

I am Ad de Bruijne, professor emeritus of the University of Amsterdam and from the first start involved in the Edulink program. Today, as said before, I am not presenting my paper but that written by my colleague Isa Baud who unfortunately cannot be present here these days.

The paper is focusing on water management by households. It is based on fieldwork done last year by two Amsterdam students in Georgetown as well as Paramaribo.

The main point is how do households perceive several natural hazards linked to climate change in those cities, cities in low elevation coastal zones (LECZ)s where a major portion of the population is located in cities. We look at the question of how experiences of specific natural hazards – heavy rainfall, flooding (also linked to drainage capacity) - interact with already existing inequalities within the urban populations, to create patterns of vulnerability among households, and how households perceive such risks, and act individually and collectively to counter them.

The reason for taking a household perspective is that vulnerability to natural hazards is very often unevenly divided between social groups, being related not only to the hazards in question, but also to the uneven distribution of entitlements to socio-economic resources. Households are active in developing their own resources where possible, and their perceptions of the risks they run are essential in understanding how they can/will act individually and collectively to build household resilience.

Conclusions: comparing Paramaribo and Georgetown

In both cities, low and higher-income neighborhoods were compared in terms of their exposure, resistance and adaptive capacity in reaction to natural hazards which are seen as part of climate change processes. The neighborhoods showed clear differences in terms of residents' education levels, occupations and type of houses in which they lived. In both cities, higher-income areas tend to either build ground-floor houses, or two-story houses with the ground floor also being used as living space. In Paramaribo public services are generally available, in Georgetown both types of neighborhoods experience difficulties in accessing public services.

In terms of exposure, households in both low and higher-income areas are regularly exposed to floods in both cities in the rainy season. In their perceptions this is due to combination of heavy rainfall and badly functioning drainage systems in their cities. Extreme floods in recent years have led a majority of households in both cities to perceive floods as a threat for the future, related to more general perceptions of flooding as part of future climate change. Particularly the perception that rainy seasons are becoming irregular, and volumes of rainfall heavier and more intense worry residents. Sea level rise, combined with floods, is perceived by higher-educated households as a future risk.

Households in lower income wards are more vulnerable to floods and experience more (negative effect of) floods. Particularly, their exposure through the length of time their areas are flooded is longer and more extensive than in higher-income neighborhoods. Interestingly, the classic tradition of building on stilts has offered protection to lower-income households in terms of their exposure to floods. This could be a recommendation to city governments – to promote adaptive building styles to prevent future flooding.

The most important negative effects that households experience are time lost from work or school, damage to house and property, health problems, and stress about the effects of flooding. Households in low-income areas experience more damages and have to invest in repairing interiors and furniture.

Households in lower income areas generally take more action to prevent their houses and surroundings from being flooded (resistance), than households in higher income areas in both cities. The most common form of resistance by households against flood risk is individually raising the level of yards, building a barrier at the door against floodwaters, and cleaning surrounding drainage canals, rather than waiting for local government to do this. In low-income areas in Paramaribo, government is also contacted as a preventive measure to clear canals. In Georgetown, low-income households also take preventive measures in terms of clearing away furniture when flood threaten.

When a flood occurs, households help each other at the neighborhood level, more so in low-income areas than in high-income areas. Households generally do not contact local government during or after floods. They work individually to clean and repair their homes. Households are pro-active towards the dangers of floods, but mainly at the household level. Collective action is low in neighborhoods in Georgetown and Paramaribo, and there are few 'formal' organizations. Cooperation between municipality and residents is limited. This suggests that their adaptive capacity is limited by the household level strategies they utilize, and that wider adaptive capacity at neighbourhood and city level still remains to be built up.

A majority of the households currently perceive climate change as increasing irregularity in the rainy seasons, and some link it to expected sea level rise in the future. The majority do not expect local government to be able to reduce flood problems in the future.