LIVESTOCK INDUSTRY ENVIRONMENTAL IMPACTS

1. BIODIVERSITY LOSS

- **The damage caused by livestock production threatens flora and fauna across the globe. A worldwide no-meat lifestyle is calculated to prevent over 60% biodiversity loss.** *(Rethinking Global Biodiversity Strategies, Netherlands Environmental Assessment Agency, 2010)*
- Example: In Mongolia, 82% of the total land area is designated as permanent pasture for livestock grazing, which is the largest single threat to biodiversity loss in Mongolia and throughout Central Asia. *(UN FAO)*

2. DEFORESTATION

- Livestock raising is one of the main drivers of deforestation. *(UN FAO, 2006)*
- Since the 1990s approximately 90% of Amazonian deforestation has been due to clearing land for grazing cattle or growing feed for livestock.
- **In Australia, 91% of all tree clearing over a 20-year period has been done for livestock grazing.** *(recent report on a 20-year study commissioned by the Queensland government as mentioned by Mr. Gerald Bisshop, retired principal scientist of the Queensland Department of Environment and Resources Management)*

3. DESERTIFICATION

- Desertification is caused by overgrazing and expansion of livestock crop-growing areas. *(TPN3 Rangeland Management in Arid Areas including the fixation of sand dunes, UNCCD, 2003)* Over 50% of the world's soil erosion is caused by livestock, which leads to desertification.
- **Some 75 billion tons of topsoil are being eroded annually due to agricultural mismanagement, climate change, and livestock grazing. In the United States alone, 54% of pasture land is overgrazed, with more than 100 tons of topsoil lost per hectare per year.** *(A study presented by Professor John Crawford at the recent Carbon Farming Conference held in New South Wales, Australia)*
- In 2010, Iraq, China, Chad, Australia, and Mongolia, among others, reported serious drought, with livestock grazing making conditions worse.

4. DISEASE

- Over 65% of human infectious diseases are known to be transmitted by animals. The filthy and inhumane conditions of factory farming harbor lethal bacteria and viruses such as avian and swine flu.
- Other diseases related to meat eating: tuberculosis, listeria, Crohn's disease, mad cow disease, campylobacter, Staphylococcus aureus, foot-and-mouth disease, HIV, the 2009 pneumonic plague outbreak in China, etc.
- Antibiotics regularly administered to livestock on factory farms causes bacteria to mutate, leading to diseases that are medication-resistant.

5. GREENHOUSE GAS EMISSIONS

- Livestock and their byproducts are accountable for at least **51% of all greenhouse gas emissions**. *(Goodland, Anhang, 2009)*
- Aerosols, or particles released along with CO2 from burning fossil fuels, despite their detrimental health aspects, have a cooling effect that roughly cancels the warming effect of the CO2. Therefore, livestock emissions have played an even larger role in global warming in the near term. (*Mohr, 2009)*
- **METHANE** is almost 100 times more potent than CO2 over a 20 year period, but disappears from the atmosphere much more rapidly compared to centuries or millennia for CO2. **The number one source of human-caused methane is animal agriculture.**
- **METHANE emissions from animal farms underestimated.**
  Based on recalculations, US researchers from the University of Missouri have concluded that the amount of methane emitted from the waste on dairy and pig farms could be as much as 65% higher than previously estimated.
- **GROUND-LEVEL (TROPOSPHERIC) OZONE** is the third most prevalent greenhouse gas after carbon dioxide and methane. Fermented animal feed generates harmful ozone gases, and at regional levels higher than those emitted by cars.
- **BLACK CARBON**, (4,470 times more potent than CO2), mainly produced from burning forests and savannahs for livestock, is responsible for 50% of total temperature increases in the Arctic and the acceleration of melting glaciers worldwide. Black carbon remains in the atmosphere for only days or weeks, so reducing emissions can be an effective rapid response to slow warming in the near term. *(Nature Geoscience)*
- **NITROUS OXIDE** is a greenhouse gas with approximately 300 times more warming potential than CO2. Sixty-five percent of global nitrous oxide emissions originate from the livestock industry.

6. LAND USE

- Livestock production accounts for 70% of all agricultural land and 30% of the ice-free land surface on the planet. *(Livestock's Long Shadow, UN FAO, 2006)*

7. OCEAN DECLINE

- The livestock sector is the largest source of nutrient pollution, which causes toxic algal blooms and oxygen depletion, leading to oceanic "dead zones" that are unable to support any aquatic life. *(Livestock's Long Shadow, UN FAO, 2006)*
- 90% of all large fish have already disappeared from the oceans, largely as a result of overfishing. *(Nature Journal, Myers & Worm, Dalhousie Univ, May 15, 2003)*
- Aquaculture (fish farms), accounting for 50% of fish and shellfish consumed globally, is endangering wild fish. *(Proceedings of the National Academy of Sciences, 2009)*
- Example: It takes up to 5 pounds of wild fish to produce 1 pound of salmon. *(Naylor. Stanford's Woods Institute for the Environment and Freeman Spogli Institute for International Studies)*
- One-third to about half the global fish catch is fed to livestock (pigs and chickens). *(Annual Review of Environment and Resources, Sea Shepherd)*

8. POLLUTION

- Of all sectors, the meat industry is the biggest source of water pollution. Excessive and unregulated animal waste, chemical fertilizers, pesticides, antibiotics, and other livestock-related contaminants choke waterways.
- The livestock industry emits 64% of all ammonia, which causes acid rain and hydrogen sulfide, a fatal gas.
- One animal factory farm produces more waste and pollution than the whole city of Houston, Texas, USA.
- In 1996, the US cattle, pork, and poultry industries produced 1.4 billion tons of animal waste, or 130 times more than produced by the entire human population.
- Manure is already known to be a major cause of both groundwater pollution and atmospheric warming. Moreover, runoff from manure and other crop fertilizers accounts for some 230 oxygen-depleted dead zones along the US coast alone.
- Examples: The dead zone in the Gulf of Mexico created by farm runoff is one of the world's largest at up to 8,000 square miles so far. A February 2010 outbreak in Brazil's Rodrigo de Freitas Lagoon caused the suffocation and death of 80 tons of fish.
- Aquaculture pollutes the environment with toxic algae and chemicals such as pesticides and antibiotics. (WWF)

9. RESOURCE OVERUSE

- **Fuel.** One 6-ounce beef steak requires 16 times as much fossil fuel energy as one vegan meal containing three kinds of vegetables and rice. *(NYTimes)*
- One kilogram of beef is equivalent to driving 250 kilometers and burning a 100-watt light bulb for 20 days non-stop. *(National Institute of Livestock and Grassland Science in Japan)*
- **Emissions.** The meat-based diet's emissions is equivalent to driving a car 4,758 kilometers – that is 17 times the emissions of an organic vegan diet, which is equivalent to only 281 kilometers . In other words, an organic vegan diet produces 94% less emissions than a meat-based diet. *(Institute for Ecological Economy Research in Germany)*
- **Land.** One meat eater requires two hectares - that's four acres of land - to support him. But that same two hectares, or four acres of land, could support the healthy lifestyle of 80 vegans.
- **Food.** Currently, 80% of hungry children live in countries that export food crops typically to feed farmed animals.
- Two-thirds of US grain exports feed livestock rather than people.
- One study in India found that producing 1 kilogram of beef requires 7 kilograms of grain for feed that could go to direct human consumption, while yielding less than one-third the amount of protein.
- About 40% of the global grain supply is going to livestock, and 85% of the world's protein-rich soy is being fed to cattle and other animals.
- **Water.** A person uses up to 15,000 liters of water per day for a meat-based diet, which is 15 times as much water as a vegan would use.

10. WATER SHORTAGE

- According to the Stockholm International Water Institute, agriculture accounts for 70% of all water use, most of which goes toward meat production.
- It takes up to 200,000 liters of water to produce 1 kilogram of beef, but only 2,000 liters to produce 1 kilogram of soybeans, 900 liters to grow 1 kilogram of wheat, and 650 liters for 1 kilogram of corn. *(Pimentel D, Berger B, Filiberto D, et al. (2004) Water Resources, Agriculture, and the Environment)*

SOLUTION

ORGANIC VEGAN DIET

- The two key sectors of energy and food must change dramatically in order to avoid the worst environmental impacts of climate change. With a growing population, this necessitates a shift away from an animal product-based diet. *(UNEP, Assessing the Environmental Impacts of Consumption and Production, 2010)*
- **A projected doubling of meat and dairy consumption by 2050 would imperil the planet due to increased emissions related to livestock, increased consumption of the Earth's biomass (plant matter grown to feed livestock), and reactive nitrogen (manure and fertilizer chemicals causing multiple harms to the environment). A diet of 100% protein from soy sources would have only 1% of the impact in 2050 of a diet in which 100% of protein was from meat.** *(Pelletier. Dalhousie University in Canada, 2010)*
- A person adopting a vegetarian diet for a year would reduce more emissions than someone swapping their car for a Toyota Prius. *(University of Chicago in the US report, 2006)*
- The emissions from consuming a diet of 100% locally grown food was compared to one of 100% plant-based foods. A vegan diet led to a reduction of 7 times the emissions of a locally-grown diet. *(Carnegie Mellon University, 2008)*
- In 2008, Germany's Foodwatch Institute estimated shifting from a conventional diet including meat and dairy, to a conventionally-raised vegan diet would reduce emissions 87%, while shifting to an organic diet including meat and dairy would only reduce emissions 8%. By contrast, a 100 % organic vegan diet would reduce emissions 94%.
- **Switching to a diet that replaces all meat with soy by 2050 would reduce the protein-associated carbon footprint 96%.** *(Pelletier. Dalhousie University in Canada, 2010)*
- **Producing one kilogram of beef generates 19 kilograms of CO2 emissions, while one kilogram of potatoes, only 280 grams of CO2.** *(Ulf Sonesson of the Swedish Institute for Food and Biotechnology, 2009)*
- Eating more of certain animal products such as chicken (instead of beef) will NOT help mitigate environmental impacts. Researchers have found that protein from chicken has an energy efficiency rating of just 5% compared to plant-based foods such as tomatoes, with 60%; oranges and potatoes at 170%, and 500% for oats. (p. 7 report by Eshel, Martin. University of Chicago, 2005)
- Eating fish will not help either. Fish was found to be similarly inefficient, in part because of the energy required for long-distance voyages to hunt large fishes such as tuna. Also, even the so-called "best managed" fish farms generate widespread environmental damage. (Dr. John Volpe. University of Victoria in British Columbia, Canada)

ORGANIC VEGAN FARMING

- Organic farming methods help rebuild and replace carbon in the soil. *(A study presented by Professor John Crawford at the recent Carbon Farming Conference held in New South Wales, Australia)*
- If all tillable land were turned into organic vegetable farmland, not only would people be fully fed, but up to 40% of all the greenhouse gases in the atmosphere could be absorbed. This is in addition to the elimination of over 50% of emissions caused by livestock raising. (Rodale Institute, 2008)
- Land used for meat production could also be returned to its natural state, which in turn helps quickly absorb vast quantities of CO2 from the atmosphere. *(Netherlands Environmental Assessment Agency)*
- Changes in farming practices, such as greater efficiency in livestock farming methods and better manure management, are not sufficient to meet the UK's 2030 goals for greenhouse-gas emissions. A reduction in meat and dairy production and consumption would more effectively mitigate global warming while improving public health and saving lives. (The Health Benefits of Tackling Climate Change.*The Lancet, 2009*)
- Livestock emission reduction plans, such as providing different food sources for animals and using manure for fuel, have been found to reduce emissions only by a few percent and in fact could create more food quality and ethics problems. (a decade-long study by New Zealand's AgResearch) Meat and dairy consumption must be reduced to significantly minimize livestock emissions. (UK Food Ethics Council Executive Director Tom MacMillan)
- **METHANE CAPTURE for energy an inadequate plan.**
  The proposal to capture methane from livestock manure in factory farms is wholly insufficient, because:
  (1) Most of the methane is from enteric fermentation - over three times the amount from manure.
  (2) The system is not often technically or cost- feasible.
  (3) Digester systems are implemented usually on farms that collect large amounts of liquid manure daily.
  (4) The many serious environmental problems caused by factory farms are still unaddressed, and more than negate any benefit from methane capture.
    a. Global warming / Greenhouse gas emissions
    b. Biodiversity loss
    c. Excessive water, food, antibiotic and fossil fuel use
    d. Air, water, soil pollution
    e. Unhygienic bacteria and virus breeding grounds

OTHER CONSIDERATIONS

- **Health.** A study conducted by Harvard University with tens of thousands of men and women found that regular meat consumption increases colon cancer risk by 300%. In fact, meat consumption is linked to leading diseases, such as heart disease, diabetes, stroke, cancer, and obesity. A vegan diet significantly helps prevent and reverse these conditions. *(Physicians Committee for Responsible Medicine)*
- **World hunger.** If everyone ate a plant-based diet, there would be enough food to satisfy 10 billion people.
- **Economics.** By shifting to a vegan diet, the world's governments would save US$32 trillion by 2050, or a full 80% of total climate mitigation costs. *(Netherlands Environmental Assessment Agency)*
- If farmers in the American Midwest switched from raising livestock to growing fruits and vegetables, US$882 million could be generated in regional sales, with 9,300 jobs created and labor income increased by US$395 million.
- Producing veg alternatives to meat products is considered a smart and attractive opportunity for the food industry. *(Goodland)*
- **UN recommends tax on livestock.**
  A report issued by the United Nation's Food and Agriculture Organization (FAO) recommends levying fees for livestock as a way to reduce this sector's emission of greenhouse gases, currently estimated at 7,000 billion tons of CO2 equivalent annually.
- **The United Nations Environment Program (UNEP) and the European Commission calls for less meat.** UNEP and European Commission have jointly launched a major report calling for radical change in the way that economies use resources, emphasizing that a global drop in meat consumption is vital to avoid devastating impacts to the environment.