

Global implications of sustainable sanitation

Panel: The water and sewage challenges and the role of the international cooperation

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Background

Civil Engineering (1999)

MSc (2001)

PhD (2005)



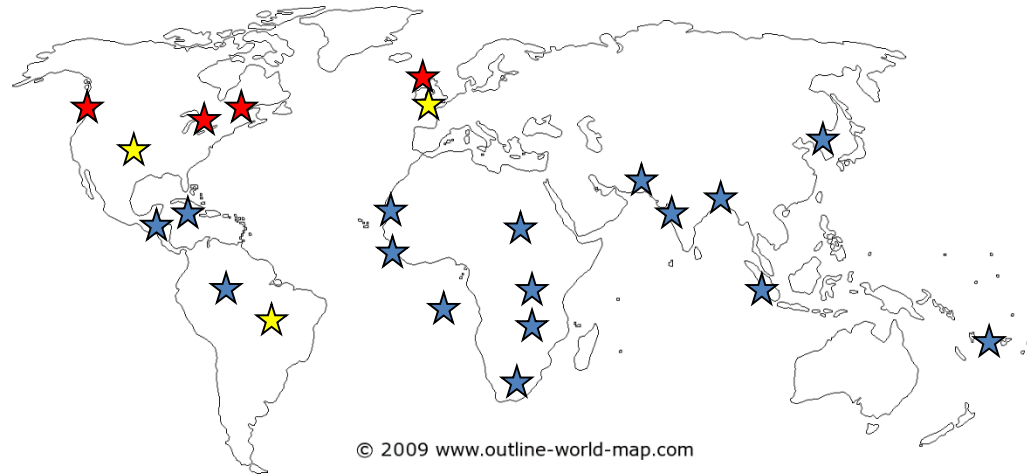
Universidade de Brasília



UNIVERSITY OF
SURREY



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SURREY



PDF (2006)

Lecturer (2007)

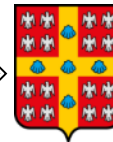
Assis. Prof. (2011) Assoc. Prof. (2017)



Health
Canada



University
of Glasgow



UNIVERSITÉ
LAVAL



University
of Victoria



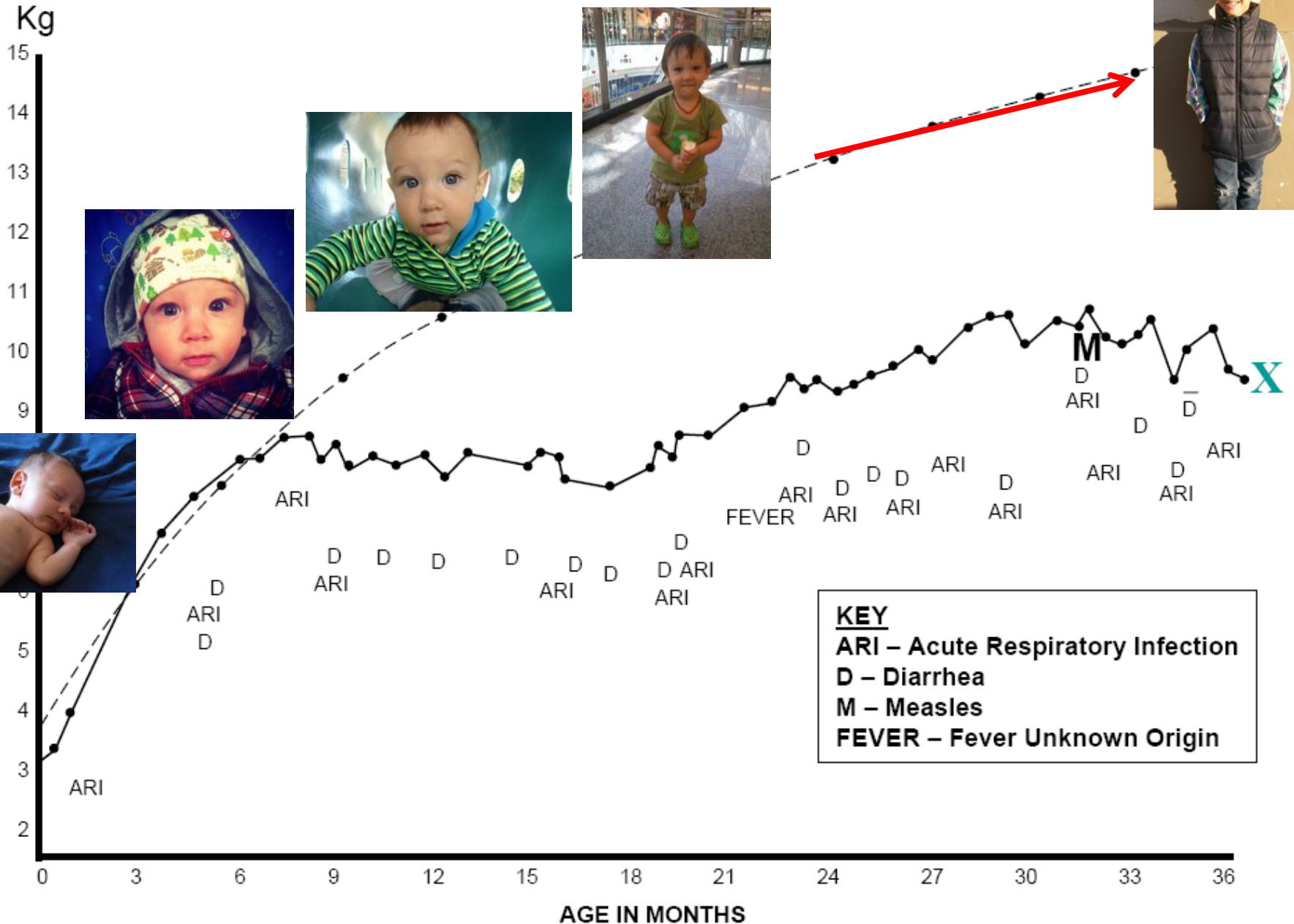
World Health
Organization



Canadian Red Cross
Croix-Rouge canadienne

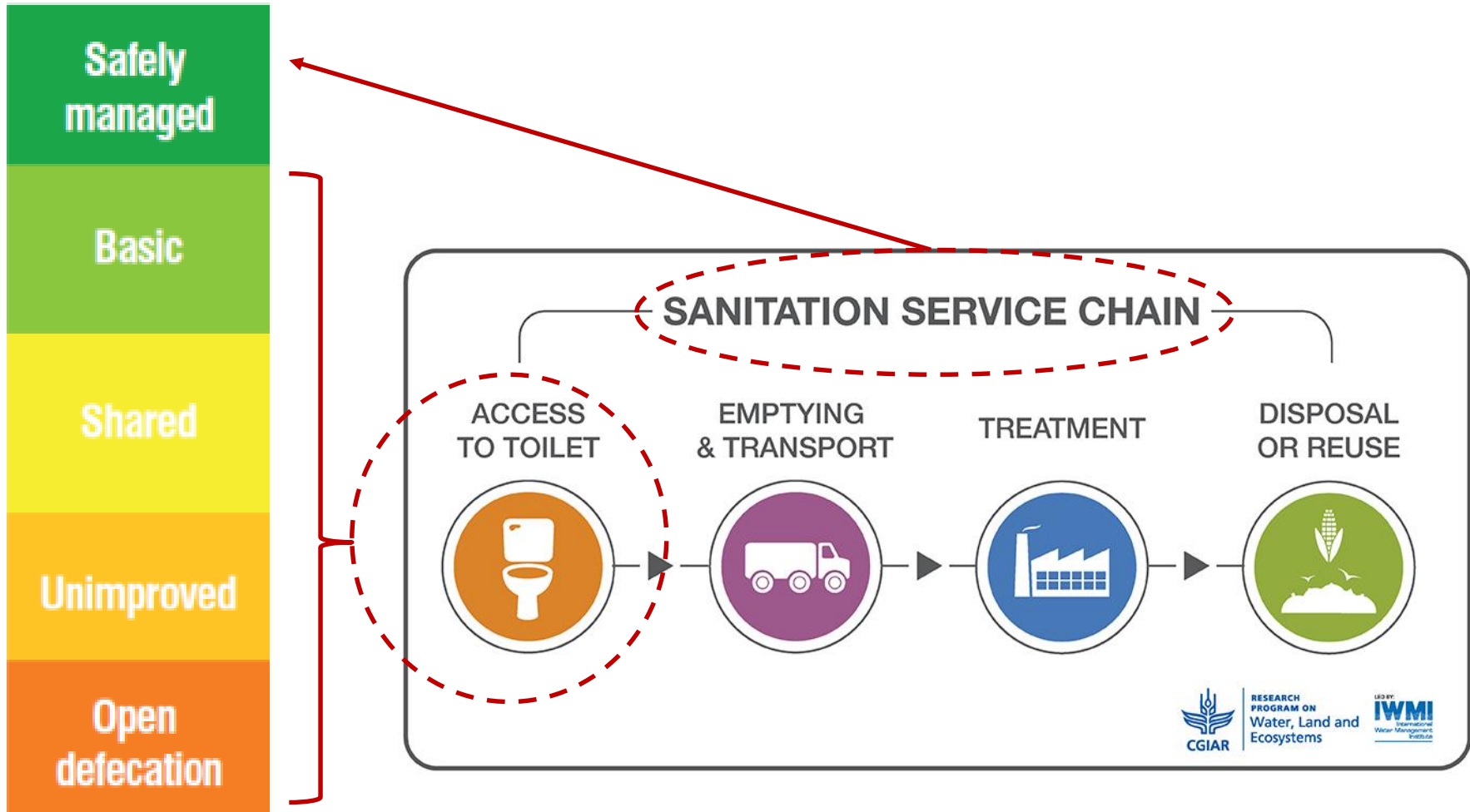


The tale of two boys: Emilio & "Juan"

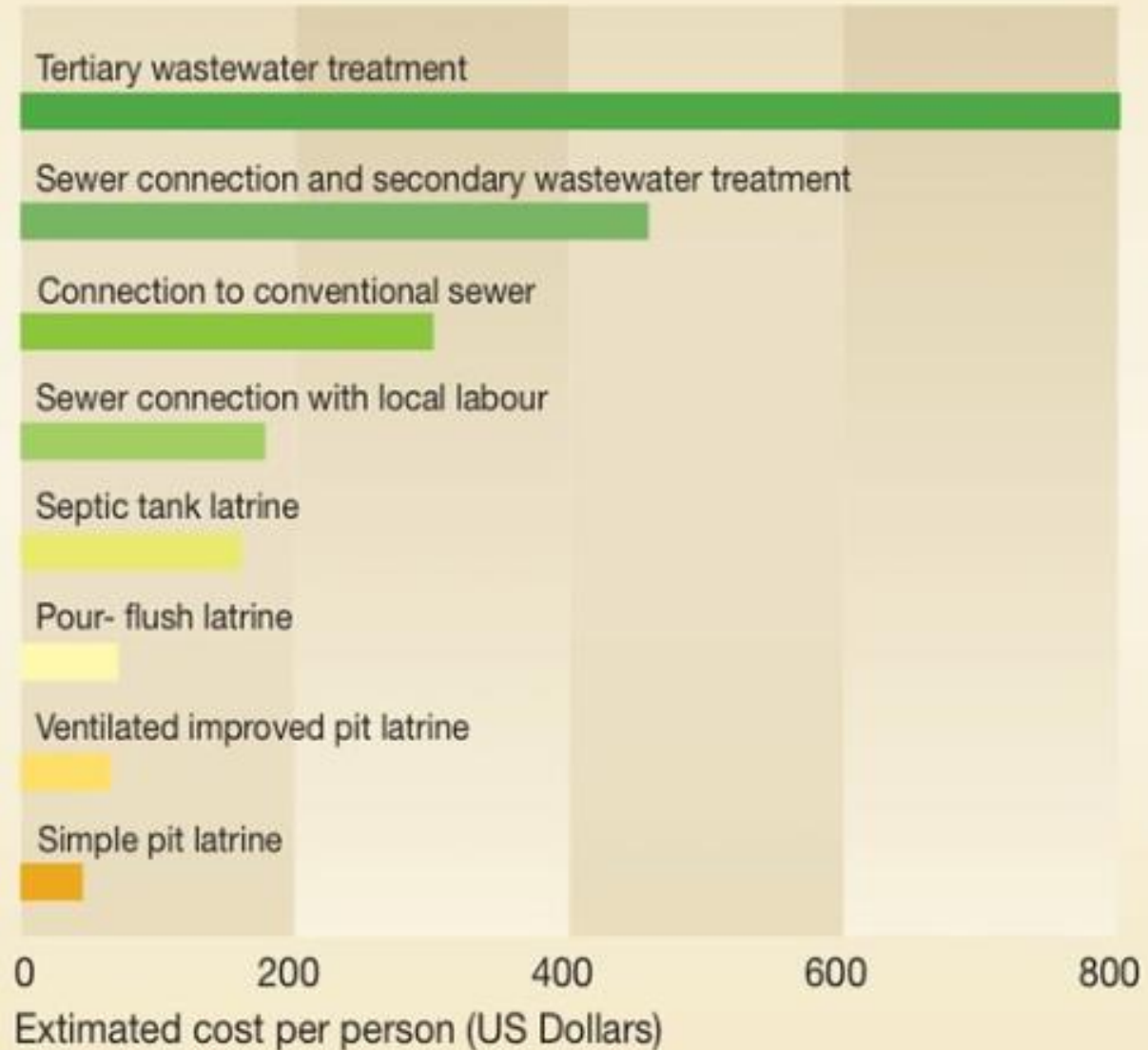


Sustainable Development Goals

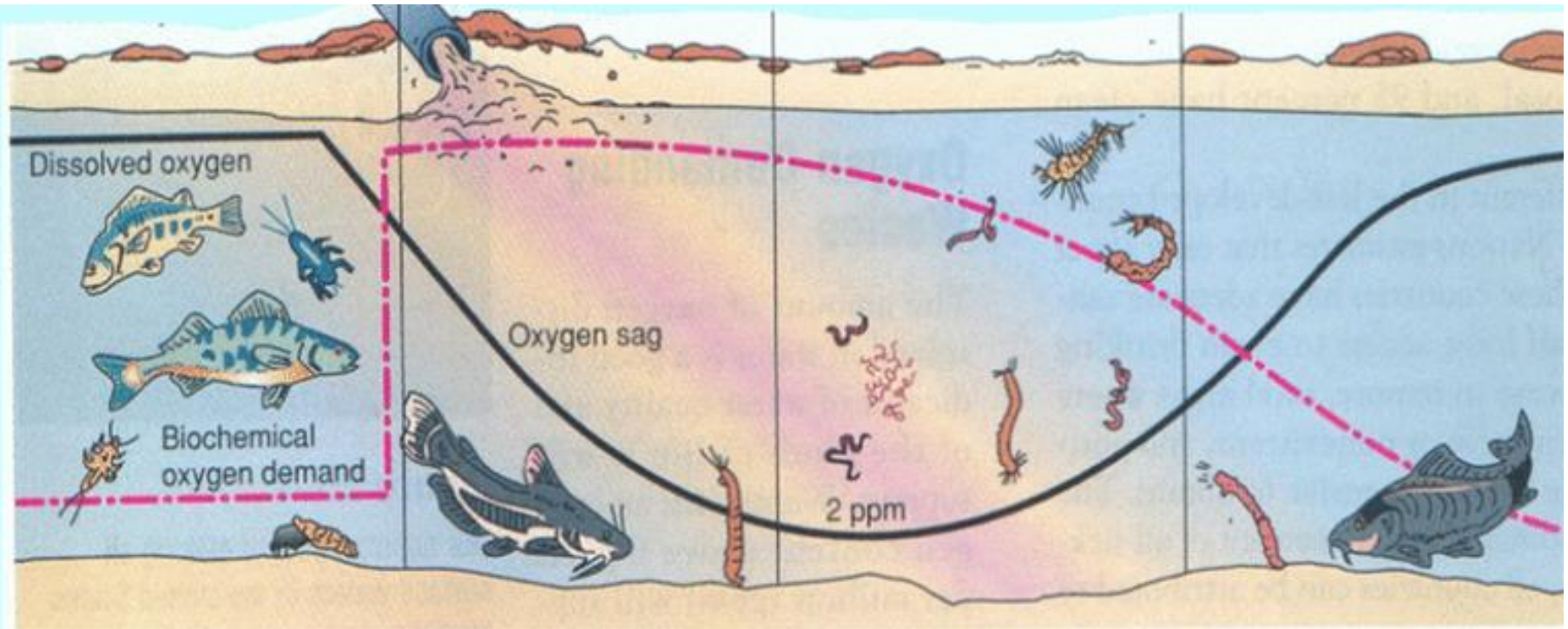
Sanitation



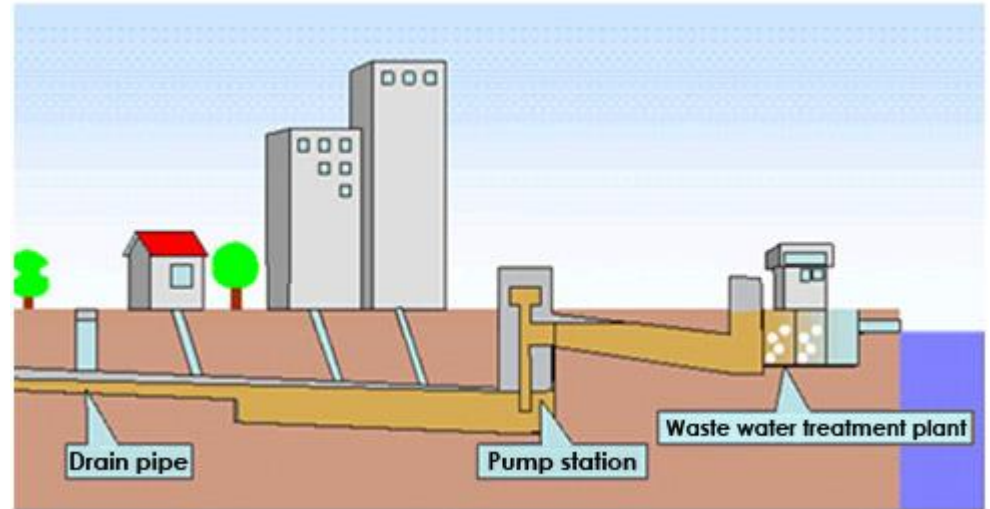
The sanitation ladder



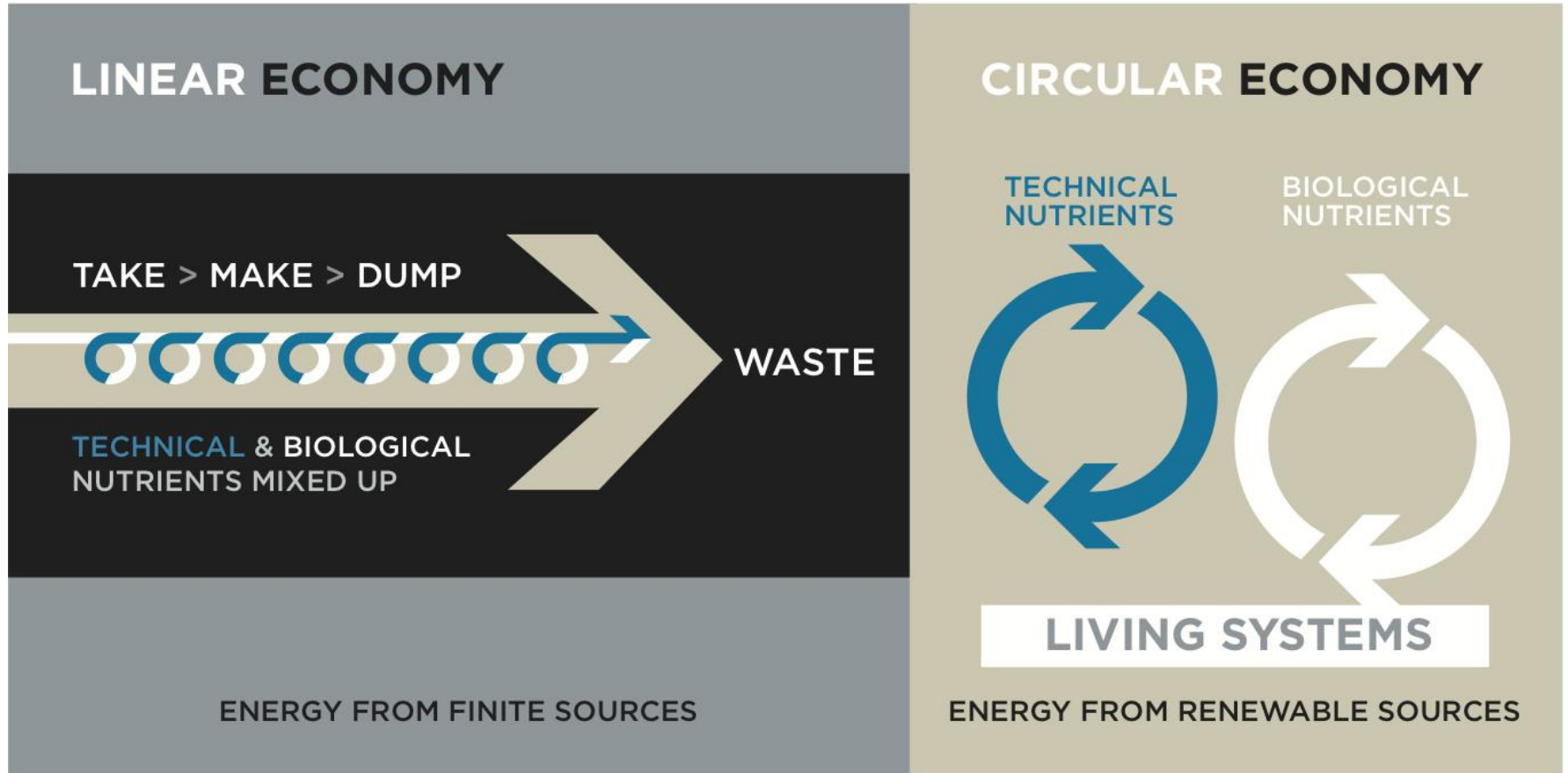
Streeter-Phelps model used for estimating BOD impact on water bodies



Is this really the best we can do?



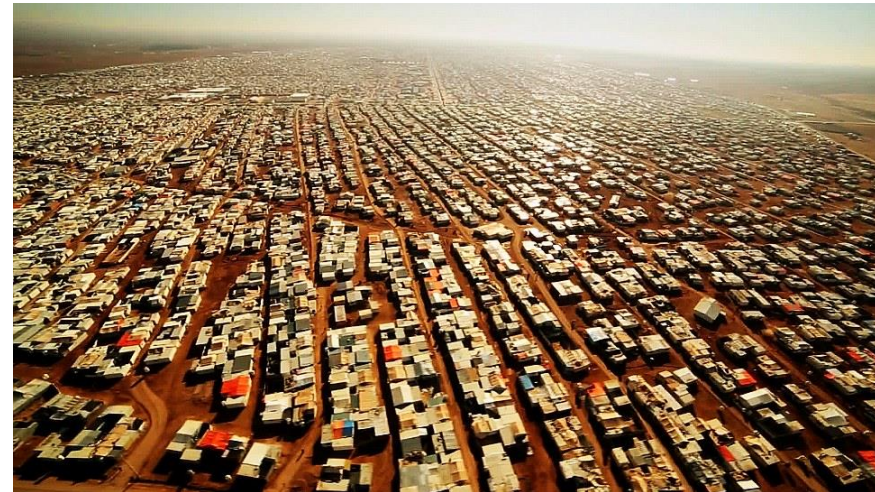
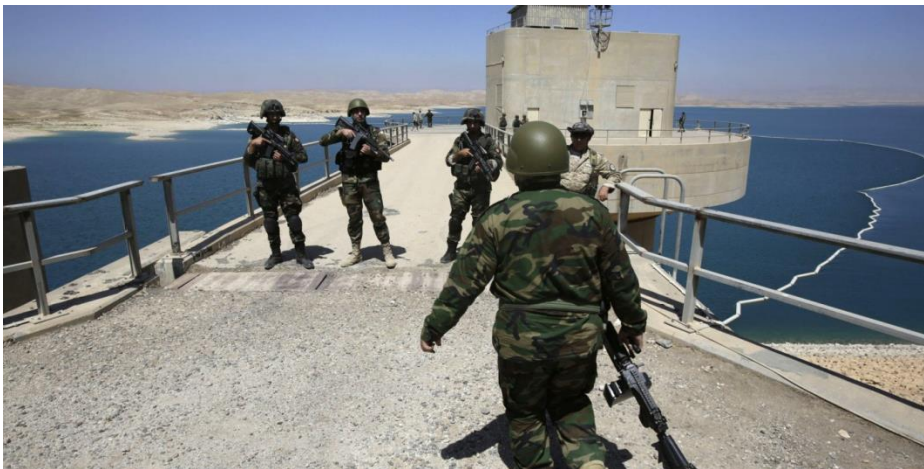
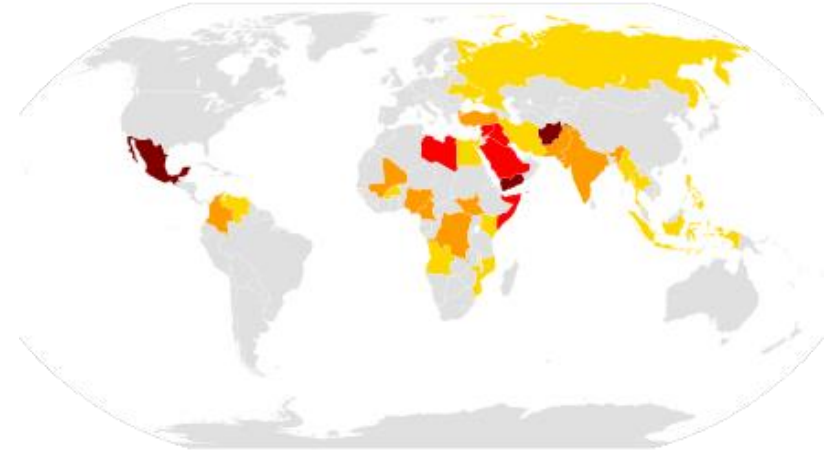
Where are we on the spectrum?



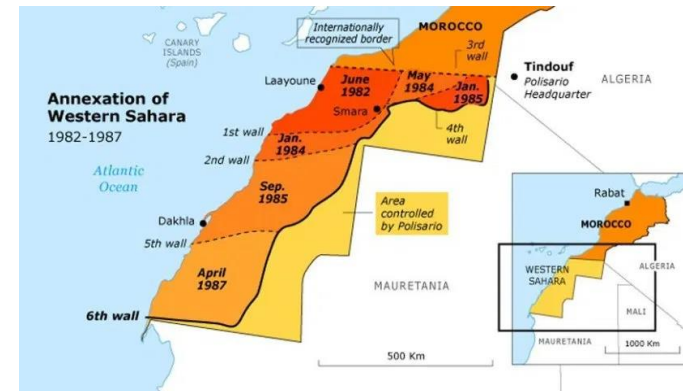
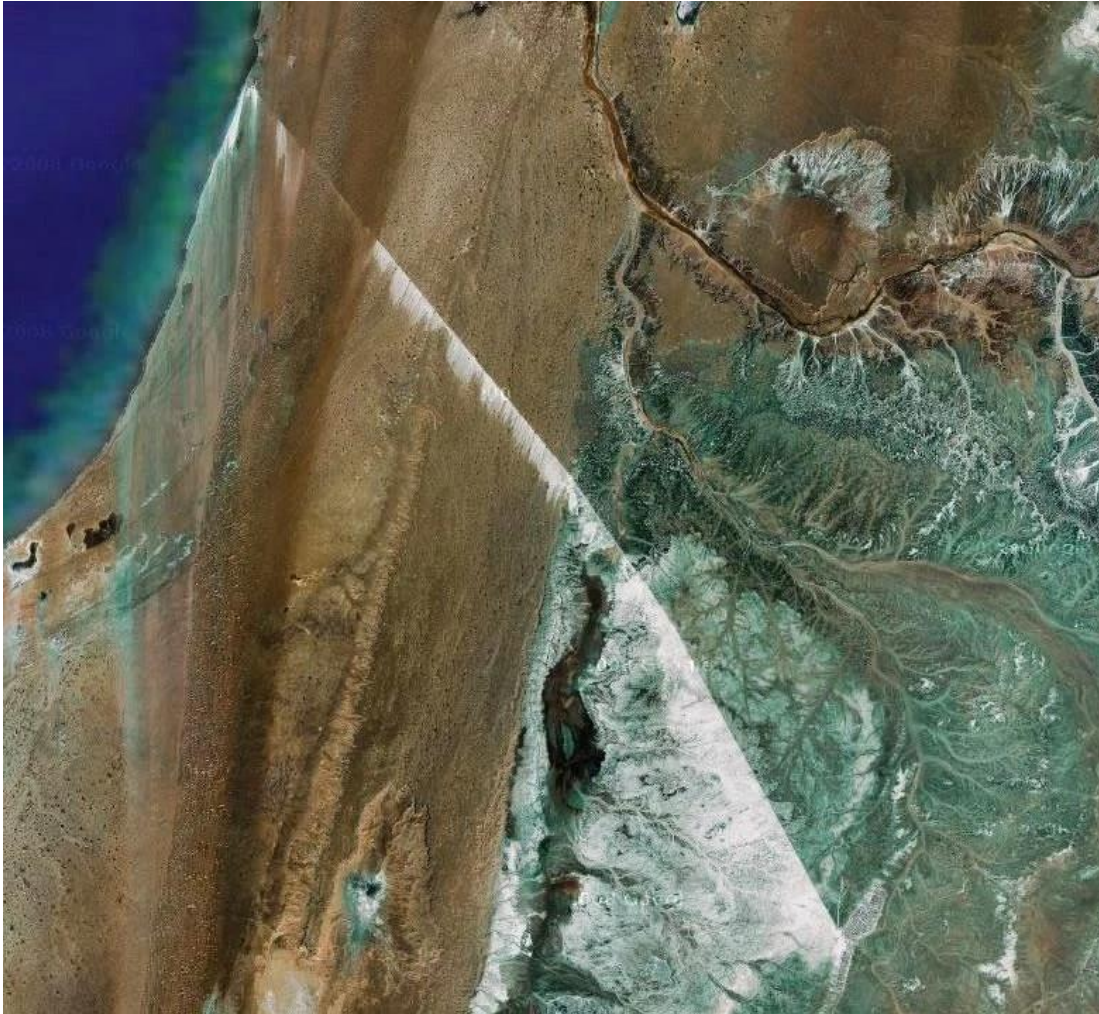
AFTER W McDONOUGH AND M BRAUNGART



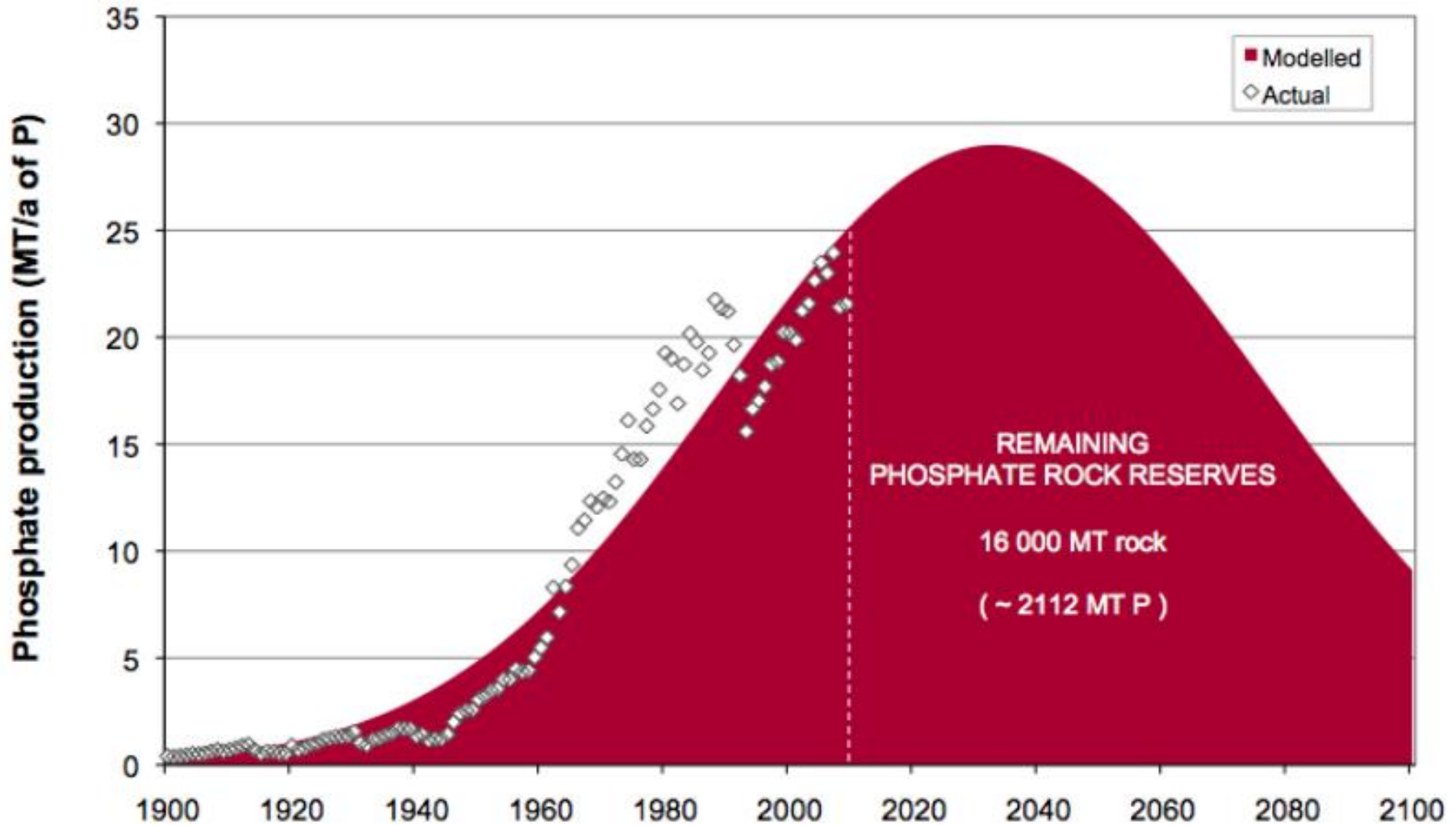
Oil wars and water wars...



Phosphorus wars?

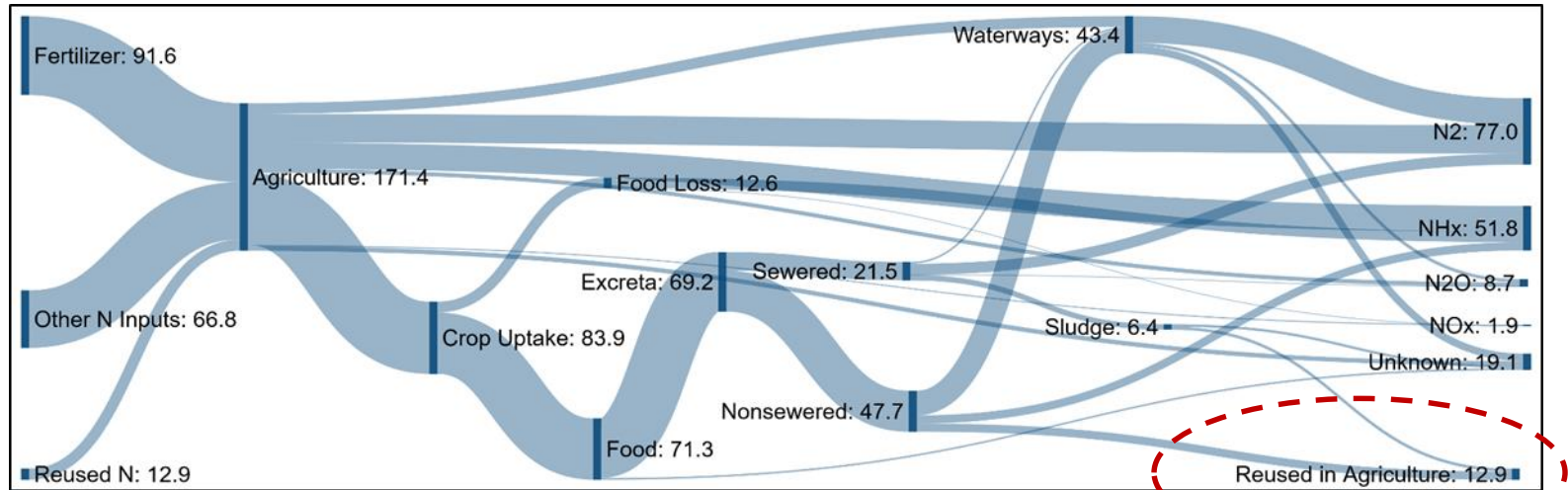


Peak phosphorus is projected to occur by 2040

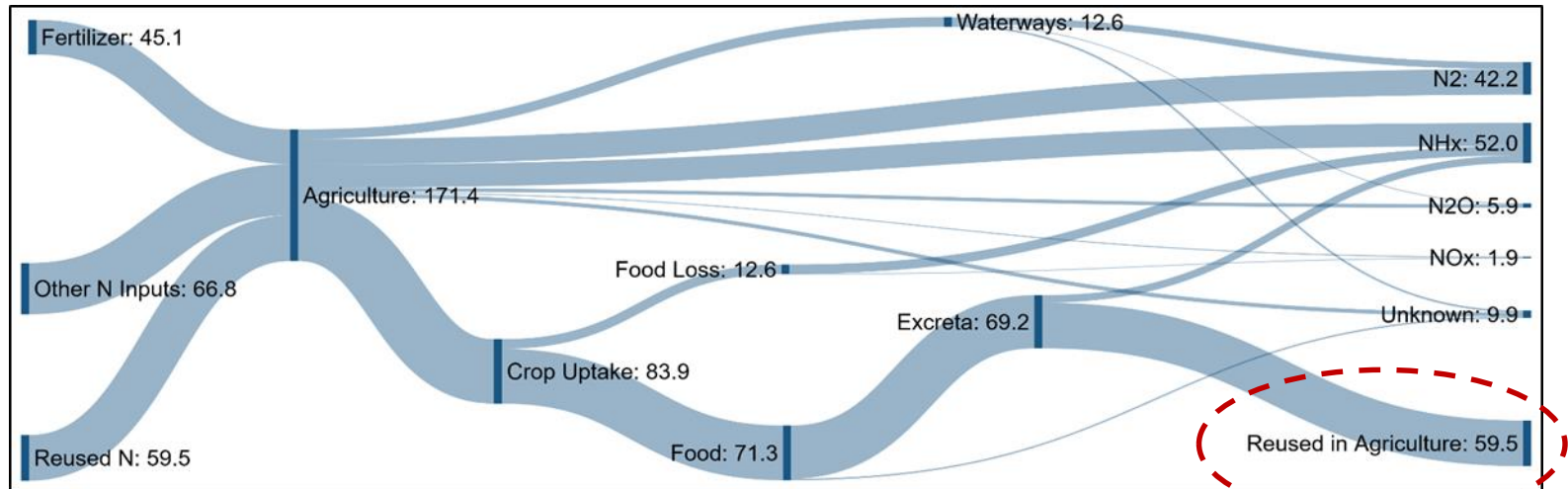


Material flow analysis shows the potential for nutrient recovery from human “waste” (N)

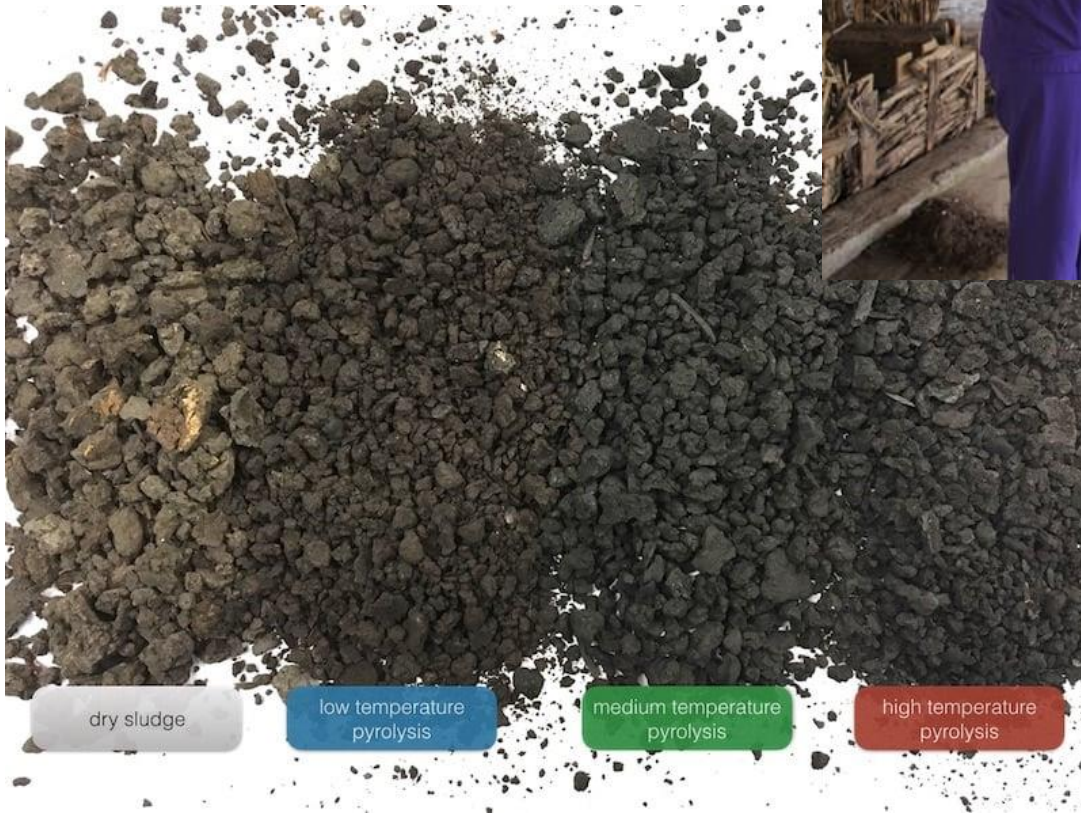
Currently



Nitrogen recovery with composting



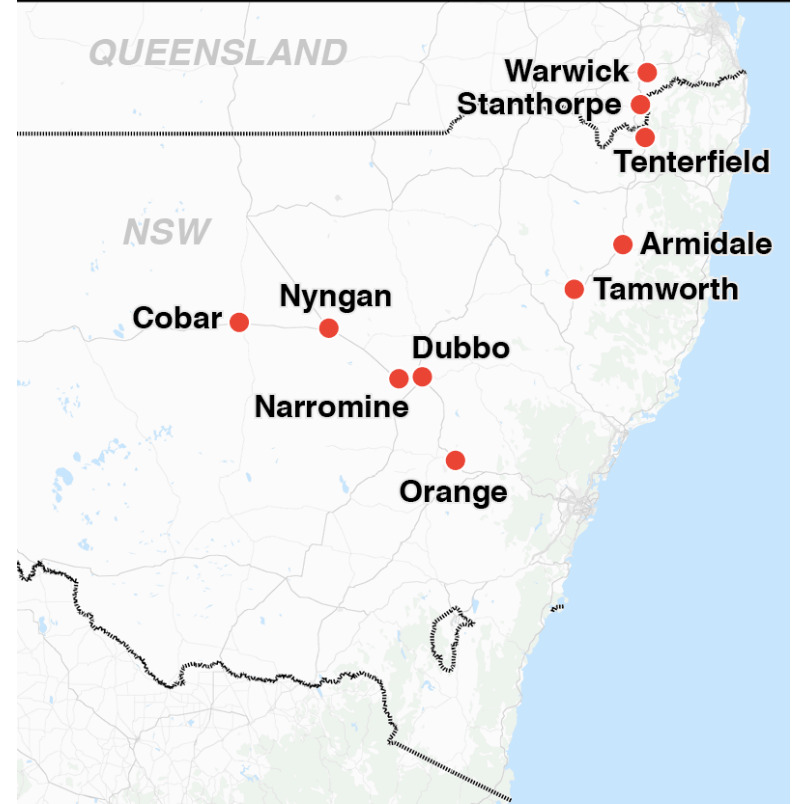
Composting, biochar, black soldier fly larvae...



Does it make sense to continue with such a water intensive sanitation?

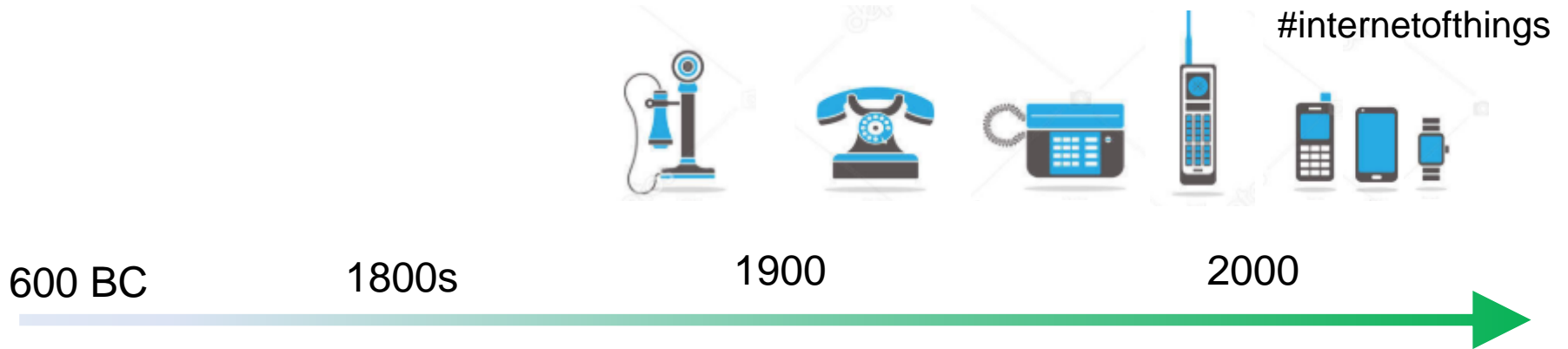


Drought seeing towns run dry



These regional towns are at risk of running out of water within the next six to twelve months, as the devastating drought drags on

Is it time for the next sanitary (r)evolution?



Cloaca maxima



Victorian sewers



Activated sludge



?

N.E.W.
paradigm

#sanitationofthings

Growing urban demographic currently not served by sustainable sanitation

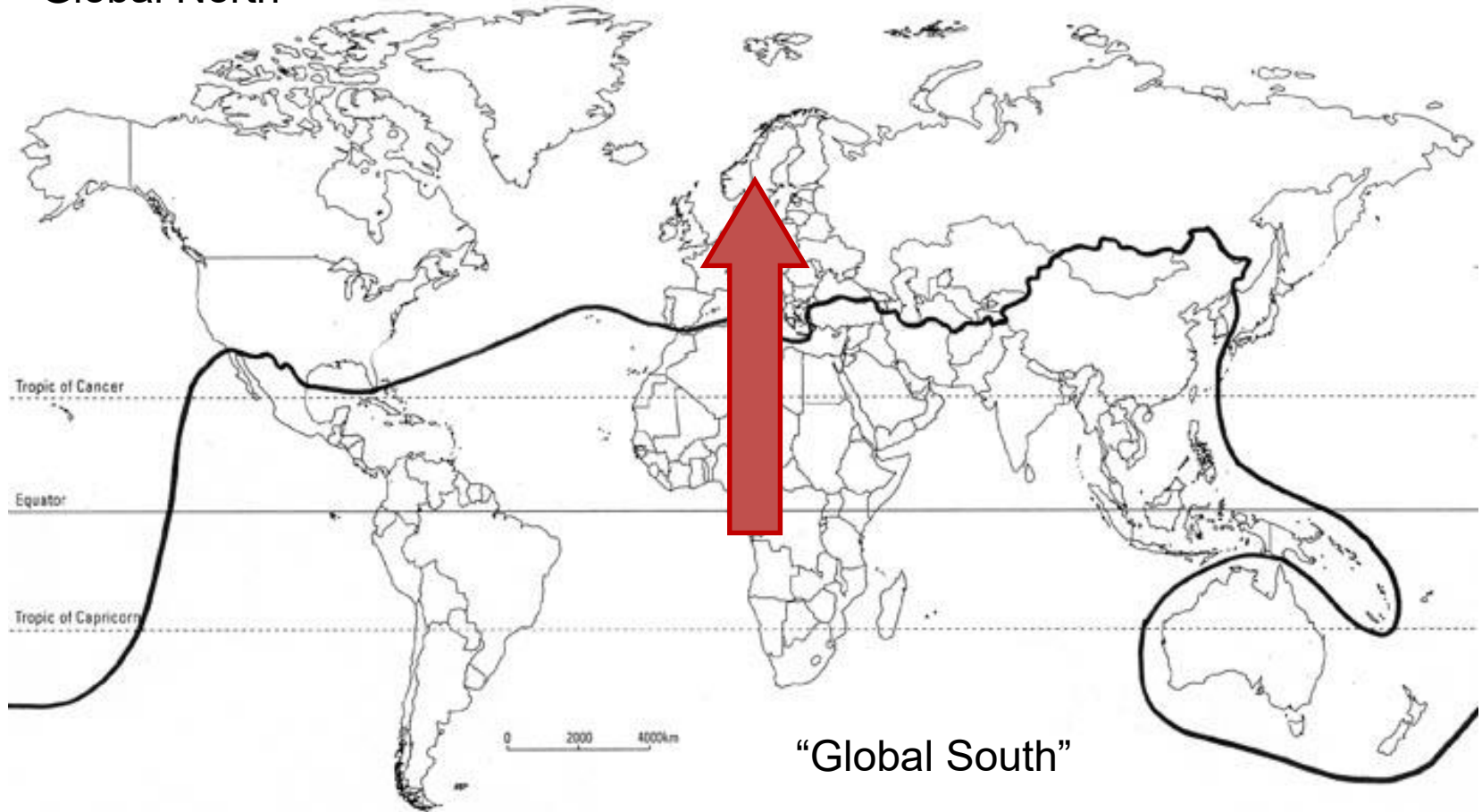
WILL AFRICA HAVE MOST OF THE WORLD'S LARGEST CITIES IN 2100?

TABLE 2
The world's 20 largest cities in 2100 (based on projected populations)

City	Population in 2015 (millions)	Extrapolated population in 2100 (millions)
<i>Lagos</i>	13.1	88.3
<i>Kinshasa</i>	11.6	83.5
<i>Dar es Salaam</i>	5.1	73.7
Mumbai	21.0	67.2
Delhi	25.7	57.3
<i>Khartoum</i>	5.1	56.6
<i>Niamey</i>	1.1	56.1
Dhaka	17.6	54.3
Kolkata	14.9	52.4
Kabul	4.6	50.3
Karachi	16.6	49.1
Nairobi	3.9	46.7
<i>Lilongwe</i>	0.9	41.4
<i>Blantyre</i>	0.8	40.9
Cairo	18.8	40.5

Migration of solutions will be inverted!

“Global North”



“Global South”

We no longer have the luxury of only addressing sanitation crisis through limited local perspectives!

Sanitation is intrinsically linked to many of the global issues we face.



Sustainable sanitation solutions are available and need to be rethought, adapted, and integrated to a circular economy.



Thanks!



The best way to predict
the future is to create it.

Peter Ducker

“ quote fancy

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