

Urban Resilience through stocks: Static and Dynamic analysis

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Abstract

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1 Introduction

Security is classically one of the intangible assets that sovereign states are most keen to have. The Institute for Security and Open Methodologies defines security as “a form of protection where a separation is created between the assets and the threat” Herzog (2006). However, security has been evolving from the militar-centric notion to a wide scope of areas where a society can suffer damage, e.g. economic security, energy security or environmental security. Along with security concerns comes the interest in preventive concepts such as resilience. From the urban planner perspective, resilience is ultimately linked with the well being provided to dwellers in the face of a socio-economic disruptive event (either with positive or negative consequences). In this work we aimed at providing different measures of resilience both from a static

(input-output analysis) and a dynamic models (system dynamics).

Resilience in social-ecological systems has been studied in several approaches from more ecological-centered (Holling (1973)) to more

Urban metabolism as a metaphor has been around for quiet a long time now (Wolman, 1965) and the research around it has evolved towards some specific methodologies for urban areas analysis. The majority of the analysis in the area of Urban Metabolism today is linked to *Material Flow Analysis (or Accounting) (MFA)* essentially as a tool compare regions performances in what regards to their demands, waste discharges or emissions. One of the many uses of MFA studies can be the production of input data for formal predictive models.

Another important concept that is usually linked to urban metabolism is the self sustainability appraisal. Self sustainability is a broad concept which is largely translated (i.e. reduced) to self sufficiency, and should be gather more efforts for a formal definition. For this work, *resilience* is the key concept to assess the (self) sustainability of urban areas.

In this work I'll be focused on defining the conce

These models In this paper i'll propose some definitions, concepts and methodologies to the citys' metabolism (analysis) should be put to its own rescue

However not many authors have settled their opinions

2 Definitions

2.1 City

Plain text!!

3 Concepts

3.1 Urban Services

More plain text.

4 Methodologies

4.1 Measuring Resilience

4.2 System Dynamics

5 High resolution Input Output coefficients

For the kind of resilience measurements at aim in this work arises the need for input output in very small regions (i.e. civil parishes (*port. freguesia*))

The construction of input output matrices for very small regions or even individual entities is a disaggregation exercise which has to be performed with the proper caution since a lot of assumptions

Where survey-based information on regional sales and purchases is unavailable, the regional modeller often has to use simple (e.g. employment-based) location quotients (LQs) to derive estimates of regional input-output coefficients from national tables.

(justify the use of location coefficients)

References

- Herzog, P. (2006). *Open-Source Security Testing Methodology Manual v2.2*. Institute for Security and Open Methodologies.
- Holling, C. S. (1973). Resilience and Stability of Ecological Systems. *Annual Review of Ecology and Systematics* 4(1), 1–23.
- Wolman, A. (1965). The metabolism of cities. *Scientific American*, 276–296.