

## **METABOLIC APPROACHES TO URBAN SUSTAINABILITY (Juanjo Galan)**

### **THE CONCEPT**

- How to define the “ideal” urban metabolism? Other consideration apart from footprints (e.g. social)?
- Can the urban metabolism be flexible? Somehow it defines a final stage... can it reinvent itself?
- What is the difference between systems analysis and flow (metabolic) analysis? Is the metabolic approach a measurement of the functioning of systems?
- How to fix a goal in the beginning? Who can change it on the way (planners, inhabitants)?
- Can metabolic approaches support urban homeostasis? Can homeostasis be connected to urban health? People grow and die, cities grow and change
- Is the ecological footprint a kind of Material Flow Analysis per capita?. That would facilitate the comparison between cities

### **LIMITS & SCALES**

- Do metabolic methods differentiate between nodes and connections of a system when connection flows to physical or geographical entities?
- How relevant is the city structure and its functioning in understanding urban metabolism? How can we deal with flows which traverse spatial units? How can we define the limits of the studied flows?

### **WHICH FLOWS? HOW DO THEY INTERACT?**

- How much does the study conclusion depends on the flows that you examine? On which grounds should you choose the flows that you study in each case?
- 4<sup>th</sup> dimension?: Visualizing and measuring the interaction between flows?
- Bio-inspiration? Do we have examples of circular metabolisms in nature?
- Due to the connected nature of an-made systems, is it always better to work in large scales?
- How could we integrate several flows models into a synthetic model?

### **PEOPLES INVOLVEMENT**

- Should there be other methods promoting bottom-up approaches to metabolic studies?
- How can locals be involved in metabolic planning processes?

### **USE & IMPLEMENTATION**

- How can individuals, communities, cities, planners and decision-makers use metabolic studies?
- How crucial or necessary is for this tool to be integrated in policy making?

### **SOCIO-CULTURAL DIVERSITY**

- How does the socio-cultural context of a city influence in its ecological footprint? Area there cities that because of their spatial structure or socio-cultural are less sustainable?
- How to quantify the effect of different social structures /ways of living in the urban metabolism?
- How crucial or necessary is for this tool to be integrated in policy making?

### **WHICH TEAMS**

- What would constitute the most efficient team to run a Material Flow Analysis of one city? (cross-disciplinary analysis)

## **ENVIRONMENTAL ECONOMICS vs. ECOLOGICAL ECONOMICS (Milutin Stojanovic)**

### **ECONOMY AS METABOLIC PROCESS**

- Is economy a specific dimension of any socio-ecological system? (related with transformative processes within the metabolism of the system?)
- Physics, Entropy, Ecology and Economy?
- Is the existing land the main limiting factor? What about energy? What about increasing the carrying capacity of the available land? (Malthusians vs. Cornucopians?)
- Can “genuine” digital economies reduce the material intensity of the economy and support less-material wellbeing?
- How can it be that the carrying capacity is not so essential to economics? (financial vs. real economy?)
- Can metabolic models provide the trail and error method by designing different scenarios?

### **LINKING AND MANAGING THE ECONOMY?**

- How is it that in environmental economics, the economy is a separated subsystem in dialogue with the social and the environmental subsystems?... The strong-sustainability approach and the ecological economics seem to be more consistent
- We have tools to intervene in environmental economics. What about ecological economics? Is it only about macro-scale footprint limits?

### **MARKET-based ECONOMIES?**

- Is decoupling an important concept? Can it provide “ideal” solutions?
- Do we need economic growth in developed countries?
- Economic resilience: How much can local and global economies change without breaking?
- If markets do not allocate efficiently environmental resources, are current economic models enough to promote sustainability?
- Is income inequality globally and locally necessary for sustainability of harmful to it?. Is it connected to fair distribution?

### **GOVERNANCE-SOCIAL-POLITICS**

- How can we link elective democracies and sustainability? “Education, education, education”? (Toni Blair)
- Do we need global governance to achieve consistent sustainability transitions? Is it enough to work at a local or national level? Do good guys lose?
- What is the role of society In ecological economics? (the benefits described in the MPB and MSC graphs are social benefits)
- What is economy? Can we represent value & trust with different metrics (e.g. block chain, e-coins)
- How to distribute the carrying capacity? Is there a global platform? How would it look like?



# Landscape and the Sustainable Development Oxymoron?

## ENVIRONMENTAL ECONOMICS vs. ECOLOGICAL ECONOMICS (Milutin Stojanovic)

