

“Localization”: A means to reduce negative transportation impacts in the “natural city”

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Introduction

Humans have evolved as a part of nature, not apart from it. When looking at nature, all species have a common need to shelter themselves and breed and feed, as well as move some distance in order to accomplish these activities. Movement can be by shoot and root growth and seed dispersal in plants, or whole or partial bodily movement in animals. Human movement across the landscape to acquire resources is, therefore, a natural process, in accordance with all other species.

With the evolution of human society came a need to move further from a home base to seek resources. This need was heightened when agricultural practices increased and distinct family groups formed that settled in one location for the duration of their lives. Nomadic wandering decreased with agriculture, which provided short-term stability in local resource acquisition but this, in turn, often led to local soil depletion, water reduction and ecosystem function degradation over time. Once shrinking of local resources occurred, groups that did not desire or could not move elsewhere due to occupation of adjacent land, would either exploit adjacent lands by force through conquering neighboring tribes and pillaging their resources, but more commonly through trade with neighbors, especially when local resources were in decline.

Ecology and human ecology

● According to ecological theory, the “**carrying capacity**” of any population is inevitably reached when the space and time scale to renew the land to provide sufficient resources is matched by the needs of the population. As populations increase in terms of the number of mouths to feed (abundance) coupled with the increased desire for a more affluent lifestyle (per capita consumption), the time to reach carrying capacity is also shortened. This time limitation thus puts more stress on the population, often causing a reactionary “fight or flight”

response to threats from individuals within the population or from neighboring populations. Reaching carrying capacity under this scenario leads to massive die-off of individuals through starvation and/or killings, often until the resource stress is abated.

In human societies, this resource-driven turmoil can also lead to shifts in power (often to domineering males) where exploitation occurs on an ongoing basis as resources are further damaged in the ensuing chaos.

But there is another option in the face of resource depletion – cooperation. This can happen only if exploitation is slowed to a pace where adaptation and recovery of resources can occur to avoid undue stress.

● **Mutualism:** Reaching carrying capacity, as all populations inevitably do, can thus lead to “mutualism,” a form of symbiosis or partnering between individuals, populations and even species where both parties benefit. Cooperative behavior has been exhibited in most species that undergo high resource limitations, including humans. It is under these conditions of resource limitation that cooperation is most required and employed rather than when resources are plentiful. The logic is that it is to each other’s benefit if both survive through cooperative leveraging of skills to share limited resources, rather than both eventually dying off through “fight or flight” reactionary responses and further over-exploitation by both parties of the already limited resources.

The “cost” of mutualism is to give up a portion of a particular resource that you are good at exploiting or to provide your skills to acquire that resource, with the understanding that there is a benefit gained of obtaining labor or another resource that you are not good at exploiting, from the other party. For example, mycorrhizal fungi operate in low nutrient soils to provide plants with soil nutrients in exchange for sugars from the plant. Mutually, both survive these nutrient-deficient conditions through a “win-win” relationship where each is giving to the other a small portion of their energy in order to leverage remaining resources.

Transportation of goods and people

In human society, as the dominant resource of any group is decreased, alternatives need to be sought, so cooperation is required through trade in skills, labor and products in order to gain a different resource from elsewhere. Thus, movement of both skills and products across a landscape has evolved into “transportation.”

Humans have now taken transportation of resources to the extreme in that global trade now is the dominant direction of movement of resources. But with “globalization” there is also

an inherent belief that an increase in intensity and expansion of resource exploitation should follow. This is opposite to the natural “paring down” of exploitation that comes with sharing limited remaining resources so that all parties mutually survive.

A root fungus that takes too much sugar from a plant and gives back little in nutrients is considered “parasitic” and will eventually be usurped by another species of fungus that provides the plant what it requires without excessive demands. The plant will evolve defences to ensure that it is not exploited. This is a similar response seen by humans in small communities toward large corporations that are seen as “parasitic” and not giving their fair share of resources back to the host community.

● **Parasitism:** And as with all parasites, if it kills the host, it too will die. Parasitism is a short-term exploitation mechanism, often evolving when resources are abundant and movement is not limited across a landscape, so that inter-generational movement is fast, but not long-lived. Disease outbreaks usually occur when population levels of a host species are high and transportation distances are short between hosts, but then parasites causing the diseases will kill off the hosts and then die off themselves. Parasites usually do not realize when they are killing their host.

Global trade and sustainability

As global trade continues, it is known to increase the “ecological footprint” (WACKERNAGEL and REES, 1995). This is defined as the space that is exploited and the turn-around time to extract and then recover those resources again while assimilating pollution. China is a good (though hardly unique) example of this phenomenon, where new exploitation of resources through partnerships is leading to over-consumption of natural resources and pollution problems, as well as social unrest between the “haves” and the “have-nots”. The dominant trade model still remains that of “competition” for resources where there is a clear winner and loser, rather than “cooperation” resulting in a win-win situation.

The current global economic model thus in fact does not function economically. Economy would ensure that remaining resources are distributed fairly among players cooperating in the trade system, particularly non-human partners that are usually not accounted for, yet are the host partners and essential to support for the long-term survival of humans. This continued over-exploitation is due to carrying capacity being ignored, which naturally drove the process of cooperative trade of resources in the first place.

According to the First Law of Thermodynamics, “Energy cannot be created or destroyed.” Therefore, energy is finite on Earth. The only external source is from the sun, captured mainly as matter by plants, and heat by the earth and atmosphere. Historical, stored solar energy in the form of fossil fuels also exists, but this too is finite.

With this Law seemingly ignored, global trade has attempted to keep expanding into new markets that end up becoming part of a global monopoly over particular resources (e.g. oil) controlled among a few “exploiters.” Thus cooperative trade does occur, but it is shifted within segments of markets rather than fairly among peoples and communities, who are still facing resource depletion at carrying capacity levels. Global trade, then, spawns an economic model that is not sustainable over the long term as it exacerbates resource over-exploitation and has inherently too much waste generation lacking assimilative capacity.

Oversupply to a global market also results in an “all or nothing” trade system where there are clear winners or losers with larger suppliers edging out smaller suppliers in a “race to the bottom” to provide the resources for the lowest return. Transpor-

tation that meets “local” trade issues will be marginalized in favor of “global” trade due to “economy of scale” that continues exploiting resources and thus ignores limitations. This global trade network, so far, supersedes all others, but at the expense of long-term survival in the face of known resource depletion, that may yet be seriously acknowledged.

A “big box store” that uses foreign-made products with low-paid staff is still subject to carrying capacity. But, it can delay the inevitable by taking a larger share of the pie and going it alone in the short-term at the expense of long-term sustainability. Sustainability would ensure sharing of markets with diverse small business “mom and pop” enterprises by mutual agreement, and potentially skill development and product swapping. By cooperating within local economies and sharing markets, a business can keep local people employed at higher pay levels that also helps keep customers coming through the door over the long term. This was the concept that Henry Ford used to start his company; fair wages stimulate the economy and produce longevity through mutual benefit.

Global trade is also inefficient in terms of the distances for transportation of these goods that should be meeting local needs. The last 250 years of cultural evolution into a global trade market has resulted in faster modes of transportation with personal vehicles able to travel long distances to enable this long-distance resource exploitation. “Localization” would reduce the impacts of transportation for acquiring resources, both of goods and commuters.

The desire to move products over long distances from offshore markets to facilitate “just in time” delivery has also increased the need for larger and more abundant road infrastructure. This has caused a massive “paving over” of urban areas to the detriment of nature and its ability to renew itself, also resulting in pollution from vehicle emissions, as well as from the factories that operate our car-based culture.

This personal mode of transport has also spawned low-density car-designed urban and suburban areas, for which car access is invariably planned. This has resulted in perpetual grid-lock of our cities, exacerbating the need for wider and more roads (more pavement) and furthering air and water pollution. The World Health Organization reports that 3 million people die annually from air pollution compared to 1 million from vehicle accidents. The Ontario Medical Association estimated the number of premature deaths in Ontario as 17,000 in 2005, rising to 24,000 by 2026.

Localization: Towards a realistic, ecologically sound future

We will never eliminate the need to travel, nor the accustomed mode of travel in “developed” nations: the car. This expectation of private travel is inherent in our North American way of thinking as a society where individual rights are paramount. Planning for mass transit is not feasible in smaller communities, nor is it feasible for cash-strapped communities, or where past planning has not allowed its accommodation in already built-up areas. And given our “need” to compete in a global market, the pace of living has increased to allow for faster exploitation of resources; that is, producing “affluence.” Public transit is most often slower and less convenient than personal vehicles so it remains the less-desirable mode of transportation by the majority of people.

The more realistic solution, given the current mindset of the average “Westernized” society member, is to look at reducing the number and distance of trips, as well as prohibiting vehicles within certain areas that are deemed “car free.”

● **Re-designing cities as living ecosystems** to provide for local resources would also reduce the ecological footprint of

cities. Currently, most planning practices ignore the need of food and water security, which, ironically, are the only needs that must be met for basic survival. Housing (shelter) dominates the landscape (providing for breeding and comfort), but the basic necessity of food supply through globalization is taken for granted and ignored in city planning.

The Toronto area now contains a Greenbelt around it, but food security was a minor item of attention that was not seriously considered as necessary for protection under planning policy. Two "specialty crop" areas that grow grapes and tender fruit (Niagara) and vegetables (Holland Marsh) were protected, but the remaining Class 1 arable farmland was left out of the Greenbelt for "future expansion" of the megalopolis limits for housing.

What was not considered was the essential rate of global trade that relies on oil to transport goods and the difficulty in supplying sufficient amounts to meet a growing demand, spurred by globalization and new market exploitation itself. Transportation of resources relies solely on this historical solar energy in the form of oil, which is a limited and rapidly diminishing resource.

● **The protection of prime agricultural land** as a resource close to cities to reduce transportation distances is an essential element of localization that stems from trading between nearest neighbors.

Currently, farm products are at their lowest levels in terms of price as they compete on a global market that is highly competitive. The localization of farm products will establish a mutual relationship between urban and rural communities that is beneficial to both, and that leverages remaining limited resources namely oil supplies. Currently, rural farmers are suffering as city residents act as parasites on the global supply chain; those who do best are able to engage local consumers as partners. This is a small proportion of the market to date, but cooperation within local areas is a natural process that likely will evolve as oil supplies dwindle and carrying capacity limits are felt by local residents. Affluence is still being artificially propped up by the exploitation of global resources from less affluent countries, usually under short-term parasitic relationships rather than mutually and equitably beneficial sharing of resources.

● **Climate:** Localization of communities would reduce the need for further paving for travel in cities to accommodate a burgeoning population of vehicles, as well as reductions in air pollution and carbon emissions promoting climate change. This would allow for restoration and renewal of natural areas and plant and animal life that provide natural services and mitigate climate extremes. Evapotranspiration and shading/temperature are both triggers for what type of weather occurs in a local climate. Plants and soils are the main controllers of weather, as is pavement. Too much pavement results in extreme conditions that are not off-set or absorbed by plants and soil.

Abnormal alteration of climate is considered the largest threat to global stability, yet is still ignored or even derided as "false" by many global market players. Again, parasites do not often know when they are killing the host until it is too late. Local planners also ignored climate change and the role that nature plays in altering local weather as well as absorbing its extremes. The Ontario provincial "Places to Grow Act" that is the new planning document for the Greenbelt area only mentioned climate change once in reference to reducing energy use to mitigate climate change. No reference to the loss of nature or biodiversity was mentioned in terms of its effect on climate although the "urban heat island effect" is well-documented, as is climate change.

Climate change will speed up the time to top carrying capacity limits, causing extreme stress and thus the "fight or flight"

response. It will also alter the ability of the natural world (the unacknowledged partner) to provide for resources to the human population. As partners in nature, humans have evolved to be reliant directly on exploiting resources over larger areas and slower temporal scales that give rise to mutual relationships with nature as resources ebbed. Societies that were successful and survived long term gave back to nature, often honoring it, as can be seen by the extant indigenous cultures today. Those cultures that have recently evolved (Western cultures) have not matured enough to recognize that nature is the ultimate partner. A mutual relationship with nature that is based on localization is required for the long-term survival of society and cities.

● **Movement of people:** Localization would also lead to a planning and design regime that would promote walking and biking locally, thus improving health and attracting new residents. This would increase the diversification of local community businesses that would employ local residents. "Live-work communities" have yet to be fully realized in planning for urban or sub-urban Toronto areas, but attempts are being made within neighborhoods to "buy local" to support small local businesses (BALLE). The issue of where the goods that are being purchased come from has yet to be addressed though. Ironically, many local businesses that individually transport small quantities of goods daily into a neighborhood, may in fact cumulatively cause more traffic woes and pollution problems than one large centrally-located business (i.e. big box store). The central issue of moving commodities, not just commuters, has yet to be addressed in planning.

Conclusion

The best chance of changing this pattern of movement of goods is to adopt a "localization mandate" for all cities and towns through planning policies and good planning to address transportation issues that have spawned historic "pavement, pollution and poor planning" practices. We need to change planning practices toward sustainable communities that are based on mutualism and cooperation and giving back, rather than parasitism, over-exploitation and taking.

A rethinking is needed of the way goods and people move across landscapes to provide for human "breeding and feeding" in order to promote a truly "natural city." All species attempt to minimize the energy expended to meet their daily caloric needs. Our ways of acquiring energy are literally "sucking the life" out of the earth as our urban areas act like huge vacuums of global products. Minimizing our ecological footprint requires also minimizing our reach on a daily basis. Hence, there is a desperate need for localization.

Localization has been primarily attempted through the Farmers' Markets and Slow Food Movement that are now bringing local produce into city centers on a weekly basis and providing dining experiences in local traditional restaurants. A small business sector that adapts to local needs will thrive if a cooperative approach is used among various industries to supply a variety of goods and services.

This type of shift in thinking and practice needs to be generated among all businesses. With the decline in global fossil fuel reserves and the ever-increasing climate change, and ever poorer air pollution and degradation of nature, localization will not only be desirable, but absolutely necessary.

Reference

WACKERNAGEL, M. and W. REES (1995), *Our Ecological Footprint: Reducing Human Impact on the Earth* (Gabriola Island, BC, and Philadelphia, PA, New Society Publishers).