



## Group Assembly Process (GAP) - Stirring Paper

# Where does responsibility begin and end?

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There comes a time in the life of most environmentally-minded people when we find ourselves standing in a supermarket aisle deliberating whether to buy the regionally and conventionally produced tomato or the imported organically grown fruit. Maybe we also wonder about how our tomato's background checks out in other regards: Are the organic and the conventional version are produced by the same company? Is one more land- but less energy-intensive? What about the water requirements? How much fuel is used for transportation? Is tomato production important for regional development? We could probably come up with a whole research agenda to inform tomato buyers (and this would be an agenda that has, in part, been pursued by Theurl and colleagues (2013)). To generalize our supermarket aisle deliberations: We are well-aware of the fact that what we consume is linked to environmental impacts associated with production.

Sustainability scientists are currently trying to find answers to very similar questions. Of course, they frame them in a little bit more abstract manner but the interest driving them is essentially the same one driving our trouble in the supermarket aisle. This type of research seeks to quantify the "upstream", the "embodied", the "virtual" or the "footprint" flows associated with the production of traded goods: Accounts are being developed which contain information on how much water (Chapagain and Hoekstra, 2008; Hoekstra and Hung, 2005), energy and emissions (Peters et al., 2011; Wiedmann, 2009), material (Schoer et al., 2012; Wiedmann et al., 2013), land (Kastner et al., 2014; Weinzettel et al., 2013), or even labor (Alsamawi et al., 2014) was required directly and indirectly to produce a certain amount of an exported product. Under these accounts, all of the material (or water or energy or land) required directly and indirectly to produce exports is allocated to the country which imports these goods for final consumption. Based on such accounts, it has been suggested that we might have to exercise caution in celebrating environmental protection in one country because it could be linked to environmental burdens elsewhere:

The regrowth of forest cover in some countries may have been enabled by (illegal) logging in other countries (Meyfroidt and Lambin, 2009).

The environmental Kuznets curve, where we do find evidence of it, is associated with displacement activities to other countries (Roca, 2003; Rothman, 1998).

Stricter environmental legislation in the developed countries can be linked to an outsourcing of production to countries with lower environmental standards (West et al., 2010).

On the basis of accounts which consider upstream flows, it has also been suggested that the stabilization or even decline in the resource use of mature industrialized economies is enabled by the import of resource-intensive goods from other countries (Wiedmann et al., 2013).

While these accounts provide us with new insights on the global distribution of resource use, they will not answer our “local-vs.-organic-tomato” question, not even if we frame it in a more generalized manner. While they can inform us about the land, water, energy, material, or labor needed in the production of the tomato, the accounts cannot tell us who should be held responsible for what. At the national level, for which most of the aforementioned studies were developed, however, it is necessary to answer this question of responsibility before we can allocate upstream requirements to a country. Should a country be held responsible for all of the direct and indirect impacts associated with its final consumption? And, if so, how should these impacts be allocated: According to the value of consumption, the energy content, the material content, or a mixed approach? Should a country be held responsible for its production? For what occurs under (and thus is subject to) its political mandate? For all those activities through which it generates revenues/income? Can responsibility be shared? Can it be shared between producers and consumers? Between countries? Can it also be shared between generations? If so, how should we depreciate former and current material or land or energy investments over time? Is it desirable to share responsibility beyond the (spatial and temporal) coverage of political mandates?

When we consider all of these possibilities, it becomes clear that while the “consumer pays” or the “producer pays” approaches may have their advantages, they also fail capture some of the finer aspects of responsibility and sharing of responsibility. In academia, these issues are being raised with regard to accounting for emissions (e.g. Jakob and Marschinski, 2012). Chakravarty and colleagues (2009) have suggested a system of “common but differentiated responsibilities” under which high-emitting individuals would be held accountable for their CO<sub>2</sub> emissions.

In developing a system of sharing responsibility for production and consumption that is not only fair but also conducive to our shared environmental protection goals, science can already provide a wealth of information on the ‘metrics’ of upstream requirements. In deciding how to allocate these requirements, however, input is needed from policy-makers and practitioners, from activists, and from individuals in the supermarket aisle. Undoubtedly, different groups will have different preferences on how responsibility should be allocated. We could identify how each of these preferences would shape the way we think about the distribution of global resource use and the according potential to intervene into those patterns, providing a basis for the discussion of the advantages and disadvantages of each approach. In doing so, we could also identify interrelations and important factors that the metrics currently offered by scientific researchers leave out. The development of methods for accounting for upstream resource requirements associated with trade is ongoing – it seems like there is no better time to intervene.

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