



# Potentials and Challenges of using ICTs for climate Change Adaptation: A Study of vulnerable Community in *Char* Lands



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- ▶ **Between 2000-2015, ... .. grew 7 fold from 6.5% to 43%**
- ▶ **Globally 3.2 billion people are using ... ..  
... by end 2015, of which 2 billion are from developing countries**
- ▶ **The proportion of ... .. at home increased from 18% in 2005 to 46% in 2015.**
- ▶ **The proportion of the population covered by ... .. grew from 58% in 2001 to 95% in 2015.**

- Between 2000-2015, global Internet penetration grew 7 fold from 6.5% to 43%
- Globally 3.2 billion people are using the Internet by end 2015, of which 2 billion are from developing countries
- The proportion of households with Internet access at home increased from 18% in 2005 to 46% in 2015.
- The proportion of the population covered by a 2G mobile-cellular network grew from 58% in 2001 to 95% in 2015.

*Source: ITU, 2015*

- Internet use in Bangladesh increased from 4.5% in 2011 to 9.6 in 2014
- Mobile cellular subscription increased from 13.2 in 2006 to 34.4 in 2009
- Fixed broadband subscriptions increased from 0.3% to 1.2 in 2014

*Source: WB , 2016*



✓ **Globally ICTs can play the role of villains or heroes of climate change.**

➤ **Villains because ICT companies produce emissions**

➤ **Heroes because ICT can be part of the solution**

✓ **It is recognized that ICTs are powerful tools for socio-economic development.**

✓ **The potentials of using ICTs in addressing climate change are also recognized.**

✓ **Their actual use on ground is gradually increasing.**

✓ **Increased availability and use of ICTs have significant potentials for CCA in Bangladesh.**

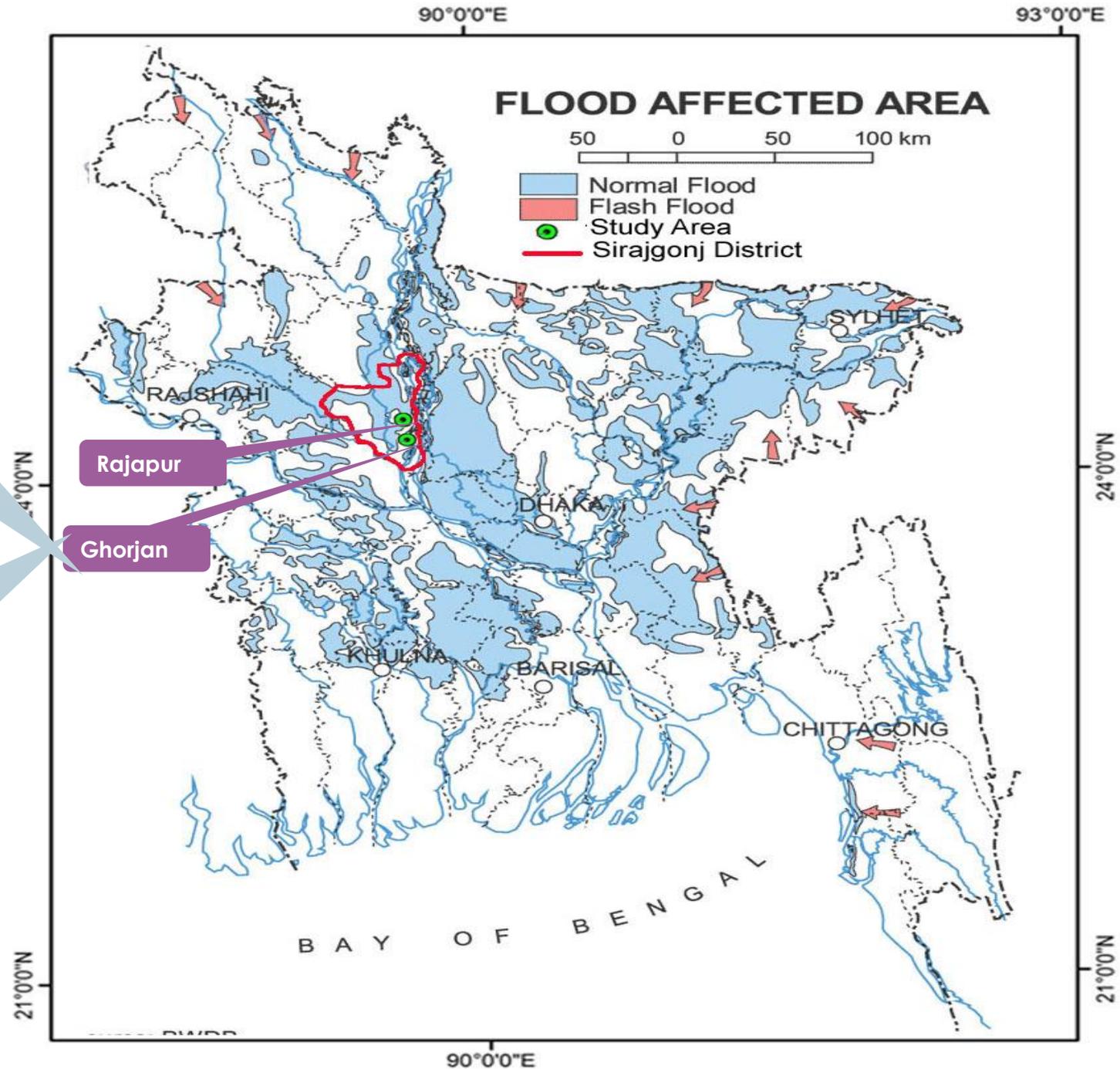
Research Objectives	Specific Research Questions
<p>1. Understanding the community perception of climate change and its impacts occurring on the lives and livelihoods of people living in <i>Char</i> (river islands)</p>	<ul style="list-style-type: none"> <li>• Are there any changes observed in temperature, rainfall and seasonal pattern?</li> <li>• What are the major climatic hazards/events of the locality and what changing patterns are observed in the frequency and intensity of those hazards?</li> <li>• How do climatic hazards impact on lives and livelihoods?</li> </ul>
<p>1. Assessing the role of ICTs in adapting with the climate change impacts on <i>Char</i> community</p>	<ul style="list-style-type: none"> <li>• What are the available and most used ICTs in the community and how accessible are they to people?</li> <li>• Do the available ICTs contribute in adapting with the impacts of major climatic hazards and in which way?</li> </ul>
<p>1. Identifying the challenges and areas of improvement associated with the use of ICTs in adapting with the climate change impacts in <i>Char</i></p>	<ul style="list-style-type: none"> <li>• What are the challenges of using ICTs in adapting with the impacts of major climatic hazards in the community?</li> <li>• What programmatic and practice level changes are required for expanding the use of ICTs in CCA?</li> </ul>

### Study Area 1

Upazilla: Belkuchi  
Union: Rajapur  
Villages: Shomeshpur  
& Thakurpara

### Study Area 2

Upazilla: Chauhali  
Union: Ghorjan  
Villages: Rhaikawlia  
& Teghori



Source: PMO office library Dhaka, GoB  
Year: N.D.

# Study area at a glance

Union	Area (Acres)	Population*			Sex Ratio**	Population Density (Sq. km)	Average Size of household***
		Total	Male	Female			
Rajapur	6,178	48,331	24,343	23,988	4.7	1,933	4.7
Ghorjan	6,993	18,748	9,433	9,315	3.9	662	3.9

\* Bangladesh average of Population Density is 1015

\*\* Bangladesh average of Sex Ratio (Number of males per 100 Females) 100.3

\*\*\* Bangladesh average of Size of household: 4.4. Population Density is 1015

Source: BBS, 2012

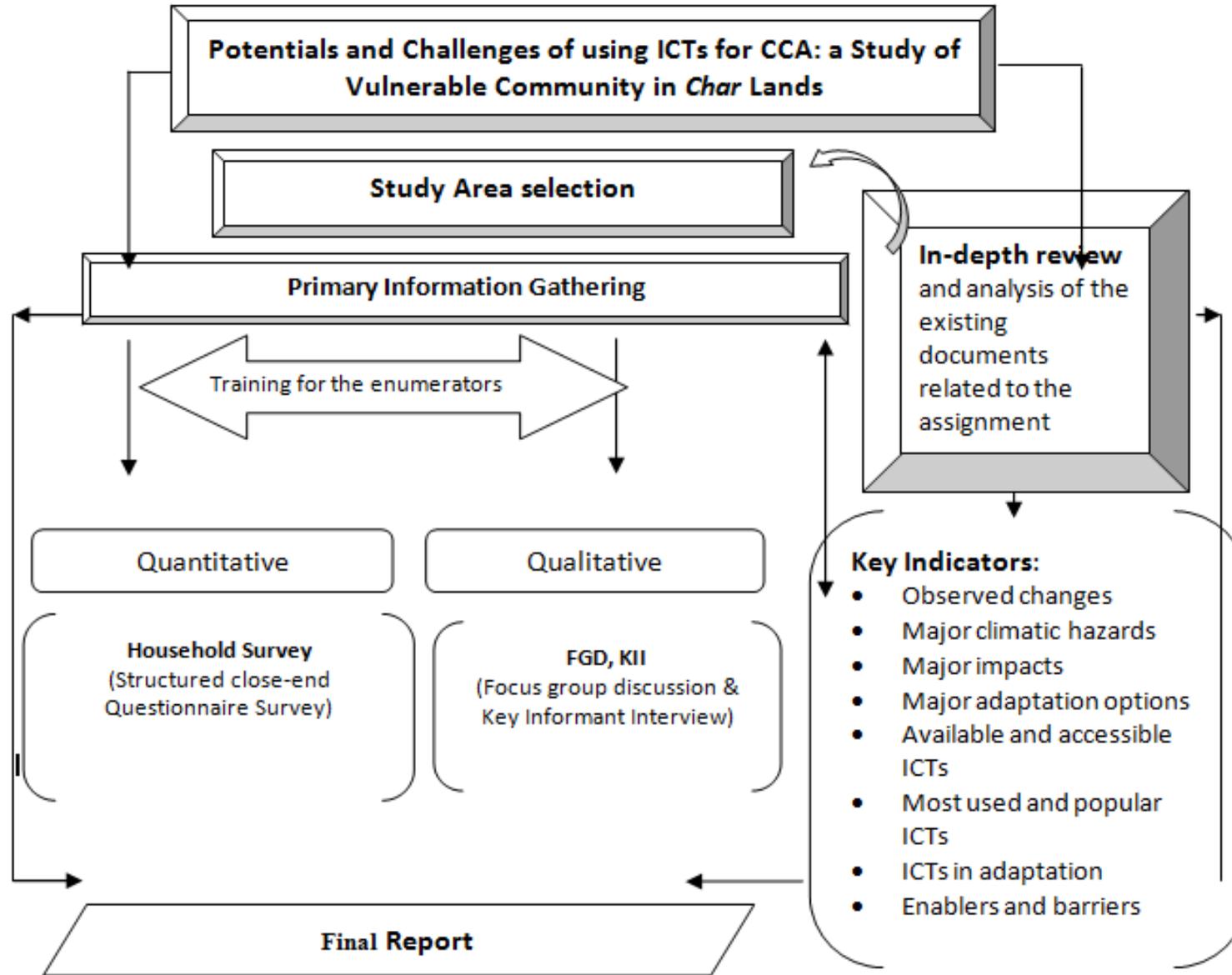
# Study area at a glance

Union	Literacy Rate (%)*			Occupation					
				Agriculture		Industry		Service	
	Both	Male	Female	Male	Female	Male	Female	Male	Female
Rajapur	42.3	44.5	40.1	1973	36	3284	385	949	123
Ghorjan	27.7	31.4	24.1	2868	68	490	14	88	15

\* Bangladesh average of Literacy Rate is 51.8% (male 54%, female 49.4%)

Source: BBS ,2012

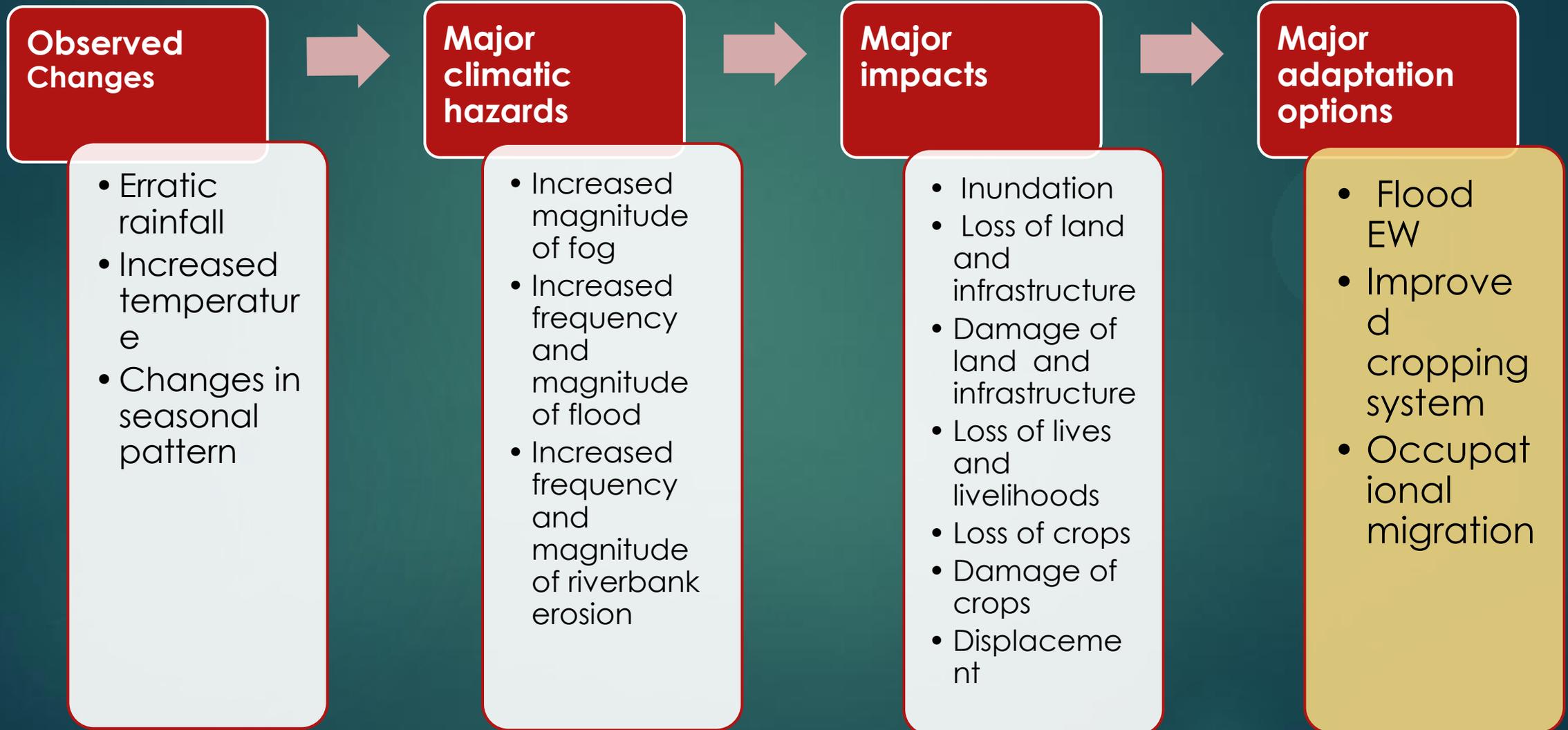
# Methodology:



## Distribution of population and sample in study villages

- 25 HH questionnaire survey from each study village (around 5% of total HH)
- 2 FGD from each village (total 8)
- 3 KII from each village (total 12)

# Flowchart of climate change impact and adaptation need in the study area



*“It used to be winter in Kartik (October-November), but now it does not happen, winter comes late”.* Rahela Khatun, Homemaker, Age: 45, Village: Rehaikaulia

*“For the last 2-3 years it has become difficult to ride motor bikes in summer because of heat waves”.* Amina Khatun, Age: 40, Field Officer, Local NGO

*“Rainy season used to take place in Ashar-Shrabon (June-July), now it comes in Bhadro- Ashwin (August-September). Now intensive rains pour in for a shorter period (30 to 45 days) compared to before. But in that shorter period the intensity of rainfall has increased than before”.* Mohammad Khairul Farmer, Age: 53, Thakurpara

*“We used to feel six seasons before very clearly. Now it is only four.”*

Khadija Khatun, Home maker, Age: 35, Shomeshpur

- ▶ “Now there is excessive fog in the winter. Earlier it never came up as a major problem”.

*Rita Rani, Home maker, Age: 50, Thakurpara*

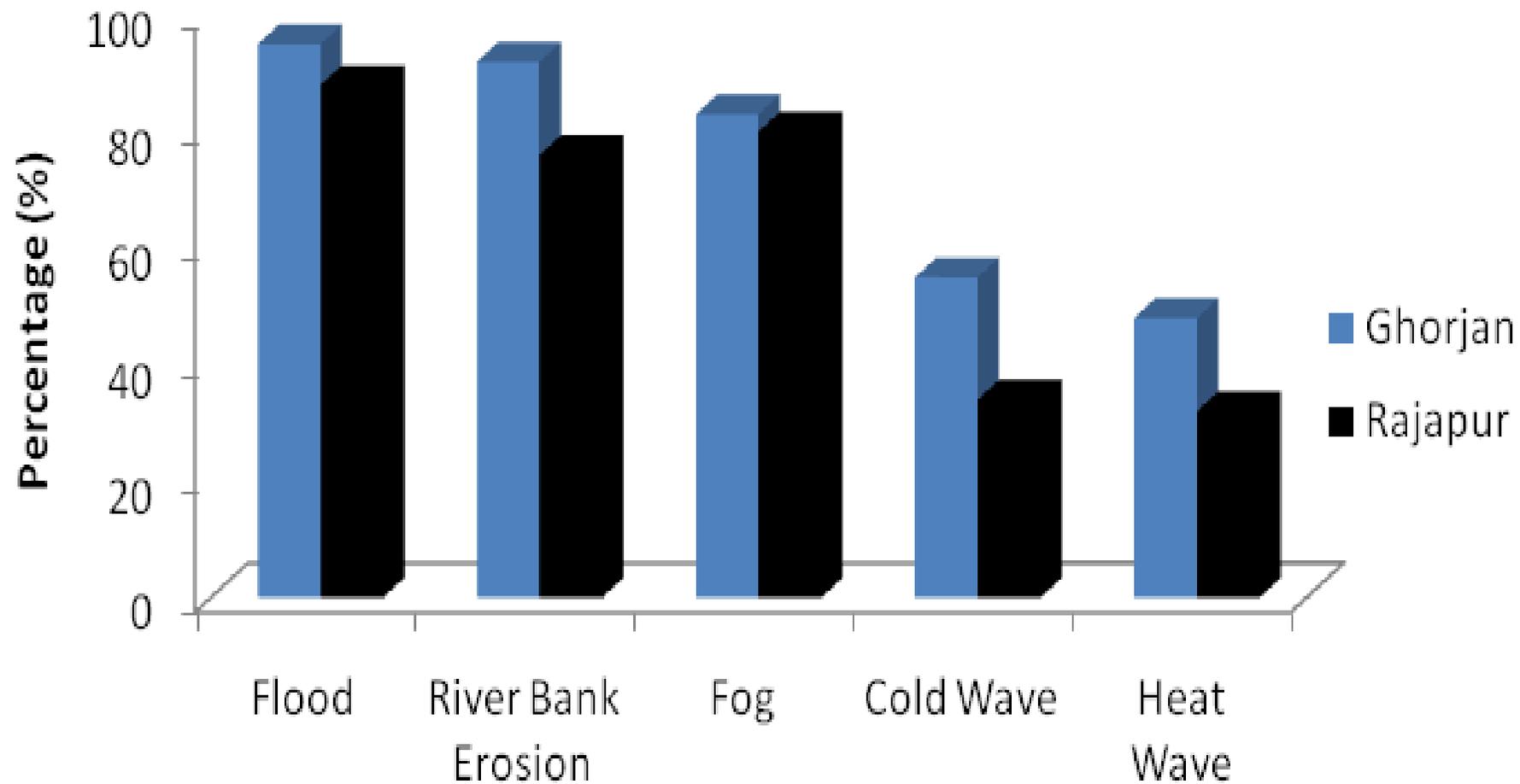
- ▶ “It used to be slow flood every year before. Now it comes as flash flood suddenly due to excessive rainfall in the upstream in Kurigram. It sometimes happen 2/3 times a year and water stays up to 15-20 days. This is not normal”.

*Abdur Rahman, Farmer, Age: 60, Teghori*

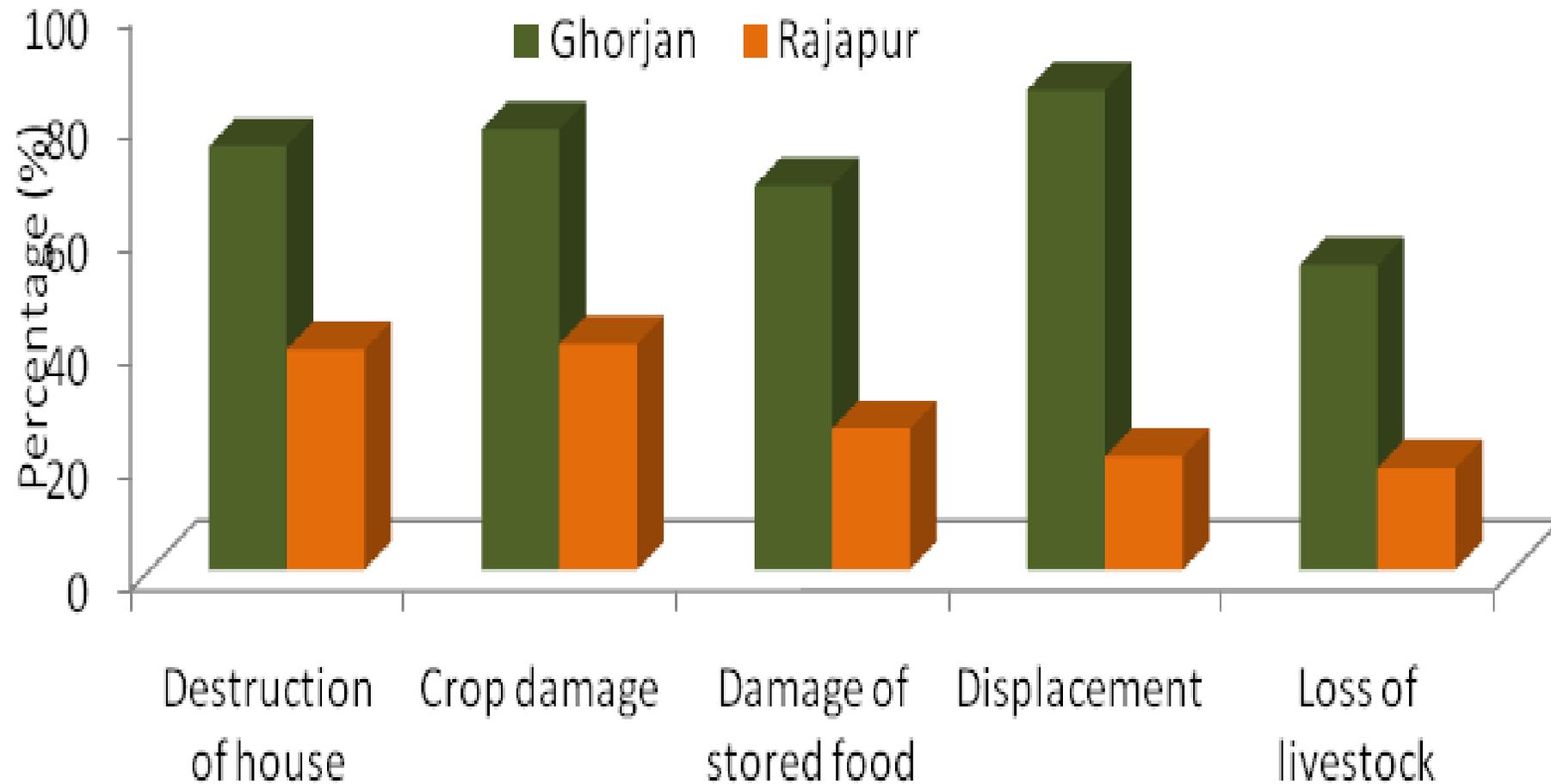
- ▶ “In the past both hot days and rainy days used to come gradually. Now it does not come in time, but when it comes, it comes suddenly”

*Amina Khatun, Home maker, Farmer, Age: 48, Rehaikaulia*

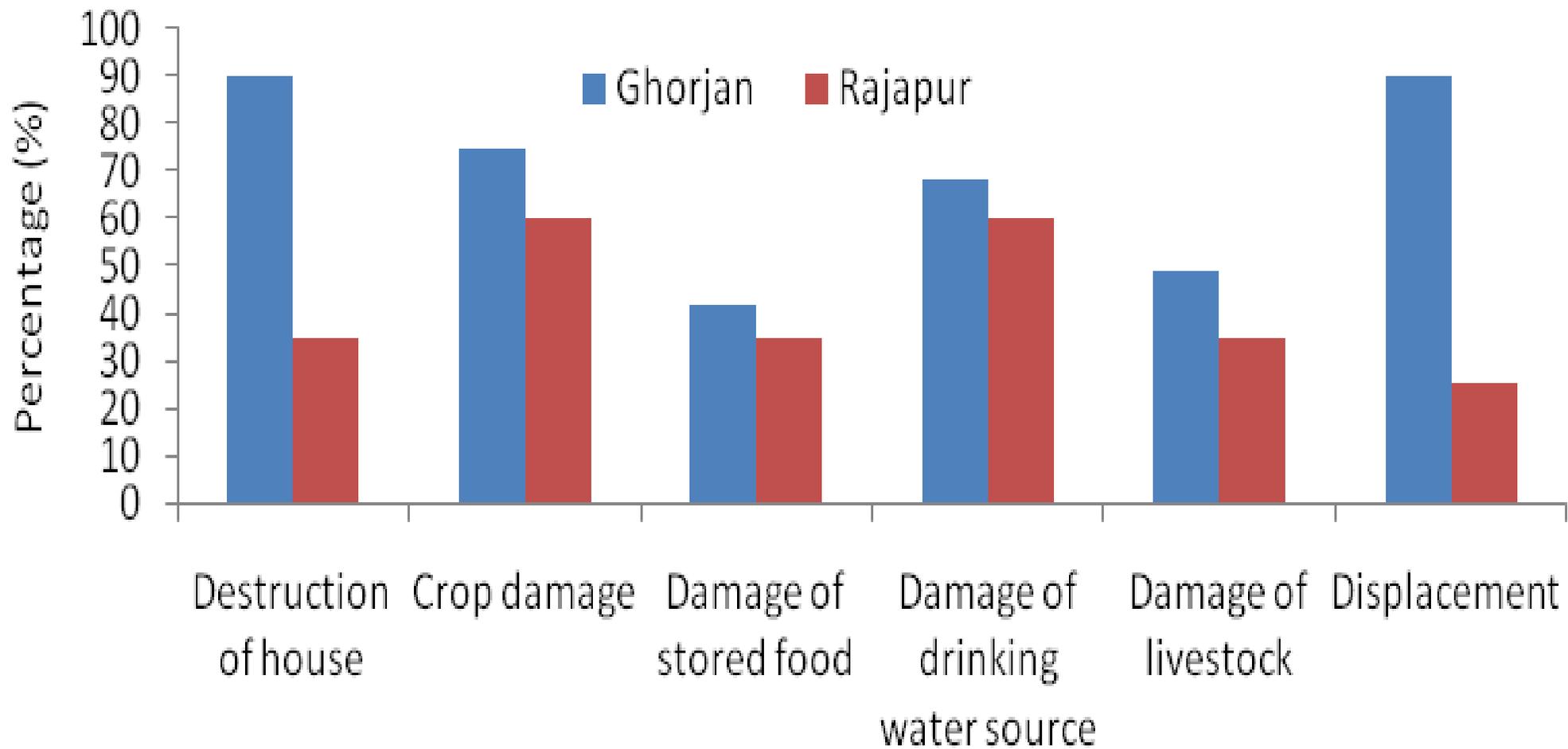
## Harmful climatic hazards in Rajapur and Ghorjan



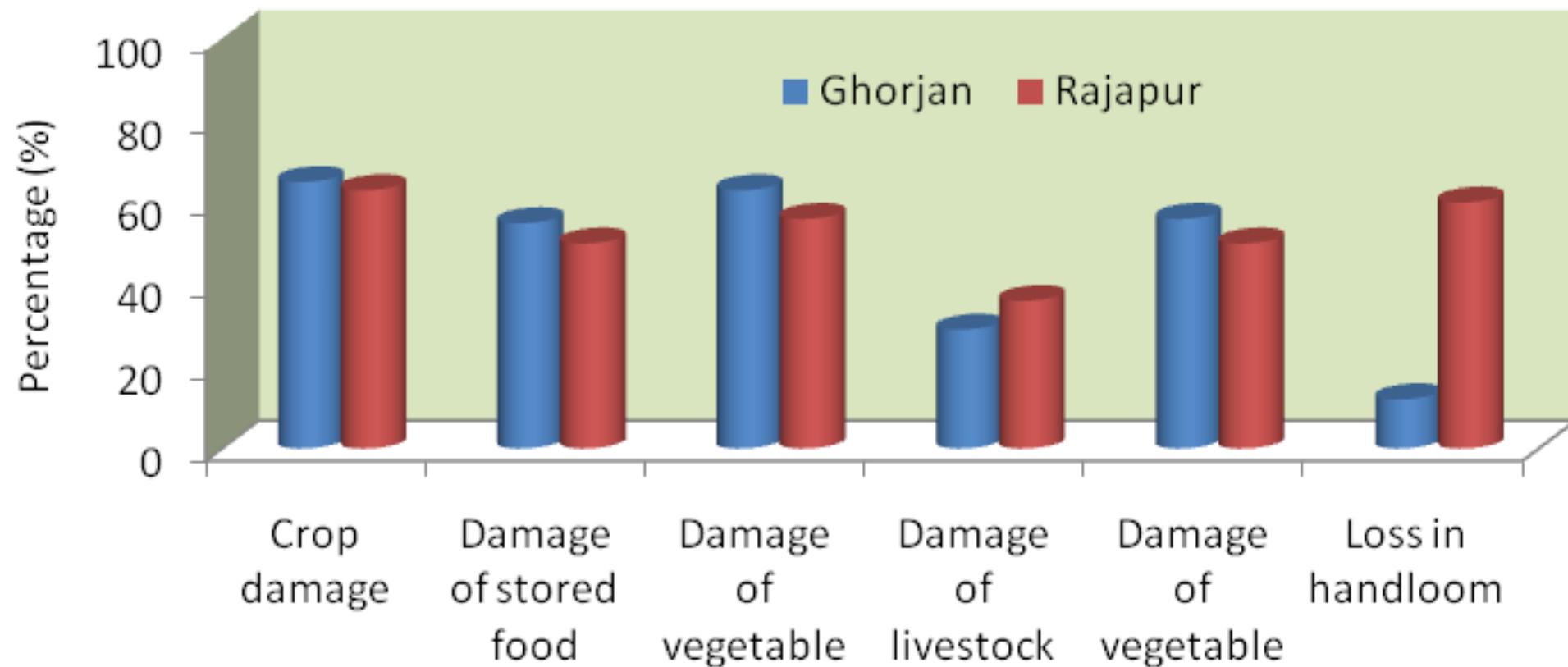
## Impact of riverbank erosion on lives and livelihoods



## Impact of floods on lives and livelihoods



## Impacts of fog on lives and livelihoods



- ▶ *“Aman rice, rice seedbed, teel, jute (when it is small) vegetable, peanuts, Kaon rice get submerged and damaged in flood. It also submerges homestead, livestock, poultry, latrine, and tube well and creates crisis for drinking water”.*

*Farida Begum, Farmer, Age: 35, Thakurpara*

- ▶ *“Floods have increased too...Aman, teel, kaon cannot be harvested before flood comes. Particularly the transplanted varieties of crops get more damaged”.*

*Moinuddin, Farmer, Age: 50, Shomeshpur*

- ▶ *“Transplanted seedlings and other Rabi crops get damaged due to winter and fog. Mustard gets attacked with pests”.*

*Mohammad Ali, Farmer, Age:40, Teghori*

- ▶ *“Fog has increased a lot in winter. It damages mustard, corn, sugarcane, winter vegetables, potato and crop seedbed. Fruits don't get ripe unless it's sunny”.*

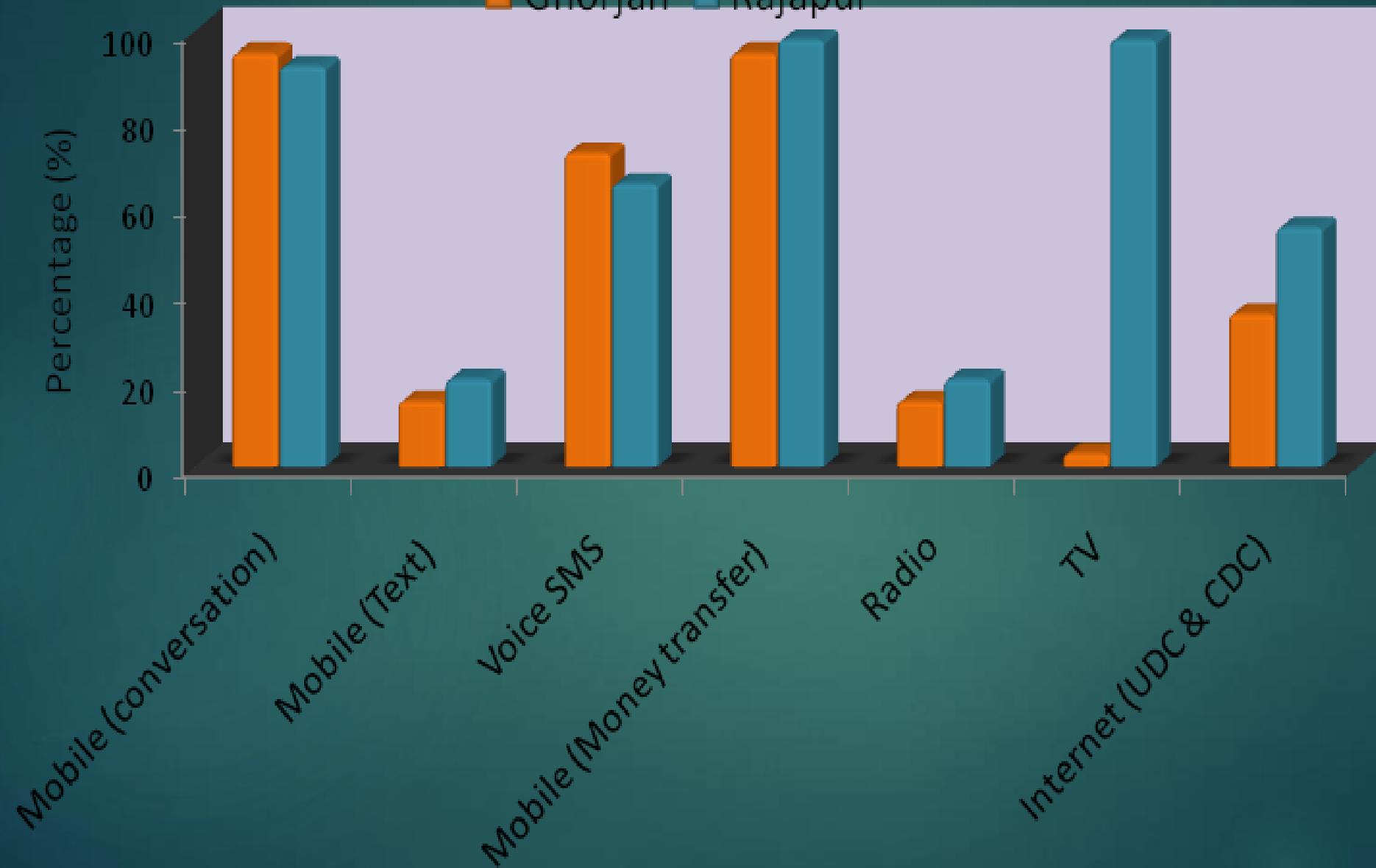
*Komola Rani, Home maker, Age: 35, Thakurpara*

- ▶ *“We do not even plant a tree in our homestead...we know that our house will get eroded before the tree grows”.*

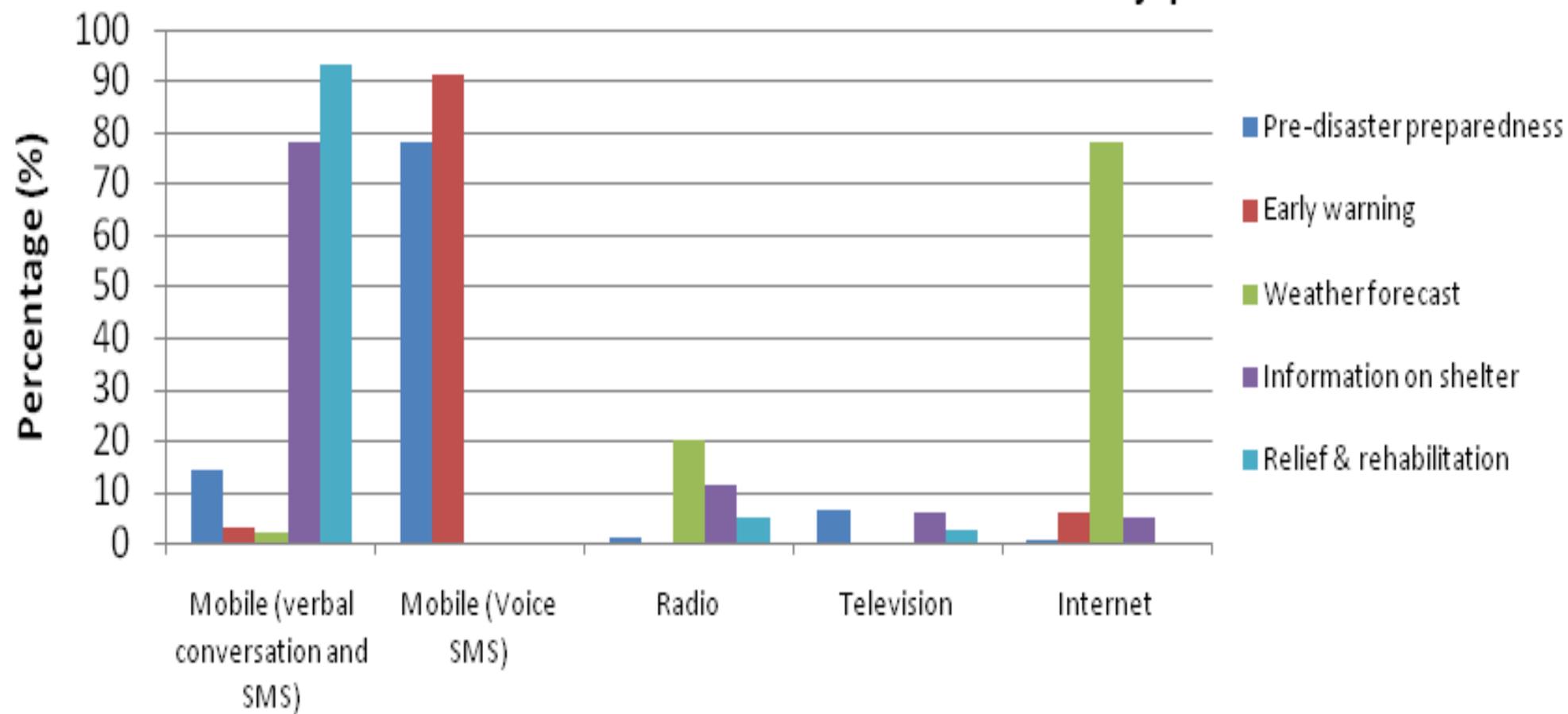
*Eunus Mia, Farmer, Age: 55, Rehaikaulia*

# Available ICTs in the study area

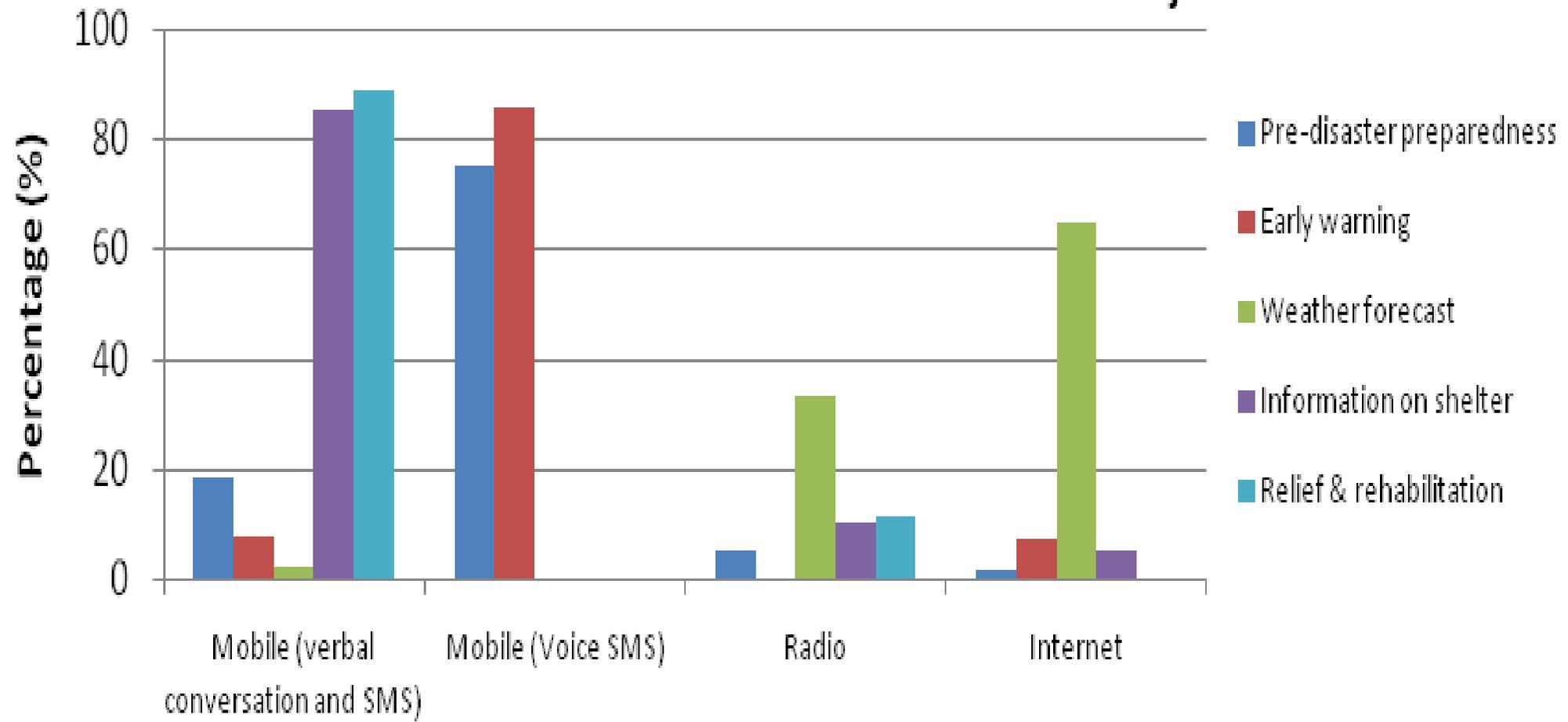
■ Ghorjan ■ Rajapur



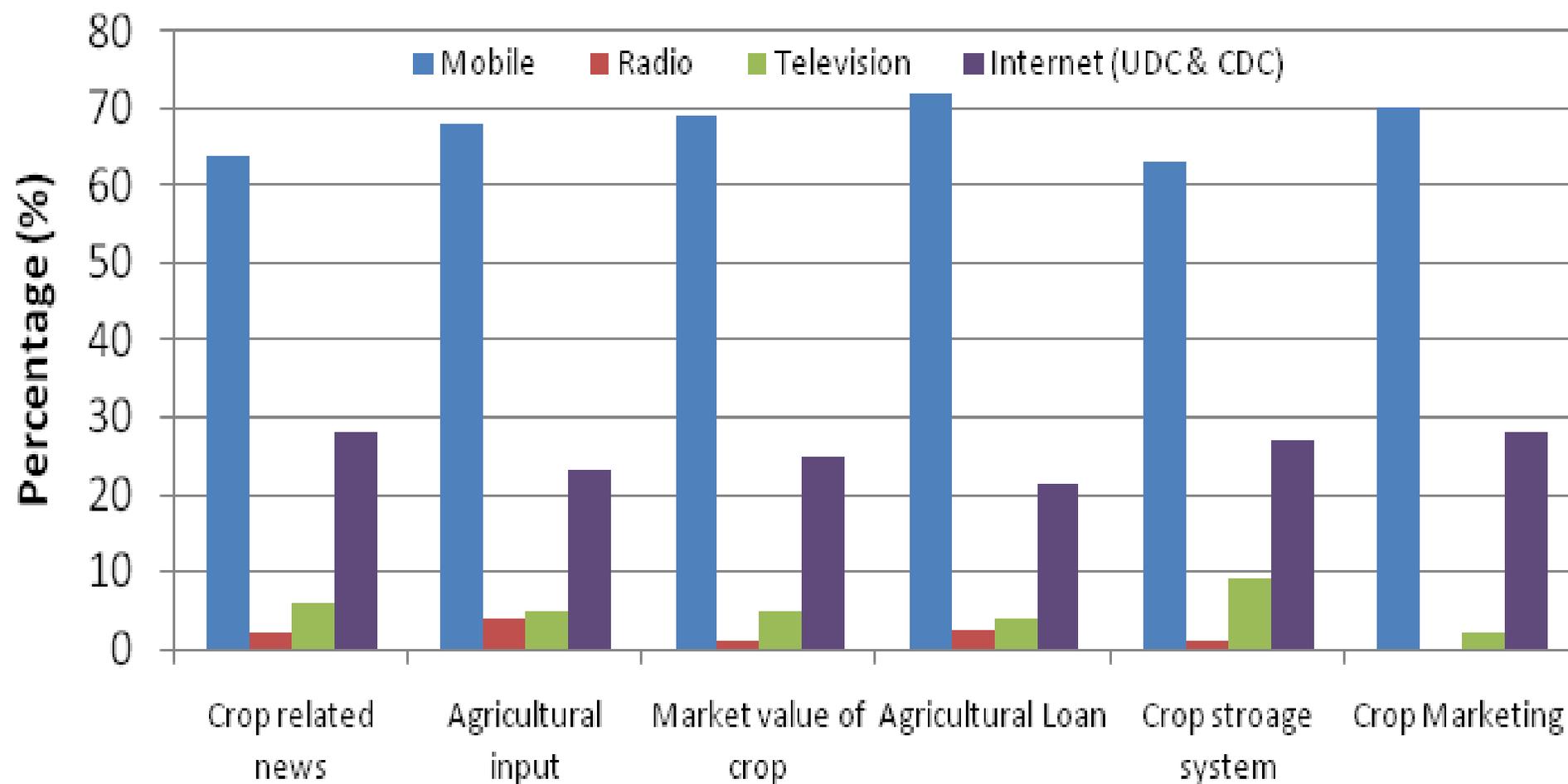
## ICTs as a source of information for DRR in Rajapur



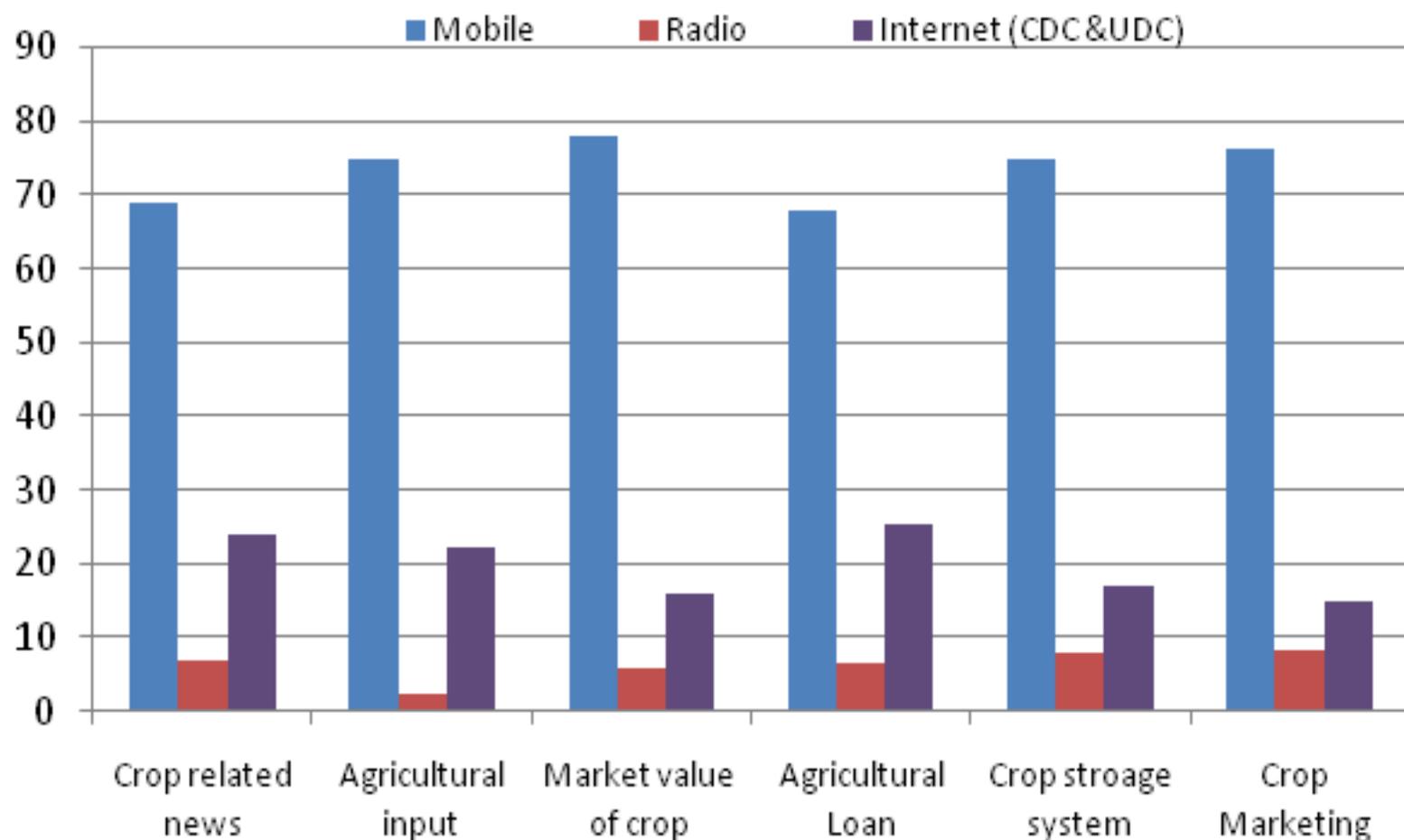
## ICTs as a source of information for DRR in Ghorjan



## Use of ICTs as a source of info on agriculture in Rajapur



## Use of ICTs as a source of info on agriculture in Ghorjan



- ▶ *"I get flood forecasting and EW in my mobile, like all other UP members. If I am in bazaar when I get the voice message, I put my phone in a loud speaker like an announcement, so that others hear it themselves. This is very effective. Voice SMS is more effective than text message."*

**Nur Mohammad, UP member, Ward no 5, Rajapur**

- ▶ *"Many people come to visit my CDC to ask about water level during rainy season. When there is Kaitan (torrential rain), they come to ask me that when the rain will stop."*

**Abdur Rahman, CDC Entrepreneur, Age:25, Teghori**

- ▶ *"We did not get any flood EW even 2 years back. We only knew about flood coming in 2/3 days when there was news on flood in the upstream (Kurigram) in TV. Now we get 5 days EW in voice message in mobile phones. Now we don't have to depend on watching the sky."*

**Maloti Rani, Home maker, Age: 45, Thakurpara**

- ▶ *"When there was no system of such EW voice message, we used to depend on our experience and idea which was not always correct. Now with accurate EW, our loss of property has reduced."*

**Marium, Farmer, Age: 50, Shomeshpur**

- ▶ **"My children go to school and come home reading flood and rainfall information from the CDC dashboard. This helps me taking preparation for the flood. Timely preparations help reducing the damage of flood".**

**Anjira, Farmer, Age: 40, Teghori**

- ▶ **"Two years back there was no CDC. My cow died of the disease Tarka after flood. No cow of the area died during flood this year as people get information on how to protect livestock from CDC.**

**Anwara, Farmer, Age: 30, Teghori**

- ▶ **"When I did not have any mobile, I could not know about the whereabouts of my husband when he went for work. Now there is no fear. "**

**Momena Begum, Farmer, Age: 30, Teghori**

- ▶ **"Now it is safe to send money. People used to get cheated before".**

**Md. Johurul Islam, Grocer and BKash agent, Age: 25 years, Rehaikaulia**

Vulnerable sector	Adaptation measures	Existing and potential uses of ICTs at community level
Poverty	Increasing income	<ul style="list-style-type: none"> <li>• To make money through the formation of ICT enabled microenterprise (UDC, CDC, mobile money transfer)</li> <li>• To get /manage money; most obviously through m-enabled remittance systems.</li> <li>• To search /negotiate for employment opportunities</li> </ul>
Disaster management (flood and river erosion)	<ul style="list-style-type: none"> <li>• Early warning</li> <li>• Occupational migration</li> <li>• Disaster response</li> <li>• Reconstruction</li> </ul>	<ul style="list-style-type: none"> <li>• Mobile phone voice SMS, internet from UDC, CDC are used for receiving EWs</li> <li>• Communication through mobile phones are used in making rational choice on occupational migration to adapt with river erosion</li> <li>• ICTs has the potential for rapid data gathering during emergency response, prioritised decision making, and facilitate logistics.</li> <li>• ICTs can also help to mobilise and monitor re-construction efforts</li> <li>• ICTs has the potential to play central role in monitoring the displacement and settlement of populations due to river erosion</li> </ul>
Agriculture and food security	<ul style="list-style-type: none"> <li>• Agriculture extension service</li> <li>• Development of tolerant varieties</li> <li>• Supply chain</li> </ul>	<ul style="list-style-type: none"> <li>• ICTs are already used and has the potential for further use to access information and knowledge to strengthen local agriculture and livestock production systems (i.e. new seeds and crops variety, livestock breeds, irrigation applications, reminders about planting dates, pest and disease control, livestock vaccinations, alternative fertilizers, etc.)</li> <li>• The use of ICTs such as mobile phones also helps to improve market access (through</li> </ul>

# Challenges

Table: Challenges faced by community in using the ICTs in **Rajapur** (number of responses)

Challenges	Mobile (Communication)	Mobile (Money transaction)	Radio	Television	Internet (UDC)	Internet (CDC)
Network problem	55	8	N/A	N/A	43	74
Electricity supply	15	18	17	34	48	56
Expenses	6	3.5	4.8	6.2	8	9.5
Unavailability	6	4.5	2.8	3.4	35.6	29.8
Distance	N/A	5.5	N/A	N/A	43	24
Time constrain	5	3.2	2.7	5.8	34	37

# Challenges

Table: Challenges faced by community in using the ICTs in **Ghorjan** (number of responses)

Challenges	Mobile (communication)	Mobile (Money transaction)	Radi o	TV	Internet (UDC)	Internet (CDC)
Network problem	78	12	N/A	N/A	50	85
Electricity supply	25	30	22	78	56	83
Expenses	15.6	28	32.5	80	28	35
Unavailability	6.2	5.5	3.2	65	39	45
Distance	N/A	4.8	N/A	N/A	78	55
Time constrain	2.4	2	3.8	N/A	85	49

# Key findings:

- ▶ Erratic behaviour of temperature and rainfall is already felt in the community and it is impacting on the lives and livelihoods of the people
- ▶ Every HH living even in the remotest villages without electricity are connected with ICT in one way or other, mostly through mobile phones, women has lesser direct access
- ▶ Different initiative of ICT for development are contributing in reducing climate vulnerabilities of the community but need to raise awareness on the available services to ensure their optimum benefit
- ▶ There are huge untapped potentials of using ICTs in CCA-DRR using the existing infrastructure.
- ▶ Limited organizational and human capacities of stakeholders remain key obstacle to more frequent use of ICT as a tool to promote CCA.

# Recommendations:

- ▶ Dissemination of flood EW has proven to be very useful in the study area which can be further **replicated** in all other flood prone area of the country. There are also growing need for **fog EW** in the community which should be looked at.
- ▶ Dissemination of **agromet data through mobile phones**, particularly through voice SMS should be explored.
- ▶ **Raising awareness** about the available mobile app on agriculture. Both adaptation and mitigation.
- ▶ **Solar run mobile tower** are demanded by communities who are deprived of regular electricity supply. This option should be looked at as this has both adaptation and mitigation benefits.
- ▶ UP chair is found to be felt threatened of losing power as people are getting services from UDC without coming to him. This is an indicator that UDCs are making people empowered. This also indicates that UDC management should be strictly **kept out of the influence of local power politics**.

Cont...

- ▶ **Women should be given special incentives** so that they do not get dropped out from being UDC /CDC entrepreneur. This will significantly contribute in women empowerment.
- ▶ **Televisions should give more emphasis** on airing information on DRR and CCA opportunities as they can access almost everyone in the country.
- ▶ UDCs should be **situated in places** which can be easily accessed by people living in remote places like *Chars*.
- ▶ CDCs should be managed with more **skill and drive** to build it like an enterprise.
- ▶ Designing **innovative financial mechanisms** that promote access and use of ICT in commercially less attractive regions and among the poor could greatly enhance ICT's contribution to CCA initiatives.
- ▶ **Attracting more private sector investment** and establishing new multi-stakeholder funds could further ICT-enabled CCA.
- ▶ **A sound and transparent regulatory and legal framework for ICT** for development will foster trust in and access to ICT applications.



### ২নং রাজাপুর ইউনিয়ন ডিজিটাল সেন্টার

জনগণের দোরগোড়ায় তথ্য সেবা  
আমাদের সেবা সমূহঃ

- কম্পিউটার প্রশিক্ষণ, কম্পোজ ও প্রিন্ট।
- নন-জুর্ডিশিয়াল স্ট্যাম্প রিসেজ।
- অনলাইনে বৈদ্যুতিক মিটারের আবেদন।
- অনলাইনে জমির জাবোদা পরগার আবেদন।
- অনলাইনে বিশ্ববিদ্যালয়ে ভর্তির আবেদন।
- অনলাইনে ভিসা চেঞ্জিং ও ভিসা প্রসেসিং।
- অনলাইনে জন্ম ও মৃত্যু নিবন্ধন।
- অনলাইনে চাকুরী আবেদন।
- অনলাইনে শিক্ষক নিয়োগের আবেদন।
- ছবি তোলা, ছবি প্রিন্ট, ফটোকপি ও স্ক্যান।
- ই-মেইল, ইন্টারনেট ও ভিডিও কলিং।
- অনলাইনে কেনাকাটা/ভাটুর্যাল শপ।
- সকল পাবলিক পরীক্ষার রেজাল্ট দেখা।
- সরকারী সুরমা।

টাকা জমাদা

ফাড ট্রাঙ্গফার

এজে ব্যাংক সেবাস

ইউটিলিটি বিল পরিশোধ

পাসপোর্ট ফি জর

ZURICH PRACTICAL ACTION

## বন্যার আগাম প্রস্তুতিসহ

কৃষি, মৎস্য ও প্রাণিসম্পদ বিষয়ে সমস্যা সমাধানের জন্য যেকোনো মোবাইল থেকে ফোন করুন ১৬১২৩

কৃষি কল সেন্টার  
আমাদের কল সেন্টার

# কৃষকের ডিজিটাল ঠিকানা

এখানে ডিজিটাল উপায়ে কৃষি সমস্যার সমাধান দেয়া

সমাধান পেতে দ্রুত যোগাযোগ করুন-

মোঃ ইউসুফ আলী, উদ্যোক্তা

রাজাপুর ইউনিয়ন ডিজিটাল সেন্টার

রুকঃ রাজাপুর বেলকুচি

মোবাঃ ০১৭১৩-৭২২৩২৯

QAIS প্রজেক্ট

**Thank you 😊**

