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Beyond dissipation and concentration

Hansjürg Leibundgut

Why does one have to think about sustainability? Probably because a majority has come to realize that current means of occupying the world cannot be sustained for an extended period of time. Overconsumption of resources as well as inequities in the distribution of wealth present two formidable challenges to all disciplines concerned with the built environment. In its mission statement, the Holcim Foundation addresses sustainability in relation to five key criteria without giving special weight to any of them. From my point view, however, the two pertaining to ecology and economy require greater attention than the other three (i.e., quantum change, social impact, and aesthetic quality). More precisely stated, humanity is essentially threatened by the dissipation of natural

resources and the concentration of capital. In both cases, the issue is a problematic channeling of flows: that of material and money.

The dissipation of resources

The first risk-laden phenomenon is the precarious exploitation of natural reserves. For the past two centuries, humanity has selectively scarred the earth to an extent unprecedented in history, extracting materials and thereby changing their flows or setting them on new courses. A few examples suffice to illustrate this condition:

Our chief power source is provided by fossil fuels that are extracted from the earth. After combustion, CO_2 is produced, 50% of which remains in the atmosphere for decades. The human impact on the natural fossil fuel cycle in turn has a significant influence on future climatic conditions, and thus on the future economy. Therefore to counter this tendency, the concentration of CO_2 must be reduced by a factor of four.

Copper is used extensively in all branches of industry. A steady stream of Cu is dispersed through corrosion, contaminating the soil and water due to inadequate recycling processes. In that copper is becoming increasingly scarce, it must be set aside for conducting electricity rather than being squandered on such building applications as gutters and facades.

Rare elements such as palladium have already been exploited and dissipated to such an extent that industry can no longer count on their future use. Uranium is excavated and converted into materials that may not be discarded under any circumstances. Harmful radioactivity on the one hand, and the high explosive yield of materials made from uranium on the other hand, require very strict control of this rather recent material deployment. Dangerous substances should be removed from the environment at the expense of those who produce them.

The example of asbestos calls attention to what enormous damage can result when harmful elements are dispersed minutely throughout the environment. In this case, it was shown that negative consequences of using this material far outweighed any positive effect.

What is evident from such examples is that the current state of material flows is highly problematic. One of the most troubling consequences is the concentration of CO_2 in the atmosphere, a dilemma whose threat is growing at a rapid pace. And yet, the extent to which fossil fuels are consumed far exceeds human energy requirements, far beyond what indeed is needed. This part of the problem is clear.

Not so evident is how this challenge is related to the energy needs of mankind. The sun radiates 10,000 times more energy to the earth than is currently utilized. As a matter of fact, technology already exists to convert solar energy into electrical power for practical applications. The yearly costs for energy derived from solar power within the building sector are, for example, less than the yearly replacement costs within the automotive industry. It is a purely economic question of when and if the production of the human environment and its attendant energy flows will be satisfied by ecologically unproblematic material flows.

The concentration of capital

The second risk-laden phenomenon is the problematic tendency of how monetary resources are distributed, with capital routinely concentrated among a few. Capital is extracted from work and materials in a collective effort – in what meanwhile has become a global society. Materials are made available by the earth free of charge. The exploration for materials takes place fundamentally in the form of work. Capital provides the means, for example, to enhance human performance in the exploration of materials through technical processes. For their part, those technical means require work and material. Capital also serves in this process to increase the effect of human labor in an ever escalating chain.

The accumulation of capital in the hands of a privileged few enables a concentration of power, which in turn generates envy and resentment. This is to say that disparities in the distribution of wealth engender social tensions due to differences brought about in productive potential. In order to sustain these continuously increasing differences, more elaborate measures of segregation and their reinforcement have to be established that again lead to new problems.

Correlation between resource dissipation and capital concentration

More than likely, the squandering of resources and hoarding of wealth are closely related phenomena. The exploration rights for terrestrial resources are granted to very few organizations, and thus to a small number of individuals. The refinement processes of raw materials into goods are frequently under the same control as those in possession of exploration rights and those with facilities for extracting raw materials. Private assets of the capitalist economy originate from the reserves of the production economy. And so the cycle continues.

The intimate link between the flow of material and the flow of capital – not to mention the fact that the concentration of wealth was and still is facilitated by a gratuitous dissipation of resources – explains the enormous obstacles to attain an effective transition from today's unsustainable economy to a new sustainable economy. This new economy must and will be marked by a drastic reduction in material indulgence.

The transition from a primarily fossil fuel economy with limited source facilities in the world – which by the way enables the concentration of wealth – to a non-centrally developed, financed, and serviced solar energy economy – based for example on wind, photovoltaic, waterpower, heat pumps, biomass, etc. – would solve not only a large portion of the resource-flow problem, but also would alleviate the problem concerning the concentration of capital.

This is to emphasize that the issue of sustainability must come to bear upon current practices of extraction and concentration. Such practices can be countered through careful monitoring of material flows and establishing more equitable flows of capital. To achieve these objectives requires an integrated understanding of how ecological and economic processes are interdependent rather than constituting mutually exclusive systems. The dissipation of materials is directly linked to patterns of capital concentration and vice versa. By implication, decentralized resource systems demand a distributive justice of monetary resources in order to ensure not only sustainable ecologies, but also sustainable livelihoods for all.