

The *LiveDesign* Paradigm

Synthesizing Qualitative Policy Statements with Quantitative Economic Measures

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Based on *combinatorics of words*, a novel approach is introduced to study the temporal evolution of policy strategies in an *algorithmic sense*.

Hitherto all models yield restricted qualitative output.
The model on four word alphabet (described below) will stimulate research and will be of interest for practical use.

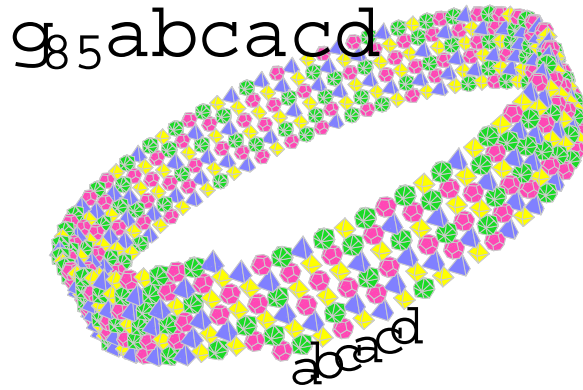


Figure 1: Development of an Abelian Square-free Chain depicting sustainable development parameters:



Quantification of sustainability

The morphism (function in the conventional sense of calculus) is denoted by g . Its arguments are initial letters of the chain. The next set of characters are defined by g , and an illustration of rule 85, ref. [1] is in Figure 1. A segment is defined to be Abelian square-free if no two adjacent parts are identical after permutation. Within the context of *combinatorics of words* a strategic layout of the succeeding characters will attribute such (hard to construct) Abelian square-free patterns.

It has been conjectured that during the policy development a sequence of steps (dictated by a morphism g) are followed. The sustainability of the socio-economic model (simplified by the four characters of *nutrition, sanitation, education and recreation* – as the basic building blocks) is depicted by the evolving chain. The degree of compliance to the Abelian square-free characterization furnishes a quantitative measure of sustainability. Hence a quantitative value symbolizes the *path for a policy*.

This application of pure mathematics in socio-economic policy analysis typifies the intellectual merit of this multi-disciplined workshop. An NSF proposal and a PhD dissertation will result based on the recommendations of the participants incorporating classical results from *theoretical computer science* ref. [2].

References

- [1] Veikko Keränen. *Abelian Squares are Avoidable on 4 Letters*. ICALP Press, 1992.
- [2] B. Mossé. Reconnaissabilité des substitutions et complexité des suites automatiques. *Bulletin de la Société Mathématique de France*, 124:329–346, 1996.