CFSE panel discusssion. 10th March.

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”From global to local: challenges for sustainable resource use in a changing world”

- Focus of series reflects concerns around biodiversity conservation, global food security and bioenergy. The fate and trajectory of all three of these concerns, for better or worse, is inextricably linked to land-use.
- In a rapidly changing world, increasingly referred to as the dawn of the Anthropocene, humans are exerting profound changes on how landscapes are shaped in three main ways
    - Spatial scale (no corner untouched)
    - Speed (the great acceleration)
    - Connectedness
- It is on this third dimension, of connectedness, that I would like to focus my opening remarks, and suggest that it is here that many of the greatest knowledge gaps still lie, and it is here that we can find some of the most fruitful and rewarding areas of investigation for future research
- We have learnt a lot about the specific environmental impacts and social implications of individual land-uses at the local level. And we have also learnt a lot about strategic priorities for food security and biodiversity at the global level – ably demonstrated in the context of climate change and food security by Tim´s excellent review paper shared as background material to this discussion
- Yet, in an increasingly interconnected world we need to move towards an uncomfortable middle ground of both research and policy endeavour that seeks to untangle and address some of the concerns that link the local and the global, and are so critical to devising lasting solutions, without being lost in their complexity. In this I believe we still have a very long way to go
- In responding to our charge of key knowledge gaps and frontier research questions I would like to briefly outline first how the imprint of global dynamics on local patterns of land and resource use manifests itself across multiple scales; and then zoom in to highlight how despite the seemingly overwhelming influence of remote and distant drivers of land-use change, local phenomena and priorities can scale up to reshape the global picture. In making my points I will draw particularly on work and experiences from Latin America, and particularly Brazil.
- **At the global level**
    - Concepts of global footprints of resource use are increasingly appreciated. The latest WWF Living Planet report and impact of “green” Nordic countries that are import dependent. Yet we are only just starting to scratch the surface of understanding impacts of global connections.
        - We need to go much finer-scale than country to country, and unpack how specific geographies of producers are linked with specific geographies of consumers.
            - *Work of SEI-PCS on coupling specific areas of Brazil with EU and China. What does this mean?*

- *We need to contextualize global footprints with respect to local dynamics; water footprints and water scarcity – almost entirely unexplored.*
- *New dimension of climate change, revealing indirect climate impacts can transmit through the global system such that a drought in one corner of the world can affect food prices in another. Such indirect effects call for global-scale approaches to climate adaptation as well as mitigation if we are to avoid devastating local consequences.*

- **At the regional level**
    - Dropping to the regional level we can see how shifting patterns of demand and the price of land, juxtaposed on a highly heterogeneous landscape of environmental regulations and enforcement can result in profound interconnections in how landscapes change in neighbouring regions. We are only just starting to appreciate the myriad ways in which this is occurring
        - Take Brazil, and look at major areas of expansion of 3 of the main land uses, sugar cane, soy and beef, and a clear pattern of highly interconnected land-uses emerges with three belts
        - Success of deforestation falling in Amazon offset by
            - Increased deforestation in the Cerrado
            - Increased soy expansion in less regulated neighbouring countries of Paraguay and Bolivia
- **And at the local level**
    - At the local scale we can see how rapid processes of agricultural change and expansion, driven by domestic and global demand, are giving rise to what I suggest are novel spaces (or even societies) in frontiers around the world. Areas where the local and the global truly collide.
        - Very recent and close approximation of starkly different actors. GPS guided tractor next to manual tilling
        - The fate of different actors in such landscapes is strongly determined by the many connections that bind these actors together, for better or worse. Interconnections that are very rarely accounted for in research or policy design, and that all too frequently focus on specific actor or land-use types, glossing over the fact that these different actors coexist in mosaic landscapes
            - How to develop tailored policies that can account for side-effects on other actors?
            - How to explicitly account for and exploit the positive interactions that exist between different actors in setting a given region on a more sustainable trajectory.
            - And how to do this recognising that such landscapes can change rapidly, and the window of opportunities for shaping their trajectory endogenously can rapidly close as the system becomes increasingly rigid.
- **And then zooming out**

    - In zooming back out from the local I want to end by emphasising the fact that despite the ever increasing influence of global dynamics, local dynamics matter and can have a profound influence on large-scale processes, yet they are often ignored
        - Example of this in our recent work presenting the first assessment that couples actor-dynamics with regional deforestation, overturning popular assumptions about who is to blame
        - Another, more positive example in Brazil is the case of the green counties program from the municipality of Paragominas, now a global poster child of progress in land-use sustainability
        - Also at the global level, actions by local indigenous groups in Panama led to the UN-REDD program being temporarily ejected from the country in protest over the way in which local concerns over customary rights were not being adequately accounted for in carbon finance and accounting programs
        - These examples underscore the fact that the notion of the Anthropocene - i.e. that the combined effect of local human activities is having an overriding effect on the global biophysical system - is also true of the social system. Reflecting on the old saying of "think global act local", the fact that we live in an increasingly interconnected world means that acting locally can influence global conditions whether or not we are "thinking globally".
- **And to wrap up**
    - From a research and policy perspective a main point I want to make is that these connections that tie the local and the global, which I have only been able to scratch the surface of here, force us move to the uncomfortable and awkward middle ground of devising solutions for a more sustainable planet that take account of both scales. Ricocheting effects across scales are overturning common assumptions – such as fast local dynamics shaped by slowly changing global drivers – that need to be increasingly recognised and accounted for in our work.
        - Possible add-ons depending on time
        - Many regions of the world stand at a cross-roads
        - The consequence of which is giving ever more prominence to meso-scale solutions.
        - Something we are trying to do in P2CS. UN Declaration on Forests as a starting point; but what does this mean for distributed responsibilities across global supply chains, not just on producers but to unpack levels of engagement and attribute a more nuanced distribution of responsibilities, but also motivations, perceptions of risk and capacities to act. And to try to intelligently combine both supply and demand side options as part of a hybrid model of assessing and delivering a more sustainable system of land and resource use globally.

Additional reminders for discussion

- Need to think about a more strategic framework for research (individually and in the institutions, i.e. publishing)
    - And for dialogue. Often scientists working at different scales have different ontologies or world views. I.e. solving global hunger vs. food sovereignty. They are

no incompatible, but the area in between is unexplored and grey and difficult to publish in. No top ranking journal wants a paper that says : hang on this is complicated we need to open up a debate or discussion here. It’s all about clear results. And global is sexier, lets face it.

- Linking research on problems with research on solutions
- Conceptual and methodological pluralism
- Power, equity and justice dimensions largely absent from many debates
- Need to invest dedicated resources in development of a stronger science-society interface
- Drawing from Chapin et al's three approaches to sustainability, that comprise managing risks, building resilience to change, and achieving transformation