Disaster Knowledge Transfer in Networks: Enablers and Barriers

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Agenda

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- Research Objectives
- Hedlund's KMM
- Methodology
- Findings
  - Enablers
  - Barriers
- Conclusions

Research Background

- Since UN has adopted the Hyogo Framework in 2005, South Asian countries have started establishing multi-stakeholder networks to respond to disasters
- However, recent literature still raise unresolved, alarming issues related to information and knowledge management in multi-stakeholder establishments in these countries.

Research Gaps

- Knowledge transfer in resource-deprived South Asian environments have not yet been fully addressed in literature
- Research Gaps
  - (1) How the knowledge of a certain disaster management stakeholder (or a group) is transferred to other stakeholders during disaster response
  - (2) What are the barriers and enablers of knowledge transfer in multi-stakeholder environments

Research Objectives

- (1) To provide insight into how different types of stakeholders involved in knowledge transfer and what kinds of knowledge transformations are required for the flood response
- (2) To understand how practices of these stakeholders develop barriers or enablers for knowledge transfer during flood response.

Scope of the Research

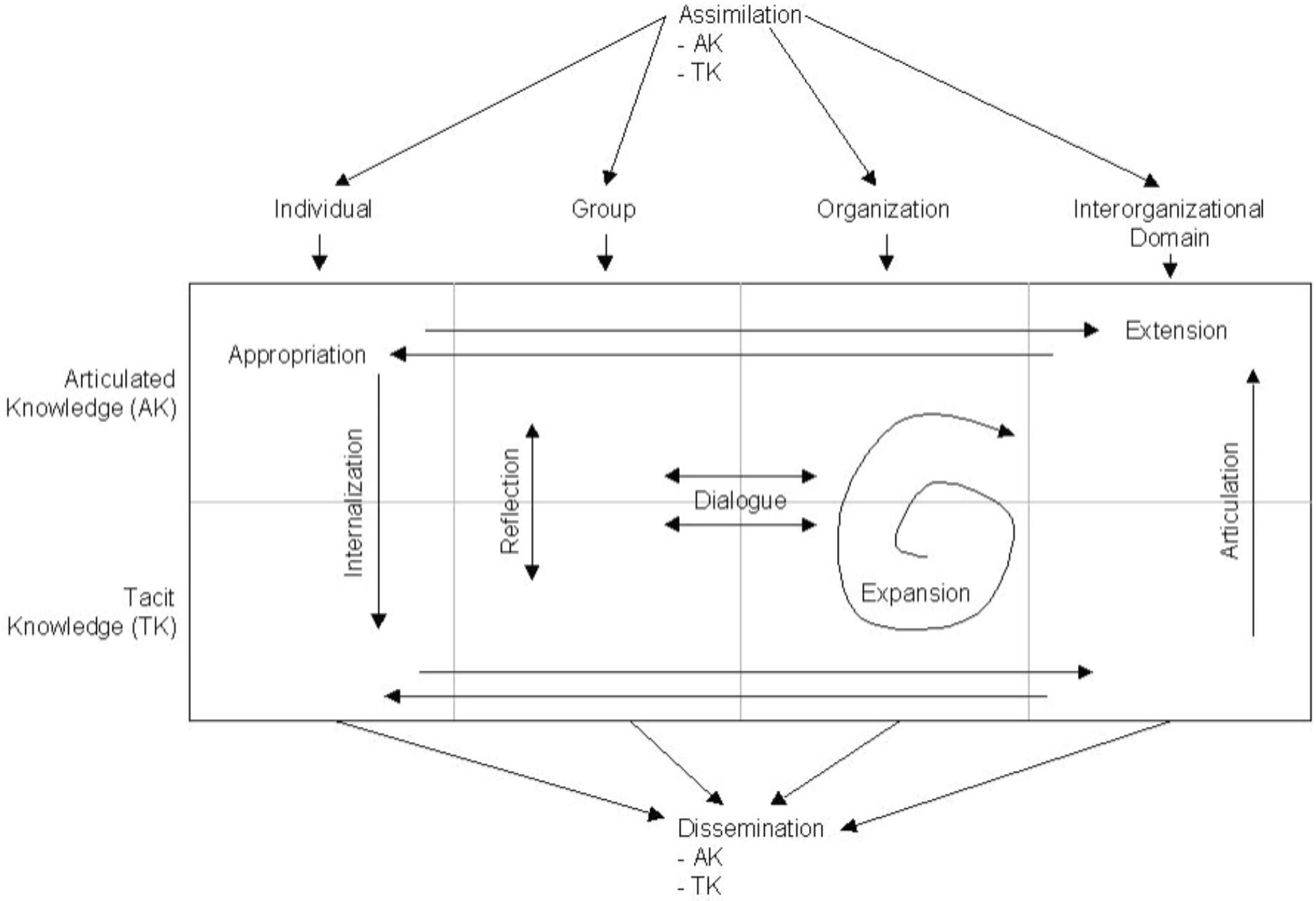
- Two case studies in a single geographical area (Ratnapura division of Sri Lanka)
- The analysis is conducted only on riverine floods
- This research concerns two levels of knowledge transfer,
  - (1) Knowledge transfer between individuals within a group
  - (2) Knowledge transfer between individuals and other groups (or organizational units)

Hedlund's KM Model – Knowledge Management in N-form corporations

- This article utilizes Hedlund's N-form Corporations model to evaluate the practices of stakeholders to recognize barriers and enablers for knowledge transfer during flood response

HKMM (Hedlund, 1994)

- Two types of knowledge (tacit and articulated)
- Four levels of carrier (individuals, small groups, organizations, the inter-organizational domain)
- The dynamics of knowledge transfer and transformation, which are articulated by the following processes:
  - Articulation and internalization, the interaction of which is reflection
  - Extension and appropriation, the interaction of which is dialogue
  - Assimilation and dissemination, which refers to "knowledge imports from and exports to the environment

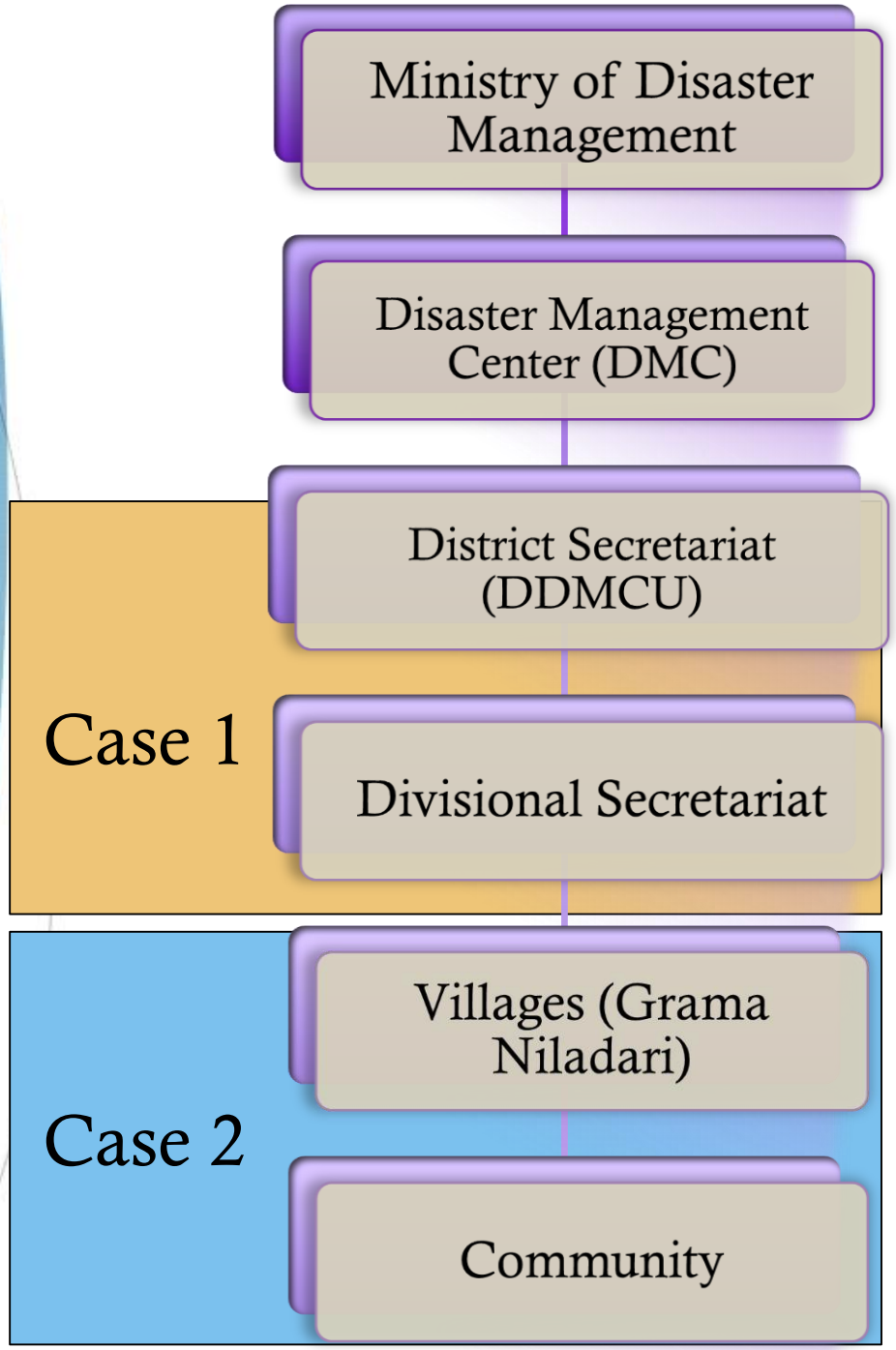

Assimilation
- AK
- TK
Individual
Group
Organization
Interorganizational Domain
Extension
Appropriation
Articulated Knowledge (AK)
Internalization
Reflection
Dialogue
Expansion
Articulation
Tacit Knowledge (TK)
Dissemination
- AK
- TK

Sri Lanka's National Disaster Management Framework

- Disaster Management Act (No.13) - 2005
- Sri Lanka's civil administration structure is divided into 25 districts
- Each district has an appointed district secretary
- Each district has several divisions, with each division also having a divisional secretary.
- The civil service structure manages the village level with Grama Niladari (Village Officers) who report to the divisional secretary.

Sri Lanka's National Disaster Management Framework

Selected Cases



Selected Case Studies

- **CASE 1 - DDMCU in the Ratnapura (District Level)**
- **CASE 2 - CBDMC in Marapana village (Village Level)**
  (Palmadulla division of Ratnapura district)
- The Ratnapura district has the highest number of flooding incidents in the past decade - 80 floods (DMC-SL, 2012)
- Floods significantly affected Ratnapura in 1913, 1940, 1941, 1989, 2003 and 2016
- The 2003 May flood caused 122 deaths, affected 34,473 families
- The 2016 May flood affected 14,031 individuals and damaged 287
- The flood situation is particularly devastating in this area because approximately half of the population live on a floodplain

Methodological approach and Data Collection methods

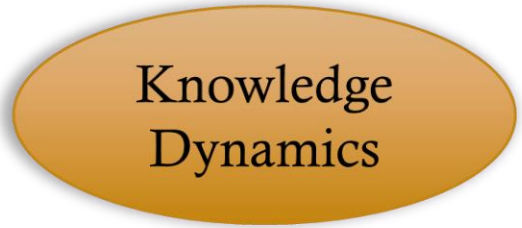
- Methodology – Interpretive Case Study methods (Two Disaster Drill exercises – Table top exercise and flood map development)
- Employs the process of Building Theory From Case Study Research proposed by Eisenhardt (1989)
- Purposive sampling - the Critical Case Sampling strategy
- Participant observation was employed as the primary data collection method (Direct observations and video recording)
- Glaserian strand of GROUNDED THEORY METHOD (Glaser & Strauss, 1967) was used for data analysis
- Three-stage coding process (open, selective and theoretical coding)

Data Analysis

- The coding process commenced with the line-by-line coding, and the process developed seventy open codes.
- Once the analysis reaches a level where no further open codes formed, the open coding stage was ceased, and the selective coding stage commenced.
- Three main themes were developed.

Interactions between stakeholders that belong to different groups

Interactions among stakeholders that belong to a single group.



Different procedures and methods that various stakeholders followed to facilitate knowledge transfer

Findings

Appropriation and Extension

Hedlund's KMM identifies

- **Appropriation** - the process of transferring knowledge from higher agency levels to lower agency levels
- **Extension** - the transfer of knowledge from lower to higher agency levels

Appropriation and Extension

- Case Study shows the existence of a hierarchical functional structure (DMC → DDMCU →Div Sec → GN → Community)
  - **Top – Down knowledge transfer → Appropriation**
    - Functional knowledge is passed down the line in the exact descending order of functional hierarchy
    - Some knowledge articulation Practices, but mostly knowledge is kept tacit
  - **Bottom – Up knowledge transfer → Extension**
    - Very few knowledge articulation Practices, largely tacit knowledge

Enabler 1

- The established structural stakeholder network and the developed functional hierarchies (Top-Down and Bottom-Up) found as an enabling factor

However…

- The case study demonstrates a knowledge block between District level and Village Level stakeholders
- A limited knowledge transfer between the two functional groups

DDMCU

Distance

Community

Barrier 1

- Very limited dialogue between the two groups
- As the two groups are functionally apart, it's difficult to transfer community's local and indigenous knowledge to DDMCU
- Similarly, the articulated functional knowledge of higher authorities does not sufficiently reach the lower level agencies and community

Articulation and Internalization

- Articulation → Tacit knowledge being made explicit, or articulated
- Internalization → Articulated knowledge becomes tacit

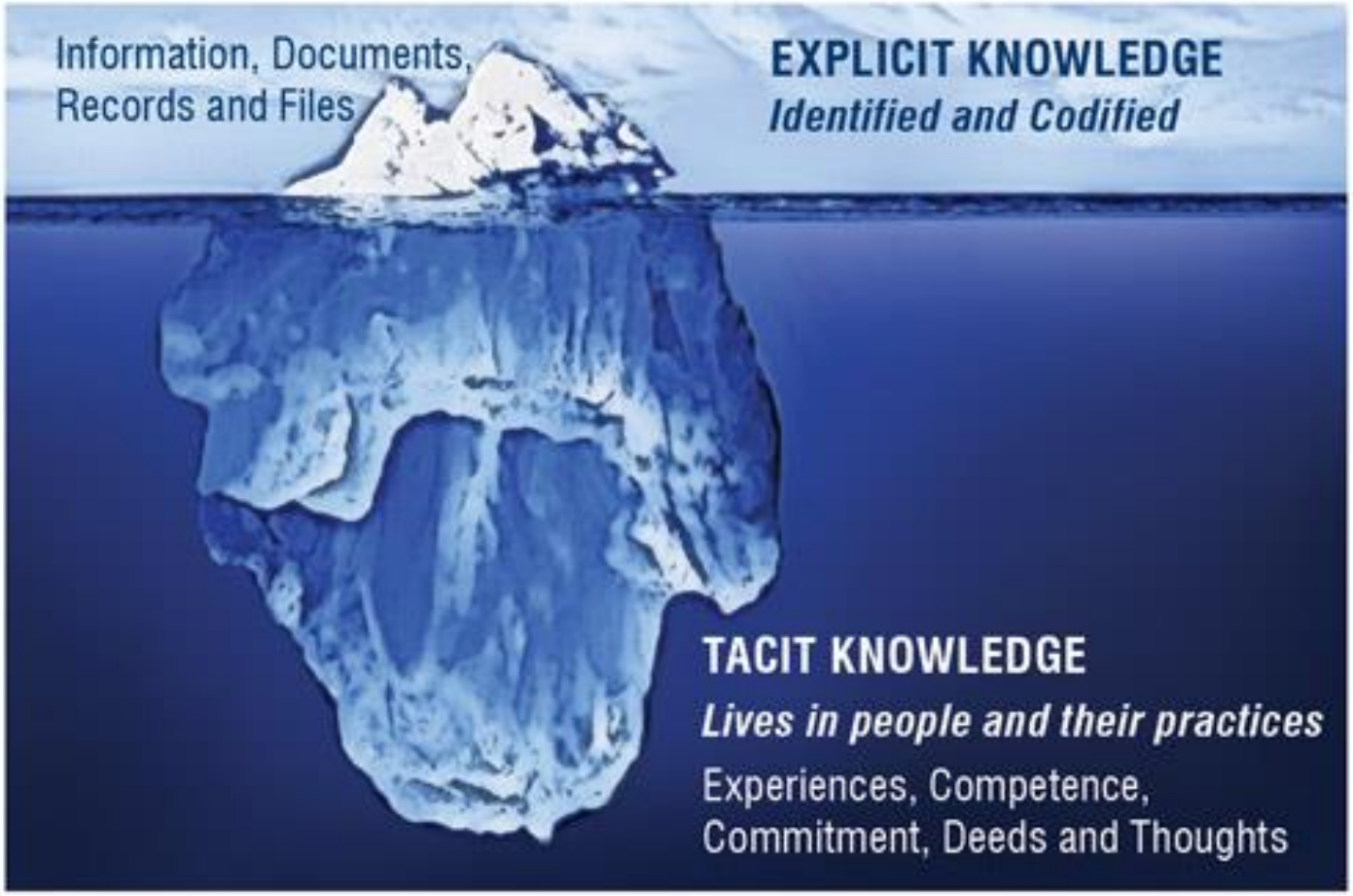
Articulation

Functional knowledge transfer:
Dissemination of knowledge essential for the formal operation of disaster management activities flows in the functional hierarchy

Voluntary knowledge transfer:
Dissemination of tacit knowledge by one's own free.

- Local administrative officers engaged in the functional knowledge transfer
- Functional KT – Articulated (35%), Tacit (65%)
- Community members and administrative officers engage in Voluntary KT - Articulated (5%), Tacit (95%)

Tacitness



- Voluntary knowledge does not involve articulation (Tacit K → Explicit K)
- Tacit knowledge will be easily forgotten and lost during the knowledge transfer

Internalization

- Knowledge Internalization (i.e. articulated knowledge becomes tacit)
- The DDMCU stakeholders found to follow the some of the aspects of SOPs and district level disaster plans, hence Internalization was seen
- It was also found that couple of forms and memos are been circulated among disaster responders
- However…. The attepts towards arculation kept minimum during disaster situations

Barrier 2

- The absence of methods to articulate the community's local and indigenous knowledge (voluntary knowledge) is recognized as one of the prominent barriers in the considered context

Tacitness

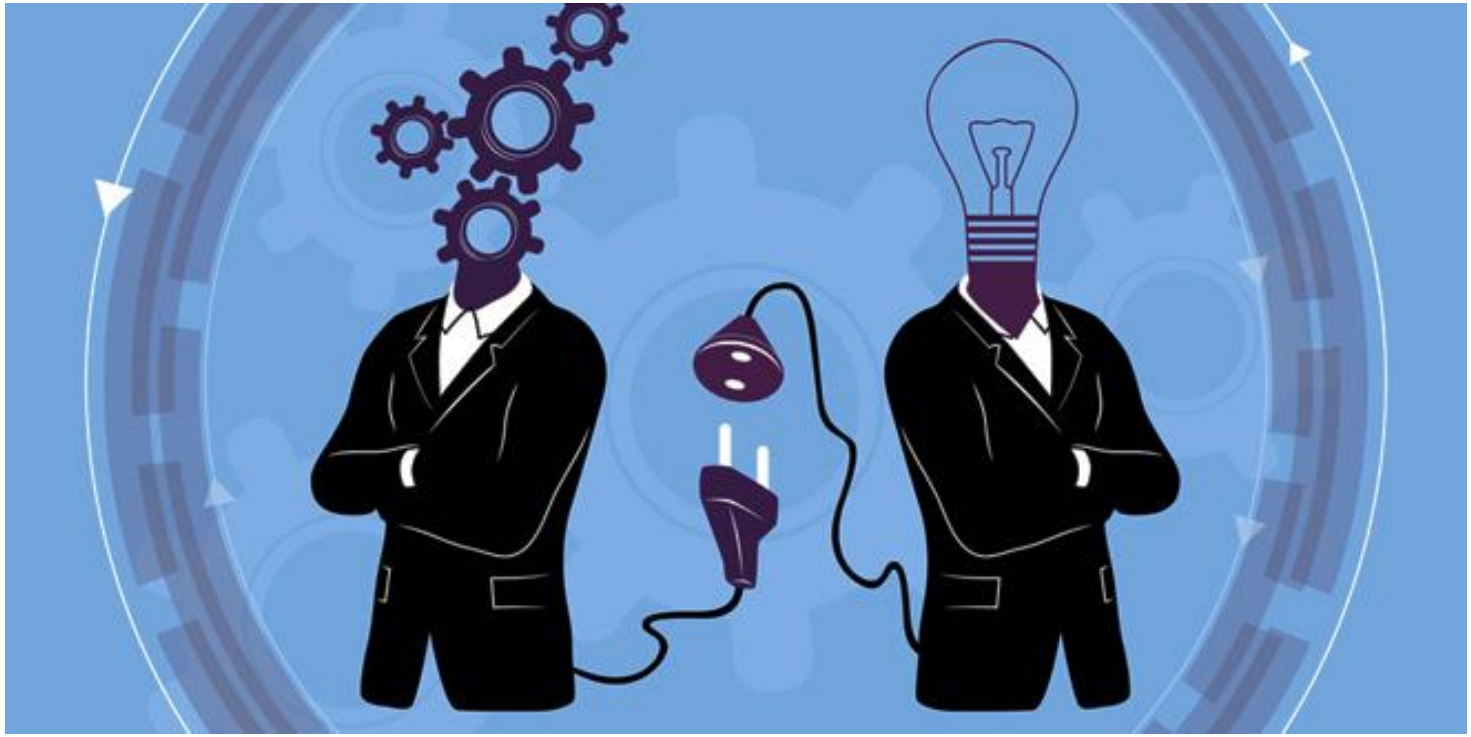
- Case study finds existence of strong bonding relationships between the close acquaintances within functional groups
- If stakeholders are known to each other by sharing some functional experiences before and that support effective KT during a disaster situation

Enabler 2

- Having strong bonding relationships among the functional groups has served as a strong enabler of the disaster knowledge transfer (Tacit KT)

Assimilation and Dissemination

- Knowledge imports from and exports to the environment



Assimilation and Dissemination

- Stakeholders improvise the existing knowledge to implement their disaster management functions and share the function-related knowledge with others

Enabler 3

- The stakeholders' practices of relying on personal connections fuel the knowledge transfer capability as tacit knowledge is intrinsically transferred through the close associations of experience, intuition, or opinion sharing.

Dependency

- Observations of this case study indicated that DDMCU stakeholders demonstrated a high dependency on other stakeholders for the completion of the tasks they are assigned to
- Some stakeholders refrained to initiate the tasks that they are assigned to until they receive an outcome or knowledge from another stakeholder.

Barrier 3

- This high dependency demonstrated some serious shortcomings towards knowledge transfer, including delays in their operations, reduced the efficiency of response and recovery procedures.

Dependency vs Combination of knowledge (rather than its division)

- To establish an effective knowledge transfer it is required to reduce division of knowledge transfer responsibilities and should aim at combining pieces of knowledge
- Hedlund (1994) further argued that dividing the complexity into units which are independent of each other does not produce much novelty.
- **Dividing stakeholders into separate knowledge units has resulted in a significant barrier towards effective disaster knowledge in this case study**

Contributions

- Some of the findings (say barrier 1 and 3, enabler 1 & 3) partly or fully verify the existing literature.
- This paper also serves as a validation of the use of HKMM model in the disaster management context.

Future Research

- To incorporate other data collection methods in triangulation
- To continue the third stage of GTM (theory building)

Concluding Remarks

- Having strong bonding relationships among functional groups has served as a strong enabler of disaster knowledge transfer
- Absence of methods to articulate local operational practices has is turned as one of the main barriers
- This paper proposes the importance of establishing government efforts to develop stakeholder associations between DDMCU and community

Q & A