THE FUTURE OF FOOD

ENVIRONMENT

WORLD PRESERVATION FOUNDATION

WPF

www.worldpreservationfoundation.com

CONTENTS

1	Document Overview	04
2	Water Security	08
3	Food Security	34
4	Climate Refugees	50
5	Biodiversity	67
6	Ocean Security	84
7	Methane	115
8	Desertification	131
9	Deforestation	147
10	Climate Change	163
11	The Vegan Solution	195
12	Forward Thinkers	201
13	Livestock Subsidies	207

— 1 —

DOCUMENT OVERVIEW

What this document does

The looming environmental and humanitarian crisis is on a scale we cannot imagine. The world's ecosystems and the services they provide, as well as the natural biodiversity of the planet are fast approaching tipping points from which there is no return.

This document shows just how fast these environmental tipping points are approaching. It also shows that if something is not done about it now, in our own lifetime, we will witness an environmental catastrophe that will forever change the fabric of the natural world.

Fortunately, however there is a way our behaviour can dramatically and rapidly change the course of environmental ruin, this solution is made clear at the end of each section.

Every point in this document has been carefully selected from government agencies, environmental organisations, charities, and reputable news sources.

Each section follows a problem, cause, timeline, and solution structure. Each point has been abbreviated, with the exact quote following below, along with the publication that it was taken from.

Find out more:

www.worldpreservationfoundation.com

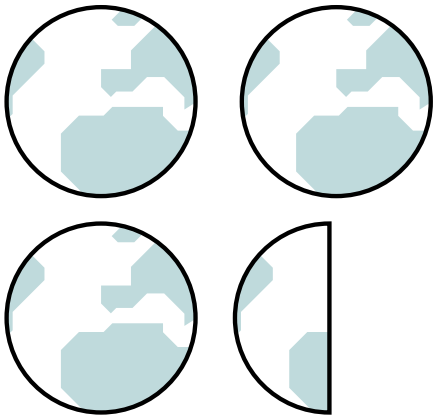
contact@worldpreservationfoundation.com

LEADING AUTHORITIES AND EXPERTS POINT TO AN EFFECTIVE AND VIABLE SOLUTION

UNITED NATIONS

"The United Nations; Food and Agriculture Organization (FAO) in 2006, stated that: "The livestock sector emerges as one of the top two or three most significant contributors to the most serious environmental problems, at every scale from local to global"

UNFAO, 2006



IF A WESTERN DIET WERE ADOPTED GLOBALLY, 3.5 PLANETS WOULD BE NEEDED

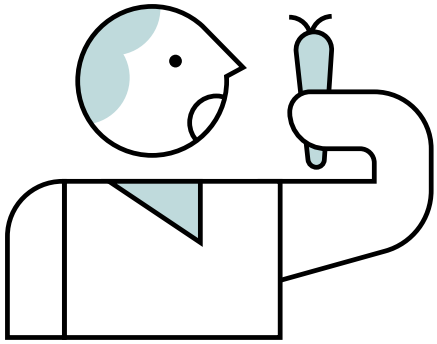
"Humans are over-consuming natural resources at an unsustainable rate. Around 3.5 planet Earths would be needed to sustain a global population achieving the current lifestyle of the average European or North American"

United Nations Water, 2014

STOPPING CLIMATE CHANGE ONLY POSSIBLE WITH PLANT BASED DIET

"A substantial reduction of the environmental impacts of agriculture would only be possible with a substantial worldwide diet change, away from animal products"

United Nations Environment Programme, 2010



– 2 –

WATER SECURITY

INTRODUCTIION

We do not have enough fresh water for our current population, let alone population growth, because much of the world's water sources are drying up. Already, more than a billion people live with critical water scarcity and 5 billion rely on polluted water.

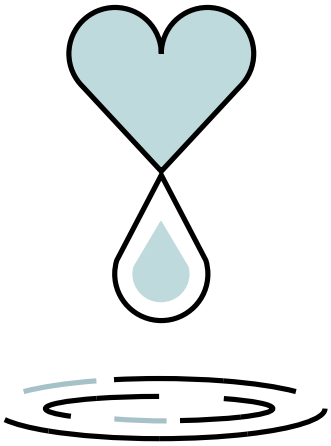
By 2025, two-thirds of the population will face water shortages, unless we take action. Water scarcity has already created millions of climate refugees, heightened international tension and even resulted in armed conflict.

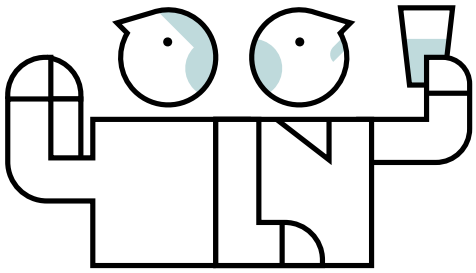
Food production uses most fresh water, with livestock using two-thirds of this. This is mainly because producing animal protein requires 100 times more water than plant protein. Livestock are also the main cause of water pollution, particularly nitrification. Therefore changing to a meat and dairy free vegan diet presents a viable solution to a thirsty world.

WATER = LIFE

"Water is essential for life. No living being on planet Earth can survive without it. It is a prerequisite for human health and well being as well as for the preservation of the environment"

United Nations, 2005





CALIFORNIA HAS ONE YEAR OF WATER SUPPLIES REMAINING

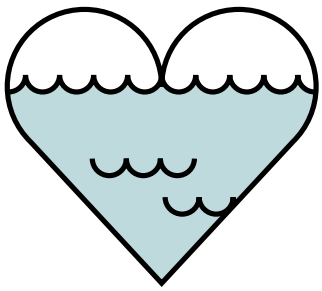
"[California] state has only about one year of water supply left in its reservoirs, and our strategic backup supply, groundwater, is rapidly disappearing. California has no contingency plan for a persistent drought like this one (let alone a 20-plus-year mega-drought), except, apparently, staying in emergency mode and praying for rain"

LA Times, 2015

BY 2030 THE WORLD WILL NEED 40% MORE WATER

"The planet is facing a 40% shortfall in water supply by 2030, unless we dramatically improve the management of this precious resource"

United Nations Educational, Scientific and Cultural Organization (UNESCO), 2015



"Thousands have lived without love, not one without water"

W.H. Auden

– 2 –

Water Security

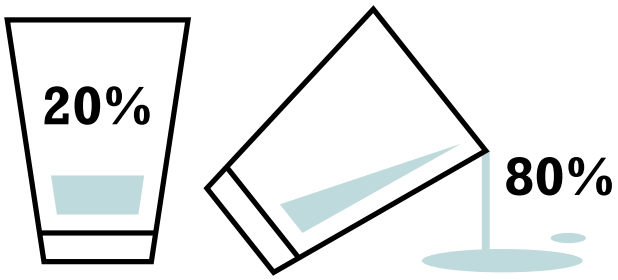
PROBLEM

Water scarcity

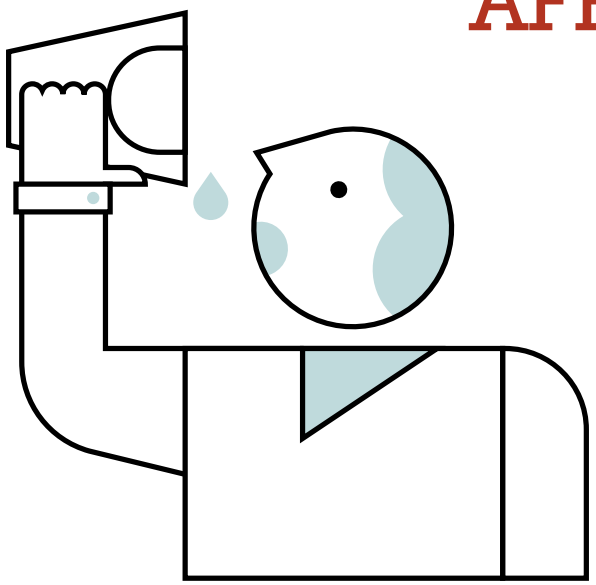
80% OF THE WORLD'S WATER IS NOT SECURE

"80% of the world's population lives in areas where the fresh water supply is not secure"

Nature Journal, 2010



WATER SCARCITY AFFECTS 1.6 BILLION



"1.6 billion people live in countries with absolute water scarcity"

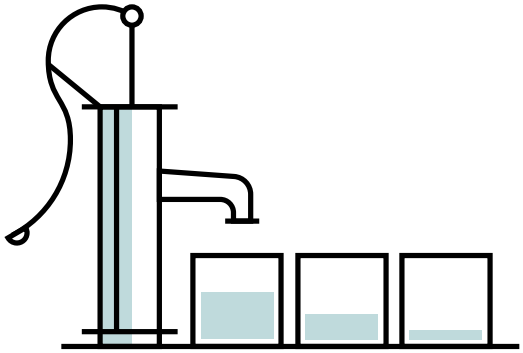
United Nations, 2006

– 2 –

Water Security

PROBLEM

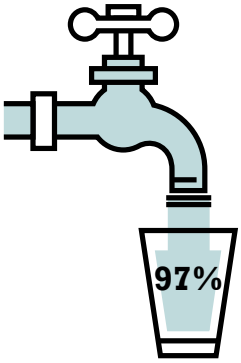
Unsustainable Withdrawal From Aquifers



NON-RENEWABLE AQUIFER WATER THREATENS LIFE ON EARTH

"Aquifers provide us with freshwater that makes up for surface water lost from drought-depleted lakes, rivers, and reservoirs. We are drawing down these hidden, mostly non-renewable groundwater supplies at unsustainable rates threatening our very future. These aquifers typically cannot recharge, and once this "fossil" water is gone, it is gone forever potentially changing how and where we live and grow food"

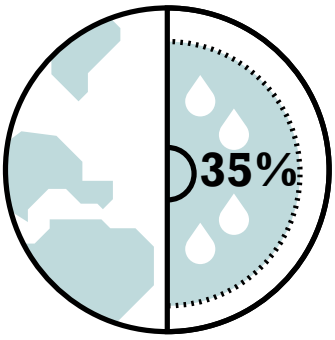
National Geographic, 2014



97% OF FRESHWATER IS IN AQUIFERS, SOIL, SWAMPS AND PERMAFROST

"30% of the world's freshwater is stored underground in the form of groundwater (shallow and deep groundwater basins up to 2000 metres, soil moisture, swamp water and permafrost). This constitutes about 97% of all the freshwater that is potentially available for human use is stored in aquifers"

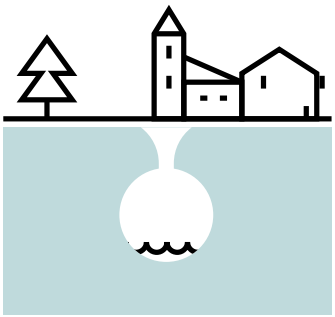
United Nations Water



AQUIFERS SUPPLY 35% OF FRESHWATER DEMANDS

"Underground aquifers supply 35% of the water used by humans worldwide"

Water Resources Research, 2015



DEPLETED AQUIFERS THREATEN 2 BILLION PEOPLE

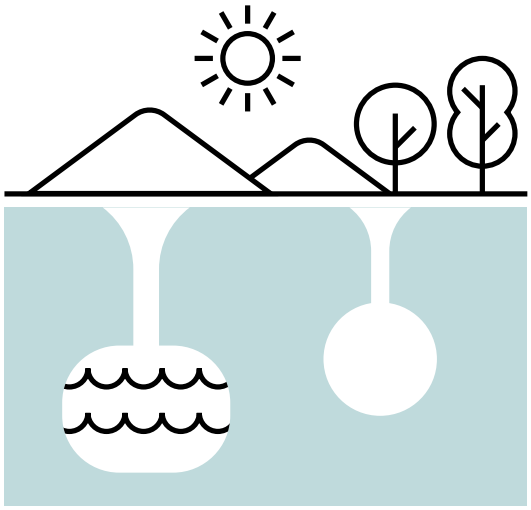
"Almost 2 billion people live in regions where aquifer water is being used up faster than it can be replenished"

Nature Journal, 2012

OVER HALF THE WORLD'S LARGEST AQUIFERS ARE THREATENED

"Of the 37 largest aquifers on Earth, 21 have exceeded sustainability tipping points and are being depleted, and 13 are considered significantly distressed, threatening regional water security and resilience"

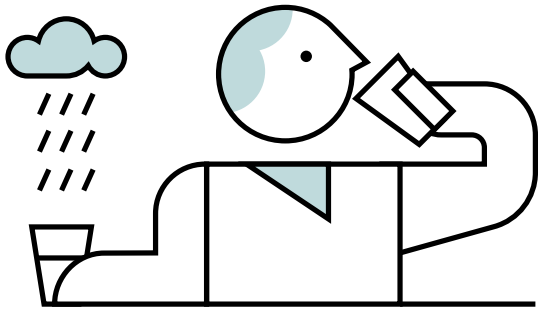
NASA, 2015

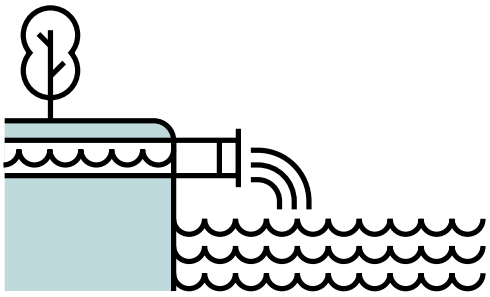


AQUIFERS SUPPLY 50% OF US DRINKING WATER

"Aquifer water provides drinking water for more than one-half of the US population"

United States Geological Survey

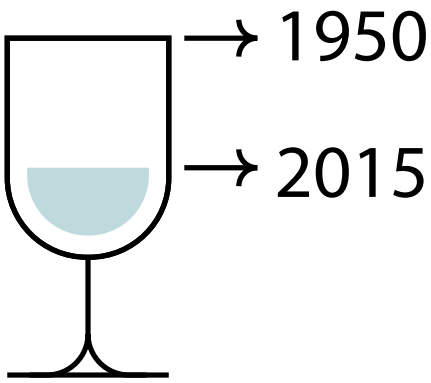




40% OF SEA LEVEL RISE IS FROM DISPLACED AQUIFER WATER

"40% of the observed sea-level rise in recent decades is due to water that has been pumped out of aquifers"

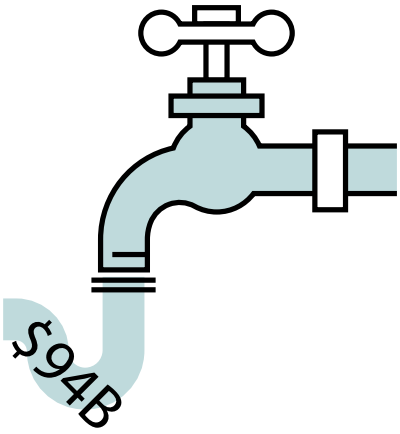
Washington Post, 2015



DRINKING WATER LEVELS FALL BY TWO THIRDS SINCE 1950

"The world's drinking water supplies have fallen by almost two thirds since 1950"

International Fund for Agricultural Development



WATER INSECURITY COSTS $94 BILLION ANNUALLY

"In agriculture, water insecurity costs existing irrigators US$94 billion per year"

Global Water Partnership, 2015

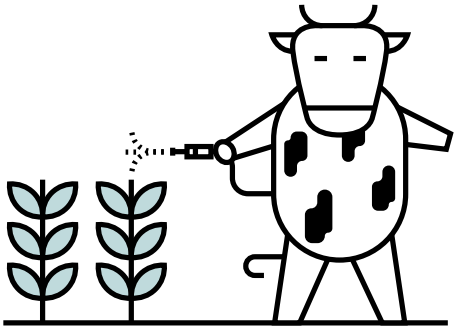
– 2 –

Water Security

CAUSE

AGRICULTURE USES 70% OF WATER WITHDRAWALS, & 90% IN DEVELOPING COUNTRIES

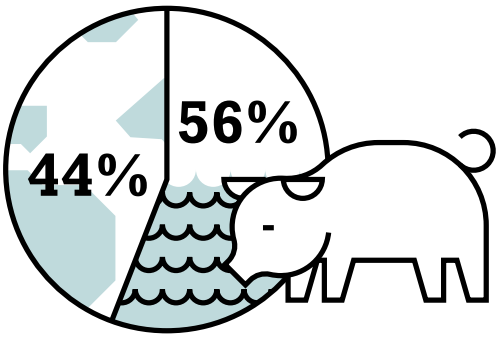
The agricultural sector is already the largest user of water resources, accounting for roughly 70% of all freshwater withdrawals globally, and over 90% in most of the world's least-developed countries



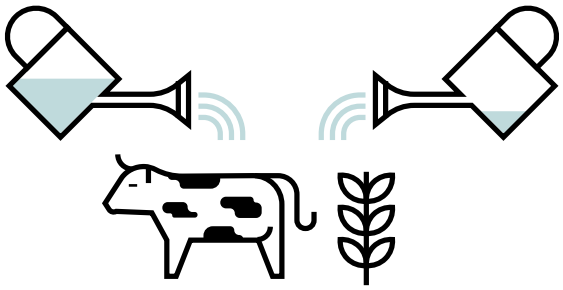
World Water Assessment Program, 2014

LIVESTOCK CONSUMES 56% OF FRESHWATER IN THE US

"Irrigating feed crops and raising livestock consume 56% of all freshwater in the United States. In contrast, domestically all showers taken, toilets flushed, cars washed, glasses drunk, and lawns watered, consume less than one-tenth as much water as agriculture"



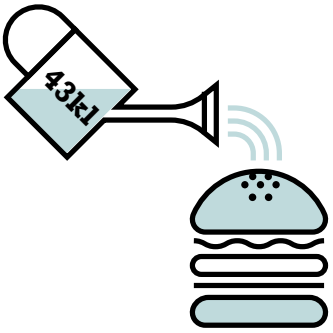
Center for Science in the Public Interest, 2006



1KG OF ANIMAL PROTEIN USES 100X THE WATER OF PLANT PROTEIN

"Producing 1 kg of animal protein requires about 100 times more water than producing 1 kg of grain protein"

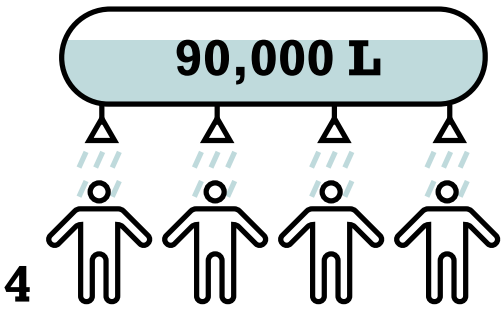
American Journal on Clinical Nutrition, 2003



1KG BEEF USES 43K LITRES OF WATER

"43,000 litres of water is required to produce 1 kg of beef"

Oxford Journals BioScience, 2004



ANNUAL SHOWERS FOR 4 PEOPLE USES 90K LITRES WATER, THE SAME REQUIRED TO PRODUCE 2KG OF BEEF

"The average four-person UK family would use 90,000 litres of water per year for their daily showers"

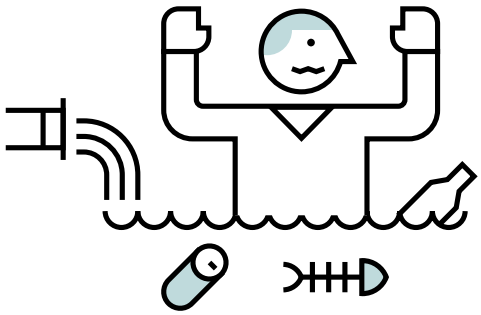
The Telegraph, 2011

– 2 –

Water Security

PROBLEM

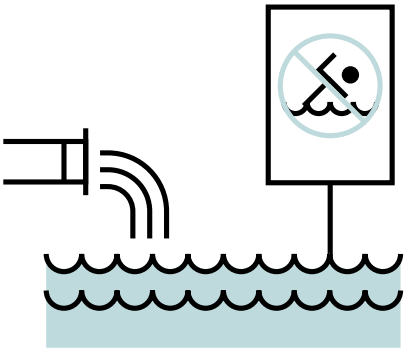
Polluted Waters



5 BILLION PEOPLE ARE AFFECTED BY WATER POLLUTION

"The world's rivers are so badly affected by human activity that the water security of almost 5 billion people, and the survival of thousands of aquatic species, are threatened"

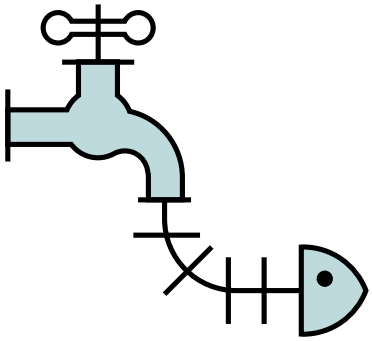
The Guardian, 2010



40% OF US RIVERS TOO POLLUTED FOR SWIMMING

"About 40% of rivers and lakes in the US surveyed by the EPA are too polluted for swimming or fishing"

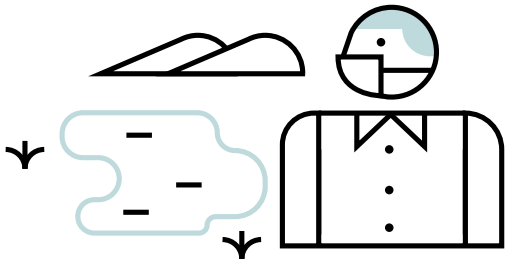
The Nature Conservancy, 2015



AGRICULTURAL RUN-OFF FEEDS ALGAL BLOOMS AND SUFFOCATES AQUATIC LIFE

"High levels of nitrate can cause an abundance of algae in water bodies, which in turn robs water of oxygen as bacteria break down the excess organic matter. Fish and other aquatic animals begin to suffocate, and stress is usually evident when oxygen drops below 3 milligrams per litre of water"

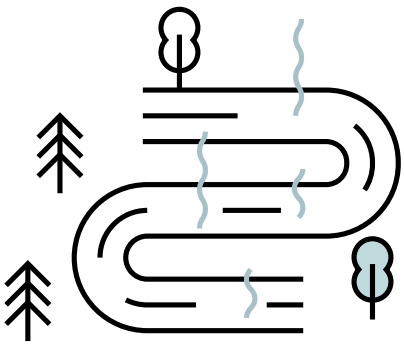
National Geographic, 2013



WATER FROM A DRYING CALIFORNIA LAKE CAUSING TOXIC AIR POLLUTION

"[California] state's largest lake, the 350-square-mile Salton Sea, [is] burping up hydrogen sulphide, a gas created by the decaying organic matter trapped beneath the water… The hydrogen sulphide can be smelled as far as 130 miles away in Los Angeles. But the smell is only one small part of a more serious public-health problem, one that has the potential to affect millions of people in southern California and beyond… As the playa is exposed, it dries quickly in the desert heat and sun; desert winds kick up the dust, creating a serious air-pollution problem"

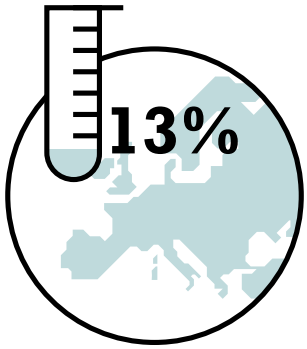
The Atlantic, 2015



50% WORLD'S MAJOR RIVERS POLLUTED OR DEPLETED

"Half the world's major rivers are being seriously polluted and or depleted"

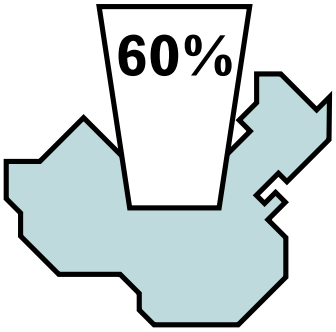
The Nature Conservancy, 2015



13% OF EUROPE'S GROUNDWATER IS POLLUTED

"13% of the groundwater monitoring stations across Europe, in 2009, exceed the 50 mg of nitrates per litre limit"

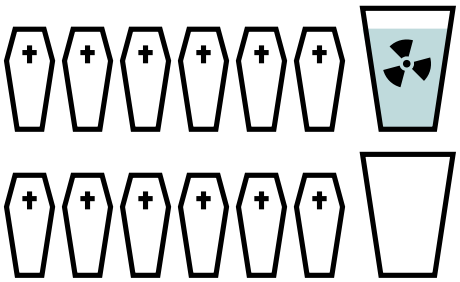
European Commission, 2012



60% OF CHINA'S GROUNDWATER IS POLLUTED

"Nearly 60% of China's ground water is polluted, only 3% of the China's urban groundwater can be classified as clean"

The Guardian, 2014



12 MILLION DIE ANNUALLY FROM WATER SHORTAGES /CONTAMINATION

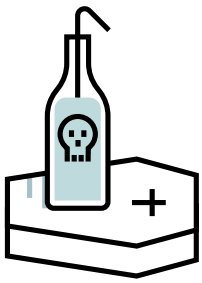
"Every year, 12 million people die as a result of water shortages or contaminated drinking water"

International Fund for Agricultural Development, 2001

1.5 MILLION CHILDREN DIE ANNUALLY FROM WATER SHORTAGES/CONTAMINATION

"UNICEF reports that 1.5 million young children die every year due to lack of safe water and sanitation"

UNICEF, 2006



– 2 –

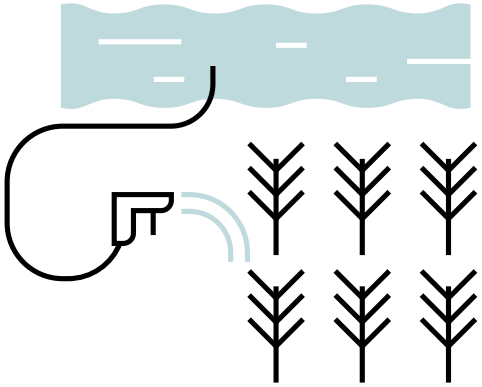
Water Security

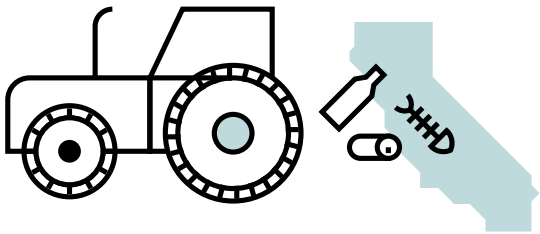
CAUSE

AGRICULTURAL WATER USE CHANGES ECOSYSTEMS, AND COSTS $20 BILLION TO THE US ANNUALLY

"The way that water is managed in agriculture has caused wide-scale changes in ecosystems and undermined the provision of a wide range of ecosystem services. The external cost of the damage to people and ecosystems, and clean-up processes, from the agricultural sector is significant. In the United States of America the estimated cost is US$9–20 billion per year"

United Nations, 2006





CALIFORNIAN AGRICULTURE CREATES 96% OF NITRATE POLLUTION

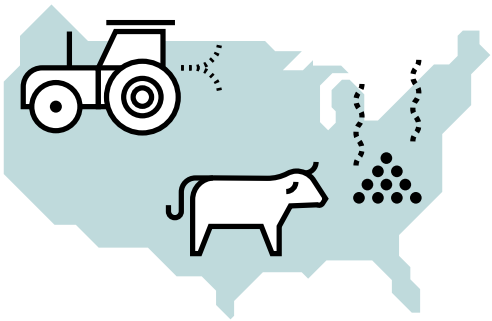
"In California agriculture accounts for 96% of total nitrate water contamination, including 54% from synthetic fertilizers and 33% from animal manure"

Grace Communications Foundation, 2015

AGRICULTURE IS THE LEADING CAUSE OF WATER POLLUTION IN THE US

"Agriculture is the leading source of impairment in the Nation's rivers, affecting 60% of the impaired river miles."

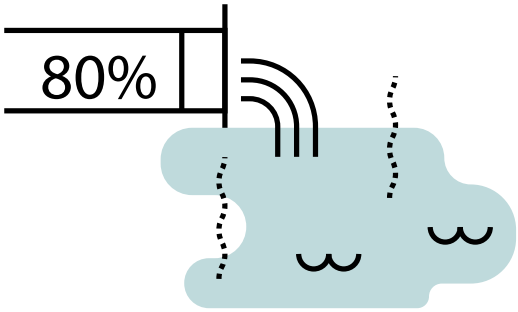
United States Environmental Protection Agency, 1994



AGRICULTURE ACCOUNTS FOR 80% OF US NITROGEN POLLUTION

"Agricultural activities in the United States, primarily row crop and livestock production, account for over 80% of all nitrogen added to the environment"

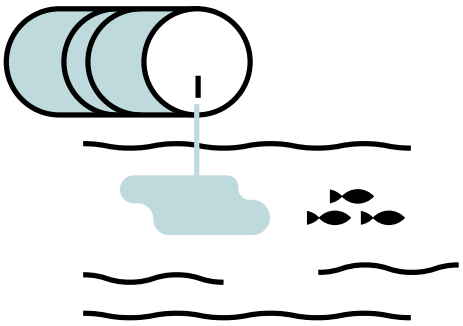
Environmental Working Group, 1996



80% OF GLOBAL SEWAGE/AGRICULTURAL WASTE IS UNTREATED

"2 million tonnes of sewage and agricultural waste is put into the world's waterways every day, more than 80% of this wastewater is untreated"

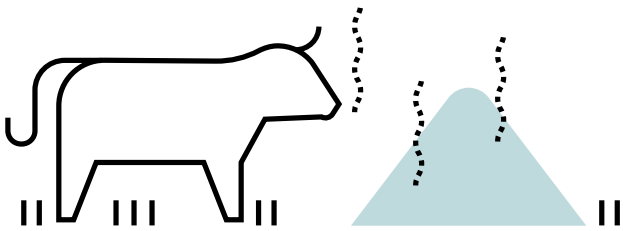
United Nations Environment Programme, 2010



1M^3 WASTEWATER CONTAMINATES OVER 1000M^3

"1m^3 of non-treated wastewater may spoil over 1000m^3 of fresh water for human consumption or other activities"

Reuters, 2010



A COW PRODUCES 120 LBS. OF MANURE DAILY

"According to the EPA, a 2,000-cow dairy generates more than 240,000 pounds of manure daily or nearly 90 million pounds a year"

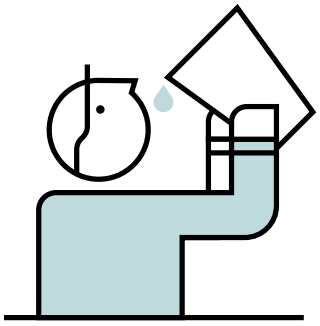
Yale University, 2014

– 2 –

Water Security

TIMELINE

1

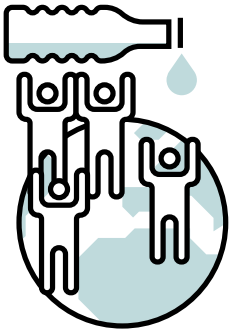


WATER SCARCITY AFFECTS 1.6 BILLION

"1.6 billion people live in countries with absolute water scarcity"

United Nations, 2006

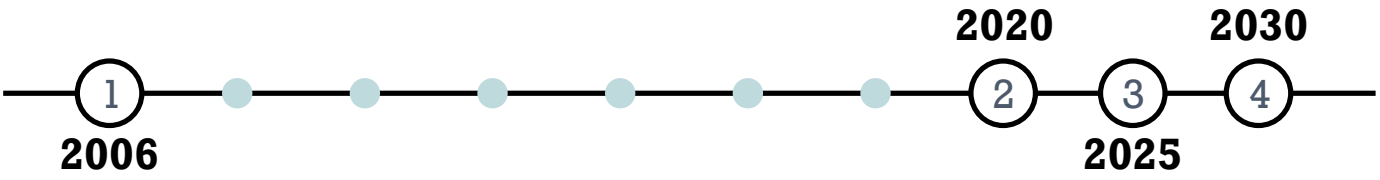
2



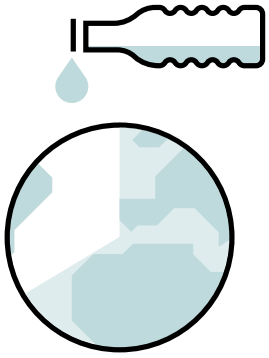
250 MILLION ADDITIONAL PEOPLE TO FACE CLIMATE CHANGE WATER STRESS BY 2020

"By 2020, between 75 and 250 million of people are projected to be exposed to increased water stress due to climate change"

Intergovernmental Panel on Climate Change, 2007



3

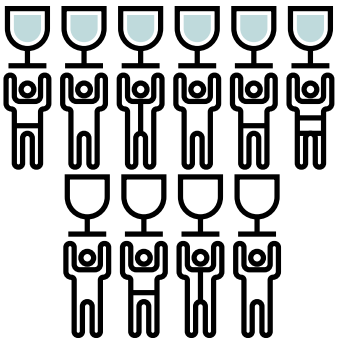


BY 2025 TWO-THIRDS OF THE WORLD WILL FACE WATER SHORTAGES

"At the current consumption rate, this situation will only get worse. By 2025, two-thirds of the world's population may face water shortages. And ecosystems around the world will suffer even more"

WWF, 2015

4



WORLD WILL HAVE ONLY 60% OF REQUIRED WATER BY 2030

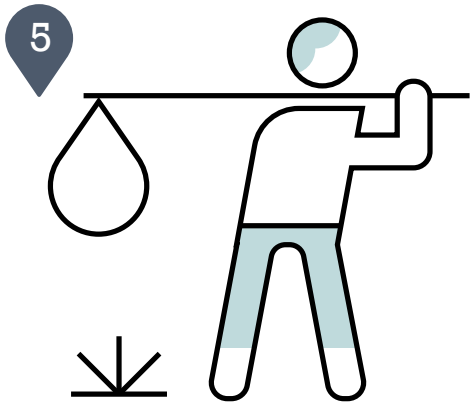
" By 2030, the world is projected to face a 40% global water deficit under the business-asusual (BAU) scenario"

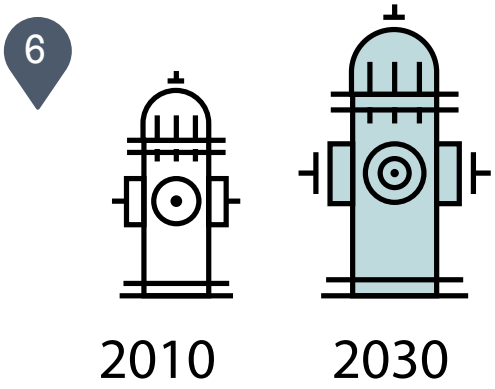
UN Water, 2015

135 MILLION CLIMATE REFUGEES BY 2020

"By 2020 an estimated 60 million people could move from desertified areas of sub-Saharan Africa towards North Africa and Europe, and worldwide, 135 million people could be placed at risk of being uprooted by desertification"

United Nations, 2006

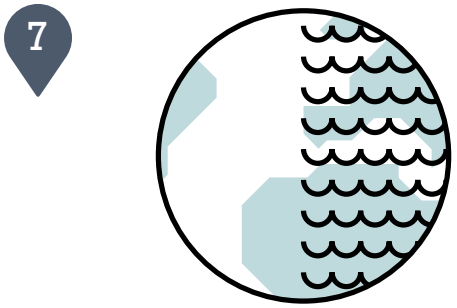




GLOBAL WATER DEMAND TO INCREASE 30% BY 2030

"The world's demand for fresh water is projected to increase by over 30% by 2030"

WWF, 2010



HALF THE WORLD WILL EXPERIENCE WATER STRESS BY 2030

"By 2030, 47% of the world's population will be living in areas of high water stress"

United Nations Water, 2012

8

HACKED NESTLE DOCUMENT PROJECTS 1/3 OF THE WORLD TO FACE WATER SCARCITY BY 2025, WITH THE SITUATION TURNING CATASTROPHIC BY 2050

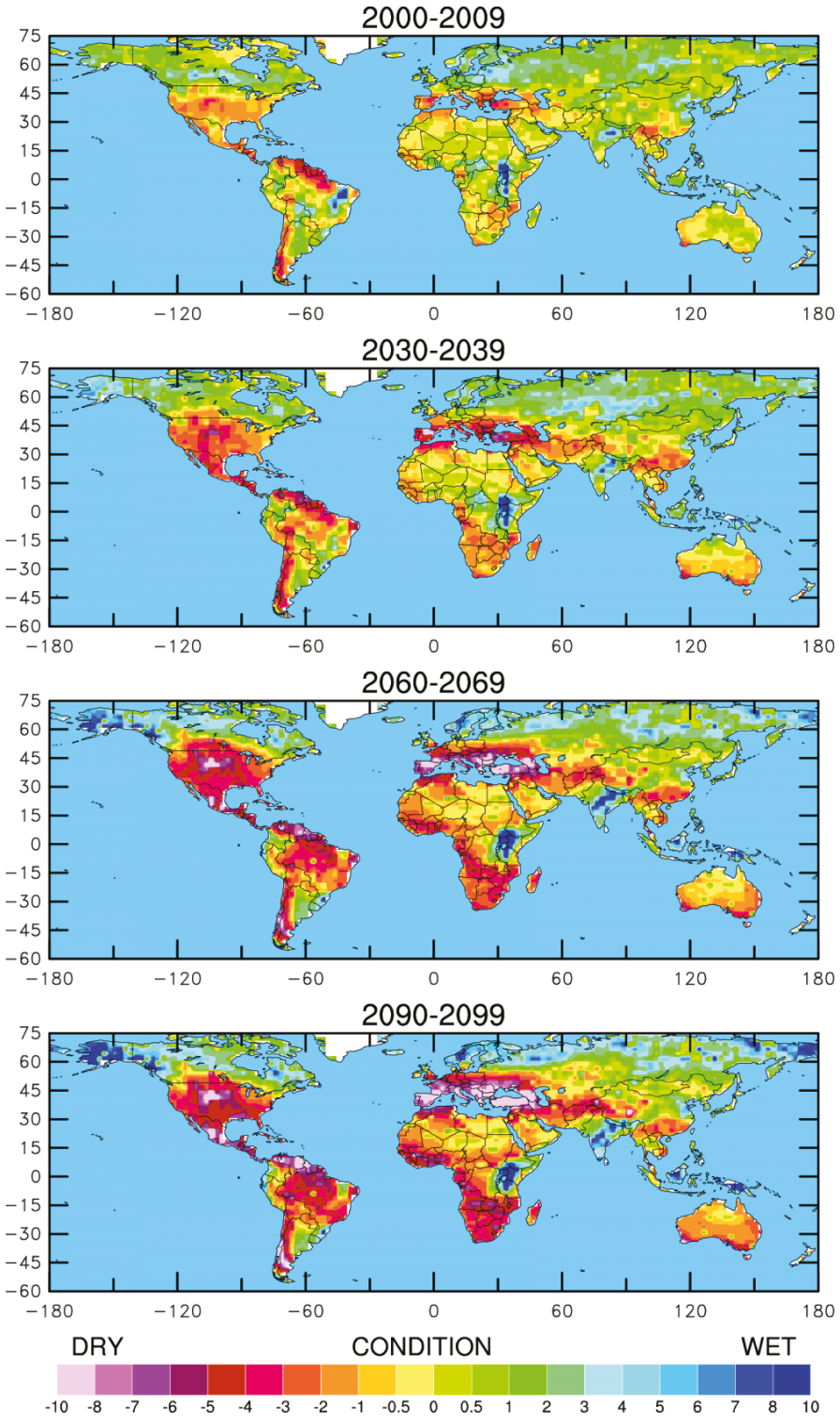
"World on 'catastrophic' path to run out of fresh water, increased meat consumption in the developing world is fast depleting fresh water supplies, according to a secret report first released by WikiLeaks… [The] secret US report titled "Tour D'Horizon with Nestle: Forget the Global Financial Crisis, the World Is Running Out of Fresh Water…Nestle thinks one-third of the world's population will be affected by fresh water scarcity by 2025, with the situation only becoming more dire thereafter and potentially catastrophic by 2050… In private, Nestle executives told US officials that the world is on a collision course with doom because non-Americans eat too much meat"

WikiLeaks, 2009

WATER PROJECTION MAPS

"Future drought. These four maps illustrate the potential for future drought worldwide over the decades indicated, based on current projections of future greenhouse gas emissions"

WIREs Climate Change, 2010



– 2 –

Water Security

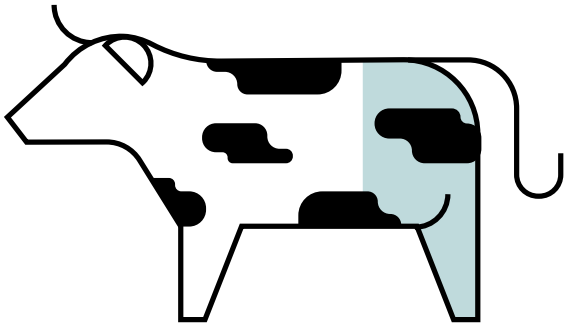
SOLUTION

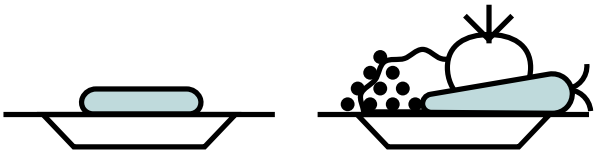
Change in diet

HUMANS WILL SURVIVE ONLY IF WE REDUCE ANIMAL FOODS BY 75% BY 2050

"There will not be enough water available on current croplands to produce food for the expected 9 billion population in 2050 if we follow current trends and changes towards diets common in western nations"

Stockholm International Water Institute (SIWI), 2012

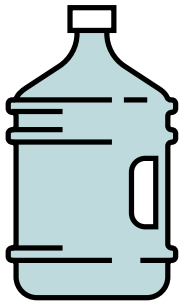




ANIMAL PRODUCTS MUST NOT EXCEED 5% OF GLOBAL CALORIES

"There will be just enough water (by 2050), if the proportion of animal based foods is limited to 5% of total calories"

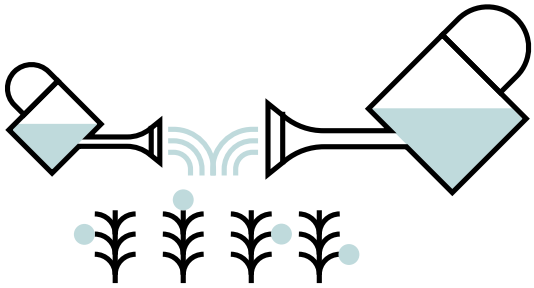
Stockholm International Water Institute (SIWI) 2012



GOING VEGAN SAVES 600 GALLONS DAILY

"A person who doesn't eat meat or dairy, indirectly consumes nearly 600 gallons of water per day less than a person who eats the average American diet"

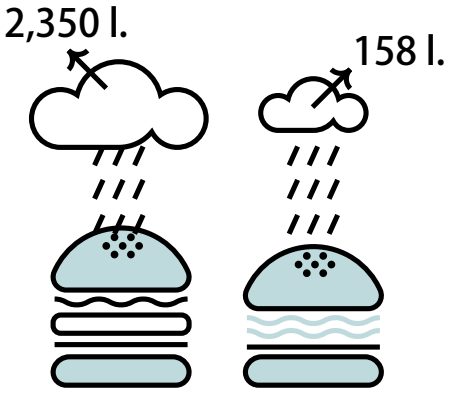
National Geographic, 2015



VEGETARIAN DIET SAVES 1300 LITRES PER DAY

"Water demand is reduced by 36% by eating products of vegetable origin"

Twente Water Centre, 2012



A SOY BURGER USES 158 LITRES; A BEEF BURGER USES 2,350 LITRES

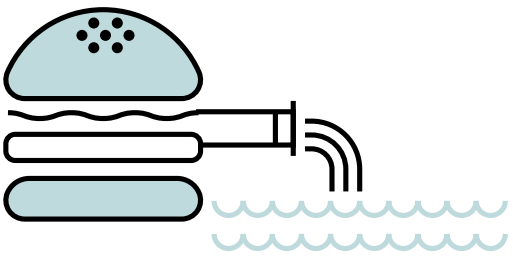
"Water footprint for 150 gram soy burger in Belgium is 158 litres, vs. a global average of 2350 litres of water for 150 gram beef burger"

UNESCO-IHE, 2011

WORST WATER POLLUTION SOLVED BY NOT EATING MEAT

"The largest challenges are to manage nitrogen better in agriculture and to moderate Europeans' consumption of animal protein. Amazingly, livestock consumption of animal protein. Amazingly, livestock consume around 85% of the 14 million tonnes of nitrogen in crops harvested or imported into the EU; only 15% is used to feed humans directly. European nitrogen use is therefore not primarily an issue of food security, but one of luxury consumption"

European Nitrogen Assessment, 2011



– 3 –

FOOD SECURITY

INTRODUCTIION

Food for a growing world is facing a 'perfect storm' of declining yields, land degradation, water availability, land availability, climate change and exploding livestock numbers. Producing twice the amount of food by 2050 is simply not possible without a major change in diet. Our world cannot support both the projected human population and current or future growth in livestock population.

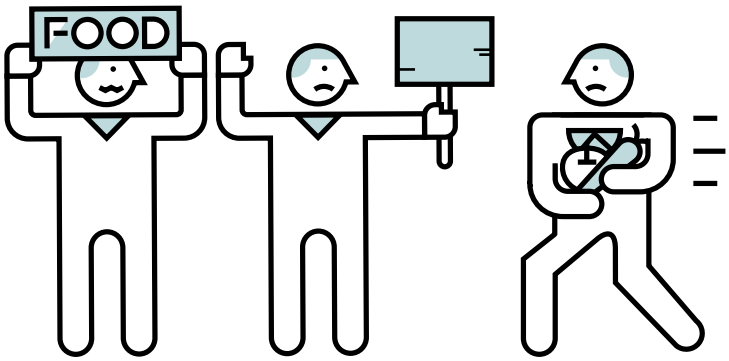
Food insecurity leads to displacement of people creating refugees; causes political unrest and can lead to riots and armed conflict. Society collapse is projected by 2040 if we pursue business as usual.

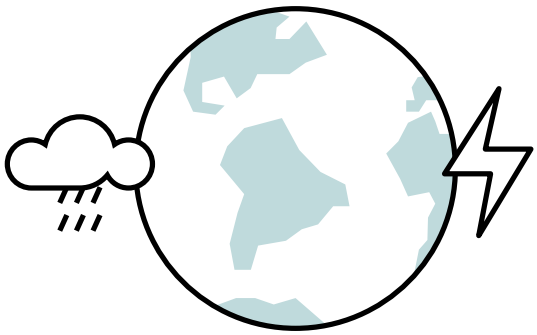
The solution is radical but simple: by switching to a plant-based diet our world can easily sustain the projected population increase.

FOOD SECURITY THREATENED

"The ability of the global food system to achieve food security is under significant pressure"

Lloyds, 2015





EXTREME WEATHER EVENTS THREATEN GLOBAL FOOD PRODUCTION

"Increases in the intensity and frequency of extreme weather events such as floods, droughts and wildfires, coupled with a rise in conditions amenable to the spread and persistence of agricultural pests and diseases, are expected to have a destabilising effect on world food production. This is further exacerbated by the growing issue of water scarcity, which is accelerating at such a pace that two-thirds of the world's population could live under water stress conditions by 2025"

Lloyds, 2015

WORLD NEEDS TO DOUBLE FOOD PRODUCTION BY 2050, BUT CROP YIELDS ARE FALLING

"The world needs to produce at least 50% more food to feed 9 billion people by 2050. But climate change could cut crop yields by more than 25%. The land, biodiversity, oceans, forests, and other forms of natural capital are being depleted at unprecedented rates. Unless we change how we grow our food and manage our natural capital, food security, especially for the world's poorest, will be at risk"

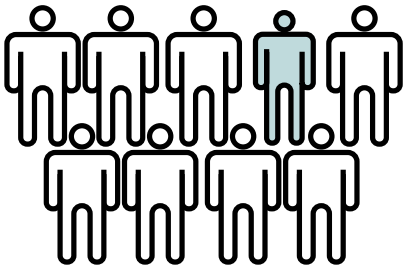
World Bank, 2015

– 3 –

Food Security

PROBLEM

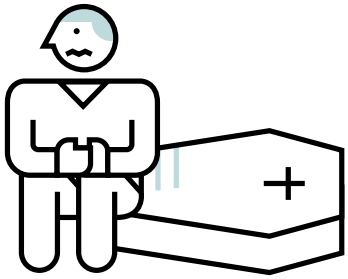
World Hunger



1 IN 9 ARE HUNGRY

"There are 795 million undernourished people in the world today. That means one in nine people do not get enough food to be healthy and lead an active life"

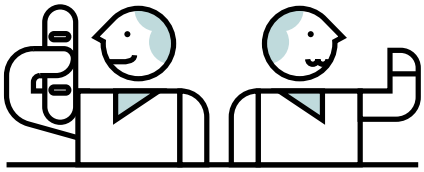
World Food Programme, 2015



2.6 MILLION CHILDREN DIE FROM HUNGER ANNUALLY

"Each year 2.6 million children die as a result of hunger related causes"

Save the Children, 2012



14% OF US HOUSEHOLDS ARE FOOD INSECURE

"In 2013, 14.3% of US households (17.5 million households) were food insecure"

World Hunger Education Service (WHES), 2015

CAUSES OF FOOD INSECURITY

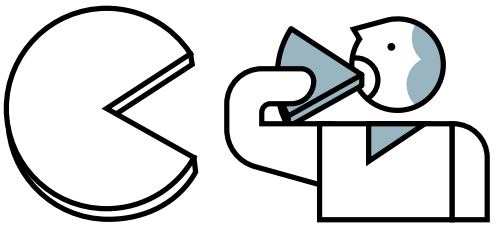
"Conflict, political instability or natural disasters have resulted in protracted crises, adding to vulnerability and food insecurity"

FAO, World Food Programme, 2015

30% OF THE GLOBAL POPULATION IS OBESE

"2.1 billion people, nearly 30% of the global population, are overweight or obese. That is nearly two and a half times the number of adults and children who are undernourished. This crisis is not just a pressing health concern; it is also a threat to the global economy. The total economic impact of obesity is about $2 trillion a year, or 2.8% of world GDP, roughly equivalent to the economic damage caused by smoking or armed violence, war, and terrorism"

McKinsey Global Institute, 2015



– 3 –

Food Security

PROBLEM

Food price hyper-volatility

FOOD COMMODITY PRICES THREATEN MILLIONS

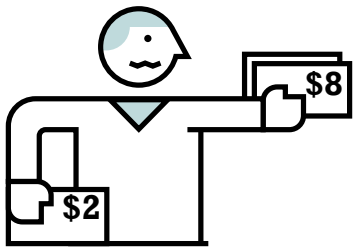
"The current situation in world food markets, characterized by sharp increases in maize, wheat and soybean prices, has raised fears of a repeat of the 2007-2008 world food crisis. But swift, coordinated international action can stop that from happening. We need to act urgently to make sure that these price shocks do not turn into a catastrophe hurting tens of millions over the coming months."

FAO, IFAD and WFP, 2012

FOOD PRICE SPIKES CAUSED BY EXTREME WEATHER EVENTS

"The world has experienced three international food price spikes in the past five years. Weather has been among the drivers for each. Droughts in some parts of the world have impaired global grain production practically every other year since 2007. Elsewhere, major floods also created severe damages to crops. The increased diversion of food crops for biofuels and the financial speculation have played a decisive role in rising prices and volatility"

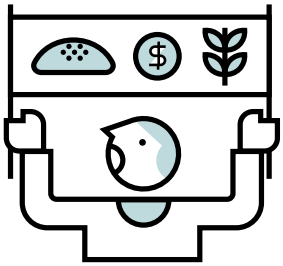
FAO, IFAD and WFP, 2012



THE POOR SPEND 80% OF THEIR INCOME ON FOOD

"Those already undernourished or living in poverty are spending 70% - 80% of their daily income on food"

GRID Arendal / United Nations Environment Programme, 2009



FOOD PRICE RIOTS THREATEN SOCIAL STABILITY

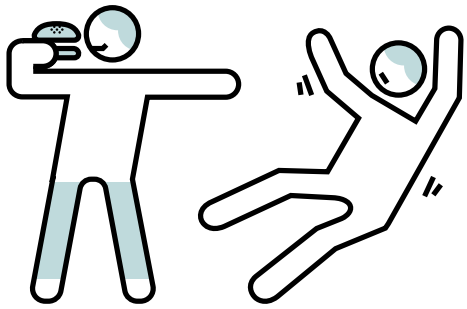
"As the prices of food and energy soared to new heights between 2007 and 2008, many countries were confronted with major social and political crises. Food riots and protests threatened Governments as well as social stability in Africa, Asia, the Middle East and Latin America and the Caribbean"

United Nations, 2011

– 3 –

Food Security

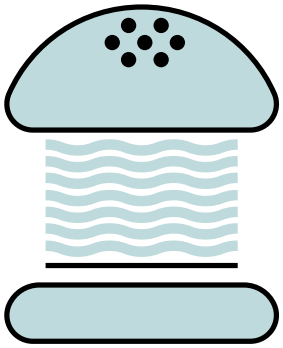
CAUSE



2 BILLION CARNIVORES TAKING THE RESOURCES OF 4 BILLION VEGETARIANS

"Worldwide, an estimated 2 billion people live primarily on a meat-based diet, and an estimated 4 billion live primarily on a plant-based diet. The US food production system uses about 50% of the total US land area, 80% of the fresh water, and 17% of the fossil energy used in the country"

American Journal of Clinical Nutrition, 2003



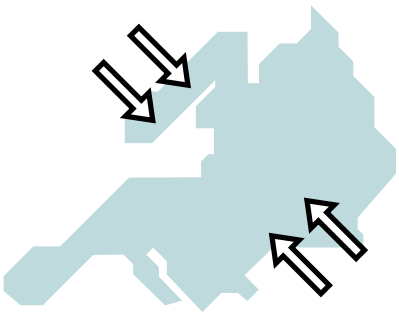
RICH COUNTRIES EAT 750% MORE MEAT

"The surge in food prices in the last years has resulted in a 50% - 200% increase in selected food-commodity prices, driven 110 million people into poverty and added 44 million more to the undernourished"

Nature Journal, 2014

80% OF EUROPE'S LIVESTOCK FEED IS IMPORTED, EXPLOIITING DEVELOPING COUNTRIES

"Only 20% of the proteins that are fed to animals originate in Europe. The missing amount is imported from other countries, including developing ones, playing an important role in the further impoverishment of these countries and in the exploitation of their environmental resources"

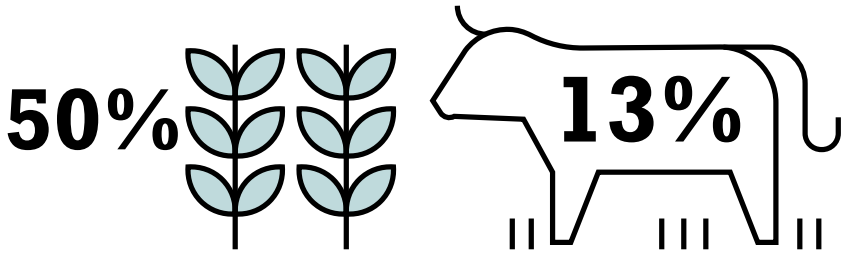


European Journal of Clinical Nutrition, 2006

LIVESTOCK CONSUMES 50% OF THE WORLDS GRAIN TO PROVIDE 13% OF THE WORLDS CALORIES

"Livestock supply 13% of energy to the world's diet but consume one-half the world's production of grains to do so"

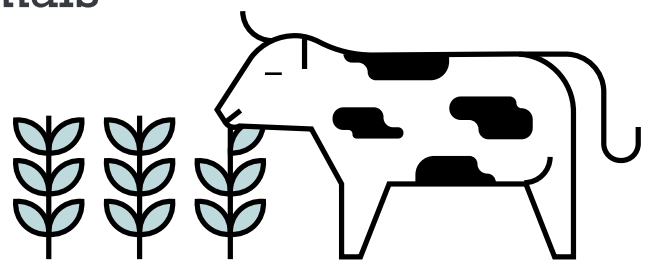
Animal Frontiers Magazine, 2013



80% OF SOY AND 50% OF CORN IS FED TO LIVESTOCK

"80% of the global soybean crop and 40% to 50% of the annual corn crop are fed to cattle, pigs, chickens, and other animals used in agriculture"

Humane Society International, 2011



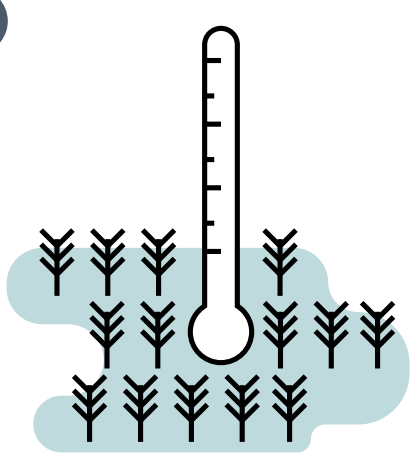
– 3 –

Food Security

TIMELINE

Food price hyper-volatility

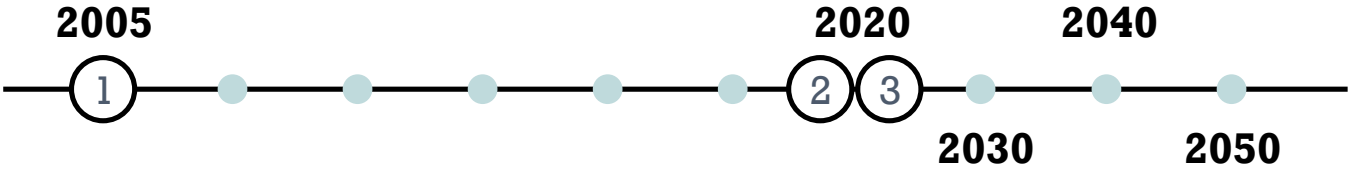
1



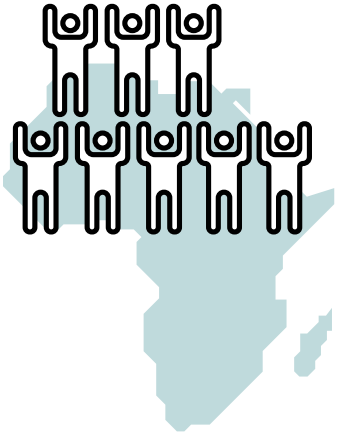
RISING TEMPERATURES DESTROY CROP YIELDS

"The International Rice Research Institute in Manila has found that damage to the world's major grain crops begins when temperatures climb above 30°C during flowering. At about 40°C, yields are reduced to zero. "In rice, wheat, and maize, grain yields are likely to decline by 10% for every 1°C increase --over 30°C. We are already at or close to this threshold"

Worldwatch Institute, 2005



2



BY 2020 AFRICAN CROP YIELDS COULD FALL BY 50%

"By 2020, in some African countries, yields from rain-fed agriculture could be reduced by up to 50%. Agricultural production, including access to food, is projected to be severely compromised. This would further adversely affect food security and exacerbate malnutrition"

Intergovernmental Panel on Climate Change, 2007

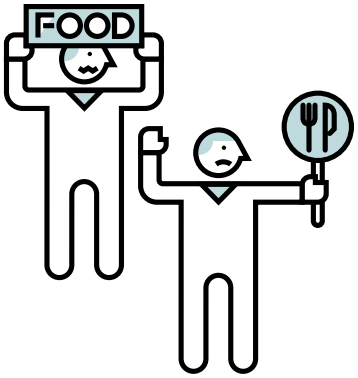
3

FOOD PRICES TO INCREASE BY 30% TO 50%

"The world price of food is estimated to become 30% to 50% higher in coming decades and have greater volatility"

GRID Arendal / United Nations Environment Programme, 2009

4

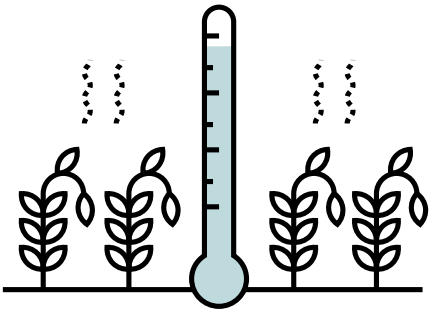


BY 2040 FOOD SHORTAGES WILL LEAD TO THE COLLAPSE OF SOCIETY

"Society will collapse by 2040 due to catastrophic food shortages… based on plausible climate trends, and a total failure to change course, the global food supply system would face catastrophic losses, and an unprecedented epidemic of food riots… In this scenario, global society essentially collapses as food production falls permanently short of consumption"

The Independent, 2015

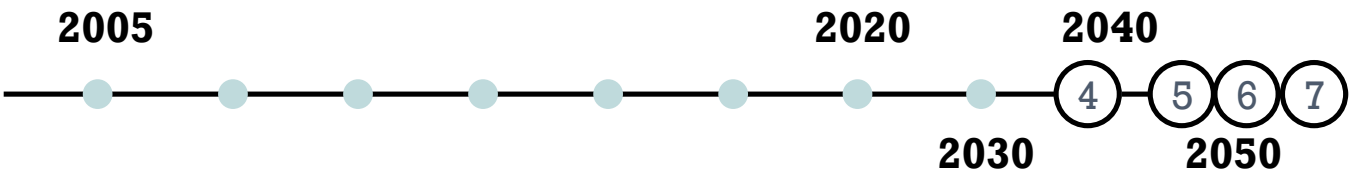
5



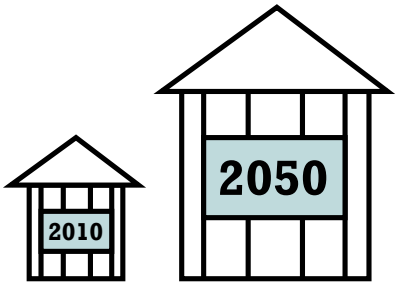
GLOBAL CROP YIELDS WILL FALL BY 30% FROM WARMING TEMPERATURES

"By 2050 climate change will have a negative impact on agriculture and human well being. Irrigated wheat yields will fall by about 30% and irrigated rice yields by about 15% in developing countries"

IFPRI, 2009



6

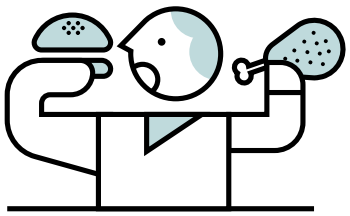


BY 2050 DEMAND FOR FOOD WILL INCREASE BY 70%

"By 2050 it is predicted that demand for food could increase by 70%"

WWF, 2010

7



MEAT CONSUMPTION TO INCREASE 75% BY 2050

"Shifting diets, coupled with a growing population, would see global [meat] consumption increase by more than 75% by 2050"

Chatham House, 2015

– 3 –

Food Security

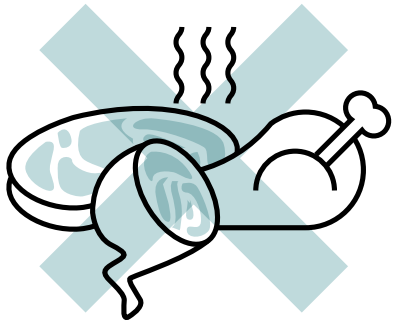
SOLUTION

Change in Diet

WITHOUT LIVESTOCK THE WORLD COULD FEED AN ADDITIONAL 4 BILLION PEOPLE

"Shifting crops away from animal feed and biofuels to growing food exclusively for human consumption would increase global calorie availability by as much as 70%, and we could feed an additional 4 Billion people"

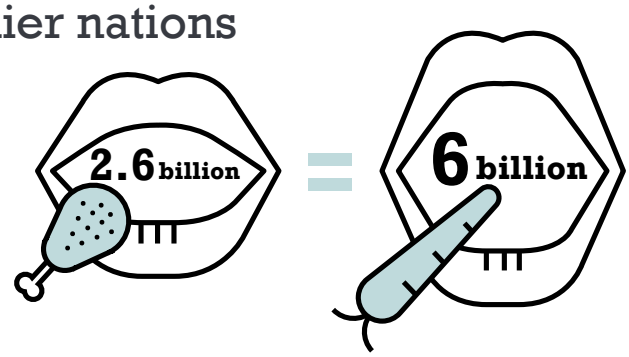
Scientific American, 2013

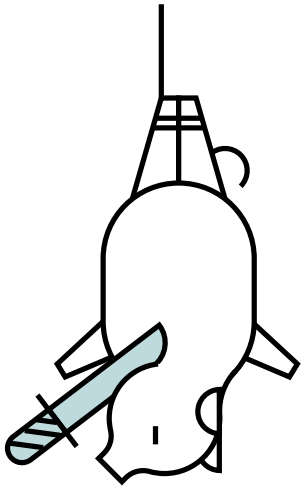


VEGETARIAN DIET CAN FEED 6 BILLION

"The World Hunger Program at Brown Universitycalculated that recent world harvests, if equitablydistributed with no diversion of grain to feedinglivestock, could provide a vegetarian diet to 6 billionpeople, whereas a meat rich diet like that of people in the wealthier nations could support only 2.6billion"

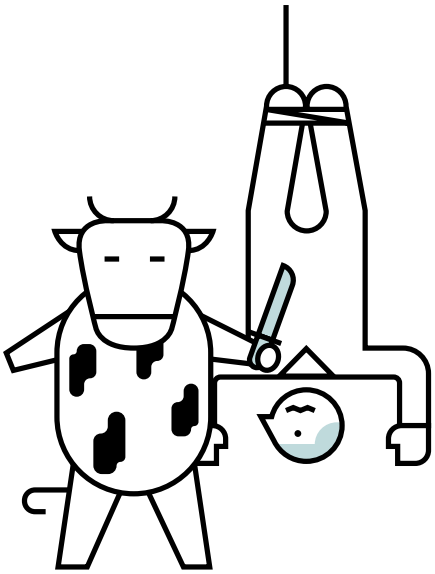
WorldWatch, 2004





"CAN WE JUSTIFY KILLING ANIMALS FOR FOOD?"

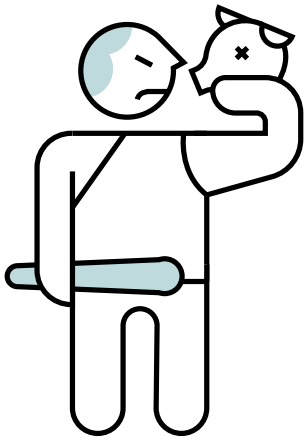
BBC, 2015



DOES ANIMAL-SUFFERING MATTER?

"Cows have a moral interest in continuing to live… you don't have to think about humans in exactly the same way that you think about cows. But you've got to explain why you think it's permissible to do to an animal what you think it would be impermissible to do to a human being. In the case of people their suffering matters, but their happiness also matters. The same should be true in the case of animals"

Jeff MacMahan, Professor of Moral Philosophy, University of Oxford-BBC, 2015

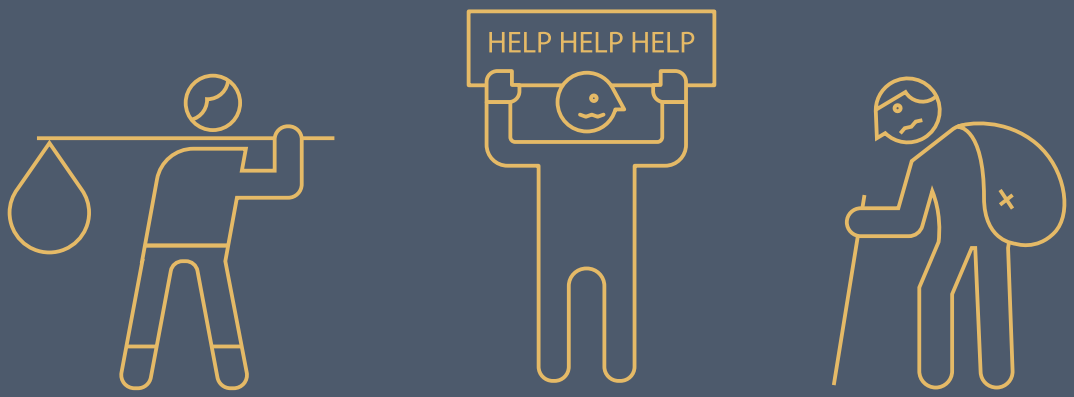


"OUR FUTURE SELVES WILL CONSIDER MEAT EATING TO BE BARBARIC"

Peter Singer, Professor of Bioethics at Princeton University-BBC, 2015

— 4 —

CLIMATE REFUGEES



INTRODUCTIION

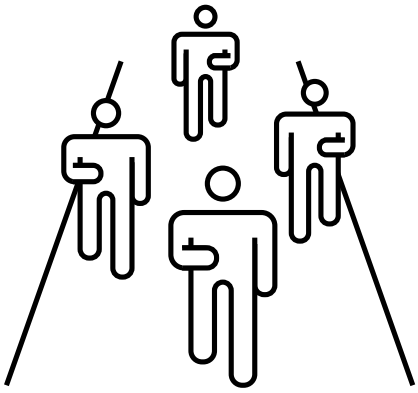
The roots of the Syrian refugee crisis lie in the years of extreme drought in that region. Globally more than 100 million people have fled their homelands due to climate change induced drought, water scarcity, floods and extreme weather events.

Changing to a vegan diet will ease the pressure of greenhouse emissions from livestock, particularly shorter-term emissions, which in turn will moderate the climate chaos we are witnessing, while also dramatically reducing the demand for scarce water.

150 MILLION CLIMATE REFUGEES BY 2050

"Global warming could create
150 million climate refugees by 2050"

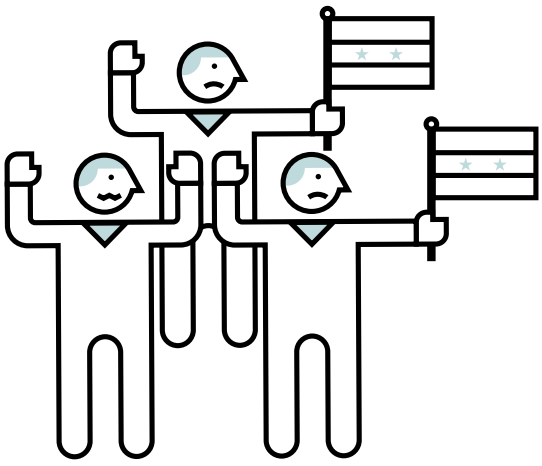
Environmental Justice
Foundation, 2008



SYRIAN REFUGEES LARGELY CLIMATE REFUGEES

"What's the common factor between the tragic deaths
of refugees in the Mediterranean and the Arab spring?
Food shortages driven by global warming…
Mass migration is no 'crisis':
it's the new normal as the climate changes…
[The Syrian drought] helped kick things
over the threshold into open conflict.
And a drought of that severity was
made much more likely by
the ongoing human-driven
drying of that region"

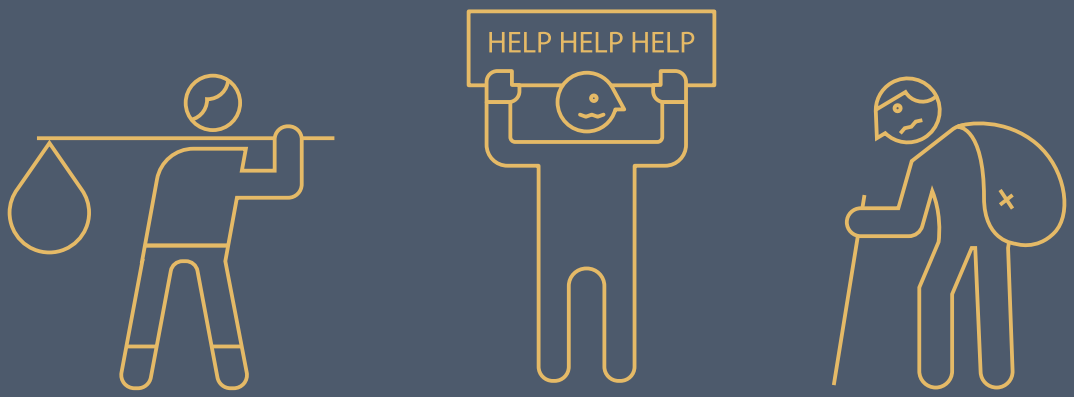
PNAS, 2015



– 4 –

Climate Refugees

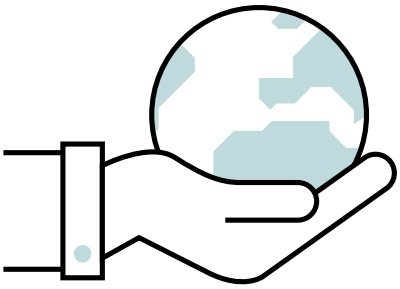
PROBLEM

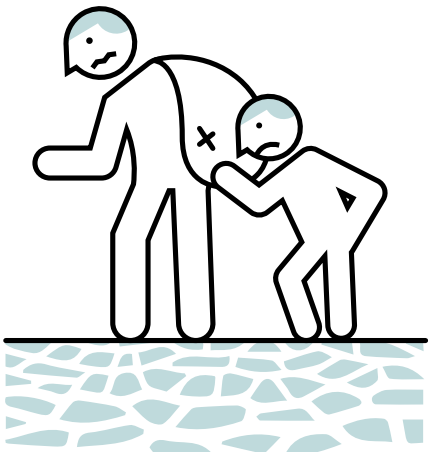


CLIMATE CHANGE IS THE GREATEST HUMANITARIAN CHALLENGE OF OUR TIME

"Climate change is already seriously affecting hundreds of millions of people today and in the next 20 years those affected will likely more than double, making it the greatest emerging humanitarian challenge of our time"

Global Humanitarian Forum, 2009

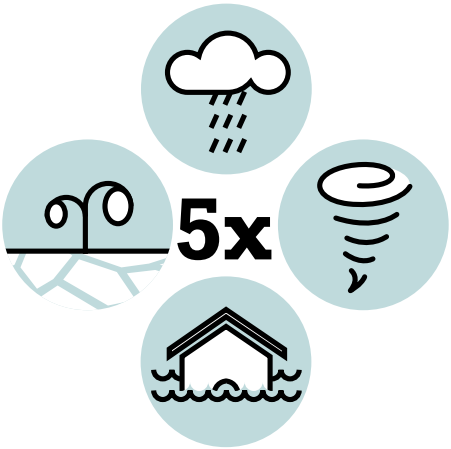




CLIMATE CHANGE CREATES CLIMATE REFUGEES

"The gravest effects of climate change may be those on human migration, as millions will be displaced"

UNHCR, 2009

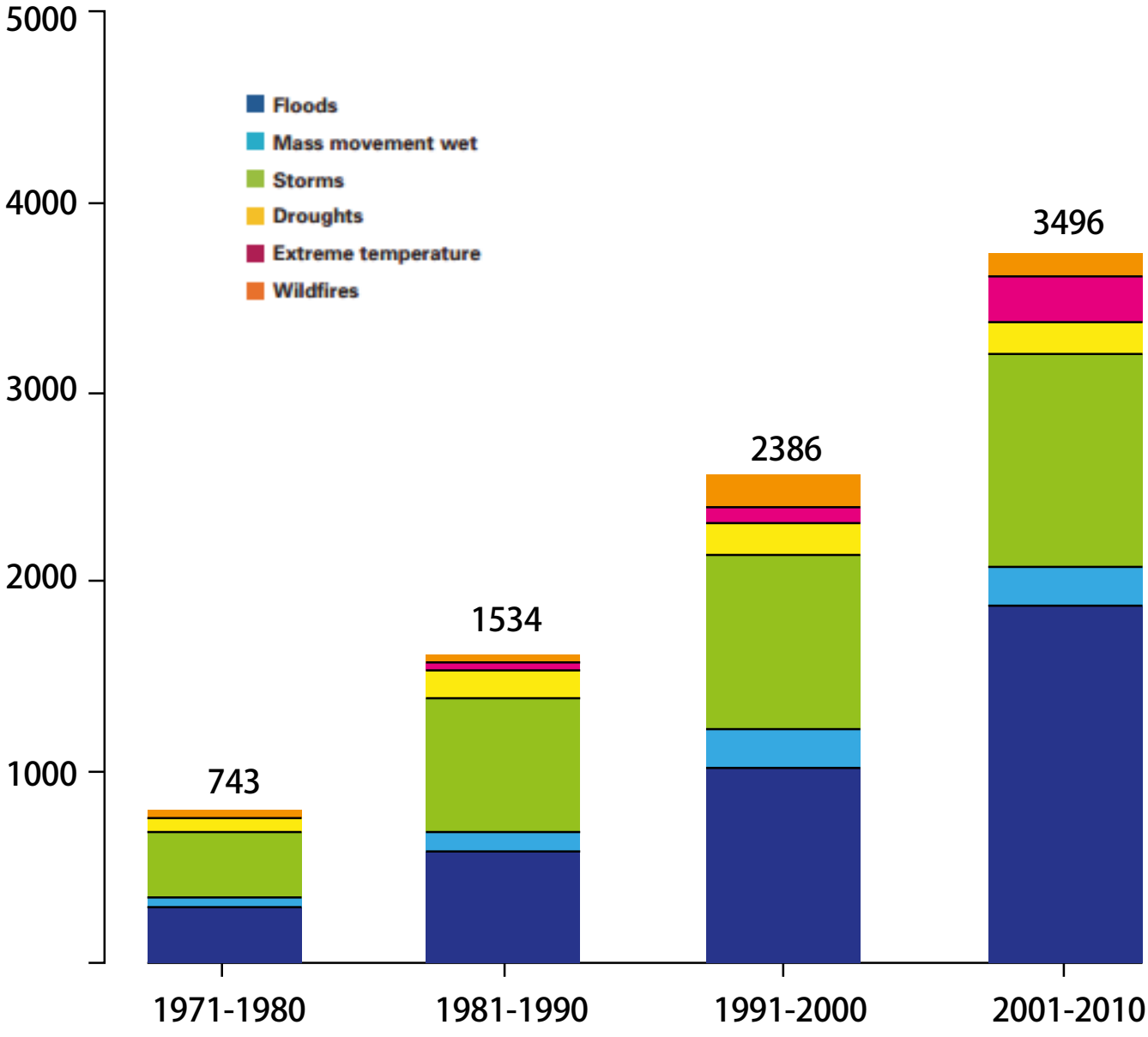


NATURAL DISASTERS ACCELERATING

"Natural disasters are occurring nearly five times as often as they were in the 1970's"

WMO, 2014

NUMBER OF REPORTED DISASTERS BY DECADE, BY HAZARD TYPE (1971-2010)



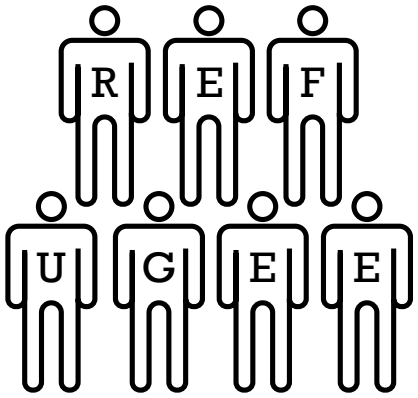
WMO, 2014

22 MILLION DISPLACED BY NATURAL DISASTERS IN 2013

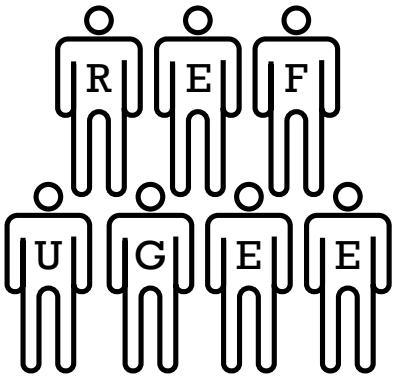
"In 2013, 22 million people were displaced by disasters brought on by natural hazard events"

UNHCR, 2015

22M



36M

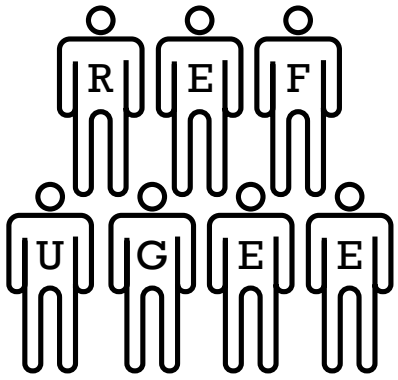


36 MILLION DISPLACED BY NATURAL DISASTERS IN 2008

"36 million people were displaced by natural disasters in 2008, of whom more than 20 million were forced on the move by climate change-related factors"

UNHCR, 2009

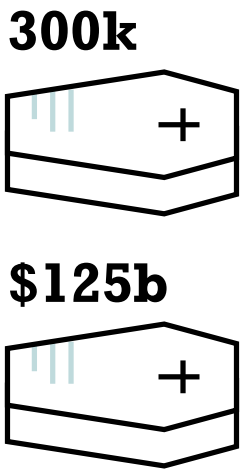
146M



146 MILLION DISPLACED BY NATURAL DISASTERS BETWEEN 2000 AND 2005

"In the recent past, the number of persons affected by drought has been comparable to that of victims of hurricanes and floods, 146 million, on average, between 2000 and 2005"

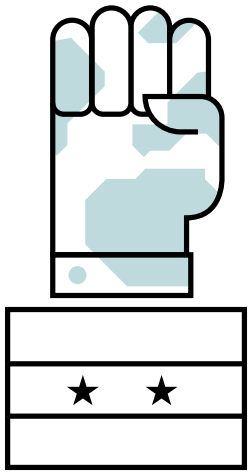
UNHCR, 2008



CLIMATE CHANGE KILLS 300K PEOPLE AND COSTS $125 BILLION ANNUALLY

"The growing economic and humanitarian costs of climate change [are] attributable for the deaths of over 300,000 people and economic losses of $125 billion annually, an estimated 500 - 600 million people, around 10% of the planet's human population, are at extreme risk from the adverse effects of climate change"

Environmental Justice Foundation 2008



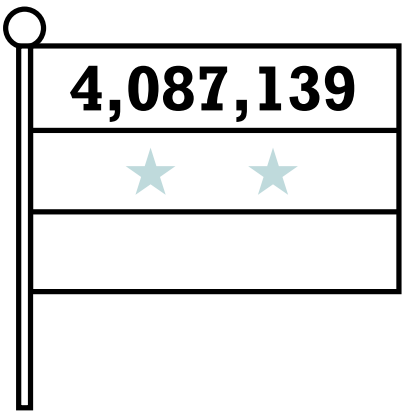
SYRIAN CIVIL WAR CAUSED BY CLIMATE CHANGE

"A severe drought in the fertile crescent in Syria, Iraq, and Turkey killed livestock, drove up food prices, sickened children, and forced 1.5 million rural residents to the outskirts of Syria's jam-packed cities, helping trigger a civil war that has killed hundreds of thousands of people"

PNAS, 2015

4,087,139 SYRIAN REFUGEES

"The total number of Syrian refugees currently stands at 4,087,139" (September 2015)

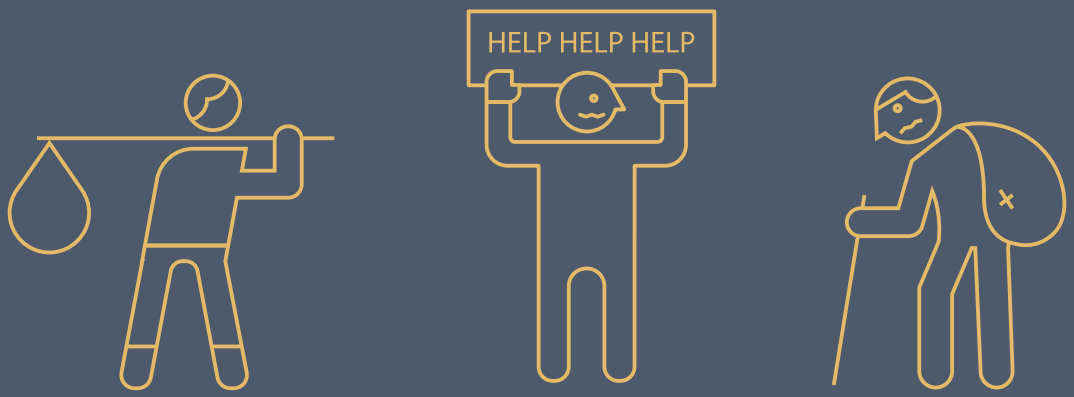


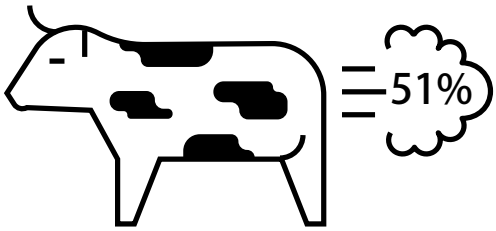
UNHCR, 2015

– 4 –

Climate Refugees

CAUSE





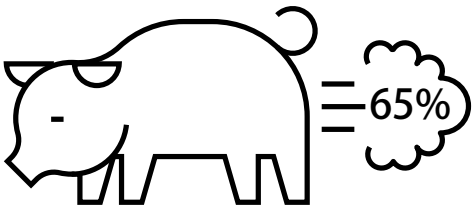
LIVESTOCK CREATES 51% OF GREENHOUSE GAS EMISSIONS

"The United Nations Food and Agriculture Organization, estimates that 18% of annual worldwide GHG emissions are attributable to cattle, buffalo, sheep, goats, camels, pigs, and poultry. But recent analysis… finds that livestock and their by-products actually account for at least 32.6 billion tons of CO2 per year, or 51% of annual worldwide GHG emissions"

Worldwatch Institute, 2009

WHY LIVESTOCK EMISSION FIGURES VARY SO MUCH

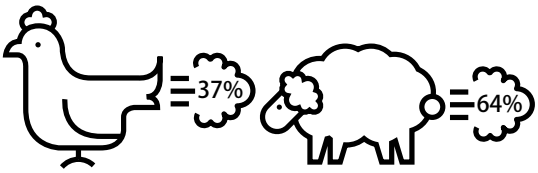
The main point of difference between FAO's 18% and World Watch's 51% is accounting period. FAO uses the commonly accepted but arbitrary 100 year greenhouse gas accounting, whereas World Watch uses 20 year accounting. Livestock are the greatest source of short term emissions, so when their warming impact is assessed over 20 years, livestock become the single biggest greenhouse gas source. World Watch also include CO2 emitted when livestock breath out, a point of contention with some industry authors.



LIVESTOCK RELEASES 65% OF ALL NITROUS OXIDE EMISSIONS

"Livestock is responsible for 65% of all emissions of nitrous oxide, a greenhouse gas 296x more destructive than carbon dioxide and which stays inthe atmosphere for 150 years"

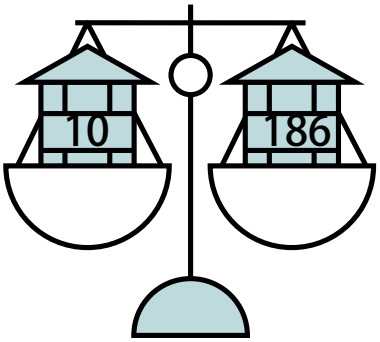
Steinfeld, H. et al, 2006



LIVESTOCK RELEASES 37% OF ALL METHANE AND 64% OF AMMONIA

"[Livestock] accounts for respectively 37% of all human-induced methane (23 times as warming as CO2), which is largely produced by the digestive system of ruminants, and 64% of ammonia, which contributes significantly to acid rain"

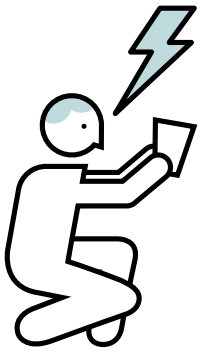
Steinfeld, H. et al, 2006



10 COUNTRIES RELEASE 51% OF AGRICULTURAL GHG EMISSIONS

"The 10 countries with the largest agricultural emissions in 2011 were (in descending order): China, Brazil, United States, India, Indonesia, Russian Federation, Democratic Republic of Congo, Argentina, Myanmar, and Pakistan. Together, these countries contributed 51% of global agricultural emissions"

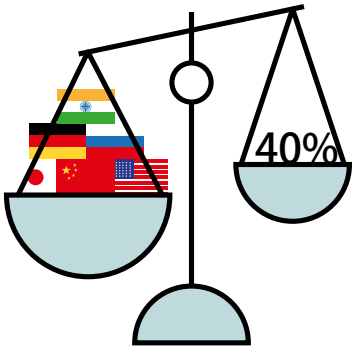
World Resources Institute, 2014



CLIMATE CHANGE FIRST AFFECTS THE WORLD'S POOREST

"The first hit and worst affected by climate change are the world's poorest groups. 99% of all casualties occur in developing countries. A stark contrast to the 1% of global emissions attributable to some 50 of the least developed nations"

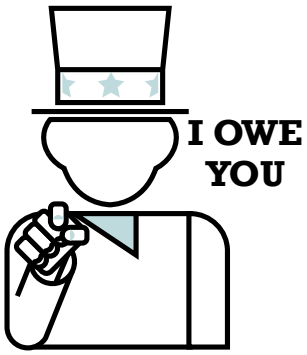
Global Humanitarian Forum, 2009



SIX COUNTRIES RELEASE 60% OF CO2

"Six countries (China, United States, India, Russia, Japan, and Germany) are responsible for 60% of CO2 emissions"

Business Insider, 2014



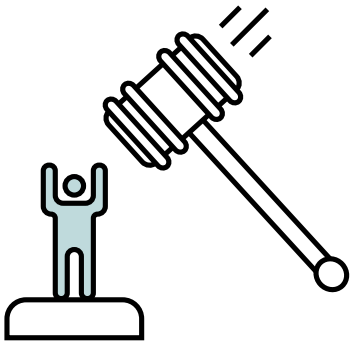
DEVELOPED NATIONS HAVE A RESPONSIBILITY FOR THE VICTIMS OF GLOBAL WARMING

"By a large measure, the wealthy industrialized countries have caused most past and present greenhouse gas emissions, and it is thus these countries that have the greatest moral, if not legal, responsibility for the victims of global warming"

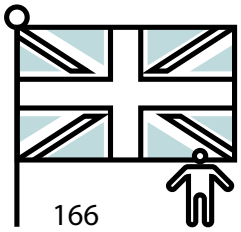
Environment Magazine, 2008

ENVIRONMENTAL REFUGEES ARE NOT PROTECTED BY LAW

"Environmental refugees are not protected by international laws. They face greater political risks than refugees who flee their homes due to conflict or political oppression.
Unlike traditional refugees, climate refugees may be sent back to their devastated homeland or forced into a refugee camp"



National Geographic, 2015

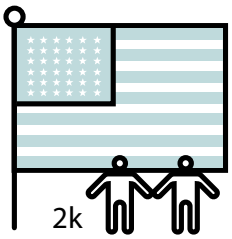


VS

UK TAKES JUST 166 SYRIAN REFUGEES

"Between June 2014 and June 2015, the UK took 166 Syrian refugees"

The Guardian, 2015

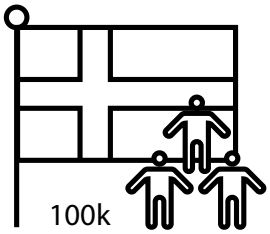


VS

US ACCEPTS 2K REFUGEES SINCE 2012

Since 2012, the US has accepted 2,174 Syrian refugees – roughly 0.0007% of America's total population

The Guardian, 2015

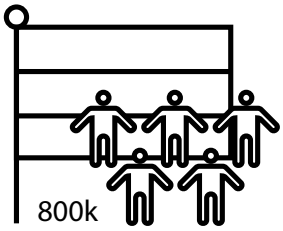


VS

SWEDEN TAKES 100,000 SYRIAN REFUGEES

"In recent years, Sweden has taken in more asylum seekers per capita than any other country in Europe… Sweden has taken 100,000 Syrian refugees, which is 1% of the population"

Washington Post, 2015



GERMANY TAKES 800,000 SYRIAN REFUGEES

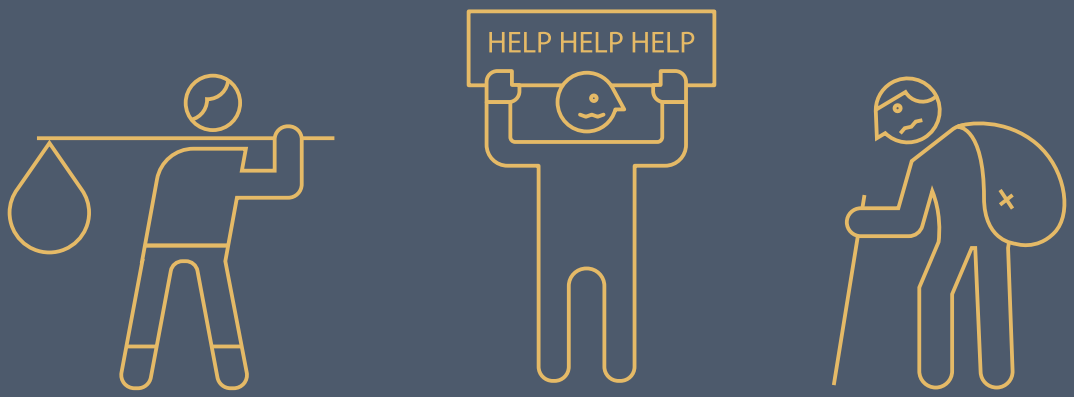
"800,000 asylum seekers and refugees are expected to arrive in Germany this year"

The Guardian, 2015

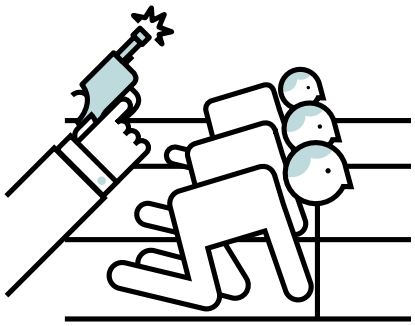
– 4 –

Climate Refugees

TIMELINE



1

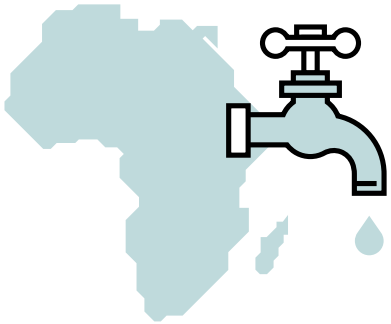


CLIMATE REFUGEES, THIS IS THE BEGINNING

"If We Don't Stop Climate Change...What We See Right Now Is Just the Beginning… The surge of people fleeing to Europe from the Middle East highlights how quickly mass migrations can occur. It may also offer a glimpse of what's to come as climate change makes some regions around the world unliveable"

Frank Biermann, Professor of Political Science and Environmental Policy Sciences at VU University Amsterdam, Inside Climate News, 2015

2



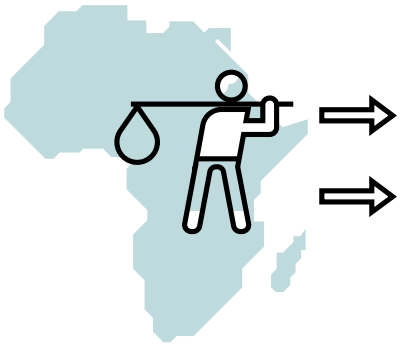
BY 2020 AFRICAN WATER SHORTAGES WILL AFFECT 250 MILLION PEOPLE

"Increased water shortages in Africa will affect between 74 million and 250 million people by 2020"

UNHCR, 2008

2015 — 2020 — 2025 — 2050

3

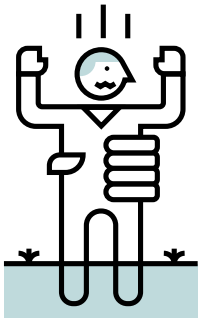


135 MILLION CLIMATE REFUGEES BY 2020

"By 2020 an estimated 60 million people could move from desertified areas of sub-Saharan Africa towards North Africa and Europe, and worldwide, 135 million people could be placed at risk of being uprooted by desertification"

United Nations, 2006

4

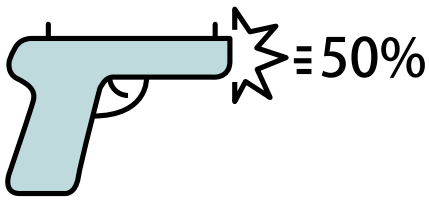


CLIMATE CHANGE WILL UPROOT MILLIONS

"Climate change will fundamentally affect the lives of millions of people who will be forced over the next decades to leave their villages and cities to seek refuge in other areas"

Biermann & Boas, 2012

5

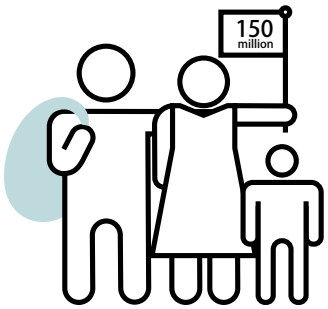


BY 2030 THE RISK OF CIVIL WAR IN AFRICA WILL INCREASE BY 50%

"Climate change could increase the risk of civil war in Africa by more than 50% in the year 2030 compared to 1990"

UNHCR, 2009

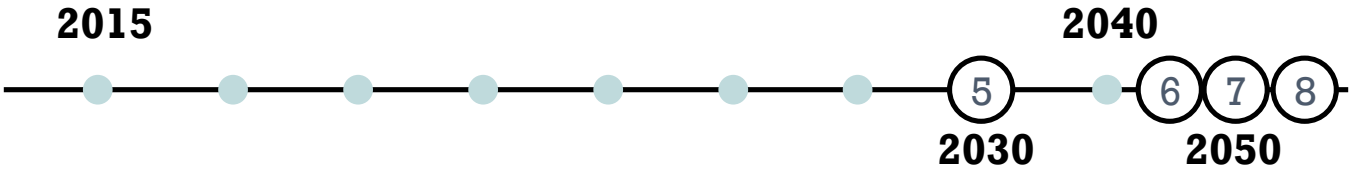
6



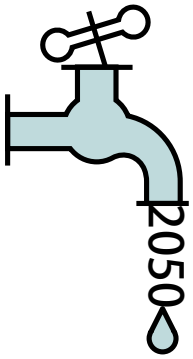
150 MILLION CLIMATE REFUGEES BY 2050

"Global warming could create 150 million climate refugees by 2050"

Singer, 2012



7

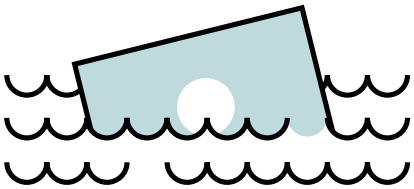


FRESHWATER AVAILABILITY COULD AFFECT A BILLION PEOPLE BY 2050

"Freshwater availability in Central, South, East and Southeast Asia particularly in large river basins is projected to decrease due to climate change which, along with population growth and increasing demand arising from higher standards of living, could adversely affect more than a billion people by the 2050's"

Piguet, 2008

8



FLOODED LAND IN BANGLADESH WILL CREATE 20 MILLION CLIMATE REFUGEES BY 2050

"Bangladesh will lose 17% of its land by 2050 due to flooding caused by climate change. The loss of land could lead to as many as 20 million climate refugees from Bangladesh"

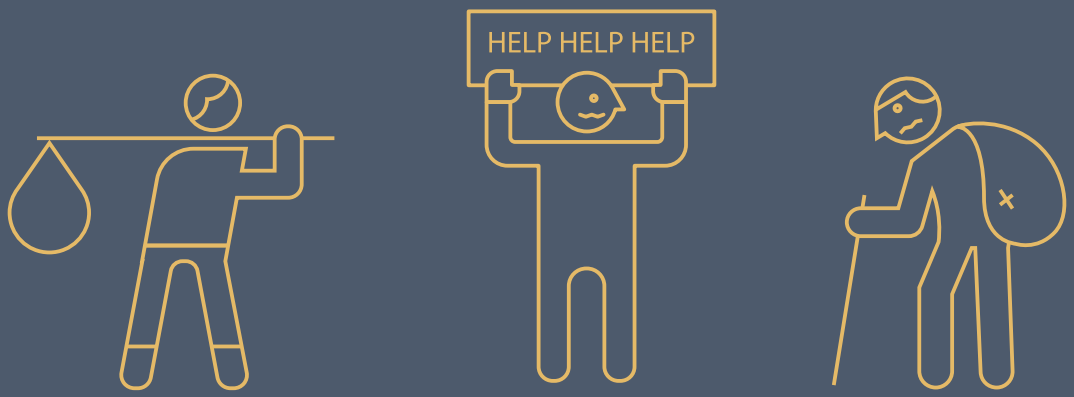
Younus, 2014

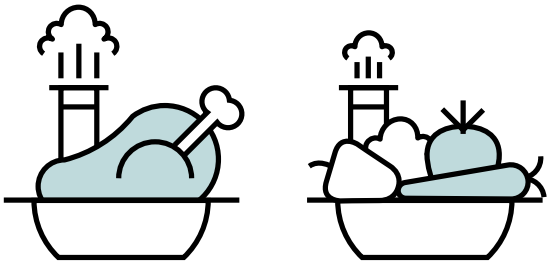
– 4 –

Climate Refugees

SOLUTION

Change in Diet

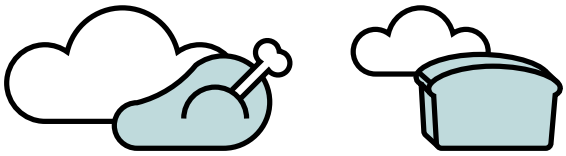




HALVE FOOD EMISSIONS WITH PLANT BASED DIET

"Meat-free diet can reduce greenhouse gas emissions by half"

Scarborough, P et all, 2014



PLANT BASED DIET TO REDUCE GHG EMISSIONS

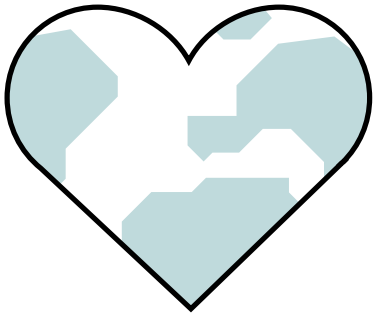
"Changes in diet and reductions of losses in the food supply chain, have a significant… potential to reduce GHG emissions from food production"

Intergovernmental Panel on Climate Change, 2014

INCREASE THE PLANETS CHANCE OF SURVIVAL, GO VEGETARIAN

"Nothing will benefit human health and increase the chances for survival of life on Earth as much as the evolution to a vegetarian diet" - Albert Einstein

Eshel et al, 2014



"EARTH WAS CREATED FOR ALL OF US, NOT SOME OF US"

Anthony D Williams

– 5 –

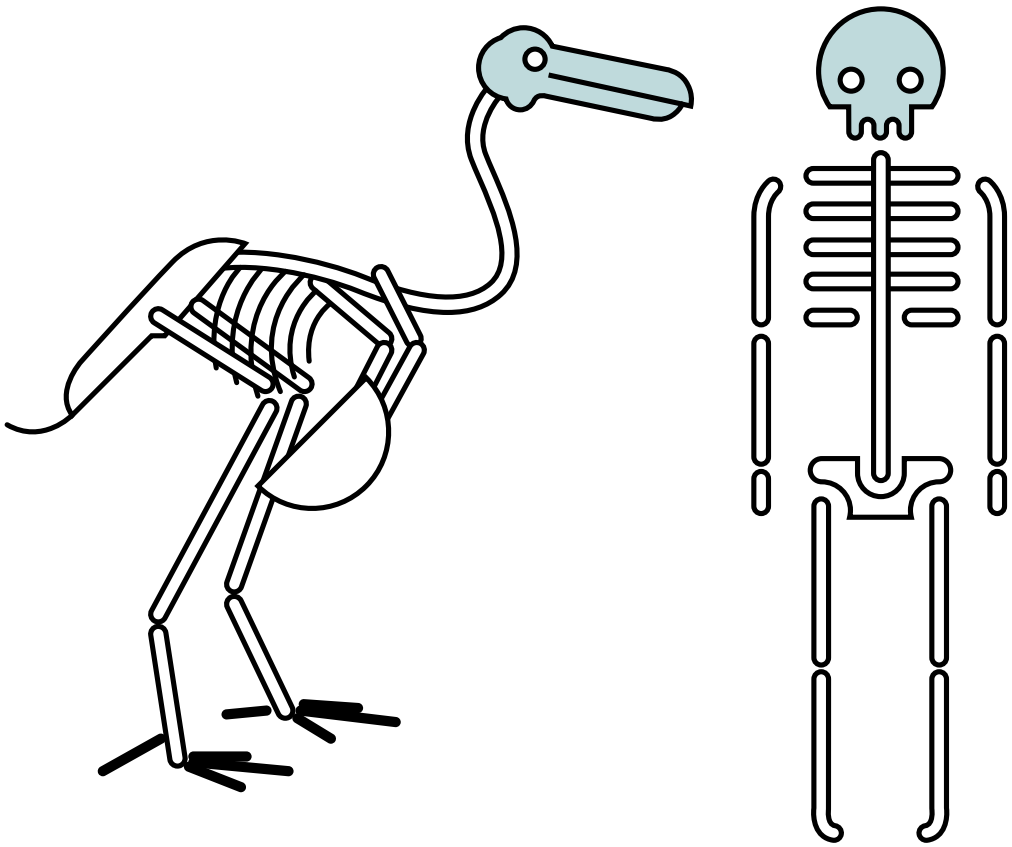
BIODIVERSITY

INTRODUCTIION

The world is in the grips of the sixth great extinction and humans are causing it. The web of life that we depend on for food, water and health is being destroyed.

Fortunately, there is a solution. Returning grazing lands to native forests and habitat will release over a quarter of the earth's surface. This is the least expensive and most effective means we have of halting this extinction.

HUMANS HAVE CAUSED THE SIXTH GREAT MASS EXTINCTION



"Human alteration of the global environment has triggered the sixth major extinction event in the history of life and caused widespread changes in the global distribution of organisms. These changes in biodiversity alter ecosystem processes and change the resilience of ecosystems to environmental change. This has profound consequences"

Nature Journal, 2000

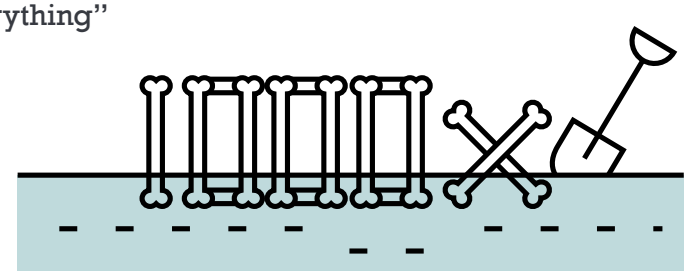
– 5 –

Biodiversity

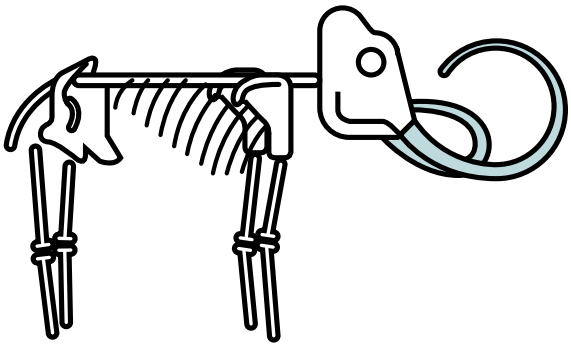
PROBLEM

BIODIVERSITY EXTINCTION HAPPENING 1000X FASTER THAN NORMAL, IF WE DON'T STOP IT WE RISK LOSING EVERYTHING

"Plants and animals are now disappearing at up to 1,000 times the natural background rate of extinction, with vital life-supporting ecosystems that could soon be irreversibly damaged. And then we have global warming, even with the strictest greenhouse gas emission limits, the Earth's temperature is still expected to rise another 3.5°C within a few decades, which would result in the death of the Amazon rainforest, massive hurricanes smashing coastal cities, vast runaway release of methane from melting permafrost, and ultimately, mass extinctions… If these six factors are not stopped fast, we risk losing everything"

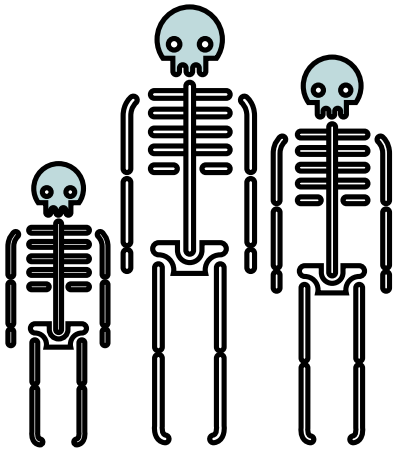


Nature Journal, 2005



"HUMANS ARE RESPONSIBLE FOR SO MANY SPECIES DYING OUT THAT WE ARE NOW IN THE MIDST OF A SIXTH MASS EXTINCTION"

Environmental Sciences Journal, 2015



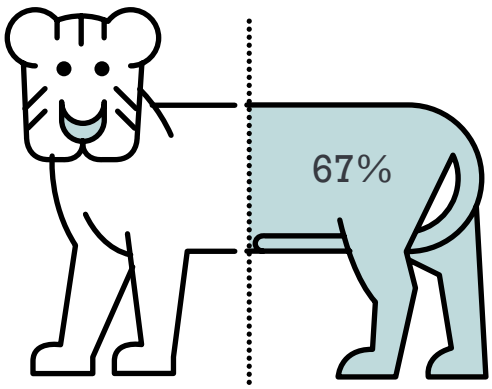
"THE ACCELERATING LOSS OF BIODIVERSITY POSES A FUNDAMENTAL THREAT TO THE SURVIVAL OF HUMANKIND"

IPBES, 2013

WILD ANIMAL NUMBERS COULD FALL BY 67% FROM 1970-2020

The number of wild animals on Earth could fall by more than two-thirds in the 50 years to 2020, according to a new report which places the blame on the destruction of habitats, hunting and pollution. The forecast could lead to major consequences for humans.

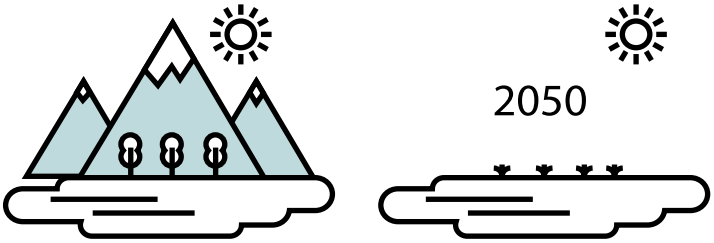
The Living Planet Report 2016 says that animal losses are on track to reach 67 percent in the 50 years to 2020. The report's authors also took into consideration a recent trend in animal population decline, citing a 58 percent plummet between 1970 and 2012.



WWF Living Planet Report 2016

EARTH'S WILDERNESS COULD BE LOST BY 2050

Biologists have revealed that over the last 20 years, the Earth has lost 3.3 million square kilometers (1.27 million square miles) of wilderness – an area twice the size of Alaska and half the size of the Amazon rain forest. If the trend continues, we stand to lose everything in 30 years'time.

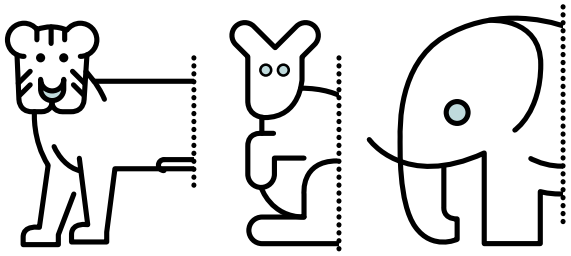


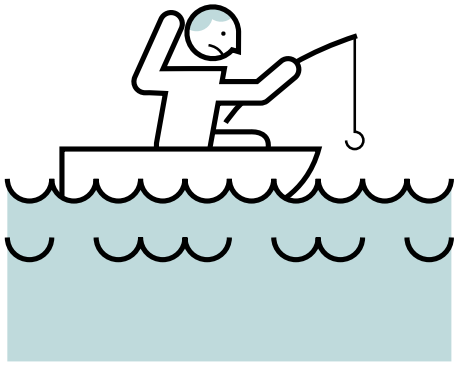
Current Biology Journal, 2016

GLOBAL WILDLIFE HAS BEEN HALVED SINCE 1970

"Wildlife populations have been cut in half over the past four decades… The number of mammals, birds, reptiles, amphibians and fish on Earth dropped by 52% from 1970 to 2010"

WWF Living Planet Report 2016

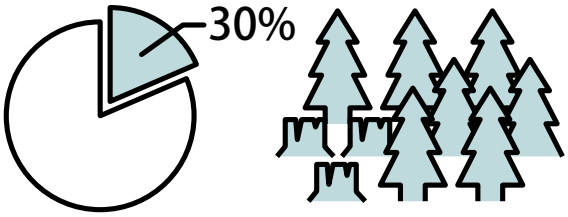




90% OF FISH GONE

"Overfishing has wiped out 90% of big fish, since the 1950's"

Nature Journal, 2003



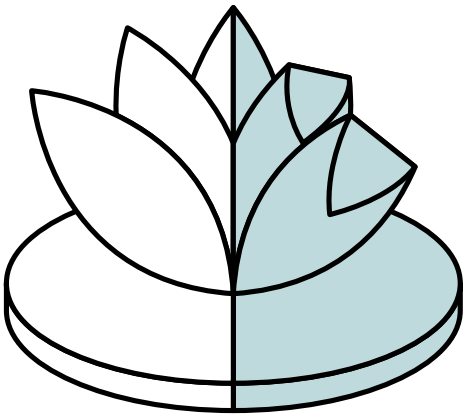
30% OF FORESTS GONE

"30% of global forest cover has been cleared, while another 20% has been degraded"

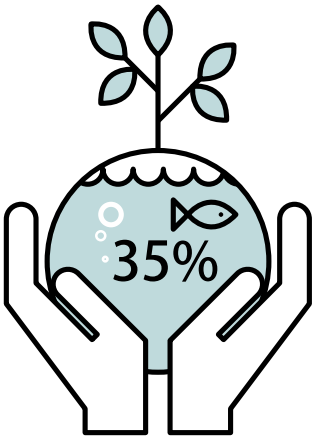
World Resources Institute, 2015

50% OF WETLANDS GONE

"Since 1900 over half of wetlands worldwide have disappeared"



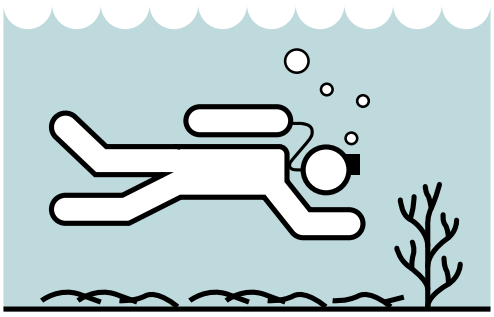
Wageningen Environmental Research (Alterra), 2008



35% OF MANGROVES GONE

"More than 35% of the world's mangroves are already gone. The figure is as high as 50% in countries such as India, the Philippines, and Vietnam, while in the Americas they are being cleared at a rate faster than tropical rainforests"

WWF, 2015



70% OF CORAL DEGRADED

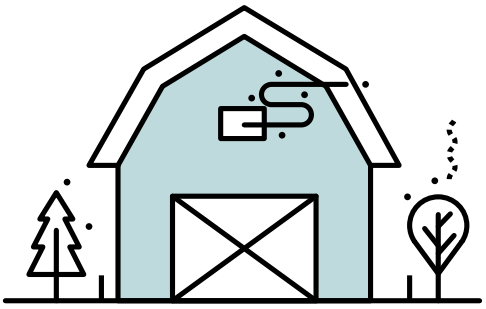
"70% of coral reefs are projected to suffer from degradation by 2030 without a dramatic change in how much carbon we emit"

Nature Climate Change Journal, 2013

– 5 –

Biodiversity

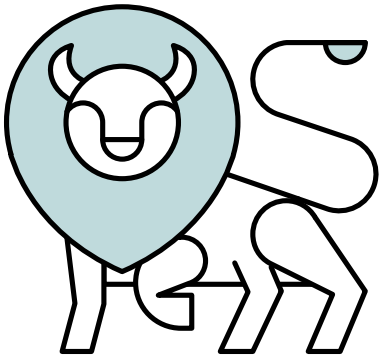
CAUSE



LIVESTOCK PRODUCTION IS THE GREATEST THREAT TO BIODIVERSITY

"The livestock sector may well be the leading player in the reduction of biodiversity, since it is the major cause of deforestation, as well as one of the leading drivers of land-degradation, pollution, climate change, overfishing, sedimentation of coastal areas and facilitation of invasions by alien species"

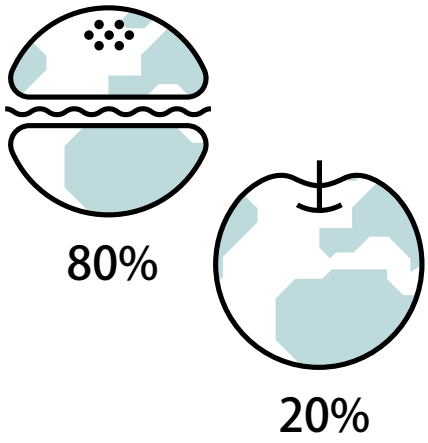
UNFAO, 2006 -



MEAT IS THE BIGGEST THREAT TO WILDLIFE

"Diets rich in beef and other red meat can be bad for a person's health. And equally [as] bad for Earth's biodiversity… human carnivory, and its impact on land use is the single biggest threat to much of the world's flora and fauna"

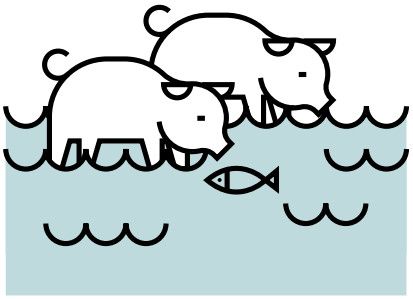
Science of the Total Environment Journal, 2015



80% OF AGRICULTURAL LAND IS FOR MEAT AND DAIRY

"80% of agricultural area is currently devoted to meat and dairy production"

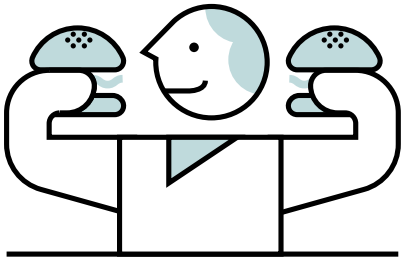
Netherlands Environmental Assessment Agency, Planbureau Voor Der Leefomgeving (PBL), 2009



AGRICULTURE IS CHANGING THE FACE OF THE EARTH

"Humans have transformed 40% to 50% of the ice-free land surface, changing prairies, forests and wetlands into agricultural and urban systems"

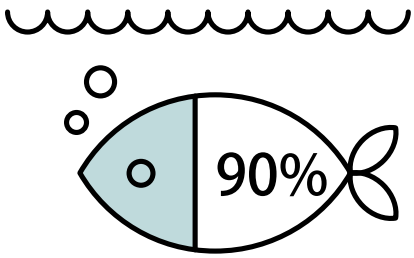
Nature Journal, 2000



MEAT CONSUMPTION HAS DOUBLED SINCE 1970

"Global animal protein consumption has more than doubled since 1970"

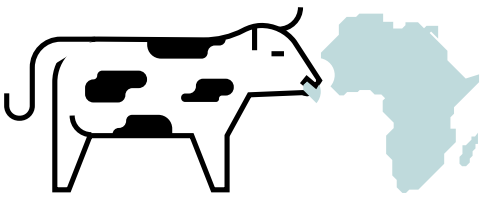
Netherlands Environmental Assessment Agency, Planbureau Voor Der Leefomgeving (PBL), 2009



90% OF BIG FISH GONE

"Overfishing has wiped out 90% of big fish, since the 1950's"

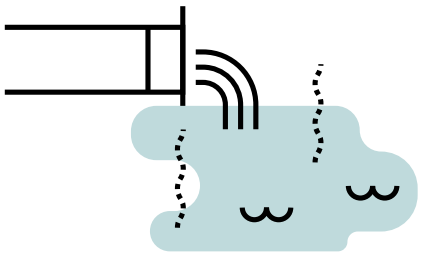
Nature Journal, 2003



CATTLE ARE RESPONSIBLE FOR 80% OF AMAZON DEFORESTATION

"Cattle ranching is the number one culprit of deforestation in virtually every Amazon country, and it accounts for 80% of current deforestation"

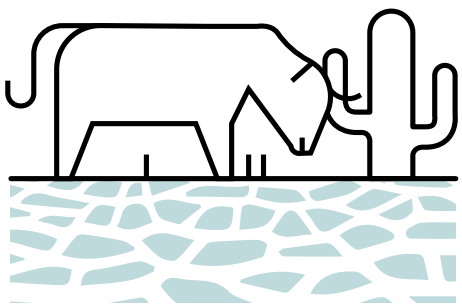
Royal Society Philosophical Transactions B, 2008



AGRICULTURAL WATER MISMANAGEMENT IS DESTROYING ECOSYSTEMS

"The way that water is managed in agriculture has caused wide-scale changes in ecosystems and undermined the provision of a wide range of ecosystem services. The external cost of the damage to people and ecosystems, and clean-up processes, from the agricultural sector is significant. In the United States of America the estimated cost is US$9 to US$20 billion per year"

UNESCO, 2012



OVERGRAZING CAUSES DESERTIFICATION

"The major causes of soil erosion / desertification are still inappropriate agricultural practices, deforestation and overgrazing"

Joint Research Centre, 2003

– 5 –

Biodiversity

TIMELINE

All Life on Earth Is Threatened

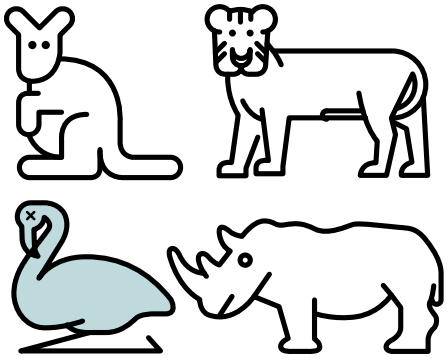
1

BIODIVERSITY TIPPING POINT BY 2045

Earth's biodiversity could reach a tipping point as early as 2045, threatening to collapse all of Earth's ecosystems, threatening all life on earth

Nature Journal, 2012

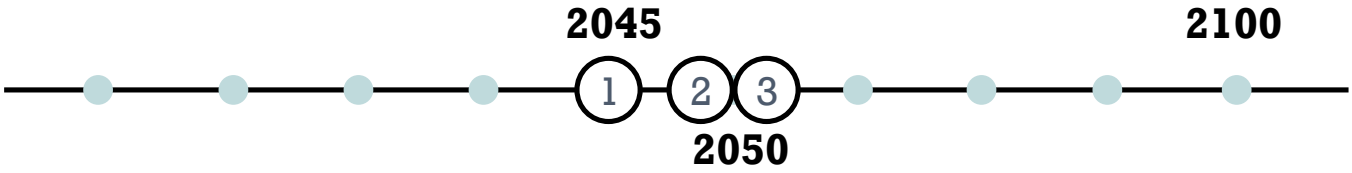
2



QUARTER OF EARTH'S SPECIES EXTINCT BY 2050

"One-fourth of Earth's species could be headed for extinction by 2050"

Conservation Biology Journal, 2006

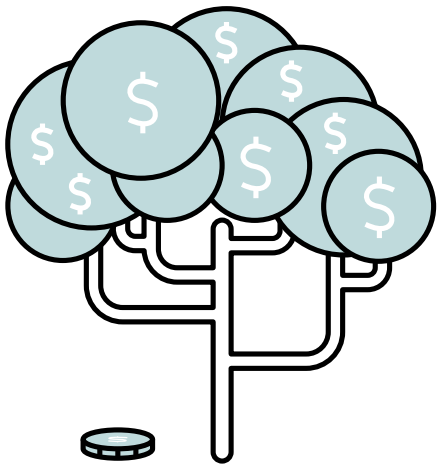


3

GLOBAL LOSS OF ECOSYSTEM SERVICES WILL COST 7% OF GLOBAL GDP BY 2050

"The estimated annual loss in ecosystem services from the cumulative loss of biodiversity will be worth nearly €14 trillion (thousand billion) by 2050, equivalent to 7% of the global 2050 GDP"

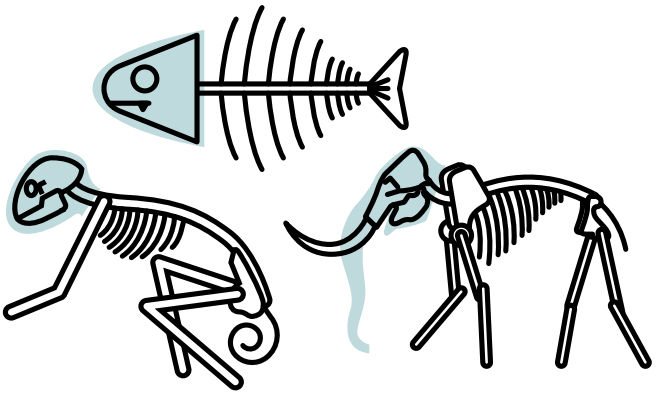
European Commission, 2008

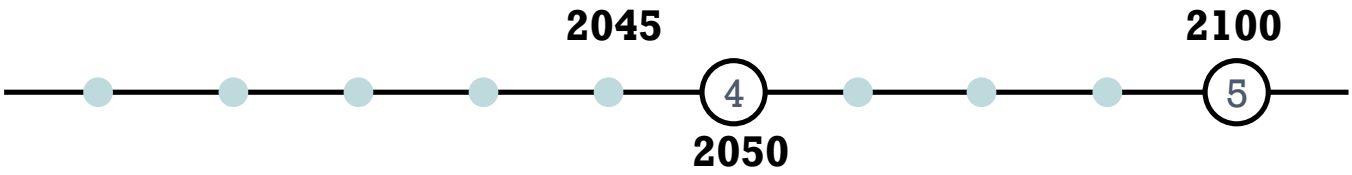


4 70% OF ALL SPECIES EXTINCT IF TEMPERATURES INCREASE BY 3.5°C

"If the global average temperature increase exceeds about 3.5°C, model projections suggest between 40% and 70% of species assessed around the globe will face extinction"

Intergovernmental Panel on Climate Change, 2007

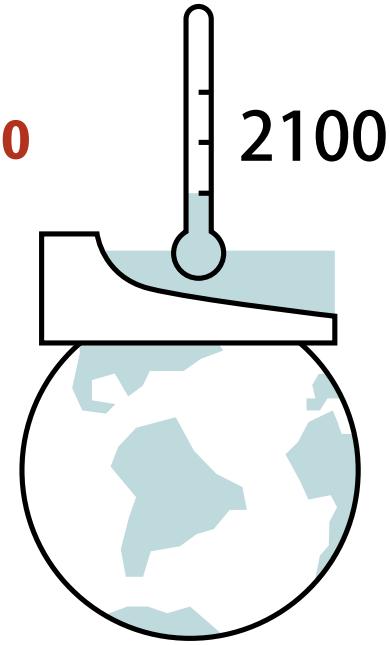




5 WORLD ON TRACK FOR 5.2°C WARMING BY 2100

"Projections published in the American Meteorological Society's Journal of Climate indicate a median probability of surface warming of 5.2°C by 2100, with a 90% probability range of 3.5°C to 7.4°C"

American Meteorological Society, 2009



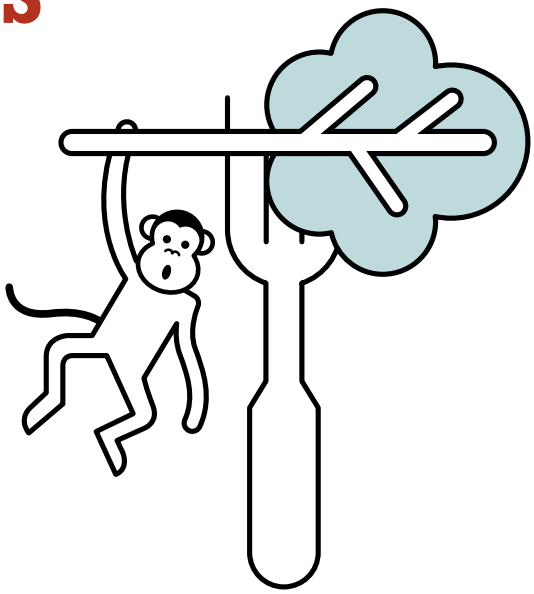
– 5 –

Biodiversity

SOLUTION

PLANT BASED DIET MOST EFFECTIVE TO STOP BIODIVERSITY LOSS

"A no meat diet would have the single greatest benefit, preventing the loss of 60% of biodiversity loss"



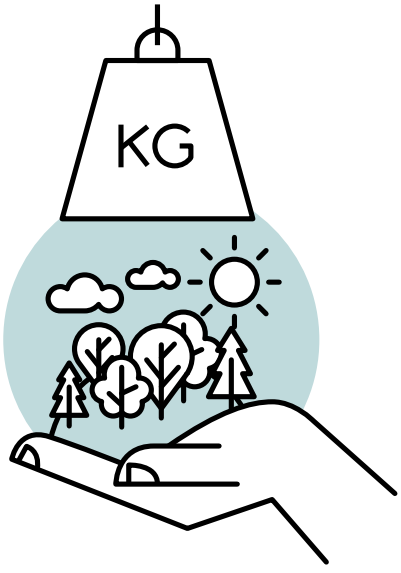
Netherlands Environmental Assessment Agency, 2010

ECOSYSTEM BANKRUPTCY

"A rescue package similar to that introduced after the global financial crisis is urgently needed to halt the worldwide loss of biodiversity, which is resulting in a heavy human cost… we are bankrupting our natural economy"

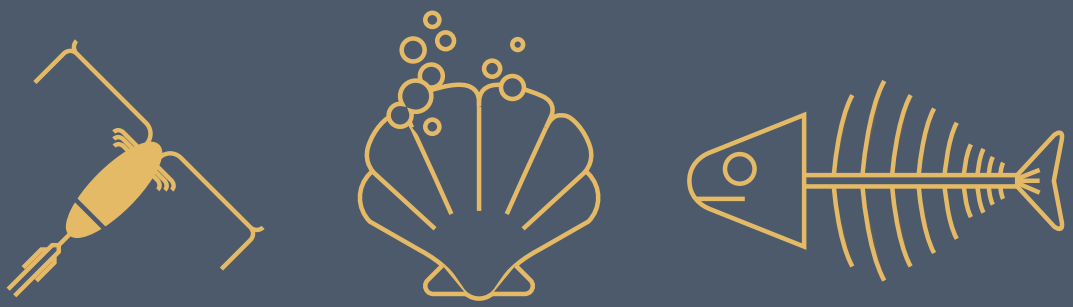
Secretary General Ban Ki-moon

United Nations News Centre, 2010



– 6 –

OCEAN SECURITY



INTRODUCTIION

The oceans are dying, and we have caused it. As we wipe out one species of fish, we move on to another and this has been the continuing trend in recent decades, today 90% of the worlds large fish are now gone.

Oceanic dead zones (from agricultural runoff, particularly livestock), overfishing, and ocean acidification can all be moderated or reversed by a change in diet from animal based to plant based.

OCEANS SUPPORT LIFE ON EARTH, THEY ARE BEING DESTROYED

"Oceans are essential for supporting life on Earth and for human well being… their importance cannot be underestimated… the world's oceans and seas are changing. Human activities are taking a terrible toll. Marine ecosystems are being damaged by over-exploitation, illegal, unreported and unregulated fishing, destructive fishing practices and marine pollution. Increased sea temperatures and sea-level rise, caused by climate change, as well as ocean acidification, pose a further threat to marine life, coastal and island communities, and national economies. And yet we all, wherever we live, rely on these oceans and seas for our very livelihoods"

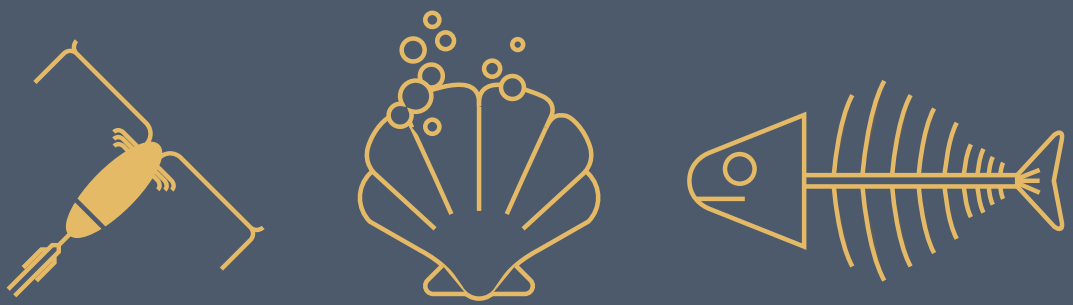
United Nations Convention on Biological Diversity, 2015

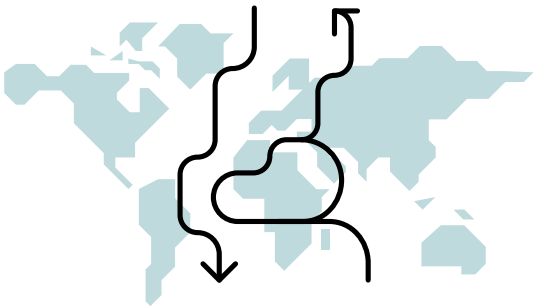
– 6 –

Ocean Security

PROBLEM

Oceanic Warming

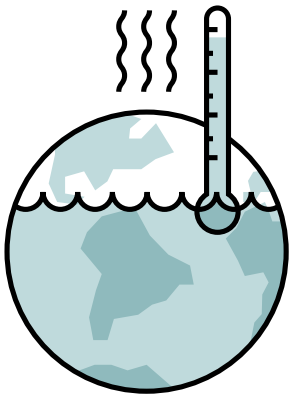




COLLAPSING OCEAN CURRENTS TO TRIGGER CATASTROPHIC WARMING

"analyses suggest that the [Atlantic ocean circulation) is in an unstable regime susceptible for large changes.. .. we show that the AMOC collapses 300 years after the atmospheric CO2 concentration is abruptly doubled from the 1990 level"

Science Advances Journal, 2017



90% OF LAND WARMING IS CAUSED BY OCEAN WARMING

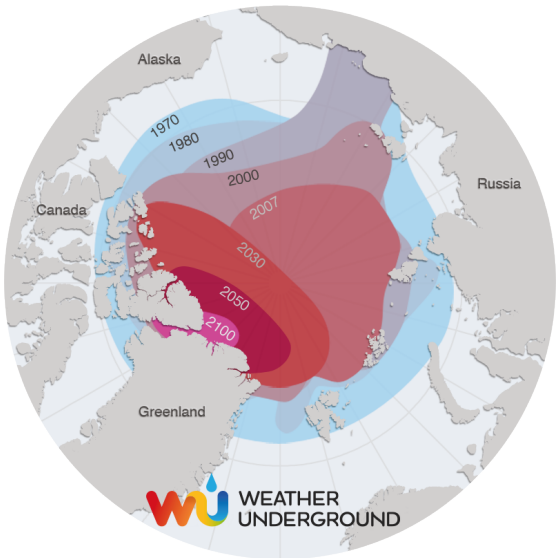
"Ocean warming exerts a large influence on the continents: 80% to 90% of warming over land has been estimated to be indirectly driven by ocean warming"

World Bank, 2013

SEA ICE EXTENT OBSERVATIONS

"Sea ice extent observations (1970 to 2007) and forecast (2030 to 2100) reproduced using data from the NOAA GFDL model"

Weather Underground, 2015

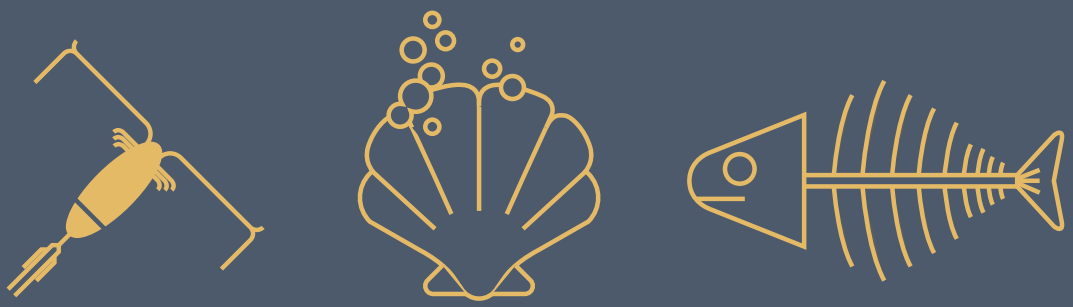


– 6 –

Ocean Security

PROBLEM

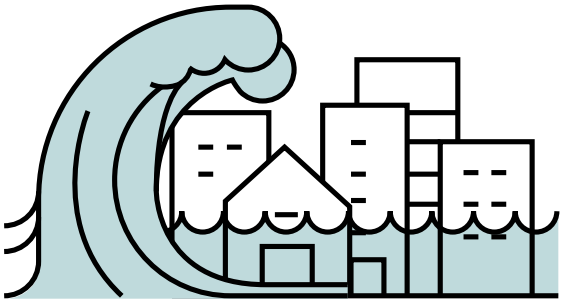
Sea Levels Are Rising

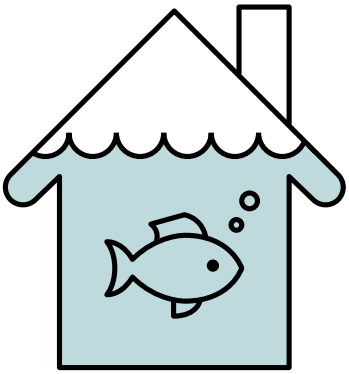


ICE SHELF COLLAPSE WOULD RAISE GLOBAL SEA LEVELS BY 16 FEET, THREATENING MILLIONS OF PEOPLE

"Since the 1970's warming ocean waters have melted a significant section of ice in the Amundsen Sea in the Southern Ocean, so much that collapse of a far greater mass of ice may be inevitable. Scientists from NASA and elsewhere, based on a half-dozen studies in the past two years, now believe it may be too late to stop so much Antarctic ice from melting that it would send sea levels rising 16 feet more, inundating regions home to hundreds of millions of people. What may still be possible, however, is for humans to control just when that might happen"

National Geographic, 2015

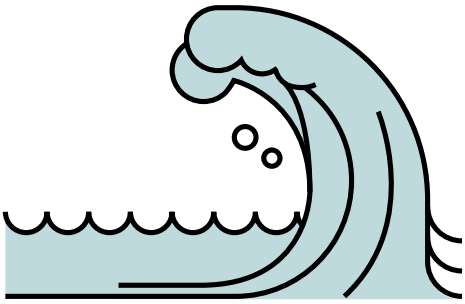




SEA LEVELS TO RISE 20 FEET EVEN IF WE LIMIT GLOBAL WARMING TO 2°C

"Even if world manages to limit global warming to 2°C, the target number for current climate negotiations, sea levels may still rise at least 6 meters (20ft) above their current heights, radically reshaping the world's coastline and affecting millions in the process"

The Guardian, 2015



HISTORICAL DATA SHOWS OCEANS HAVE RISEN 20 FEET WHEN GLOBAL TEMPERATURES ARE JUST 1°C OR 2°C HIGHER THAN AVERAGE

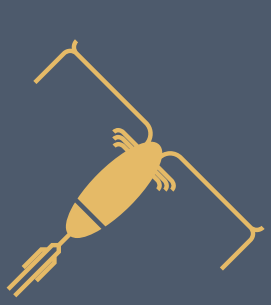
"Global sea levels have risen at least six meters, or about 20 feet, above present levels on multiple occasions over the past three million years. What is most concerning is that amount of melting was caused by an increase of only 1-2 degrees (Celsius) in global mean temperatures"

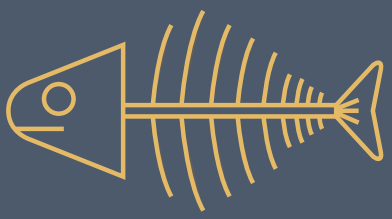
Science Daily, 2015

– 6 –

Ocean Security

CAUSE





LIVESTOCK IS RESPONSIBLE FOR 51% OF GREENHOUSE GASES

"Livestock and their by-products actually account for at least 32.6 billion tons of carbon dioxide per year, or 51% of annual worldwide GHG emission"

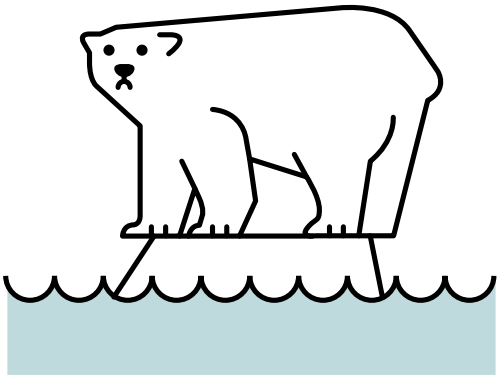
Worldwatch Institute, 2009

WHY LIVESTOCK EMISSION FIGURES VARY SO MUCH

The main point of difference between FAO's 18% and World Watch's 51% is accounting period. FAO uses the commonly accepted but arbitrary 100 year greenhouse gas accounting, whereas World Watch uses 20 year accounting. Livestock are the greatest source of short term emissions, so when their warming impact is assessed over 20 years, livestock become the single biggest greenhouse gas source. World Watch also include CO2 emitted when livestock breath out, a point of contention with some industry authors.

OCEANS ABSORB 93% OF ANTHROPOGENIC HEAT

"The world's oceans have been taking up approximately 93% of the additional heat caused by anthropogenic climate change"

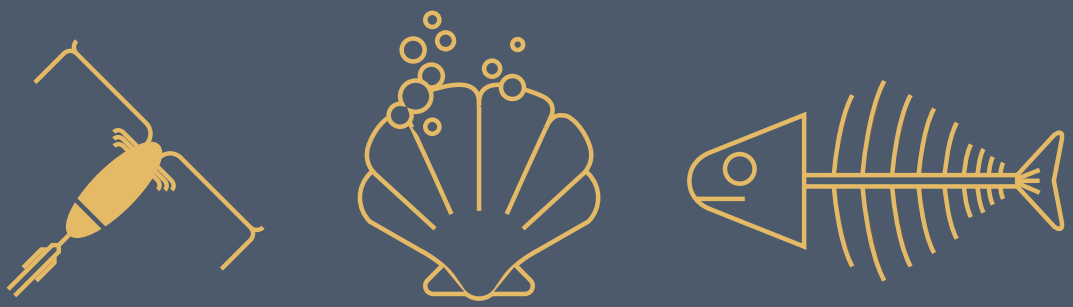


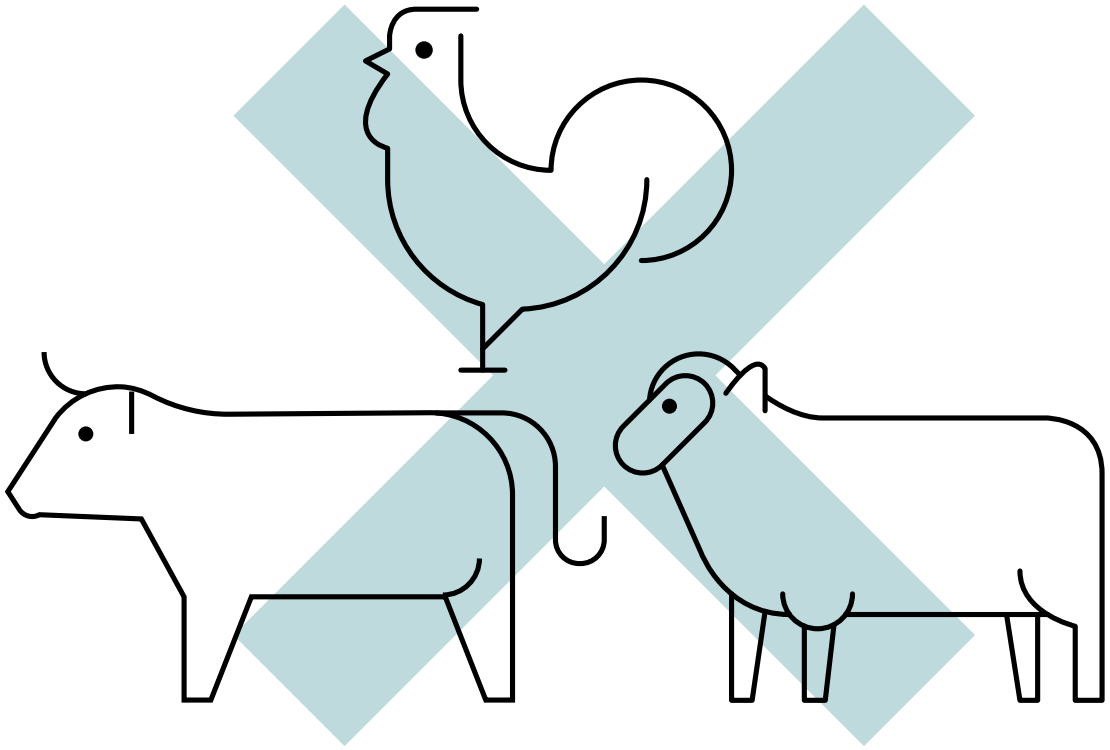
World Bank, 2013

– 6 –

Ocean Security

SOLUTION





STOP PRODUCING GHG'S TO REDUCE HEAT

"The only way to reduce ocean temperatures is to dramatically reign in our emission of greenhouse gases. However, even if we immediately dropped carbon dioxide emissions to zero, the gases we've already released would take decades or longer to dissipate"

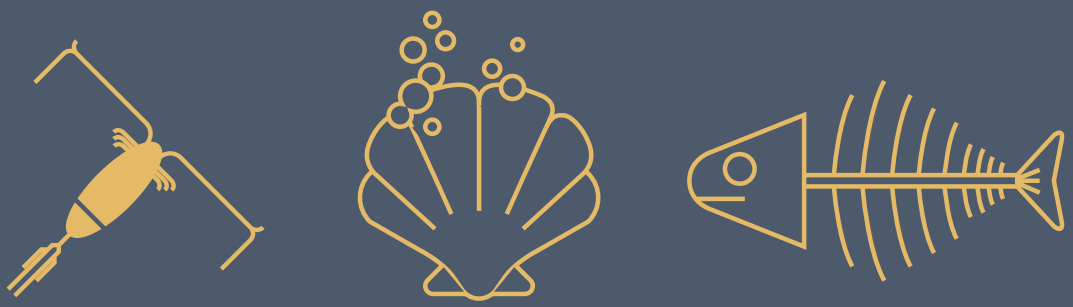
National Geographic, 2015

– 6 –

Ocean Security

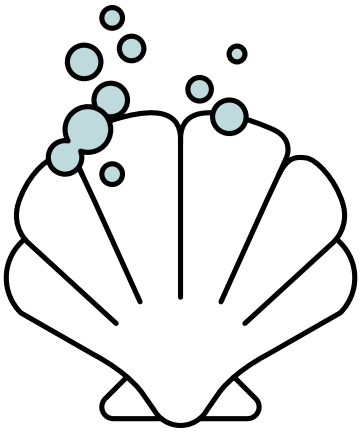
PROBLEM

Ocean Acidification

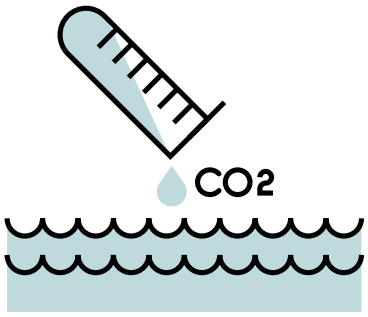


OCEAN ACIDIFICATION REDUCES BIODIVERSITY

"The potential consequences of ocean acidification on marine organisms are complex. A major concern is the response of calcifying organisms, such as corals, algae, molluscs and some plankton, because their ability to build shell or skeletal material (via calcification) depends on the abundance of carbonate ion. For many organisms, calcification declines with increased acidification. Other impacts of acidification include reduced survival, development, and growth rates as well as changes in physiological functions and reduced biodiversity"



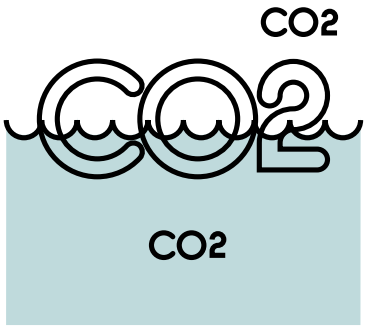
United Nations World Meteorological Organization, 2015



CO2 ABSORPTION DRIVES ACIDIFICATION

"The oceans are absorbing carbon dioxide (CO2) from the atmosphere and this is causing chemical changes by making them more acidic"

The Royal Society



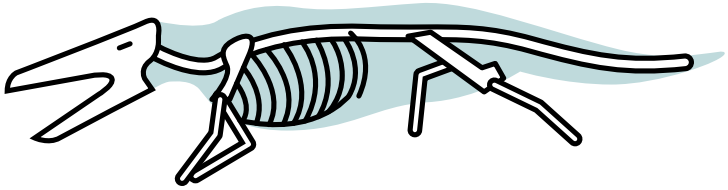
OCEANS ABSORB 50% OF CO2

"Oceans absorb half of all man made carbon dioxide"

National Geographic, 2004

OCEAN ACIDIFICATION CAUSED GLOBAL EXTINCTION 252 MILLION YEARS AGO

"252 million years ago the Permian-Triassic Boundary extinction caused by ocean acidification wiped out more than 90% of marine species and more than two-thirds of the animals living on land"

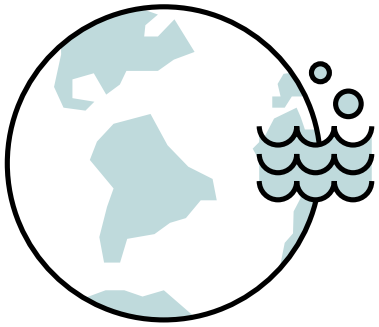


Science Daily, 2015

OCEANS 30% MORE ACIDIC

"In the past 200 years alone, ocean water has become 30% more acidic"

Smithsonian Ocean Portal, 2016



OCEAN ACIDIFICATION IS OCCURRING 10X FASTER THAN AT ANY POINT IN THE LAST 55 MILLION YEARS

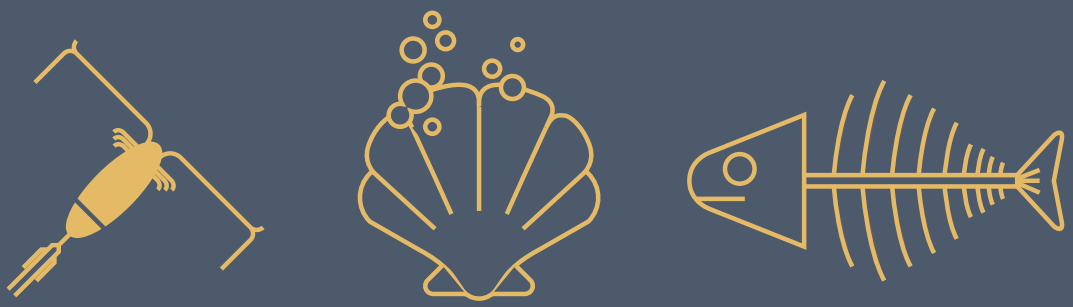
"Ocean acidification is happening 10 times faster than that which preceded the extinction 55 million years ago during the Palaeocene Eocene Thermal Maximum, the largest ocean acidification event since the extinction of the dinosaurs"

UK Ocean Acidification Research Programme, 2009

– 6 –

Ocean Security

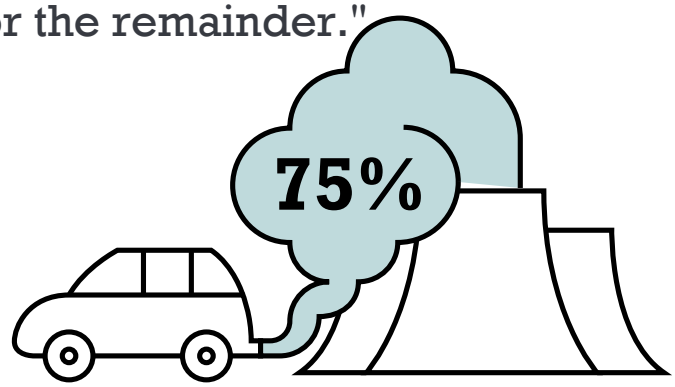
CAUSE



Fossil fuel burning creates 75% of CO2

"Fossil fuel combustion (plus a smaller contribution from cement manufacture) is responsible for more than 75% of human-caused CO2 emissions. Land use change (primarily deforestation) is responsible for the remainder."

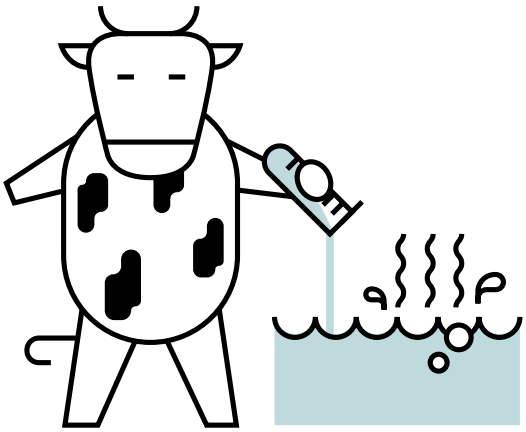
IPCC, 2007



LIVESTOCK ARE RESPONSIBLE FOR 64% OF HUMAN INDUCED AMMONIA EMISSIONS

Livestock are also responsible for almost two-thirds (64%) of anthropogenic ammonia emissions, which contribute significantly to acid rain and acidification of ecosystems''

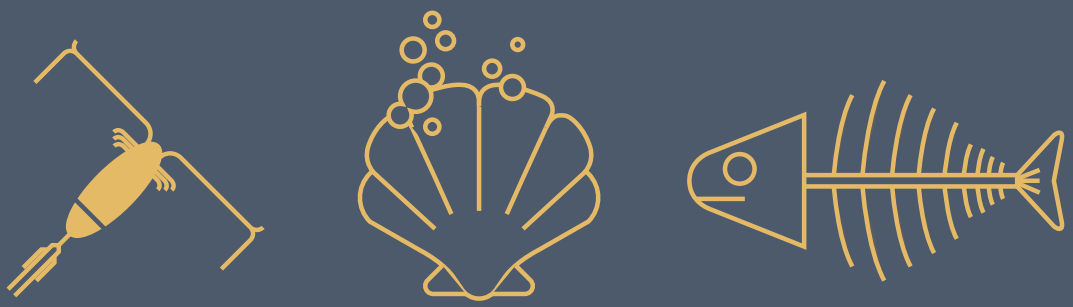
UNFAO, 2006



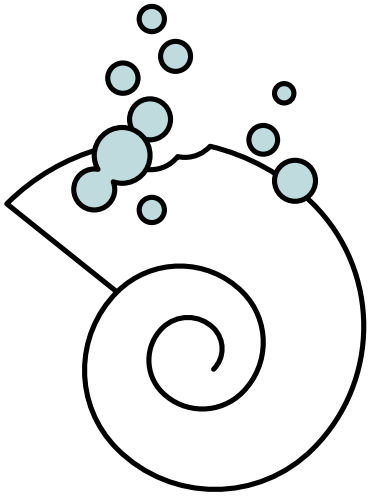
– 6 –

Ocean Security

TIMELINE



1



OCEAN ACIDIFICATION RATE FASTER THAN LAST 300 MILLION YEARS

"The oceans are becoming more acidic at the fastest rate in 300m years. This [acidification] is unprecedented in the Earth's known history. We are entering an unknown territory of marine ecosystem change, and exposing organisms to intolerable evolutionary pressure. The next mass extinction may have already begun."

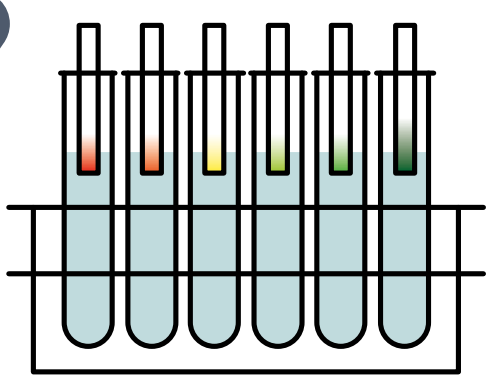
The Guardian, 2013

2013

1 — 2

2100

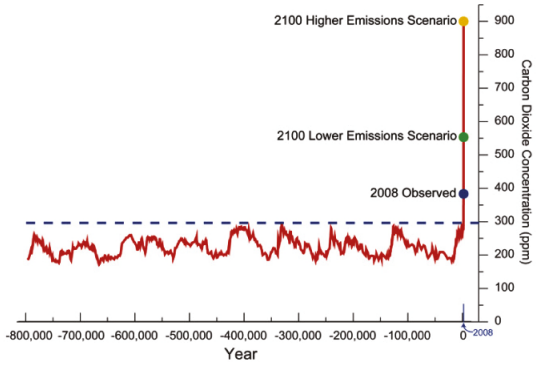
2



BY 2100 OCEANS 150% MORE ACIDIC

"By the end of this century the surface waters of the ocean could be nearly 150% more acidic"

National Oceanic and Atmospheric Administration



800,000 YEAR RECORD OF CARBON DIOXIDE (CO_2) CONCENTRATIONS

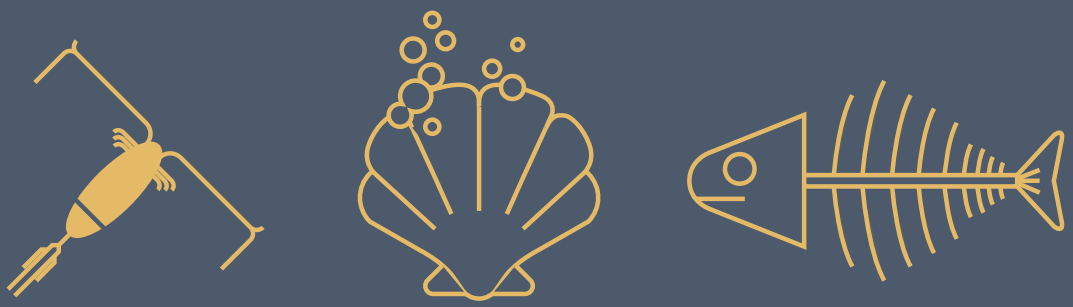
National Oceanic and Atmospheric Administration, 2016

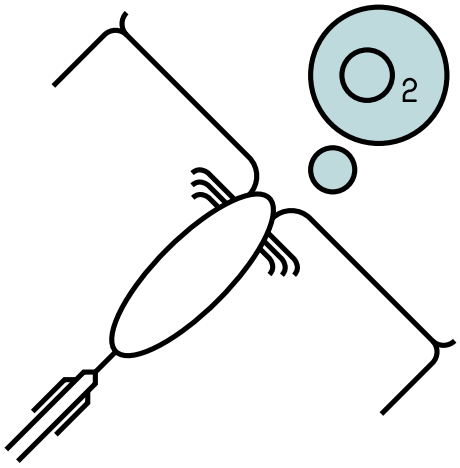
– 6 –

Ocean Security

PROBLEM

Phytoplankton Die Off

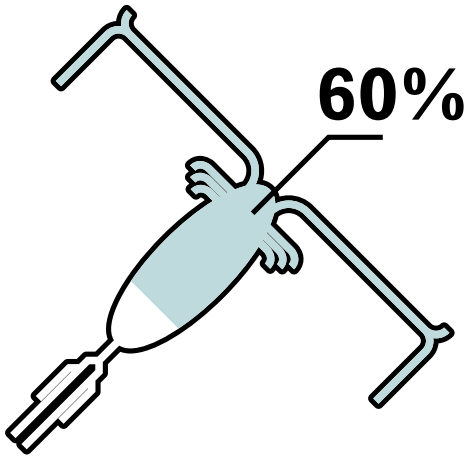




PHYTOPLANKTON CREATE 50% OF WORLD'S OXYGEN

"Half of the world's oxygen is produced via phytoplankton photosynthesis"

National Geographic, 2004



PHYTOPLANKTON DOWN 40%

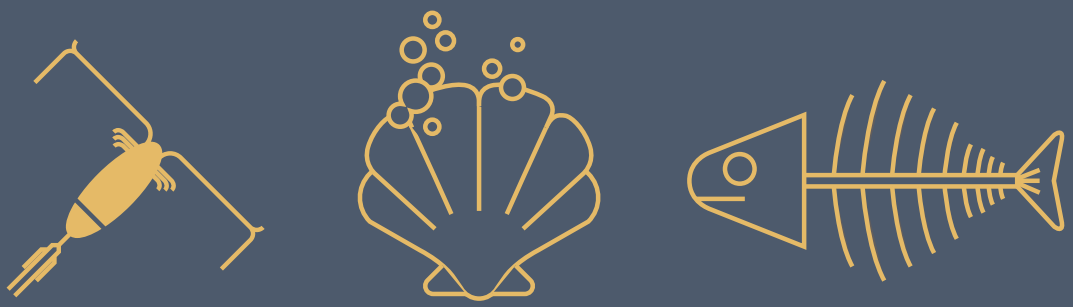
"Phytoplankton numbers are down 40% since the 1950's"

Scientific American, 2010

– 6 –

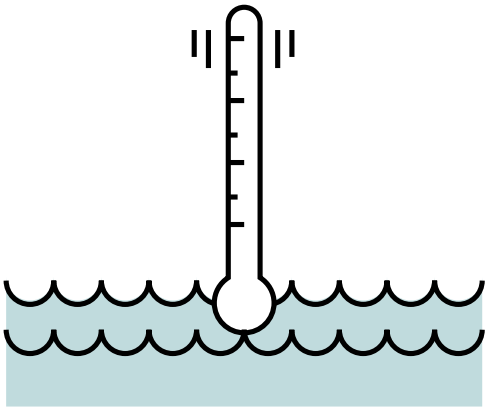
Ocean Security

CAUSE & TIMELINE



OCEAN TEMPERATURE RISES ARE KILLING PHYTOPLANKTON

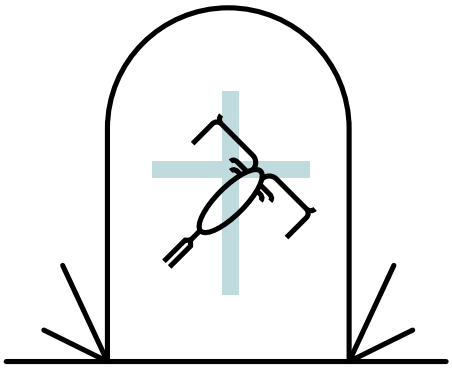
"Rising sea surface temperatures is the main cause of phytoplankton die-off"



Scientific American, 2010

2013 — 3 — 2100

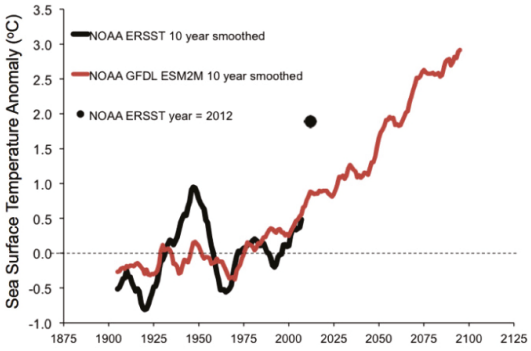
3



PHYTOPLANKTON TO DECREASE A FURTHER 6% TO 11% BY 2100

"Phytoplankton and zooplankton biomass are expected to decrease by 6% and 11% respectively by the end of century due to climate change"

Global Change Biology, 2014



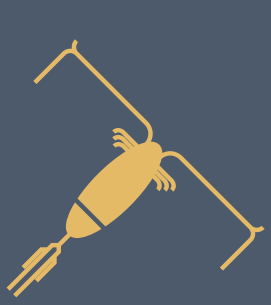
SEA SURFACE TEMPERATURE ANOMALY (°C)

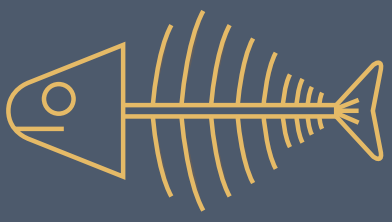
National Oceanic and Atmospheric Administration, 2015

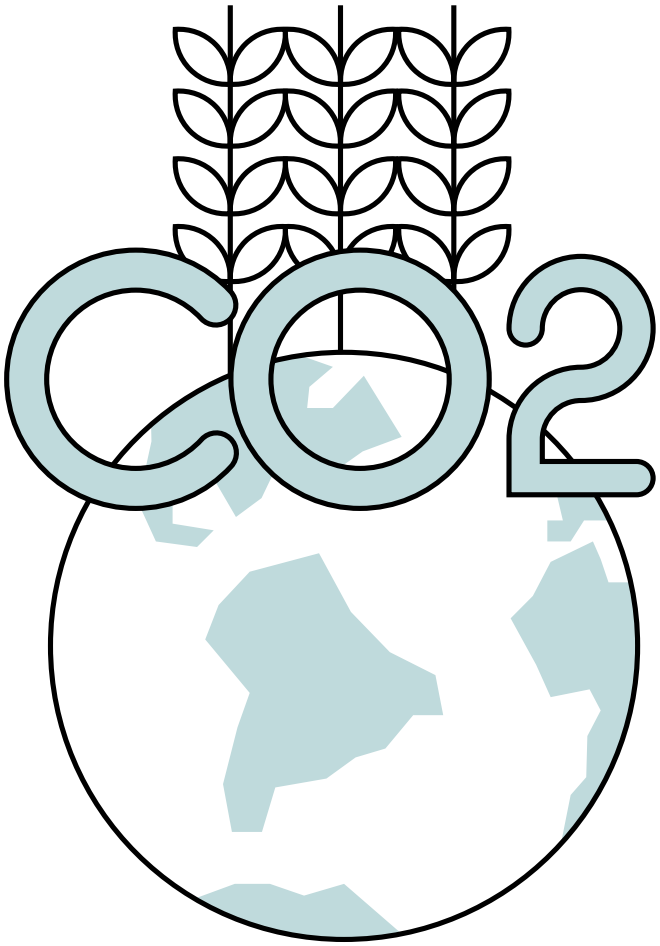
– 6 –

Ocean Security

SOLUTION







ORGANIC AGRICULTURE CAN ABSORB 100% OF ATMOSPHERIC CO2

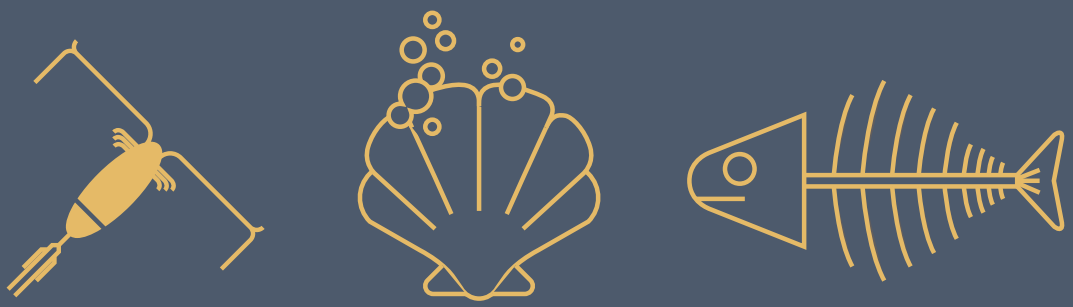
"We could sequester more than 100% of current annual CO2 emissions with a switch to widely available and inexpensive organic management practices"

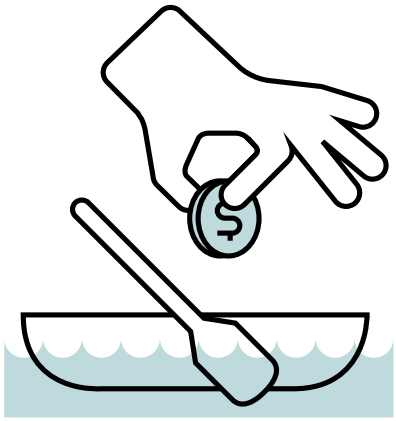
Rodale Institute, 2014

– 6 –

Ocean Security

PROBLEM & CAUSE

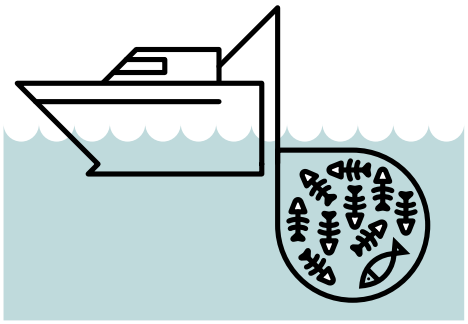




FISHING SUBSIDIES DESTROY THE OCEANS

"Globally, fisheries subsidies amount to about $35bn per year. Without them, many high seas fisheries would not be economically viable"

Global Ocean Commission



90% OF BIG FISH GONE

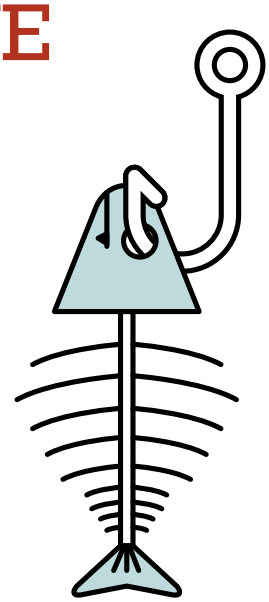
"Overfishing has wiped out 90% of big fish, since the 1950's"

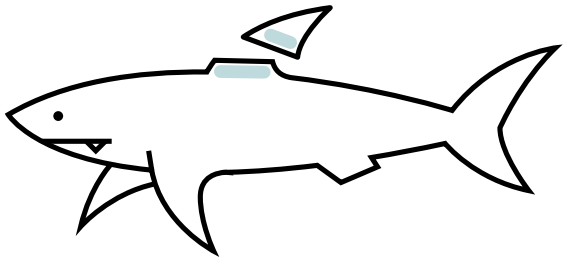
Nature Journal, 2003

75% OF TUNA AND MACKEREL POPULATIONS HAVE GONE

"Tuna and mackerel populations have suffered a "catastrophic" decline of nearly three quarters in the last 40 years… [The] WWF and the Zoological Society of London found that numbers of the scombridae family of fish, which also includes bonito, fell by 74% between 1970 and 2012, outstripping a decline of 49% for 1,234 ocean species over the same period"

The Guardian, 2015

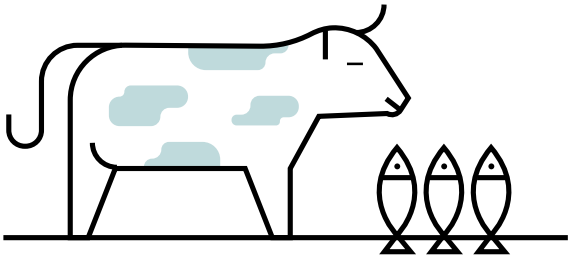




100 MILLION SHARKS ARE KILLED ANNUALLY

"One of the most comprehensive studies ever compiled on illegal shark killing brings new startling statistics. An estimated 100 million sharks are killed every year around the world, a number that far exceeds what many populations need to recover"

National Geographic, 2013



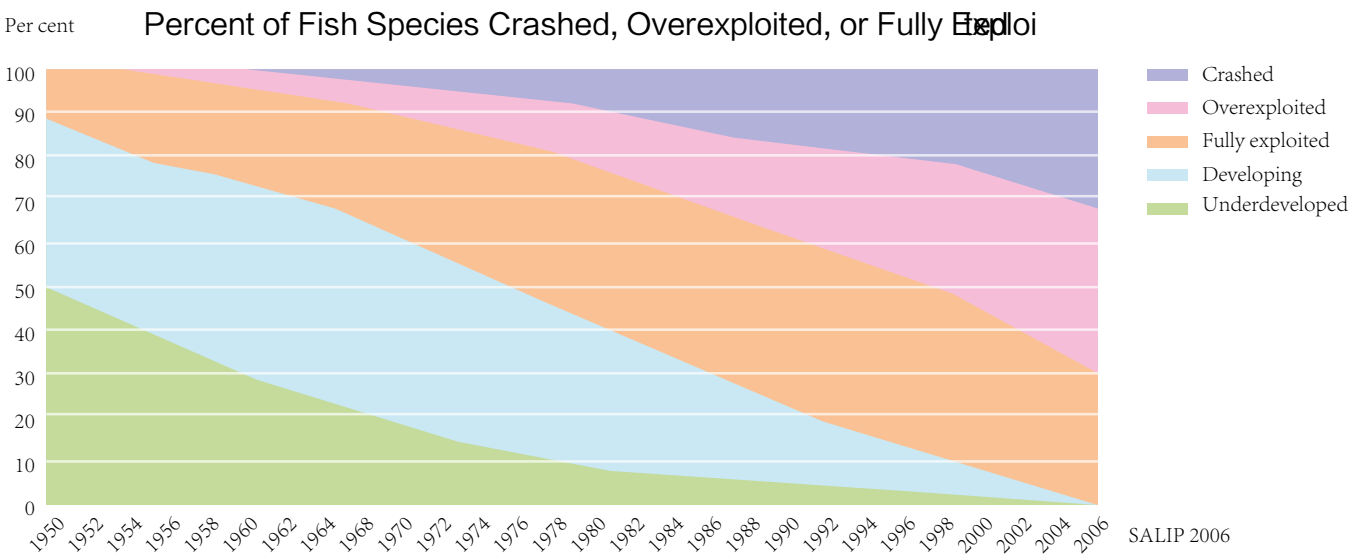
50% OF SEA LIFE IS FED TO LIVESTOCK

"Thirty million tons or 36%, by some accounts as much as 50%, of global fisheries' catch each year are used to feed livestock"

UNFAO, 2009

OCEANS AT THE BREAKING POINT

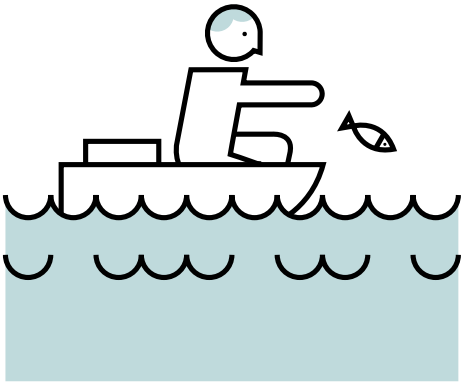
"The condition of the world's fisheries has drastically declined as a result of overfishing"



Scientific American, 2013

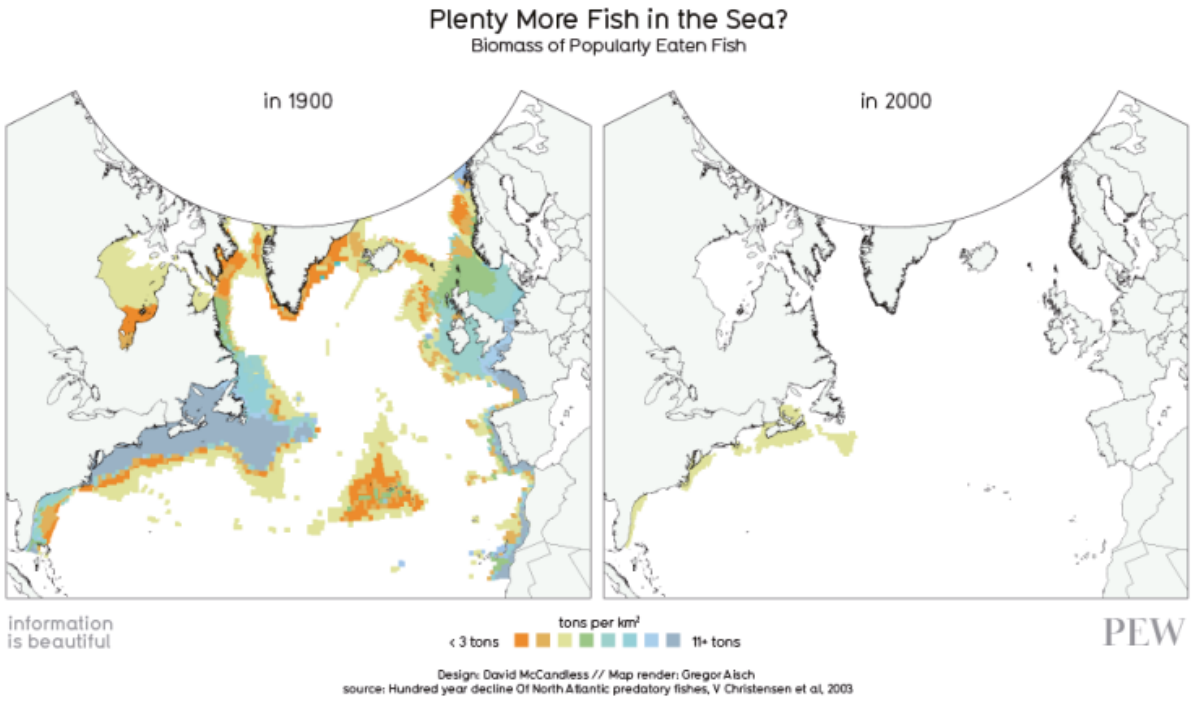
17% TO 22% OF CATCHES ARE THROWN BACK DEAD OR DYING

"17% to 22% of what fishermen catch every year is discarded at sea, likely already dead or dying"



Oceana, 2014

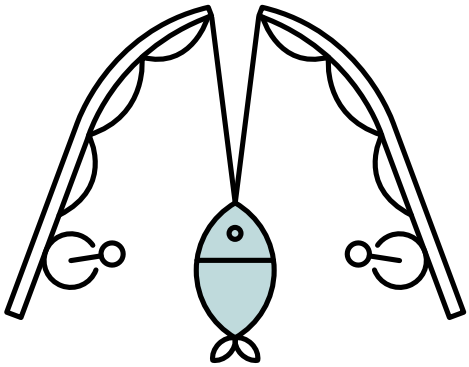
AVAILABLE FISH BIOMASS IN THE NORTH ATLANTIC



University of Oxford, 2011

FISHING FLEETS HAVE INCREASED 10X SINCE 1950'S, BUT CATCH IS DOWN 50%

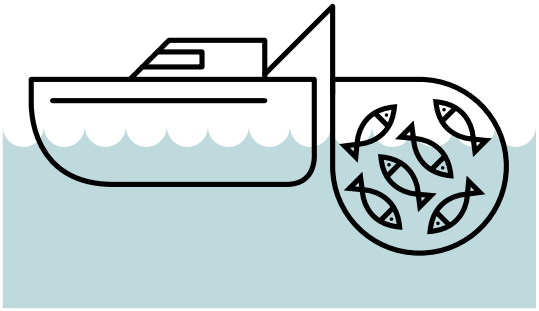
"[Fishing] fleets now fish all of the world's oceans and have increased in power by an average of 10-fold (25-fold for Asia) since the 1950s. Significantly, for the equivalent fishing power expended, landings from global fisheries are now half what they were a half-century ago, indicating profound changes to supporting marine environments"



Fish And Fisheries Journal, 2012

1 TRILLION FISH CAUGHT A YEAR

"The most reliable estimates of fish numbers are likely to be those based on average weight data taken from more than one reference. These total 0.43-1.14 trillion and account for 29% of fish capture tonnage. In addition, the lower estimate for multi-species categories with an EMW is likely to be very conservative and totals a further 0.079 trillion for another 7% of fish capture tonnage. Combining these two figures brings the lower estimate for this 36% of capture tonnage to 0.51 trillion. It is concluded that the number of fish caught each year is of the order of a trillion"

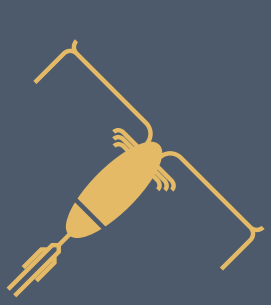


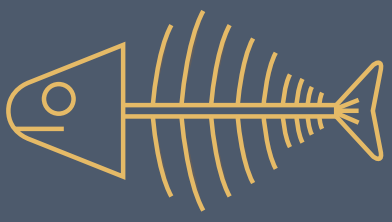
Fishcount, 2015

– 6 –

Ocean Security

TIMELINE & SOLUTION



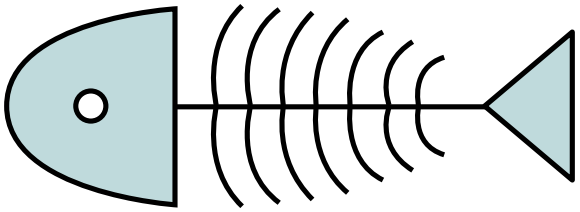


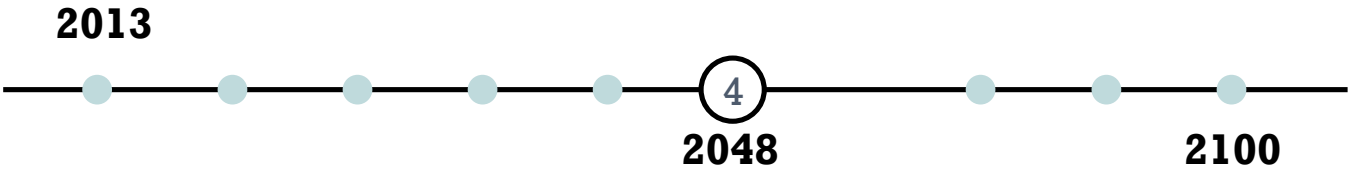
4

FISH EXTINCTION BY 2048

"If fishing rates continue apace, all the world's fisheries will have collapsed by the year 2048"

National Geographic

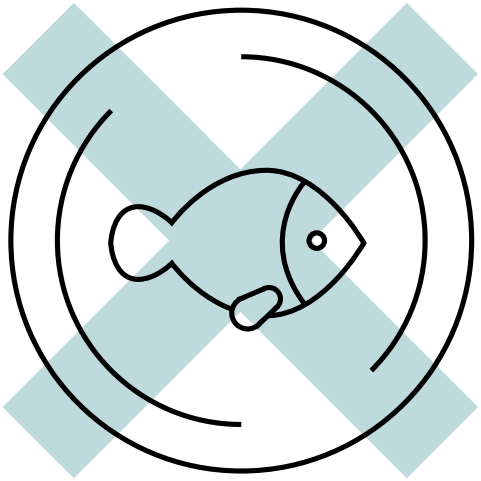




DON'T EAT FISH!

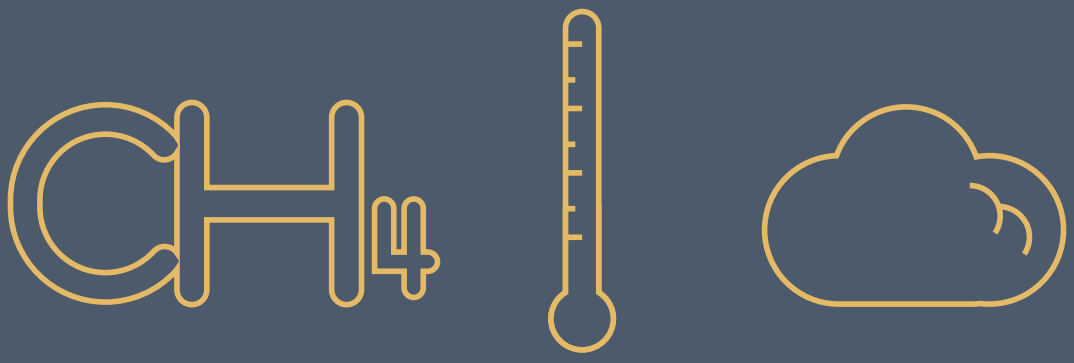
"If you want to save the fish just don't eat them"

James cameron, 2015



– 7 –

METHANE

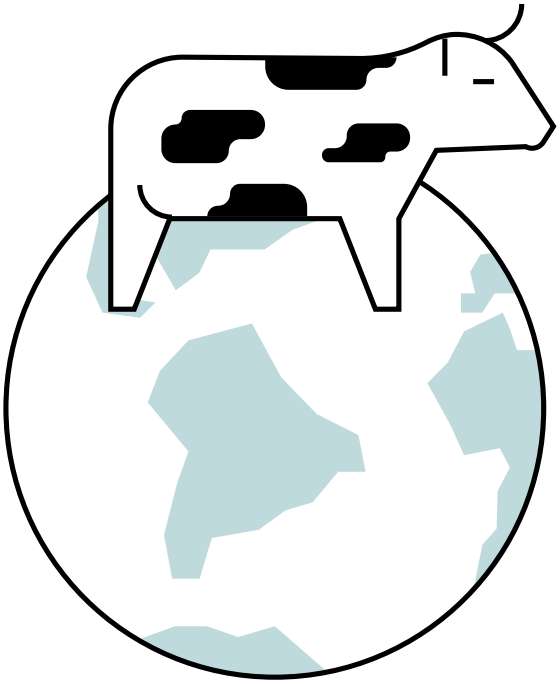


INTRODUCTIION

Methane is largely ignored by the climate science community as a distraction from the main problem: carbon dioxide. The mainstream view is that because it is removed from the atmosphere within 12 years, its warming is not a concern.

However, methane and the other short-term greenhouse gases it helps create are responsible for over 40% of global warming. More importantly, it offers a powerful means of moderating global warming in the coming decades. One comparison showed that cutting methane emissions by half, was equivalent to cutting carbon dioxide emissions by 100% by 2050.

The greatest source of human-caused methane is livestock (cattle, pigs, sheep) and therefore a change in diet away from animal consumption will greatly assist in global cooling.



Methane concentrations growing faster than ever - livestock to blame

"methane concentrations are rising faster than at any time in the past two decades and, since 2014, are now approaching the most greenhouse-gas-intensive scenarios. New analysis suggests that the recent rapid rise in global methane concentrations is predominantly biogenic-most likely from agriculture

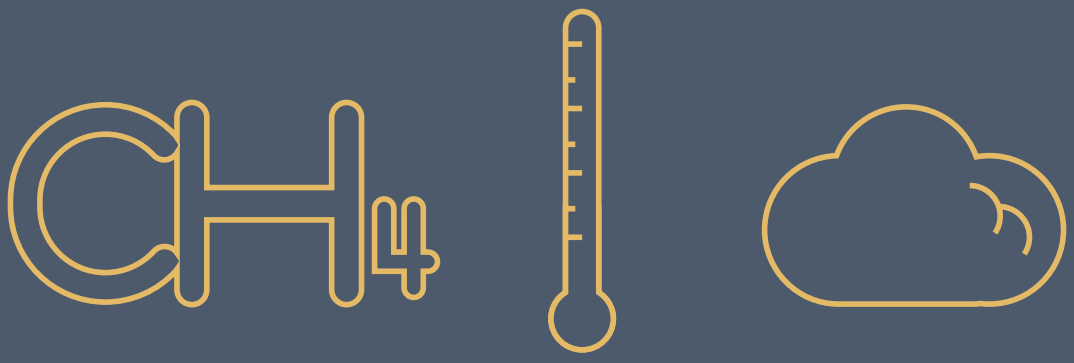
Environmental Research Letters Journal, 2016

– 7 –

Methane

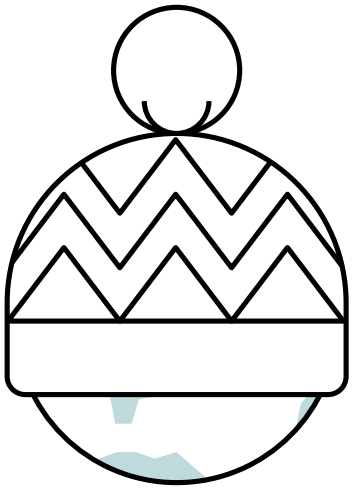
PROBLEM

Atmospheric Methane



METHANE 34X MORE WARMING THAN CO2

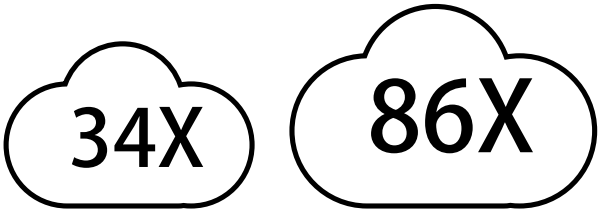
"Methane is 34 times stronger a heat-trapping gas than CO2 over a 100-year time scale"



IPCC, 2013

METHANE 86X MORE WARMING THAN CO2 OVER 20 YEARS AND 34X OVER 100 YEARS

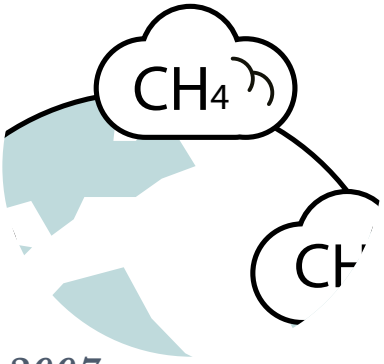
"Policymakers typically ignore methane's warming potential over 20 years (GWP20) when assembling a nation's emissions inventory. Instead, they stretch out methane's warming impacts over a century, which makes the gas appear more benign than it is, experts said. The 100-year warming potential (GWP100) of methane is 34, according to the IPCC. There is no scientific reason to prefer a 100-year time horizon over a 20-year time horizon; the choice of GWP100 is simply a matter of convention. The 100-year GWP value underestimates the gas's negative impacts by almost five times, said Ilissa Ocko, a climate scientist at the nonprofit Environmental Defense Fund"



Scientific American, 2015

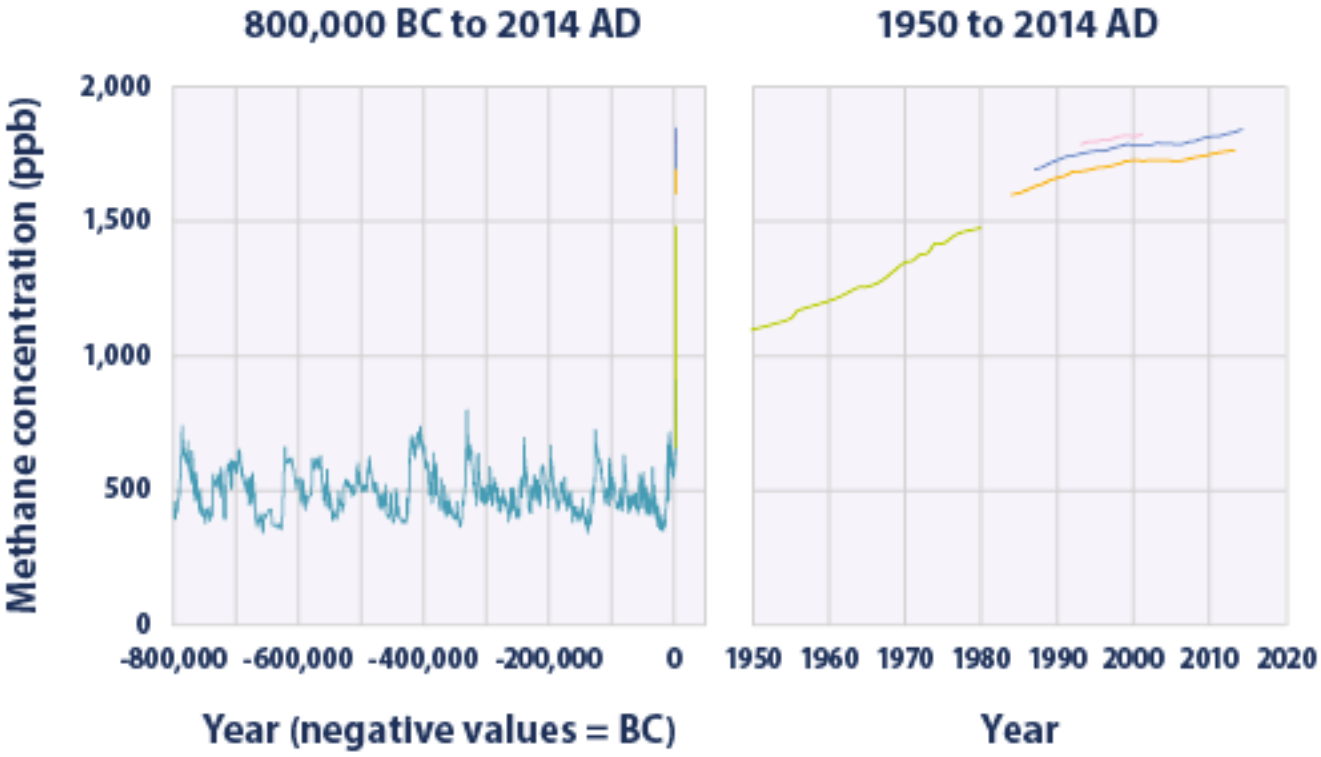
METHANE CONCENTRATIONS AT 650,000 YEAR HIGH

"Atmospheric concentrations of methane (1774 ppb) in 2005 exceed by far the natural range over the last 650,000 years"



Intergovernmental Panel on Climate Change, 2007

GLOBAL ATMOSPHERIC CONCENTRATION OF METHANE OVER TIME



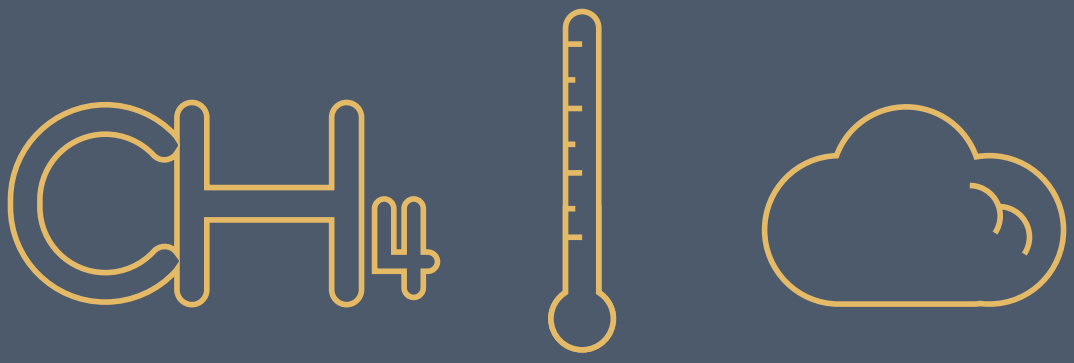
United States Environmental Protection Agency, 2015

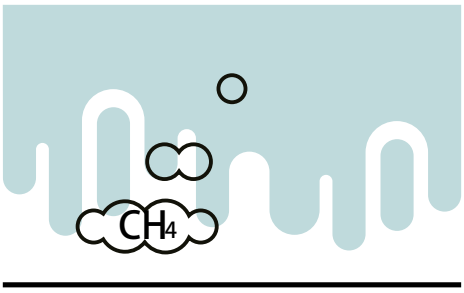
– 7 –

Methane

PROBLEM

Frozen Methane Stores Releasing

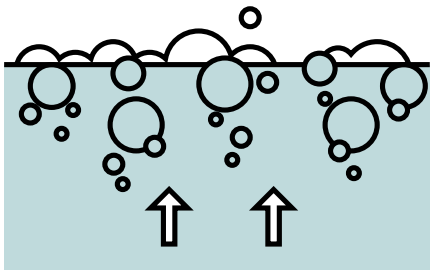




FROZEN METHANE RELEASING

"As the planet warms, vast stores of methane, a potent greenhouse gas, could be released from frozen deposits on land and under the ocean"

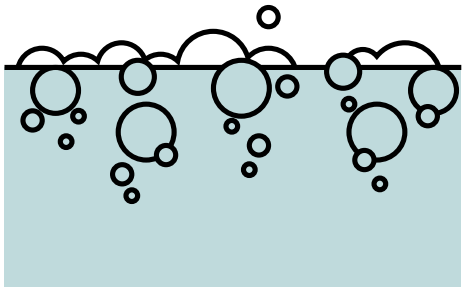
Nature Reports Climate Change, 2009



METHANE EMISSIONS ACCELERATING

"Between 1974 and 2000, methane emissions increased by 58% in northern Siberia"

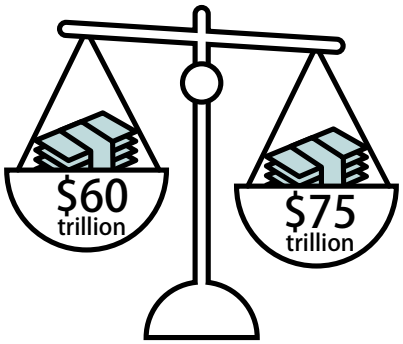
Nature Reports Climate Change, 2009



THE SIBERIAN SHELF CONTAINS MORE CARBON THAN ALL THE EARTH'S VEGETATION

"The Siberian Shelf alone harbours an estimated 1,400 billion tonnes of methane in gas hydrates, about twice as much carbon as is contained in all the trees, grasses and flowers on the planet. If just 1% of this escaped into the atmosphere within a few decades, it would be enough to cause abrupt climate change"

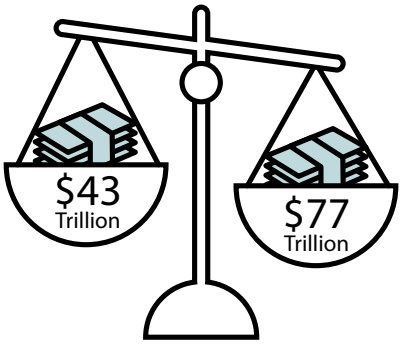
Nature Reports Climate Change, 2009



IF THE SIBERIAN METHANE THAWED IT WOULD COST THE GLOBAL ECONOMY $60 TRILLION

"A major release of methane trapped in the frozen seabed off Russia could accelerate global warming and cause $60 trillion in damage, almost the size of world GDP [$75 Trillion]"

Scientific American, 2014

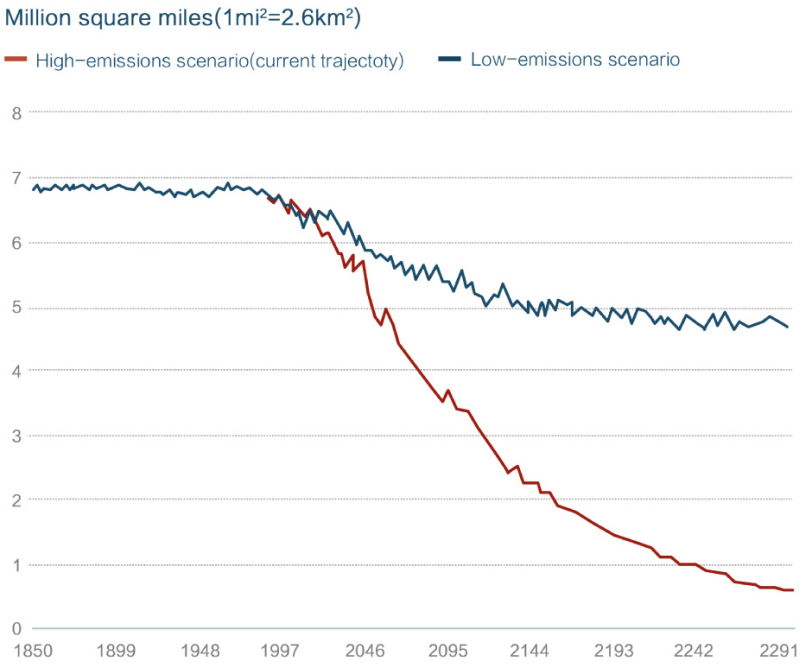


ALASKA'S PERMAFROST THAW OUT WILL COST $43 TRILLION, GLOBAL GDP IS $77 TRILLION

"Last week, scientists revealed that Alaska alone could lose 24% of its permafrost by 2100. In fact scientists suspect that in the worst-case scenario 70% of Arctic permafrost could thaw. That act alone could release 20 to 100 times more CO2 than the United States burns in a year, causing another $43 trillion in damages globally, Global Gross Domestic Profit for 2014 was $77 Trillion"

National Geographic, 2015
Statista, 2015

PERMAFROST EXTENT



NG STAFF
SOURCES: COMMUNITY LAND MODEL;CHARLES KOVEN, LAWRENCE BERKELEY NATIONAL LABORATORY

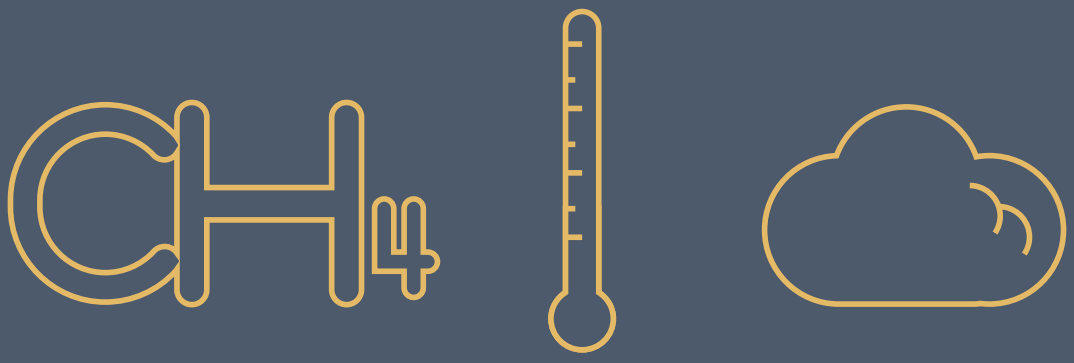
National Geographic, 2015

– 7 –

Methane

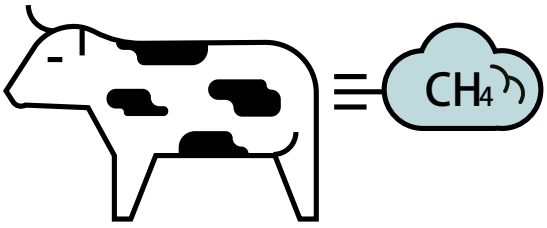
PROBLEM

Livestock Related Methane



66% OF METHANE FROM HUMAN ACTIVITIES

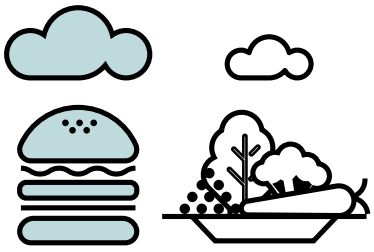
Geophysical Researh Letters, 2006



37% OF METHANE FROM LIVESTOCK

"37% of human induced methane comes from livestock"

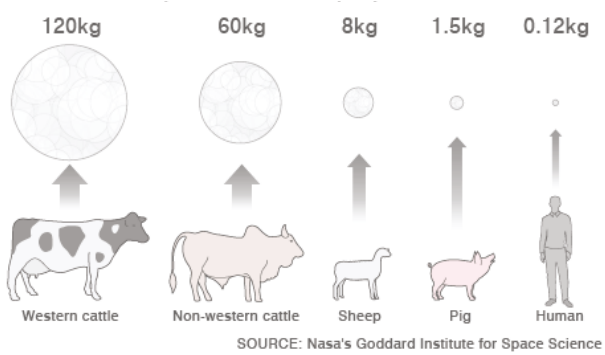
UNFAO, 2006



CATTLE AND SHEEP CREATE 19X TO 48X MORE GHG EMISSIONS THAN PLANT PROTEIN

"The global production of cattle and sheep is responsible for 19 to 48 times more greenhouse-gas emissions, based on pounds of food produced, than the global production of protein-rich plant foods like beans or soy products"

International Business Times, 2014



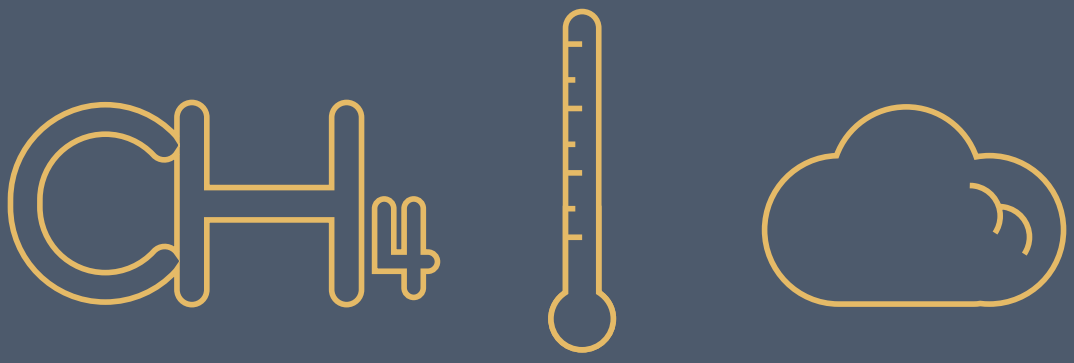
METHANE BY HUMAN/COW /OTHER ANIMAL COMPARISON

BBC, 2009

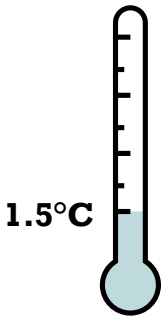
– 7 –

Methane

TIMELINE



1

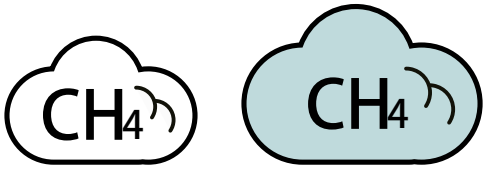


THE EARTH WILL WARM BY 1.5°C BY 2030

"Researchers from Cornell University in the US have predicted that unless emissions of methane (and black carbon) are reduced immediately, the Earth will warm by 1.5°C by 2030 and by 2.0°C by between 2045 and 2050, whether or not carbon dioxide emissions are reduced"

United Nations Framework Convention on Climate Change, 2014

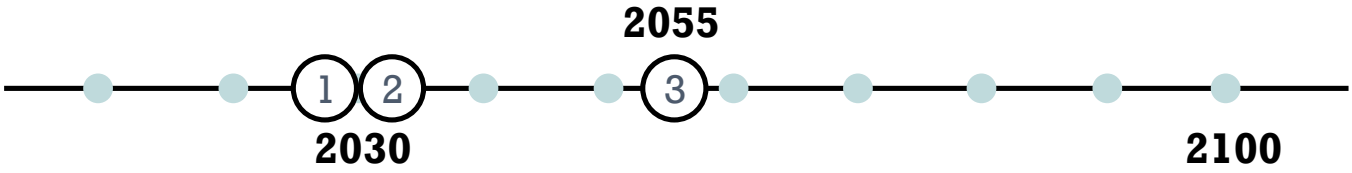
2



BY 2030 METHANE TO INCREASE 20%

"Global anthropogenic methane emissions are projected to increase 20% by 2030"

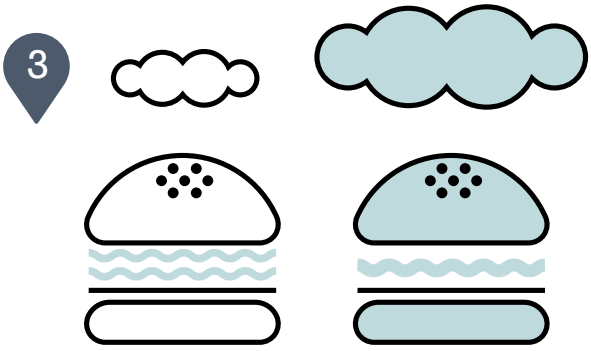
Global Methane Initiative, 2016



IF CURRENT DIETARY TRENDS CONTINUE METHANE AND NITROUS OXIDE EMISSIONS WILL MORE THAN DOUBLE BY 2055

"If current dietary trends (increasing global consumption of animal products) were to continue, emissions of CH4 and N2O would more than double by 2055 from 1995 levels"

3

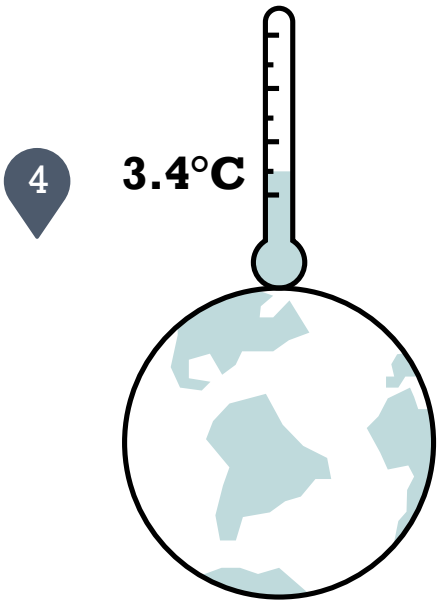


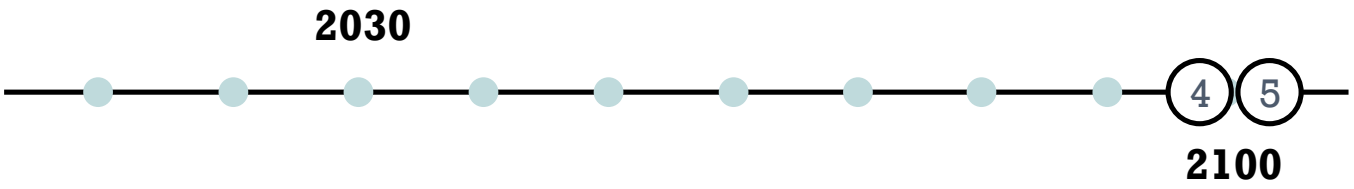
Chatham House, The Royal Institute Of International Affairs, 2014

THE EARTH WILL WARM BY 3.4° BY 2100

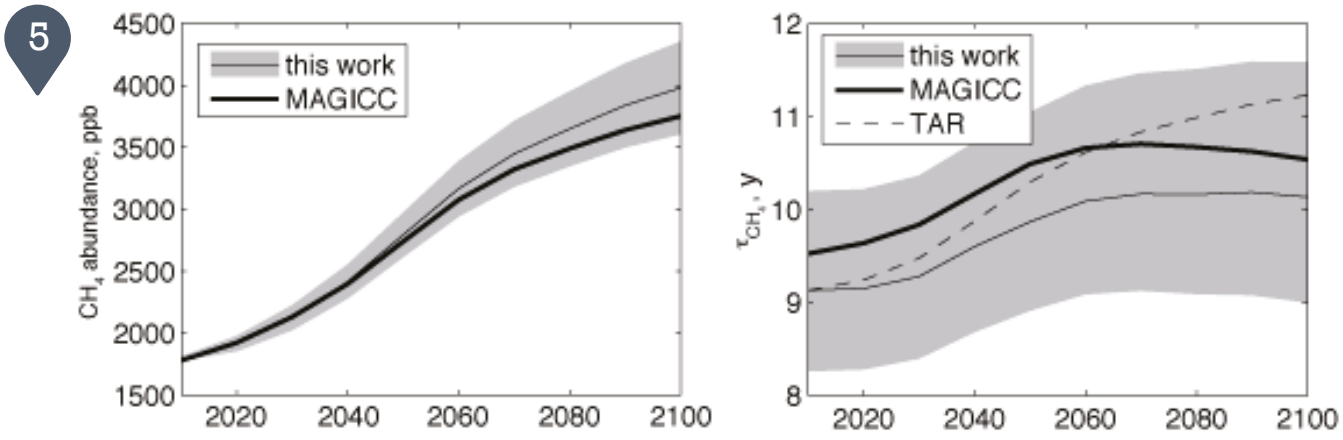
"Our analysis shows that the national contributions to date, with no further progress post-pledge period, result in expected warming in 2100 of 3.4°C"

Climate Interactive, 2017





METHANE PROJECTIONS FOR THE 21ST CENTURY



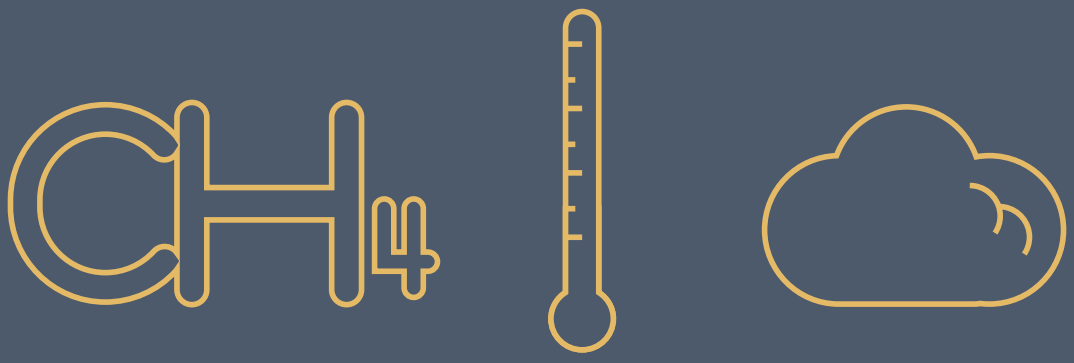
Atmospheric Chemistry and Physics Journal, 2013

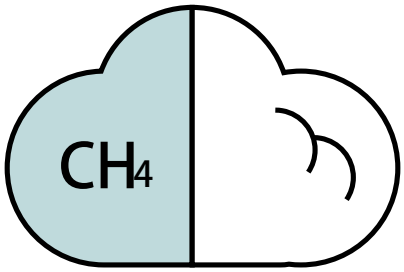
– 7 –

Methane

SOLUTION

Change in Diet

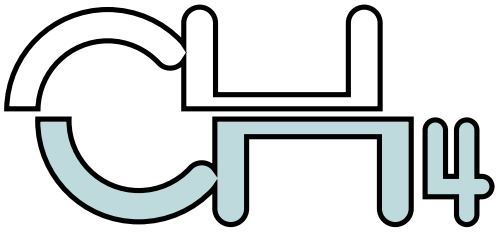




CUT METHANE EMISSIONS IN HALF TO EQUAL THE IMPACT OF STOPPING CO2 ENTIRELY

"Based on 2005 emissions, the same impact [by] 2050... could be achieved by decreasing CH4 emissions by 46% as stopping CO2 emissions entirely"

PNAS journal, 2013



HALVE METHANE TO REDUCE WARMING BY 0.55°C

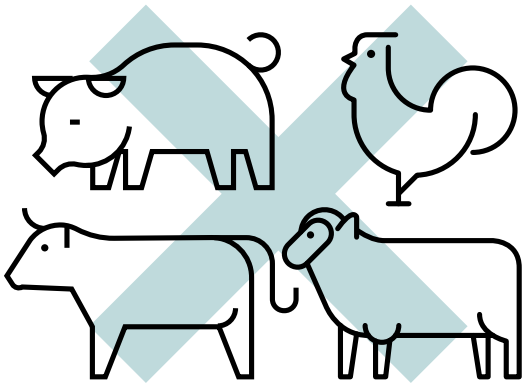
"A 50% reduction in methane emissions by 2050 maintained until 2100 could help reduce global temperature by about 0.55°C or 1°F"

Global Methane Initiative, 2016

ELIMINATE LIVESTOCK TO STOP WARMING

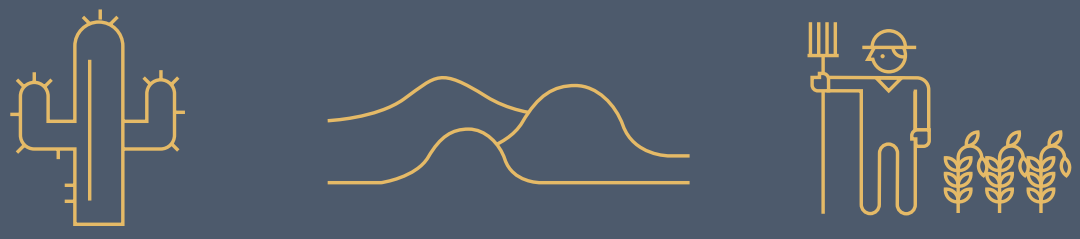
"Reductions in global ruminant numbers could make a substantial contribution to climate change mitigation goals and yield important social and environmental co-benefits"

International Business Times, 2014
Nature Journal, 2014



– 8 –

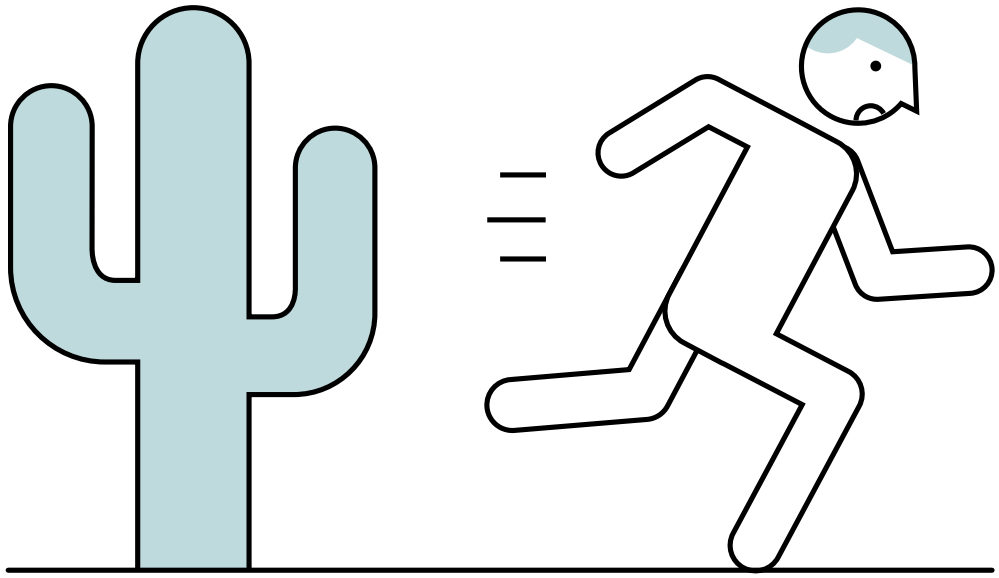
DESERTI-FICATION



INTRODUCTIION

More than a billion acres of farmland on the planet have already been abandoned due to degradation and desertification. It is predicted that if we continue with 'business as usual' we will exhaust our ability to farm altogether within 60 years.

Trees and natural vegetation are the solution to halt and reverse desertification, but these are in direct conflict with grazing livestock. The solution is simple: remove the livestock.



DESERTIFICATION THREATENS 1 BILLION PEOPLE

"The livelihoods of more than one billion people in some 100 countries are threatened by desertification. Nearly one billion of the poorest and most marginalized people, who live in the most vulnerable areas, may be the most severely affected by desertification"

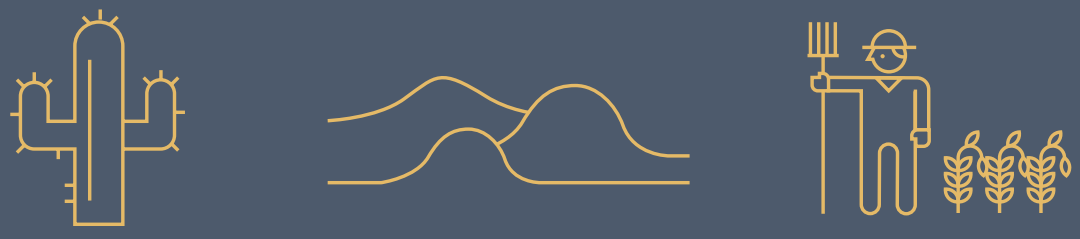
United Nations Environment Program, 2005

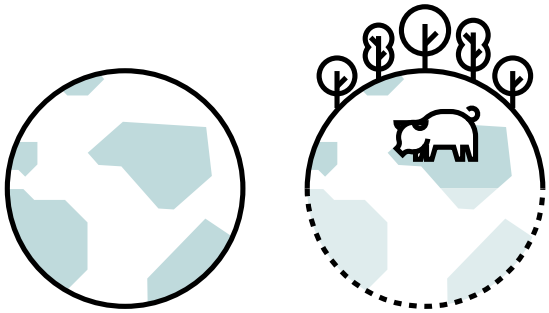
– 8 –

Desertification

PROBLEM

Agricultural Land Turning to Desert

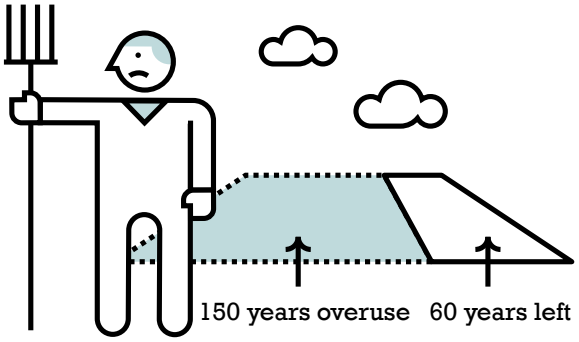




50% OF WORLD SOIL GONE

"Half of the topsoil on the planet has been lost in the last 150 years"

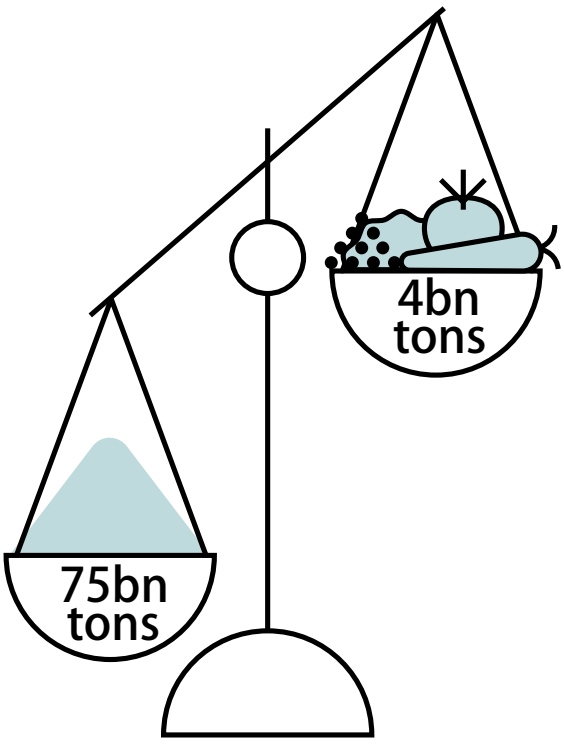
WWF, 2016



60 YEARS OF FARMING LEFT IF SOIL DEGRADATION CONTINUES

"Generating three centimetres of top soil takes 1,000 years, and the world's topsoil could be gone within 60 years"

Scientific American, 2014



75 BILLION TONNES OF SOIL LOST ANNUALLY

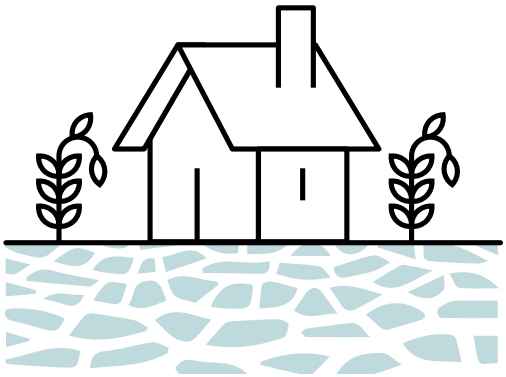
"An estimated 75 billion tonnes of soil is lost annually with more than 80% of the world's farming land moderately or severely eroded"

Agriculture journal, 2013

4 BILLION TONNES OF FOOD PRODUCED ANNUALLY

"Each year, about 4 billion metric tonnes of food are produced"

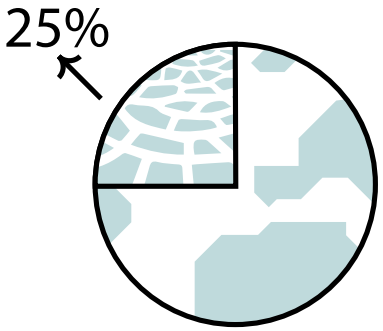
European Parliamentary Research Service, 2014



POOR IN 100 COUNTRIES MOST AFFECTED

"Over 250 million people are directly affected by desertification and one billion people in over 100 countries are at risk"

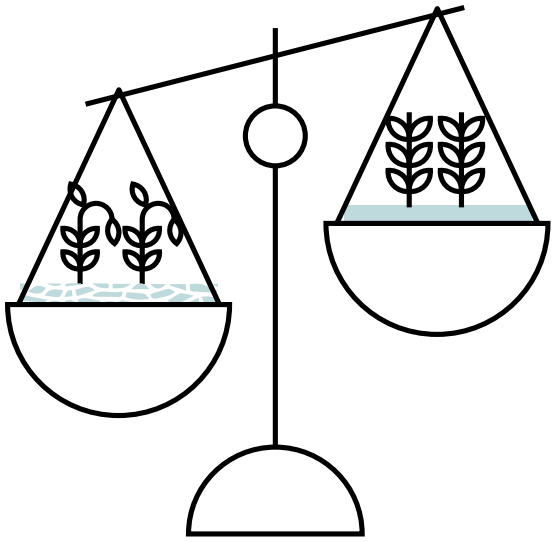
IFAD, International Fund for Agricultural Development, 2001



DESERTIFICATION THREATENS 25% OF EARTH'S SURFACE

"One quarter of the earth's surface is threatened by desertification, an area of over 3.6 billion hectares"

IFAD, International Fund for Agricultural Development, 2001



DESERTIFICATION AFFECTS 168 COUNTRIES

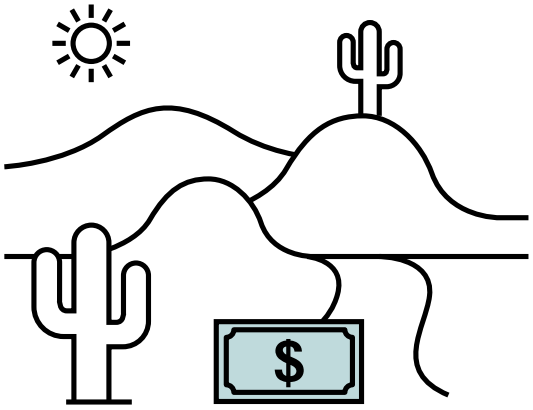
"Desertification, the degradation of the land in the world's dryland areas, now affects 168 countries"

United Nations Convention to Combat Desertification, 2013

195 COUNTRIES IN THE WORLD

"There are 195 independent sovereign states in the world"

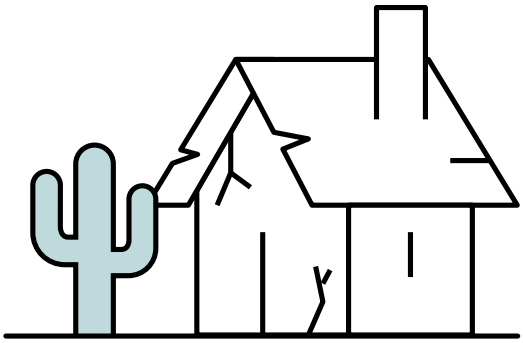
Nations Online



DESERTIFICATION COSTS $40 BILLION US ANNUALLY

"Lost value from land use change and land degradation at 10% to 17% of current global GDP annually."

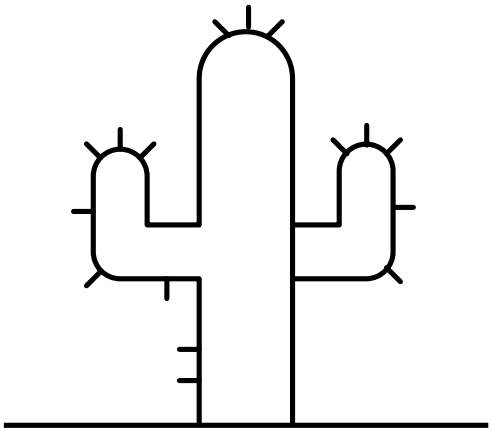
ELD, The Economics of Land Degradation, 2015



135 MILLION MADE HOMELESS BY DESERTIFICATION

"Desertification threatens the livelihoods of one billion people and has already made 135 million people homeless"

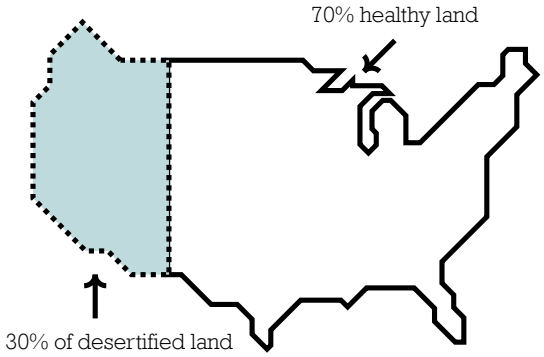
IFAD, International Fund for Agricultural Development, 2001



ONE THIRD OF GLOBAL ARABLE LAND IS DEGRADED OR DESERT

"One third of the world's arable land is thought to have been affected by degradation or desertification"

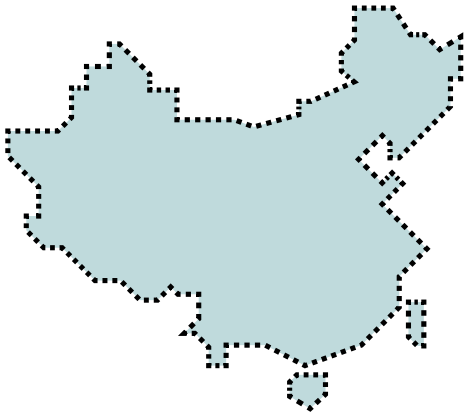
ELD Initiative, 2015



DESERTIFICATION AFFECTS 30% OF US

"Over 30% of the land in the United States is affected by desertification"

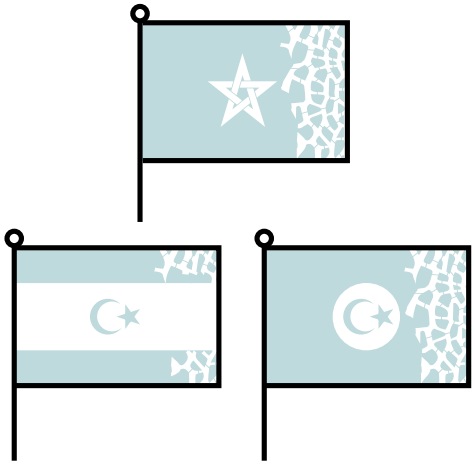
United Nations Convention to Combat Desertification



GOBI DESERT EXPANDS 3,600 KM2 ANNUALLY

"The Gobi Desert in China expands more than 3,600 square kilometres (1,390 square miles) every year"

National Geographic



DESERTIFICATION CLAIMS 1,000 KM2 OF LAND IN MOROCCO, TUNISIA, AND LIBYA ANNUALLY

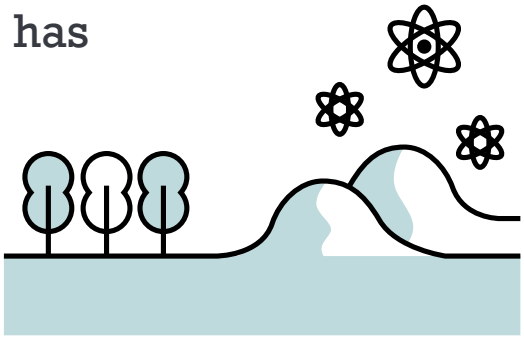
"Morocco, Tunisia, and Libya each lose more than 1,000 square kilometres (386 square miles) of productive land every year to desertification"

National Geographic

SOIL DEGRADATION RELEASES CARBON

"The degradation of soils from unsustainable agriculture and other development has released billions of tons of carbon into the atmosphere"

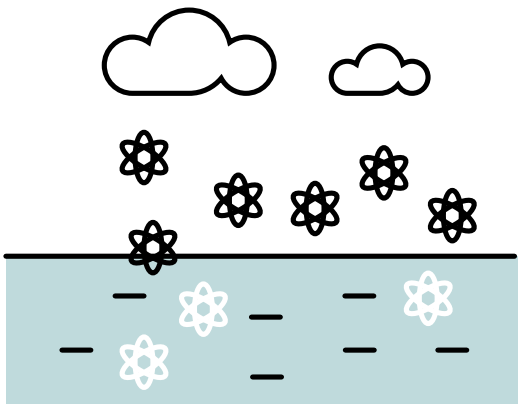
Yale University, 2014



THE SOIL'S ABILITY TO ABSORB CARBON HAS DROPPED 70%

"Scientists say that more carbon resides in soil than in the atmosphere and all plant life combined; there are 2,500 billion tons of carbon in soil, compared with 800 billion tons in the atmosphere and 560 billion tons in plant and animal life… the world's cultivated soils have lost between 50% and 70% of their original carbon stock"

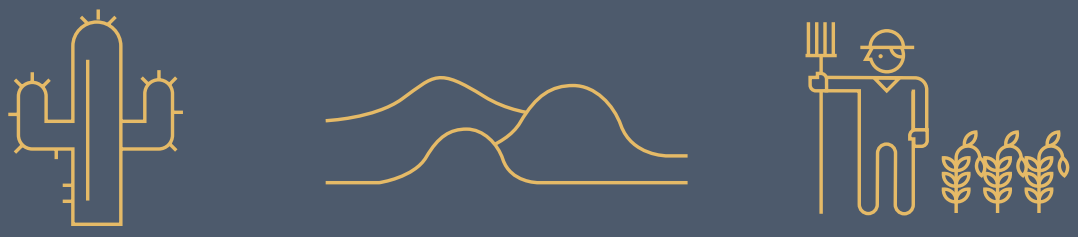
Yale University, 2014



– 8 –

Desertification

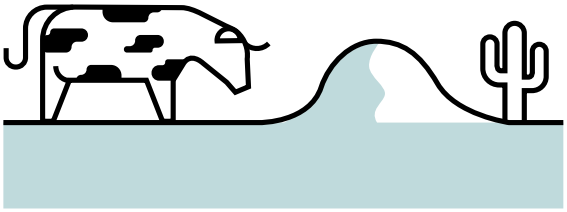
CAUSE



AGRICULTURAL MISMANAGEMENT CAUSES DESERTIFICATION

"Desertification is the accumulated result of ill-adapted land use and the effects of a harsh climate. Four human activities represent the most immediate causes: over-cultivation exhausts the soil, overgrazing removes the vegetation cover that protects it from erosion, deforestation destroys the trees that bind the soil to the land and poorly drained irrigation systems turn croplands salty"

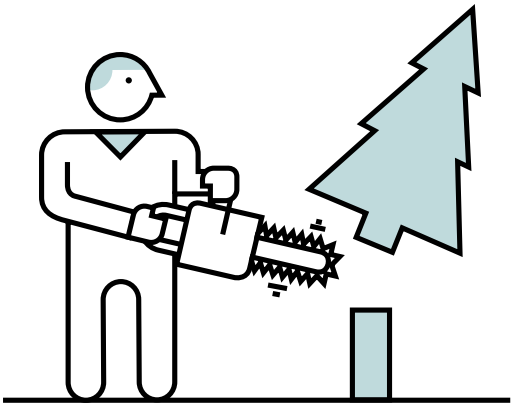
United Nations Educational, Scientific & Cultural Organization (UNESCO)



INAPPROPRIATE AGRICULTURE CAUSES DESERTIFICATION

"The major causes of soil erosion are still inappropriate agricultural practices, deforestation and overgrazing"

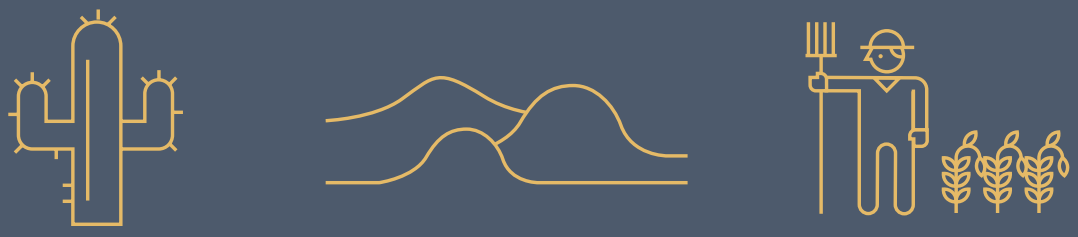
European Commission, 2003



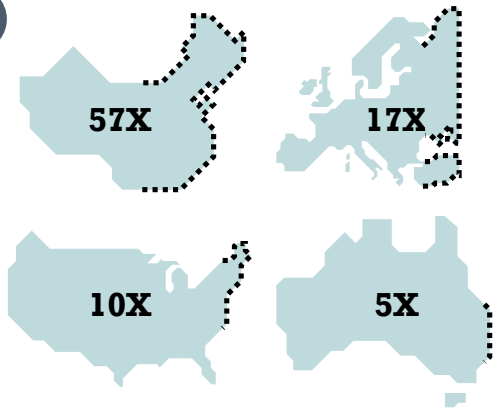
– 8 –

Desertification

TIMELINE



1

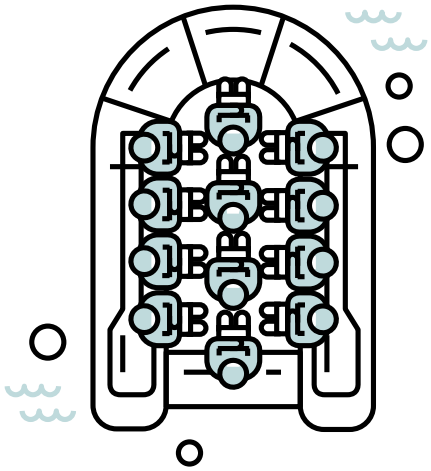


SOIL IS BEING LOST 57X FASTER THAN IT'S CREATED IN CHINA, 17X IN EUROPE, 10X IN THE US, AND 5X IN AUSTRALIA

"Soil is being lost in China 57 times faster than it can be replaced through natural processes. In Europe that figure is 17 times, in America 10 times while 5 times as much soil is being lost in Australia"

Agriculture Journal, 2013

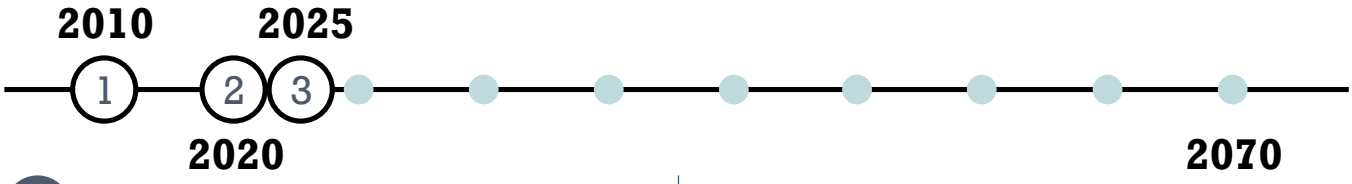
2



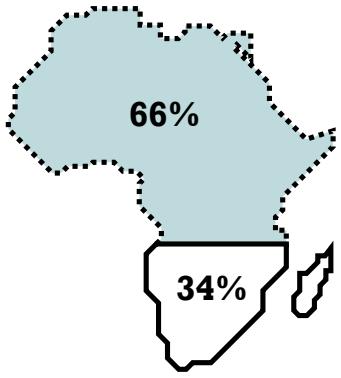
BY 2020 DESERTIFICATION WILL CREATE 135 MILLION REFUGEES

"By 2020 an estimated 60 million people could move from desertified areas of sub-Saharan Africa towards North Africa and Europe, and worldwide, 135 million people could be placed at risk of being uprooted by desertification"

United Nations, 2006



3

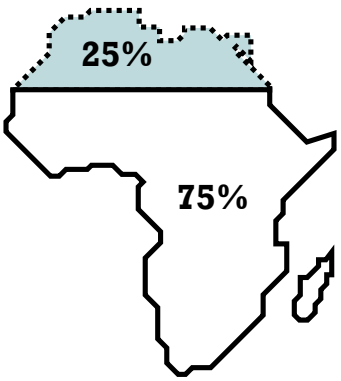


BY 2025 66% OF AFRICAN LAND WILL BE DESERT

"Two-thirds of Africa's farmland may be swallowed by Saharan sands by 2025"

National Geographic, 2010

VS

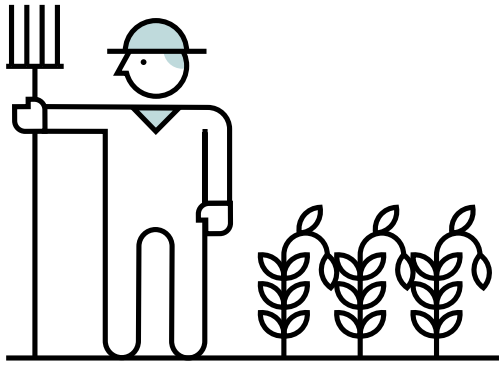


PRESENTLY 25% OF AFRICA IS DESERT

"The continent of Africa is the second largest in the world, and over 25% of its total land area is desert"

National Geographic

4

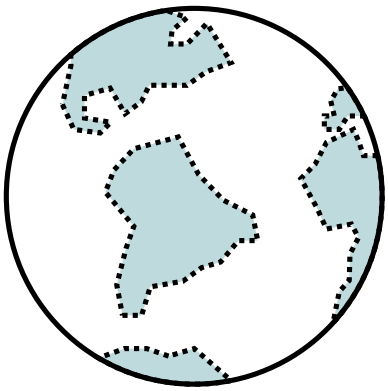


70% OF AFRICA'S POOR DEPEND ON FARMING

"More than 70% of Africa's poor depends on farming, according to the IPCC"

National Geographic, 2010

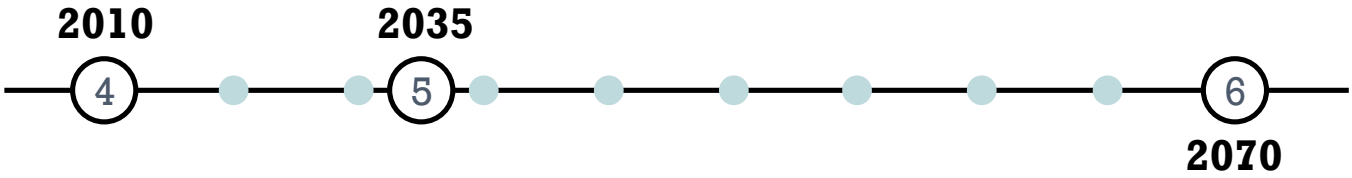
5



BY 2035 SOIL LOSSES WILL REDUCE CROP YIELDS BY 41% IN ASIA

"During the next two decades if soil losses continue unchecked in Africa, the potential rain fed crop production will decline about 15%, in Southeast Asia, production will fall about 19%, and in Southwest Asia, more than 41%"

Published by Schweizerbart'sche, E., 1998

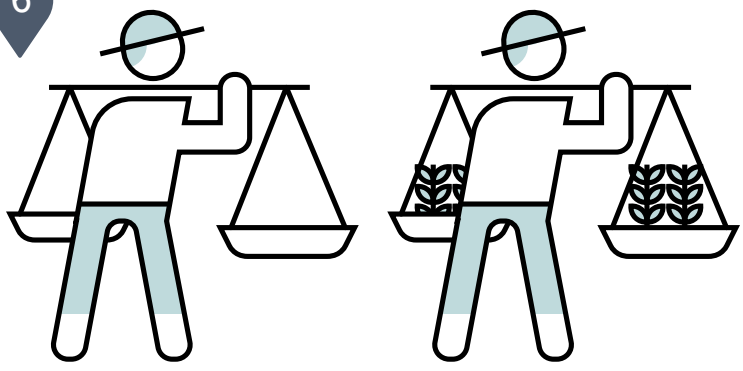


BY 2070 THE WORLD WILL RUN OUT OF SOIL

"World soil, including European and British soils, could vanish within about 60 years if drastic action is not taken"

The Telegraph, 2010

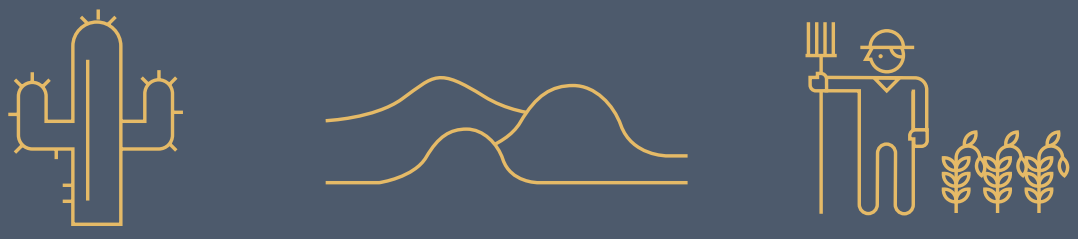
6



– 8 –

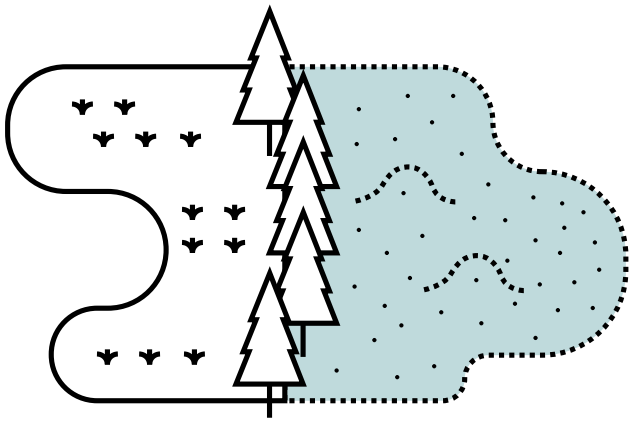
Desertification

SOLUTION



PLANTING TREES PROTECTS AGAINST DESERTIFICATION

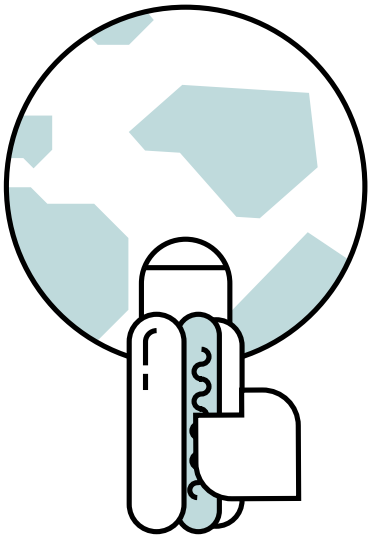
"Almost 270,000 people live in the Aguié Department of Niger. For many years, poor people in the area cut down trees for fuel, building and other uses. With each year's rains, tiny tree shoots would emerge from the soil, a reminder of the thousands of stumps and roots lying just below the surface. Animals grazed on the shoots and farmers cleared them to make way for crops. But without the trees, the land became unproductive and the crops failed.
IFAD recognized that the only way to improve food security and incomes in the region was to come up with a programme that would allow the trees to grow. In 2000, an assisted natural regeneration programme was implemented on more than 100,000 hectares of land. IFAD has been a major contributor to the programme.
The programme has been a resounding success. An evaluation found there were about 50 new trees per hectare in the programme area. Vast zones of the 100,000-hectare area are now protected from sandstorm damage.
Reforestation rates were lower in non-programme areas. Assisted natural regeneration has also contributed to restoring soil fertility. The benefits of tree regeneration have been so dramatic that farmers not directly involved in the programme are also following the practice"



International Fund for Agricultural Development (IFAD)

PLANT BASED DIET CAN SAVE THE WORLD

"A substantial reduction of impacts would only be possible with a substantial worldwide diet change, away from animal products"



United Nations Environment Programme, 2010

– 9 –

DEFORESTATION

INTRODUCTIION

Forests, the lungs of the planet, are under extreme threat. Up to a fifth of global greenhouse gas emissions come from deforestation and forest degradation.

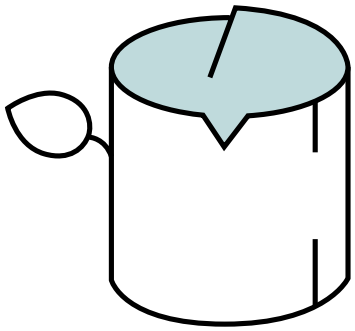
How the land is used following logging is critical to understanding deforestation, because without follow-up fires and cultivation, the land would return to forest.

The dominant land use after logging is food production, particularly grazing land (Amazon), and soybean production (southern Brazil) driven by demand for livestock feed.

Removing the drivers of deforestation by changing diet away from livestock would have a dramatic impact on this destruction.

15 BILLION TREES ARE CUT DOWN ANNUALLY

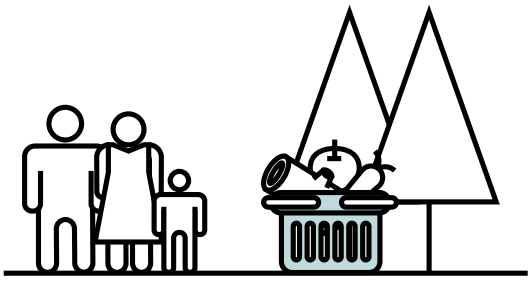
"There are roughly 3 trillion trees on Earth… The study also finds that human activity is detrimental to tree abundance worldwide. Around 15 billion trees are cut down each year, the researchers estimate; since the onset of agriculture about 12,000 years ago, the number of trees worldwide has dropped by 46%"



Nature Journal, 2015

FORESTS CONTRIBUTE TO THE LIVELIHOODS OF 1 BILLION PEOPLE

"Forests are home to 300 million people around the world and they contribute to the livelihoods of many of the 1.2 billion people living in extreme poverty. Forests provide global food security and resources, food, fodder, fuel and medicine"



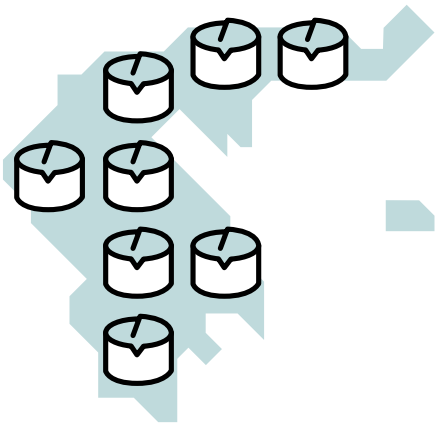
International Union for Conservation of Nature, 2008

– 9 –

Deforestation

PROBLEM

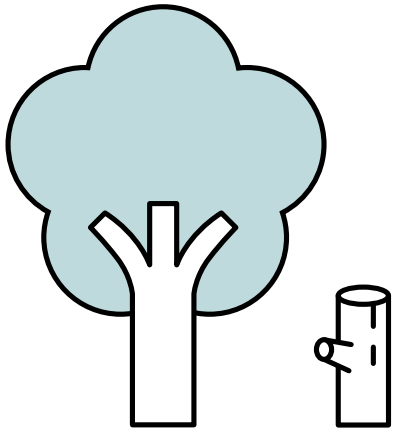
Forests Threatened



AN AREA THE SIZE OF GREECE IS DEFORESTED ANNUALLY

"1,300 km2 of the world's tropical forests are being cut down every year, that's an area the same size as Greece"

United Nations Environment Programme, 2009



50% OF ORIGINAL FOREST GONE IN LAST 50 YEARS

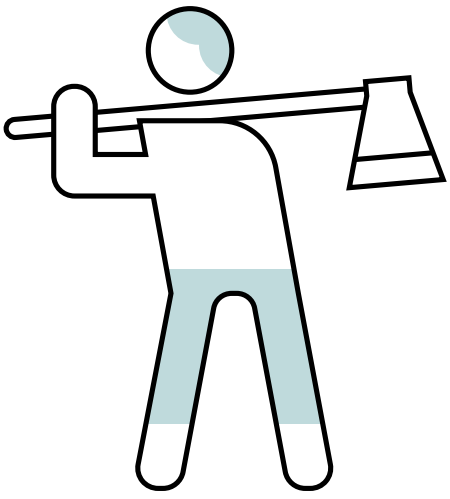
"Over the past 50 years, about half the world's original forest cover has been lost"

WWF, 2014

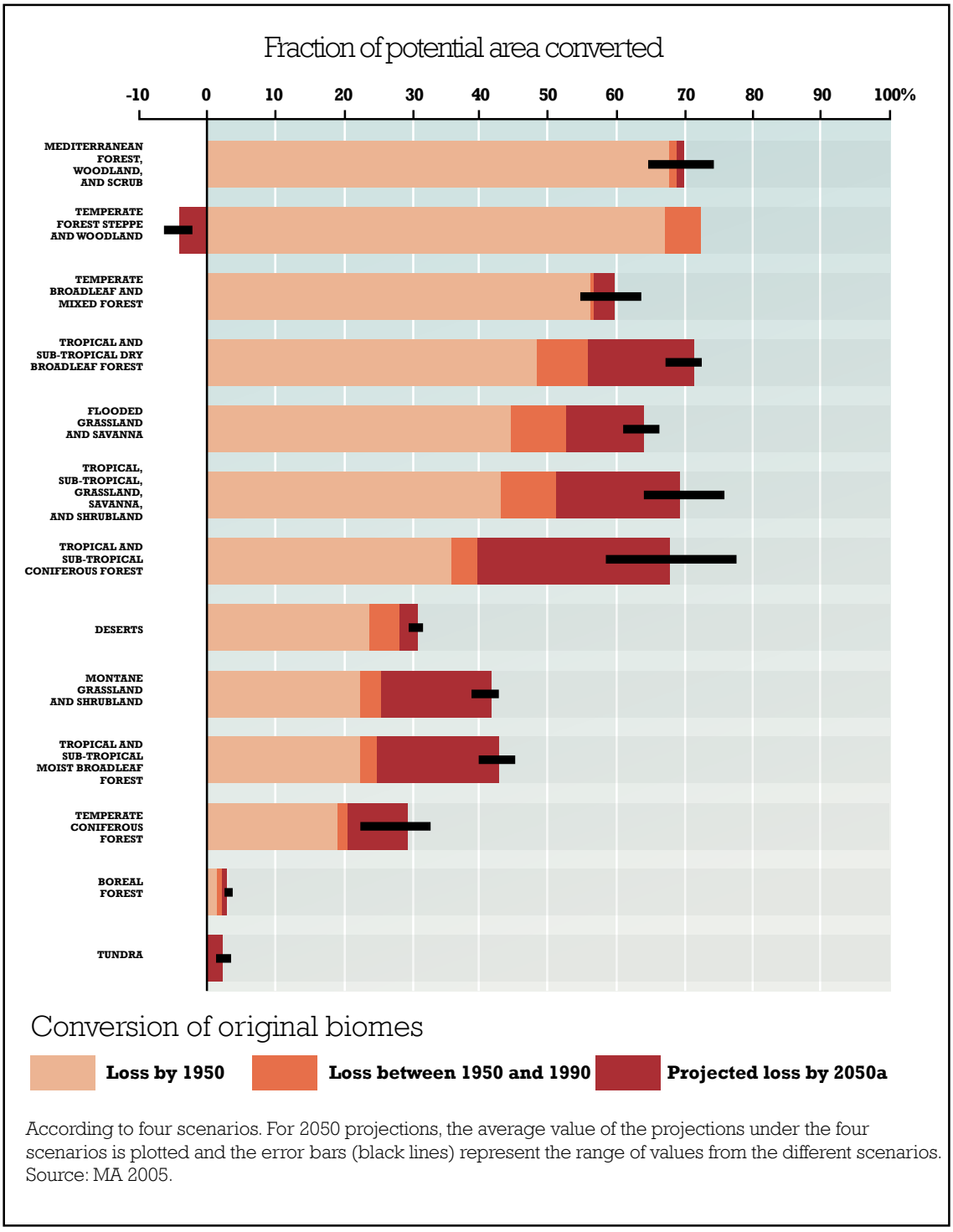
3 TRILLION LESS TREES

"We now have 3 trillion less trees"

The Conversation, 2015

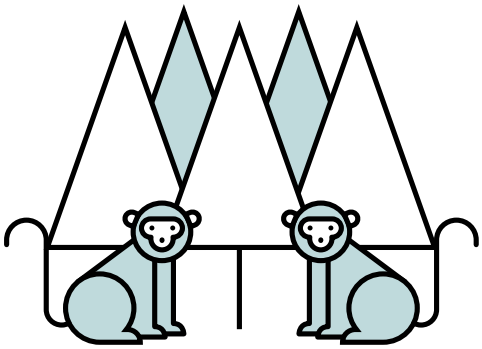


"CONVERSION OF ORIGINAL BIOMES, 1950-2050"



According to four scenarios. For 2050 projections, the average value of the projections under the four scenarios is plotted and the error bars (black lines) represent the range of values from the different scenarios. Source: MA 2005.

United Nations Environment Programme, 2009



70% OF BIODIVERSITY IS IN FORESTS

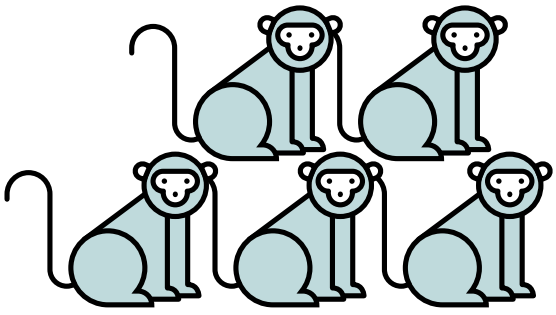
"70% of Earth's land animals and plants live in forests"

National Geographic

ANNUALLY DEFORESTATION COSTS MORE THAN THE RECENT BANK CRISIS

"The global economy is losing more money from the disappearance of forests than through the current banking crisis costing the world between $2 & $5 trillion annually"

BBC, 2008



2012 GLOBAL GDP = $73 TRILLION

"In 2012, global GDP amounted to about US$73.48 trillion"

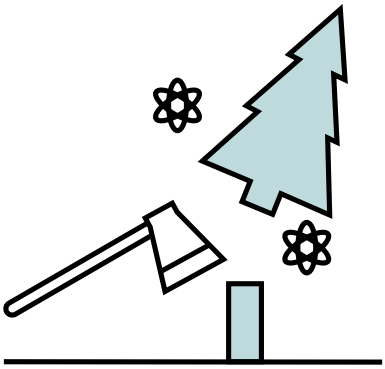
Statista, 2015

– 9 –

Deforestation

PROBLEM

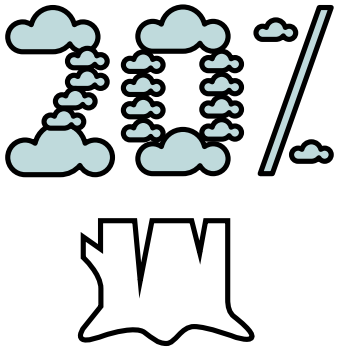
Deforestation Drives Global Warming



DEFORESTATION RELEASES CARBON INTO THE ATMOSPHERE

"Lost forest cover heats the planet, because trees absorb CO2 while they're alive, and when they're burned or cut down, the greenhouse gas is released back into the atmosphere"

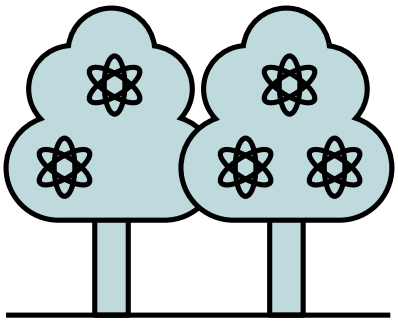
Time Magazine, 2008



20% OF CO2 EMISSIONS FROM DEFORESTATION

"Almost 20% of all global CO2 emissions are caused by deforestation"

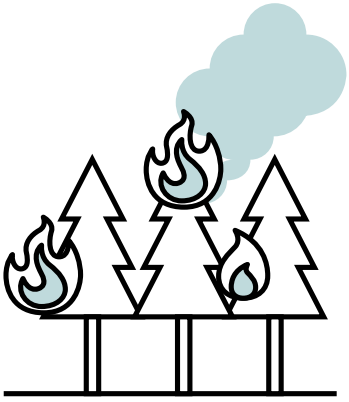
IPCC, 2007



FORESTS ABSORB 40% OF CO2

"World's forests absorb almost 40% of man-made CO2"

The Telegraph, 2011



75% OF BLACK CARBON FROM DEFORESTATION

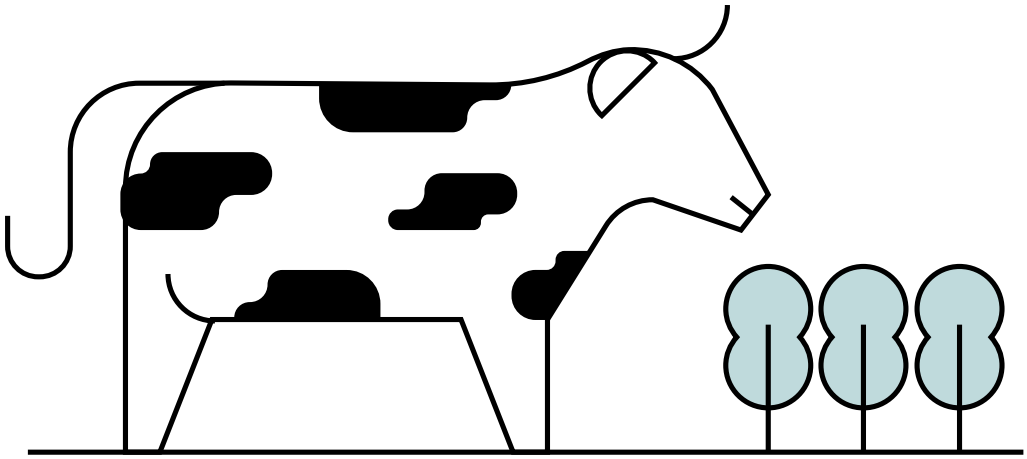
"Three quarters of black carbon (soot) and ozone pollution come from deforestation fires and open fires"

Journal of Geophysical Research, 2013

– 9 –

Deforestation

CAUSE



CATTLE RANCHING RESPONSIBLE FOR 80% OF AMAZON DEFORESTATION

"Cattle ranching is the number one culprit of deforestation in virtually every Amazon country, and it accounts for 80% of current deforestation"

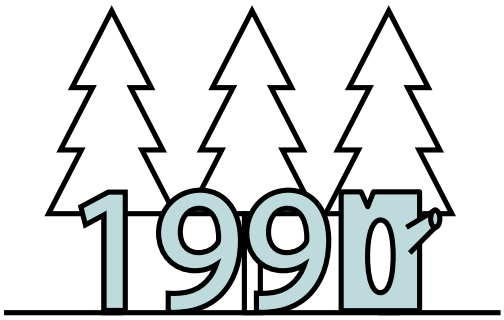
WWF, 2008

– 9 –

Deforestation

TIMELINE

1

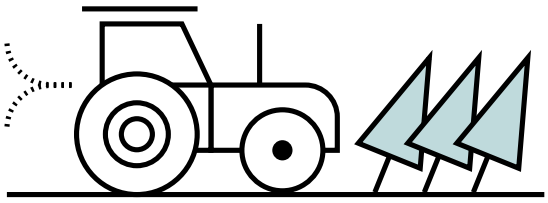


RAINFOREST DEFORESTATION INCREASED BY 25% SINCE THE 90'S

"Tropical deforestation rates this decade are 8.5% higher than during the 1990's. However the loss of primary tropical rainforest, the wildest and most diverse swaths, has increased by as much as 25% since the 1990's"

Scientific American, 2009

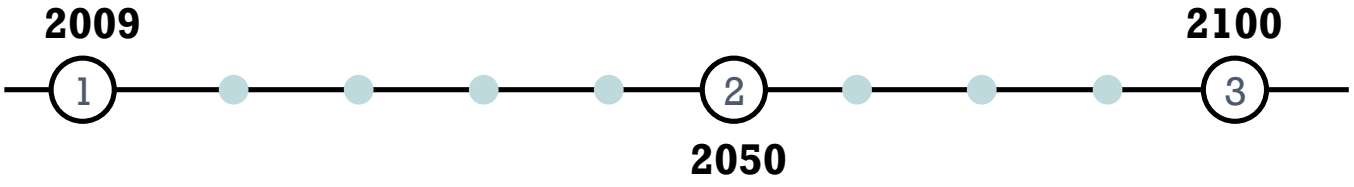
2



10% MORE RAINFOREST WILL BE DESTROYED IN THE NEXT 35 YEARS

"By 2050 cropland will have expanded by 42% and fertilizer use increased sharply by 45% over 2009 levels. A further tenth of the world's pristine tropical forests will disappear over the next 35 years"

Nature Climate Change Journal, 2014

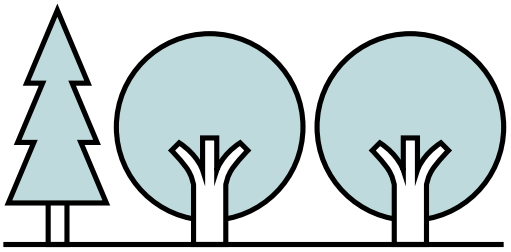


3

RAINFORESTS HAVE 100 YEARS LEFT

"If the current rate of deforestation continues, the world's rainforests will vanish within 100 years"

NASA, 2001



2009

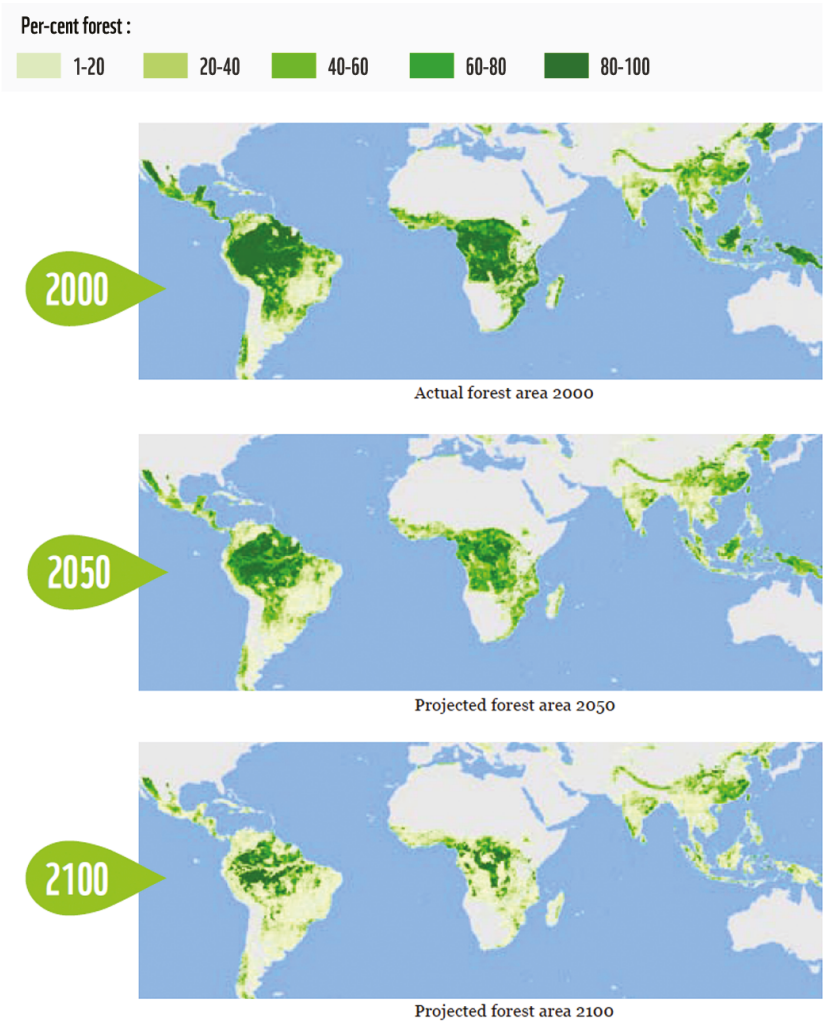
4

2100

4 MAP: FOREST AREA

"Forest area in 2000 and projected forest area in 2050 and 2100, as calculated by the Living Forests Model under a Do Nothing Scenario, in which a demand for land increases to supply a population with food, fibre and fuel, and historical patterns of poorly planned and governed exploitation of forest resources continue"

WWF, 2009

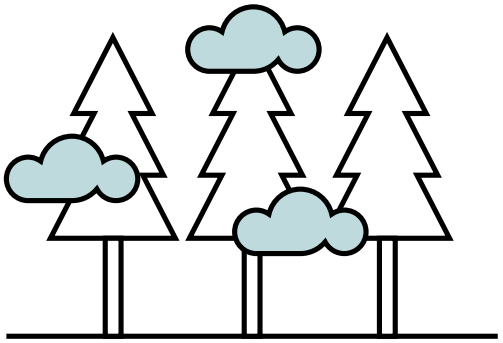


– 9 –

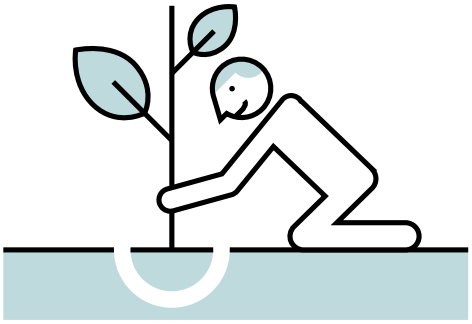
Deforestation

SOLUTION

"KEEPING FORESTS ALIVE IS CRUCIAL TO SOLVING CLIMATE CHANGE"



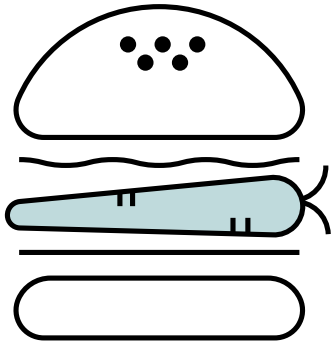
The Nature Conservancy



PLANTING TREES WILL STOP GLOBAL WARMING

"We could make a very significant impact on global warming a few decades from now by planting trees on around 500 million acres. It surely sounds like a lot of land but, by way of comparison, the world has about 10 times that amount in pasture land right now, so it would not be a matter of trying to plant trees in the desert or on lands already used for crop production"

Union of Concerned Scientists, 2012



SWITCHING FROM ANIMAL PROTEIN TO PLANT PROTEIN CAN STOP DEFORESTATION

"From now on, the question of whether we get our protein from animals or plants has direct implications for how much more of the world's remaining forest we have to raze"

Worldwatch Institute, 2004

– 10 –

CLIMATE CHANGE

INTRODUCTIION

Climate chaos is already upon us, with a lot worse to come. Livestock production is a large and growing source of greenhouse gases, and is the greatest source of short-term emissions.

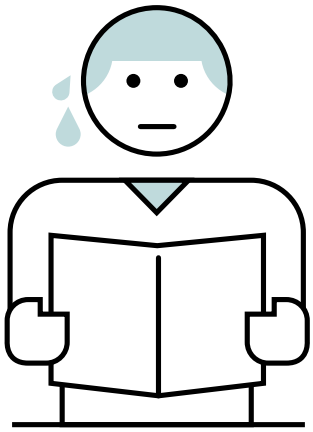
Slashing short-term emissions give us the circuit-breaker desperately needed to stem global warming – this is clearly demonstrated by studies that look at the warming impact of sector emissions over the next two decades, showing livestock to be the source of half of global emissions.

Slashing livestock numbers and returning grazing lands to native vegetation provides a short term fix and importantly, longer term carbon sequestration, the re-absorption of carbon from the atmosphere. This solution is by far the lowest cost option.

PRESIDENT BARACK OBAMA

"No single event makes a trend. But the fact is, the 12 hottest years on record have all come in the last 15. Heat waves, droughts, wildfires and floods, all are now more frequent and more intense"
-- President Barack Obama

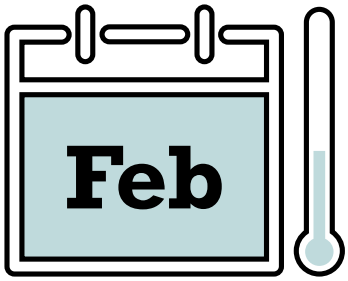
Livescience, 2013



2015 HOTTEST ON RECORD, 1°C OVER PRE-INDUSTRIAL LEVELS

"Global temperatures are set to rise more than one degree above pre-industrial levels according to the UK's Met Office. Figures from January to September this year are already 1.02°C above the average between 1850 and 1900. If temperatures remain as predicted, 2015 will be the first year to breach this key threshold. The world would then be half way towards 2°C, the gateway to dangerous warming"

BBC, 2015

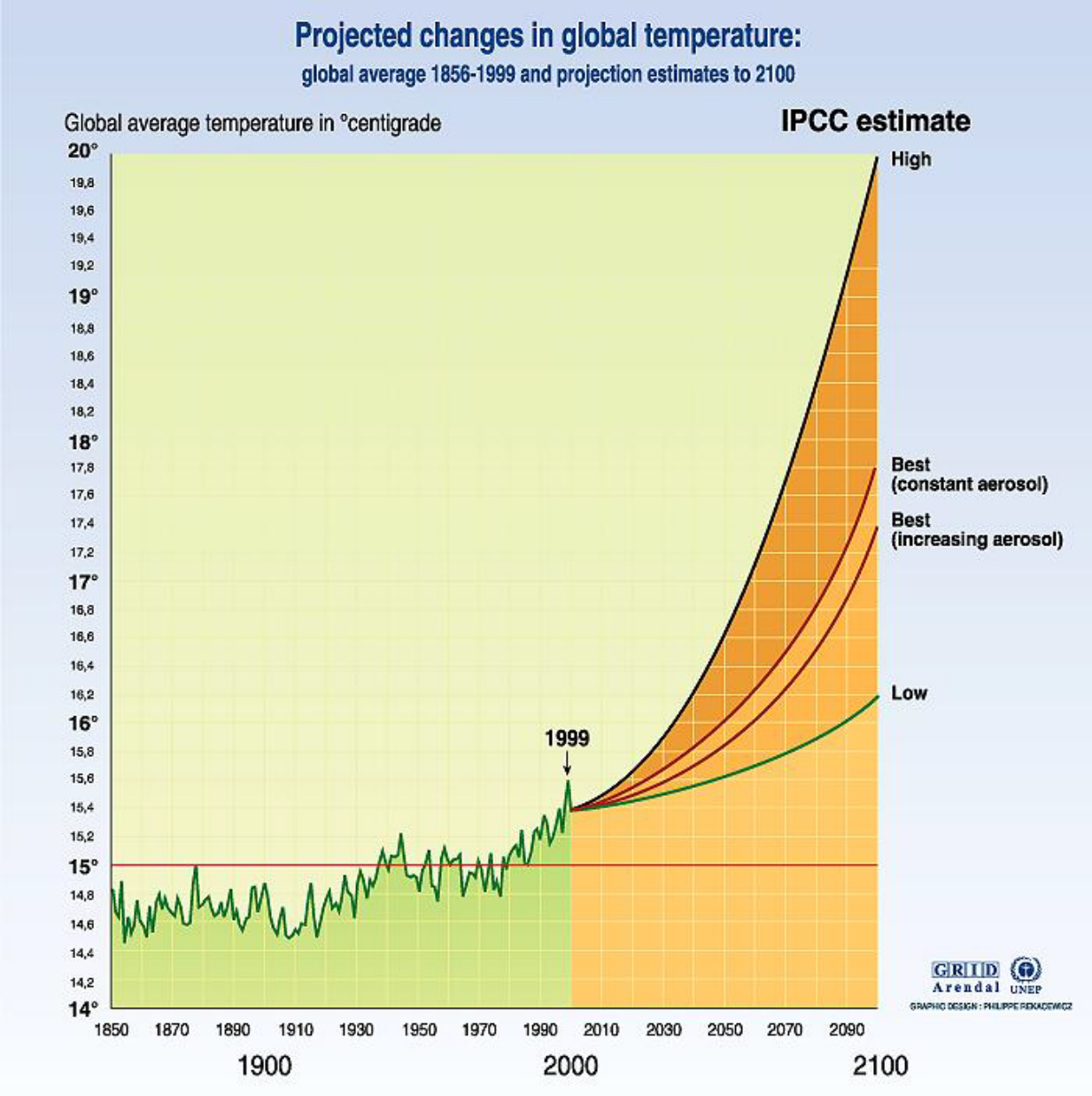


FEBRUARY 2016 SMASHES GLOBAL TEMPERATURE RECORDS

"February smashed a century of global temperature records by a "stunning" margin, according to data released by NASA. The unprecedented leap led scientists, usually wary of highlighting a single month's temperature, to label the new record a "shocker" and warn of a "climate emergency". The NASA data shows the average global surface temperature in February was 1.35°C warmer than the average temperature for the month between 1951-1980, a far bigger margin than ever seen before. The previous record, set just one month earlier in January, was 1.15°C above the long-term average for that month"

The Guardian, 2016

PROJECTED CHANGES IN GLOBAL TEMPERATURE



Source : Temperatures 1856 - 1999: Climatic Research Unit, University at East Anglia, Norwich UK. Projections: IPCC report 95.

GRID Arendal / United Nations Environment Programme

– 10 –

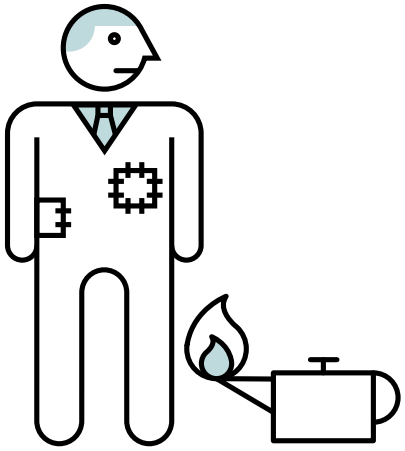
Climate Change

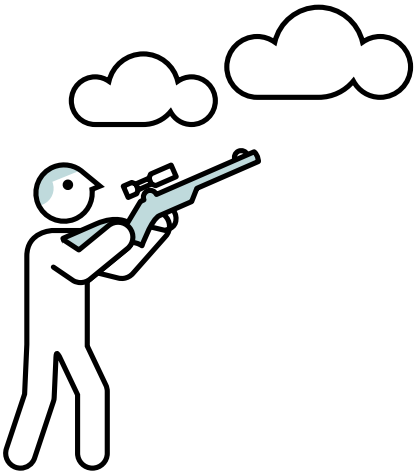
PROBLEM

Climate Change is Threatening Society

"UNLESS THE WORLD TAKES BOLD ACTION NOW, A DISASTROUSLY WARMING PLANET THREATENS TO PUT PROSPERITY OUT OF REACH OF MILLIONS AND ROLL BACK DECADES OF DEVELOPMENT"

World Bank, 2013

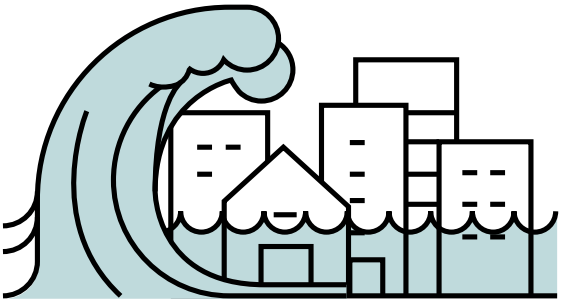




CLIMATE CHANGE IS A THREAT TO NATIONAL SECURITY – THE PENTAGON

"The Pentagon declared climate change an immediate risk to national security and outlining how it intends to protect bases, prepare for humanitarian disasters and plan for global conflicts. Defence Secretary Chuck Hagel unveiled the plan at the Conference of Defence Ministers of the Americas in Peru, where he said defence leaders "must be part of this global discussion" on climate change. Militaries, he added, "must be clear-eyed about the security threats presented by climate change, and we must be pro-active in addressing them"

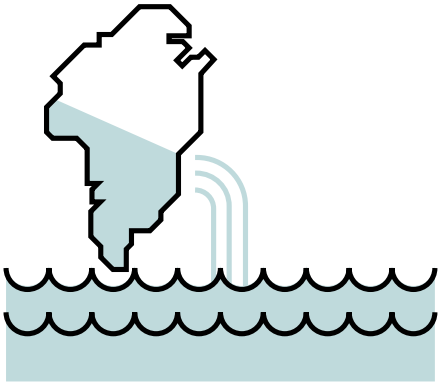
Scientific American, 2014



CLIMATE CHANGE IS CHANGING THE WORLD

"Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global average sea level"

Intergovernmental Panel on Climate Change, 2007



GREENLAND HAS LOST 9 TRILLION TONS OF ICE SINCE 1900, AND THE RATE OF LOSS HAS DOUBLED BETWEEN 2003 AND 2010

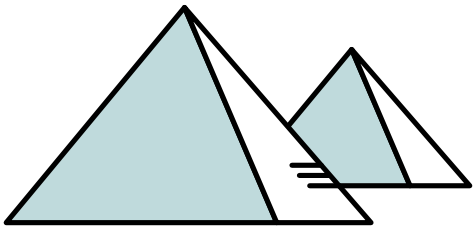
"A massive new study has calculated just how much ice the Greenland ice sheet has lost since the year 1900. The number is [an] astounding: 9,103 gigatons (a gigaton is a billion metric tons).
That's over 9 trillion tons in total. And moreover, the rate of loss has been increasing, with a doubling of annual loss in the period 2003 to 2010 compared with what it was throughout the 20th century"

Washington Post, 2015

ALASKA LOSES 75 BILLION TONS OF ICE A YEAR

"Scientists with the University of Alaska at Fairbanks and several other institutions report a staggering finding: Glaciers of the United States' largest, and only Arctic, state, Alaska, have lost 75 gigatons (a gigaton is a billion metric tons) of ice per year from 1994 through 2013"

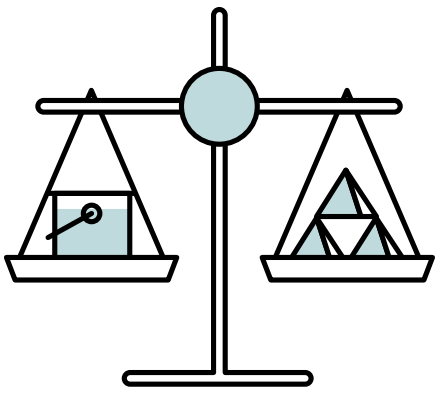
Washington Post, 2015



THE GREAT PYRAMID IN GIZA WEIGHS 5.9 MILLION TONNES

"The mass of the [great Egyptian] pyramid is estimated at 5.9 million tonnes"

Wikipedia



Therefore the scale of Greenland's ice loss is equal in weight to 1,525,423 great pyramids of Giza

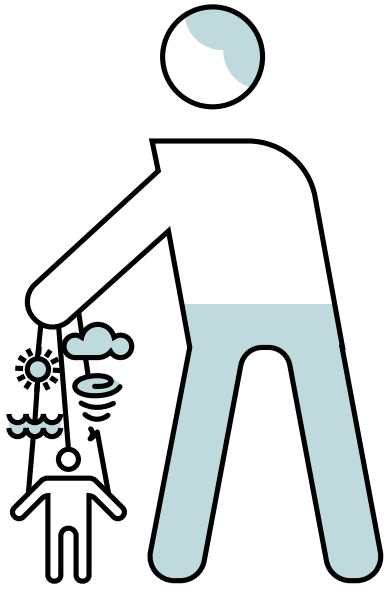
– 10 –

Climate Change

CAUSE

HUMANS CAUSING EXTREME CLIMATE CHANGE

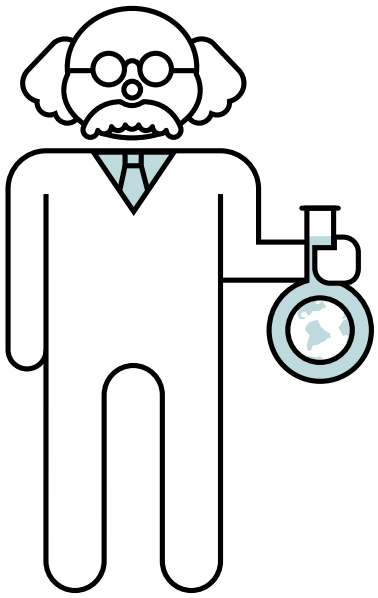
"We know without any doubt that our climate is changing and our weather is becoming more extreme due to human activities"
--Secretary-General Michel Jarraud



United Nations
World Meteorological Organization, 2014

97% OF SCIENTISTS SAY HUMANS CAUSE CLIMATE CHANGE

"97% of climate scientists agree that climate-warming trends over the past century are very likely due to human activities, and most of the leading scientific organizations worldwide have issued public statements endorsing this position"



NASA, 2013

– 10 –

Climate Change

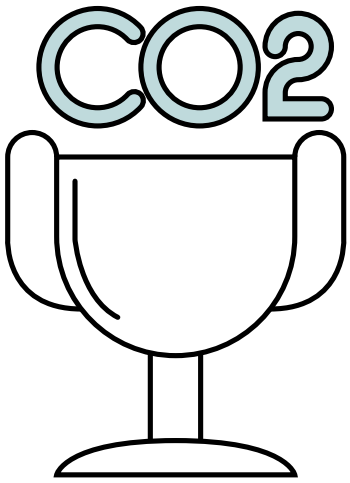
PROBLEM

Atmospheric Greenhouse Gases

ATMOSPHERIC GHG CONCENTRATIONS BREAKING RECORDS

"High greenhouse gas levels mark start of new era of climate reality"

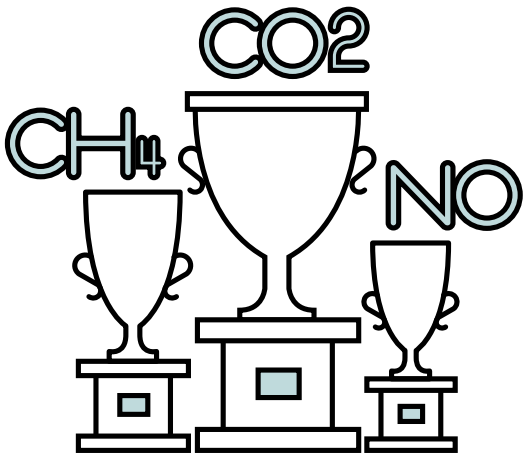
United Nations World Meteorological Organization



CO2 NOW 142%, METHANE 253%, AND NITROUS OXIDE 121% OF PRE INDUSTRIAL LEVELS

“In 2013, concentration of CO2 in the atmosphere was 142% of the pre-industrial era (1750), and of methane and nitrous oxide 253% and 121% respectively”

United Nations World Meteorological Organization, 2014

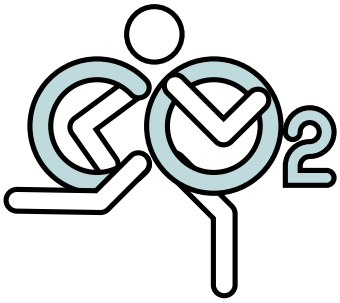


METHAN SURGE, AGRICULTURE TO BLAME

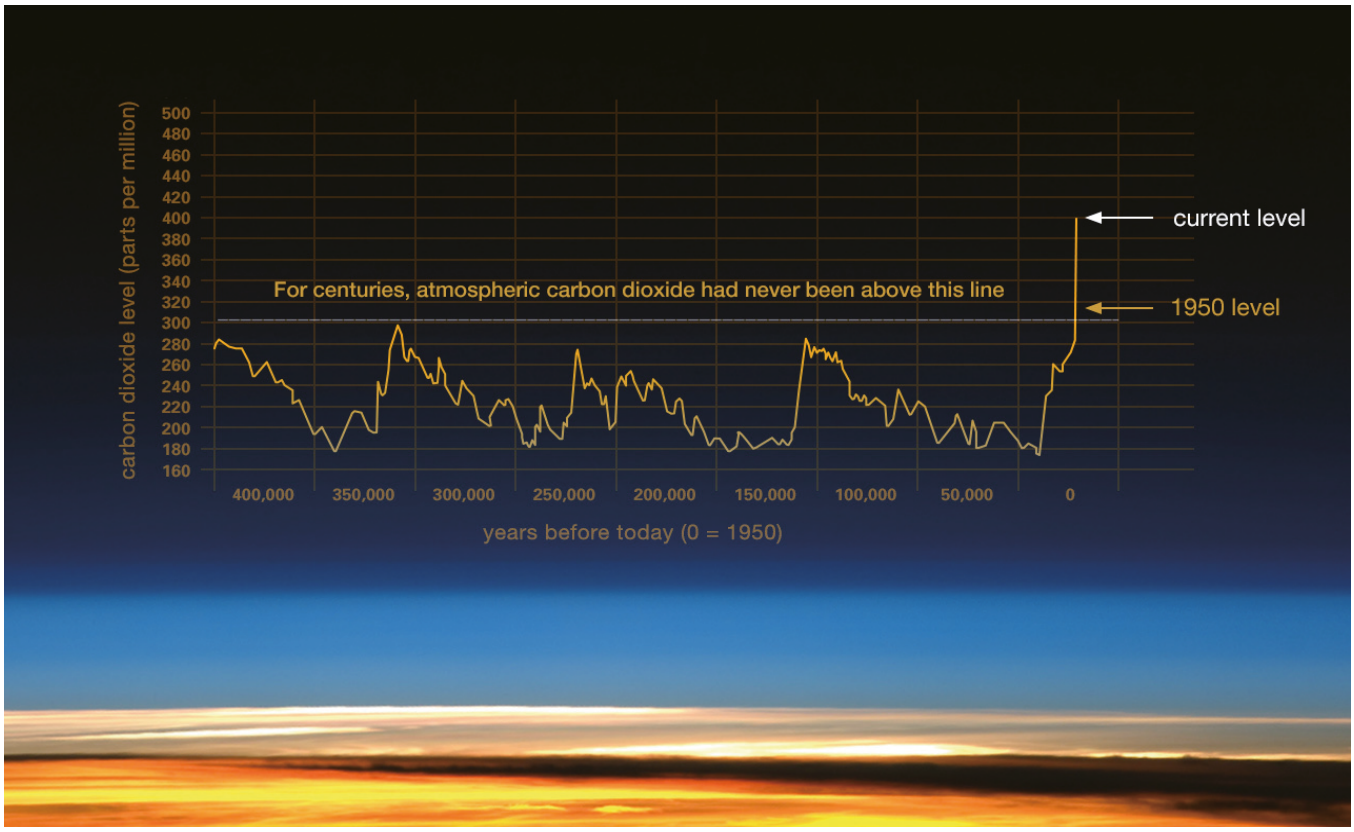
"Methane surge needs 'urgent attention'"

BBC news, 12 Dec 2016

CO2 LEVELS HAVE LEVELLED OFF FOR LAST FEW YEARS



"Climate Change: How Do We Know? For 650,000 years atmospheric carbon dioxide has never been above this line, this graph, based on the comparison of atmospheric samples contained in ice cores and more recent direct measurements, provides evidence that atmospheric CO2 has increased since the Industrial Revolution"

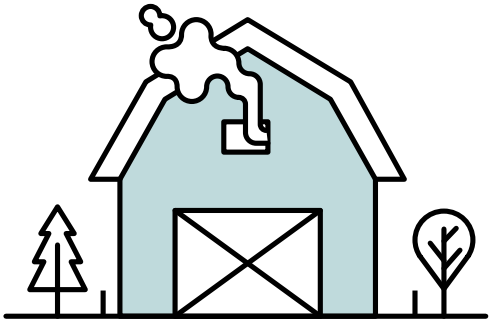


NASA, 2001

– 10 –

Climate Change

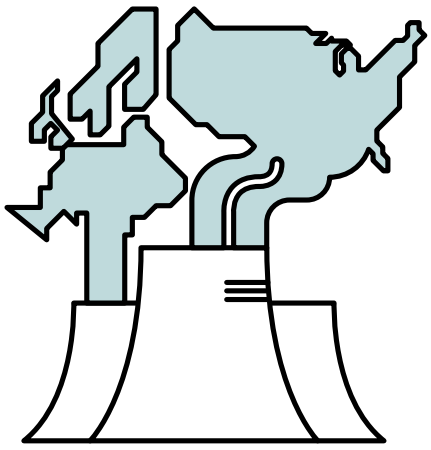
CAUSE



LIVESTOCK GHG: 5% OF GLOBAL CO2, 44% OF GLOBAL METHANE AND 53% OF GLOBAL NITROUS OXIDE EMISSIONS

"GHG emissions from livestock are 14.5% of global emissions"

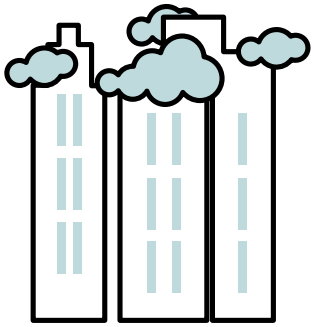
FAO, 2013



SINCE 1950 DEVELOPED NATIONS HAVE CREATED 72% OF CO2 EMISSIONS

"Environmentally, developed nations account for about 72% of total carbon dioxide emissions that accumulated in the atmosphere between 1950 and 2000. Thus, to the extent cumulative CO2 may be contributing to global warming, developed nations bear the preponderant responsibility"

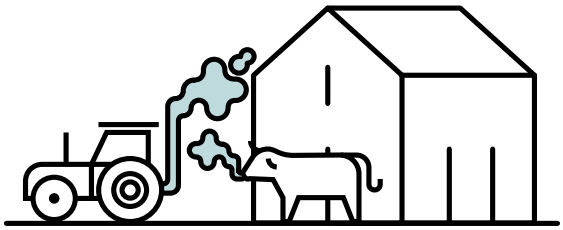
Federation of American Scientists, 2008



DEVELOPED NATIONS CREATE THE MOST GREENHOUSE GAS EMISSIONS

"A few countries account for most greenhouse gas emissions: in 2000, the United States led by emitting 19% of the world total, followed by China with 14%; no other country reached 6%; the top seven emitters accounted for 52% of the 185 nations' emissions"

Federation of American Scientists, 2008



AGRICULTURAL CO_2 DERIVES FROM ENERGY USAGE, ANIMAL RESPIRATION, DEFORESTATION, AND GRASSLAND CONVERSION

"CO2 is also produced on farms from fossil fuels and energy usage and, as some authors highlight, by the exhalation of animals, which is generally not taken into account. Additionally, deforestation and conversion of grassland into agricultural land releases considerable quantities of CO2 and N2O [nitrogen oxide] into the atmosphere, as the soil decomposes carbon rich humus. In Europe (the EU-27), for example, enteric fermentation was the main source (36%) of GHG emissions in the livestock sector, followed by N2O soil emissions (28%)"

UN Environment Programme, 2012

– 10 –

Climate Change

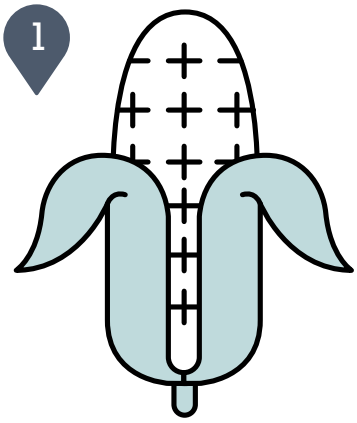
TIMELINE

Agricultural Productivity Threatened

CEREAL CROP YIELDS TO DECREASE 10% TO 15% WITH 1°C TO 2°C WARMING

"On average, in cereal-cropping systems, adaptations such as changing varieties and planting times enable avoidance of a 10% to 15% reduction in yield, corresponding to 1°C to 2°C local temperature increases."

IPCC, 2007



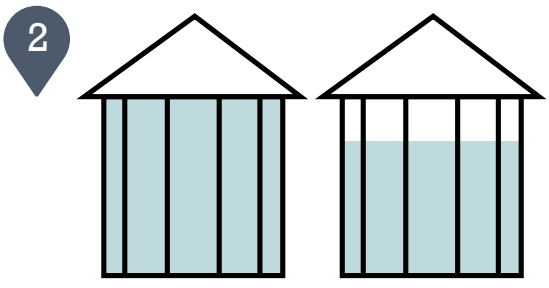
1 — **2007**

2 — **2050**

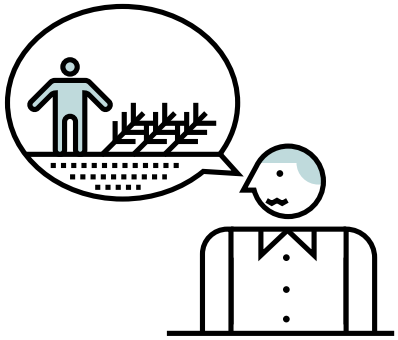
GLOBAL CROP YIELDS TO FALL 25% FROM 2050

"[Increasing global temperatures will be an increasingly negative impact of climate change on crop yields from the 2030s onwards. The impact will be greatest in the second half of the century, when decreases of over 25% will become increasingly common"

Leeds University, 2014



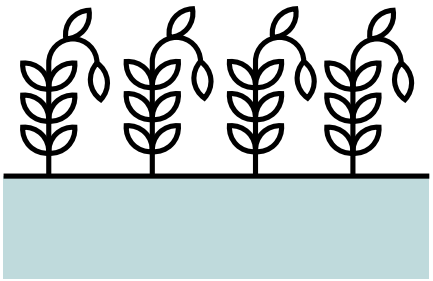
3



"WE MUST AVOID A 4°C WARMER WORLD. THE FUTURE OF OUR CHILDREN DEPENDS ON US TAKING ACTION"

World Bank, 2013

4



WARMING OVER 4°C WOULD DECIMATE AGRICULTURE

"If the warming were to go beyond 6°F to 7°F (4°C) we would see extensive changes in agriculture"

National Geographic, 2014

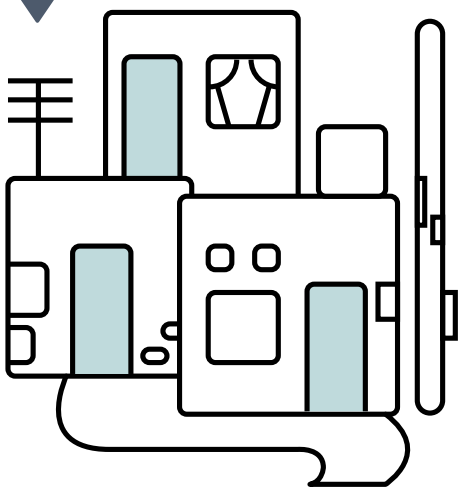
2012 — 2014 — 2030

100 MILLION FACE EXTREME POVERTY BY 2030

"Climate change could force more than 100 million people into extreme poverty by 2030"

Worldbank, 2015

5

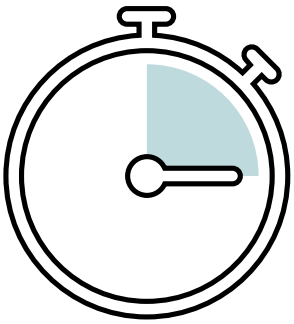


– 10 –

Climate Change

PROBLEM

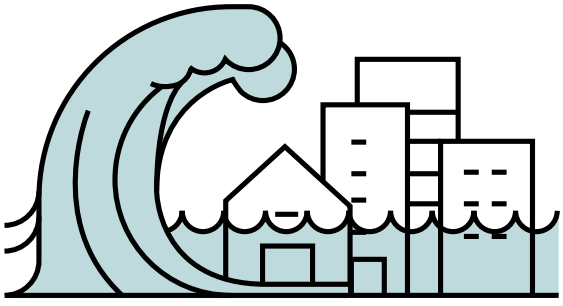
Extreme Weather Caused by Climate Change



THE WORLD HAS ONLY A FEW YEARS TO STOP CATASTROPHIC WARMING

"The world is not ready for the impacts of climate change, including more extreme weather and the likelihood that populated parts of the planet could be rendered uninhabitable, says the planet's leading body of climate scientists in a major new UN report. The 772 scientists who wrote and edited the report argue that world leaders have only a few years left to reduce carbon emissions enough to avoid catastrophic warming, which would produce significant sea level rise and large-scale shifts in temperatures that would dramatically disrupt human life and natural ecosystems"

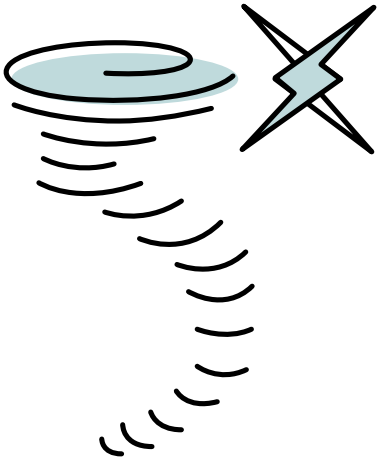
National Geographic, 2014



DISASTERS INCREASE FIVE FOLD SINCE 1970'S

"Disasters including storms, floods and heat-waves have increased fivefold since the 1970's, United Nations finds"

The Guardian, 2014



GLOBAL WARMING HAS DISPLACED 26 MILLION & COSTS $125 BILLION ANNUALLY

"Earth's gradual rise in temperature has resulted in 26 million people displaced, $125 billion in annual economic losses and more than 300,000 yearly deaths, as climate change speeds desertification and magnifies scourges from malnutrition to flooding"

Time Magazine, 2009

EVERY 1°C RISE = 20X MORE GLOBAL CONFLICTS

"Every one-degree rise in temperature means a 20-fold increase in global conflicts"

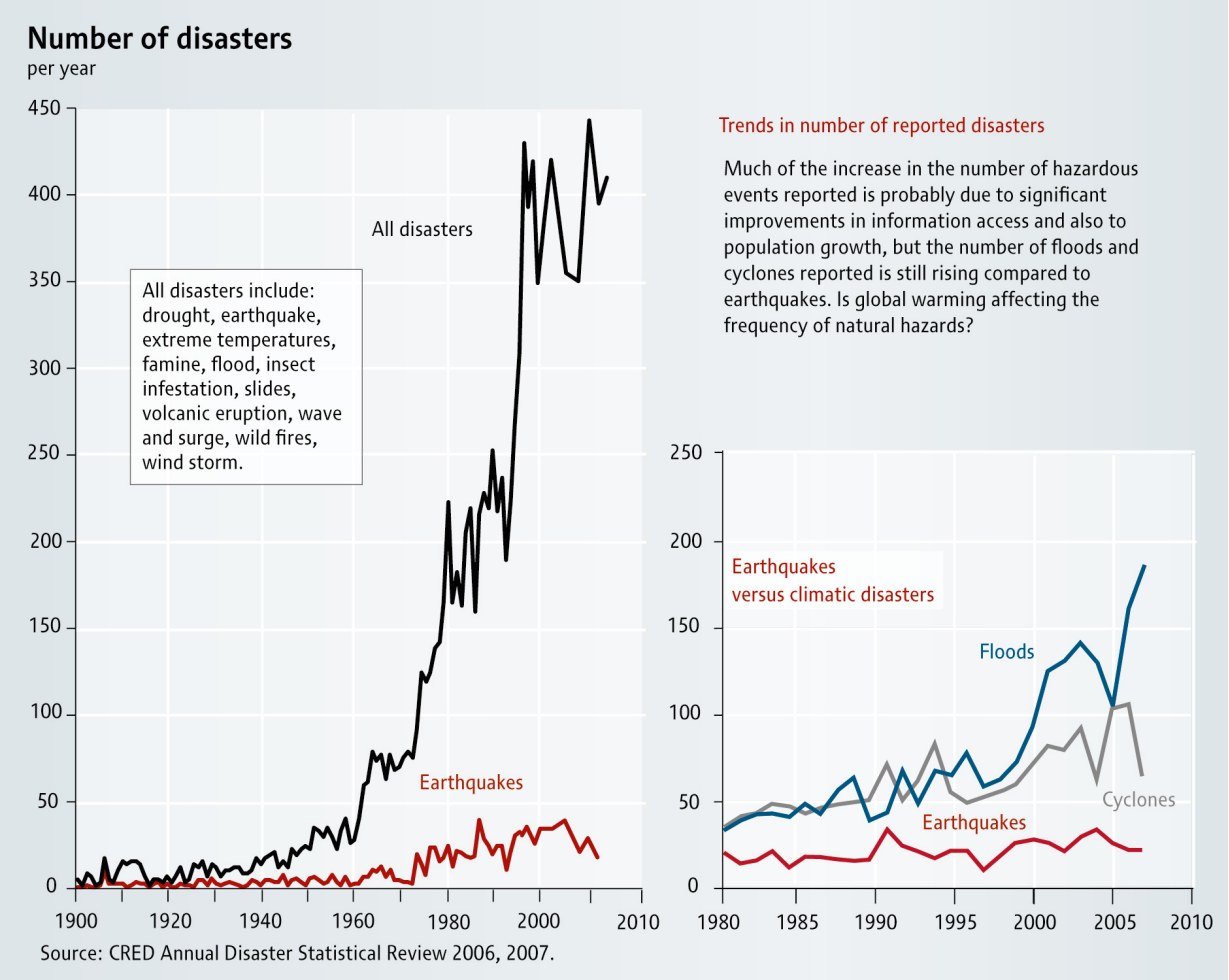
United Nations, 2013

– 10 –

Climate Change

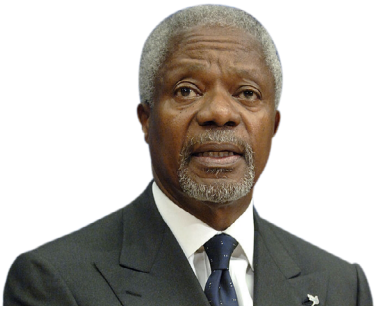
CAUSE

"TRENDS IN THE NUMBER OF REPORTED HAZARDOUS EVENTS"



GRID Arendal / United Nations Environment Programme

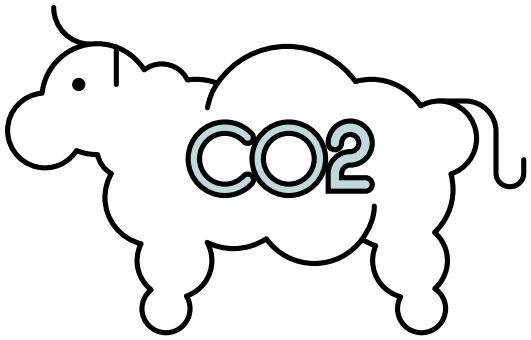
"We can no longer hold back from speaking out on the silent suffering of millions worldwide"
— Kofi Annan, UN Secretary-General



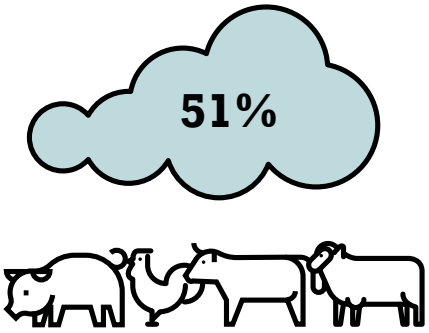
Time Magazine, 2009

IGNORING METHANE AND NITROUS OXIDE, LIVESTOCK EMIT 7.1GT CO2 A YEAR (WARMING IMPACT OVER 100 YEARS)

"Food systems emit 30% of all human greenhouse emissions… Livestock is responsible for 7.1 GtCO2 estimate a year of greenhouse gas emissions, just under 15% of the global total, and equivalent to tailpipe emissions from all the world's vehicles"



Chatham House,
The Royal Institute Of International Affairs, 2016



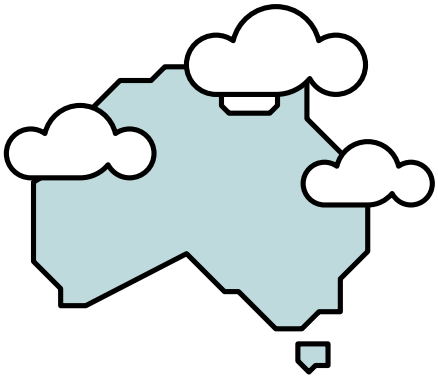
LIVESTOCK CREATE 51% OF GHG EMISSIONS WARMING IMPACT OVER 20 YEARS

"Livestock and their by-products actually account for at least 32.6 billion tons of carbon dioxide per year, or 51% of annual worldwide

Worldwatch Institute, 2009

WHY LIVESTOCK EMISSION FIGURES VARY SO MUCH

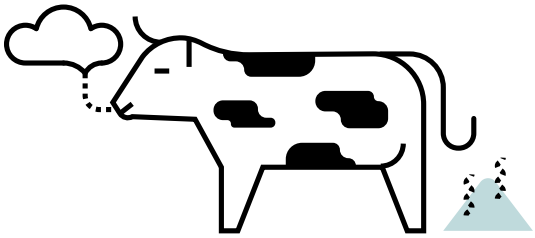
The main point of difference between FAO's 18% and World Watch's 51% is accounting period. FAO uses the commonly accepted but arbitrary 100 year greenhouse gas accounting, whereas World Watch uses 20 year accounting. Livestock are the greatest source of short term emissions, so when their warming impact is assessed over 20 years, livestock become the single biggest greenhouse gas source. World Watch also include CO2 emitted when livestock breath out, a point of contention with some industry authors.



LIVESTOCK CAUSE 50% OF GHG EMISSIONS IN AUSTRALIA

"Beyond Zero Emissions in Australia found that livestock produced almost half the national emissions when accounted over 20 years"

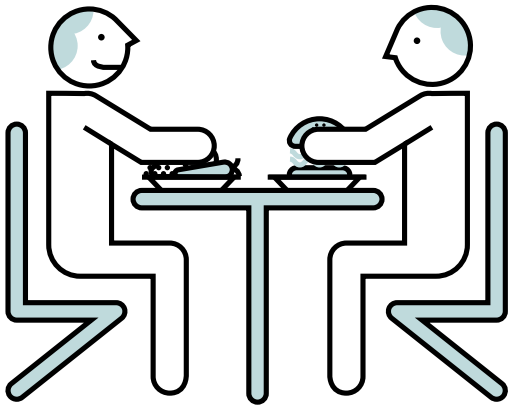
The International Journal of Climate Change: Impacts and Responses, 2015



LIVESTOCK CAUSE 65% OF NITROUS DIOXIDE EMISSIONS

"Livestock is responsible for 65% of all emissions of nitrous oxide, a greenhouse gas 296x more destructive than carbon dioxide and which stays in the atmosphere for 150 years"

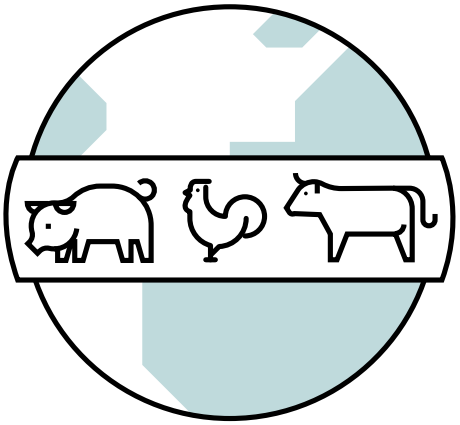
Food and Agriculture Organization of the United Nations, 2006



MEAT EATERS CREATE 100% MORE GHG EMISSIONS THAN VEGANS

"Dietary GHG emissions in meat-eaters are approximately twice as high as those in vegans"

Climate Change journal, 2014



LIVESTOCK OCCUPY 30% OF EARTH'S SURFACE

"Livestock presently use 30% of the earth's entire land surface"

Food and Agriculture Organization of the United Nations, 2006

– 10 –

Climate Change

TIMELINE

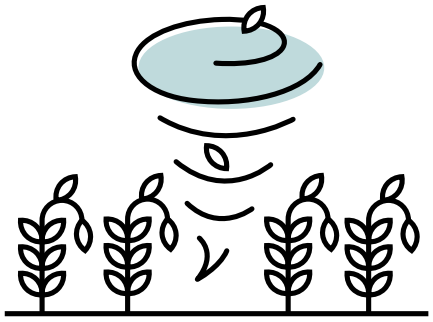
1

BY 2029 CLIMATE CHANGE WILL SERIOUSLY AFFECT 1 IN 10

"Within the next 20 years, 1 in 10 of the world's present population could be directly and seriously affected by climate change"

Time Magazine, 2009

2



BY 2033 WIDESPREAD FOOD SHORTAGES, UNPRECEDENTED HEAT WAVES AND CYCLONES, WILL BE COMMONPLACE

"If the world warms by 2°C, warming, which may be reached in 20 to 30 years, will cause widespread food shortages, unprecedented heat waves, and more intense cyclones"

World Bank, 2013

2033

2050

1 2 3 4

2029

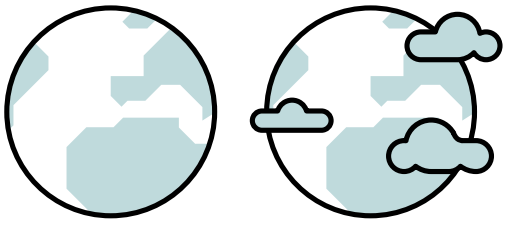
2036

3

"THE WORLD WILL CROSS A THRESHOLD INTO ENVIRONMENTAL RUIN BY 2036"

Scientific American, 2014

4



BY 2050 FOOD GHG EMISSIONS WILL INCREASE BY 80%

"By 2050 global agricultural greenhouse gas emissions are projected to increase by 80%"

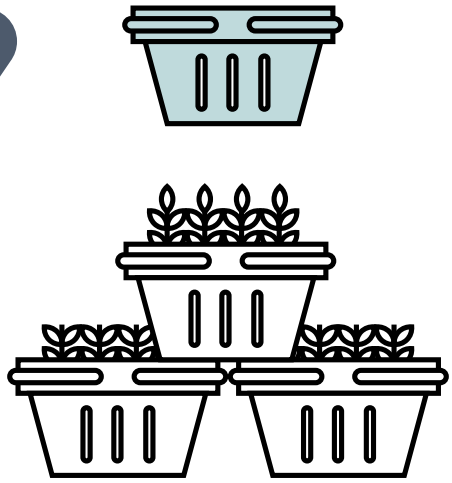
Nature Journal, 2014

DROUGHTS TO AFFECT 25% OF THE WORLD'S CEREAL REGIONS BY 2050

"Climate change will increasingly take effect by 2050 and may cause large portions of the Himalayan glaciers to melt, disturb monsoon patterns, and result in increased floods and seasonal drought on irrigated croplands in Asia, which accounts for 25% of the world cereal production"

GRID Arendal / United Nations Environment Programme, 2009

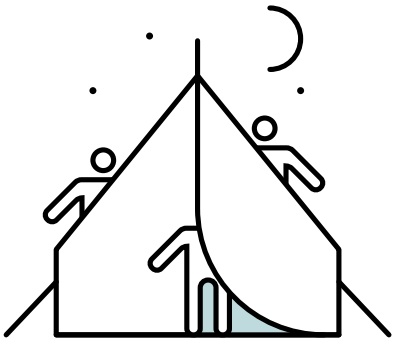
5



2050

5,6,7

6

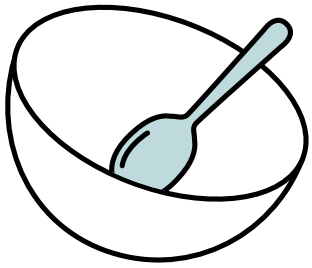


150 MILLION CLIMATE REFUGEES BY 2050

"Global warming could create 150 million climate refugees by 2050"

Environmental Justice Foundation, 2008

7

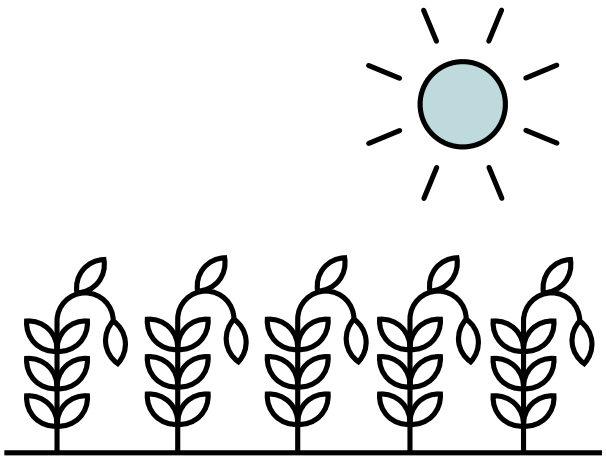


UNDERNOURISHED TO INCREASE BY 25% TO 90% BY 2050

"With warming of 1.2°C to 1.9°C by 2050, the proportion of the population undernourished is projected to increase by 25% to 90%"

World Bank, 2013

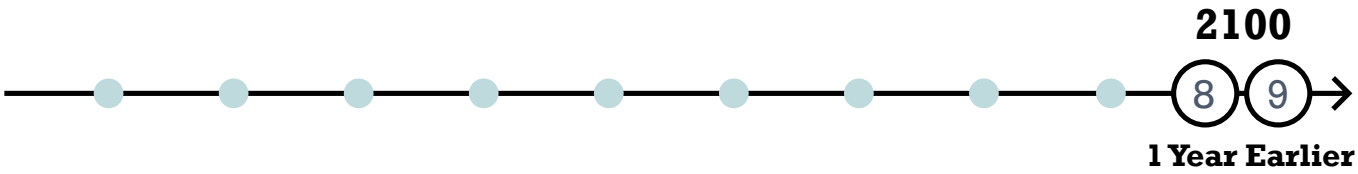
8



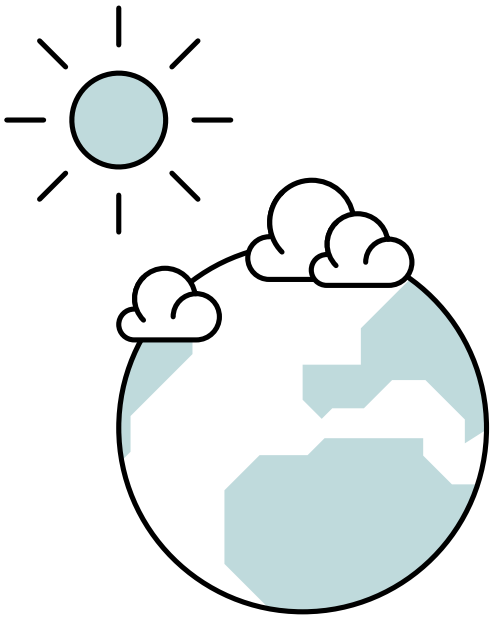
66% CHANCE OF 4.2°C TO 6.5°C WARMING BY 2100

"There is a 66% likelihood that emissions will lead to a warming of 4.2°C to 6.5°C, and a remaining 33% chance that warming would be either lower than 4.2°C or higher than 6.5°C by 2100"

World Bank, 2013



9



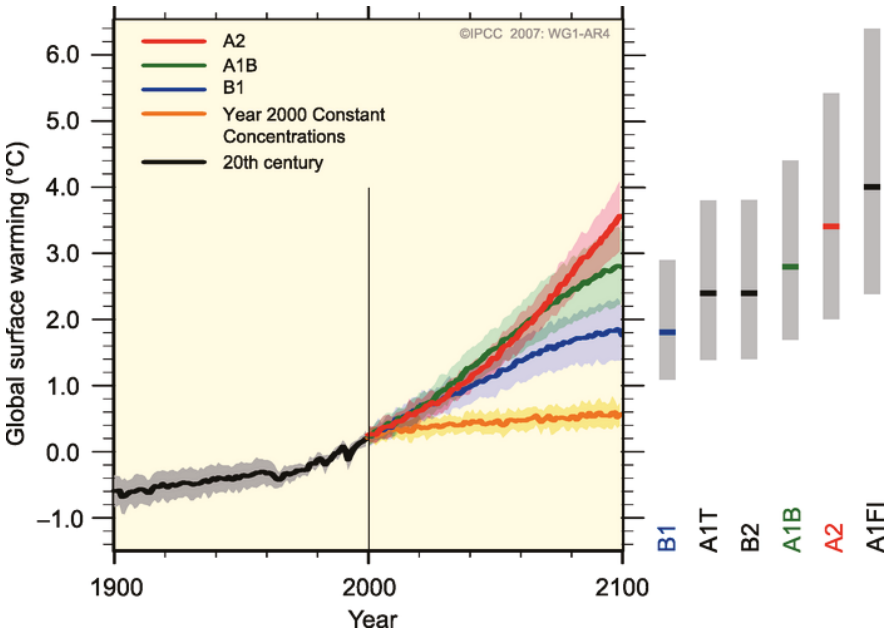
WE ARE ON COURSE FOR 3.5°C TO 4°C WARMING BY 2100

"The current United Nations Framework Convention on Climate Change emission pledges and commitments would most likely result in 3.5°C to 4°C warming by the end of this century"

World Bank, 2012

MULTI-MODEL AVERAGES AND ASSESSED RANGES FOR SURFACE WARMING

10

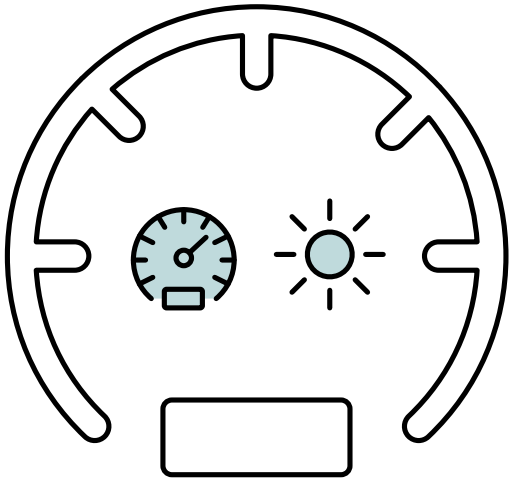


Intergovernmental Panel on Climate Change, 2007

2100

10 11

11



WARMING IS AN UNPRECEDENTED 20X FASTER

"Models predict that Earth will warm between 2°C and 6°C in the next century. When global warming has happened at various times in the past two million years, it has taken the planet about 5,000 years to warm 5°C. The predicted rate of warming for the next century is at least 20 times faster. This rate of change is extremely unusual"

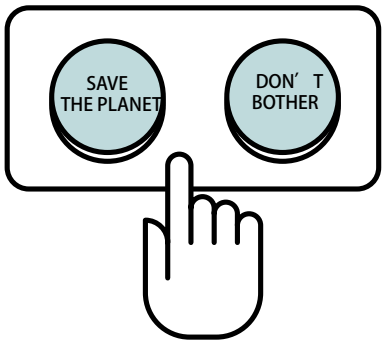
NASA, 2012

– 10 –

Climate Change

SOLUTION

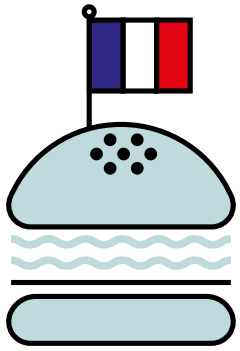
Change in Diet



KEEP WARMING BELOW 2°C TO SAVE THE PLANET

"We have the knowledge and we have the tools for action to try to keep temperature increases within 2°C to give our planet a chance and to give our children and grandchildren a future. Pleading ignorance can no longer be an excuse for not acting"
-- Secretary-General Michel Jarraud

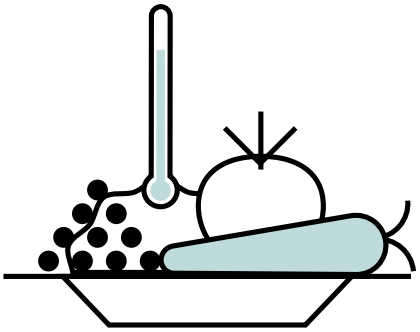
United Nations World Meteorological Organization, 2014



REDUCING MEAT CONSUMPTION FIRMLY OFF THE TABLE AT PARIS CLIMATE CONFERENCE

"As of 21 October, commitments to reducing emissions from the livestock sector appear in only 21 of the 120 national plans submitted in advance of the Paris climate conference. Reducing meat consumption appears in none"

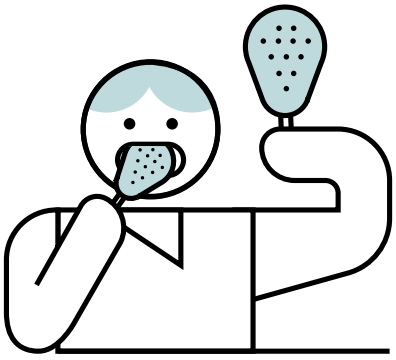
BBC, 2015



HEALTHY DIET NEEDED TO MEET 2°C TARGET

"Global adoption of a healthy diet would see a yearly emissions saving of 6 GtCO2 e in 2050, almost all of which would result from reduced consumption of meat and dairy produce. As a consequence, the predicted emissions gap between proposed mitigation measures and the two-degree scenario could be reduced by a quarter"

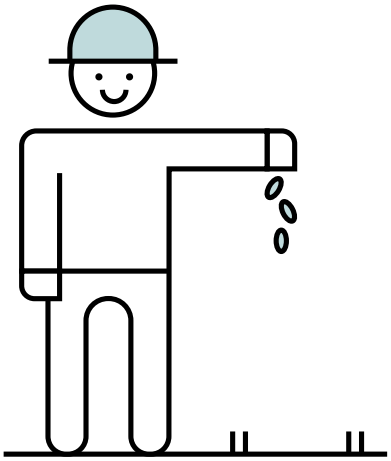
Chatham House Report, 2015



OVER-CONSUMPTION OF MEAT WILL STOP ANY CHANCE OF PREVENTING 2°C WARMING

"Without concerted action to address over-consumption of meat, it will be near impossible to prevent global warming from passing the danger level of 2°C"

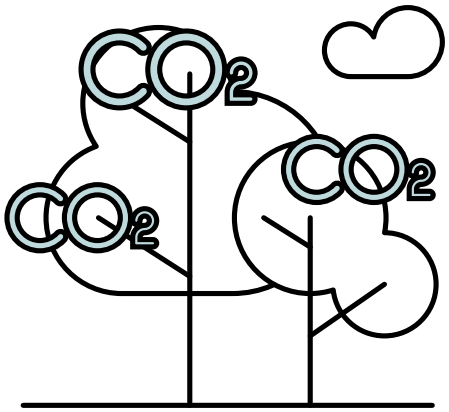
BBC, 2015



REPLANT FORESTS TO ABSORB CARBON

"A global food transition to less meat, or even a complete switch to plant-based protein food would have a dramatic effect on land use. Up to 2,700 mega hectares of pasture and 100 mega hectares of cropland could be abandoned, resulting in a large carbon uptake from re-growing vegetation"

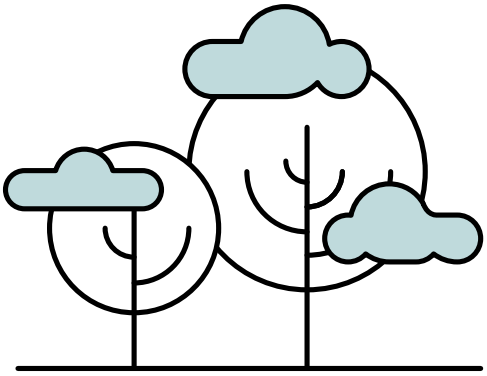
Netherlands Environmental Assessment Agency, 2009



CONVERTING GRAZING LAND INTO FOREST IS THE CHEAPEST CO2 MITIGATION OPTION

"A global transition to a low meat-diet as recommended for health reasons would reduce the mitigation costs to achieve a 450 ppm CO2-eq. stabilisation target by about 50% in 2050"

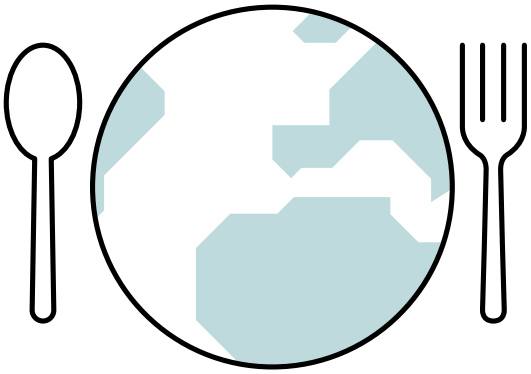
Netherlands Environmental Assessment Agency, 2009



TREES VERSUS GEO-ENGINEERING

"Growing trees is less expensive and risky than carbon capture and storage or geo-engineering"

Netherlands Environmental Assessment Agency, 2009



REDUCE WARMING IMPACTS WITH PLANT BASED DIET

"A substantial reduction in climate change impacts would only be possible with a substantial worldwide diet change, away from animal products"

United nations Environment Programme, 2010

DROPPING GLOBAL DEMAND FOR MEAT AND DAIRY IS CENTRAL TO ACHIEVING CLIMATE GOALS, PREVENTING 2°C WARMING IS HIGHLY UNLIKELY WITHOUT THIS

"Shifting global demand for meat and dairy produce is central to achieving climate goals… Recent analyses have shown that it is unlikely global temperature rises can be kept below two degrees Celsius without a shift in global meat and dairy consumption"

Chatham House, The Royal Institute Of International Affairs, 2014

REDUCING MEAT BY 20% IS EQUAL TO CHANGING YOUR CAR

"The geophysicists Gidon Eschel and Pamela Martin have estimated that if every American reduced meat consumption by just 20%, the greenhouse gas savings would be the same as if we all switched from a normal sedan to a hybrid Prius"

Time Magazine, 2008

– 11 –

THE VEGAN ORGANIC SOLUTON

INTRODUCTIION

The impact of the world turning vegan would be profound. Ecosystems would be restored; a quarter of the earth's surface could be returned to native vegetation; global warming would slow almost immediately; our health and quality of life would improve dramatically.

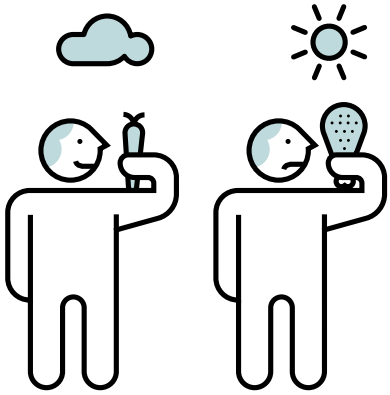
If organic or agro-ecological farming methods were also adopted, the impact would be dramatically improved. Replacing large scale industrialised farming with methods to store carbon in the ground and improve soil health have now been shown to equal yields, particularly in drought, and improve biodiversity.

"A GLOBAL SHIFT TOWARDS A VEGAN DIET IS VITAL TO SAVE THE WORLD FROM HUNGER, FUEL POVERTY AND THE WORST IMPACTS OF CLIMATE CHANGE"

The Guardian, 2010

REDUCING MEAT CONSUMPTION WOULD REDUCE THE COSTS OF STABILISING GHG'S BY 50%

Reducing global meat consumption would reduce greenhouse gas emissions and cut the costs of climate policy substantially. This is the result of a PBL study published in Climatic Change. Apart from a reduction in methane and N2O emissions, vast agricultural areas would become unused, mostly as a result of reduced cattle grazing, and could take up large amounts of carbon. Shifting worldwide to a healthy low-meat diet would reduce the costs of stabilising greenhouse gases at 450 ppm CO2 eq. by more than 50%

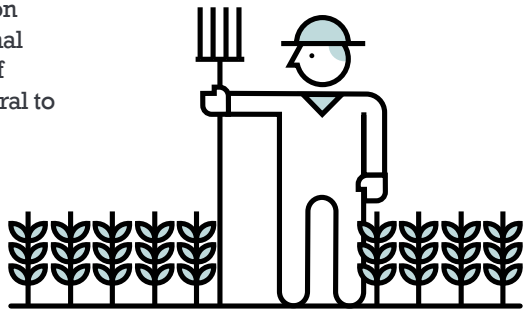


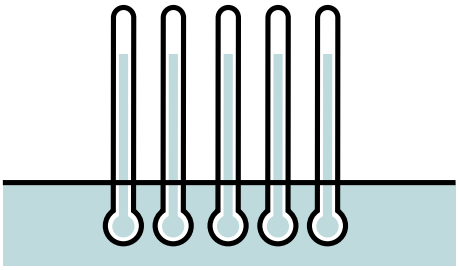
PBL, Netherlands Environmental Assessment Agency, 2009

TURNING AGRICULTURAL PRACTICES ORGANIC SEQUESTERS ATMOSPHERIC CO2, DECREASES GHG EMISSIONS, MAINTAINS YIELDS, IMPROVES WATER RETENTION, AND INCREASES FARM PROFITABILITY

"Changing farming practices to organic, regenerative and agro ecological systems can increase soil organic carbon stocks, decrease greenhouse gas emissions, maintain yields, improve water retention and plant uptake, improve farm profitability, and revitalize traditional farming communities while ensuring biodiversity and resilience of ecosystem services. Regenerative organic agriculture is also integral to the climate solution"

Rodale Institute, 2014

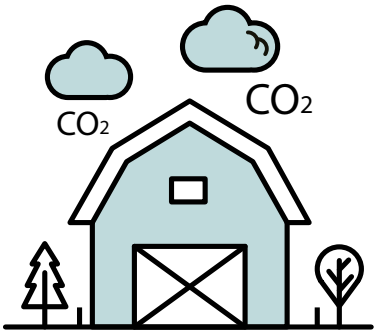




REGENERATIVE ORGANIC AGRICULTURE ESSENTIAL TO LIMIT WARMING TO 1.5°C

"Total global emissions of greenhouse gases in 2012 were about 52 gigatonnes CO2. Annual emissions must drop to ~41 gigatonnes CO2 by 2020 if we are to have a feasible chance of limiting warming to 1.5°C. Regenerative organic agriculture can get us there"

Rodale Institute, 2014



ORGANIC FARMING CAN SEQUESTER 100% OF CURRENT ANNUAL CO2 EMISSIONS

"Simply put, recent data from farming systems and pasture trials show that we could sequester more than 100% of current annual CO2 emissions with a switch to widely available and inexpensive management practices"

Rodale Institute, 2014

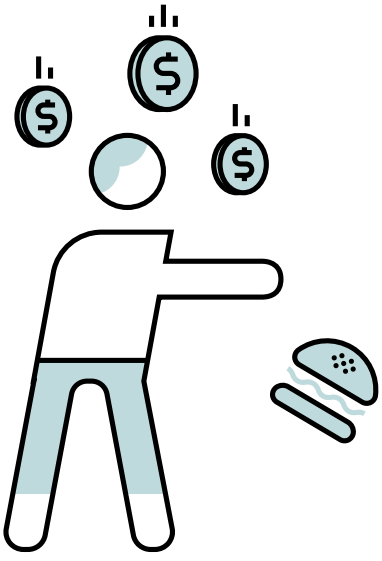
A STRICT VEGAN DIET WOULD HALVE AGRICULTURAL GHG EMISSIONS

"This study quantifies the sources of agricultural GHG emissions and explores the impact of diet on GHG emissions in Finland. The emissions associated with production of basic food items were quantified for four diet options. For current average food consumption, emissions from soil represent 62% of the total. The emissions due to enteric fermentation contribute 24%, and energy consumption and fertiliser manufacture both about 8%. Regarding GHG emissions, environmental performance of the extensive organic production is poor. A strict vegan diet would nearly halve the agricultural GHG emissions"

Progress in Industrial Ecology Journal, 2009

REDUCE GLOBAL MORTALITY BY UP TO 10%, AND REDUCE GHG EMISSIONS BY UP TO 70% WITH PLANT BASED DIETS, THE ECONOMIC BENEFITS WOULD BE WORTH BETWEEN $1 AND $31 TRILLION ANNUALLY

"Transitioning toward more plant-based diets that are in line with standard dietary guidelines could reduce global mortality by 6% to 10% and food-related greenhouse gas emissions by 29% to 70%... The monetized value of the improvements in health would be comparable with, or exceed, the value of the environmental benefits… Overall, we estimate the economic benefits of improving diets to be $1 to $31 trillion US dollars, which is equivalent to 0.4% to 13% of global gross domestic product (GDP) in 2050"



Proceedings Of The National Academy Of Sciences Of The United States Of America, 2015

A VEGETARIAN DIET CAN SAVE MILLIONS OF LIVES A YEAR, CUT GHG EMISSIONS SUBSTANTIALLY, AND SAVE BILLIONS OF DOLLARS ANNUALLY IN HEALTHCARE COSTS

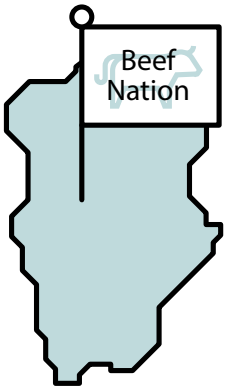
"By eating less meat and more fruit and vegetables, the world could prevent several million deaths per year by 2050, cut planet-warming emissions substantially, and save billions of dollars annually in healthcare costs and climate damage... A new study published in the Proceedings of the National Academy of Sciences is the first to estimate both the health and climate change impacts of a global move towards a more plant-based diet. We do not expect everybody to become vegan, said lead author Marco Springmann of the Oxford Martin Program on the Future of Food. But if they did, they'd live longer and help reduce the changes that are skewing the climate. What we eat greatly influences our personal health and the global environment"

NBC News, 2016

VEGAN DIETS WOULD CUT GHG EMISSIONS BY 70%

"Following dietary recommendations would cut food-related [GHG] emissions by 29%, adopting vegetarian diets would cut them by 63% and vegan diets by 70%"

NBC News, 2016



BEEF ALONE HAS A HUGE ENVIRONMENTAL FOOTPRINT

"If cattle were their own nation, they would be the world's 3rd largest greenhouse gas emitter, use 33% of earth's water and 25% of earth's land area. And beef demand is expected to grow by 95% by 2050."

World Resources Institute, 2016

– 12 –

FORWARD THINKERS

INTRODUCTIION

Several leading figures have spoken out against food business-as-usual. Their sentiments are now gaining more traction; the movement has begun.

GIVE UP MEAT TO HALT CLIMATE CHANGE

"People should give up eating meat to halt climate change… meat is a wasteful use of water and creates a lot of greenhouse gases, it puts enormous pressure on the world's resources. A vegetarian diet is better… it's important that people think about what they are doing and that includes what they are eating" - Lord Stern

The Telegraph

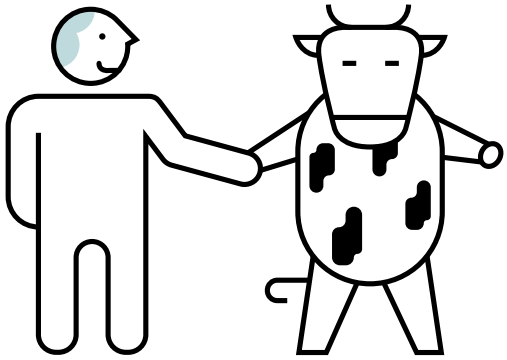
LORD STERN

Nicholas Herbert Stern, Baron Stern of Brentford, Kt, FRS, FBA is a British economist and academic. He is IG Patel Professor of Economics and Government, Chair of the Grantham Research Institute on Climate Change and the Environment at the London School of Economics (LSE), and 2010 Professor of Collège de France. Since 2013, he has been President of the British Academy

THE FUTURE OF SOCIETY IS MORALLY VEGETARIAN

"If society continues to develop without catastrophe on something like the course that you can sort of see over time, I wouldn't be in the least surprised if it moves toward vegetarianism and protection of animal rights. In fact, what we've seen over the years, and it's hard to be optimistic in the twentieth century, which is one of the worst centuries in human history in terms of atrocities and terror and so on, but still, over the years, including the twentieth century, there is a widening of the moral realm, bringing in broader and broader domains of individuals who are regarded as moral agents."

Noam Chomsky



NOAM CHOMSKY

Noam Chomsky is an American cognitive scientist, psychologist, linguist, philosopher, logician, political commentator, social justice activist, and anarcho-syndicalist advocate. Often described as the "father of modern linguistics," Chomsky is also a major figure in analytic philosophy. He has spent his entire career at the Massachusetts Institute of Technology (MIT), where he is currently Institute Professor Emeritus. He is widely considered a prominent cultural figure, and was voted the "world's top public intellectual" in a 2005 poll.

PHILIP WOLLEN

LIVESTOCK FARMING TAKES FOOD FROM THE WORLD'S POOREST

"When I travel around the world, I see that poor countries sell their grain to the West while their own children starve in their arms. And we feed it to livestock. So we can eat a steak? Am I the only one who sees this as a crime? Every morsel of meat we eat is slapping the tear-stained face of a starving child. When I look into her eyes, should I be silent? The Earth can produce enough for everyone's need. But not enough for everyone's greed"

Live Learn Love Eat, 2012

Philip Wollen OAM (born 1950) is an Australian philanthropist. He is a former Vice-President of Citibank and was also General Manager at Citicorp. Wollen became a vegan following his departure from Citibank and is a prominent member of the animal rights movement. He conducts intervention programs to rescue abused animals and funds outreach programs that promote animal welfare and abstinence. At age 34, Australian Business Magazine named him in the "Brightest and Best" top 40 headhunted executives in Australia. In 2005 he received the Medal of the Order of Australia and in 2007 he won the Australian of the Year (Victoria) award. In 2012 he was made an Honorary Fellow of the Oxford Centre of Animal Ethics, UK. In 2014 he received the University of Adelaide Distinguished Alumni Award.

– 13 –

LIVESTOCK SUBSIDIES

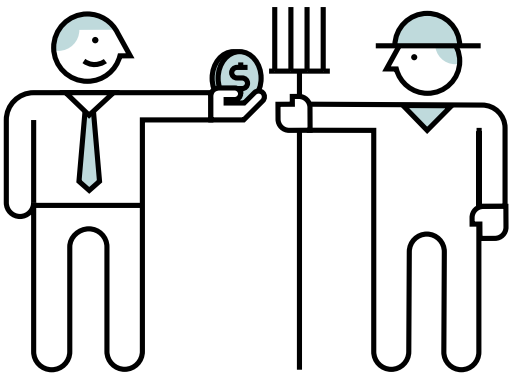
INTRODUCTIION

Billions of dollars are spent annually propping up livestock industries. This is indefensible.

OECD LIVESTOCK SUBSIDIES AMOUNTED TO $53 BILLION IN 2013

"The dearth of policies and funding to tackle livestock emissions stands in marked contrast to the abundance of government support afforded to meat and dairy producers. Livestock subsidies among OECD countries amounted to $53 billion in 2013. In the EU, cattle subsidies alone exceeded $731 million, equivalent to $190 per cow.26 This largesse is not confined to industrialized countries. In China, for example, pork subsidies exceeded $22 billion in 2012, equivalent to about $47 per pig"

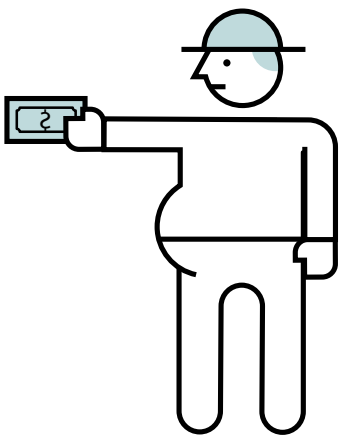
Chatham House, The Royal Institute Of International Affairs, 2014



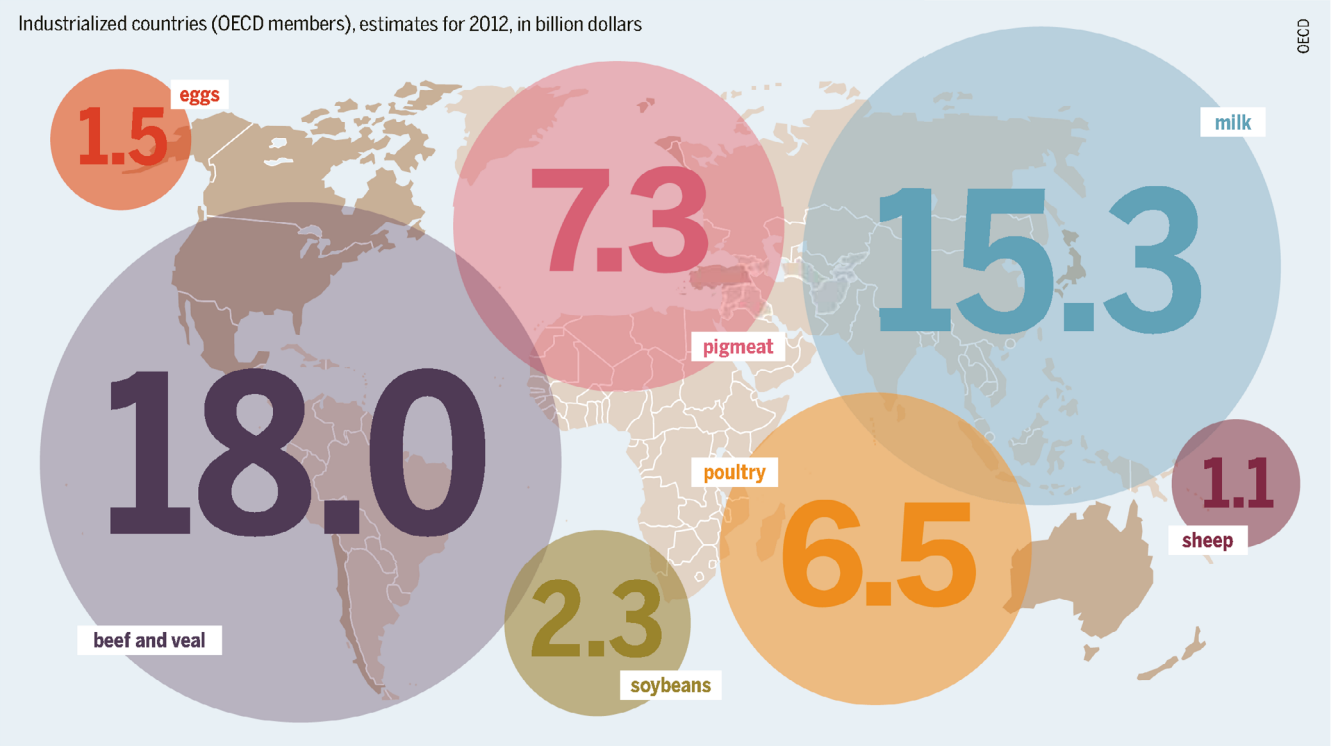
38% OF THE EU BUDGET GOES TO FARM SUBSIDIES

"Farm subsidies will consume some 38% of the EU budget for 2014-2020, equivalent to 363 billion euros ($485.7 billion) of the 960 billion total, or around 50 billion euros a year"

Reuters, 2013



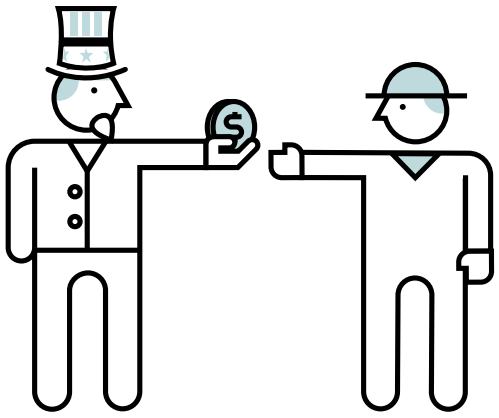
DIRECT SUBSIDIES FOR ANIMAL PRODUCTS AND FEED



Friends Of Earth Europe, 2014

US FARM SUBSIDIES ARE $20 BILLION ANNUALLY

"American farm subsidies are egregiously expensive, harvesting $20 billion a year from taxpayers' pockets"



The Economist, 2015

REFERNCES

1. Steinfeld, H. et al. Livestock's long shadow: environmental issues and options. (2006).

2. UN Water, 2013. Water Cooperation Facts and Figures, from http://www.unwater.org/water-cooperation-2013/water-cooperation/facts-and-figures/en/

3. Hertwich, E. Assessing the Environmental Impacts of Consumption and Production: Priority Products and Materials. (UNEP/ Earthprint, 2010)

4. UN Department of Economic and Social Affairs, International Decade of Action''Water for Life'', 2005-2015

5. www.latimes.com/opinion/op-ed/la-oe-famiglietti-drought-california-20150313-story.html

6. WWAP (United Nations World Water Assessment Programme). 2015. The United Nations World Water Development Report 2015: Water for a Sustainable World. Paris, UNESCO.

7. Gilbert, N. Balancing water supply and wildlife. Nat. News (2010). doi:10.1038/news.2010.505

8. UN Department of Economic and Social Affairs, International Decade of Action''Water for Life'', 2005-2015

9. Dimick, D, 2014. If you think the Water Crisis can't get worse, Wait until the Aquifers are DrainedÐational Geographichttp://news.nationalgeographic.com/news/2014/08/140819-groundwater-california-drought-aquifers-hidden-crisis/

10. UN Water, Statistics, http://www.unwater.org/statistics/en/?page=5

11. Richey, A. S. et al. Quantifying renewable groundwater stress with GRACE. Water Resour. Res. 51, 5217–5238 (2015).

12. Mascarelli, A. Demand for water outstrips supply. Nat. News doi:10.1038/nature.2012.11143

13. Richey, A. S. et al. Quantifying renewable groundwater stress with GRACE. Water Resour. Res. 51, 5217–5238 (2015)

14. Nolan, B. et al. 1998-2015, Nutrients National Synthesis Project, USGS https://water.usgs.gov/nawqa/nutrients/pubs/wcp_v39_no12/

15. Richey et al, 2015. Quantifying renewable groundwater stress with GRACE. Water Resource Research, Vol 51, Issue 7, July 2015

16. IFAD, 2001. Desertification as a global problem, International Fund for Agricultural Development Information Sheet https://www.ifad.org/documents/10180/319d29cc-6b4f-4b9a-8bfe-29a4014f2a1d

17. Sadoff, C. et al, 2015. Securing Water, Sustainable Growth: Report of the GWP/ OECD Task Force on Water Security and Sustainable Growth, Oxford UK

18. WWAP (United Nations World Water Assessment Programme). 2014. The United Nations World Water Development Report 2014: Water and Energy. Paris, UNESCO

19. Jacobson, M. 2006. How a More Plant-Based Diet Could Save your Health and the Environment, Center for Science in the Public Interest, Pennsylvania State University, 2006 ISBN 0893290491

20. Pimentel, D. & Pimentel, M. Sustainability of meat-based and plant-based diets

and the environment. Am. J. Clin. Nutr. 78, 660S–663S (2003).

21. Pimentel, D. et al. Water Resources: Agricultural and Environmental Issues. BioScience 54, 909–918 (2004).

22. http://www.telegraph.co.uk/news/earth/energy/8904423/Power-showers-use-twice-as-much-water-and-electricity-as-baths.html

23. https://www.theguardian.com/environment/2010/sep/29/human-impact-world-rivers-water-security

24. http://www.nature.org/ourinitiatives/habitats/riverslakes/threatsimpacts/

25. Postel, S. 2013 Stronger Efforts Needed to Reduce Nitrate Pollution in Mississippi River Basin, Water Currents Magazine, National Geographic, November 2013. http://voices.nationalgeographic.com/2013/11/01/stronger-efforts-needed-to-reduce-nitrate-pollution-in-mississippi-river-basin/

26. https://www.theatlantic.com/science/archive/2015/11/the-airborne-toxic-lake-event/414888/

27. http://www.nature.org/ourinitiatives/habitats/riverslakes/threatsimpacts/

28. https://www.theguardian.com/environment/2014/apr/23/china-half-groundwater-polluted

29. http://ec.europa.eu/eurostat/statistics-explained/index.php/Agri-environmental_indicator_-_nitrate_pollution_of_water

30. IFAD, 2001. Desertification as a global problem. International Fund for Agricultural Development Information Sheet.

31. UNICEF, 2006. Progress for Children: A Report Card on Water and Sanitation, No. 5. UNICEF, New York 2006

32. UNDESA, 2006. Water for Food Factsheet from http://www.un.org/waterforlifedecade/food_security.shtml

33. GCF, 2015. Drinking Water Blues: Nitrate Pollution from Coast to Coast. http://www.gracelinks.org/789/drinking-water-blues-nitrate-pollution-from-coast-to-coast

34. EPA, 1994. National Water Quality Inventory Report to Congress. https://www.epa.gov/sites/production/files/2015-09/documents/1994_national_water_quality_inventory_report_to_congress.pdf

35. EWG, 1996. Pouring It On: Nitrogen Use and Sources of Nitrate Contamination, https://www.epa.gov/sites/production/files/2015-09/documents/1994_national_water_quality_inventory_report_to_congress.pdf

36. UNEP, 2010. Sick Water: The central role of wastewater management in sustainable development. Presentation by Water and Energy Relief International https://www.slideshare.net/WERI/sick-water-screen-2-million-tons-of-sewage-industrial-and-agricultural-waste

37. van Lier, J. 2010 Water Day blog Delft University https://www.slideshare.net/WERI/sick-water-screen-2-million-tons-of-sewage-industrial-and-agricultural-waste

38. Grossman, E. 2014. As Dairy Farms Grow Bigger, New Concerns About Pollution. Yale Environment 360 article. http://e360.yale.edu/features/as_dairy_farms_grow_bigger_new_concerns_about_pollution

39. UNDESA, 2006. Water Scarcity. UN-Water Factsheet. http://e360.yale.edu/features/as_dairy_farms_grow_bigger_new_concerns_about_pollution

40. IPCC, 2007. Climate Change 2007: Contributions of Working Groups I, II and III to the Fourth Assessment.Geneva, 2007

41. http://www.worldwildlife.org/threats/water-scarcity

42. UNWDR, 2015. Water for a Sustainable World. United Nations World Water Development Report.

43. UN Secretary-General Statements and Messages, 5 June 2006. Đlobal Desertification Affecting One Fifth of the World's Population Đne of the most serious threats facing Humanity.Đttp://www.un.org/press/en/2006/sgsm10501.doc.htm

44. WWF, 2010. Sustainable Agriculture: Links to International Development. http://assets.wwf.org.uk/downloads/wwf_sustainable_agriculture_briefing.pdf

45. UNWater, 2012. Managing Water under Uncertainty and Risk. The United Nations World Water Development Report 4

46. Forget the Financial Crisis, the World is running out of Water, Public Library of US Diplomacy, Switzerland https://wikileaks.org/plusd/cables/09BERN129_a.html

47. Dai, A. Drought under global warming: a review. Wiley Interdiscip. Rev. Clim. Change 2, 45–65 (2011).

48. Jagerskog, A. & Clausen, J. Feeding a thirsty world: threats and opportunities for water and food security. (Stockholm International Water Institute, SIWI, 2012).

49. Jagerskog, A. & Clausen, J. Feeding a thirsty world: threats and Đpportunities for water and food security. (Stockholm International Đater Institute, SIWI, 2012).

50. Water Conservation Tips, National Geographic Reference SeriesĐttp://www.nationalgeographic.com/environment/freshwater/water-conservation-tips/
Steinfeld, H. et al. Livestock's long shadow: environmental issues and options. (2006).

51. Hoekstra, A. The hidden water resource use behind meat and Ýairy. (Twente Water Center, University of Twente, 2012).

52. Ercin, A. et al. 2011. The Water Footprint of Soy Milk and Soy Burger and Equivalent Animal Products. Value of Water Research Report Series No.49.

53. Sutton, M. A., Howard, C. M. & Erisman, J. W. The European Đitrogen Assessment: Sources, Effects and Policy Perspectives. ĐCambridge University Press, 2011).

54. Food System Shock: The Insurance impacts of acute disruption to global food supply. Emerging Risk Report - 2015 Society and SecurityĐttp://www.lloyds.com/~/media/files/news%20and%20insight/risk%20insight/2015/food%20system%20shock/food%20system%20shock_june%202015.pdf

55. Food System Shock: The Insurance impacts of acute disruption to Đlobal food supply. Emerging Risk Report - 2015 Society and SecurityĐttp://www.lloyds.com/~/media/files/news%20and%20insight/risk%20Đnsight/2015/food%20system%20shock/food%20system%20Đhock_june%202015.pdf

56. Food Security Overview, 2016 http://www.worldbank.org/en/topic/foodsecurity/overview#1

57. World Food Programme Zero Hunger Campaign, 2015Ðttp://www1.wfp.org/zero-hunger

58. Hunger in America: 2016 United States Hunger and Poverty, Ðttp://www.worldhunger.org/hunger-in-america-2016-united-states-hunger-poverty-facts/

59. A Life Free From Hunger: Tackling Child MalnutritionÐave the Children, 2012

60. State of Food Insecurity in the World In Brief, 2015. UNFAOÐttp://www.fao.org/3/a-i4671e.pdf

61. Dobbs, R & Swinburn, B. 2015. The Global Obesity Threat. Article in Project Syndicate. http://www.mckinsey.com/mgi/overview/in-the-news/the-global-obesity-threat

62. Joint statement from FAO, IFAD and WFP on international food pricesßAO, IFAD adn WFP, Rome, 2012 http://www.fao.org/news/storyÐen/item/155472/icode/

63. Nellemann, C. et al. The Environmental Food Crisis - TheÞnvironment's role in averting future food crises. UNEP, 2009

64. UNDESA, 2011. The Global Social Crisis: Report on the World Social Situation, Chapter 4. UN. New York, 2011.

65. Joint statement from FAO, IFAD and WFP on international food pricesßAO, IFAD adn WFP, Rome, 2012 http://www.fao.org/news/storyÐen/item/155472/icode/

66. Pimentel, D. & Pimentel, M. Sustainability of meat-based and plant-based diets and the environment. Am. J. Clin. Nutr. 78, 660S–663S (2003).

67. Tilman, D. & Clark, M. Global diets link environmental sustainability and human health. Nature 515, 518–522 (2014).

68. Baroni, L., Cenci, L., Tettamanti, M. & Berati, M. Evaluating the environmental impact of various dietary patterns combined with different food production systems. Eur. J. Clin. Nutr. 61, 279–286 (2006).

69. Smith, J. et al. Beyond milk, meat, and eggs: Role of livestock in food and nutrition security. Anim. Front. 3, 6–13 (2013).

70. The Impact of Industrialized Animal Agriculture on Food Security in the Developing World. An HSI Report. November 2011

71. The Irony of Climate. World Watch Magazine, March/April 2005 Vol18 No 2

72. Pachauri, R. K. Climate Change 2007, Synthesis Report. Üontribution of Working Groups I,II and III to the Fourth Ússessment Report. (IPCC, 2007).

73. Nellemann, C. The environmental food crisis – The environment's role in averting future food crises. (United Nations Environment Program, 2009).

74. Global Resource Observatory, Anglia Ruskin UniversityÚ model to investigate resource insecurity, political instabilityÚnd economic growth. http://www.anglia.ac.uk/global-sustainabilityÐinstitute-gsi/research/global-risk-and-resilience/global-resource-observatory

75. IFPRI, 2009. Climate Change: Impact on Agriculture and Costs of Adaptation. http://www.ifpri.org/publication/climate-change-impact-agriculture-and-costs-adaptation

76. Sustainable Agriculture: Links to Inter-

national DevelopmentÐWF Briefing, August 2010

77. Wellesley, L., Happer, C. & Froggatt, A. Changing Climate, Changing Diets: Pathways to Lower Meat Consumption. (Chatham House Report, 2015).

78. Hamburgers will not feed the world. Scientific American, August 2013

79. Meat: Now, it's not personal. World Watch Magazine, July/Úugust 2004, Vol 17, No. 4.

80. BBC Radio 4 Analysis. Interviews with Peter Singer, Elizabeth Harman, Jeff MacMahan and Gary Cormstock, 26 October 2015

81. EJF, 2009. No Place Like Home: What next for climate refugees? EJF, London

82. Kelley, C. P., Mohtadi, S., Cane, M. A., Seager, R. & Kushnir, Y. Climate change in the Fertile Crescent and implications of the recent Syrian drought. Proc. Natl. Acad. Sci. 112, 3241–3246 (2015).

83. GHF, 2009. The Anatomy of a Silent Crisis, Human Impact Report: Climate Change. Global Humanitarian Forum, Geneva, 2009

84. Climate Change could become the biggest driver of displacement:ÐNHCR cheif. UNHigh Commission for Refugees News, 16 Dec. 2009

85. The Atlas of Mortality and Economic Losses from Weather, Climate and Water Extremes (1970-2012). World Meteorological OrganizationÒ014

86. The Atlas of Mortality and Economic Losses from Weather, Climate and Water Extremes (1970-2012). World Meteorological Organization 2014

87. Environment, Disasters and Climate Change. News and Stories. ÐN High Commission for Refugees, 2015 http://www.unhcr.org/Ðages/49c3646c10a.html

88. Climate Change could become the biggest driver of displacement:ÐNHCR cheif. UNHigh Commission for Refugees News, 16 Dec. 2009

89. New Issues in Refugee Research. Paper No. 153: Climate and Forced Migration. UNHCR, Switzerland, January 2008

90. No Place Like Home: Where next for climate refugees?ÞJF, London, 2015

91. Kelley, C. P., Mohtadi, S., Cane, M. A., Seager, R. & Kushnir, Y. Climate change in the Fertile Crescent and implications of the recent Syrian drought. Proc. Natl. Acad. Sci. 112, 3241–3246 (2015).

92. Total Number of Syrian refugees exceeds four million for first time. UNHCRÐews, 9 July 2015

93. Steinfeld, H. et al. Livestock's long shadow: environmental issues and options. (2006).

94. Goodland, R. & Anhang, J. Livestock and Climate Change: What if the key actors in climate change are cows, pigs and chickens? World Watch Magazine 10–19 (2009).

95. Russell, S. 2014. Everything you need to know about agricultural emissions. WRI blog post May29 2014

96. Cappiello, D. 2014. These 6 Countries are Responsible for 60% of CO2 Emissions. AP, Dec 5 2014 (source World Bank, Global Carbon Project, AP Research)

97. Human Impact Report: Climate Change - The Anatomy of a Silent Crisis. Global HUmanitarian Forum, Geneva, 2009

98. Biermann, F & Boas, I. 2008. Protecting Climate Refugees: the Case for a Global Protocol. Environment Magazine, Nov-Dec 2008

99. Climate Refugee. National Geographic Encyclopedia. http://www.nationalgeographic.org/encyclopedia/climate-refugee/ Accessed March 2017.

100. Frank Biermann, Professor of Political Science and Environmental Policy Sciences at VU University Amsterdam, Inside Climate News, 2015

101. Piguet, E. 2008. New Issues in Refugee Research: Climate change and forced migration. UNHCR, 2008

102. Global Desertification one of the most serious threats facing humanity. UN Secretary-General press release, 5 June 2006Ðttp://www.un.org/press/en/2006/sgsm10501.doc.htm

103. Biermann, F. & Boas, I. in Climate Change, Human Security and Violent Conflict (eds. Scheffran, J., Brzoska, M., Brauch, H. G., Link, P. M. & Schilling, J.) 291–300 (Springer Berlin Heidelberg, 2012). doi:10.1007/978-3-642-28626-1_15Ð_

104. Climate Change could become the biggest driver of displacement: UNHCR chief. UNHCR news, 16 December 2009

105. Singer, A (2012, July 30). Climate Refugees: A Human Cost of Global WarmingÐttp://www.worldwatch.org/climate-refugees-human-cost-global-warming

106. Piguet, E. 2008 .New Issues in Refugee Research: Climate Change and Forced Migration. UNHCR January 2008

107. Younus, M. A. F. Vulnerability and Adaptation to Climate Change in | Md Aboul Fazal Younus | Springer. (Springer, 2014).

108. Scarborough, P. et al. Dietary greenhouse gas emissions of meat-eaters, fish-eaters, vegetarians and vegans in the UK. Clim. Change 125, 179–192 (2014)

109. IPCC. IPCC, 2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. (Intergovernmental Panel on Climate Change (IPCC), 2014)

110. Eshel, G., Shepon, A., Makov, T. & Milo, R. Land, irrigation water, greenhouse gas, and reactive nitrogen burdens of meat, eggs, and dairy production in the United States. Proc. Natl. Acad. Sci. 111, 11996–12001 (2014)

111. Chapin Iii, F. S. et al. Consequences of changing biodiversity. Nature 405, 234–242 (2000)

112. Hopkin, M. Past century sees biodiversity dive. Nat. News (2005). doi:10.1038/news050516-14

113. Ceballos, G. et al. Accelerated modern human–induced species losses: Entering the sixth mass extinction. Sci. Adv. 1, e1400253 (2015).

114. Hamid, Z. 2013. Even farm animal diversity is declining as accelerating species loss threatens humanity. IPBES, 2013

115. WWF, 2016. Living Planet Report 2016, Risk and resilience in a new era. WWF International, Gland, Switzerland.

116. Watson, J. E. M. et al. Catastrophic Declines in Wilderness Areas Undermine Global Environment Targets. Curr. Biol. 26, 2929–2934 (2016)

117. WWF, 2016. Living Planet Report 2016, Risk and resilience in a new era. WWF International, Gland, Switzerland.

118. Myers, R. A. & Worm, B. Rapid worldwide depletion of predatory fish communities. Nature 423, 280–283 (2003).

119. WRI, 2015. Forests - Sustaining forests for people and planet. WRI topic http://www.wri.org/our-work/topics/forests

120. Braat, L. & ten Brink, P. The Cost of Policy Inaction: The case of not meeting the 2010 biodiversity target. (Alterra, for the Institute for European Environmental Policy, 2008)

121. Frieler, K. et al. Limiting global warming to 2 °C is unlikely to save most coral reefs. Nat. Clim. Change 3, 165–170 (2013).

122. Steinfeld, H. et al. Livestock's long shadow: environmental issues and options. (2006).

123. Machovina, B., Feeley, K. J. & Ripple, W. J. Biodiversity conservation: The key is reducing meat consumption. Sci. Total Environ. 536, 419–431 (2015).

124. PBL, 2009. Milieubalans 2009. Planbureau voor de Leefomgeving, http://www.rivm.nl/bibliotheek/rapporten/500081015.pdf

125. Chapin Iii, F. S. et al. Consequences of changing biodiversity. Nature 405, 234–242 (2000).

126. PBL, 2009. Milieubalans 2009. Planbureau voor de Leefomgeving, http://www.rivm.nl/bibliotheek/rapporten/500081015.pdf

127. Myers, R. A. & Worm, B. Rapid worldwide depletion of predatory fish communities. Nature 423, 280–283 (2003).

128. Nepstad, D. C., Stickler, C. M., Filho, B. S.- & Merry, F. Interactions among Amazon land use, forests and climate: prospects for a near-term forest tipping point. Philos. Trans. R. Soc. B Biol. Sci. 363, 1737–1746 (2008).

129. UNESCO. Managing Water Under Uncertainty and Risk: United Nations World Water Development Report #4 (3 Vols.). (UNESCO, 2012).

130. Land Degradation - Contributions to the International Workshop, 5-6 Dec 2002, Ispra, Italy.Institute for Environment & Sustainability Joint REsearch Centre, European Commission

131. Barnosky, A. D. et al. Approaching a state shift in Earth/'s biosphere. Nature 486, 52–58 (2012).

132. Malcolm, J. R., Liu, C., Neilson, R. P., Hansen, L. & Hannah, L. Global Warming and Extinctions of Endemic Species from Biodiversity Hotspots. Conserv. Biol. 20, 538–548 (2006)

133. EC 2008. The global cost of biodiversity loss: 14 trillion Euros? DG Environment News Alert Service, 4 Sept 2008

134. Parry, M. L. Climate Change 2007: Impacts, Adaptation and Vulnerability : Working Group II Contribution to the Fourth Assessment Report of the IPCC Intergovernmental Panel on Climate Change. (Cambridge University Press, 2007)

135. Sokolov, A. P. et al. Probabilistic Forecast for Twenty-First-Century Climate Based on Uncertainties in Emissions (Without Policy) and Climate Parameters. J. Clim. 22, 5175–5204 (2009)

136. NEAA, 2010. Rethinking Global Biodiversity Strategies: Exploring structural change in production and consumption to reduce biodiversity loss. (Netherlands Environmental Assessment Agency, 2010).

137. UN, 2010. Biodiversity loss is bankrupting the natural economy - Ban. UN News Centre. http://www.un.org/apps/news/story.asp?NewsID=36052#.VcOC5reRJFc

138. UNCBD, 2015. Healthy Oceans, Healthy Planet: Message of the Executive Secretary of the Convention on Biological Diversity, World Oceans Day 8 June 2015

139. Liu, W., Xie, S.-P., Liu, Z. & Zhu, J. Overlooked possibility of a collapsed Atlantic Meridional Overturning Circulation in warming climate. Sci. Adv. 3, e1601666 (2017)

140. World Bank. 2013. Turn Down the Heat: Climate Extremes, Regional Impacts, and the Case for Resilience. A report for the World Bank by the Potsdam Institute for Climate Impact Research and Climate Analytics. Washington, DC:World Bank.

141. Wunderground, 2015. Arctic Sea Ice Decline, climate information series, from https://www.wunderground.com/climate/SeaIce.asp

142. refers to: Buis & Cole, 2014. The "Unstable" West Antarctic Ice Sheet: A Primer. NASA Earth Science News Team, 2014.

143. refers to: Dutton, A. et al. Sea-level rise due to polar ice-sheet mass loss during past warm periods. Science 349, aaa4019 (2015).

144. refers to: Dutton, A. et al. Sea-level rise due to polar ice-sheet mass loss during past warm periods. Science 349, aaa4019 (2015).

145. Goodland, R. & Anhang, J. Livestock and Climate Change: What if the key actors in climate change are cows, pigs and chickens? World Watch Magazine 10–19 (2009).

146. World Bank. 2013. Turn Down the Heat: Climate Extremes, Regional Impacts, and the Case for Resilience. A report for the World Bank by the Potsdam Institute for Climate Impact Research and Climate Analytics. Washington, DC:World Bank.

147. Pristine Seas: Sea Tempreature Rise. Critical Issues series, National Geographic, from http://ocean.nationalgeographic.com/ocean/explore/pristine-seas/critical-issues-sea-temperature-rise/

148. WMO, 2015. Monitoring Ocean Carbon and Ocean Acidification. Climate Change Bulletin Vol 64(1)-2015

149. Ocean Acidification due to increasing carbon dioxide. Policy Document 12/05, The Royal Society, June 2005

150. refers to findings of the World Ocean Circulation Experiment (WOCE) and the Joint Global Ocean Flux Study (JGOFS)

151. Clarkson, M.O. et al 2015. Ocean acidification and the Permo-Triassic mass extinction. Science, 2015 DOI: 10.1126/science.aaa0193

152. Ocean Acidification. Ocean Portal, Smithsonian National Museum of Natural History, 2016 http://ocean.si.edu/ocean-acidification

153. Steinfeld, H. et al. Livestock's long shadow: environmental issues and options. (2006)

154. Solomon, S et al. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. (Intergovernmental Panel on Climate Change (IPCC), 2007)

155. International Program on the State of theOcean: State of the Oceans Report, 2013

156. What is Ocean Acidification?- The Chemistry. NOAA PMEL Carbon Program http://www.pmel.noaa.gov/co2/story/What+is+Ocean+Acidification%3F

157. 800,000 Year Record of Carbon Dioxide (CO2) Concentrations, Monitoring References Global Climate Change Indicators, 6 April 2016 https://www.ncdc.noaa.gov/monitoring-references/faq/indicators.php

158. Source of Half Earth's Oxygen Gets Little Credit, National Geographic News, June 7, 2004

159. Phytoplankton Population Drops 40 Percent Since 1950. Climate Wire, Scientific American, 29 July 2010

160. Phytoplankton Population Drops 40 Percent Since 1950. Climate Wire, Scientific American, 29 July 2010

161. Chust, G. et al, 2014. Biomass changes and trophic amplification of plankton in a warmer ocean. Global Change Biology, 2014; DOI: 10.1111/gcb.12562

162. Rodale Institute. Regenerative Organic Agriculture and Climate Change: A Down-to-Earth Solution to Global Warming. (Rodale Institute, 2014).

163. Drivers of Decline. Global Ocean Commission Research, 2015

164. Myers, R. A. & Worm, B. Rapid worldwide depletion of predatory fish communities. Nature 423, 280–283 (2003).

165. referring to Living Blue Planet Report: Species, Habitats and Human Well-being. WWF,2015

166. referring to Worm et al (2013) Global catches, exploitation rates, and rebuilding options for sharks. Marine Policy 40: 194–204.

167. Forests, Fisheries, Agriculture: A Vision for Sustainability. UNFAO Expert Consultation, Rome, Italy, 2-4 December 2009

168. Naam, R, 2013. The Limits of the Earth, Part 1: Problems. Scientific American Guest Blog, April 17, 2013

169. Keledjian, A, et al (2014) Wasted Catch: Unsolved Problems in US Fisheries, Oceania report, March 2014

170. Williams, A. et al,(2011) The Future of Arctic Enterprise: Long-term outlook and implications. Smich School of Enterprise and the Environment, University of Oxford, November 2011

171. Watson, R. A. et al. Global marine yield halved as fishing intensity redoubles. Fish Fish. 14, 493–503 (2013).

172. Mood, A & Brooke, P, 2010. Estimating the number of fish caught in global fishing each year. Research paper for Fishcount.org.uk, 2010

173. referring to Stokstad, E. Global Loss of Biodiversity Harming Ocean Bounty. Science 314, 745–745 (2006)

174. James Cameron on the vegan solution, presentation uploaded 6 October 2012. https://www.youtube.com/watch?v=S9lU-4wpyFVo

175. Saunois, M., Jackson, R. B., Bousquet, P., Poulter, B. & Canadell, J. G. The growing role of methane in anthropogenic climate change. Environ. Res. Lett. 11, 120207 (2016)

176. Stocker, T., Qin, D., Plattner, G.-K. & Tignor, M. Climate Change 2013, The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. (IPCC, 2013).

177. referring to Stocker, T., Qin, D., Plattner, G.-K. & Tignor, M. Climate Change 2013, The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. (IPCC, 2013).

178. Solomon, S et al. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. (Intergovernmental Panel on Climate Change (IPCC), 2007)

179. Climate Change Indicators: Atmospheric Concentrations of Greenhouse Gases, US EPA, 2015 from https://www.epa.gov/climate-indicators/climate-change-indicators-atmospheric-concentrations-greenhouse-gases

180. Mascarelli, A. A sleeping giant? Nat. Rep. Clim. Change 46–49 (2009). doi:10.1038/climate.2009.2

181. Warming aids Arctic economies but far short of 'cold rush'. Scientific American Sustainability series, from https://www.scientificamerican.com/article/warming-aids-arctic-economies-but-far-short-of-cold-rush/

182. Welch, C. Five reasons we need to act now on climate change. National Geographic, Dec 4 2015

183. Houweling, S. et al, 2006 Atmospheric constraints on global emissionsÐf methane from plants. Geophys. Res. Lett., 33, L15821

184. Steinfeld, H. et al. Livestock's long shadow: environmental issues and options. (2006)

185. referring to Ripple, W. J. et al. Ruminants, climate change and climate Ðolicy. Nat. Clim. Change 4, 2–5 (2014)

186. Bell, D, 2009. The Methane Makers, BBC News Magazine, 28 Oct 2009

187. referring to Howarth, R. W. A bridge to nowhere: methane Þmissions and the greenhouse gas footprint of natural gas. ÐEnergy Sci. Eng. 2, 47–60 (2014)

188. About Methane. Global Methane Initiative background brief, 2016 from https://www.globalmethane.org/about/methane.aspx

189. Bailey, R., Froggatt, A. & Wellesley, L. Livestock – Climate Change's Forgotten Sector: Global Public Opinion on Meat and Dairy Consumption. (Energy, Environment and Resources , Chatham House, 2014).

190. Climate Scoreboard, UN Climate Pledge Analysis, Climate Interactive 2017, from https://www.climateinteractive.org/programs/scoreboard/

191. Holmes, C. D., Prather, M. J., Søvde, O. A. & Myhre, G. Future methane, hydroxyl, and their uncertainties: key climate and

emission parameters for future predictions. Atmos Chem Phys 13, 285–302 (2013)

192. Smith, K. R., Desai, M. A., Rogers, J. V. & Houghton, R. A. Joint CO2Ðand CH4 accountability for global warming. Proc. Natl. Acad. Sci. Ð2013). doi:10.1073/pnas.1308004110

193. About Methane. Global Methane Initiative background brief, 2016 from https://www.globalmethane.org/about/methane.aspx

194. referring to Ripple, W. J. et al. Ruminants, climate change and climate policy. Nat. Clim. Change 4, 2–5 (2014)

195. referring to MEA. Millennium Ecosystem Assessment. (2005). Available at: http://www.unep.org/maweb/en/index.aspx. (Accessed: 13th March 2013)

196. Soil Erosion and Degradation, Overview. WWF series on Threatsßrom http://www.worldwildlife.org/threats/soil-erosion-and-degradation

197. Arsenault, C. Only 60 years of Farming Left If Soil Degradation Continurs, Scientific American Sustainability series, 6 Dec 2014

198. Tackling Food Waste: The EU's contribution to a global issue. EPRS Briefing 23/1/2014 from http://www.europarl.europa.eu/RegData/bibliotheque/briefing/2014/130678/LDM_BRI%282014%29130678_REV1_EN.pdf

199. Desertification as a global problem. IFAD briefing, 2001,Ðfrom https://www.ifad.org/documents/10180/319d29cc-6b4f-4b9a-Øbfe-29a4014f2a1d

200. 168 Countries Affected by Desertification, Country Reports Show. UNCCD Press Release 14/4/2013, from http://www.unccd.int/en/media-center/MediaNews/Pages/highlightdetail.aspx?HighlightID=187

201. ELD Initiative (2015). The Value of Land: Prosperous lands and positive rewards through sustainable land management. Available from http://www.eld-initiative.org/fileadmin/pdf/ELD-main-report_08_web-72dpi_01.pdf

202. Desertification as a global problem. IFAD briefing, 2001, from https://www.ifad.org/documents/10180/319d29cc-6b4f-4b9a-8bfe-29a4014f2a1d

203. referring to Firsing, S. T. Disturbing Times: The State of the Planet and Its Possible Future. (30° South Publishers, 2008).

204. referring to Peacock, K. W. Natural Resources and Sustainable Development. (Infobase Publishing, 2008)

205. Climate Refugees. National Geographic Encyclopedia, Society, Education information series, from http://www.nationalgeographic.org/encyclopedia/climate-refugee/

206. Schwartz, J. 2014. Soil as Carbon Storehouse: New Weapon in Climate Fight? Yale Environment 360 newsletter March 4, 2014Ðeferring to FAO, 2011. The state of the world's land and water resources for food and Agriculture (SOLAW) UNFAO, Rome, 2011

207. Nature and Extent of soil erosion in Europe, Soil Thematic Strategy, TWG Soil Erosion WP2. Report 28 October, 2003

208. Pimentel, D. & Burgess, M. Soil Erosion Threatens Food Production. Agriculture 3, 443–463 (2013).

209. UN Secretary-General Statements and Messages, 5 June 2006. Đlobal Desertification Affecting One Fifth of the World's Population Đne of the most serious threats facing Humanity.Đttp://www.un.org/press/en/2006/sgsm10501.doc.htm

210. Dell'Amore, C. 2010. Africa-wide "Great Green Wall" to halt Sahara's Spread?Đational Geographic magazine, 7 January 2010

211. Africa: Physical Geography. National Geographic Encyclopedia entry, from http://www.nationalgeographic.org/encyclopedia/africa-physical-geography/

212. Dell'Amore, C. 2010. Africa-wide "Great Green Wall" to halt Sahara's Spread?Đational Geographic magazine, 7 January 2010

213. Blume, H.-P. et al. Towards Sustainable Land Use: Furthering Cooperation Between People and Institutions Volume I and II. (Schweizerbart'sche, E., 1998).

214. reporting on Carbon Farming Conference & Expo. Dubbo NSW, 27-28 October 2010. http://carbonfarming.blogspot.com.au/

215. IFAD and Desertification, Topics we Cover, International Fund for Agricultural Development, from https://www.ifad.org/en/topic/tags/desertification/1953052

216. Hertwich, E. 2010 Assessing the Environmental Impacts of Consumption and Production: Priority Products and Materials. (UNEP/Earthprint, 2010).

217. Ehrenberg, R. Global count reaches 3 trillion trees. Nat. News doi:10.1038/nature.2015.18287

218. Aguilar, L, 2008. Reforestation, Afforestation, Deforestation, Climate Change and Gender. IUCN Factsheet, 2008

219. UNEP, UNFAO & UN Forum on Forests. Vital Forest Graphics. ĐUNEP/GRID-Arendal, 2009)

220. Deforestation, Our Earth, Forests information series, WWF Globalßrom http://wwf.panda.org/about_our_earth/deforestation/

221. referring to Crowther, T. W. et al. Mapping tree density at a global scale. Nature 525, 201–205 (2015)

222. UNEP, UNFAO & UN Forum on Forests. Vital Forest Graphics. ĐUNEP/GRID-Arendal, 2009)

223. Deforestation. National Geographic Reference series, from http://www.nationalgeographic.com/environment/global-warming/deforestation/

224. referring to TEEB. TEEB – The Economics of Ecosystems and Biodiversity. (TEEB for Business Coalition, 2010).

225. Global GDP at current prices from 2010 to 2020, Statista- The Statistics Portal, 2017, from https://www.statista.com/statistics/268750/global-gross-domestic-product-gdp/

226. Walsh, B. 2008. Meat: Making Global Warming Worse, Time MagazineĐept 10, 2008

227. Solomon, S et al. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. (Intergovernmental Panel on Climate Change (IPCC), 2007).

228. referring to Reich, P. B. Biogeochemistry: Taking stock of forest carbon. Đat. Clim. Change 1, 346–347 (2011).

229. Bond, T. C. et al. Bounding the role of black carbon in the climate system: A scientific assessment. J. Geophys. Res. Atmospheres n/a–n/a (2013). doi:10.1002/jgrd.50171

230. referring to Nepstad, D. C., Stickler, C. M., Filho, B. S.- & Merry, F. Interactions among Amazon land use, forests and climate: prospects for a near-term forest tipping point. Philos. Trans. R. Soc. B Biol. Sci. 363, 1737–1746 (2008).

231. Measuring the daily destruction of the world's rainforests.Đcientific American, The Sciences series, 2009, from https://www.scientificamerican.com/article/earth-talks-daily-destruction/

232. Baj□elj, B. et al. Importance of food-demand management for climate mitigation. Nat. Clim. Change 4, 924–929 (2014).

233. Urquart, G. et al, 2001. Tropical Deforestation. NASA Earth Observatory, fromĐttps://earthobservatory.nasa.gov/Features/Deforestation/tropical_deforestation_2001.pdf

234. referring to UNEP, UNFAO & UN Forum on Forests. Vital Forest Graphics. (UNEP/GRID-Arendal, 2009)

235. Climate Change: Our Priorities: Forests, Lungs of our Planet. Initiatives, urgent issues, The Nature Conservancy

236. referring to Elias, P, and Lininger, K, 2010. The Plus Side: PromotingĐustainable Carbon Sequestration in Tropical Forests. Union of Üoncerned Scientists, November 2010

237. Meat: Now, it's not personal! but like it or not, meat-eating is becoming a problem for everyone on the planet. World Watch Magazine July/August 2004

238. Bryner, J. 2013. State of the Union: Obama Urges Action on Climate Change. Live Science, Planet Earth, February 12, 2013

239. referring to HadCRUT4 near surface temperature observation Ýatasets, from http://www.metoffice.gov.uk/hadobs/hadcrut4/data/Üurrent/download.html

240. referring to NASA GISS BLOBAL Land-Ocean Temperature Index, from https://data.giss.nasa.gov/gistemp/tabledata_v3/GLB.Ts+dSST.txt

241. referring to Vital Climate Graphics, based on the IPCC reports, from http://www.grida.no/publications/79

242. World Bank Group President Jim Yong Kim's Statement at the Spring Meetings 2013 Opening Press Conference, April 18 2013, from http://www.worldbank.org/en/news/speech/2013/04/18/world-bank-group-president-jim-yong-kim-statement-at-the-spring-meetings-2013-opening-press-conference

243. referring to: 2014 Climate Change Adaptation Roadmap,ĐS Dept of Defense, Alexandria, VA, June 2014

244. Pachauri, R. K. Climate Change 2007, Synthesis Report. Contribution of Working Groups I,II and III to the Fourth Assessment Report. (IPCC, 2007)

245. referring to Kjeldsen, K. K. et al. Spatial and temporal distribution ofĐmass loss from the Greenland Ice Sheet since AD 1900. Nature 528, Ó96–400 (2015).

246. referring to: Larsen, C. F. et al. Surface melt dominates Alaska glacier mass balance. Geophys. Res. Lett. 42, 2015GL064349 (2015).

247. Press Release No. 1002- Record Greenhouse Gas Levels Impact Atmosphere and Oceans, 9 September 2014

248. Climate Change: How do we Know? Climate change series, Facts, Evidence, from https://climate.nasa.gov/evidence/

249. referring to Saunois, M., Jackson, R. B., Bousquet, P., Poulter, B. & Canadell, J. G. The growing role of methane in anthropogenic climate change. Environ. Res. Lett. 11, 120207 (2016).

250. Globally Averaged CO2 levels reach 400 parts per million in 2015, World Meteorological Organization press release, 24 October 2015

251. Press Release No. 1002- Record Greenhouse Gas Levels Impact Atmosphere and Oceans, 9 September 2014

252. Climate Change: How do we Know? Climate change series, Facts, Evidence, from https://climate.nasa.gov/evidence/

253. Tackling Climate Change through Livestock: A global Assessment of Þmissions and Mitigation Opportunities. FAO, Rome, 2013

254. frp, https://fas.org/sgp/crs/misc/RL32721.pdf

255. Growing Greenhouse Gas Emissions Due to Meat Production.ÐNEP/GRID Climate Change, Resource Efficiency, Ecosystem Management, October 2012 from https://na.unep.net/geas/getuneppagewitharticleidscript.php?article_id=92

256. Parry, M. L., Canziani, O. E., Palutikof, J. & van der Linden, P. Climate Change 2007 – Impacts, Adaptation and Vulnerability Contribution of Working Group II to the Fourth Assessment Report of the IPCC. (Cambridge University Press, 2007).

257. referring to Challinor, A. J. et al. A meta-analysis of crop yield under climate change and adaptation. Nat. Clim. Change 4, 287–291 (2014).

258. Bondeau, A. et al. Turn down the heat : climate extremes, regional Ðmpacts, and the case for resilience - full report. 1–254Ð(The World Bank, 2013).

259. referring to IPCC, 2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. (Intergovernmental Panel on Climate Change (IPCC), 2014).

260. Hallegatte, S et al, 2016. Shock Waves: Managing the Impacts of Climate Change on Poverty, Climate Change and Development Series, Washington, DC: World Bank doi:10.1596/978-1-4648-0673-5

261. referring to IPCC, 2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. (Intergovernmental Panel on Climate Change (IPCC), 2014).

262. referring to GHF, 2009. Forum 2009:Climate Change - The Anatomy of a Silent Crisis. Global Humanitarian Forum, Geneva, 2009

263. referring to WMO, 2014. Atlas of Mortality and Economic Losses from Ðeather, Climate and Water Extremes

(1970-2012). WMO-No. 1123Đorld Meteorological Organization 2014

264. Droughts, the Most Devastating Disasters, Set to Increase, Warn Climate Change Experts. UN Meetings Coverage and Press Releases, 22 May 2013. from http://www.un.org/press/en/2013/iha1319.doc.htm

265. UNEP/GRID Arendal graphic, 2009, from Blue Carbon- The Role of Healthy Oceans in Binding Carbon, at http://www.grida.no/resources/7324

266. Wellesley, L., Happer, C. & Froggatt, A. Changing Climate, Changing Diets: Pathways to Lower Meat Consumption. (Chatham House Report, 2015).

267. Goodland, R. & Anhang, J. Livestock and Climate Change: What if the key actors in climate change are cows, pigs and chickens? World Watch Magazine 10–19 (2009).

268. Wedderburn-Bisshop, G., Longmire, A. & Rickards, L. A. Neglected Đransformational Responses: Implications of Excluding Short Lived Þmissions and Near Term Projections in Greenhouse Gas Accounting. Đnt. J. Clim. Change Impacts Responses 7, 11–27 (2015).

269. Steinfeld, H. et al. Livestock's long shadow: environmental issues and options. (2006)

270. Scarborough, P. et al. Dietary greenhouse gas emissions of meat-eaters,Đfish-eaters, vegetarians and vegans in the UK. Clim. Change Ñ25, 179–192 (2014).

271. referring to GHF, 2009. Forum 2009:Climate Change - The Anatomy of a Silent Crisis. Global Humanitarian Forum, Geneva, 2009

272. Bondeau, A. et al. Turn down the heat : climate extremes, regional impacts, and the case for resilience - full report. 1–254 (The World Bank, 2013).

273. Mann, M. 2014. Earth Will Cross the Climate Danger Threshold by 2036. Đcientific American article, April 1, 2014.

274. Tilman, D. & Clark, M. Global diets link environmental sustainability and human health. Nature 515, 518–522 (2014).

275. UNEP, 2009. The Environmental Food Crisis: The Environment's Role In Averting Future Food Crises. A UNEP Rapid Response Assessment. United Nations Environment Programme, GRID-Arendal, www.grida.no

276. EJF, 2009. No Place Like Home: What next for climate refugees? Þnvironmental Justice Foundation, London

277. Bondeau, A. et al. Turn down the heat : climate extremes, regional impacts, and the case for resilience - full report. 1–254 (The World Bank, 2013)

278. Jim Yong Kim, 2012. A World 4 Degrees Hotter? We Must avoid it. OPED, World Bank , November 19, 2012

279. Solomon, S et al. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. (Intergovernmental Panel on Climate Change (IPCC), 2007).

280. How is Today's Warming Different from the Past? NASA Earth Observatory Feature story, page 3, from https://earthobservatory.nasa.gov/Features/GlobalWarming/page3.php

281. Press Release No. 1002- Record Greenhouse Gas Levels Impact Útmos-

phere and Oceans, 9 September 2014

282. Wellesley, L., Happer, C. & Froggatt, A. Changing Climate, Changing Diets: Pathways to Lower Meat Consumption. (Chatham House Report, 2015)

283. Wellesley, L, Can eating less meat help reduce climate change?ÛBC News: Science and Environment, 24 November 2015

284. Stehfest, E. et al. Climate benefits of changing diet. Clim. Change 95, 83–102 (2009).

285. UNEP. Assessing the Environmental Impacts of Consumption and Production: Priority Products and Materials, A Report of the Working Group on the Environmental Impacts of Products and Materials to the International Panel for Sustainable Resource Management. (UNEP/Earthprint, 2010).

286. Bailey, R., Froggatt, A. & Wellesley, L. Livestock – Climate Change's Forgotten Sector: Global Public Opinion on Meat and Dairy Consumption. (Energy, Environment and Resources , Chatham House, 2014).

287. Walsh, B. Meat: Making Global Warming Worse, Time Science, Sept 10, 2008

288. referring to UNEP. Assessing the Environmental Impacts of Consumption and Production: Priority Products and Materials, A Report of the Working Group on the Environmental Impacts of Products and Materials to the International Panel for Sustainable Resource Management. (UNEP/Earthprint, 2010).

289. Rodale Institute. Regenerative Organic Agriculture and Climate Change: A Down-to-Earth Solution to Global Warming. (Rodale Institute, 2014).

290. Risku-Norja, H., Kurppa, S. & Helenius, J. Dietary choices and greenhouse gas emissions – assessment of impact of vegetarian and organic options at national scale. Prog. Ind. Ecol. Int. J. 6, 340–354 (2009)

291. Springmann, M., Godfray, H. C. J., Rayner, M. & Scarborough, P. Analysis and valuation of the health and climate change cobenefits of dietary change. Proc. Natl. Acad. Sci. 113, 4146–4151 (2016)

292. referring to Springmann, M., Godfray, H. C. J., Rayner, M. & Scarborough, P. Analysis and valuation of the health and climate change cobenefits of dietary change. Proc. Natl. Acad. Sci. 113, 4146–4151 (2016)

293. referring to Springmann, M., Godfray, H. C. J., Rayner, M. & Scarborough, P.ÐAnalysis and valuation of the health and climate change cobenefits of dietary Ühange. Proc. Natl. Acad. Sci. 113, 4146–4151 (2016)

294. Ranganathan, J. and Waite, R. Sustainable Diets: What You need to Know in 12 Charts. World Resources Institute April 20, 2016

295. Bailey, R., Froggatt, A. & Wellesley, L. Livestock – Climate Change's Forgotten Ðector: Global Public Opinion on Meat and Dairy Consumption. ÐEnergy, Environment and Resources , Chatham House, 2014).

296. Dunmore, C. Farm Subsidies still get top share of EU austerity budget. Reuters article, Feb 8, 2013

297. Milking Taypayers: As Crop prices fall, farmers grow subsidies instead. The Economist print edition, United States, Feb 12 2015

www.worldpreservationfoundation.com