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Importance of Contextualized Communication for Better Disaster Preparedness and Disaster Risk Reduction: A Case Study from Bihar

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Abstract

In India, the disaster preparedness has primarily been restricted to being response oriented that is mainly concentrated on the rescue operations. Insufficient community preparedness and lack of proper communication leads to large scale causalities. The lack of proper communication is due to the fact that the relevant information among the community participants is not spread properly. One of the major reasons for this is: the difference in the language of communication among the people and the language in which the information is officially shared. Due to this language gap it becomes very difficult for the native people to understand the guidelines related to the disaster risks and disaster preparedness, thereby making them more vulnerable to disaster risks. Five districts from Bihar have been identified for data collection. The districts feature prominently from North to South on the map showing Multi Hazard Zones in Bihar issued by Bihar State Disaster Management Authority. Quantitative data analysis clearly reflects that firstly, the official languages (English and Hindi) used by the government agencies for knowledge transfer are totally inadequate and secondly, translating the information in regional languages like Magahi, Bhojpuri and Maithili considerably enhance the quality and the quantity of responses that are generated during data collection. Community involvement can be promoted and made efficient only when the regional languages are used as the desired media of communication.

Keywords: disaster management; community preparedness; flood; cold wave; heat wave; communication

1. Introduction

India is probably among the most vulnerable countries in the Asia which is highly exposed to all kinds of disaster. It has altogether 36 states and Union Territories and nearly 27 of them are prone to disasters. Past studies have indicated that the scenario of disaster in India in the coming future is likely to become worse due to the climate change and global warming. As result of haphazard development and climate change disasters of high magnitude are expected to be triggered in the coming years.

India and its immediate neighbours are at a high risk of a number of natural disasters such as floods, landslides, earthquakes, tsunamis, heat waves, cold waves and cyclone due to the climatic and terrain conditions. According to NPDM (2009) India's profile for hazard vulnerability shows that earthquakes accounts for 57% of all natural calamities followed by droughts 16%, floods 12%, cyclones 8% and landslides 3%.

India and its neighbouring countries have experienced a consecutive series of different kinds of man-made as well as natural disasters in the past few decades. This has led to a widespread destruction, substantial loss of livelihood, life and properties which has added to the pain and sufferrings of the people.

Bihar is a state in eastern India. The state covers an area of 94,163 square kilometres with 82,878,792 inhabitants. Bihar lies mid- way between West Bengal in the East and Uttar Pradesh in the West. It is bounded by the country Nepal to the North and Jharkhand to the South. The capital city of Bihar is Patna and Hindi and Urdu are considered as the official languages of the state, while majority of people speak Angika, Bhojpuri, Magadhi, Maithili and Bajjika. According to the 2011 census, the total population of Bihar is 10.41 crores and the literacy rate is 61.80% (Bihar population 2011 – 2020 Census). Bihar is one of the multi- disaster prone states in India. The state faces many natural disasters, including floods, heat waves, cold waves, earthquake, drought, fire, etc. The frequency and prevalence of the disasters has a widespread effect over 38 districts of the state. Out of 38 districts, 28 districts are prone to the disaster of flood and were affected by it in the years 2007 and 2008, especially the districts of South Bihar. The district lying in the south of Ganges are prone to disaster of drought and the district lying in the North – Eastern part of the state is prone to cyclone storm, in which every year almost 80 person lose their lives and the disaster destroys their properties and infrastructure. Therefore, it is the need for the people to prepare and prevent in all hazardous situations in Bihar (Kumar, N. 2015)

The disaster management programmes have shown a major shift from the conventional 'relief and reactive centric' approach to a more integrated and comprehensive approach with greater significance on the dynamic strategy consisting of 'Mitigation, Prevention and Preparedness' in the pre- disaster phase. In this approach, public awareness, educational and research based strategy to deal with such situations are the need of the hour. This is where initiatives in India lag. Because of social stratification and prevailing illiteracy topped by multilingualism, several sections of society fail to receive adequate instructions and training which leaves them highly vulnerable in face of crisis. Clearer guidelines in native and regional languages need to be discharged for the authentic involvement of vulnerable groups in training activities in order to develop better disaster management plans. This leads to the main Objective of this paper that is to suggest effective and contextualized communication techniques for better knowledge transfer for improved disaster preparedness.

2. Literature review

2.1 Public Awareness and increased Community Participation

Marginalized communities are high flown by disasters and are intensely vulnerable to the risks of the disaster. More often the marginalized communities/ group are neglected from the disaster risk management decision making and implementation processes, thereby adding to their vulnerability risks. Therefore, it is important to include these groups and communities at a greater length to build resilience to disasters. So, understanding the level to which the concerns of children, women and other marginalized communities are presently situated in the framework is an important parameter. Public awareness, education and research have been given adequate thrust so far and the roles of the media in disaster mitigation and management have been clearly spelt out. Several international and national level researches are being done to address the issue of lack of community preparedness in the face of disaster and the methods and advantages of tapping indigenous knowledge, which may function as disaster indicators.

Community participation is an important element for local disaster risk management (Hori and Shaw, 2014). In Xu Weilan et al. (2015) a cross sectional survey has been conducted to gather information about community preparedness for emergency in a province of China. The study concludes with some stark findings like low level of preparedness of the residents, lack of community education in situations of disaster and recommendation for the vulnerable groups have been identified. These groups should be trained intensively to reduce casualties. Guochun Wu et al. (2018) studies individuals' earthquake preparedness in China. According to Cui et al. (2018) pre- disaster mitigation and preparedness are important methods used to reduce potential disaster impact and to increase the resilience of community. The Protective Action Decision Model, Health Belief Model, Extended Parallel Process Model, Theory of Planned Behaviour and Social Cognitive Theories and personal- Relative-To- Event Model are commonly adopted research frameworks (Duval & Mulilis, 1999; Lindell & Perry, 2012). Terms like protective behaviours/ actions, hazards adjustments behaviours/ actions and mitigation or preparedness are common phrases used to describe the activities undertaken in anticipation of natural hazards (Bubeck et al., 2012; Kohn et al., 2012; Lindell, 2013).

2.2 Survey of Disaster Management and Indigenous Knowledge in Bihar

Kansal, Kishore & Kumar (2016) discuss disaster of flood in Bihar, which affects and damages the life and property of the state. It mainly affects the farmers who are depend on agriculture, the infrastructure and also the socio economic life of people. To reduce the disaster, the government has implemented structural and non- structural measures. The structural measures consist construction, maintenance of embankments, land spurs, and the non-structural measures contain flood plain zoning, watershed

management, flood forecasting, disaster mitigation, preparedness and response towards disaster management by raising awareness and giving training to the community.

Oloo & Ongong (2017) remarks that Kosi River in Bihar is highly vulnerable to flood which resulted in destruction and damage of houses, properties and lives of people. The Kosi River is frequently known as 'Sorrow of Bihar' (Sinha et al., 2002). To reduce and control the disaster and risk management of the community, the government has adopted the safety chain which was developed by the United States- the Federal Emergency Management Agency (FEMA), which consists the pro- action, mitigation, prevention, preparation, response, recovery towards the flood disaster. An Example of pro action in floods protection is restricted building in disaster prone areas. The people are also taking preventive measures to deal with such disaster by getting training, emergency service or response in the phase of disaster by providing medical aids, fire brigade and the police. Indigenous knowledge and local communities are also needed to strengthen the skills and abilities to mitigate the disasters.

2.3 Effective Communication during Disasters

Davies & Kapur (2014) describes effective communication as a tool for guidance, response and assistance during and after disaster. Organisation must communicate and coordinate responses among the stakeholders to prevent panic, promoting appropriate health behaviours, and supporting the affected populations. It is through media interviews, internet articles and social media and town hall forums that the communication can be accessed among respondents.

According to the Citizen's Disaster Response Centre (CDRC, 2001), the key to its disaster management program is education. Through CRDC's disaster education program, Communities Based Disaster Management aims to strengthen the traditional community values such as self- help, resourcefulness and cooperativeness. Popular awareness- raising materials such as simple and colourful comic books and posters written in local language are proven effective for disseminating information on disaster management, if the contents and situations are familiar to the local people.

2.4 Transferring Knowledge in disaster preparedness

Izadkhah & Hosseini (2005) focuses on educating children that can transfer knowledge from them to their families. The best way of publicising awareness programmes in developing countries is the integration of the awareness initiatives into children's activity. Children are good messenger in disseminating information toward disaster and preparedness starting to the family and it reaches to all the levels of the society. It is through educational activity or campaign that results into successful public awareness-raising for children. Public awareness and education is a key component for raising the awareness of the public to disaster mitigation and prevention. Education is a tool to increase the knowledge, ideas and understanding for making the community aware, prepare and also to react in times of disaster. Educational materials

such as painting books, comic strips, story books and crossword puzzles has demonstrated an effective awareness programme through children to develop protective measures to the community.

Ahmed, Ahmad & Zakaria (2015) focuses on the importance of understanding the knowledge dissemination or sharing in disaster management. Since, knowledge sharing plays a crucial role in influencing or identifying the four factors in disaster management such as, environmental factors, motivational factors, institutional factors and technological factors in disaster relief organisation in disaster management. Knowledge sharing facilitate and integrate knowledge behaviour through understanding the factors influencing in disaster management.

3. Hypotheses

Based on the review of literature and after developing an insight into the research area it can be hypothesized that:

- Inclusion of regional and local languages during disaster related information dissemination by government agencies will not only increase community preparedness but it will also encourage community participation due to greater connectivity.
- Targeting vulnerable communities towards disaster preparedness will considerably decrease human loss during disaster.

4. Research Methodology

This paper focus upon the two major research methodologies that is based upon the theoretical models operating in the field of determining controlled human behavior in the face of crisis. They are: The Protective Action Decision Model (PADM) and the Social Cognitive Theory (SCT). The PADM is based upon the findings from the research depending upon the response of the people to disasters and environmental hazards; and the SCT focuses upon the influence of individual's experience, the actions of others and the environmental factors on individual heath behaviors.

On the basis of these two frameworks of the theoretical models the research methodology for this paper is divided into two major elements listed below:

1. Assessment
   • Interacting with local population to identify their native or regional languages and assessing the existing Disaster Management information
   • Information dissemination in the language of the Government agencies and obtaining feedbacks about the quantum of information received through feedback
   • Information dissemination in local languages
   • Feedback on quantum of information received
2. Information Dissemination and Focused Group Training (FGT)

• Identifying marginalized section and people of an older age group

• Imparting Disaster Management information in the language of ease that is, the local or the regional languages

4.1 Data collection

The areas that are disaster prone in the state of Bihar are taken into consideration, for example the flood, drought and cyclone prone areas. Five disaster prone districts of Bihar have been shortlisted for data collection based on their vulnerability towards multiple disasters. They are: Patna, Nalanda, Muzaffarpur, Vaishali and Darbhanga. The districts feature prominently from North to South on the Map showing Multi Hazard Zones in Bihar issued by Bihar State Disaster Management Authority (Figure 1)

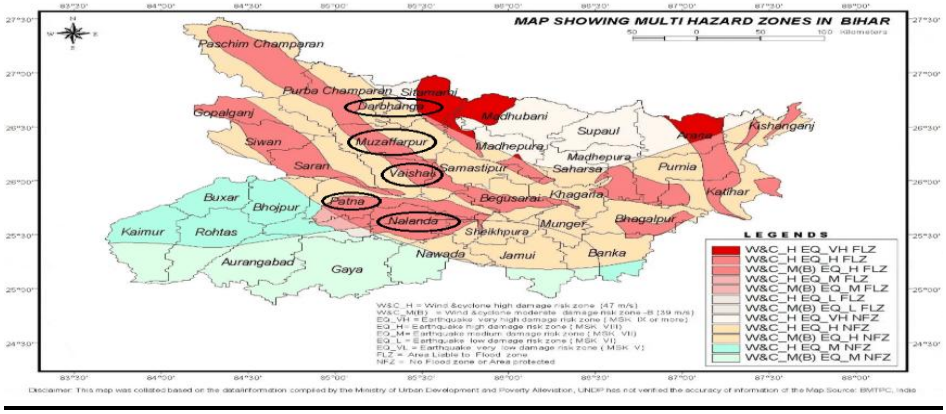

Figure 1

Source: http://bsdma.org/Home.aspx (02/02/2020)

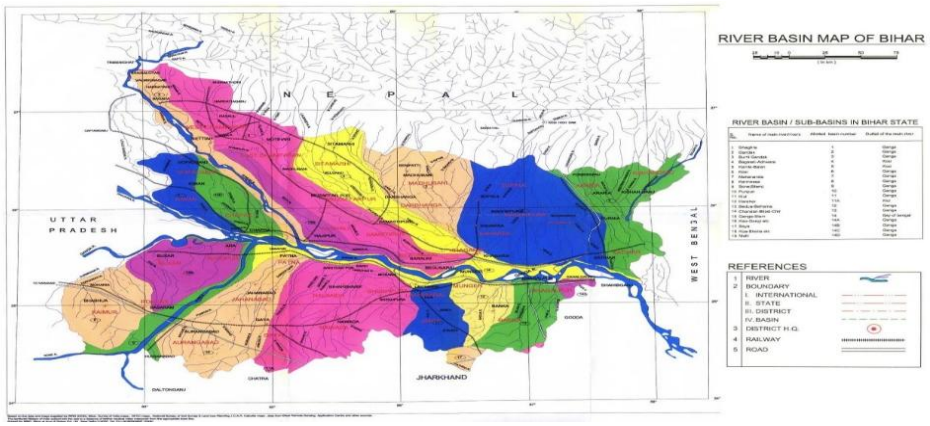

Figure 2

Source: http://fmis.bih.nic.in/Riverbasin.html (02/02/2020)

The major focus is on the communities that have settled by the side of riverbanks as these communities are always at risk of some or the other kind of disaster. From these communities the resource persons or the informants were chosen who were mainly the adults of the older age group, that is approximately 60

years of age. The reason to select the people of this age group was their local or indigenous knowledge of the disaster risks and the preventive measures to some extent.

Older people think differently from the modern ideology so the process of knowledge dissemination also differs in their case. Data collection and interaction was conducted in Hindi as well as their local or regional languages so that the informants can interact in a better way.

The disaster management brochures and modules of the NDRF and SDRF have been used for preparing the questionnaire for interviewing people. A set of questionnaire for flood, heat waves and cold waves were prepared for interviewing people form the various communities of the above mentioned districts of Bihar.

5. Data analysis / Results

This present section analyses the data obtained from the community residents of Patna, Nalanda, Muzaffarpur, Vaishali and Darbhanga districts of Bihar towards emergency preparedness based on a multi- hazard approach and is typically applicable to preparedness in all hazard situations of Bihar and adjoining states.

The numbers of informants per disaster were more than 30 and there were more female informants as compared to the males. They were mostly Bhojpuri, Magahi or Maithili speaking people and they knew Hindi when it came to speaking but they were more used to and comfortable using their native and regional languages.

The informants were mostly poor and were living in the conditions of poverty, so they were illiterate in general. However, they were acquainted to the natural disasters as the area in which they had been living was very prone to the disasters. Most of the informants did not attend the NDRF/ SDRF training camps so they were not aware of the preventive measures and precautions that should be taken at the time of hazards. During the data collection, the respondents were made to answer the questions related to the disaster flood, heat waves and cold waves from the prepared questionnaires and their responses in both Hindi as well as regional languages were recorded and for each response one token was raised.

For this research, the responses for three disasters that is, flood, heat waves and cold waves has been recorded. Two questions per disaster have been analyzed and the data depending upon the responses for the same is mentioned below.

5.1 Flood

A set of ten questions (Annexure 1) in English, Hindi and regional languages related to flood was prepared for interviewing people from the five districts (Patna, Nalanda, Muzaffarpur, Vaishali and

Darbhanga) of Bihar. Out of ten, two questions were analyzed, and the table along with the pie chart for the same is raised based upon the responses of the people.

Language	Total Number of Responses	Percentage
Hindi	69	31.51%
Regional	150	68.49%

Table1.1. Total number of people's response in Hindi and regional language for Flood question 1

The above table shows the total number of responses of people for flood question 1. The token responses in Hindi and the Regional languages along with its percentage is mentioned in the table above. Based upon the percentage and response tokens of the respondents the pie chart is raised to show the responses of people in a clearer way.

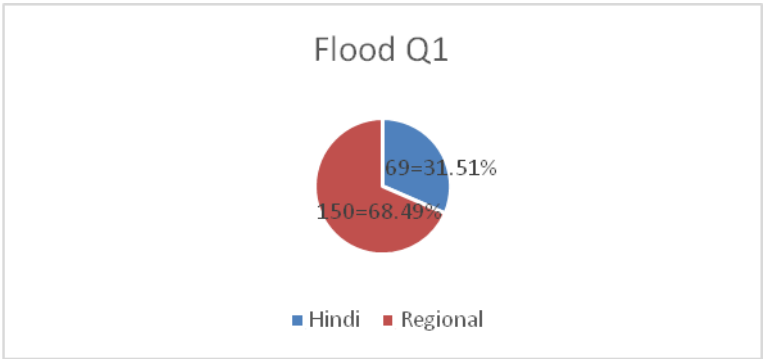

Figure 1.1. People's response in Hindi as well as regional language for flood Q1

In figure 1.1. The total numbers of responses (Hindi and Regional languages) were taken to be 219, out of 219 responses only 69, that is 31.51% responses were recorded in the Hindi language. The responses in the native or regional languages were more than the double of the responses in Hindi. Out of 219, 150 responses or 68.49% were in local and regional languages. This shows the preference, understanding and comfort zone of the respondents for their native or regional language.

Language	Total Number of Responses	Percentage
Hindi	69	34.85%
Regional	129	65.15%

Table 1.2. Total number of people's response in Hindi and regional language for Flood question 2

Table 1.2 shows the responses of people for flood question 2. The token responses in Hindi and Regional or native languages is mentioned in the table above, also the percentage for the responses has been taken out and with the help of it a Pie chart has been prepared for better depiction of the responses.

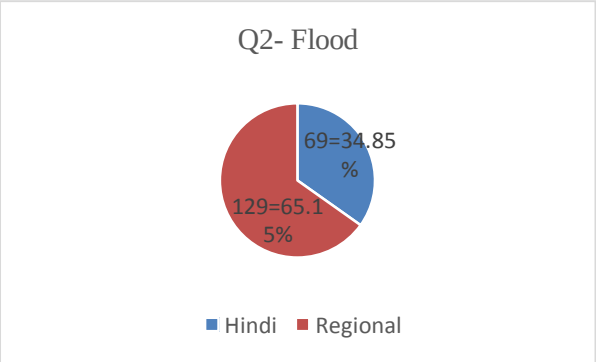

Figure1.2. People's response in Hindi as well as regional language for flood Q2

In figure 1.2, the total numbesr of responses after calculating the token responses of both the languages is 198. Out of 198 responses only 69, that is 34.85% responses were recorded in the Hindi language. For this question also the response token in the native or regional languages is much higher. Out of 198,129 responses or 65.15% were in local and regional language.

5.2 Heat Waves

A set of six questions (Annexure 2) in English, Hindi and regional languages related to heat waves was prepared for interviewing people from the five districts (Patna, Nalanda, Muzaffarpur, Vaishali and Darbhanga) of Bihar. Two out of six questions were interpreted and based on the responses the table and pie chart for the same is raised.

Language	Total Number of Responses	Percentage
Hindi	74	27.00%
Regional	200	73.00%

Table1.3. Total number of people responses in Hindi and Regional Language for Heat Waves question 1.

Table 1.3 shows the responses of people for heat waves question 1. People's response in native or regional language along with Hindi is recorded. With the help of the percentage and token response number the pie chart has been prepared to show the responses in an intelligible way.

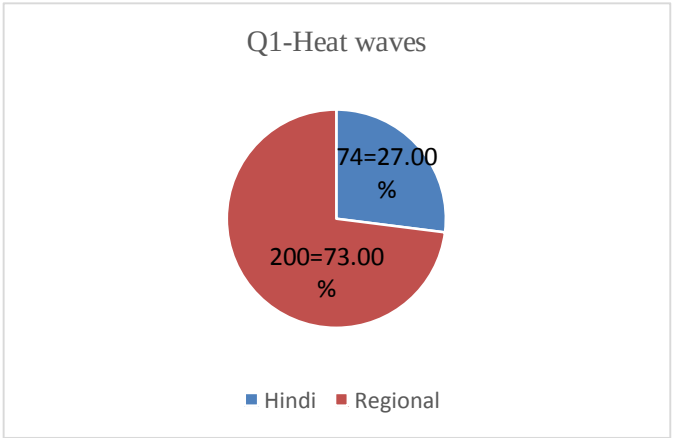

Figure 1.3 People's response in regional as well as native language for Heat Waves Q1

In Figure 1.3, the total numbers of responses in the regional languages as well as Hindi were totalled as 274 and out of 274 responses only 74 that is 27.00% responses were recorded in the Hindi language. It is observed that response in the native or regional languages was much higher that is, out of 274, 200 responses or 73.00% were in local and regional language.

Language	Total Number of Responses	Percentage
Hindi	67	29.64%
Regional	159	70.36%

Table 1.4. Total number of responses in Hindi and regional language for Heat Waves question 2

The above table shows the total number of responses of people for heat waves question 2. The token responses in Hindi and the Regional languages along with its percentage is mentioned in the table above. Based upon the percentage and response tokens of the respondents the pie chart is raised to show the responses of people in a clearer way.

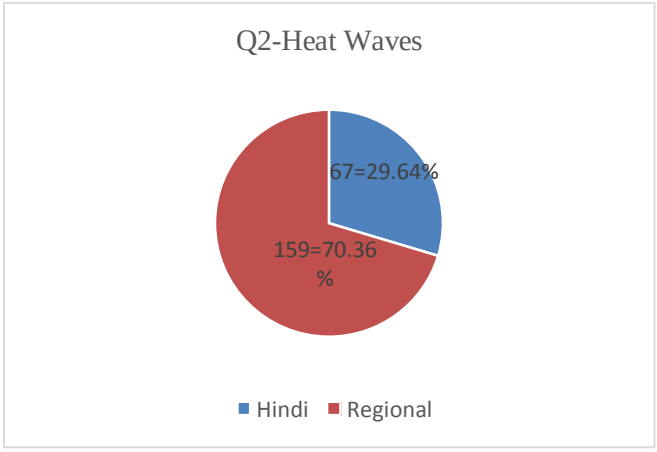

Figure 1.4 People's response in Hindi as well as regional language for Heat Waves Q2.

In Figure 1.4, the total numbers of responses of Hindi as well as regional languages were taken to be 226, out of 226 responses, only 29.64% that is,67 responses were recorded in Hindi Language and 70.36% that is,159 responses were recorded in regional or local languages. As per the data the total numbers of response in native languages were much higher than Hindi language.

5.3 Cold Waves

A set of five questions (Annexure 3) in English, Hindi and regional languages related to heat waves was prepared for interviewing people from the five districts (Patna, Nalanda, Muzaffarpur, Vaishali and Darbhanga) of Bihar. Two out of five questions were interpreted in the tabular form and the pie chart for the same is raised based on the responses of the respondents.

Language	Total Number of Responses	Percentage
Hindi	94	28.66%
Regional	234	71.34%

Table1.5. Total number of people's response in Hindi and regional language for Cold Waves question 1

Table 1.5 shows the responses of people for cold waves question 1. The token responses in Hindi and regional or native languages are mentioned in the table above; also the percentage for the responses has been taken out and with the help of it a Pie chart has been prepared for better illustration of the responses.

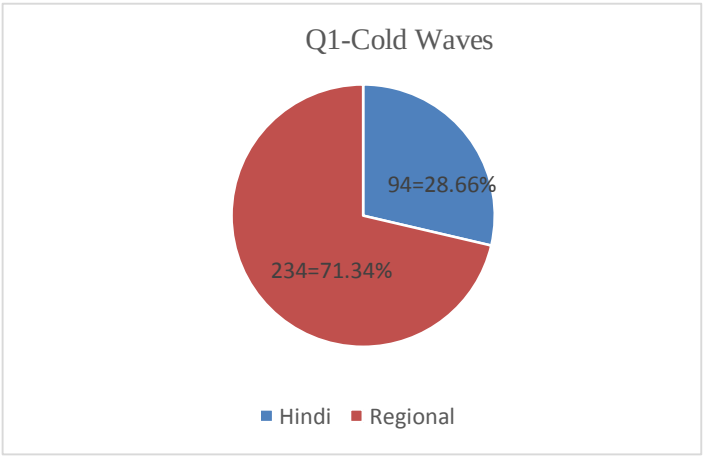

Figure 1.5 People's response in Hindi as well as regional language for Cold Waves Q1.

In Figure 1.5, the total numbers of responses (Hindi and Regional languages) were taken to be 328, out of 328 responses only 28.66% that is 94 responses were recorded in the Hindi languages. Out of 328, 71.34% responses or 234 token response in local and regional language. It can be clearly observed that the response in the regional languages is much higher as compared to the responses in Hindi.

Language	Total Number of Responses	Percentage
Hindi	57	25.22%
Regional	169	74.78%

Table 1.6. Total number of people responses in Hindi and regional language for cold waves question 2

Table 1.6 shows the responses of people for cold waves question 2. People's response in native or regional languages along with Hindi is recorded. With the help of the percentage and token response number the pie chart has been prepared to show the responses in a comprehensive manner.

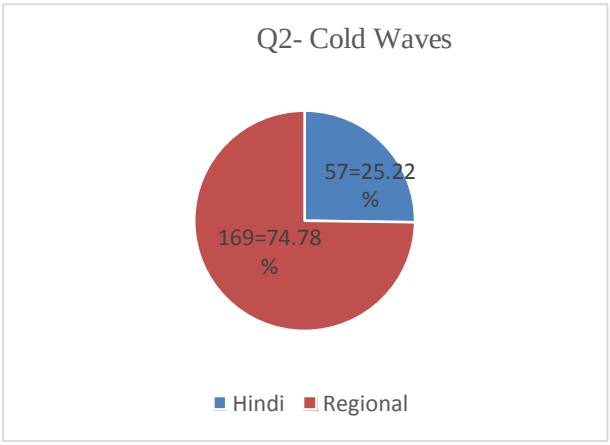

Figure 1.6 People's response in Hindi as well as regional language for Cold waves Q2.

In Figure 1.6, the total numbers of responses in both Hindi as well as regional languages were totalled out to be 226 and out of 226 response tokens only 57 that is, 25.22% responses were recorded in the Hindi language. Out of 226, 74.78% that is, 169 response tokens were recorded in local and regional language. Here also it can be observed that the responses in the local or regional languages were much higher as compared to the responses in Hindi.

6. Conclusion

It was observed that for each question related to the disasters flood, heat waves and cold waves the responses of the respondents in the local or regional languages were much higher than the responses in Hindi. It can be clearly observed that the responses in the native or regional language for almost every question analyzed above is approximately double than the responses in Hindi. Therefore, it can be concluded that the people of the Patna, Nalanda, Muzaffarpur, Vaishali and Darbhanga Districts of Bihar are much more comfortable in understanding and responding in their native language than using Hindi. However, they use Hindi and can comprehend it too, but when it comes to day-to-day interaction they prefer their own native language. So the information dissemination becomes easier when their regional language is used for interaction. It is therefore sure that if the information related to disaster management or disaster preparedness is spread to them in their own language then it would be easier for them to understand and comprehend. The awareness in local languages will help them in better preparedness form hazardous situation of disasters.

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Annexures

Annexure 1- Questionnaire (Flood)

Annexure 2- Questionnaire (Heatwaves)

Annexure 3- Questionnaire (Cold waves)

Annexure 1

Flood Questionnaire

1. आपातकालीन किट में का होखे के चाही? (Bhojpuri)

   आपातकालीन कीट में की होआ चाही? (Maithili)

   आपातकालीन किट में का होए के चाही? (Magahi)

   आपातकालीन कीट में क्या होना चाहिए? (Hindi)

   What should be there in the emergency kit? (English)

2. राहत सामग्री में का का आवेला ? (Bhojpuri)

   राहत सामग्री में की की एतई? (Maithili)

   राहत सामग्री में का का अतयी? (Magahi)

   राहत सामग्री में क्या-क्या आता है ? (Hindi)

   What item comes under relief materials? (English)

3. बाढ़ प्रभावित क्षेत्र में घर कौन सी चीज से बनाए के चाही? (Bhojpuri)

   बाढ़ प्रभावित क्षेत्र में घर कतउ से बनाइये? (Maithili)

   बाढ़ प्रभावित क्षेत्र में घर कोंची से बनवे के चाही? (Magahi)

   बाढ़ प्रभावित क्षेत्र में घर किस चीज से बनाएं? (Hindi)

   What materials should you use for building houses? (English)

4. बाढ़ से मिट्टी के घर को का होइ जाला? (Bhojpuri)

   बाढ़ स माइटक घर का की भ जाई छई? (Maithili)

   बाढ़ घरी मट्टी के घर के का होजा हई? (Magahi)

   बाढ़ से मिट्टी के घर को क्या हो जाता है ?(Hindi)

   How does flood affect the kachha houses? (English)

5. वाटर प्रूफ बैग में का रखें के चाही।(Bhojpuri)

   वाटर प्रूफ बैग में की की राखे चाहि? (Maithili)

   वाटर प्रीफ बैग में कौची कौची रखे के चाही? (Magahi)

   वाटर प्रूफ बैग में क्या रखना चाहिए? (Hindi)

   What should we keep in water proof bag? (English)

6. अफवाह का होखे ला? (Bhojpuri)

   अफ़वाह की होई छई? (Maithili)

   अफ़वाह का होव हई? (Magahi)

   अफवाह क्या होती है ?(Hindi)

   What are rumours? (English)

7. बाढ़ के दौरान कईसन पानी पिए के चाही? (Bhojpuri)

   बाढ़ के खण केहन पाईन पबिक चाही? (Maithili)

   बाढ़ के घरी किसान पानी पीये के चाही? (Magahi)

   बाढ़ के दौरान कैसा पानी पीना चाहिए? (Hindi)

   What type of water should you drink during flood? (English)

8. दस्त का होखेला उस समय का सेवन करे के चाही? (Bhojpuri)

   दस्त की होई छई आ औई समय कथी सेवन करक चाहि? (Maithili)

   दस्त का होव हई आऊ उ घरी का खाए के चाही? (Magahi)

   दस्त क्या है उस समय क्या सेवन करना चाहिए ? (Hindi)

   What is dysentery and what should you eat during that time? (English)

9. हैलोजन के गोली का हो खेला उनका उपयोग कहा करब ? (Bhojpuri)

   हलोजन क गोली की होई छई आ औई क कथि काज होई छई? (Maithili)

   हलोजन के गोली का होव हई आऊ औकर का उपयोग का हई? (Magahi)

   हैलोजन की गोलियां क्या होती है उनका क्या उपयोग होता है ?(Hindi)

   What are halogen tablet? What is its used? (English)

10. बच्चन के कहां खेले से रोके के बा? (Bhojpuri)

बच्चा क कत्त खेले स रोके चाही? (Maithili)

बच्चा के कहा खेले से रोके के चाही ? (Magahi)

बच्चों को कहां खेलने से रोके ? (Hindi)

Where should you stop kids from playing? (English)

Annexure 2

Heat Waves Questionnaire

1. लू से बचें ला का का खाएं के चाही अउर का का पीय के चाही? (Bhojpuri)

   लू लागे से बचे लेल की करा चाही आ किंकी पीबे चाही? (Maithili)

   लू लगे से बचे लागी कउची खाए के चाही औउ कउचीका पीये के चाही? (Magahi)

   लू लगने से बचने के लिए क्या क्या खाना चाहिए और क्या क्या पीना चाहिए ?(Hindi)

   What should one eat and drink during heat waves? (English)

2. केकरो लू लागला पर का दवाई करे के चाही? (Bhojpuri)

   केकरो लू लागे पर की दवाई कराके चाही? (Maithili)

   केकरो लू लगे पर का इलाज कराये के चाही? (Magahi)

   किसी को लू लगने पर क्या उपचार देना चाहिए ?(Hindi)

   What treatment should be given to a person affected by heat waves? (English)

3. लू का होख लई बिहार में लू कब चललई। कइसे पता चललई की लू चले लगलइ? (Bhojpuri)

   लू की होई छई आ बिहार म लू केखन लागई छई ? केन्न पता चलई छई की लू चाले लगलई? (Maithili)

   लू का होव हई? बिहार में लू कखनी आव हई? कइसे पता चलहई की लू चले लगयी? (Magahi)

   लू क्या होता है बिहार में लू कब चलता है ?कैसे पता चलता है कि लू चलने लगा ?(Hindi)

   What are heat waves? When is Bihar is affected by heat wave? How do you know that heat waves have started? (English)

4. का का ने खाएं पीय के चाही? (Bhojpuri)

   की की खै पीबे नइ चाही? (Maithili)

   कउची कउची ना खाए पीये के चाही? (Magahi)

   क्या नहीं खाना पीना चाहिए ?(Hindi)

   What should you avoid eating during heat waves? (English)

5. लू मे जानवरों के देखभाल कइसे करे के चाही? (Bhojpuri)

   लू म जानवर क देखभाल केन्ना करा क चाही? (Maithili)

   लू के घरी जानवर के कइसे देखभाल करे के चाही? (Magahi)

   लू में पशुओं की देखभाल कैसे करनी चाहिए? (Hindi)

   How should you look after the animals during heat waves? (English)

6. लू से बचें के जानकारी कहाँ से मीलल? (Bhojpuri)

   लू से बचे क जानकारी कत्त स भेटल? (Maithili)

   लू से बचे के जानकारी कहा से मिल्लव? (Magahi)

   लू से बचने की जानकारी कहां से मिली है? (Hindi)

   From where did you know about the preventive measures that should be taken during heat waves? (English)

Annexure 3

Cold waves Questionnaire

1. शीतलहर से बचने के लिए का का करे के चाही। (Bhojpuri)

   शीतलहर स बचे क लेल कथि करेक चची? (Maithili)

   शीतलहर से बचे लागी का करे के चाही? (Magahi)

   शीतलहर से बचने के लिए क्या करना चाहिए? (Hindi)

   What preventive measures should you take during cold waves? (English)

2. शीतलहर लागे के का लक्षण बा। (Bhojpuri)

   शीतलहर लागे क कथि लक्षण छई? (Maithili)

   शीतलहर के लक्षण का होव हे? (Magahi)

   शीतलहर लगने पर क्या लक्षण रहता है? (Hindi)

   What are the symptoms of cold waves? (English)

3. शीतलहर कब चललई? (Bhojpuri)

   शीतलहर केखन चलई छई? (Maithili)

   शीतलहर कखनी चलहई? (Magahi)

   शीतलहर कब चलता है? (Hindi)

   When does cold waves occur? (English)

4. शीतलहर में पशुओं की देखभाल कइसे करे के चाही? (Bhojpuri)

   शीतलहर म पशु क ध्यान केन्न रखे क चाही? (Maithili)

   शीतलहर में पशु के कइसे देख रेख करे के चाही? (Magahi)

   शीतलहर में पशुओं की देखभाल कैसे करनी चाहिए? (Hindi)

   How should you look after the animals during cold waves? (English)

5. शीतलहर से बचे के जानकारी कहां से मीलल? (Bhojpuri)

   शीतलहर स बचे क जानकारी कत्त स भेटत? (Maithili)

   शीतलहर से बचे के पता कहा से चलहई? (Magahi)

   शीतलहर से बचने की जानकारी कहां से मिली? (Hindi)

   From where did you know about the preventive measures that should be taken during cold waves?