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# CLIMATE CHANGE CHALLENGE 2011

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**SUPREME MASTER**  
**T E L E V I S I O N**

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Constructive Programming for a Peaceful World



# Supreme Master Ching Hai Speaks with the Press

December 18, 2010, Cancun, Mexico

HALLO, noble media members of Mexico and especially here in Quintana Roo Province. I'd really like to convey my appreciation and respect, first of all, for your courageous efforts and commitment to report all the truth and all the important news, to provide accurate information to the public.

WE are here today to talk about the dangerous situation of our planet. First of all, together we thank Heaven for protecting us thus far. We are still alive here in order to make such a discussion today. This is due to Heaven's grace, also of course the physical and spiritual efforts of Earthly beings and all the saints on Earth and above, that our world is still existing. We thank them all.



AND through the media's caring concern for this subject as well, we can speak together about the solution. I have come to lend my humble support to your great endeavor and in the hope that you can save our world, through your noble and powerful work, from further destructive causes that are threatening our world. All this is so that we will live to see our future generations, our children, thrive in better conditions than we do now.

THESE conditions, I'm sorry to say, are getting worse and extremely urgent. For example, we are losing the world's inland glaciers that provide water to over a billion and a half people. Drought-afflicted regions have more than doubled in the past three decades. And fires, floods, and category-5 hurricanes are more frequent and fiercer than ever. There are now about 25-40 million climate refugees, which could easily become a billion within the next few decades. Where will they go?

Methane heats the atmosphere 100 times more than CO<sub>2</sub> but disappears quickly, in 9 or 12 years.

MEANWHILE, potent methane gas once frozen beneath the earth has become a ticking time bomb due to rising temperatures in the Arctic and is now set to trigger runaway climate change. We are living the worst-case scenario and the scientists are crying out for us to hit the emergency brake now, and hard.

HOWEVER, the solution that we are proposing, like focusing on reducing fossil fuels, won't give fast enough results for us because carbon dioxide, once released into the atmosphere, stays for centuries or more. Scientists are now saying that we must take advantage of shorter-lived emissions like methane—which heats the atmosphere 100 times more than CO<sub>2</sub> but disappears quickly, in 9 or 12 years, and black carbon (or soot)—which generates 4,470 times more warming potential than CO<sub>2</sub> but disappears within a few weeks.

THESE are very, very dangerous heat trapping gases but they disappear quickly. If we eliminate them we will cool the planet in a few years. So it's the emergency brake that we need, and the place to start is the livestock industry. Because livestock industry, animal raising, generates the largest human-made source of methane; it is also a very large source of black carbon, or soot, and accounts for at least 51% of all greenhouse gas emissions that heat up our planet.

SO if we stop the livestock industry then we will stop global warming – fast and simple. Furthermore, if we use all the tillable land on the planet to plant organic vegetables, then we will absorb 40% carbon dioxide from the atmosphere.

BUT there are even more compelling reasons to stop the livestock industry and meat production, which I'm sure we all would welcome because it is a very inexpensive but major solution to many serious problems that we are facing right now on our planet. Livestock farming is like producing food in reverse. In fact, the "product" is hunger, war, death and destruction, and maybe even destroying the whole planet, the whole life on this planet. The way we are going looks that way. The many by-products are water shortages, food crisis, water, air, and soil pollution, deforestation, desertification, ocean dead zones, and biodiversity loss. We use almost half of the world's grain supply to pour into the meat and dairy industry; most of our water supply; almost half the global fish caught to feed chickens and pigs; and 30% of the planet's ice-free land. With two hectares of land, we can support either 1 meat eater or 80 healthy vegans.

THE good news is that if we all stop eating meat and dairy, we can regain our all protective ecosystems, stop over 60% of the biodiversity loss, save four-fifths of the economic cost to mitigate emissions within 50 years, and much, much, much more. Of course, we save lives, human lives, by stopping all the sickness due to animal consumption, and stop the global warming to save our planet.

AND we should stop eating fish also because the fish industry has caused the astounding loss of 90% of the large fish in our oceans. We have to stop it in order to revive marine life from its current brink of collapse. We could also enhance public health and stop all the deadly meat-related disease, chronic diseases, fatal diseases, all kinds of disease, from heart disease, cancer, to viral flu pandemics.

Animal raising accounts for at least 51% of all greenhouse gas emissions.

ANYTHING less than the vegan solution will not work for our situation right now. For example, improving fish farming, even with the best methods, still has failed to stop the large-scale polluting of the oceans. And when we say we raise the animals "organically" or capture methane from manure to reduce emissions—these methods also fall exceedingly short of expectation. Even in the case of capturing methane from animal manures, three times that amount is still being released from the livestock digestive process. Plus, this technique cannot be considered clean energy at all, when the same factory farm is destroying the environment in a dozen other ways.

With two hectares of land, we can support either 1 meat eater or 80 healthy vegans.

BUT all these things that I have reported to you, I think you know them all or you know some of them already. And we thank all the kind scientists and diligent researchers of the world. But now, it is the urgent time to bring these emergency facts that we know into constructive, life-sustaining actions. We must help to end all the mass killings of the tens of billions of animals a year, not only to stop catastrophic climate change consequence, but also to save the original goodness of our own humanity in our heart.

WE have to save our loving kindness, by live and let live, by protecting the weak and defenseless, because we are humane, we are the children of God. We should act like God: merciful, compassionate, protective, loving and kind. All the religions have taught us the same anyway, like non-violence, harmony with nature. The world needs not only food and money, but also spiritual infusion. In truth, positive spiritual energy is what has sustained our world up till now, helping us to progress and evolve in many ways.

THEREFORE, respected journalists, ladies and gentlemen, your noble mission is not only to save this planet but also to restore the benevolence of the humans' heart. Because after all, what is more worth saving than the best qualities that we have within ourselves? We must shape our future on virtue and compassion. Then, all generations hereafter shall thrive and flourish.

YOU have my heartfelt best wishes and full support. May Heaven bless you and protect you, especially while on duty.

THANK you for coming.

GRACIAS.

The GOOD NEWS is  
WE can STILL SAVE our PLANET

# Climate Change Facts

Atmospheric, Biodiversity, Land & Ice Cap, Human, Ocean and Other Impacts of Climate Change

## 1. ATMOSPHERIC IMPACTS

### 1. GREENHOUSE GAS LEVELS

- Currently, the IPCC's worst-case scenario forecasts are being realized or exceeded, leading to a catastrophic 1000 parts per million of CO<sub>2</sub> by end of century.<sup>1,2</sup> To preserve the planet in a similar state as now, humankind must aim to reduce CO<sub>2</sub> levels from the current 385 parts per million to a stabilized target of 350 parts per million.<sup>3</sup>
- Carbon sinks are saturating and becoming carbon sources that add rather than absorb greenhouse gases:
  - Global plant growth is in a decade-long decline (2000-2009) due to climate change-induced stress from drought.<sup>4</sup>
  - The ocean has absorbed so much CO<sub>2</sub> that it is acidifying at an alarming rate.<sup>5</sup>
- With just a 2-degree Celsius average global rise, billions of tons of methane could be released from the Arctic, leading to mass extinctions of life.<sup>6</sup>

### 2. RISING TEMPERATURES

- Without drastic action now, a worst-case scenario rise of 4 degrees Celsius, which means spread of deserts, collapse of the Amazon, and massive release of methane and CO<sub>2</sub> gases from melted permafrost, will actually be reached as early as 2060, with a catastrophic warming of 5-7 degrees likely by century's end.<sup>7,8,9</sup>
- Scientists report that the first eight months of 2010 have been the hottest on record globally.<sup>10</sup>
- 2010 was also the year when unprecedented heat and high temperatures were recorded in 16 countries, the highest number ever, including Kuwait, Iraq, Saudi Arabia, Chad, Niger, Russia, Myanmar, and Pakistan.<sup>11</sup>
- In the past century alone, the temperature has climbed 0.7 degrees Celsius, at a rate 10 times faster than historic norms, due to human causes.<sup>12</sup>
- The past ten years have seen the hottest average annual temperatures ever recorded in our planet's history.<sup>13</sup>
- Without mitigation, much of the USA, for instance, by end of the century would have extreme temperatures of 122 degrees Fahrenheit (50 degrees Celsius).<sup>14</sup>
- Pledges made by governments in Copenhagen to reduce greenhouse gases are not enough to avert runaway climate change. They would still lead to a dangerous temperature increase of more than 3 degrees Celsius.<sup>15</sup>

## 2. BIODIVERSITY IMPACTS

- The rate of biodiversity loss is an astounding 1,000 to 10,000 times higher than a natural background extinction rate.<sup>16,17</sup>
- The current rate of species extinction far exceeds anything in the fossil record.<sup>18</sup>
- Ecosystems may be headed towards permanent damage as countries fail to achieve goals to protect animal and plant life.<sup>19</sup>

### SOME 2010 REPORTS ON SPECIES AFFECTED:

- Antarctic penguin populations declined more than 80% since 1975 due to loss of sea ice.<sup>21</sup>
- Arctic caribou are in steep decline due to climate change-caused starvation as early thaws and freezing over events make plant food inaccessible.<sup>22</sup>
- Similar to 2007 and 2009, in September 2010, tens of thousands of walrus came ashore in an unusual behavior, due to lack of sea ice where they normally rest.<sup>23</sup>
- Migratory birds are dying because of ill-timed travel that leaves them without adequate food supplies when they arrive at destinations and/or places like wetlands drying that no longer provide habitat.<sup>24</sup>

- Up to 270 unique species are now being lost every day.<sup>20</sup>
- The Earth is said by some experts to be undergoing her “sixth great extinction event” due to climate change as well as other mostly human-caused factors.<sup>25</sup>
- As global average temperature increase exceeds about 3.5 degrees Celsius, there may be extinctions of up to 70% of species around the globe.<sup>26</sup>

## 3. LAND & ICE CAP IMPACTS

### 1. DROUGHT & DESERTIFICATION

- Within 50 years, there could be irreversible drought (permanent desertification) in the southwestern US, Southeast Asia, Eastern South America, Western Australia, Southern Europe, Southern Africa, and northern Africa.<sup>27</sup>
- The percentage of Earth’s land area gripped by severe drought more than doubled from the 1970s to the early 2000s.<sup>28</sup>
- Examples of recent regional droughts:
  - China’s northern region, where 10-meter deep cracks began to appear in fields. Without drastic changes in water use, there could be tens of millions of environmental refugees from China appearing within the next ten years.<sup>29</sup>
  - Having just faced historic floods in 2009 due to a record rise in Amazon River water levels, several communities in Brazil’s Amazonas state have been isolated by drought and can no longer be accessed by boat, only by foot through the forest.<sup>30, 31</sup>
  - Iraq, China, Chad, Australia, Mongolia, Africa’s Sahel region, among others, have been suffering drought conditions in 2010.<sup>32, 33, 34, 35, 36, 37</sup>

### 2. EXTREME WEATHER EVENTS

- Extreme weather events are becoming more intense and more frequent.<sup>38, 39</sup>
- Some of 2010’s major disaster events:
  - Russian heat wave and fires. The summer 2010 heat wave as well as the polluted air from the forest fires caused fatalities in Moscow to double to a total of 700 people per day.<sup>40, 41</sup> City officials of Moscow, Russia reported a 60% increase in the mortality rate this past summer, when nearly

11,000 of the city's inhabitants perished due to the effects of excessive smog and record high temperatures.<sup>42</sup>

- Pakistani floods. Massive floods, the worst in the nation's history, resulted in about 2,000 fatalities, with more than 20 million injured or homeless. One-fifth of country was underwater.<sup>43</sup>
- Chinese landslides. Nationwide floods and landslides left over 3,100 killed and over 1,000 missing in 2010 alone. Floods across China increased sevenfold since the 1950s.<sup>44</sup>
- Brazil was struck by extreme heavy floods in April and June 2010 with hundreds of fatalities each time.<sup>45</sup>
- Poland suffered her worst flooding in decades in May 2010.<sup>46</sup>
- Forest fires raged in Portugal in summer 2010, spurred on by low humidity levels, strong winds, and temperatures reaching record highs of 40 degrees Celsius.<sup>47</sup>
- In Chad and Nigeria in 2010, floods wiped out the small amounts of food crops left after the drought.<sup>48</sup>
- Extreme cold and snow storms in 2010 in India, Northern Europe, North America, and South America.
- A lot of earthquakes and volcano activity in 2010 disrupted Indonesia, Iceland, Turkey, Chile, Haiti, etc.
- Global warming can cause ice-capped volcanoes like Iceland's Eyjafjallajökull to more easily erupt due to the ice loss causing a release of pressure on the hot rocks beneath the Earth's surface.<sup>49</sup>
- Landslides and avalanches in high mountains have increased over the past decade due to global warming. Volcanoes are increasingly at risk of collapse with mega-landslides that could bury cities.<sup>50</sup>
- Glacial lake outburst floods are increasing as lakes from glacial melt grow in number and size in Nepal.<sup>51</sup>

### 3. FOREST DECLINE

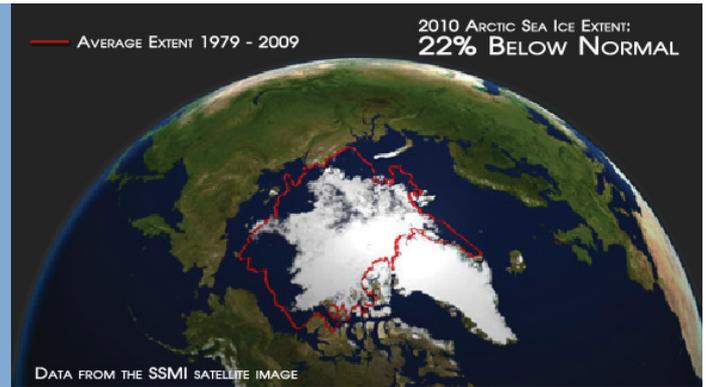
- Africa had the second highest net annual loss of forests in 2000-2010, with an alarming 3.4 million hectares that disappeared each year.<sup>52</sup>
- Deforestation accounts for approximately 20% of all greenhouse gas emissions.<sup>53, 54</sup>
- Trees absorb less carbon as climate warms.<sup>55</sup> Forests could even start to release huge amounts of CO<sub>2</sub> from trees and soil.<sup>56, 57, 58</sup> They already do release CO<sub>2</sub> in huge amounts through forest fires.<sup>59</sup>
- Bark beetle infestations in North American forests are spreading with global warming and turning forests into carbon emitters.<sup>60</sup>

### 4. ICE: ARCTIC & ANTARCTIC WARMING

- Atmospheric methane in the Arctic has spiked sharply upward, increasing 33% in just 5 years.<sup>61</sup>
- Melting permafrost in Siberia is releasing five times the amount of methane than was previously thought.<sup>62</sup>
- The East Siberian Arctic Shelf's shallow undersea permafrost is also showing instability and releasing significant amounts of methane.<sup>63</sup>
- The Arctic tundra is already emitting significantly more methane and nitrous oxide than previously estimated.<sup>64</sup>
- Some scientists are calling the thawing Arctic a "ticking time bomb."<sup>66, 67, 68</sup>
- Current warming makes it unlikely that the Arctic will return to its previous conditions.<sup>69</sup>

This year's summer Arctic sea ice (2010) was at its third **smallest** area on record, with all three most shrunken area events occurring within the **past four years**.

*(US National Snow and Ice Data Center [NSIDC], 2010 annual report)<sup>65</sup>*



- In winter 2009-2010, Arctic warming brought severely cold winds and heavy snow to eastern North America and eastern Eurasia.<sup>70, 71, 72, 73</sup>
- Overall warming has extended the annual melting period for Arctic sea ice to 20 days longer now than three decades ago, meaning more heat can be absorbed by the Arctic sea, and big impacts on marine ecosystems and North American climate.<sup>74</sup>
- Due to disappearing ice, polar explorers were able for the first time to journey around the North Pole in a small fiberglass sailing boat, a feat that would have been impossible even 10 years ago without an ice-breaker ship because the passages were sealed with ice.<sup>75</sup>
- The Arctic is warming at twice the rate of anywhere else on Earth.<sup>76</sup>
- The Arctic sea ice cover in 2007 was the lowest ever recorded and the Northwest Passage was navigable for the first time.<sup>77</sup> Only 10% now is older and thick ice, while over 90% is newly formed and thin.<sup>78</sup> Scientists forecast a completely ice-free summer as soon as 2012 or 2013.<sup>79, 80</sup>
- Without the protective ice to reflect sunlight, 90% of the sun's heat can enter the open water, thus accelerating global warming.<sup>81</sup>
- The world's two major ice sheets, **Greenland and Antarctica**, are now melting at accelerated rates, whereas before 2000, they were thought to be stable.<sup>82</sup>
- Greenland is seeing its worst ice melt and glacial area loss in at least five decades.<sup>83</sup>
- Glaciers have recently doubled or tripled their movements toward the sea.<sup>84</sup>
- "Icequakes" caused by breaking icebergs have more than tripled since 1993.<sup>85</sup>
- The possible, complete loss of the Greenland Ice Sheet would result in a 7-meter sea level rise.<sup>86</sup>
- Melt water speeding the Greenland Ice Sheet melt could cause its disintegration over decades rather than centuries, as previously forecast.<sup>87</sup>
- On August 5, 2010, one-quarter of Greenland's Petermann Glacier, four times the size of New York's Manhattan Island and the largest in nearly half a century, broke off. "The freshwater stored in this ice island could keep the Delaware or Hudson rivers flowing for more than two years," said Professor Andreas Muenchow of the University of Delaware.<sup>88, 89, 90</sup>
- On the Antarctic Peninsula, 99% methane gas has been seen continuously bubbling up in certain areas of the water's surface.<sup>91</sup>
- A major review published in 2009 found that especially Antarctica's ice shelves on the Western Peninsula are retreating at an ever-accelerating rate, speeded by warming waters beneath the shelves.<sup>92, 93, 94</sup>
- Over 2008, the Wilkins Ice Shelf on the Western Antarctic Peninsula disintegrated.<sup>95</sup> In 2002, the vast 12,000-year-old Larsen B Ice Shelf took only three weeks to disintegrate entirely.<sup>96</sup>

### 5. ICE: GLACIER MELT

- More than 46,000 glaciers and permafrost expanses are thawing rapidly in “the Third Pole,” the Earth’s 3rd largest store of ice after the Arctic and Antarctic, located on the Tibetan plateau and Himalayas. Known as “Asia’s water tower,” the region’s glacial retreat could affect more than 1.5 billion people across 10 countries.<sup>97</sup>
- With Bolivia’s 18,000-year-old Chacaltaya Glacier already gone, other South American Andean glaciers could disappear within a few decades.<sup>98,99</sup>
- Kyrgyzstan’s glaciers are receding 3 times as fast as during the 1950s, or as much as 50 meters per year. 95% of the glaciers could be gone by the end of the century.<sup>100</sup>
- Africa’s Mount Kilimanjaro has lost 85% of its glacier cover since 1912 and could be completely gone in 20 years.<sup>101</sup>
- The US Glacier National Park is set to be glacier-free by 2020, 10 years earlier than previously forecast.<sup>102</sup>

## 4. HUMAN IMPACTS

### 1. CLIMATE REFUGEES

- There are an estimated 25-30 million climate refugees. Numbers may increase to 200 million, or up to 1 billion, by 2050.<sup>103</sup>
- Nepal’s first “climate refugee village” of 150 people is being resettled due to climate change-induced water shortage. (July 2010 <sup>104, 105</sup>)

### 2. CONFLICT

- The US intelligence community considers global warming as a serious security threat. Top US intelligence analyst Thomasingar indicated that floods and droughts will soon cause mass migrations and unrest in many parts of the world. (2010 <sup>106, 107</sup>)
- Evidence points to global warming as a primary cause of the violence in Darfur. (2007 <sup>108, 109</sup>)

### 3. DISEASE

- Warmer temperatures are causing the spread of malaria, Blue-tongue virus, West Nile virus, dengue fever, and other diseases to reach millions more people never before exposed to them, in higher latitudes or on new continents.<sup>110, 111</sup>
- An additional 400 million people could be exposed to malaria by 2080 due to climate change.<sup>112</sup>
- More respiratory diseases like asthma and mental illnesses related to disasters are expected with global warming.<sup>113, 114</sup>

### 4. MORTALITY

- Climate change disasters are already responsible for some 315,000 deaths a year, with another 325 million people severely affected.<sup>115</sup>

### 5. SHORTAGE: FOOD

- Half the world’s population will face serious food shortages within the century.<sup>116</sup>
- Harvests are already distressed by drought or floods in Russia, Germany, Canada, Argentina, Australia, Ukraine, Pakistan, etc. (Sept 2010 <sup>117</sup>)

- Food prices rose 5% globally in August 2010. In Mozambique, food riots in response to raised bread prices led to 10 fatalities and 300 injuries. (Sept 2010 <sup>118, 119, 120</sup>)
- High food prices that sparked deadly 2008 food riots worldwide were due to a combination of climate change and increased demand for animal feed from populations in India and China. <sup>121</sup>
- The number of people suffering from hunger exceeded 1 billion for the first time in 2009. <sup>122</sup>
- Over 9 million people die worldwide each year because of hunger and malnutrition. Five million are children. <sup>123</sup>

### 6. SHORTAGE: WATER

- The world's rivers are in a "crisis state" on a global scale. Water supplies for nearly 80% of the world's populations are highly threatened. Nearly a third of sources studied are also highly jeopardized by biodiversity loss. <sup>124, 125</sup>
- Recent regional reports on water shortage:
  - The Middle East's water supply has shrunk to a quarter of its 1960 level. <sup>126</sup>
  - The Tigris and Euphrates rivers dropped to less than a third of their normal levels due to drought. <sup>127</sup>
  - UK's increasingly hotter, drier summers could cause extreme water shortages as river flows are reduced by 80%. <sup>128, 129</sup>
- Sources of groundwater for wells, which support half our world's population, are running dry. <sup>130</sup>
- 1.1 billion people lack access to safe drinking water. (2005 <sup>131</sup>)

## 5. OCEAN IMPACTS

### 1. ACIDIFICATION

- Oceans are acidifying 10 times faster now than 55 million years ago when a mass extinction of marine species occurred. <sup>132</sup>
- If emissions aren't stopped, a mass marine extinction is possible by the end of the century with degraded coastal waters and outbreaks of toxic algae and jellyfish. <sup>133</sup>

### 2. DEAD ZONES

- Oxygen-depleted dead zones caused by global warming can remain for thousands of years. <sup>134</sup>
- Climate change, as well as agricultural run-off, is causing new and larger low-oxygen dead zones. Now well over 400 in number and usually along coasts, dead zones have been doubling every decade since the 1960s. (2008 <sup>135</sup>)
- Toxic algae growth could become a tipping point. In the Baltic Sea, record high temperatures in summer 2010 led to an immense patch of algae the size of Germany, and spreading. <sup>136, 137</sup> Toxic algae infestations are occurring with ever greater frequency in both inland and ocean waters worldwide. <sup>138</sup>

### 3. CORAL BLEACHING

- In Southeast Asia and the Indian Ocean, experts are reporting coral bleaching in 2010 as the worst since 1998, when a similar event caused 16% of the world's coral reefs to perish. <sup>139</sup>

### 4. OCEAN CIRCULATION

- Over the next century, the Atlantic Ocean circulation might slow to a stop or reverse due to large amounts of melted freshwater changing the ocean's salt concentration. Such an event could trigger an ice age in Europe and North America.<sup>140, 141</sup>

### 5. OCEAN WARMING

- An estimated 90% of the heat from greenhouse gases over the past 50 years has been absorbed by the oceans, all the way to the deep ocean floor. If the heat currently being poured into the deep ocean were to stay in the atmosphere instead, our ambient temperature would rise at a rate of 3 degrees Celsius per decade. The Antarctic Ocean has the strongest deep warming, and is adding to sea level rise as well, both through expansion and the melt of land ice into the ocean.<sup>142</sup>
- Frozen methane from beneath the ocean floor could be released in massive amounts if the oceans are warmed enough, thus leading to further catastrophic warming. Sudden explosive releases of methane could also trigger 15-meter tsunamis. At the current rate, sea temperatures could increase by as much as 5.8 degrees Celsius by 2100.<sup>143</sup>
- The ocean temperature is rising 50% faster than previous 2007 estimates.<sup>144, 145</sup>

### 6. PHYTOPLANKTON LOSS

- Warming oceans caused a 40% decline in phytoplankton populations since 1950, which will have serious consequences. Phytoplankton not only provides crucial support to the marine ecosystem, it produces half the world's oxygen and eliminates CO<sub>2</sub>.<sup>146</sup>

### 7. SEA LEVEL RISE

- Dr. John Holdren, president of American Association for the Advancement of Science, predicts a possible 4-meter sea level rise by end of the century,<sup>147</sup> and Dr. James Hansen, NASA's head of the Goddard Institute for Space Studies, has stated the likelihood of a 5-meter sea level rise by end of the century.<sup>148</sup>
- A sea level rise of even 1 meter would result in over 100 million climate refugees and endanger major cities like London, Cairo, Bangkok, Venice, New York, and Shanghai.<sup>149</sup>

#### EXAMPLES OF COUNTRIES AFFECTED BY SEA LEVEL RISE:

- **Âu Lạc (Vietnam):** At the nation's rice bowl region, the Mekong Delta, ocean salt water has encroached an unprecedented 60 kilometers up-river in 2010, threatening 100,000 hectares of rice.<sup>150</sup>
- **Thailand:** Seawater is expected to reach Bangkok's ground level in 25 years.<sup>151</sup>
- **Egypt:** More than 58 meters of coastline have vanished every year since 1989 in Rasheed.<sup>152</sup>

- Sea level rise caused at least 18 island nations to completely disappear while many more coastal areas are continually threatened.<sup>153</sup> More than 40 other island nations are at risk from rising sea levels.<sup>154</sup>
- Sea level rise threatens half of the world's population living within 200 kilometers of a coastline. Already, low-lying coastal regions and deltas see effects: 17 million in Bangladesh have fled their homes, mainly because of coastal erosion. Groundwater sources are contaminated by saltwater in Israel and Thailand, small island states in the Pacific and Indian Oceans and the Caribbean Sea, and in some of the world's major deltas, such as the Yangtze Delta and Mekong Delta.<sup>155</sup>

- Current global consumption patterns would require a second Earth. Natural resources are currently being consumed at 1.5 times the capacity that Earth can provide.<sup>156</sup>
- Tipping points could arrive suddenly. Sudden shifts in the Earth's natural systems could arrive precipitously, without warning.<sup>157</sup>

## 6. OTHER IMPACTS

### FINANCIAL COSTS

- Damage from rising seas, floods and heat waves due to the loss of Arctic Sea ice will cost the sectors of agriculture, real estate and insurance up to US\$24 trillion by 2050. Heat waves, flooding and other factors are already resulting in hundreds of billions of dollars lost annually.<sup>158, 159</sup>
- Global losses due to natural disasters could triple to US\$185 billion per year by 2100. Damage from climate change-related powerful cyclones could add to this up to US\$58 billion annually.<sup>160</sup>
- In the 2009 Copenhagen climate change summit, nations approved a US\$30 billion fund to help vulnerable countries cope with climate change impacts, plus agreed to provide US\$100 billion per year from 2020.<sup>161, 162</sup>

# Livestock Industry's Environmental Impacts

Biodiversity Loss, Deforestation, Desertification, Disease, Greenhouse Gas Emissions, and More

## 1. BIODIVERSITY LOSS

- The damage caused by livestock production threatens flora and fauna across the globe.<sup>1</sup>
  - 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.<sup>2,3</sup>

## 2. DEFORESTATION

- Livestock raising is one of the main drivers of deforestation.<sup>4</sup>
- Since the 1990s approximately 90% of Amazonian deforestation has been due to clearing land for grazing cattle or growing feed for livestock.<sup>5</sup>
- In Queensland, Australia, 91% of all tree clearing over a 20-year period has been done for livestock grazing.<sup>6</sup>

## 3. DESERTIFICATION

- Desertification is caused by overgrazing and expansion of livestock crop-growing areas.<sup>7</sup>
- Over 50% of US soil erosion is caused by livestock, which leads to desertification.<sup>8</sup>
- 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.<sup>9</sup>
- 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.<sup>10</sup>

The filthy and inhumane conditions of factory farming harbor lethal bacteria and viruses such as avian and swine flu.<sup>11</sup>

- Other diseases related to meat eating: tuberculosis, listeria, Crohn's disease, mad cow disease, Campylobacter infection, Staphylococcal illness, foot-and-mouth disease, HIV, pneumonic plague (as in 2009 deadly outbreak in China), etc.
- Antibiotics regularly administered to livestock on factory farms causes bacteria to mutate, leading to diseases that are medication-resistant.<sup>12,13,14</sup>

## 5. GREENHOUSE GAS EMISSIONS

- Livestock and their byproducts are accountable for **at least 51%** of all greenhouse gas emissions.<sup>15</sup>
- **Aerosols**, or particles released along with CO<sub>2</sub> from burning fossil fuels, despite their detrimental health aspects, have a cooling effect that roughly cancels the warming effect of the CO<sub>2</sub>. Therefore, livestock emissions have played an even larger role in global warming in the near term.<sup>16</sup>
- **Methane** is almost 100 times more potent than CO<sub>2</sub> over a 5-year period,<sup>17</sup> but disappears from the atmosphere much more rapidly compared to centuries or millennia for CO<sub>2</sub>. The number one source of human-caused methane is animal agriculture.<sup>18</sup> 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.<sup>19,20</sup>
- **Ground-level (tropospheric) ozone** is the third most prevalent greenhouse gas after carbon dioxide and methane.<sup>21</sup> Fermented animal feed generates harmful ozone gases, and at regional levels higher than those emitted by cars.<sup>22, 23, 24, 25</sup>
- **Black carbon** (4,470 times more potent than CO<sub>2</sub>), 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.<sup>26</sup>
- **Nitrous oxide** is a greenhouse gas with approximately 300 times more warming potential than CO<sub>2</sub>. Sixty-five percent of global nitrous oxide emissions originate from the livestock industry.<sup>27</sup>

## 6. LAND USE

- Livestock production accounts for 70% of all agricultural land and 30% of the ice-free land surface on the planet.<sup>28</sup>

## 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.<sup>29</sup>
- 90% of all large fish have already disappeared from the oceans, largely as a result of overfishing.<sup>30</sup>
- Aquaculture (fish farms), accounting for 50% of fish and shellfish consumed globally, is endangering wild fish.<sup>31</sup>
  - Example: It takes up to 5 pounds of wild fish to produce 1 pound of salmon.<sup>32</sup>
- One-third to about half the global fish catch is fed to livestock (pigs and chickens).<sup>33, 34</sup>

## 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.<sup>35</sup>
- The livestock industry emits 64% of all ammonia, which causes acid rain and hydrogen sulfide, a fatal gas.<sup>36, 37</sup>
- One animal factory farm produces more waste and pollution than the whole city of Houston, Texas, USA.<sup>38</sup>
- 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.<sup>39</sup>

- 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.<sup>40,41</sup> 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.<sup>42</sup>
  - A February 2010 outbreak in Brazil's Rodrigo de Freitas Lagoon caused the suffocation and death of 80 tons of fish.<sup>43,44</sup>
- Aquaculture pollutes the environment with toxic algae and chemicals such as pesticides and antibiotics.<sup>45</sup>

## 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.<sup>46</sup>
- One kilogram of beef is equivalent to driving 250 kilometers and burning a 100-watt light bulb for 20 days non-stop.<sup>47</sup>
- **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.<sup>48, 49</sup>
- **Land:** One meat eater requires two hectares (four acres) of land to support him. But that same two hectares could support the healthy lifestyle of 80 vegans. (Supreme Master TV's interview with US law professor Gary Francione, Rutgers University, USA, 2008)
- **Food:** Currently, 80% of hungry children live in countries that export food crops typically to feed farmed animals.<sup>50</sup>
- Two-thirds of US grain exports feed livestock rather than people.<sup>51</sup>
- Producing 1 kilogram of beef requires 7 kilograms of grain for feed that could go to direct human consumption,<sup>52,53</sup> while yielding less than one-third the amount of protein.<sup>54</sup>
- About 40% of the global grain supply is going to livestock,<sup>55</sup> and 85% of the world's protein-rich soy is being fed to cattle and other animals.<sup>56</sup>
- **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.<sup>57,58</sup>

## 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.<sup>59</sup>
- 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.<sup>60</sup>

### MEAT VS. VEG DIET

- **GHG emissions:** Meat diet generates 17 times more emissions than an organic vegan diet.<sup>61</sup>
- **Land:** Two hectares, or four acres of land, could support 1 meat eater or 80 vegans. (Supreme Master TV's interview with US law professor Gary Francione, Rutgers University, USA, 2008)
- **Water:** A meat eater uses 15 times as much water as a vegan would use.<sup>62</sup>
  - 200,000 liters to produce 1 kilogram of beef
  - 2,000 liters = 1 kilogram of soybeans
  - 900 liters = 1 kilogram of wheat
  - 650 liters = 1 kilogram of corn
- **Fossil fuel:** Animal products require 11 times as much fossil fuel input—releasing 11 times as much carbon dioxide.<sup>63</sup>
- **Food:** One kilogram of beef requires 7 kilograms of grain to be produced.<sup>64</sup>

### COST OF **ONE** HAMBURGER

- 5 sq. meters (55 sq. feet) of destroyed tropical rainforest.<sup>65</sup>
- 23,000 liters (6,000 gallons) of clean water (14 months of daily showers).<sup>66, 67</sup>
- 1.8 kilograms (4 pounds) of grain consumed by the cow (about 3 loaves of bread).<sup>68</sup>
- 4 kilograms (8.75 pounds) of topsoil lost (topsoil = fertile layer of soil).<sup>69</sup>
- 30 plant species, 100 insect species, and dozens of birds, mammals lost.<sup>70</sup>

# The Solution

Organic Vegan Diet and Farming, plus Other Considerations

## 1. ORGANIC VEGAN DIET

- According to a 2010 report from the United Nations Environment Program (UNEP), 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.<sup>1</sup>
- 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.<sup>2</sup>
- A person adopting a vegetarian diet for a year would reduce more emissions than someone swapping their car for a Toyota Prius.<sup>3</sup>
- 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.<sup>4</sup>
- In 2008, Germany's Foodwatch Institute estimated that 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%.<sup>5,6</sup>
- Switching to a diet that replaces all meat with soy by 2050 would reduce the protein-associated carbon footprint 96%.<sup>7</sup>
- Producing one kilogram of beef generates 19 kilograms of CO<sub>2</sub> emissions, while one kilogram of potatoes generates only 280 grams of CO<sub>2</sub>.<sup>8</sup>
- 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.<sup>9</sup>
- 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.<sup>10</sup>

## 2. ORGANIC VEGAN FARMING

- Organic farming methods help rebuild and replace carbon in the soil.<sup>11,12</sup>
- 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.<sup>13</sup>
- Land used for meat production could also be returned to its natural state, which in turn helps quickly absorb vast quantities of CO<sub>2</sub> from the atmosphere.<sup>14</sup>

- 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.<sup>15</sup>

METHANE CAPTURE for energy is an inadequate plan:

- The proposal to capture methane from livestock manure in factory farms is wholly insufficient, because:
  - Most of the methane is from enteric fermentation - over three times the amount from manure.<sup>16</sup>
  - The system is not often technically or cost- feasible.
  - Digester systems are implemented usually on farms that collect large amounts of liquid manure daily.<sup>17</sup>
  - The many serious environmental problems caused by factory farms are still unaddressed, and more than negate any benefit from methane capture:
    - Global warming / Greenhouse gas emissions
    - Biodiversity loss
    - Excessive water, food, antibiotic and fossil fuel use
    - Air, water, soil pollution
    - Unhygienic bacteria and virus breeding grounds
- 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.<sup>18</sup> Meat and dairy consumption must be reduced to significantly minimize livestock emissions.<sup>19</sup>

### 3. 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.<sup>20</sup>
- **World hunger:** If everyone ate a plant-based diet, there would be enough food to satisfy 10 billion people.<sup>21</sup>
- **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.<sup>22</sup>
- 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.<sup>23</sup>

- Producing veg alternatives to meat products is considered a smart and attractive opportunity for the food industry.<sup>24</sup>
- 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 CO<sub>2</sub> equivalent annually.<sup>25, 26</sup>
- The United Nations Environment Program (UNEP) and the European Commission 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.<sup>27</sup>
- **Biodiversity loss:** A worldwide no-meat lifestyle is calculated to prevent over 60% biodiversity loss.<sup>28</sup>

We must shape our future on  
virtue and compassion. Then,  
all generations hereafter shall  
thrive and flourish.

~ Supreme Master Ching Hai

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