Changing Climate – Building Resilience
March 26 2018, Mikaël Akimowicz

Building a resilient climate in Canada

On Wednesday March, 21st 2018, EcoWest[i], a not-for-profit which aims to promote sustainable solutions to foster economic growth at the municipal level, organized a one-day seminar on opportunities to improve the resiliency of communities in Canada. A variety of backgrounds were represented – i.e., conservation practitioners, planners, academics … The morning sessions were dedicated to presentations whereas in the afternoon we had the opportunity to participate to two different round tables among the four that were proposed and which tackled flooding preparedness, urban storm water management, human capital for planning frameworks, and regulations that can support resiliency.

After a long day of permanent intellectual stimulation (I commend the organizers for that), the main take-away of the day was, in my opinion, the importance of understanding natural processes, developing comprehensive integrated frameworks based on systemic approaches to adapt to and to mitigate climate change, as well as not opposing these processes in shortsighted and often incomplete causal approaches.

H. Venema[ii] and J. McConnell[iii] presented an interesting piece on multifunctional approaches to plan climate-resilient investment. Based on the observation that climate change is occurring faster in Canada than anywhere else in the world, meaning that extreme events will occur more frequently in the coming years, they defended that infrastructure has to be conceptualized in a way that better allows to mitigate that uncertainty. For them the key concept here is multifunctionality (Cf. Figure 1[iv]), an approach that emphasizes the benefits that can result from multipurpose activities.

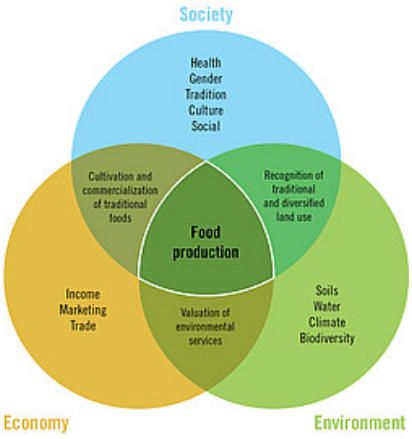


*Figure 1: Agriculture is a multifunctional activity*

Indeed, most human activities have side-effects, which are also called externalities. Although some of these externalities are negative - e.g., pollution – others are positive – e.g., maintaining biodiversity, meaning that activities with positive externalities can be beneficial for other activities. Genuine planning, therefore, aims to facilitate and develop synergies among activities by increasing the production of

positive externalities and reducing the production of negative externalities. This approach has been extensively used in the European Union for agricultural and rural policies; exploring EU experiences could help design better policies in Canada.

The two presenters then developed the critical role that can be played by agriculture. They defended to repurpose the role of agriculture to not only an activity that produces food and fiber but also furnishes positive externalities that can contribute to mitigating climate change. Indeed, agriculture can provide and sustain ecosystem services (Cf. Figure 2[v]) that are natural processes which fulfill functions that, most of the times, are currently provided artificially. The interesting point here is that these ecosystem services are usually cumulative, meaning that one good practice improves the impact of another one.


*Figure 2: A classification of ecosystem services*

For instance, when a soil lacks nitrogen, one usually adds nitrogen either industrially produced or extracted from distant places, which obviously triggers the sustainability of the production process. Instead, creating a favorable space for plants and microorganisms, that naturally generate nitrogen to increase the likelihood of their presence in soils, would help reduce this negative impact of the current production process. Similarly, adopting practices that improve the soil structure instead of impoverishing it can contribute to improving the capacity of soils to retain water and overall reduce run-offs. In this case, the cumulative effect is that microorganisms help maintaining soil structure, which by retaining more water supports the development of additional microorganisms. As one can see, this means that recognizing the specificity and unicity of places play a critical role in designing relevant policy and, therefore, advocates for designing place-based policies instead of one-size-fits-all policies.

This point of view was strengthened by R. Canart,[vi] who strongly insisted on re-building the organic matter contained in soils. Most current farming practices do not pay much attention to organic soil matter and, as a result, the amount of organic soil matter has strongly decreased over time. Although an average prairie soil should contain approximately 12% of organic matter, current prairie soils contain on average 6% of organic matter. As a result, prairie soils are less fertile and more incline to erosion, two effects that, like ecosystem services, are cumulative; they tend to create a vicious circle that needs to be broken.

Fortunately, localized projects are on-going and experiments are implemented here and there. These on-site experiments are beneficial to build a place-based/contextualized knowledge that can benefit other farmers. Stereotypically conceived as solutions that can only be adopted on small farms, R. Canart highlighted that large farms can significantly benefit from those practices and mentioned the existence of

a 6000 acres farm in Saskatchewan that has engaged in large-scale experimentation. Indeed, as business managers, farmers are much more likely to adopt practices that are financially beneficial; unfortunately, financial returns resulting from the adoption of such practices (e.g., agroecology) are usually long-term benefits that do not provide strong incentives for farmers on the short run. Because some businesses may not have the financial flexibility to modify their production processes, breaking the cycle of environment-harming practices may require the design of policies that financially support the adoption of good practices.

These perspectives resonated well with the intervention of S. Madden[vii] who delivered a more general speech on infrastructure. For her, investment in infrastructure has to increase rapidly. Given the cumulativity of undesirable effects mentioned above, she stated that one dollar invested nowadays is worth four dollars invested in the future, without mentioning the time period though. Bottom-line, no decision is an extremely expensive stance on the long run. One of her main point was to consider the life duration of infrastructure and try to favor flexible infrastructure whose life expectancy can be extended. Environmental infrastructure based on a re-purpose of agriculture (Cf. Figure 3[viii]) sounded a good example but no clear connection was made. Generally speaking, these three interventions pledge for knowledge-intensive solutions based on the understanding of natural processes and the identification of synergies among activities and investment in order to promote the sustainability of communities.

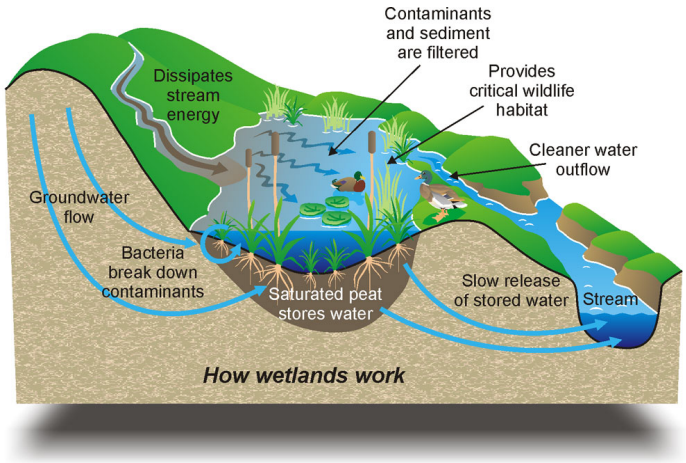


*Figure 3: Wetlands are green infrastructure that provide ecosystem services*

Then, more technical discussions around planning took place. In particular, an afternoon round table discussed the opportunities offered by municipal by-laws and zoning that can allow to design more resilient communities.

- Land reserve: each time a piece of land is developed, a percentage of that land can be used by the municipality to promote alternative land uses such as parks.
- Hazard lands: if considered too risky for development due to the occurrences of extreme events such as floods, pieces of land can be excluded from development and alternative land uses can be promoted such as recreation football fields or biodiversity conservation areas.
- Secondary plans: this second layer of planning addresses specific issues in areas where the general framework provided by the Official municipal plan is not detailed enough or could be inconsistent.

- Development agreement: a development permit can be granted only if specific conditions are respected. The constraints run with the property and opportunities to break the agreement exist but are severely controlled.

I would like to commend EcoWest for their organization and the quality of the information that was delivered. More information can be found here http://eco-ouest.com/wp-content/uploads/2018/02/Changing-Climate-Building-Resilience-Mar-21-2018-Keystone-Centre-Brandon1.pdf. Presenters were passionate about the topic and I would bet that in case you get any question, they will gladly respond to any request you might send them.

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[i] http://eco-ouest.com/en/
[ii] H. Venema, IISD, is with the Prairie Climate Centre. https://www.iisd.org/about/people/henry-david-venema/all
[iii] J. McConnell is Mayor of Town of Virden.
[iv] https://www.globalagriculture.org/report-topics/multifunctionality.html
[v] http://www.metrovancouver.org/services/regional-planning/conserving-connecting/about-ecological-health/ecological-services/Pages/default.aspx
[vi] R Canart is Manager of the Upper Assiniboine Conservation District. http://www.uarcd.com/profiles.htm
[vii] S. Madden is a sustainable transportation planner with Urban Systems http://urbansystems.ca/about-us/our-team/
[viii] https://faezehforghanifard.wordpress.com/2015/06/07/green-infrastructure-wetlands/