Sustained building in low-lying areas or not?

This article has been published online in Dutch at Gebiedsontwikkeling.nu at May 11, 2023.

Martine van den Boomen (Hogeschool Rotterdam), Audrey Esteban (TU Delft), Maged Elsamny (TU Delft), Vera Konings (Gemeente Rotterdam), Dana Huibers (Gemeente Dordrecht), Gerben Mol (AMS Institute), Sascha Stolp (Gemeente Amsterdam), Kasper Spaan (Waternet) & Ellen van Bueren (TU Delft)

The Living Labs Greater Rotterdam and Greater Amsterdam are the real life urban laboratories and test beds of the RED&BLUE transdisciplinary knowledge agenda and impact program. The RED&BLUE research program focusses on the development of integrated real estate and infrastructure climate risk strategies for urban Deltas. The living labs are crucial for identifying the urban climate challenges, translating these challenges into applied and scientific research questions, demonstrating and validating the research results in practice, and finally in consolidating the findings into integrated climate adaptation strategies and ensuring their long-lasting implementation.

These ambitious objectives can only be reached in co-creation and joined learning with the stakeholders involved and require a good understanding of the context of the urban climate challenges. This context was explored through focus group research with the purpose to identify the key questions underling each of the urban cases to be identified.

Photograph from Markus Christ via Pixabay

Focus group research question

Flood risk, extreme rainfall, soil subsidence, drought and heat stress are already felt by citizens living in areas prone to risks. Although the future is uncertain, it is inevitable that current climate risks will increase. Still we continue to build in low-lying areas. In four focus group discussions we explored with the participants why we should stay or move. "Should we move to higher grounds or protect our urban delta against climate change?"

Photograph from Alfred Derks via Pixabay

Method

The audience (governments, investors, constructors & scientists) was divided into two groups based on whether they supported or opposed building in low lying areas. The participants of each group were asked to produce and share their argumentations through collective brainstorming. The arguments were written down on sticky notes. After saturation of arguments the groups were switched, participants in favour were asked to produce argumentation against and vice versa. Hereafter, the groups presented their findings collectively which contributed to understanding of the arguments and the overall direction on how to move forward. Afterwards, the arguments were analysed and classified by the researchers in six key arguments for the two extremes which are displayed in Figure 1.

As for method, an interesting observation is that 75% of the participants chose for building in low-lying areas while 25% preferred to move to higher grounds. Another observation is that arguments produced by the two groups were similar and not differential in quantity. As such, the group in favour of building in low-lying areas produced upon request an equal number of arguments against building in low-lying areas and of similar quality as the group originally in favour of moving to higher ground did. This indicates that participants quite well understand each other's perspectives. The preferences are therefore subscribed to the value participants attribute to the arguments.

The focus group discussions are summarised in the following sections. We emphasise that the arguments are views and opinions of participants.

Why should we stay?

Citizens do not want to move. People are deeply rooted in their areas and have a history of living and working there. People are even prepared to deal with the known consequences of climate risks as is illustrated by the community at Noordereiland in Rotterdam, where inhabitants deal with manageable flooding. Forcing people to leave to higher grounds may result in a revolution and political instability, according to one of the participants.

Moreover, Dutch people have been living with water since ages. Most Dutch people live below sea level and are protected by an ingenious system of dikes and storm surge barriers. Land has been reclaimed from the sea and giving up land to the sea feels as a defeat. Dutch people are proud of their history and knowledge on dealing with flood risk. We did it in the past and we can do it in the future. This is who we are, our identity and our trademark on a global scale.

It is also too costly to move. The ports and most of the industries are concentrated in the urban delta which also houses the majority of the people. These activities have led to development of infrastructures, businesses, living areas but also cultural values and tourism. The cosmopolitan urban deltas are a magnet for future development. We cannot just pick-up developed areas and position them elsewhere. Moving to higher grounds would result in huge disinvestments, destruction of capital and cultural heritage.

When not properly planned and managed moving to higher grounds will increase climate gentrification and injustice. The wealthier people are the first to be willing and able to move to higher grounds. Less investments in the urban delta will increase the climate risks and lower the value of properties. As consequence, the urban delta will gradually impoverish, forcing the less wealthy people to concentrate in these areas prone to increasing risks. To prevent climate gentrification and injustice, the urban delta should be protected and differential migration discouraged.

The idea for moving to higher grounds collectively also assumes that the Netherlands has an abundance of space. This is felt to be a misconception. Simply put, the Netherlands needs the space reclaimed from the sea in the past. The areas prone to flooding comprise 60% of the Netherlands. Imagining that the entire county can grow and develop in the remaining 40% is challenging. Moreover, concentrating high-dense building in the urban Delta will preserve our green-corridor and our National Ecological Network in the higher areas.

Finally, staying also brings great opportunities as it allows for becoming a truly resilient and adaptive society, while embracing uncertainty. Living with water can become our greatest export product.

Photograph from Mabel Amber via Pixabay

Why should we move?

It may be too risky to stay. The uncertainty of climate scenarios and their consequences is huge. At present climate change is largely approached as a series of probable single unwanted events to deal with, while the combined probable events and their interdependencies may be overlooked. Waiting for that catastrophe may result in avoidable casualties, but also in diminishing our current action perspective.

In line with underestimating climate risks, we may overestimate our capability to manage the climate risks. Being successful in the past does not automatically guarantee our success in the future. The future climate challenges are much more complicated than protecting the urban delta against flood risks. Is it for example technically possible to sustain long term dense building while dealing with soil subsidence and lowering the groundwater level, and raising the levees?

It is too costly to stay. Huge investments are required to sustain living in our urban delta. Higher dikes and reinforced storm surge barriers are required, but also dams, sluices, massive pumps to discharge excessive water and retention reservoirs. Moreover, soil subsidence will have an enormous impact on foundations of buildings and infrastructures, for which costly solutions need to be implemented. Keeping the dense cities liveable also requires investments in local climate adaptation measures, for example to prevent heat islands, to deal with excessive drought and excessive rainfall.

Staying in the urban delta will increase climate gentrification and injustice. Climate adaptation measures are costly and will impact ground and property prices. Inevitably segregation in climate risk areas will occur within the urban delta. The less wealthy people will concentrate in those areas where climate investments stay behind and also bear the remaining risk cost of unwanted climate events.

Moving to higher grounds offers huge opportunities. The Western part of the Netherlands can be developed into a beautiful nature reserve. Wetlands are scarce, offer unique ecological properties and are extremely important for healthy eco systems, also from a global point of view. Besides, a natural wetland offers a very solid natural flood defence.

Another great opportunity of moving to higher grounds is the redistribution of functions in spatial planning. Basically, we can dream all over again in largely a greenfield and take advantage of the lessons learned in the past. It will result in a much more effective and efficient use of space. Spatial planning can become our greatest export product.

Photograph from Elsemargriet via Pixabay

Table 1. Clustered argumentation for sustained building in low-lying areas or moving to higher grounds

Why should we move to higher grounds?	Why should we protect our urban delta?
• It is too risky to stay • It is too costly to stay • We must prevent climate gentrification • We want to preserve and develop our wetlands • We cannot manage the risks • Opportunity for better spatial planning	• People do not want to move • It is too costly to move (disinvestment) • We must prevent climate gentrification • We want to preserve our green-corridor • We can manage the risks • Opportunity for becoming adaptive, resilient while embracing uncertainty

Conclusion

After a plenary discussion it became evident that each extreme scenario intends to serve the same needs: a safe, prosperous and sustainable environment for society with a fair distribution of risks and costs among all stakeholders. The debate is mainly on the strategy on how to reach those needs. The municipality of Rotterdam for example explicated three strategies for dealing with flood risks in the unembanked areas: protect against flooding, live with the tide, and diminish the tide with a dam. The municipality of Dordrecht highlighted the development of the *Maasterras* area, situated in higher grounds, as a shelter location in case of flooding. The municipality of Amsterdam emphasized that people do not want to move and need to be kept safe, which they will expect their (local) government to take care of. Opportunities are seen in spatial adaptive pathway principles that can facilitate both extreme scenarios. Elevation based development principles are also a possible solution in low-lying areas.

Afbeelding van Hans via Pixabay

The municipalities pointed out that sustained living in low lying areas is considered feasible as long as timely climate risk mitigation measures are taken and climate risks are adequately communicated with citizens. However, to avoid a lock-in, proactive integral spatial planning mitigating climate risk is required.

To develop such integrative approach, the participants came to the following concluding key underlying questions: How are future climate risks distributed among the wide group of stakeholders? Are stakeholders aware of their risks? How can climate risks be communicated effectively? Who is responsible for mitigating the climate risks? Who pays for mitigating risks, how much and when? How can we collectively and proactively manage the necessary transitions, take advantage of our current action perspective and avoid being taken over by events?

The greater Rotterdam and Amsterdam living labs will continue developing answers for these questions by connecting the urban cases to the research in the RED&BLUE project.

Photograph from David Mark via Pixabay

We thank the participants for their lively contribution. The participants of the focus groups contributed on an individual basis and were affiliated with the following organisations: AMS Institute, Bouwinvest Real Estate Investors, Fakton Consultancy, Blauwhoed, Gebiedsontwikkeling.nu, Gemeente Almere, Gemeente Dordrecht, Gemeente Rotterdam, Gemeente Amsterdam, Heijmans Woningbouw, Hogeschool Rotterdam, Hoogheemraadschap De Stichtse Rijnlanden, Provincie Noord-Brabant, Raad voor de leefomgeving en infrastructuur, Rabobank, Rijksvastgoedbedrijf, SADC, Stichting Kennis Gebiedsontwikkeling, TU Delft, Waternet, Waterschap Amstel, Gooi en Vecht

We also would like to acknowledge Louis Nelen, Abdi Mehvar, Arthur Verwayen and Tom Daamen (TU Delft) for their contribution to this session at the Annual SKG conference 2023.

This publication is part of the research project RED&BLUE: Real Estate Development & Building in Low Urban Environments (NWA.1389.20.224) of the NWA-ORC research program financed by the Dutch Research Council (NWO).