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New International Agreement on Climate Change planned for adoption in December 2015

Livestock Sector's Role

The FAO estimates that the livestock sector is responsible for greenhouse gas (GHG) emissions of 7.1 gigatonnes CO_2-e per annum, i.e.14.5% of human-induced emissions.[i] The European Council Conclusions of October 2014 stress "the need to ensure coherence between the EU's food security and climate change objectives". The Council Conclusions also encourage the sustainable intensification of food production. However, further intensification of the EU's highly industrialised agriculture sector will impair sustainability.

Further intensification of livestock production will undermine food security and the natural resources on which farming depends

Industrial livestock systems depend on feeding cereals to animals; 60% of EU cereals are used as animal feed.[ii] Globally 36% of the world's crop calories are fed to animals.[iii] This is inefficient. For every 100 calories that we feed to animals in the form of human-edible crops, we receive on average just 17-30 calories in the form of meat and milk.[iv] [v]

Because of animals' inefficiency in converting these crops into meat and milk, feeding human-edible cereals to animals is a wasteful use of the land, water and energy used to grow them. Animal products from industrial systems generally consume and pollute more ground- and surface-water and require more arable land than animal products from grazing or mixed systems.[vi] A key study concludes that the anticipated further intensification of animal production systems globally will result in increasing blue (volume of surface and groundwater used) and grey (pollution caused) water footprints per unit of animal product.[vii] This is due to the larger dependence on concentrate feed in industrial systems.[viii]

The industrial livestock sector's need for huge quantities of cereals has led to the intensification of crop production with the concomitant use of monocultures and chemical fertilisers and pesticides. These contribute to erosion of biodiversity and soil fertility: 45% of Europe's soils face quality problems evidenced by low levels of organic matter.[ix] A new study reports that modern farming practices have degraded UK soil to the point where farms soils are of poorer quality than small urban plots used for growing vegetables, etc.[x]

It is questionable whether further intensification of livestock production will reduce GHG emissions

Cattle: A common assumption is that intensification of dairy production reduces GHG emissions per unit of milk produced. Recent studies show substantially higher GHG emissions for European confinement dairy systems as compared with pasture-based dairying.[xi] [xii] [xiii] US researchers have found that GHS emissions are 8% lower in year-round outdoor dairy systems than in high-production confinement systems.[xiv]

The FAO states that grassland carbon sequestration could significantly offset emissions with global estimates of about 0.6 gigatonnes CO_2–eq per year.[xv] The French Institut De L'Elevage estimates that in dairy production carbon sequestration in pasture compensates for 10-70% of methane emissions. It adds that in beef suckler systems carbon sequestration compensates for 60% to over 100% of methane emissions.[xvi]

The supplementation of ruminant diets with concentrate is often advocated as a way of reducing methane emissions. However, a 2013 FAO report points out that this could threaten

food security by reducing the grain available for human consumption and that it may also have an impact on land-use change which itself produces GHG emissions.[xvii]

Pigs and poultry: Another common argument is that industrial pig and poultry is an efficient option for minimising GHG emissions. However as further intensification will increase demand for feed grain, cropland will have to be farmed more intensively and/or it will have to expand.[xviii] Expansion of cropland, e.g. for soy production, is likely to be at the expense of forests and grasslands.[xix] This will involve increased GHG emissions due to release of stored carbon into the atmosphere as land is cleared for cropland. The FAO states that, in part due to its need for soy, industrial pork production entails higher emission intensities than backyard systems.[xx]

Moreover, the additional grain that is needed will often be grown intensively with the aid of synthetic fertilisers. The manufacture of these fertilisers uses considerable amounts of fossil fuel which results in sizeable CO_2 emissions.[xxi] In addition, the application of nitrogen fertiliser leads to substantial emissions of nitrous oxide, the most aggressive GHG.[xxii]

Do we need to change to industrial systems?
The FAO stresses that it is not necessary to change to industrial systems in order to mitigate climate change. It says "the mitigation potential can be achieved within existing systems; this means that the potential can be achieved as a result of improving practices rather than changing production systems (i.e. shifting from grazing to mixed or from backyard to industrial).

Supply-side measures insufficient on their own to prevent rise in GHG emissions
Mitigation techniques (such as improved manure management) can reduce emissions though care must be taken to ensure that any technique used does not harm animal welfare. In the developing world livestock productivity can be improved by better health and nutrition (but not through industrial production as this would undermine small-scale farmers). However, a recent Chatham House paper concludes that technical mitigation measures and increased productivity will be insufficient on their own to prevent an increase in farming's GHG emissions, let alone achieve a reduction.[xxiii] The study stresses that it is unlikely that global temperature rises can be kept below 2°C without a reduction in meat and dairy consumption.

Healthier diets would lead to reduced GHG emissions
Recent research shows that:

- a high meat diet (>100g/day) is responsible for much higher GHG emissions than a low meat diet (<50g/day). A high-meat diet produces 7.19kg CO_2-e per person per day while a low meat diet emits 4.67kg CO_2-e per person per day, a reduction of 35% [xxiv]
- halving the consumption of meat, dairy products and eggs in the EU would achieve a 25–40% reduction in GHG emissions.[xxv]

A 2014 study points out that 'business-as-usual' will lead to agriculture's GHG emissions being so high by 2050 that they alone will push global temperatures to increase by almost 2°C.[xxvi] This would be a disaster as it leaves no room for emissions from energy, transport and industry. The study stresses that only a shift to healthy diets and a halving of food waste will allow farming's GHG emissions to be reduced.

A recent study shows that if average diets among UK adults conformed to WHO recommendations, their associated GHG emissions would be reduced by 17 %. Further GHG emission reductions of around 40 % could be achieved by making realistic modifications to diets so that they contain fewer animal products and processed snacks and more fruit, vegetables and cereals.[xxvii]

Adverse impact of further intensification on animal health and welfare
Some advocate increasing animal productivity as a way of reducing GHG emissions. However, the animals used in industrial farming are already highly productive. Indeed, research shows that their productivity is so high that many suffer from serious welfare problems. The

European Food Safety Authority has concluded that "long term genetic selection for high milk yield is the major factor causing poor welfare, in particular health problems, in dairy cows".[xxviii] A UK study into leg disorders in broilers found that, primarily due to high growth rates, 27.6% of the chickens had levels of lameness that are likely to be painful.[xxix] The high productivity of modern laying hens causes osteoporosis which results in a high level of bone fractures.[xxx]

Climate change cannot be considered in isolation from other vital policy objectives. Care must be taken that measures aimed at reducing GHG emissions do not undermine other vital policy areas such as food security, the avoidance of land-use change, the availability of plentiful soil, water and biodiversity, development goals such as equity as well as animal welfare. The FAO's 2013 report on climate change emphasises that all these factors need to be assessed and integrated as part of livestock sector policies.

Conclusion

- Further intensification of livestock production in regions with industrial agricultural systems will undermine food security and the natural resources on which farming depends
- A move to more sustainable diets that include less resource-intensive foods can make a substantial contribution to reducing GHG emissions.

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