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Wednesday, November 9, 2011

what urban designers and planners can learn from landscape ecology?

I have read the ecology of landscapes and regions written by Dr Forman a decade ago when I was an assistant teacher to one of the world experts in ecological landscape design, Dr. Jala Makhzoumi. The book opened for me my horizons on what landscape ecology has to do with urban design .Although it has never coined the terms of **"Landscape Urbanism",** it definitely touches on the founding principles of what will grow to be a mainstream urban design paradigm.I have just gathered below the *reflections* gathered from the book comparing its holistic view to the tools I have been applying in urban design and seeing the big synergies with regional and local planning also in terms of scale analysis and sustainability tools.

Land Mosaic change in their gradient and may be spatially heterogeneous due to the mosaic they form. This heterogeneity is due to natural disturbance, human activities and in some cases to substrate (below ground) natural conditions.

FORM is The Diagram Of Force and STRUCTURE is the Function of change _ one of the main principles on which the changes in landscapes and regional landscapes might be explained.An interesting analysis explains further the intersections between Urban Design and Landscape Ecology although both uses the same spatial language, the different terminology affect the gap in communication .

Landscape Ecology – for the definition and to introduce the subject, I will bring forward the definition that I have read in Carl Troll book -1968)- "it is the study of the entire cause effect network between the living communities and their environmental conditions which prevails in a specific section of the landscape and become apparent in a specific landscape pattern or in a natural space classification of different orders"' .

Another interesting definition for landscape ecology stems from the research conducted in 1984 by Paul Risser .He speaks of Landscape Ecology in terms of its ***focus*** rather its activities . Landscape Ecology considers the development and dynamics of spatial heterogeneity wether it is the spatial and temporal interactions and exchanges across heterogeneous landscapes, the impact of the spatial heterogeneity on biotic and abiotic processes as well as the management of spatial heterogeneity.

Landscape Ecology uses the Patch ,Corridor, Matrix to differentiate between the different landscape types and regional territories. **Urban Design** uses District, Edge, Path to study the different urban and rural fabrics. The variations of the different territories (whether it is a natural landscape or urban fabric) are attributed to the same factors – Movements (transport or fauna), Patterns(Organic versus Manmade),Scale(regional versus local). The granularity is affected by Time - the responses of the landscape or the fabric through TIME might lead to Fine or Coarse fabric or landscape pattern.

Miller(1978) has set the different domains in scale when it comes to define the landscapes in which intervention is needed:

Continents /They are characterized by distinct boundaries usually surrounded by water surfaces .Culture, Economics and Transportation connectivity make up for their uniqueness.

Regions/Broad geographical area with a common microclimate and unified sphere of human activity and interest – physical factors such as the macroclimate, soil groups and bioms and human factors such as politics, social groupings, structure, culture contribute to their emergence.

Landscape /Mosaic formed by the mix of local ecosystems – it is an ecological unit that may be formed by a repeated cluster of spatial elements – the essential elements of landscapes can be analysed through :

1- Geological land forms
2- Soil types
3- Vegetation types
4- Local fauna
5- Natural disturbance regimes such as fire
6- Land uses
7- Human aggregation patterns which is the domain in which regional urban planning engages at

The ecology of regions – regions are usually the scale at which one single macroclimate prevails providing a region wide control over soils, ecosystems and natural processes. A region is the scale at which sustainability can be better pursued for its larger area that may cover many landscape types, its greater adequacy for ensuring resources complementarity and slower rate of change.

Patches are synonyms to boundaries –Patches affect the rates of flows and movements between ecosystems – flows and movements are defined through the array of objects they transfer be it wind carrying air, rivers with water streams ,animals , birds, airplanes carrying passengers or just a couple of neighbors walking a marathon. These six vectors can be flowing in locomotion – slow motion or in mass flow- rapid motion. Usually, mass flow crosses over external boundaries such as TGV crossing over and locomotion are for internal movements such as local breeze. Permeability – same term used in urban design- is linked to how diverse the flows are and how the density of these flows is building up.The flows crossing over the boundaries of the different patches relate to four main ecological processes Supply to Patch, Resistance of Patch, Retention by Patch, Disposal from Patch.

Corridors have been analyzed extensively especially relating to Rivers and Streams _ the analysis will be summarized later in another Blog Post.What I would like to focus on is some of the tools that were presented and which might be useful to reflect on in thinking about our cities as man-made ecosystems. The first spatial tools which are used to approach the territory under study is land use optimization

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focusing on agricultural production,natural ressources areas as well as corridors and greenways.

A generic plan might take into consideration some of the priniciples highlighted below:

1- Context – placing the landscape/corridor/fabric in its regional/continental scale

2- Flows- evaluating the flows and movements of ground /surface water ,species dispersal, transportation, recreation
3- Change- looking for changes in the natural environment such as spreading desertification, housing growth, new infrastructure ,water barriers such as damns
4- Disturbance regimes- Hurricanes, flood, cyclones are repetitive natural phenomena that might affect the future projections and proposed interventions

Another interesting concept that is linked to Landscape Ecology work in the 1990's is the concept of Whole /Holisitic landscapes. Dr Makhzoumi has written a reference book on landscape ecological design and how its approach can be applied on place making and other urban design spatial interventions.

The concept of whole landscapes apply more to regional scale.it sets again a number of principles if followed can contribute to a more holistic approach to framework planning – the holistic approach comes from integrating the human made environment's and the natural environment's in a way that does take into consideration high sensitivity topics for human activity but does not jeopardize the livability of other flora ,fauna species . it calls on identifying and maintaining natural expansion corridors, assigning biodiversity areas , taking into consideration natural disturbances phenomena and respecting connectivity, permeability and the granular scale of the landscape mosaic focusing on landscape linkages

I would like to end this post with an interesting statement by Carra made in 1990 .His answer to the ways in which we can integrate human and natural habitat was:*'Only if we view the world differently , we would be able to act differently. So, we need a change of perception, a shift of paradigm in our thinking and in our values. We need a shift from fragmentation to wholeness, from a mechanistic view of the world to an ecological view, from domination to partnership, from expansion to conservation, from efficiency to sustainability".* His answer encapsulated most of the different dimensions that planners, designers, policy makers and citizens deal with in their own way and the direction we all need to take in order to make sure that the aspirations of our cities and towns do not lead to their own destruction.

Posted by nadine bitar chahine at 2:40 AM

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