

## **Regional development & Globalization: Best Practices**

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### **Simulating Urban Redevelopment to Explore Sustainable Urban Development Pathways**

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In many low-lying, urbanized Delta regions the chances of flooding and the damage this would bring are of great concern. In highly developed countries like the Netherlands, strategies aimed at reducing flood risk have hitherto focused on reducing the chances of flooding, e.g., by building extensive flood defense systems (levies etc.). These systems, however, are never completely flood-proof. Further increasing their defence capacities is getting increasingly difficult and costly. At the same time, the economic value and population concentrated behind these barriers is growing, thus further increasing potential flood damage. Indeed, especially if indirect effects (i.e., beyond the value of individual lives and buildings) are into account, this damage could be devastating. Depending on the (political) question of what chances and damage would be 'acceptable', this may well justify a shift of focus from minimizing the (regional) chances of flooding to mitigating its potential (local) effects.

This shift of focus would imply a move towards measures aimed at the parcel or neighborhood level. Especially within current built-up areas, however, these measures may be highly expensive. At the most extreme, they may require valuable properties vulnerable to flooding to be torn down and replaced by new properties build on elevated plots, poles etc. In particular circumstances, however, potential damage reduction may be achieved a lot more efficiently, e.g., by first redeveloping those plots which' redevelopment would require relatively low transition cost, or by first targeting plots which redevelopment would at the same time contribute to other public goals, like CO2 reduction or urban reinvigoration.

The issue is that the (cost) effectiveness of these measures strongly depends on both present local land-use patterns as well as the expected future change therein. These dynamics can be explored using the Land Use Scanner model. At present, this model only simulates dominant local land use (residential, agricultural etc.). In order to properly assess these measures, we need to go beyond this and simulate the underlying dynamics of the actual structures (building types, density, value etc.) that constitute the urban fabric. Our paper introduces a land-use modelling framework that takes this approach, and demonstrates its value by applying it in the above context.

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**R14 - Land Use Patterns**

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