

**The production of animal protein consumes vastly more water than does the production of plant-based foods. This represents an unsustainable usage of a dwindling resource.**

**Where does all this water go in livestock production?** Eight percent of the world's water is used for livestock production. Water is required to grow the feed and provide drinking water. Smaller quantities are required to keep animal houses clean and for use in slaughter houses. The major use is in growing stock feed, 7% of the usage world wide, much of it related to irrigation. This represents a huge but growing waste of this shrinking and in many situations, non-renewable resource. The following table shows the overall usage of water in the various sectors and how much each sector is contributing to water depletion (Steinfeld 06):

Sector	Proportion of Water use %	Proportion of Water depletion %
Agriculture	70	93
Domestic	10	3
Industrial	20	4

There is now increasing pressure on water resources from domestic and industrial demand as shown by a four fold increase between 1950 and 1995 compared with a doubling for agriculture. In many areas of the world there is now open dispute between the various users and this situation is likely to worsen.

**The shrinking water resource: there is a pressing global urgency to improve our management of water use.** Climate change has reduced rainfall across wide areas of the earth. Dams have a limited life span of around 50 years associated with the build up of silt, significantly reducing their capacity, with approximately a 1% loss in capacity per year. Likewise groundwater is being rapidly depleted in wide areas of the world. (See below) A lot of this wastage can be traced back to large and sometimes hidden subsidies of water. In the US, some farmers pay as little as 1 to 5 cents per kilolitre where the public may pay 30 to 80 cents from the same source. The annual government subsidy in the US for irrigation infrastructure and supply is between 2.5 to 4.4 billion dollars. Worldwide the average annual subsidy 94/98 was around \$15 billion. This subsidy hardly encourages conservation, and is not money

well spent if it is used to grow animal feed.

**The use of irrigation to grow animal feed is an unacceptable waste of natural resources.** The problem for the environment is substantially magnified when irrigation is used to grow animal feed. In the US, about a 40% of irrigated land is used to grow feed crops compared to about 13% for fruit and vegetable production. By volume, the waste is even more impressive: about 60% of all irrigation water is used for animal feed production (Jacobson 06).

**The use of ground water for irrigation of feed crops is even more irresponsible.** About 30% of all fresh water in the world is stored as groundwater. Most of this has accumulated over millions of years with an average recharge rate of between 0.1% to 3% per year. Hence this is a limited resource but currently supplying just under a quarter of the world's water requirements (Pimentel 04). In many parts of the world, ground water is used extensively for irrigation, much of which is used to grow stock feed. However, in many of these regions, extraction exceeds replacement, the so-called use of fossil water, a non-renewable resource. These region include the western United States, northern China, northern and western India, Egypt, and West Asia and North Africa. Rapidly dropping water tables have been noted, requiring deeper and deeper wells (Pierce 06).

As example, water tables have dropped more than 30 metres in parts of the US and more than a 100 metres in regions of India. The net loss of water in these aquifers is in the order of 200,000 cubic kilometres per year world wide. Further withdrawal of water causes collapse of the aquifer, preventing refilling (Pimentel 04). It is likely that some of these areas will run out of water in the next decade or two, with disastrous consequences. The use of any of this water to provide feed for animals is greatly accelerating this process, as for example milk production in India.

**Groundwater requires substantial amounts of energy related to pumping, but standard irrigation needs considerable amounts of energy as well.** The cost in electricity is impressive. Delivering 10 million litres of water from a depth of 100 metres to irrigate one hectare of corn uses 28.5 mega-Watt hours per year of electricity, 32 times more than the energy cost of using surface water. (An average western house might use 5 to 10 mega- Watt hours per year.) Standard irrigation consumes substantial amounts of energy, with energy requirement of irrigated crops being around three times greater than rain fed crops. (Pimentel 04)

**The amount of water used to produce common foods is staggering.** As the following table demonstrates, the production of most animal-based foods is very wasteful of water (Modified from Pierce 06):

1kg coffee	1/4 pounder hamburger	1 kg cheese	1 kg rice	1 litre milk	1kg wheat
20,000 litres	11,000 litres	5,000 litres	5,000 litres	2,000 litres	1,000 litres

## References:

**(Jacobson 06)** Michael F. Jacobson. Six Arguments for a Greener Diet. Center for Science in the Public Interest. 2006.

**(Pierce 06)** Fred Pierce. Earth: The parched planet. New Scientist 25th February, 2006.

**(Pimentel 04)** David Pimentel, Bonnie Berger, David Filiberto, Michelle Newton, Benjamin Wolfe, Elizabeth Karabinakis, Steven Clark, Elaine Poon, Elizabeth Abbett, Sudha Nandagopal. Water Resources: Agricultural and Environmental Issues. Bioscience 2004; 54: 909-918

**(Steinfeld 06)** Henning Steinfeld, Pierre Gerber, Tom Wassenaar, Vincent Castel, Mauricio Rosales, Cess de Haan. Livestock's long shadow: environmental issues and options. LEAD/FAO publication 2006. Downloadable from [www.virtualcentre.org/en/library/key\\_pub/longshad/A0701E00.pdf](http://www.virtualcentre.org/en/library/key_pub/longshad/A0701E00.pdf)

**(White 97)** Mary E. White. Listen-Our Land is Crying. 1997 Kangaroo Press.