Brief for GSDR 2015

Synergies between healthy and sustainable diets

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In its efforts to meet greenhouse gas emissions targets, international policy has focused almost exclusively on the energy sector. Yet, as the global population and *per capita* demand for food both increase, emissions from agricultural sources risk jeopardising the achievement of those climate targets, as they already account for over a quarter of all anthropogenic emissions. The risk is heightened if the increasing demand for food causes further agricultural expansion and land cover change. Furthermore, increasing *per capita* food consumption, and also the share of livestock products, can have adverse effects on human health. There is accordingly a close interdependence between consumption patterns, human health and the sustainability of the earth system. Well-designed policies targeting the demand for particular foods could simultaneously improve the health of the global population, and restrict greenhouse gas emissions along with the impacts of land cover change. This briefing paper reviews and summarises evidence for this claim, and urges the need for policies that seek to achieve both better human health and environmental sustainability.

Latest findings

Increasing numbers of studies point to the importance of diets in meeting climate change goals. In 2009, Stehfest *et al.* showed that adoption of diets containing lower levels of animal products could reduce the overall 'cost' of climate change mitigation by 50%. Two subsequent studies (Hedenus *et al.* 2014; Bajželj *et al*. 2014) extrapolated current yield, technological and demand trends to 2050. They showed that the required land conversion and agricultural emission will on their own reach the level of emissions leading to a 2°C warming, even before emissions from other sectors such as energy and industry are considered. Even scenarios with optimistic technological and yield improvements predicted further land conversions. In order to stop further deforestation by 2050, we also need to reduce waste throughout the food supply chain and moderate increasing demand for high impact foods, particularly those of animal origin. The importance of demand side strategies to achieve climate goals was also recognised in the latest IPCC report (Smith *et al*. 2014) and a report by UNEP (Moomaw *et al.* 2012).

Box 1. Some key global indicators

- The livestock sector is responsible for ~7.1 Gt CO2e/y (~ 15%) of anthropogenic GHG emissions
- 2.1 billion people are overweight or obese (Ng et al. 2014)
- ~805 million people are malnourished due to inequality in food distribution.

There is increasing evidence that balanced diets can be compatible with environmental goals and *vice versa* (Tilman & Clark 2014, Bajzelj *et al.* 2014). There are three areas where unhealthy diets overlap with reduced sustainability:

1) **Widespread over-consumption.** Tilman and Clark (2014) estimate that in many countries *per capita* caloric consumption is, on average, about 500 kcal per day (or 20%) greater than is needed nutritionally, thereby explaining much of the global obesity epidemic (Swinburn *et al.* 2009). The obvious health benefits of decreasing over-consumption notwithstanding, the production of these calories could be avoided. The resources used in food production - land, fertiliser and agro-chemicals - could therefore also decrease, as well as transport emissions related to increased food trade and additional weight of people using transport (Michaelowa & Dransfeld, 2008; Edwards & Roberts, 2009).

2) **Food waste.** 30-40% of food is wasted due to losses in storage and transport, and lack of portion control (Gustavsson *et al.* 2011). In low-income countries, loss of food due to spoilage contributes to inadequate nutrition.

3) **Increasing consumption of livestock products.** *Per capita* consumption of livestock products has increased sharply, with major environmental consequences. Emissions from livestock arise from three sources: (i) enteric fermentation (digestion in ruminants) and manure, (ii) feed crop production, associated fertiliser use and soil carbon losses; (iii) conversion of natural vegetation, often forests, to

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cropland and pasture needed by increasing livestock numbers. Emissions from plant based foods for human consumption are on average smaller, as the efficiency of producing food calories or protein can be 4-20x greater without the intermediate step of feeding livestock.

Meat and dairy products, which are rich in protein and micronutrients, can be valuable in improving the nutritional quality of poor diets. However high levels of consumption, typical of western diets, may be 2-3x above health recommendations. Excessive consumption has been associated with negative health effects, although the extent to which this may be related to other associated factors is not yet fully understood (Garnett 2014a).

Tilman and Clark (2014) have, however, summarised research integrating ten million person-years of observations across eight study cohorts, to show the marked health benefits of diets with lower-than-average meat consumption (Mediterranean diet, pescaterianism and vegetarianism). These benefits include a 15-42% reduction in the risk of Type II Diabetes, and 6-12% reduction in the risk of cancer.

While the priority is to tackle overconsumption in high and middle-income populations, the positive effects on public health would be felt universally. If integrated, nutrition-focused agricultural policies were adopted, more grains and pulses would likely be available to improve the diets of those most vulnerable amongst the global population.

Policy responses are lacking

Governments have begun to address overconsumption, but their responses have so far not reversed the trend in diet-related non-communicable disease (Ng *et al.* 2014). Despite the need to address demand for animal products in rich countries for climate objectives, no government seems prepared to do so (Chatham House, 2014). The livestock sector attracts remarkably little attention at either the international or national climate policy levels (Ripple et al. 2013), despite being comparable to the transport sector in generated emissions. Furthermore, agricultural subsidies generally fail to take into account the health or climate consequences of the commodities they support (Birt *et al.* 2007).

Influencing people's dietary choices is perceived as politically difficult (Box 2). However, as Garnett (2014b) points out, the belief that these challenges are insurmountable is untested, since there has been inadequate focus on cross-disciplinary social science research to understand how dietary change might best be achieved.

Box 2. Possible reasons for the lack of policy responses:

- fear of appearing to intrude on individual's choices
- cultural and aspirational status of livestock products
- private-sector resistance
- public ambivalence
- limited capability to influence behavioural change

Source: Chatham House (2014)

One obstacle to action is the relatively limited public awareness in many countries of the impacts of the livestock sector on climate, as shown in a recent survey commissioned by Chatham House (Bailey *et al.* 2014).

However, while education to increase awareness is important, evidence shows that knowledge plays, at best, a small role in changing unhealthy behaviours (Marteau et al. 2012). This accords with psychological and neuroscientific evidence showing that much of human behaviour is not driven by deliberation upon the consequences of actions, but rather is automatic, cued by stimuli in the environment (which includes economic factors, socio-cultural norms and other factors).Resulting behaviour often conflicts with healthy lifestyles to which many aspire but most fail to achieve (Strack & Deutsch 2004).

What are the policy options?

No single strategy will lead to a desired win-win outcome for human health and environmental sustainability, but the UN could promote multiple, joined-up policies such as:

- Gradually removing agricultural subsidies for commodities with adverse effects on human health and the environment.
- Encouraging the food industry to promote sustainable and healthy purchasing and consumption (such as through portion control, package size, offering more alternatives to red and processed meats, etc).
- Promoting waste reduction at all stages in the food supply chain from production, through storage and transport, to marketing and consumption.
- Including the livestock sector in climate policies, as other sectors (Ripple *et al.* 2013)
- Adjusting responsibilities between governmental departments, so that health objectives drive agricultural priorities and policies, and not the other way around (Simopoulos *et al.* 2013)

Effective policies should target automatic behavioural processes, while being sensitive to the affordability and cultural norms surrounding diets. At least in public settings, such as schools, hospitals, and workplaces, the healthy, sustainable meal and snack options should always be the

most convenient, affordable and arguably the only options on offer.

Scientific debate

Further investigation of the synergies and trade-offs between healthy and sustainable food consumption is still needed. Research on the supply side options – emission reduction and productivity improvement should also continue, especially at the farm level (MacMillan & Benton 2014). More research is needed on how technological improvements impact upon health and *vice versa*, and the possibilities of rebound effects.

The biggest knowledge gap however, given the importance of the double-objective of avoiding dangerous climate change and improving health, is the lack of research on how best to achieve sustainable healthy eating patterns and as part of that, reductions in consumption of animal products.

Filling this knowledge gap will not only improve our chances of avoiding global warming, but also move us closer to ending hunger and malnutrition, and set the Sustainable Development Goals on a good footing.

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