



GAMES

FOR STRATEGY EXPLORATION IN PERI-URBAN DRINKING WATER PROBLEMS

Sharlene L. Gomes

PERI-URBAN KHULNA

Khulna City

- 3rd largest city in Bangladesh
- Experiencing rapid & uncontrolled urban expansion
- Groundwater is the primary source of water
- Pressure on groundwater due to urbanization
- Over-exploration, contamination, competition



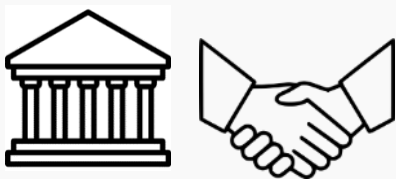
Peri-urban Khulna

- Growing demand for groundwater is affecting peri-urban communities
- Transition zone (Changing land use, economic activities, population)
- Lack access to safe drinking water supply

FACTORS TO CONSIDER DURING PROBLEM SOLVING

a. Complex institutional set-up

- Institutions are 'rules'
- Rural institutions unable to cope with changing peri-urban needs
- Fragmented, overlapping formal and informal rules



b. Multi-actor problem

- Actors with different perspectives, needs, & interests in the problem
- Problem solving requires negotiating with different actors



c. Dynamic boundaries

- Urban expansion in Khulna city
- Communities might become part of urban jurisdiction
- Future problem scenario: actors, rules, & options

PROBLEM SOLVING GAP

Solving drinking water problems

- Find alternate strategies OR
- Invest in institutional change (more suited to peri-urban needs)
 - Transformative change

Constraint faced by peri-urban communities

- Isolation from decision-making centres
 - Limited institutional knowledge
 - Negotiation experience



OPPORTUNITY

Support community's problem solving efforts

- Improved problem understanding: institutions, multi-actor context
- Strategic insight : explore different problem solving options
- Goal: Informed decision-making and negotiations

Serious games

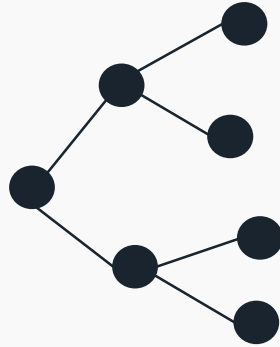
- Virtual medium for strategy exploration
- Role-playing games can facilitate learning about different actors involved





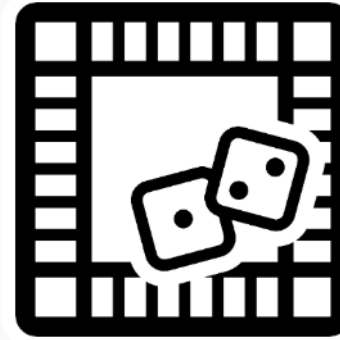
Game inputs

- Players
- Actions
- Resources
- Values



Construct GT models

Structure problem as strategic 'games' using game theory models



Create role-playing games

Translate models into role-playing games

- Game board
- Player materials
- Game scenario



Facilitate workshops

Conduct strategy exploration workshops with community.
Evaluate participant learning, game, workshop.

GAME DESIGN

GAME SESSIONS



01 Peri-urban drinking water situation

Explore strategies to address drinking water supply. Game represents the present situation.



02 Urban drinking water situation

Explore strategies to address future drinking water supply following urban expansion.



03 Groundwater monitoring situation

Explore groundwater monitoring to understand drinking water quality. Compare existing (non-cooperative) water quality monitoring strategies vs alternate (cooperative) strategies.

IMPACT ON COMMUNITY LEARNING

Improved problem understanding

- Discovered new problems, actors, institutions
- Realised that the community also has a role in problem solving (eg. Groundwater monitoring)
- Built negotiation experience



Serious games

- Visual tool
- Understand other actors in the problem
- Experience the challenges of negotiating
- Easy to relate 'game' to real-world problem

Workshop

- Interactive discussions of complex problems
- Training of facilitators is important (new skills)
- Participants need time to familiarize with game materials



CHALLENGES OF SERIOUS GAME APPLICATIONS

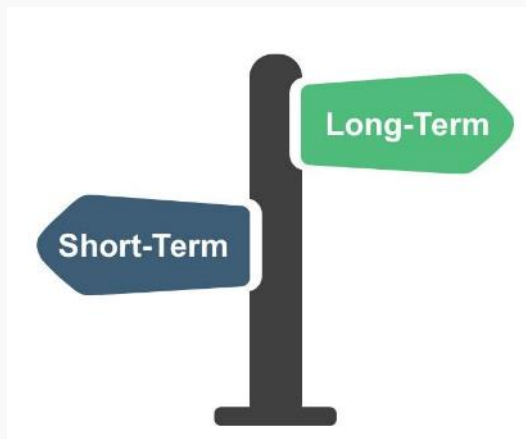


Context specific games

- Needs of problem owners
- Understand community profile
- Language, educational backgrounds, social composition
- What kinds of games are they familiar with?

Games for transformative change

- Reality: Institutional change is slow moving
- Short term impact on learning
- Difficult to measure long-term impact on problem solving



Game design requires balance

- System complexity vs playability
- Defines scope/ boundaries



More information about this game can be found here:

Gomes, S., Hermans, L., Islam, K., Huda, S., Hossain, A., & Thissen, W. (2018). Capacity Building for Water Management in Peri-Urban Communities, Bangladesh: A Simulation-Gaming Approach. *Water*, 10(11), 1704.

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Email:

S.L.Gomes@tudelft.nl

ResearchGate

https://www.researchgate.net/profile/Sharlene_Gomes