

Introduction: Breaking the Taboo

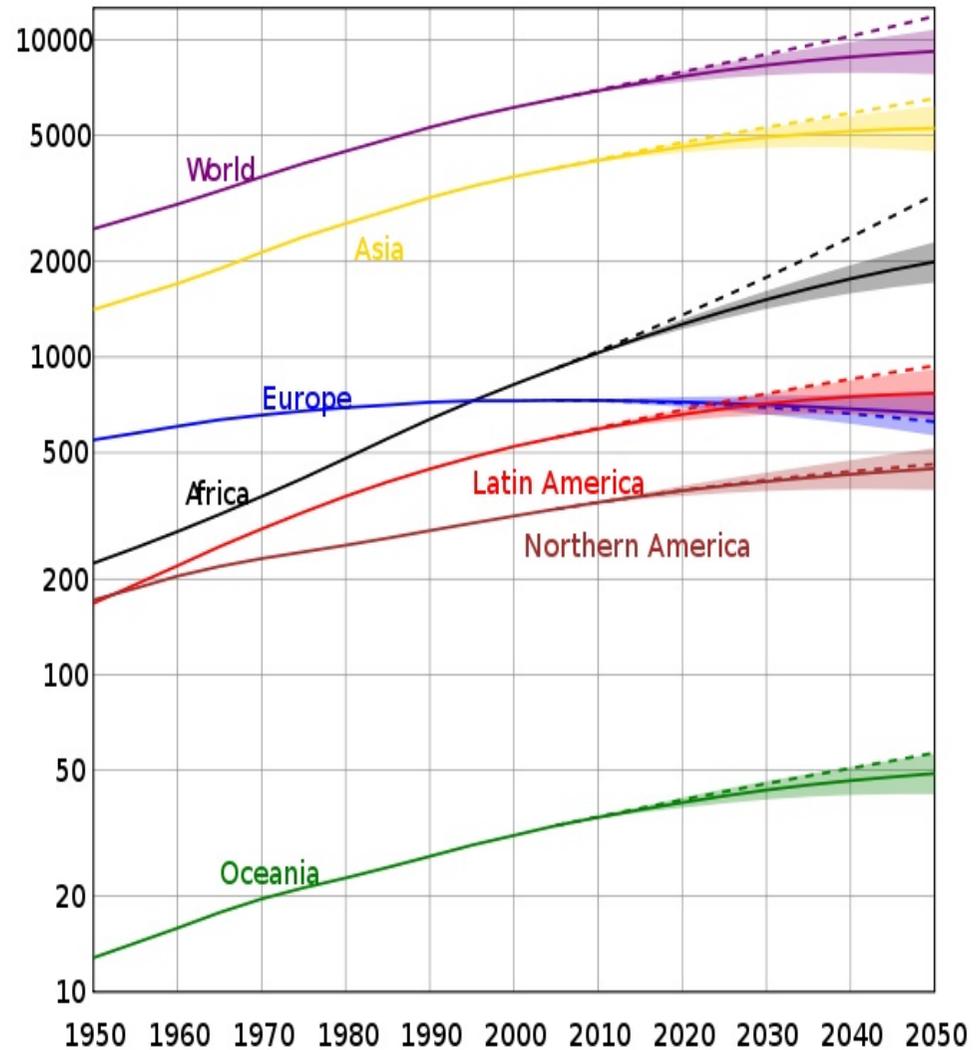
Carrying Capacity: The population overshoot

M. Dittmar conCERNed workshop February 22.2010

- ***6.8 billion people...***
- ***Some definitions***
- ***In perspective***

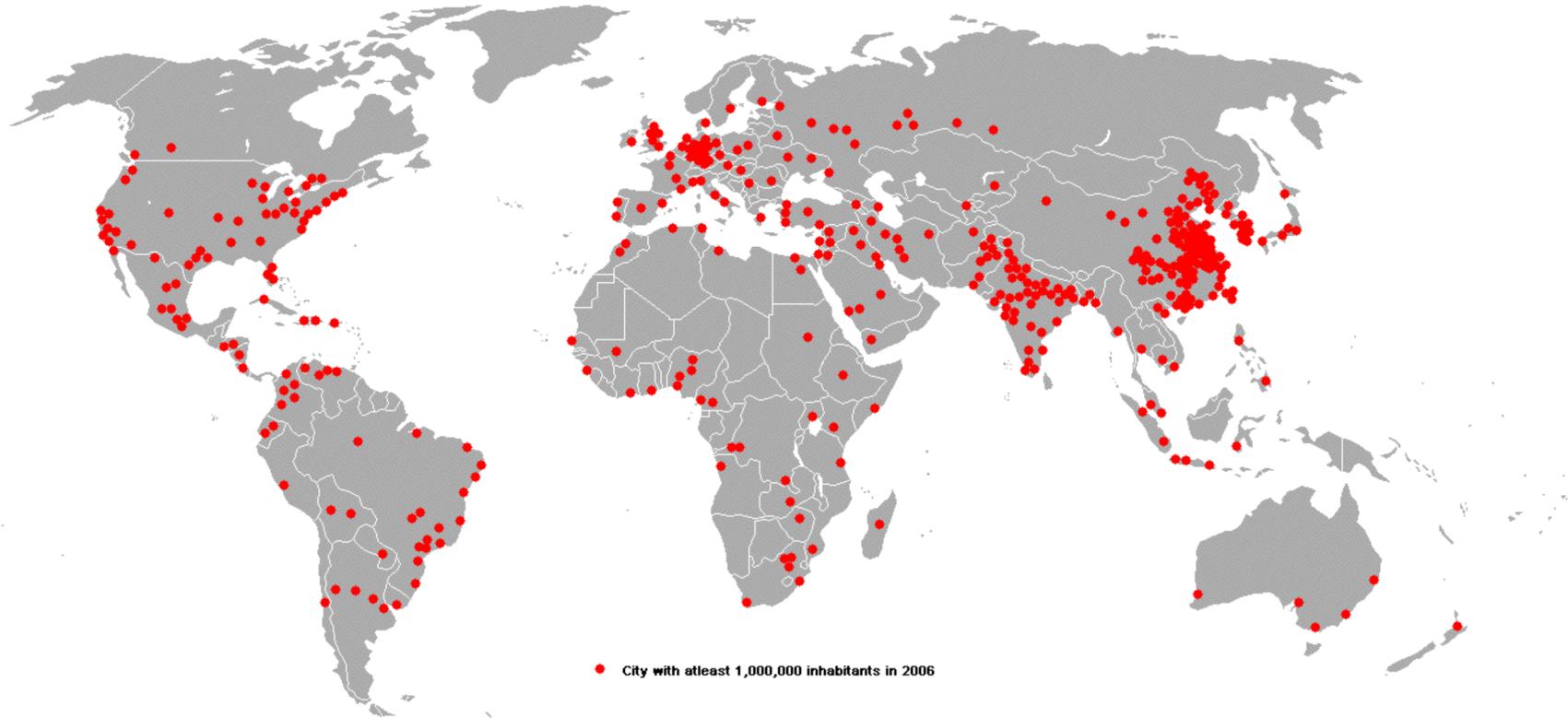
6.8 billion people... (I)

- Where and how do these people live?
- Perspectives and assumptions?
- The year 2050:
10 billion people a realistic option?
- How much space is needed for other species?

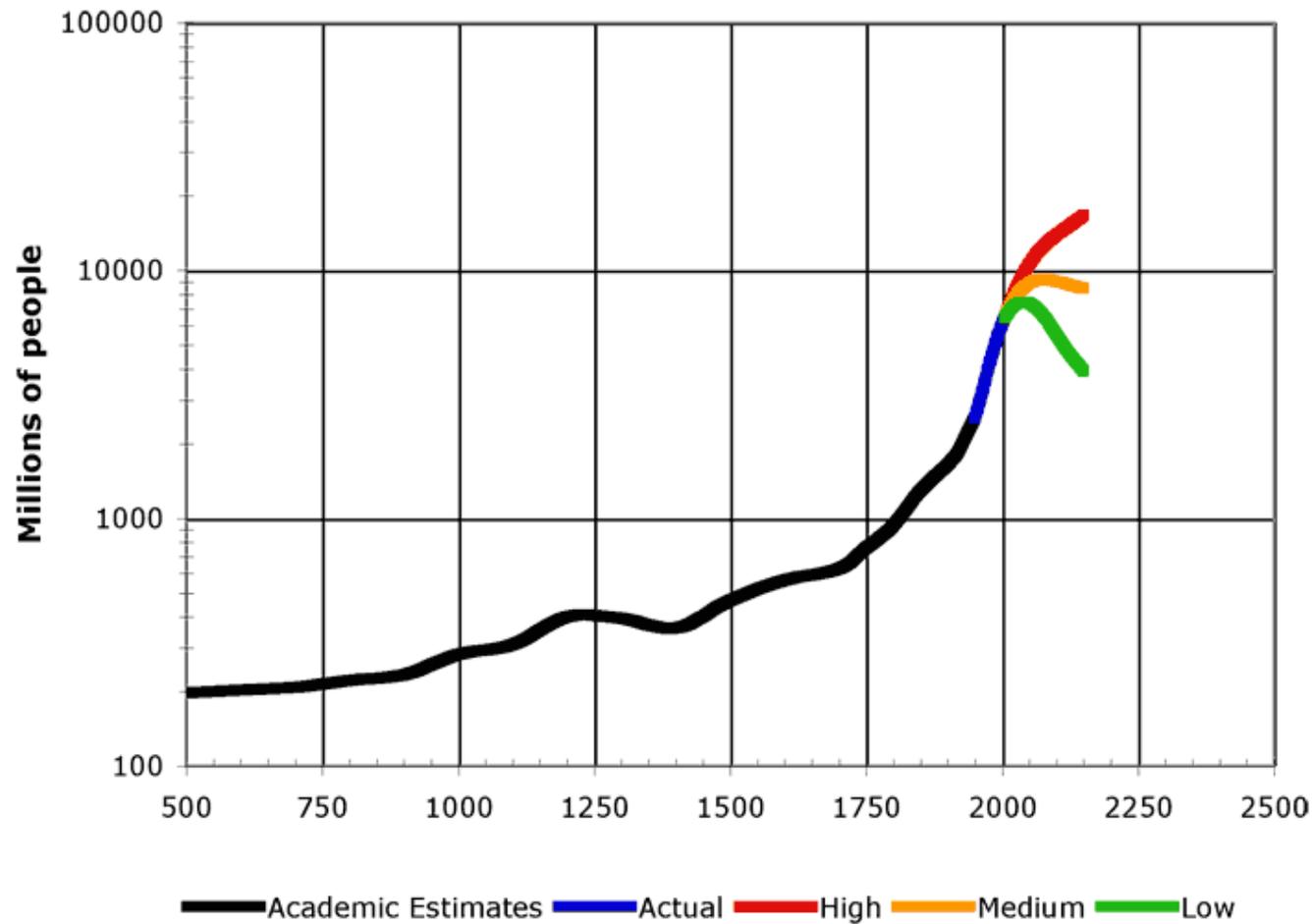


6.8 billion people... (II)

Mega Cities now



6.8 billion people... (III) future options?



6.8 billion people... (IV) future options?

- **Can the planet earth support 10 billion people?**
If yes.. What is required for a decent living?
If no.. How many people can be supported?
- **Are we destroying the life support system of our planet?
Is our lifestyle unsustainable?**
If yes .. Are we stealing from future generations?
How did we manage to exceed carrying capacity?
If not.. How many people can live sustainable
on our planet without damaging the carrying
capacity for future generations?

Some definitions (I)

- **Carrying capacity:** http://en.wikipedia.org/wiki/Carrying_capacity

The carrying capacity of a biological species in an environment is the population size of the species that the environment can sustain indefinitely, given the food, habitat, water and other necessities available in the environment. ...

As [population density](#) increases, [birth rate](#) often decreases and [death rate](#) typically increases. The difference between the birth rate and the death rate is the "natural increase".

The carrying capacity could support a positive natural increase, or could require a negative natural increase. Thus, the carrying capacity is the number of individuals an environment can support without significant negative impacts to the given organism and its environment.

Below carrying capacity, populations typically increase, while above, they typically decrease. A factor that keeps population size at equilibrium is known as a [regulating factor](#).

Some definitions (IIa)

- **Overpopulation in wild animals:**

(http://en.wikipedia.org/wiki/Overpopulation_in_wild_animals)

.. is a scenario in which the population of a wild species exceeds the [carrying capacity](#) of its [ecological niche](#).

Overpopulation is not a function of the number or density of the individuals, but rather the number of individuals compared to the resources they need to survive. In other words, it is a ratio: *population over resources*.

These resources include primarily drinking water and food, which also imply essential nutrients of the appropriate type, and suitable food sources for the species.

In the wilderness, the problem of animal overpopulation is solved by [predators](#). Predators tend to look for signs of weakness in their prey, and therefore usually first eat the old or sick animals. This has the side effects of ensuring a strong stock among the survivors, and controlling the population. In the absence of predators, animal species are bound by the resources they can find in their environment, but this does not necessarily control overpopulation. In fact, an abundant supply of resources can produce a *population boom* that ends up with more individuals than the environment can support.

Some definitions (IIb)

- **Overpopulation in wild animals:**

(http://en.wikipedia.org/wiki/Overpopulation_in_wild_animals)

In fact, an abundant supply of resources can produce a *population boom* that ends up with more individuals than the environment can support. In this case, starvation, thirst and sometimes violent competition for scarce resources may effect a sharp reduction in population in a very short lapse (a *population crash*).

- [Lemmings](#), as well as other less popular species of [rodents](#), are known to have such cycles of rapid population growth and subsequent decrease. Some animal species seem to have a measure of self-control, by which individuals refrain from mating when they find themselves in a crowded environment. This voluntary abstinence may be induced by stress or by [pheromones](#).

Some definitions (III)

- **Human Overpopulation? (Wikipedia)**

The [scientific consensus](#) is that the current [population expansion](#) and accompanying increase in usage of resources is linked to threats to the [ecosystem](#). The [InterAcademy Panel Statement on Population Growth](#), which was ratified by 58 member academies in 1994, called the expansion in human numbers "unprecedented", and stated that many environmental problems were aggravated by the population expansion.[4] At the time, the world population stood at 5.5 billion, and optimistic scenarios predicted a peak of 7.8 billion by 2050, a number that current estimates show will be reached around 2030.[5]

- **Demographic transition**

United Nation's population projections by location. *Main articles:* [Demographic transition](#) and [Sub-replacement fertility](#) The theory of demographic transition held that, after the [standard of living](#) and [life expectancy](#) increase, [family sizes](#) and [birth rates](#) decline. **However, as new data has become available, it has been observed that after a certain level of development the fertility increases again [19]. This means that both the worry the theory generated about aging populations and the complacency it bred regarding the future environmental impact of population growth are misguided.**

Some definitions (IV)

- **Carrying capacity ... (wikipedia)**

There is wide variability both in the definition and in the proposed size of the Earth's carrying capacity, with estimates ranging from 1 to 1000 billion.

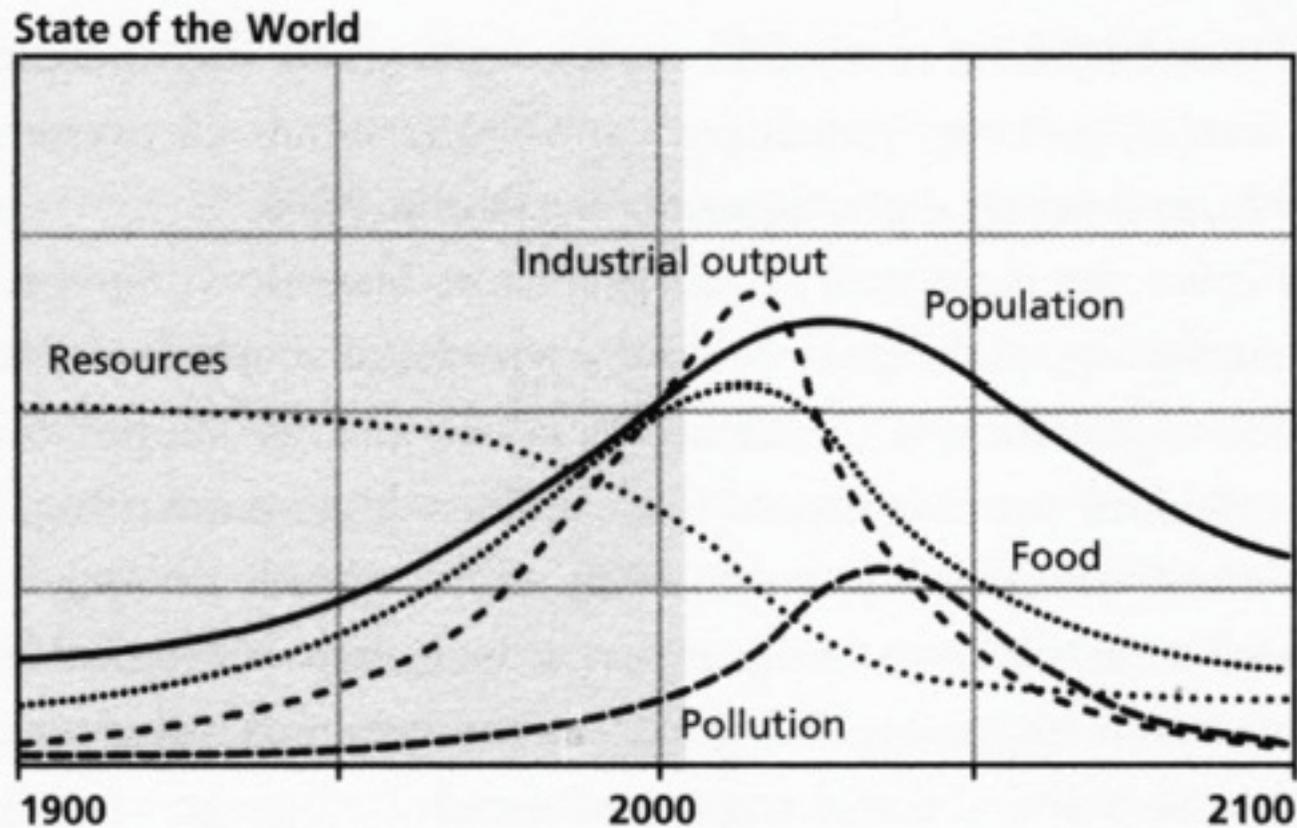
Around two-thirds of the estimates fall in the range of 4 billion to 16 billion (with unspecified standard errors).

Population as a function of food availability

Thinkers such as David Pimentel,[112] a [professor from Cornell University, Virginia Abernethy](#),[113] Alan Thornhill,[114] Russell Hopffenberg[115] and author [Daniel Quinn](#)[116] propose that like all other animals, human populations predictably grow and shrink according to their available food supply - populations grow in an abundance of food, and shrink in times of scarcity.

In perspective ..(I)

(“the limits of growth” Meadows et al 1972)



In perspective .. (II)

- Population Growth = Birth Rate - Death rate!

growth rate in 2009 roughly 1.1% or a plus 70 million people

130 million new born - 60 million death,

- **10 million by starvation and hunger related problems!**
- 50 million people died in WWII (about 10 million per year)
- Spanish flue.. (claims are that 20-50 million people died)

"In 1900, a visitor from another sphere might reasonably have decided that man, as one met him in Europe or America, was a kindly, merciful and generous creature. In 1940 he might have decided, with an equal show of justice, that this creature was diabolically malignant. And yet it was the same creature, under different conditions of stress."

H G Wells, in The Shape of Things to Come, 1933