar Lhakhang and that he has informed the thromdey thuemi.

Observers said the government has been spending significantly on constructing retention walls along the river in the area every year only for it to be washed away during the monsoons. Many said that the government should explore other designs.

There are some 10 households living in the hazardous zone in Wangdicholing village excluding those in Chamkhar town.

The thromdey thuemi could not be contacted.

Residents of Chamkhar could be seen packing their belongings to spend the night on higher ground last night.

08/05/2016

Flash flood on Dangchhu

Officials say it could have been caused by the bursting of an artificial dam or lake formation

Residents along the Dangchhu were evacuated and the Punatsangchhu projects were alerted after a flash flood was detected late yesterday.

As of yesterday evening, no one was sure about the cause of the flash flood, and officials including the dzongdag and gewog leaders kept close watch inspecting the river and alerting people.

According to Dangchhu gup, Sonam Dorji, they became aware of the flash flood at around 5pm when cow-herders residing near Tasa heard an unusual roaring sound from the Dangchhu. They knew it was a flood and eventually informed the villages downstream.

He said the cow herders informed three households along the Dangchhu located near the gewog centre, allowing their residents to reach higher ground in time. The families claimed that their walls have been partially destroyed by the flood.

"We were informed by those families at around 6:30pm, and subsequently we informed the dzongkhag and alerted schools, residents and others living downstream at Tikizampa," said the gup.

Wangdue Dzongdag Sonam Jigme said that at around 7:23pm the flood had crossed through Tikizampa and no casualties were reported.

The dzongdag said that while no lake had burst, all settlements along the river, including the Punatsangchhu projects, have been informed and alerted.

There are no emergency sirens installed along the Dangchhu.

Meanwhile, Gup Sonam Dorji said the biggest lake that feeds the river is Dipchuni. There are several other lakes but all are small ones.

08/05/2015

No threat from artificial lake: officials

An artificial lake has been formed along Drangmechu River following a cloudburst that caused Bamri and Bodhi streams to flood on August 21.

As a result of the flash flood, the two streams have deposited debris and boulders along the Drangmechhu basin, according to a report prepared by the dzongkhag and submitted to the home and cultural affairs ministry.

The dzongkhag with the help of the Department of Roads (DoR), Project DANTAK and the Royal Bhutan Police jointly carried out the inspection.

The report also states that debris on the left bank constricted the river flow forming a 2km long lake.

The Bamri and Bodhi streams are located along the Trashigang to Kanglung

gewog highway and eventually join the Drangmechhu.

The formation of the lake left many concerned after pictures and rumours circulated on social media that the lake could burst anytime.

This is because the Chazam bridge that connects Trashigang with other dzongkhags is located upstream of the artificial lake.

However, Trashigang Dzongdag Chekey Gyeltshen said that although an artificial lake has formed there is no immediate threat to life and property based on professional advice provided by the Department of Roads and Project DANTAK.

"There is no threat to the bridge because the lake has formed about 30m from the bridge downstream," the dzongdag said. "There is also no threat to the highway and people because there are no settlements downstream that are endangered and people shouldn't panic," the dzongdag added.

The dzongdag pointed out that along with the police, the dzongkhag administration is monitoring the artificial lake daily while the metrology office in-charge is monitoring the river level on an hourly basis.

However, the dzongdag added that during the inspection, as per expert opinion, it was found that mitigation measures will be possible only after the monsoon ends.

"We were told the clearing of debris could be possible only when the river subsides and it's not possible right now," he said. "But we're doing everything possible to keep a close eye on the lake formation."

09/02/2016

Flash flood in Nahi washes away bridges, cattle

No report of injuries

A flash flood on the Henirongchhu (Nahi stream) in Nahi gewog, Wangdue has washed away one suspension and two motorable bridges, and two vegetable sheds in Nahi gewog. The flash flood occurred on the night of September 17.

The flood left Nahi primary school and Nabisa chiwog cut off. The flash flood also affected three other chiwogs: Usawom, Usagom and Usakha.

Both the motorable bridges were concrete and built by the Japan International Cooperation Agency.

Drinking water sources for the Bhutan Power Corporation's staff quarters at Rinchengang, the Punatsangchhu project's staff quarters and for people living near the Wangdue bridge, were also washed away, Wangdue Dzongdag Sonam Jigme said.

A local, Kuenga Drukpa, said the flash flood also washed away several irrigation sources for Nahi, Rinchengang and Gaselo. Irrigation sources for Hyodgirongchu, Usawom, Rinchengang, and two sources of Jagarbjaphu, Bjopgizhing, and Gaselo (Tshog-gom and wom) each, have been washed away.

Dzongdag Sonam Jigme said the flood started a few minutes after an earth quake at around 5:19pm on the evening of September 17. By the time it reached Nachuzampa, near Nahi primary school, it was around 8pm.

Kuenga Drukpa said Nahi primary school is located just above the Rongchhu at Nachuzampa which was also at risk of being flooded. Many students from far-flung villages in Nahi are boarders at the school. One of the oldest schools in the country, Nahi primary school is located on the edge of the Rongchhu and has previously seen such floods.

Despite several requests, the education ministry has not yet shifted the school to a safer site, said Kuenga Drukpa, who is also a former tshogpa. The students of the school were evacuated before the flood reached the area around Nachuzampa. Nabisa residents had warned teachers at the school about the flood.

"We are hoping if the government could shift the school to near the Nahi gewog centre, as it is not just a safer place but has offices located there," said Dorji, another local.

Lham, 43, who lives close to Nachuzampa and Nahi school, said this was the first such flash flood she has experienced. Lham, who is a mother of two school-going children, said that the flood made a roaring sound and that the ground shook. "It was scary," she said. "We ran to higher ground," she added. "I am worried about the safety of my children and other students of Nahi. The flood was unpredictable, huge and occurred without any rainfall."

In 2014, another flash flood occurred on the Rongchhu while classes were in session. However, it wasn't as large as the September 17 flash flood and no bridges were washed away.

Lham said that a neighbour and one of her family members, who had been guarding their fields, located a few metres below Nahi school, against wild animals, were nearly killed by the flood. Several people have lost their cattle, she added.

Meanwhile, the Wangdue dzongkhag administration along with Desuups, army and police personnel, the area's National Council representative, government officials and other volunteers have been working since yesterday morning to build a temporary bridge to connect Nahi school. The school is likely to remain closed today.

Locals were not aware of a lake at the source of the Rongchhu, said Dzongdag Sonam Jigme.

The flood is suspected to have been caused either by a cloud burst or the bursting of an artificial lake formation.

08/05/2015

Pasakha flood protection measures to be in place by July 2017

Memories of the terrifying Barsachhu flood of 2000 were refreshed this year in July when heavy and continuous rainfall caused the river to swell once more.

Rain raised the water level higher than most people expected. Many, especially the tenants of industrial establishments such as Bhutan Ferro Alloys Ltd (BFAL) and Bhutan Carbide & Chemicals Ltd (BCCL) had to evacuate to higher ground for safety and sleep elsewhere.

However, this scenario should not repeat. Two flood protection works have been initiated along the Barsachhu. While the works have already started, an official inauguration was conducted yesterday.

These two projects are under the Least Developed Countries (LDC) funding of the National Adoption Program of Action (project) II coordinated by the UNDP's Global Environment Facilities (GEF).

M/s Jamtsho Construction is working on both the projects which are expected to be completed by July next year.

Under the first project, a 170m long gabion wall will be constructed on the right bank of the Barsachhu besides the industrial colonies of Pasakha. A fund of Nu 24.19 million (M) has been allocated for this project.

"This will protect the colonies of BFAL and BCCL," the national project engineer from the Phuentsholing thromde, Gautam Thapa said.

More than 265 tenants of BFAL and BCCL in Pasakha will benefit from this protection work.

An employee with BFAL, Kencho Pelden said that people had almost forgotten about the Barsachhu flood in 2000. "It was surprising to see the river swell this year in July," he said.

Cheku Gyeltshen and AR Gurung, employees of Bhutan Sillicon Metal Private Ltd (BSMPL) also welcomed the new protection measures. "The water level was about to touch the bridge this year in July," Cheku Gyeltshen said. "People had to run to safer places."

The second project is a 240m long gabion wall on the left bank of the river. This will protect industries such as BFAL, BCCL, and BSMPL.

A funding of Nu 48.67M has been allocated for the project.

Tenants in the colony hope that the first project will be completed by June next year, before the onset of monsoon.

Meanwhile, there is another NAPA II project in Phuentsholing that involves slope stabilisation and protection works at the Rinchending Checkpoint and Reldri High School.

The work has been awarded to a Japanese construction firm M/s Marushin Shitaka in joint venture collaboration with a local firm M/s Yangkhil Construction.

The area below the Rinchending Goenpa and the areas below the town's old hospital are also undergoing landslide protection measures. About 30 percent of these landslide protection measures have been completed, thromde officials said.

Phuentsholing thrompon Uttar Kumar Rai attended the inauguration ceremony yesterday.

08/05/2015

Weather stations to be upgraded

"Everyone in this country should know what meteorology is, and understand its importance," said D.B. Chhetri, assistant civil engineer in the Agriculture Department.

Meteorology, which is the study of weather, is a fairly new concept in Bhutan. It received impetus when His Majesty the King met with the dzongdas in 1984, and he emphasised that each dzongkhag should have its own meteorological observatory station. Today, there are 78 stations in the country, all controlled by the Agriculture Department.

The department is considering to upgrade four of the stations: at Kanglung, Bhur in Geylegphug district, Wangdiphodrang and Thimphu with the installation of new equipment and sending technicians for training.

"With the upgradation of the four main stations in the country, the Agriculture Department will be able to nationalise its meteorological service not only for agricultural and forestry purposes but for all types of needs. The existing stations with their limited instruments mainly serve departments like the forestry, Bhutan Broadcasting Service and the Agriculture Department," said Mr. Chhetri. At the moment, 13 government departments are utilising its service.

"Meteorology is especially very important for civil aviation," he said.

Quotations have been called for the Nu. 137 million instruments, which will include a sunshine recorder, wind vane (to show wind direction), anemometer (to show wind speed), automatic rain gauge, evaporation pan and soil thermometers.

Making data reliable is the objective of the meteorological service, but Mr Chhetri said it has been a near- impossible objective to achieve because of the employment of part-time observers at the stations who have not been sincere in providing data.

"We have manpower constraints. We don't have any meteorologists or hydrologists in Bhutan, " he said.

According to him, hydrology, which is the study of water, is also closely related to meteorology.

Full-time staff are also not required, because observers are needed to observe only for a short while each day.

"After upgrading the stations, and the staff trained the work will be more effective," he said.

3/5/1988

Weather ... much the same

If you have been wondering about the weather lately, it seems you are not alone. Many people think it has been a little different.

But a check with the Agriculture Department reveals that temperatures and rainfall are much the same this year as last year in spite of the appearance of late snow around Thimphu.

In Thimphu the maximum temperature in April was 21.5 degrees centigrade and the minimum 7.6 deg. C.

This can be compared with 1987 temperatures for April of 20.3 deg.C and 5.9 deg. C.

In Wangdi there was even less variation with the same maximum of 25.2 deg. and a minimum last year of 11.9 and this year 12.1.

In Bhur temperatures were higher in March with a top of 29.6 deg. compared with 25.5 last year. Readings in Rangthongwoong (Tashigang) showed a minimum of 9.4 deg. this year compared with last year's 11.5 deg. But the maximum, about 17 degrees, was the same.

There were no significant differences comparing the rainfall in 1987 with this year.

Weather data will be improved after the hydrometeorology section of the Department of Agriculture sets up stations at Bhur, Wangdi, Kanglung, and upgrades the Thimphu station within a year. A minute or an hour's weather data will he available, which will help farmers in planting and harvesting crops in particular seasons.

Mr. Harm Kool, from an international organisation, Interserve, who is presently working as an executive engineer in the hydrometeorology section, says that these stations can give information on sunshine, evaporation, wind speed, rainfall, humidity and soil temperatures.

"School teachers, wireless operators, agriculture extension workers, basic health workers are employed as part-time workers from whom we receive reports on relative humidity, rainfall and minimum and maximum temperature from 78 stations installed in different places in the country," says Mr. Kool.

5/21/1988

Picture story
Gusty winds of April 19 afternoon uproots trees on the Swimming Pool - hospital stretch.

4/23/1994

Stronger winds this year

The Meteorology Division of the Power Division has recorded unusually strong winds this year.

The executive engineer of the division estimates the wind speed to have reached between 50 to 60 kilometres per hour. The metrology division records the wind speed using the Anemometer and direction by the wind vane or weather cock on a 24-hour basis. An average reading being collected at the end of the day.

Gusty winds in the early afternoons have resulted in many roofs being blown off in Thimphu valley. In one incident, a boy was struck dead by a corrugated sheet blown off a roof.

Trees have been uprooted and dust blown all around causing a high incidence of respiratory illnesses.

"Wind is basically categorised depending upon its speed," said the executive engineer. Studies made on wind and its different features and assessing the amount of destruction a particular type of wind can be identified. According to the physical wreckage seen in Thimphu, strong gales had hit the valley.

"The valley being somewhat plain without much obstruction creates a situation for the wind to hit the valley more directly", he said.

According to the division, Wangduephodrang valley gets the most and the strongest winds.

4/6/1996

Hailstorm destroys crops

A sudden hailstorm in Samtse on the evening of April 2 caused extensive damage to crops, trees and windows.

According to Kuensel's correspondent, the hailstorm was preceeded by gusty winds which snapped branches and shook off leaves from trees.

Hailstones, the size of marbles, damaged maize and kitchen gardens; tore through banana and arecanut leaves; smashed window panes and perforated a plastic roofing that was recently fitted on the NIE auditorium.

"Some parts of the plastic roofing had become like a sieve," said the correspondent.

In Dorokha, several birds were also reported killed by the hailstones.

4/9/1994

Bhutan's rainfall: highest in Bhur

The Bhur region of Gelephu receives the highest rainfall in the country, about 5,184 mm, according to a data release from the Division of Meteorology.

This is followed by Samchi, which receives an average of about 3,769 mm of rain.

The figures, according to the Executive Engineer of the Meteorology division varies from year to year because of geographical conditions.

"There can be significant changes in the rainfall pattern because of various geographical reasons," he said, "And so the figures we state are only representative."

The Executive Engineer said that the Meteorology Division was unable to make weather forecasts because they lacked trained manpower and other facilities to do so.

The division, however, is working on producing maps, with the help of satellite oriented machines, which will help in the study of climate, rainfall and other aspects of weather.

In south eastern Bhutan Samdrup Jongkhar receives most rainfall with 3,154 mm, and Tashigang heads the east with with 2,000 mm.

In north western Bhutan Gasa receives the most, 1,352 mm and in Central Bhutan Tongsa and Shemgang receive more than 1,300 mm.

The data release also indicates increase in rain in 1992 and 1993.

The figures for 1994 are yet to be released.

11/26/1994

Hailstorm damage some mandarin plantations

Officials of the Ministry of Agriculture are deeply perturbed by the recent hailstorms that hit the orange producing belt in the south and southwestern parts of the country over the past month.

"With the last orange season recording the lowest harvest in five years we had hoped that this year's yield would be much better," said the Agriculture Secretary, Dasho (Dr)Kinzang Dorji, "However, the onslaught of three hailstorms within a period of four weeks on the major orange producing areas of Samchi, Phuntsholing, Kalikhola, Sarpang, and Gaylegphug, has made the yield of this year's orange harvest very uncertain."

The first hailstorm hit Phuntsholing dungkhag on March 21 and affected certain orange growing pockets in Phuntsholing and Bhalujora gewogs. This was followed by a very severe hailstorm on April 2 which hit the whole of Samtse dzongkhag. A third hailstorm on April 16 hit different pockets of these orange producing areas.

Reports from the dzongkhag administrations indicate that the major damage to the orange crop was caused by the hailstorm on April 2 which resulted in the shedding of the orange flowers. The trees had started flowering since mid-March.

The worst affected areas are reported to be almost all the gewogs of Samtse dzongkhag and the southern gewogs of Phuntsholing dungkhag. In parts of Samtse, it has been reported that the hailstorm had even broken branches off trees and the window panes of some of the houses. Fortunately, the damage in Samtse dzongkhag was not very severe. The dzongkhag has the largest acreage of orange orchards, estimated at about 7,000 acres, followed by Sarpang dzongkhag with 6,200 acres under orange cultivation

"Despite the hailstorms, we still remain a little optimistic about the overall yield this season because the flowering of the mandarin orange this year was much better than last year," said Dasho Dr.Kinzang Dorji.

He pointed out that damages by hailstorms are usually caused in pockets along hailstorm paths which are not necessarily very wide.

In the absence of a thorough survey and assessment of the extent of damage on a gewog by gewog basis, he said that it was still too early to make any projection of the orange production this year.

4/23/1994

Picture story
After more than 12 hours of unusually heavy rain, the Changlimithang sports stadium took on the appearance of a lake.

11/11/1995

Two killed, one injured

TWO PEOPLE were killed and a third injured at Gaseypay village, under KazIii geog in Wangduephodrang when a new house nearing completion crumbled during a hailstorm on May 1.

It took over four hours for a village rescue team to wrest the victims from the debris.

The entire buckwheat crop of the village, which was in the stage of flowering, was also destroyed.

Meanwhile reports from three gewogs in Wangduephodrang said that hailstorms and an unexpected tornado wrought havoc in the dzongkhag last week.

On April 30 a similar hailstorm ruined all crops in Lomtsokha village in Ada geog.

The gups of the gewogs have been asked to have the damage assessed and hand in detailed reports to the dzongkhag authorities, the Dzongda of Wangduephodrang, Pem L Dorji, said.

Also on April 30 a sudden tornado tore off the roof of the primary school in Nobding.

Reportedly, the dzongkhag administration has provided materials for the school to be re-roofed.

5/10/1997

Thimphu unusually wet. this season

WITH THE passing of the main summer months, data kept by the Metrology Unit in Thimphu suggest that the capital has just had its wettest and coolest monsoon in recent years.

In the months of June, July and August this year, rainfall in Thimphu averaged about 150 millimetres. Average rainfall in the same months in 1996 was read as 147 millimetres; and it was drier last year at 124.9 millimetres.

In July this year the city recorded rainfall of 235 millimetres, making it the wettest month in the last three years. The driest month was June last year with only 86.3 millimetres of rain.

Places like Phuentsholing, Gelephu, Samtse and Sibsoo in the southern belt of the country have also recorded an increase of between 20-25 percent in rainfall, according to the Metrology Unit.

Thimphu enjoyed little fluctuation in temperature this summer. The maximum temperature in the last three months averaged 27.67 degrees Celsius while the minimum temperature averaged 14.33 degrees.

The heat was on most in 1996 when the mean maximum temperature was calculated as 30.33 degrees celcius.

Naturally, lower temperatue have meant higher relative humidity. Moisture in the air peaked at 85 per cent in August this year when the thermometer failed to climb above 27.67 degrees Celsius.

9/12/1998

Mercury rising

Summer temperatures shot up by an average of one degree Celsius in the last three years during the hottest months in Bhutan according to records maintained by the meteorology unit (MU).

"Temperatures in almost all the places in the country soared steadily within the last three years during the peak summer months," says the MU's technical officer, Kinzang Sonam. "But we cannot say why since we have not done any scientific study or analysis."

This year the maximum temperature was recorded at 39 degrees Celsius in June in Phuentsholing, a 2.5-degree rise compared to June, 2001. Thimphu recorded its maximum temperature on August 6 at 29.5 degrees Celsius.

Samdrup Jongkhar, Gelephu and Phuentsholing experienced a fluctuation between 37 to 39 degrees Celsius, according to the MU.

Bhutan recorded its highest temperature in the last decade in 1997, at 40 degree Celsius in Phuentsholing. "But that was just a one-day extreme," says Kinzang Sonam. "The difference this year is that 39 has prolonged for three to four days or even more at the peak of afternoon."

He added that Bhutan's high temperature didn't usually prolong. "We might have an extreme heat at midday but it usually cools off towards late afternoon."

The MU figures also indicate that there was less rainfall this year and that the place of heaviest rainfall in the country shifted from Gelephu to Sibsoo in Samtse. While Gelephu, the previous Cherrapunji of Bhutan, received its maximum rain of 99.4 mm on June 25, Sibsoo saw a downpour of 280mm on June 30. Phuentsholing's heaviest 24-hour downpour, recorded on June 30, stood at 200 mm.

The country's heaviest downpour was recorded at about 400 mm in 2001 during which the devastating flood in Pasakha washed away lives and damaged millions worth of property. In the north of the country, Gasa experiences the heaviest rainfall.

The meteorology unit at present suffers from lack of expertise and quality equipment. Most of its data is still basic obtained by use of rudimentary instruments. Kinzang Sonam, however, is optimistic that things will improve especially after MU became the member of world meteorological organisation (WMO) in June.

"We are expecting technical as well as human resource support from the organisation," he said, adding that at present MU data are being sent to Dhaka at the SAARC meteorological research centre for analytical purposes and weather studies.

In the meanwhile, extreme temperatures have been reported around the globe. Andhra Pradesh in India experienced a high of 47.5 degree Celsius resulting in a deadly heat wave that killed more than 400 people all over the country's hottest regions.

Europe has also been hit by an exceptional heat wave with temperatures hitting 40 degree Celsius in several countries. The UK recorded its highest ever temperature at 38.1 degree Celsius in Gravesend, Kent last week. In France, a heat wave claimed about 100 lives according to the BBC world this week.

8/16/2003

Picture story

Late snowfall: the east west highway near Ura, Bumthang on Thursday. Bumthang experienced heavy snowfall a day earlier.

4/22/2006

In 2003, the agriculture ministry, on royal command, set up a district weather forecasting system to help farmers be better prepared for abrupt weather changes.

To make the forecast, the Agromet office and the Hydromet division used to rely on data provided by AccuWeather of the US.

Now the ministry has developed an in-house capacity to provide a forecast without completely relying on external data. "We are now using our own data to forecast weather with the help of an expert from Japan," said the Chief Meteorologist, Karma Tshering.

They use meteogram data, a representation of weather factors in Gangtok and Guwahati in India, used together with their 10 years of collected data, and compute five calculation points for Thimphu, Kanglung, Tsirang, Bhur and Bumthang.

Karma Tshering said that using Gangtok and Guwahati's meteogram data would be appropriate because of their proximity to Bhutan.

He said that Thimphu's calculation point focusses on Paro, Haa and Gasa. Tsirang's calculation point forecasts the weather for Wangdue, Punakha, Dagana and Zhemgang. Likewise, Kanglung's calculation point helps forecast for Mongar, Trashiyangtsi and Lhuntshe, Bhur for Dewathang, Samtse, Phuentsholing and Pemagatsel and Bumthang for Trongsa only.

Meteorologists told Kuensel that factors like rainfall, temperature and climatic conditions in each of these places were taken into consideration while calculating the focus points.

The five calculation points have comprehensive weather stations equipped with auto machines to track both maximum and minimum temperatures at ground level and to inform the head office with regular climatic conditions. The information from the weather stations are sent twice a day, at 9:30 am and 2:00 pm.

The Hydromet division and the Agromet office are now only working on temperature forecast and weather outlook to predict if the day will be sunny, cloudy or rainy. "This month will be a trial for us and we'll see if our forecast is accurate," said Karma Tshering.

Officials, however, pointed out that because of rivers, snow, valleys and altitudes in mountainous regions, it was difficult to access weather conditions and make accurate forecasts. They said they would need fast computer clusters to be able to make more accurate forecasts. "But one shouldn't be expecting it to be very accurate; it's a forecast, after all," said Karma Tshering.

10/6/2007

An unusually long spell of dry weather is scorching farmlands across central and eastern Bhutan.

Huge cracks have formed in paddy fields in Chokhortoe a3 00 1.038 Tc 0.109 Tw 10.3 0 0 10 45.4724 310.5018 Tm(dry weather is scorching)38( )TJ0 1.042 Tc 0.161 Tw T(farml

Dry weather worries farmers

Continue...

If the situation prolongs, it may affect the yield of the paddy which is our main food crop," said gup Tenzin.

The gewog clerk of the Trong gewog in Zhemgang, Sangay Dorji, 55, told Kuensel that the farmers usually harvest maize twice a year. "This year they may not be able to harvest maize for the winter season," he said.

He said that because of continuous sun shine maize plants has dried up especially in Takabi village and the people were cutting them and feeding it to cattle.

Mani Dorji, 35, of Nyangteng under Bumdeling in Trashiyangtse told Kuensel that they started Changla a week ago with the hope that they may receive rain.

"We have completed tilling the paddy fields and it is time to water the fields but without any rain we have not been able to do so," he added.

Mani Dorji said that the plantation of paddy should start and be completed in May because if it is delayed the paddy will not ripen. He said that farmers were taking turns watering the paddy fields with water from the stream.

Sonam Tobgay, 53, from Jalikhar, Bumthang, said that recently with the support from the dzongkhag they have pulled water using GI pipes from a source opposite Jalikhar village. This had been of some help. The eight paddy growers in the village shared the water.

"We have decided to perform rain ritual tomorrow," said Sonam Tobgay.

Sherab Lhendup from Nganglhakhang said that the farmers there had also decided to perform rituals for rain.

"We grow barley, wheat and buckwheat as our main cereals but the colour of our crops have changed in the dry weather," said Sherab Lhendup. "The wheat crop should be bearing flowers by this time but they are drying up."

The District Agriculture Officer of Bumthang told Kuensel that dzongkhag may have to resort to pulling water from the Chamkharchu especially for the parched paddy fields.

6/2/2007

Man and nature

Some Bhutanese farmers in the eastern dzongkhags are sitting helplessly among their dry fields, deprived of a harvest season. This means no rice for the year. Their last resort, prayer ceremonies to the guardian deities, did not seem to help.

Two years ago the farmers in western Bhutan went through a panicky harvest season when the rain would not stop. Ill-timed showers ruined paddy that was waiting to be threshed. Meanwhile farmers in the south have been affected by floods and those in the north by snow storms.

For the largely agrarian Bhutanese population the erratic weather is becoming more disconcerting every year. While past generations left it to their fate we are beginning to understand that the weather pattern is not going to get better.

The irony is that such a calamity comes at a time when Bhutanese people have never had it so good in terms of consumer goods. In some parts of the country the shops are stocked with the latest fashions and foods from overseas. Young men and women keep up with global trends and with their idols on the television screen.

What is alarming is the knowledge that these natural imbalances are not going to improve. As a recognised global hotspot that has preserved nature better than most countries it would seem that we deserve better. But we learn that we are victims of human behaviour on a global scale.

Science has made incredible advances and, after spending much time and billions of dollars, the intellectual elites have concluded that it is basically the uncontrolled consumption habits of the wealthier sections of the global population that is increasing the pressure on the environment. The demand for fuels and material luxuries has caused a serious imbalance in the ecology.

Bhutan, as a GNH society, knew this long before the extensive scientific research was conducted. Lord Buddha, 2,500 years ago, said that people would find happiness by wanting less, not by acquiring more.

When we look around today such profound teachings and extensive research have not helped. The world has not learned the lesson and, going by the trends, Bhutan may not. Despite enlightened concepts like GNH, we are preoccupied with material well being.

Yet we have no choice but to try. In serving the interests of the people the government will come to the rescue as far as food security is concerned. But we have to reach out for higher goals like GNH which stands for a more wholesome lifestyle and a more permanent answer to nature's problems.

There is no alternative.

7/14/2007

Weather forecasting comes of age

Sir,

On Royal Command, the Agromet office of agriculture ministry had started the district weather forecast system in 2003. Hitherto, we have been relying on data provided by AccuWeather of USA.

Now the meteorology section, Hydro-met Services Division, Dept. of Energy, Ministry of Trade & Industry has developed its own human resources.

The meteorology section has had a successful trial period and will continue to forecast weather conditions throughout the country.

The weather forecast will be relayed, based on synoptic observation, real time data and climatological information of past years. Under its jurisdiction, there are 20 Agrometeorological stations covering all dzongkhags, 14 of them with fully automatic data logging facility, 79 climatological stations where data is recorded manually, five automatic stations in strategic areas raised at a 20-metre height from ground level to collect wind, temperature, pressure, solar radiation, etc.; meteogram data and satellite images from neighbouring countries will be referred to in addition to come up with a reliable forecast.

The real time data from the five "forecasting points" – Thimphu, Bumthang, Gelephu, Tsirang and Kanglung are sent to Thimphu once a day at 3:00 PM along with the synoptic information observed three times a day at three-hour intervals via telephone.

The meteorology section is installing three sets of real-time automatic weather monitoring stations at Tsirang, Kanglung and Bumthang. This office has plans to install more sets in the other two forecasting points and the major stations.

Currently, as this is an initial exercise to forecast weather, the information is almost reliable. This office has future plans to upgrade the present capacity to provide more reliable weather forecast information to the public for the benefit of the people in the country.

My Say
11/7/2007

Picture story

Kanglung under a blanket of snow, the first in 14 years

1/28/2008

In the wake of a windstorm

Twentyfive more households have been reported damaged in Lumang gewog by the windstorm that hit several places in Trashigang dzongkhag on the night of April 12, as of yesterday.

This brings the total number of houses affected in Lumang gewog to 113, excluding the 25 houses in Khaling, 24 in Kangpara, 19 in Thrimshing, and one each in Sakten and Shongphu.

"We're expecting the numbers to rise as our investigation team continues to visit the affected areas," said Trashigang dzongrab, Phuntsho Gyelchen.

About eight schools buildings, four lhakhangs, and a forestry office were also damaged by the wind in these gewogs.

Meanwhile, the dzongkhag has put up a request to the ministry of home and cultural affairs for an immediate release of a Nu one million relief fund.

"This fund will be used to restore government institutions," said the dzongrab, adding that the dzongkhag has already placed orders for tarpaulin sheets, worth over Nu 600,000 from Guwahati, India, to be distributed to affected households. "We've already done minor repairs wherever possible," he said.

According to dzongkhag officials, most of the damaged houses had their roofs blown off. These included houses with CGI sheet, wooden planks, and bamboo roofs. While there was no major collapse or casualties, a few of the houses had suffered minor cracks.

The home and cultural affairs ministry has instructed the dzongkhag to make immediate arrangements for those severely affected. "We've asked the dzongkhag to proceed with necessary help for the victims, instead of waiting for a response from authorities," said the home and cultural affairs minister, Lyonpo Minjur Dorji. "We urge dzongkhag officials to be pro-active and take calculated risks on the spot so that people don't suffer."

He said discussions were also held with insurance officials, who have been requested to be reasonable while assessing the damage.

The ministry is also considering the possibility of supplying free timber, giving subsidy for CGI sheets and electrifying the affected houses. "To counter such calamities, we have many programmes for the future, including preparing designs for houses to be build. It will take off immediately," said Lyonpo Minjur Dorji.

A team comprising of dzongkhag, dungkhag and gewog officials, engineers, and RICB personnel are in the field assessing the damages.

4/19/2008

Windstorm causes extensive roof damage

The evening windstorm that hit Trashigang on Monday blew away roofs of 30 houses in seven gewogs in the dzongkhag. In all, 114 houses were affected by the storm that hit the dzongkhag, recovering from the September 21 earthquake, around 5:30 pm.

About 77 roofs have been partially damaged in the seven gewogs that reported damages so far, according to the dzongkhag's report. Reports are expected from rest of the 15 gewogs. Radhi gewog has reported some damage to maize and paddy and dzongkhag officials are still assessing the extent of the damage.

Yangneer gewog, which was badly hit by the earthquake, has suffered maximum damage, according to Trashigang dzongda, Lungten Dorji. "The storm hit the already affected area and blew away roofs," he

told Kuensel last evening. "13 roofs were completely

blown off and 41 partially damaged in Yangneer. Followed by Phongmey with 10 houses without roofs and five with damaged roofs."

In the north, Shongphu gewog has 15 damaged roofs, Samkhar gewog reported one partially damaged, while Udzorong reported 9, of which four roofs are completely damaged. Nine houses in Ritsangdung under Kanglung gewog and one in Thrimshing also reported damages. In addition to that, Kuensel found out that roofs of six houses in Khaling and five in Lumang gewogs were also damaged.

According to the Khaling gup, Kinzang Tobgye, six houses in two villages, Brekha and Bephu, suffered damage. Bamboo sheets of two houses in Brekha on the way to Thrimshing were blown away. Of the 59 households in the village, about 20 percent use bamboo mats for roofing. In Bephu, bamboo roofs of three houses were blown away and CGI sheets of a house were tilted, according to the gup.

Lumang gewog officials said that roofs of three houses were completely blown off, while two others roofs were partially damaged. Residents of Rangjung town rushed into their homes when the windstorm occurred. Lights fluctuated four times and drains were flooded with water, according to residents.

The heavy downpour also blocked the feeder road to Udzonrong, which was cleared yesterday morning. Two women from Yangneer are recovering from injuries caused by falling roofs.

Meanwhile, semso were given to the injured and over 400 tarpaulin sheets from the Gylpoi Zimpon's office were distributed as of yesterday, according to the dzongda.

9/30/2009

Storm Damage: After hail, its wind that strikes Nanong

On successive days crops were damaged by hail and then wind

Even as gewog and dzongkhag officials assess the crop damage caused by the October 19 hailstorm in Nanong gewog, another windstorm hit 11 more villages under the same gewog in Pemagatshel on the afternoon of October 20.

An hour-long hailstorm between 2:30 pm to 3:30 pm on October 19 hit acres of maize fields across 11 villages under the gewog.

The meteorology section of the department of energy on October 19 forecast better weather across the country with "possibility of light showers in the evening".

The storm came within minutes, said a farmer, Cheki who was at home at Pinshingzor, attending to her ailing mother, when the storm struck her village. Her two children were guarding the maize fields from monkeys. "There was lightning and thunder and, within minutes, heavy rain and hail started pounding us," said Cheki.

Continue...

Storm Damage: After hail, its wind that strikes Nanong

Continue...

"I immediately sent my husband to help my children, who were guarding the maize fields," she said. As they watched the dark clouds, Cheki's huge banana tree collapsed in front of her eyes and all her five-langdo maize crop was flattened.

The farmers grow maize twice a year. They mainly depend on the second harvest (winter harvest). "The summer maize harvest is infected by insects and it's exhausted by the time we finish work for the winter maize crop," said Thinley, 77, from Pinshingzor village.

He had abandoned guarding the crop since the hailstorm hit his village. He has guarded it for the past two months. The maize would have been ready for harvest in a month, according to farmers.

Nanong gup, Putur said that it could cause food shortage this winter for the villagers, as some have nothing left at all. "There are several households, who lost all their crops, so it's going to be a difficult winter for them," said Putur.

Other affected villagers are already thinking of other ways to feed their families this winter. "We'll have to go and work as daily wage workers, since most of our crop has been wiped out," said Ugyen Dorji from Khangmari, a father of three. His two langdo of maize and buckwheat are also damaged.

The damaged crop is of no use to villagers as it is very vulnerable to rot. "The flattened maize plants, when straightened, break so the crop is only good for cattle fodder," said Tshering Wangmo, a farmer, who lost two langdos of maize crop.

Dzongkhag and gewog officials are expected to complete yesterday's assessments today. Damage assessment is taking time because of the scattered settlement of the villages.

Neighbouring places in Lumang and Khaling gewogs under Trashigang also experienced rain and strong winds, but no damages have been reported, according to gewogs officials.

However, there has been no report of human or livestock casualties. "Luckily, my children escaped without harm. I'm thankful to god," said Cheki.

10/22/2010

Weather: Strong gusts cause damage

Change of season winds wreak havoc in western dzongkhags

Strong winds that hit several western districts yesterday and the day before are reported to have damaged a number of homes, lhakhangs and a school, although the extent of damage is yet to be ascertained.

In Haa, the roof of the class VI block of Katsho lower secondary school was blown off, soon after students dispersed from the morning assembly. The students were sent home.

"The wind started around half past eight in the morning, and it became very strong around nine," the dzongkhag engineer, Lhapchu, said.

In Katsho gewog, roofs of 12 traditional houses were blown off yesterday afternoon.

Continue...

Weather: Strong gusts cause damage

Continue...

"We've advised people whose homes were damaged to remain indoors because the wind is still very strong," the Katsho gup, Tshewang Penjor, said late last evening.

At around 1:45pm, the roof of the Haa district court was blown off, damaging the electricity pole nearby and cutting off power supply to the court and nearby settlements. The wind also blew off the roof of the staff quarter and the morgue of the basic health unit behind the Haa town.

In Thimphu the roofs of 11 houses in Bjemina under Mewang gewog were blown off including that of the Rabtenling dratshang. "The wind blew off the entire roof of the kitchen and store, but no monks were injured," Dorji Phuntsho, a monk, said. He also said that the dratshang walls were slightly damaged. In Thimphu the speed of the wind, which threw up a dust storm near the Chang Jiji, was measured at to be 8.1m/sec around 3:50 pm.

Most of the houses damaged were traditional buildings. People from disaster management and His Majesty's representative visited Pasikha village in Mewang gewog. The gup of Mewang, Chencho, said he visited three of the affected houses yesterday. "The people, whose homes were affected, will be staying with their neighbours until theirs gets repaired," he added.

Half of the roof of Paga goenpa in Chapcha gewog was blown off on March 8, according to dzongkhag officials. In Paro, 41 houses reported some extent of damage.

According to meteorology section's weather forecaster, Kinzang Sonam, the wind is as of now blowing from the west towards Bhutan due to difference in pressure gradient. He said this is likely to continue for a week across the whole country.

"It is because of the seasonal change, whereby low pressure is formed in Bhutan's area due to the increase in temperature," he said "It happens two times every year."

3/10/2011

More windstorm damage in Paro

A windstorm has damaged 72 households in Paro, according to dzongkhag police. Tsento gewog was affected the most, with 22 households losing roofs and experiencing other damage because of powerful winds yesterday.

Only Tshongdue town and Dogar gewog did not experience major damage.

Specific details on what types of buildings may have been affected were not available as of last night. At least one lhakang is reported to have lost its roof.

According to a dzongkhag official, one residential house also caught on fire, possibly because of the windstorm. Although investigations have not been completed, a piece of wood that caught on fire after being blown onto electrical wires is suspected to have caused the incident.

The windstorm also damaged at least five vehicles because of falling debris, according to Paro police. No one was injured, said police.

The dzongkhag was still compiling data on whether more houses may have been damaged and to what extent, as of last night.

The latest incident come in the wake of a March 9 windstorm, when more than 65 households in Paro lost their roofs and suffered damage.

3/22/2011

Cold wave spells chillier winter: Cold Season 2012-13

The cold wave that is sweeping northern India has left many parts of Bhutan shivering in the past few weeks.

While Phuentsholing residents reported feeling unusually cold this winter, Chamkhar in Bumthang recorded a drop in temperature to minus nine degree Celsius yesterday.

"The cold wave in North India does have an impact on Bhutan's weather," meteorologist Tayba Buddha said. "It has caused fluctuations in temperature around the country."

Cold wave, he said was an influx of unusually cold air into the middle or lower latitude for a prolonged period of time. "It occurs when cold, dense air moves out its source in northern Asia," Tayba Buddha said.

Last month, the average temperature recorded for Thimphu was 8.34 degree Celsius, and the minimum temperature was -1.4 degree Celsius.

In Delhi, the cold wave caused the temperature to drop to minus 1.9 degree Celsius last month, and claimed 23 lives.

Tayba Buddha said a similar cold wave struck north Delhi in 2005, causing the temperature to dip to 3.6 degree Celsius.

"During that time of cold wave, the temperature in Thimphu dropped to minus nine degree Celsius," he said. That was the coldest day Thimphu has experienced to date.

Last month, central Bhutan recorded an average temperature of 5.4 degree Celsius, and a minimum temperature of minus 3.6. While in southern Bhutan, the average temperature was 18.8 degrees, the minimum was 13.1. Eastern Bhutan recorded an average temperature of 13.5 degree Celsius and a minimum of 6.7.

Tayba Buddha said it had been forecast that the cold wave in north India might cause feeble disturbance on the western Himalayas on January 11, and slightly affect Nepal. Such disturbances can cause snow or rainfall.

"But since Bhutan isn't in the western Himalayas, there's limited chance of being affected by the disturbances," he said. "Thimphu might not experience snowfall this year."

9/1/2013

The heat has got to the Himalayas

Across the nation last week the temperature showed a steady rise

If you thought Thimphu was getting hotter this week, you are right.

Data with the metrology division under department of hydromet services show temperatures at 23 degree Celsius on June 8, 28 degree Celsius on Monday and 30 degree Celsius on Tuesday, June 11.

This trend was visible in other districts as well. In Paro, temperatures rose from 25 degree Celsius on June 8 to 27 degree Celsius on June 11. In Haa, it rose from 19.5 degree Celsius on June 8 to 26 degree Celsius on June 11.

In Punakha valley, it went up from 32 degree Celsius on June 8 to 36 degrees Celsius on June 11, and from 20 degree Celsius on June 8 to 27 degree Celsius on June 11 in Dagana.

The eastern region of Trashiyangtse saw an increase from 22 to 27 degrees Celsius. In Lhuentse, it rose from 25.5 to 38 degree Celsius, the highest temperature recorded till date this year.

Like Lhuentse that saw the hottest day on June 11, the southern border town of Phuentsholing too experienced the same on June 11 with 38 degree Celsius from 33 degree Celsius recorded on June 8.

While most people felt the rise in temperature at a more drastic pace than last summer, with some even linking it to the recent invasion of army worms and giant African land snails, metrology division officials say it was nothing unusual, and triggered by the localised climatic pattern.

"The fall of the monsoon rain was on time, experienced on evening of June 5, but the dry weather from that day till date doesn't mean that monsoon is erratic," metrology division chief, Singye Dorji said. *Continue...*

The heat has got to the Himalayas

Continue...

"Other districts have been experiencing rainfall in these days, and monsoon would slowly move towards Nepal."

Officials added summer temperature gradually increases, as it was the transition from spring to summer.

A shopkeeper in Thimphu, Thinley, said most customers preferred shopping in the evenings, because of the sticky uncomfortable heat, and shopkeepers mostly slept in their shops during day.

A farmer in Thimphu Dorji said the weather last year around same time was hot during day, but was followed by rainfall in the evenings. "I hope it rains soon, so that our crops shoot up," he said.

For Tshoki, a housewife and her two kids residing in Motithang, because of the heat she now takes her children to the park in the evenings. Those going for walks, jogging and biking are choosing evening, although they are some who said they liked the sunny weather, because they could perspire more.

Health experts say hot sunny weather can affect people's mood, and it's called seasonal affective disorder (SAD). Symptoms of SAD are depression, sadness, lethargy, fatigue, excessive sleeping, loss of appetite and irritability. "The heat causes the body's time clock to go out of sync, thus upsetting the body's routine," said a health official. "When this happens, people can easily lose their temper."

The highest temperature recorded in Bhutan in the past 17 years was in Phuentsholing on August 27, 1997 at 40 degree Celsius.

14/6/2013

Enhancing the hydro-met service

Finland-funded project will improve forecasting skills of Bhutanese staff

The Finland government has granted € 462,067 to Bhutan to help it reduce weather and climate-related loss with accurate hydro-met information, and support use of renewable energy through improved weather and climate services.

According to hydro-met officials, the project would improve their capacity in producing high quality water report, climate models, weather information and services for the country.

"Bhutanese national weather service will strengthen, substantially increasing its forecast skills," the project manager, a DHMS official, Chhimi Dorji said.

He said the project would contribute towards positive economic development of the country, and help in reduction of poverty and improved handling of natural catastrophes at times of climate change.

"A number of user groups can benefit from improved forecasts, such as agriculture, health, trade, industry, construction, transport and communication, tourism and clean energy development," Chhimi Dorji said.

A team from Finland is also in Bhutan to study the socio-economic value of climate, weather, water, disaster preparedness and hydro-met services to the Bhutanese society.

Their visit essentially is for "policy decision and future planning," and a workshop was held on August 21 between the two parties.

Cost benefit analysis was discussed as one of the major domains of the project, which is an analysis to figure out how much the society would benefit if any investment was made to certain hydrology services.

Hydro-met officials said there would always be direct or indirect benefits irrespective of the cost.

Finnish meteorological institute's (FMI) research scientist, Karoliina Pilli-Sihvola, cited climate information could be used very potentially for tourism purpose. "Historical data for different locations can be used to manage risks in different places," she said, adding that a good forecast will always attract more tourists.

The workshop also had group discussions to make the officials understand more on the concepts of socio-economic valuation of such services. Meanwhile, the project 'Strengthening of hydro-meteorological service in Bhutan' (SHSB) started last month and will end in June 2016.

The project manager from the Finland, Jenni Latikka, said the FMI is not sure of any future prospects after SHSB is completed. "This is the first one, and anything towards the future will be looked after by our foreign ministry," she said.

The grant has been awarded by the ministry of foreign affairs (MFA) of Finland to Finnish meteorological institute (FMI) for "institutional cooperation and support" to DHMS.

23/8/2013

Why farmers weren't warned

Even as some farmers in the western Bhutan gather their rain-soaked paddy harvest to minimise loss, some felt it would have helped had there been an early warning system to inform them of impending disasters.

Following the rain since Sunday afternoon, a peripheral effect of cyclone Phailin, paddy harvested, especially in Paro, where 70 percent of the farmers had finished harvesting, was affected.

With monsoon over, the cold setting in and paddy ready for harvest, farmers said it was the perfect time to harvest. A majority of the Bhutanese farmers weren't at all aware of the tropical cyclone Phailin that struck northeastern India on Saturday.

In India, advanced warnings and evacuations helped save about one million people, according to media reports. Warnings of Phailin's potential arrival in northeastern India were predicted more than a week before it hit India.

In Paro, farmer Chencho from Shaba said he continued to harvest despite the weather turning gloomy because he had already hired the paddy reaper. "The machine can't be operated at our convenience," he said.

A few hours later, his eight fields of paddy harvest were all drenched. "If we were informed of the possible rainfall, we could have waited," he said.

In Toebesa, farmer Kuenley Om also went ahead as she had already hired hands. "Without television or radio, we didn't have reliable information from any sources," she reasoned. "I didn't expect the rainfall to be so heavy at this time of the year."

In such situations related to weather forecast, hydro-met division carry out the forecast, after which it is passed on to the disaster management department for dissemination of information to the public.

As per the initial forecast, hydro-met officials said possibility of cyclone Phailin wasn't expected to impact Bhutan. "Only when it moved north-northwest in India, we sensed some possibility of rainfall in Bhutan, and immediately issued the first bulletin to the media organisations, disaster management and other agencies involved," said hydro-met services chief, Singay Dorji.

It was on Saturday, when a press release from the hydro-met services predicted light to moderate rainfall in the southwest and western parts of the country.

Had farmers paid heed to the weather forecast given on television, hydro-met officials said, the damage could have been minimum. "Farmers don't trust the weather forecast given on television," said an official.

Some farmers, however, said they didn't have access to weather forecast information while others questioned the reliability of the forecast.

Hydro-met officials said weather forecast, being very complex, it was difficult to come out with accurate forecast, even in advanced countries. "Despite limited infrastructure and resources, we give the best judgment, referring the Indian meteorology and other regional meteorology websites," said Singay Dorji.

Calling the event unfortunate, disaster management officials said lack of time affected dissemination of correct information. "We were totally caught unaware," said director general, Namgay Wangchuk.

"We saw the email from hydro-met services on Sunday and only light or moderate rainfall was projected," said Namgay Wangchuk. "Unless the warning was authentic, we'd be disseminating wrong information."

Namgay Wangchuk, also a former Paro dzongda, said harvest in Paro began since October 9 and was left to dry in the fields. "It was already too late to prevent the paddy harvest from damage," he said.

Meanwhile, no major damage was reported in Punakha, as of last evening, while the report for Paro, the worst affected dzongkhag, is still being compiled.

Punakha dzongkhag officials said, except for a few places, most haven't started harvesting.

Paddy harvest, according to agriculture officials, starts from high altitude places, like the western districts of Paro, Punakha and Wangduephodrang, to the lower regions of the country, where harvest takes place even in December.

Paddy is cultivated in all 20 dzongkhags, with the highest production coming from Punakha at 9,025MT followed by Samtse at 8,867, Sarpang at 8,704 and Paro at 7,976 as of 2011.

17/10/2013

Weather balloon service launched

The balloon will be launched twice a day during the pre-monsoon months of April, May, and June

An upper air observation service, that will allow more accurate weather forecasts, was officially launched by the Department of Hydro Met Services and Department of Air Transport (DAT) at Paro international airport, yesterday.

The upper air observation service, which will be conducted in the pre-monsoon months of April, May, and June, is carried out by launching a hydrogen filled balloon that lifts a piece of equipment called a radiosonde.

A radiosonde records features like temperature, rainfall, humidity, air pressure, wind direction and speed, among others, and transmits this information back to a ground station located at the airport every five seconds. This information is then displayed on a personal computer to be observed.

Once launched, the balloon rises five metres a second until it reaches the stratosphere or between 35-40km above earth, and bursts.

Senior meteorologist, Tayba B Tamang, said information provided by the radiosonde would provide realtime data on the weather above and around Paro airport, such as wind speed and directions, and would be useful to air traffic control in directing aircraft in or out of the airport.

For the hydro-met department, Tayba B Tamang said that such data would aid in validating their forecasts to provide more accurate models.

However, one of the primary uses of the service would be to scientists at the SAARC Meteorological Research Centre who are studying weather in the region so that they can better predict its patterns and be able to provide warnings and advisories to the public when the weather could turn bad in the region.

The service will be carried out only during the pre-monsoon months as this is when the weather is most volatile. Balloons carrying radiosondes would be launched twice a day from Paro airport during these months.

The SAARC project covers the four countries mostly affected by this volatile weather: Bhutan, Bangladesh, India, and Nepal.

The project has also installed 10 ground weather stations in Bhutan, 24 in Nepal and 50 in Bangladesh.

The three-year project, which is costing Nu 2.9 million for a year, is funded by SAARC through the STORM (Severe Thunderstorm Observation and Regional Modelling) programme which is monitoring and studying the life cycle of severe thunderstorms in the region.

8/1/2016

Weather and climate workshop

A three-day regional workshop on implementation of weather and climate related services in least developed countries in Asia started today in the capital. Participants from Afghanistan, Bangladesh, Bhutan, Cambodia, Lao People's Democratic Republic, Myanmar, Nepal and Yemen are attending the workshop.

9/9/2014

Five more hydro-meteorological stations

The balloon will be launched twice a day during the pre-monsoon months of April, May, and June

Because of the importance of hydro-meteorological data from Bhutan, the Royal Government of Bhutan and the Government of India have recently taken steps to further expand the hydro-meteorological set-up in the country by adding five more hydro-meteorological stations to the existing eight stations. This is as discussed in the meeting held in January 1981 wherein a comprehensive scheme of expansion and reorganization was finalized to be implemented by 1981-1982. The hydro-meteorological organisation, set up in 1956 in the country, plays a very constructive role in contributing towards saving a large number of lives and properties in India by way of forecasting floods in India.

Also the hydro-meteorological stations contribute much for designing flood control, irrigation and generation of hydro-electricity.

Bhutan being situated in a heavy rainfall region with steep hills, results in great swelling of the rivers during the monsoon period. So at the stations hydro-meteorological observations can be made on the major rivers of Bhutan, which flow down to India and cause floods in various parts of India, particularly North Bengal and lower Assam region. The water level in the higher reaches of Bhutan has a definite relation with the water levels lower down. By reading at the hydromet stations in Bhutan and studying the corresponding readings recorded at the Indian stations, it is possible to predict the exact amount of water that would be flowing at specific points in India at a particular time. As the water-level data from the hydromet stations in Bhutan are transmitted by wireless and the waiter itself takes time to enter India, the flood forecasting authorities are in a position to warn the civil administration about the impending floods, to enable the latter to take timely safety precautions such as evacuation of people/cattle from the flood prone areas.

In addition to the hydro-meteorological stations, a number of rain gauge stations have been set up in the southern part of the country from east to west, so that while issuing flood warnings, besides the water levels in the rivers, the amount of rainfall that has occurred in the catchment areas of the different rivers can be taken into consideration. In all the hydro-meteorological stations, wireless communication facilities have also been provided.

The hydro-meteorological data gathered for flood forecasting and other purposes, it is hoped, would in the long run be useful to our own country in planning agriculture, irrigation, hydel and afforestation projects. The Royal Government has been extending maximum cooperation to India because of the immense hydro-meteorological data on account of the involved humanitarian aspects and also because of the friendly relation between the two countries.

3/22/1981

Lhengyel Shuntshog approves reorganisation structure

The Lhengyel Shungtshog (Cabinet) recently approved the reorganization structure of government ministries and departments.

The Lhengyel Shuntshog anticipates that the reorganization of the ministries would result in a substantial reduction of staff strength, although the purpose of the exercise is not to reduce the staff, according to release from the RCSC.

Under the new organization structure, several departments have been merged. The Department of Posts, Telegraphs and Civil Wireless and the Department of Telecommunications have been merged to form the Department of Posts and Telecommunications.

The Department of Civil Aviation has been merged with the Bhutan Government Transport Service to form the Department of Civil Aviation and Transport under the Ministry of Communications.

The Department of Information and Broadcasting has been renamed Department of Information. The Bhutan Broadcasting Service will come under the Broadcasting Division of the department and Kuensel under the Publications Division.

The Department of National Properties which is under the Ministry of Finance is no longer a department but a division called Property Division.

The Public Works Department, which was previously under the Ministry of Social Services, has been dissolved and its functions for road construction has been transferred to he newly formed Department of Roads under the Ministry of Communications. Its public health engineering functions has also been handed over to the new Department of Works and Housing under the Ministry of Social Services.

The National Urban Development Corporation has been abolished and its water supply, sanitation, housing and construction responsibilities have been transferred to the Department of Works and Housing.

Bhutan Tourism Corporation, which was previously under the Ministry of Communications and Tourism, has been made a separate division in the Ministry of Trade and Industries.

The Ministry of Communications and Tourism has been renamed Ministry of Communications.

The responsibility of looking after mechanical workshops of the Ministry of Communications and Tourism has been handed over to the Department of Trade and Industries.

Hydrometeorology, which was looked after by the Department of Posts, Telegraphs and Wireless in the past will now be under the Department of Power, Ministry of Trade and Industries.

7/22/1989

Certificates awarded

Five trainees were awarded certificates yesterday, having successfully completed a one-year certificate-level course in hydrometeorology.

Speaking at the certificate awarding ceremony, the Director General of the Department of Agriculture, Dasho Khandu Wangchuck, emphasised the need for reliable meteorological data, as it was the base for all planning and research. He urged the successful trainees to be regular in recording and supplying the data to the department headquarters.

The trainees will be posted to the Class A weather stations, which are fully automatic. Two of these stations have been completed, one in Wangdiphodrang and another in Bhur in Geylegphug. A third station in Khangma will be completed within a month.

8/12/1989

Hydrology and observers

Speaking to 21-trainees of the Division of Power at the end of a oneyear hydro-meteorogical course, Lyonpo Om Pradhan, Minister for Trade and Industry, said that such trainings; were very imporgant, taking into consideration the need to man the numerous meteorology and hydrology stations in the kingdom.'

The training which began in April last year included a six-month theoretical course on Hydrology, Climatology, Survey, Hydrology insstrumentation, Meteorology Instrumentation, Basics in Electronics, General Meteorology and Mathematics. This was followed by a six-month field attachment during which the trainees were posted in different hydro-power stations in the dzongkhags.

The trainees, all having studied class eight and above, had been selected through an interview conducted by the Ministry of Trade and Industry and the RCSC.

Karma Dorji the Director of Power expressed pride in the fact that the training had been conducted using staff of the Power Division as resource persons. The training, Power officials say, is sigifificant because as it covered a more comprehensive syllabus and a longer duration than the trainings conducted by the division in the past.

With the completion of the course on April 24, the trainees will now be employed in the various hydro-power stations.

Apart from this training the Power Division has also conducted basic substation maintenance trainings for employees at the Central Maintenance Unit in Begana.

Two batches of 10 Diploma graduate Section Officers have also been sent for a three-month training to the National Power Training Institute in Faridabad, India.

5/6/1995

Building coordination among water sectors

Unless a balanced and integrated water management system was established today serious conflicts would arise among water users in the near future, according to officials involved in dealing with water resources who met in Punakha this week.

To avoid the conflict, all the three components of water use in the country—drinking water, for irrigation, and for generation of hydropower—must coordinate their activities.

A step in this direction was taken recently with the launch of an inter-ministerial Bhutan Water Partnership and the estabIsihment of two projects : the Integrated Water Resources Management, funded by Danida and implemented by the agriculture ministry, and Water Resources Management Plan and Update of the Power System Master Plan being funded by NORAD.

According to a spokesman for the Bhutan Water Partnership, one of the joint activities of the two projects was to develop a National Water Policy that will form the basis for the subsequent works within the water sector, including the preparation of a Water Act, and a National Water Resources Management Plan.

As the first step towards formulating a policy, the stakeholders at the three-day meeting in Punakha justified their importance as water users as well as explored ways and means to "harmonise" their positions.

According to Namgay Dorji of the department of power's hydrology unit, the water policy will take into consideration three aspects: assess the present water use and the existing capacity within the sectors involved with drinking water, for agriculture, and power generation. ***Continue...***

Building coordination among water sectors

Continue...

The current institutional capacity and status of present policies in departments will be taken into account in the formulation of the water policy. The need for a common organization to look after the water management will also be emphasised.

"The problems associated with water and resources management especially in drinking water supply and irrigation exist and will grow more serious in the near future," said Namgay Dorji.

Two similar workshops will be held again to finalise the draft water policy which is expected to be ready in about two weeks. The department of power is meanwhile doing a study on establishing a ministry of energy, its terms of reference and its mandates.

10/27/2001

Weather forecast for farmers

The agriculture ministry's meteorology unit has come up with a weather forecast aimed at helping Bhutanese farmers.

The Bhutan broadcasting service has already begun airing the 24-hour dzongkhag-wise forecasts over the national radio and TV.

But the agro-met, as the unit is called, is no way equipped with high tech gadgets to make forecasts.

It relies on data sourced from the University of Columbia, Global Change, a NASA agency and Accuweather in the US on a daily basis.

"The data we receive is interpreted into a weather outlook which is a few hours work," said Karma Tshering of agro-met.

To forecast the mean temperature the unit relates the outside information with the historical data of the last 16 years collected from about 90 climatic stations across the country.

Karma Tshering said that it was fairly easy to automate data interpretation using a system developed under the GIS (geographical information system) to extract spatial information over a certain area.

"But our forecast is still very rough although it is fairly accurate for 24 hours," said Karma Tshering. Again the forecast is for an entire dzongkhag and not for particular locations like Thimphu or Phuentsholing.

To be able to do that Karma says the unit will require a meteorological radio and satellite receiver to grab atmospheric data freely available in the air. While radio data was generally forecasts satellite data needs to be interpreted.

"But beefing up agro-met unit does not seem to be a priority area for the ministry in the ninth plan. So this is the best we can do for another few years," he said.

According to Karma, the 'Thimphu forecast' on the Yahoo weather site, weather.com and CNN was most likely a general forecast for the entire country.

Meanwhile the 90 climatic stations around the country monitoring agriculture conditions are now with the department of energy. "They need it mainly to record rainfall data to monitor hydrological parameters such as water yield in the water shed areas and at dam sites," said Karma.

9/14/2002

Meteorology unit needs expertise and equipment

The meteorology unit under the ministry of trade and industry says their development has been curtailed by lack of expertise and better equipment.

Meteorology entails the systematic study of weather and its causes and provides the basis for weather forecasting.

"But, forecasting has not been something within our grasp, mainly due to the lack of expertise and advance equipment", said scientific officer, Sonam Dorji.

The unit, till date, has been collecting and providing meteorological data for the road, education, and agriculture departments. The unit has also been providing data such as the average rainfall, sunshine and other climatic factors that are needed to start the feasibility of development projects.

But the data collected was at best basic because of the equipment used and the lack of expertise of the people observing, reading and managing the unit. "At times, some stations like the ones in Pelela and Thrumshingla, are hard to reach, especially when there are climatic changes, and for some stations, they are being handled by students or some other temporary workers," said Sonam Dorji.

In the ninth five year plan the unit plans to make a proposal to centralize the meteorological units which currently are under different departments. The unit is even thinking of becoming and independent department in the near future and recruiting geography honour's graduates this year and train them in meteorology.

Apart from meteorology unit, the agro-met unit, agriculture ministry has also been collecting data and been providing it to Bhutan broadcasting service. BBS has been airing daily, a dzongkhag-wise weather outlook. However, this outlook is not accurate as the unit relates outside information with data of the last 16 years collected from climatic stations across the country said Sonam Dorji.

The meteorology unit was established in 1985 under the ministry of communication for the purpose of land study for agriculture. In 1986, it was brought under agriculture department, and in 1991, under ministry of trade and industry.

The unit has 85 stations all over the country, out of which 12 station is agromet and 72, climatic. In Thimphu the equipment are stationed at Semtokha, Taba, Kawajangsa and Gidagom.

3/1/2003

World Meteorolgy day

Bhutan observed the World Meteorology day yesterday, March 23, for the first time since it became a member of the World Metrological Organisation in 2003.

The day is celebrated to mark the establishment of the World Meteorology Organisation in 1950. In Bhutan the day was celebrated to sensitise the public on issues related to meteorology.

Officials from the department of energy, agriculture ministry, trade and industry ministry, JICA and students from higher secondary schools in Thimphu attended celebrations, which was observed in Thimphu.

3/24/2007

Latest software to be used across SAARC

It will enable the hydromet dept. to provide short-term predictions.

The department of hydromet service should be able to provide three to six hourly forecast of rain, snow and humidity, with the use of the latest weather forecasting software used worldwide – the weather research forecast (WRF).

With the help of SAARC meteorological research centre, Bangladesh, the department will install the WRF software, to slowly replace the existing MetGIS model, run by the Vienna University in Austria. Hydromet officials access their output via the internet to make forecasts.

The MetGIS model was developed, in collaboration with the department of met and geophysics of Vienna University in 2010. Prior to 2010, weather prediction was done using the regional website, such as the output model used by the Indian met department.

In the initial stage, the WRF model will be run along with the existing MetGIS model.

At a three-day seminar in Thimphu, which ended yesterday, the met department representatives from all the SAARC countries discussed the WRF model, and how it can predict rainfall in the SAARC region. The past forecast, actual observations and its validations, case studies on weather patterns in their countries and the neighbouring regions were presented by participants.

In Bhutan, if the WRF model was successful, the met department plans to provide a 24-, 48- and 72-hour weather forecast, said officials. "But weather, being very complex, the forecast has to be updated everyday," meteorologist Sonam Dorji said.

SMRC scientist of the theoretical division, Sujit Kumar Debsharma, said the WRF model was a next generation, state of the art model. "It's applicable in any terrain, be it a mountainous country like Bhutan or in the plains," he said.

A station-wise annual total rainfall (TRF) mean, from 1996 to 2011 in 20 met stations across the country, studied and analysed by Sonam Dorji, showed the highest amount of annual TRF occurred at Samtse, in the southwest of Bhutan, with 5,583mm, and the lowest at Thimphu with 659 mm. The report also states Bhur in the south received the second highest annual TRF, with 5,175mm of rainfall.

From the annual profile, it was found the country experienced unimodal rainfall pattern throughout the year, the highest occurring in July, followed by June and August, and the lowest in December, followed by November and January.

5/18/2012

Meteorology stations in land dilemma

The meteorology division in the department of hydro-met services recently received a letter from the Gasa Rabdey asking them to relocate its meteorology station that falls under Rabdey's land.

The Rabdey was expanding and the station set up in 2003 was coming in its way. The land back then belonged to the government.

The Gasa incident, according to hydro-met officials, have come as a warning to them for not having the land where weather stations are located in their thram. As of today, hydromet has installed 20 class A stations across the country in all the 20 dzongkhags. Their concern is that only four stations are on leased land and the rest 16 could face the same fate like that of Gasa.

A class A station takes up about seven decimals of land. Met division officials said that from the 16 stations, five stations are on government land and the rest 11 on private land or land belonging to agencies. "The respective dzongkhags have told us that the land was reserved for other purposes," said a hydro-met official. "We have received letters from almost all of them asking us to relocate our stations," an engineer with the meteorology division, Tshencho Dorji said.

"They are the rightful owners but we want people to understand the importance of having a station in one place for a long time." Officials explained that the stations were installed mostly in late 90s and early 2000 and that it has not even surpassed a minimum requirement of 30 years of "time series" as the data collection had only started in 1996. "The time series is required for decisive factors in planning and policy making," met officials said explaining that the longer the period of time series is, better the hydro-met records were.

Hydro-meteorological data is used for disaster management, water resource management, climate change studies, agricultural purposes, and health and transport purposes. "If we relocate the station, the data will entirely change even for the remaining 19 stations," Tshencho Dorji said.

Official said all this started after the Land Act was enacted in 2007, prior to which stations were built on government land, wherever feasible.

Since then, it became mandatory for individual and agencies that had land to register them or enter into a lease agreement. "Most of the land where the stations were located were either leased or registered with other agencies," officials said.

9/18/2013

Raising the profile of the met dept.

A Finn study finds hydromet services to lack capacity and to be under utilised

The hydro-meteorological service in the country, it appears, doesn't have the capacity and was not fully utilised.

A socio-economic study conducted by experts from Finland for the hydromet services department (DHMS) found agencies, such as agriculture, tourism, and aviation, have not used meteorological services to the optimum in its development.

The draft report, which was prepared as a part of the project called 'Strengthening hydro-met services in Bhutan' (SHSB), revealed farmers don't rely on the current weather forecast.

Citing the example of last year's cyclone Phailin, the report stated that weather forecast information didn't reach the farmers. The project, which began last July, will end in June 2016.

Chief agriculture officer Chimmi Rinzin said the mode of communication for forecast for farmers wasn't good enough.

"There's no extended period of forecast either," he said, adding weather forecasts were only for a day. "Harvest doesn't happen in a day, so it doesn't serve the purpose."

Chimmi Rinzin said the hydro-met services didn't have the capacity, and that Bhutan was far behind from other countries, and relatively new in weather forecasting system.

"An extended weather forecast system beyond one to two weeks should be in place," he said, to convince farmers.

The report highlighted two issues that jeopardised creation of early warning systems.

Hydro-met department didn't have a 24/7 operational service or data (satellite or radar images) to immediately detect approaching extreme events in the first place. Since disaster management department is the only authority issuing official warnings, the link between DHMS and final beneficiaries was also lengthened, the report stated.

The other issue was lack of aviation forecasts produced for air traffic in Bhutan. "Take-offs and landings were based on the visibility," the report stated, adding, when pilots attempt to approach the airport when the cloud ceiling was too low, they were forced to turn back to Kathmandu, Nepal.

In Paro, cloud ceiling is the most important weather parameter, the report stated, and low ceilings caused most of the weather-related problems.

Civil aviation officials said lack of manpower, capacity, and equipment were the main reasons behind not having aviation forecasts.

"We need a lot of equipment and for that, a lot of fund," civil aviation's chief of metrology, Tashi Dukpa said.

The tourism council of Bhutan and association of Bhutan tour operators have no established collaboration with hydro-met services either.

Due to this, the study pointed out that Bhutan could not manage to take full advantage of the most important global tourism seasons, winter and summer.

Using good climatological information for developing products for tourists would lead to increase of international tourist arrivals by about five percent in a month during off seasons.

Hydro-met department's chief of planning coordination and research division, Phuntsho Namgyal, said the report, being in its draft form; they were awaiting feedbacks from the stakeholders.

"The study was to find out the impact of hydromet services in the socio-economic sectors," he said, adding it would help sensitise the government on hydro-met services.

Meanwhile, the Finland government granted EUR 462,067 to strengthen accuracy in the hydro-met information in Bhutan, under the SHSB project.

1/21/2014

Annexure

Year	Date/ month	Time	Flood event	River basin/ Sub-basin	Dzongkhag	Village/ Geog	Reported damage	Remarks/ source
1968	0ct 3-15		Punakha flood	Punatshangchu	Punakha		Punakha valley: several houses washed away, including Bajo Lakhang; Old traditional bridge of Wangdue Phodrang and a house with 12 people washed away;	Kuensel
1968	Between October 3-15		Thimphu flood	Wangchu/ Thimchu	Thimphu	All gewogs	About 75 houses and shops in Thimphu have been washed away by the flood waters; bridges swept away; seven persons have lost their lives and property worth several lakhs have been damaged or washed away	Kuensel
1968	4th Oct	3 days continuous rain	Paro flood	Paro river	Paro	Shaba and Wangthanka. Dobshari and Juka-thang	Stocks of rice and wheat, other food stuff, cloth and other merchandise worth lakhs, kept in the shops have been spoiled. Hydel Bridge, Dzong bridge and Bongdi bridge have been washed away. Ten persons were swept away in the flood. heavy damage to paddy land. Landslide. The Government Agriculture Farm at Bongde has been hit badly. loss is estimated to be worth Rs. 2.5 lakhs.	kuensel
1968	Oct 3-15		Phochu and mochu	sunkosh	sarpang	Kalikhola	swept away many shops and 10 persons.	kuensel
1968	Oct 3-15		Phochu and mochu flood	sunkosh	Chirang		16 lives were lost and many others injured.	
1982	10 Aug	3PM	Thungti flood	Thungti river	Trashigang	Thungti	Washed away shops and houses of four families. The flood eroded dry lands and damaged paddy fields.it was revealed that gold and silver ornaments, old silver coins and many valuable things were washed away in the flood	kuensel
1987	Sept 10	10-11PM	Mochu flood	Punatshangchu	Punakha	Punakha market area	Two shops were carried away, and three damaged by boulders, other drift material, and flood water.	kuensel
1990	May 4	2PM	Mithidang flood	Mithidang river	Trashigang	Trashigang town	Heavy flood in town. Few temporary toilets missing and some huts with minor damages. no casualties.	Kuensel
1990	June 2	6PM		Duti khola	Chhukha	Phuntsholong town	Destroying fields and houses, and disrupting the water line for Phuntsholing. Destroyed Norgay bridge. flooding two shacks. The worst hit area was the Bhu tan Oil Distributors, located opposite the Chukha colony, where the flood broke a portion of the wall and entered the pump, sweeping away many oil drums. gabion walls washed away.	Kuensel
1991	May				Trashigang	Ramjar village under Bartsam gewog	2 school girls washed away age 7 and 6. Their house also washed away.	Kuensel
1991	June 12-14		Haa chu flood.	Haa chu	Haa	Lukha village	The wooden bridge near the Haa Junior High School washed away. Embankment and vegetables field flowed.	kuensel

Year	Date/ month	Time	Flood event	River basin/ Sub-basin	Dzongkhag	Village/ Geog	Reported damage	Remarks/ source
1991	July 2,3 and 5		Duti khola flood	Duti khola	chhukha		The water supply pipes at the Duti Khola source in Phuntsholing have been washed away by heavy rainfall. The small huts around the colony were all swept away and the diesel generator	kuensel
1992	July 14		flood		Samdrup Jongkhar	s/jongkhar town below vegetable market	culling houses below the vegetable market were swept away. Six people were killed. Road between s/j and Deothang was blocked by landslide.	
1993	May 5	Early hours	Flash flood		Trashigang	Rangjung	Carried away 7 cows. Bridge washed away. Road closed to traffic.	Kuensel
1993			flashflood		chhukha	Genju	2 people washed away by landslide. Several others injured.	
1993			Flash flood	Chamurchi river	Samchi	Pagli. Chengmari.	Damage to Penden Cement Authority Ltd factory is estimated at about Nu. 30.00 million. 2 other building was washed away by landslide. Gomtu school closed and pagli checkpost washed away. Betelnut orchards and agricultural field damage. 4 irrigational channel washed away.	kuensel
1993	Aug 11	night	Flash flood	Paro basin.	Paro	Damchna, Khenphu	4 bodies swept and 2 bullocks. 2 huts completely washed away.	kuensel
1994	July 30	Few hours at midnight	Flash flood	Mithidang stream	Trashigang	Trashigang town,	14 buildings were damaged, 11 of them irreparably. Bridge half washed away. Bridge at Rongthang washed away.	
1994	October 7	morning	GLOF	Phochu	Punakha		17 people were missing. The eastern wall of the 500-year old Dzongchhung Lhakhang, constructed by Dupthop Ngagi Rinchhen, was affected after the retaining wall fell under the force of the river. Some statues and religious objects are reported missing but the main images of the "Jhou" and Dupthop Ngagi Rinchhen are still intact. The flood partially damaged the police complex at Dzong Phakha, the dzong's solar bathing house, the renovation camp of the dzong, the Phochhu suspension bridge, Glacial flood hits Punakha forest plantations opposite the dzong, and paddy field along the river banks. The flood washed away 12 houses and left nearly 1,800 acres of pasture and agricultural land covered in sand and silt. Yaks, grain, bridges, water mills, chortens, and even a few human lives, were other casualties of the flood which swept down river, along the Phochhu, into Punakha.	Kuensel

Annexure

Year	Date/ month	Time	Flood event	River basin/ Sub-basin	Dzongkhag	Village/ Geog	Reported damage	Remarks/ source
1994	October 7	morning	GLOF	Phochu		Lunana	Affected 91 households. Twelve houses were damaged and 964.74 acres of pasture lands covered with sand and silt or washed away together with 816 acres of dry land. Yaks, grains, bridges, water mills, chortens and a temple were part of the toll.	Kuensel
1995		Heavy rain over 7 days	Obstruction of the stream cause flash flood.	Tonga Rongchu	Lhunsi	Changzam village in Dungkhar gewog	Three irrigation channels were washed away and several acres of wet and dry land and three houses damaged.	
1996	July 12 and 13	Early morning hour of 13.	Flashflood caused landslide.	Sarpang Khola and kharkhola.	Sarpang	Sarpang town, kharkhola village.	Massive floods and landslides claimed the lives of at least 14 people, damaged crops and property, killed livestock, and washed away roads to all other parts of the country.	Kuensel
1996	July 13		flashflood		Trashigang	Bartsham	A man was buried and killed on the spot when his hut collapsed under a landslide.	Kuensel
1996	July 13		Flashflood.	Barsachu river.	Chukha	Pasakha	After a flash flood washed away more than Nu 30 million worth of raw material and landslides damaged parts of the factory complex, the Bhutan Ferro Alloys Ltd. (BFAL). Washed away bridge.	
1999	August		Sethey kherey flood.	Sethey chu.	Sarpang	Gelephu and lodrai	substantial paddy land washed away.	
1999	September 2	midnight	Stream catchment flood	Kuktorgangchu	Trashiyangtse		Five people dead. washed away one house and two huts, some cattle and destroyed about 11 acres of land.	Kuensel
2000	August		flashflood	Barsa river	chhukha	pasakha	31 missing. 10 building collapsed and more than 400 families homeless. Samtse has reported five deaths, Trashigang one, Sarpang two, two in Mongar and six in Tala. Total death 49.	Kuensel
2000	August	7am, thursday	flashflood	Dhuti khola	chhukha	Phuntsholing	17 huts were washed away in the vegetable market. while the BOD fuel station, a private sawmill, the city corporation water supply office were submerged, automobile workshop and the city corporation's staff quarters were severely damaged.	Kuensel
2000	August 3		flashflood	Toorsa river	samtse	Noonpani village,	5 died. the Jitti bailey bridge, Daina bridge, the suspension bridge in Chengmari, the Kuchi-Daina bridge, the Jogitar suspension and the Namchu suspension bridge - were also washed away. Water pipes and electric poles were damage.	Kuensel
2000	August 3		Flashflood		Trashigang	Wamrong dungkhag. Nanong geog	One men killed and four houses washed away.	Kuensel
2000	August 3		Flashflood		Monggar	Kengkhar	Two persons were killed. 15 houses destroyed.	Kuensel
2003	September		Bareykang river caused Flashflood	Kholongchu	Trashiyangtse	Bumdelling	damaged about 25 acres of fields.	Kuensel

Year	Date/ month	Time	Flood event	River basin/ Sub-basin	Dzongkhag	Village/ Geog	Reported damage	Remarks/ source
2004	July 9		Flashfloods and landslides		Eastern Dzongkhag	Melphey Wamrong Resirbo	Eleven lives have been lost to floods in the eastern dzongkhags, 29 houses have been totally washed away, about 26 have collapsed, and 107 were partially damaged.	Kuensel and BBS
2004	September	10:45 pm	flashflood	Small stream flooded	Trashigang	Phongmey Lower Secondary School	Two students killed and two missing.	Kuensel
2005	May		flooding	Amochu	Chukha	Phuntsholing	A settlement of about a dozen makeshift shops upstream, washing away two measuring gauges installed along the riverbank. Damaged dried land.	
2005	August 23		flooding	Kholongchu	Trashiyangtse	Bomdelling	Washed away more than three acres of paddy fields. Affected the roosting grounds of Black Necked Crane.	Kuensel
2007	July 4	Last for 15 minutes	flashflood	Sangmari and Pasadangdri stream	Trashiyangtse	Toetso	Destroyed the paddy cultivated land. Washed away 59 metres of the Kesheri irrigation canal and destroyed the Samthang irrigation canal.	
2008	July 18	Around 12 am.	Flooding	Yakchu river	Haa	Damthang	Washes away four cows. Water enter the traditional houses and filled with debris.	
2008	September		flooding	Amochu	Chhukha	Phuntsholing	A part of the gabion wall, along the left bank, built by Phuentsholing city corporation (PCC), was washed away.	Kuensel
2008	September		Landslide and flooding	Dhaukhola river	Samtse	Sukrutey	five households residing near the river lost more than half their paddy fields.	Kuensel
2009	25-26 May	24 hours	Heavy rainfall and flood (Aila cyclone)	Olaronchu stream	Thimphu,	Semtokha and Hongtsho	Two students washed away.	Kuensel
2009	25-26 May	24 hours	flooding (Aila cyclone)	Haa chu	Haa	Haa town	Washed away four labour camps and a workshop. Flooding the town and forcing residents to evacuate their homes	Kuensel
2009	25-26 May	11:20 am	Heavy rainfall(Aila)	Darachhu	Dagana		washed away the Dagachu bridge. washed away 20 m of the Dagana-Sunkosh road.	Kuensel
2009	25-26 May	4:15 p.m.	Heavy rainfall(Aila)			Wangkha, Tanalum, Tshimasham, Taktikoth	One Dantak labourer was killed while clearing a landslide area. Road block on Thimphu-phuntsholing highway	Kuensel
2009	25-26 May		Heavy rainfall(Aila)		S/jongkhar		One person killed	Kuensel
2009	25 May		landslide or snow avalanche Cyclone Aila.		Gasa	Laya	Two hundred and thirteen yaks, 45 horses, 19 mules and one cow are believed to have been washed away.	
Total caused by flood and storm: 9 - People dead. 49 - Bridges damaged. 10 - Highways blocked/washed. 6 – Schools. 2 VTI. 2 RNR. 18 houses & 24 huts								
2009	June		Flooding	Genekha rongchu (stream)	Thimphu	Zamtong and Tshochekha	Washed away about 2.3 km of the 4.350 km long farm road. Destroyed irrigation channels and a suspension bridge in the village. Bridges washed away.	Kuensel

Annexure

Year	Date/ month	Time	Flood event	River basin/ Sub-basin	Dzongkhag	Village/ Geog	Reported damage	Remarks/ source
2010	July	2AM	Flood water	Singye river	Chukha	Pasakha (Singye)	Three people have been killed and five others injured. Lost all belongings.	
2010	July 28		Flash flood		Thimphu	Namseling, Mewang	Washed away culverts and damaged crops and houses along the stream flowing beneath the sharp bend near a small automobile workshop.	
2010	August 27		Flash flood	Sarpang river	Sarpang	Sarpang town	Washed away five huts and damaged nine others. Heavy rainfall also damaged roads between Sarpang and Gelephu at numerous points.	
2012	June	3am	Fash flood		Gasa	Damji	Damaged paddy fields, irrigation channels, farm roads, drinking water supply schemes and crops three bridges and roads. A cowshed was reportedly washed away, along with a cow, at Damji. Powerline disrupted.	Kuensel
2012	June 27		Flash flood	Korongchu	P/Gatshel	Chengkari	Two shops (makeshift houses) were already washed away. Underground electric cable was also washed away by rainfall in Dungsam. Nganglam-Gyalpoizhing highway was washed away	
2012	July		Heavy rain cause flash flood.	Setikarey river and other small streams. Paitha khola (river).	Sarpang	Around Gelephu town, Pelrithang	Affected the land with full of debris. The rain water has also entered the Pelrithang jail and family quarters. Overflowing water from the adjacent drainage has entered the cottage structures. Stopped vehicle movement between Sarpang and Gelephu.	
2012		Morning	Flooding	Paitakhola and Sethikarey (Stream)	Sarpang	Near Gelephu.	One Van and Toyota vehicle washed away while crossing the road.	
2013	June		Flash flood	Swelling streams (Jechulum).	Punakha	Kabjisa Geog	Flash flood damages 6 acres including paddy field. Caused a block at Punakha-Gasa road, after a small culvert bridge got washed away. Several farm roads in the villages have also been damaged	
2013	August 10	Afternoon	Flooding	Yudhiri river	Trashigang	Phongmey and Sakteng	The flooded river has washed away both road and ropeway.	
2014	June 17	evening	flash flood	Sengphug Rongchu	Trashiyangtse	Toetsho gewog	Three suspension bridges and two irrigation channels were washed away. Destroyed between 600 and 700 acres of paddy fields.	
2015	June 28	Evening 6:30pm	Flood or GLOF	Lemthang Tsho outburst	Gasa	Laya leading to Punakha-wangdue valley.	Washed away six wooden bridges (bazams). The two drinking water pipes connecting Bajo town that was washed away. Around 300 cordycep collectors are also stranded on the other side of the lake. Some livestock lost.	Editorial
2015	June 30		Flash flood	Amochu	Chukha	Bangay bazaar in phuntsholing.	Seven families lost their make shift houses and shops. It also flooded a brick factory and workshop. Submerged two excavators and three school buses downstream.	

Year	Date/ month	Time	Flood event	River basin/ Sub-basin	Dzongkhag	Village/ Geog	Reported damage	Remarks/ source
2015	August 8		Flash flood	Dagachu basin	Dagana		No major damages were found except some walls along the rivers are washed away.	
2015	August 8		Flash flood	Nahi stream	Wangdue	Nahi geowg	washed away one suspension and two motorable bridges, and two vegetable sheds in Nahi gewog. Nahi primary school and Nabisa chiwog has been cut off. Drinking water sources for Rinchengang and other BPC staffs and PHPA staffs residence was washed away. Washed away several irrigation sources for Nahi, Rinchengang and Gaselo.	
2015	August 18	Night	Flash flood	Sethikhari river	Sarpang	Gelephu	flood the road while also triggering landslides to block the road at Box cutting. Water gushed into houses. It also affected land.	
2015	August		Flash flood		Samdrup Jongkhar	Samdrup jongkhar	Broke the retaining walls, damaged the parking lot and carried the truck away.	
2016	June 20	Early morning	Fash flood	Sarpang river	Sarpang	Sarpang town	Washed away all the 52 shops in sarpang town. It cuts off vehicular movement and people.	
2016	July 23		Flash flood	Amochu	Chukha	Phuntsholing	Flooded workshops and warehouses located along its banks.	Kuensel
2016	July 24		Flash flood	Setikharay seasonal stream		Gelephu (Pelrithang)	The occupants of 22 houses were evacuated to higher ground. Threaten lives and property. Floodwater swept muck and debris into their homes. It also washed away walls of one of the houses. The water treatment plant was submerged under water and covered with sand and debris.	
2016			Monsoon rainfall.		Whole country	Whole country	Road at Sorchen was washed away. Tserang-Sarpang highway has been cutoff and bridge near Sarpang checkpoint was washed away. Dzongkhalum near Trongsa was damaged. Buduney bridge in samtse has beed damaged. Workshops in phuntsoling and makeshift in Sarpang was damaged. Some of the GR(geowg road) all over Bhutan was also washed away.	
2016	July 25		Flash flood	Punatsangchu basin	Punakha and wangdue.		PHPA II cofer dam and main dam construction site was flooded. Submerged an area used for mining sand in basin. Washed away embankment walls at Kamichu. 11-year-old boy was washed away by the Sukti river in Gomtu	

Annexure

Year	Date/ month	Time	Flood event	River basin/ Sub-basin	Dzongkhag	Village/ Geog	Reported damage	Remarks/ source
2016	July 26		Flesh flood	Setikaray stream.	Gelephu	Gelephu geowg, Ghaden chewog	16 household in Gelephu Geowg were partially submerged under swollen setikharay. Culvert between Gelephu-Pelrithang highways was completely washed away. More than 60 acres of cultivated paddy land and 500m long wall belonging to 30 household of Gaden chewog was damaged by Taklai eiver. 2 acres of cordamam filed was eroded in Jmcholing.gewog. More than 100 metres of the Gelephu-Zhemgang highway near Chisopani bridge were washed away. More than 100m of road foundation at Jamcholing was washedaway. Gelephu dzongkhag was cut off from rest of the Dzongkkhags.	
2016	July 27	During night	GLOF	Chamkhar basin	Bumthang	Bumthang	No damage was occurred other than rise of water level.	

There was flood in 1950 lasting for 24hrs and 1960 for 5 days in phochu…fixture of Himalayan history.
1956 river phochu flood.
As per the official records, Bhutan has experienced 21 outburst cases, of which 17 happened between the 1950s and 1970s, and four in the last 40 years.