



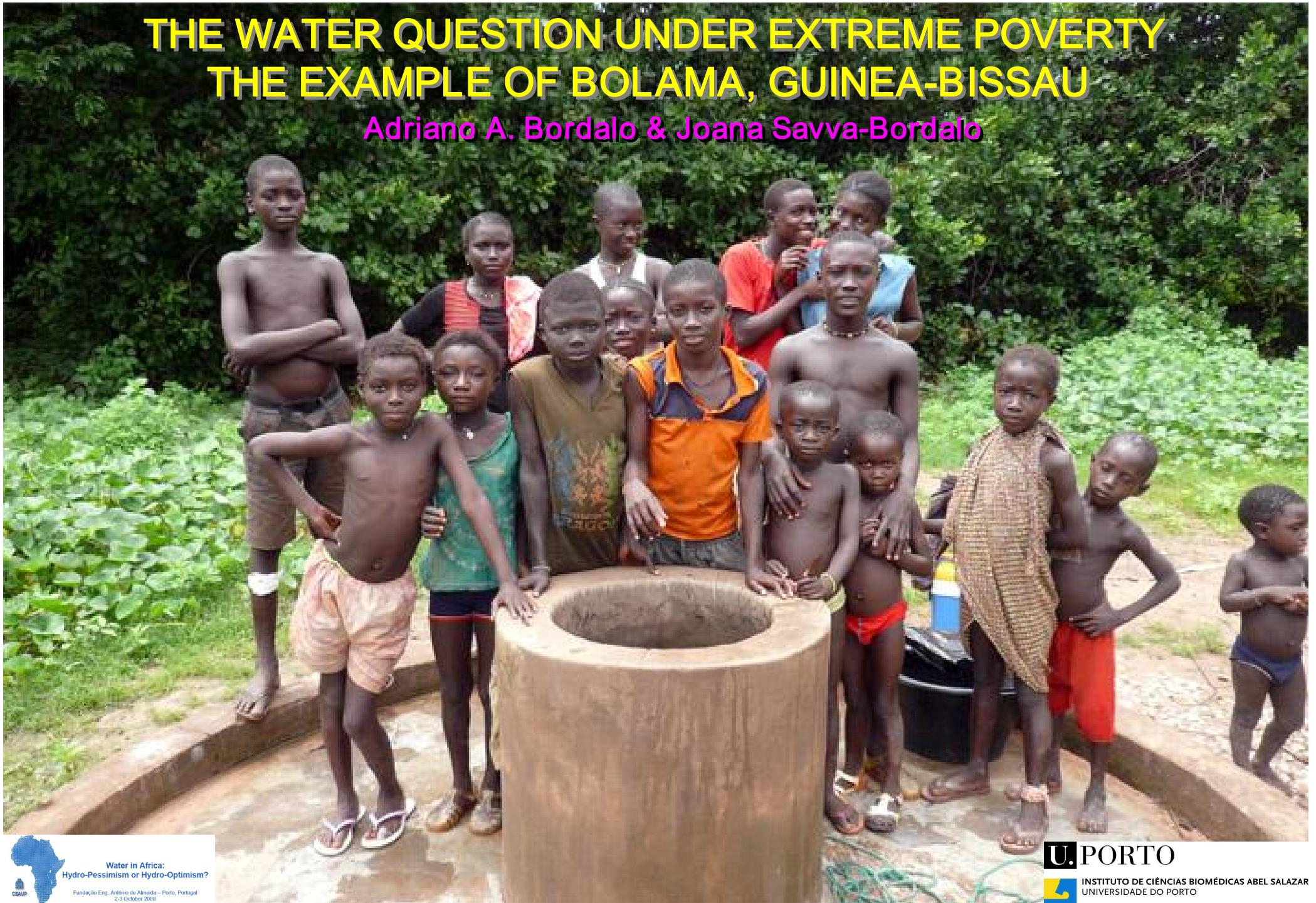
Water in Africa: Hydro-Pessimism or Hydro-Optimism?

Água em África: Hidro-pessimismo ou Hidro-optimismo

Centro de Estudos Africanos da Universidade do Porto
Porto, Portugal, 2-3 October 2008

THE WATER QUESTION UNDER EXTREME POVERTY THE EXAMPLE OF BOLAMA, GUINEA-BISSAU

Adriano A. Bordalo & Joana Savva-Bordalo



Water in Africa:
Hydro-Pessimism or Hydro-Optimism?
Fundação Eng. António de Almeida – Porto, Portugal
2-3 October 2008

U. PORTO

INSTITUTO DE CIÊNCIAS BIOMÉDICAS ABEL SALAZAR
UNIVERSIDADE DO PORTO

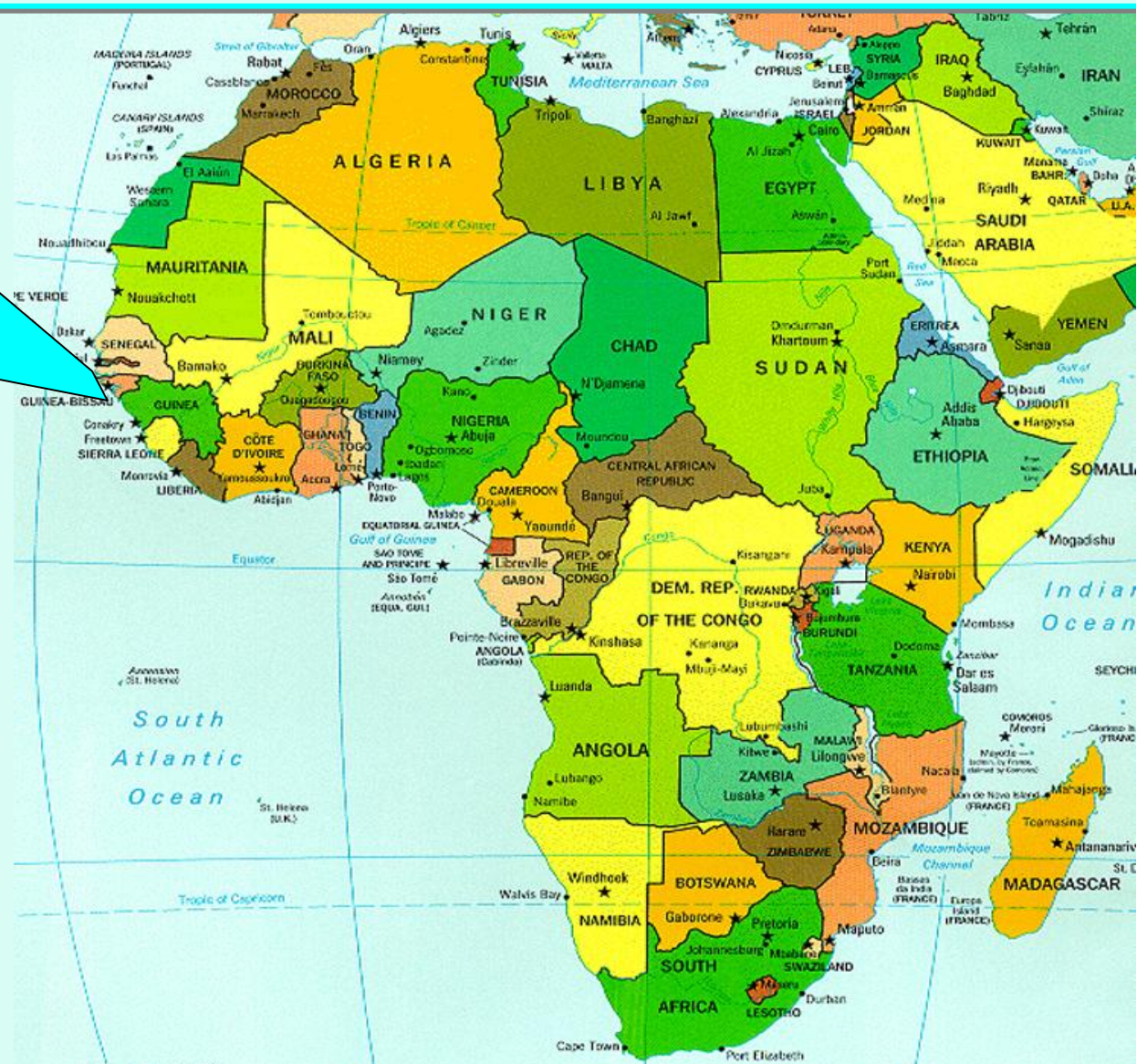
GUINEA-BISSAU



28,000 km² land area
(32,000 km²)
Tropical rain forest (85%)
Wet - June to November
Dry - December to May

1,600,00 inhabitants
AIDS - 7% [30%]
GDP - \$188

13.6% "potable" water
Cholera
Diarrheas
Malaria
Respiratory diseases



WATER CONSUMPTION PER PERSON

EUROPE - 150 liters



WATER CONSUMPTION PER PERSON

AFRICA - 50 liters



WATER CONSUMPTION PER PERSON

AFRICA - 50 liters



*RURAL POPULATION
network*



52 L

*URBAN POPULATION
network*



72 L

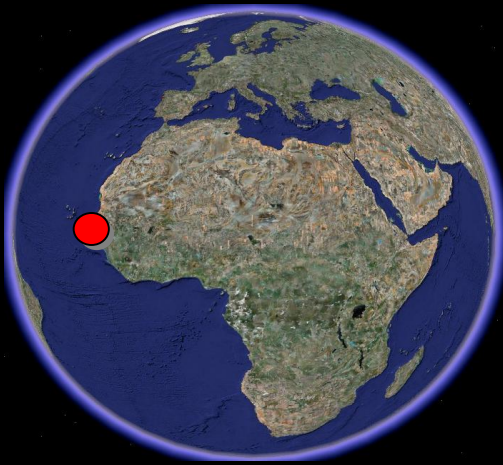
WATER USES



THE ORIGIN OF WATER



THE ORIGIN OF WATER



WATER CONSTRAINTS



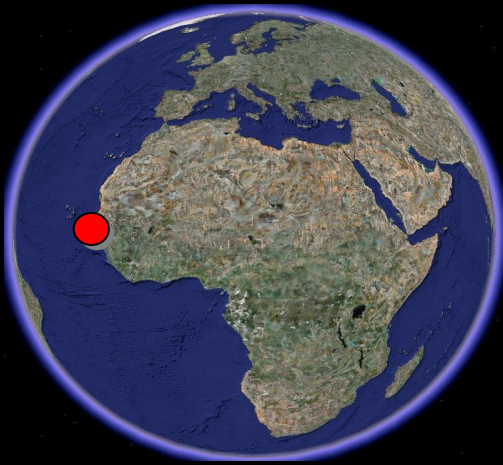
WATER CONSTRAINTS



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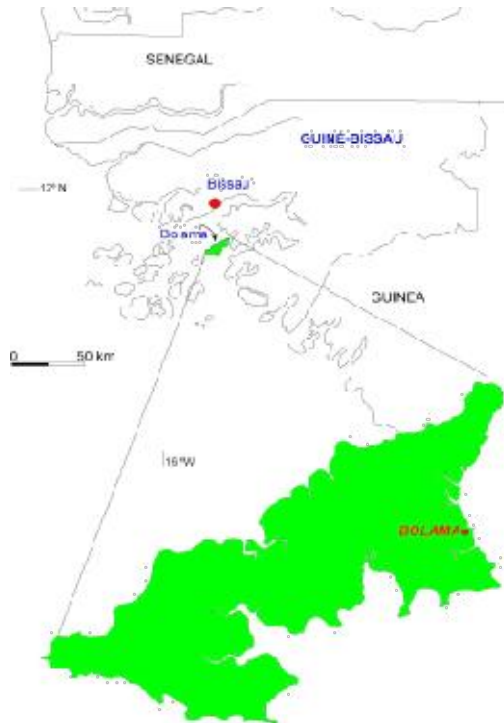
WATER CONSUMPTION



21 liters

40 liters (Muslim areas)

RATIONALE

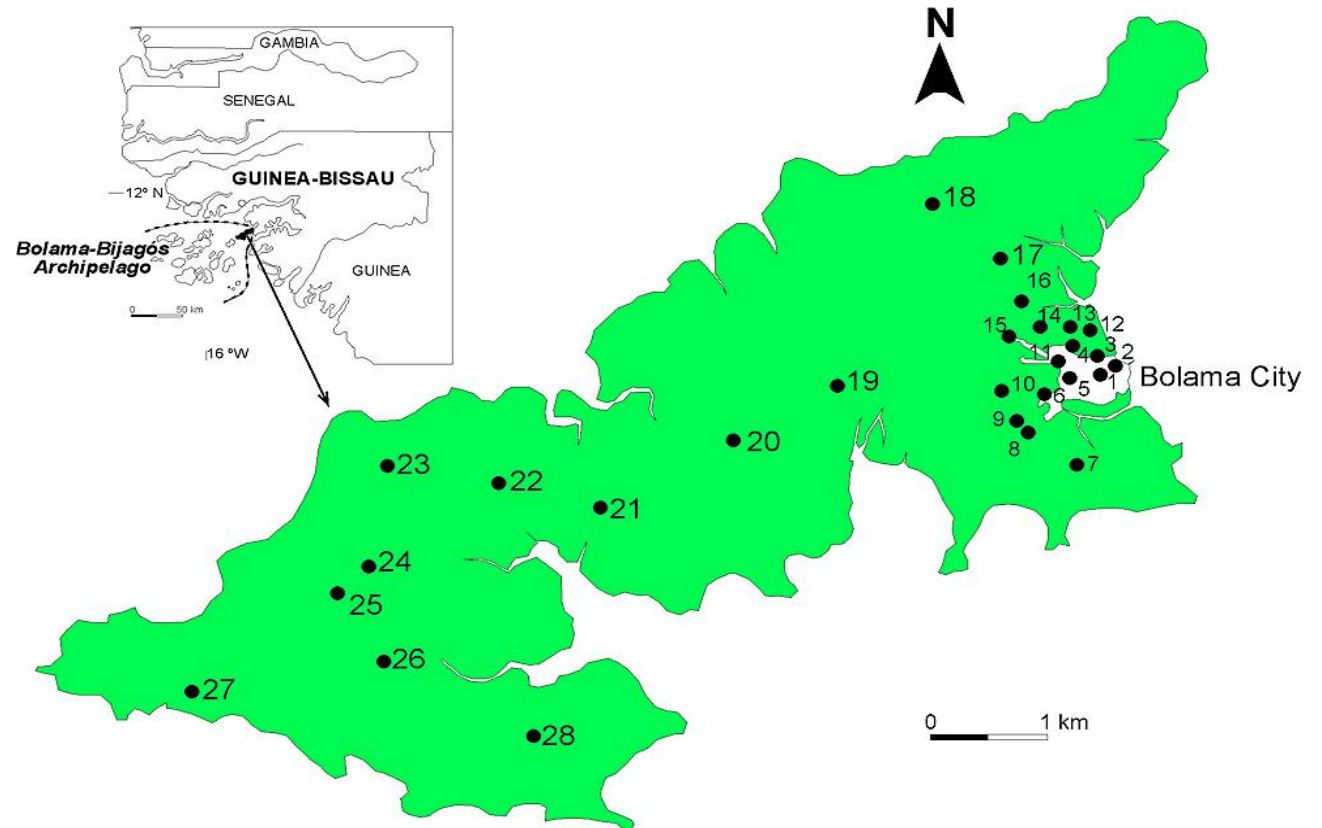


1. Seasonal water quality

2. Disease

3. Sustainable measures

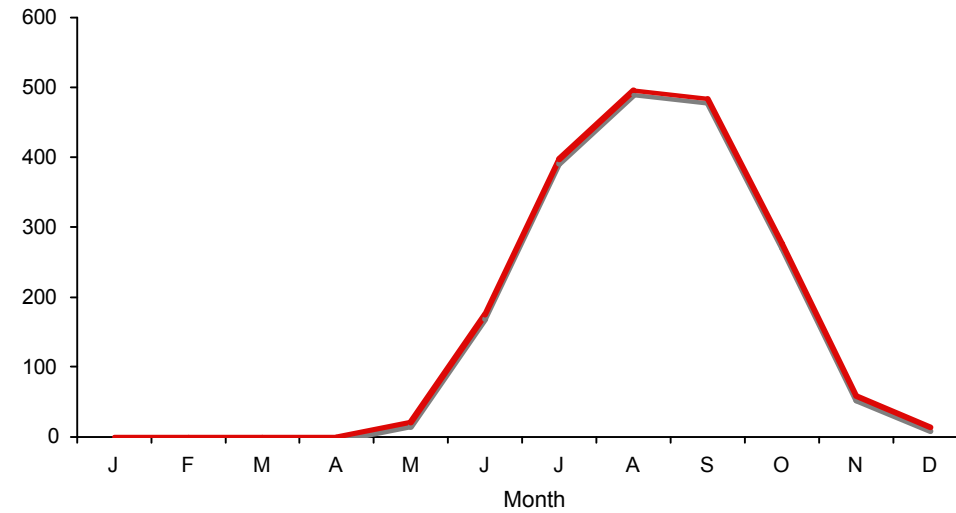
SAMPLING STRATEGY



28 - 43 wells

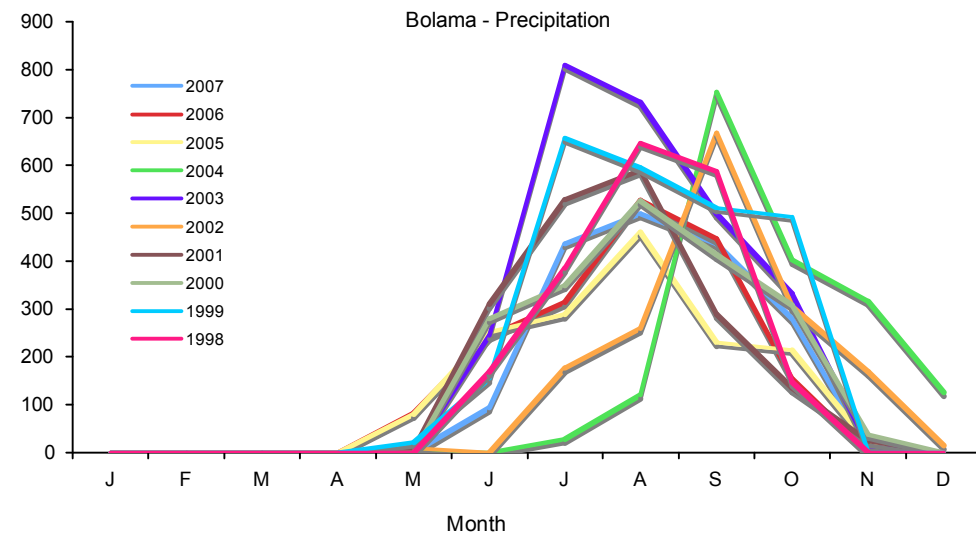
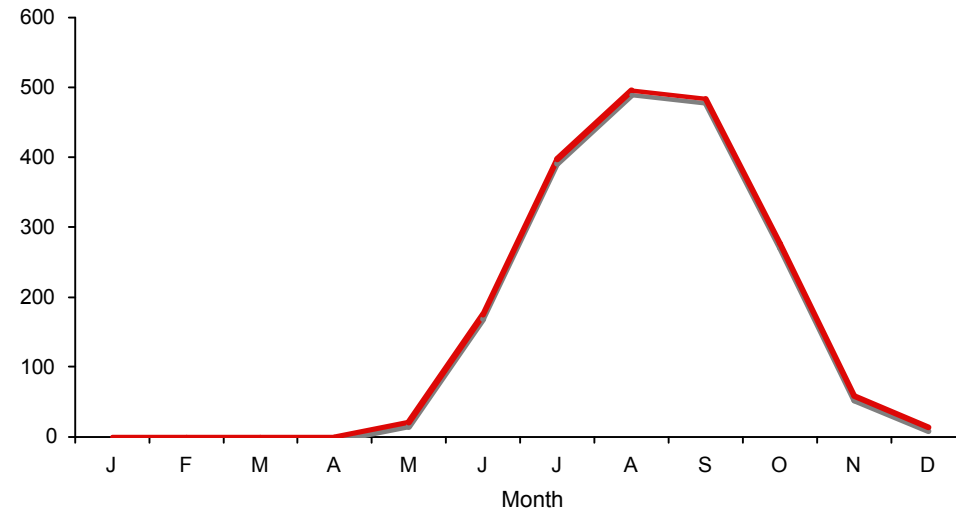
PRECIPITATION

1998 - 2007



PRECIPITATION

1998 - 2007



WATER ACIDITY



wet season

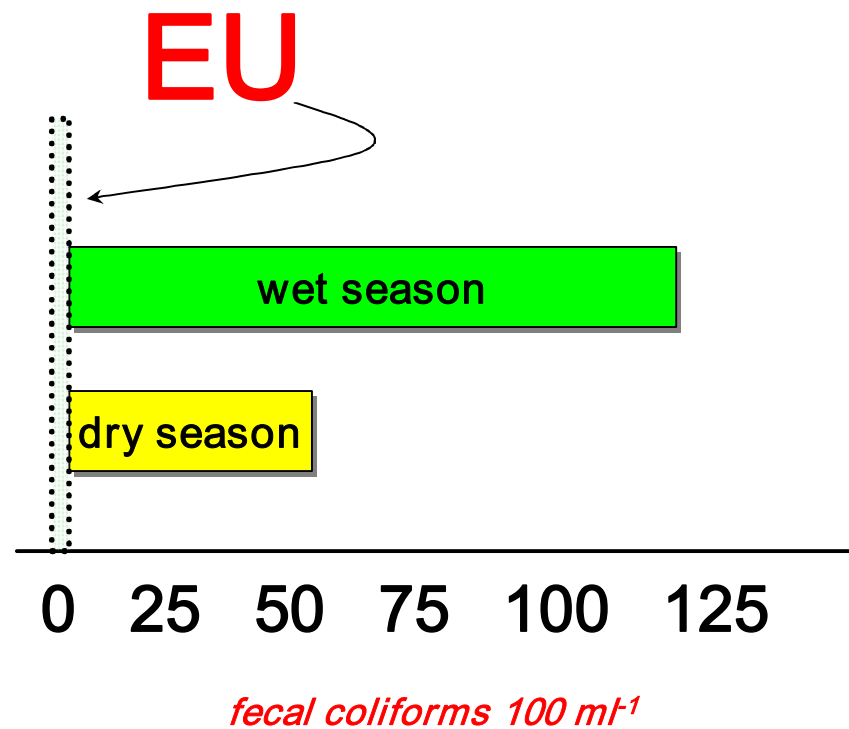
dry season

EU

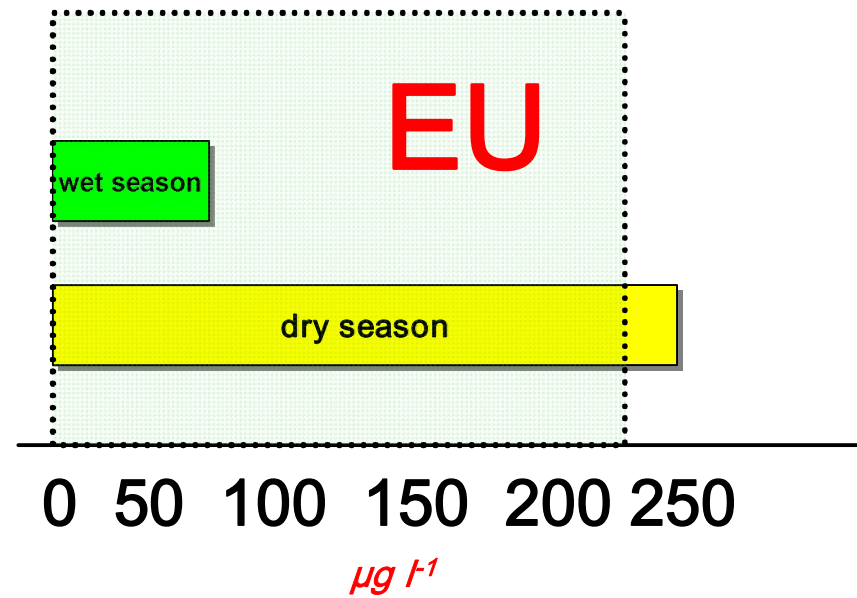
1 2 3 4 5 6 7 8 9

pH

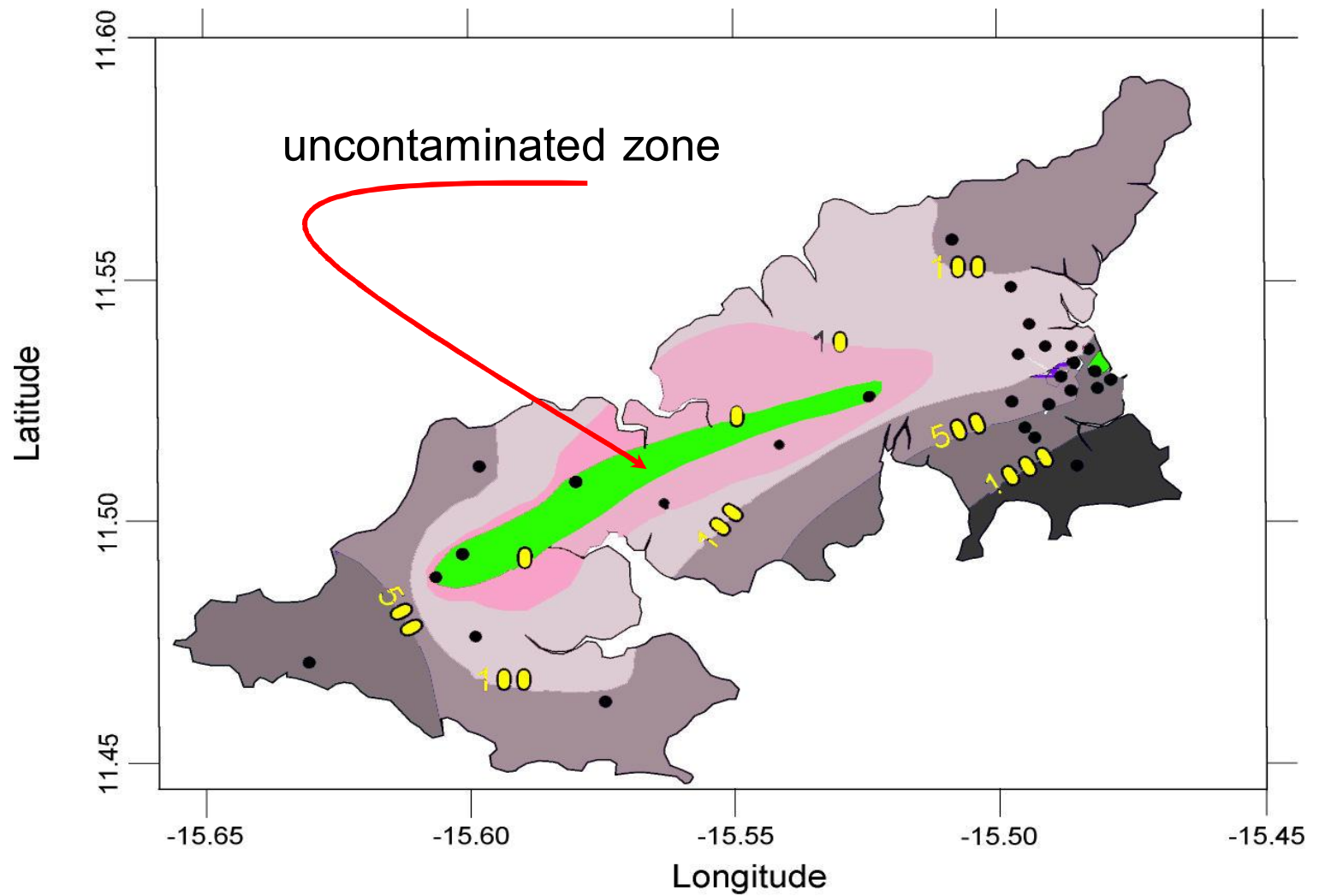
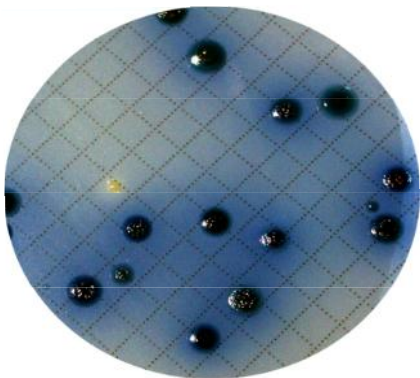
FECAL CONTAMINATION



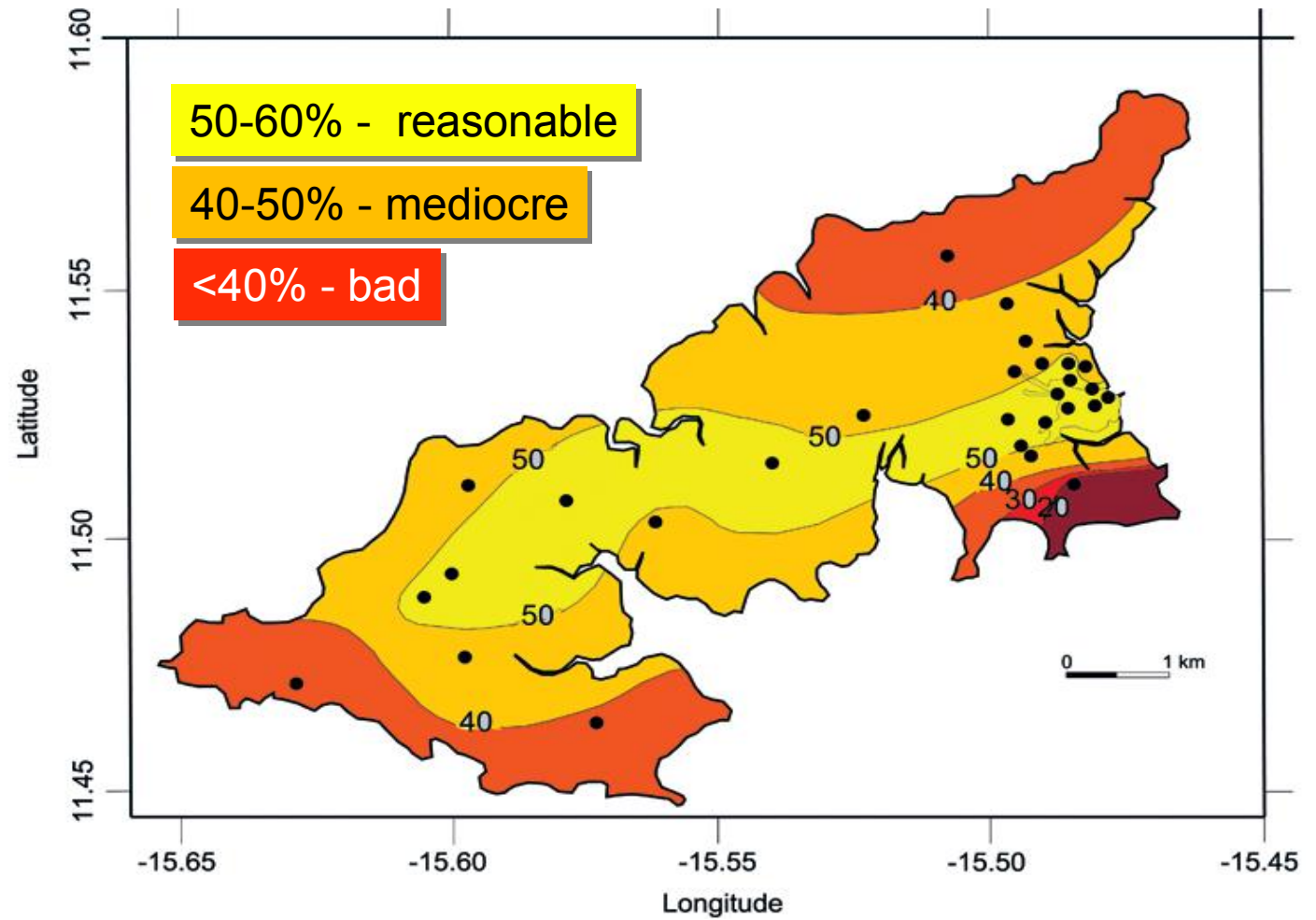
IRON



FECAL COLIFORMS



WATER QUALITY INDEX

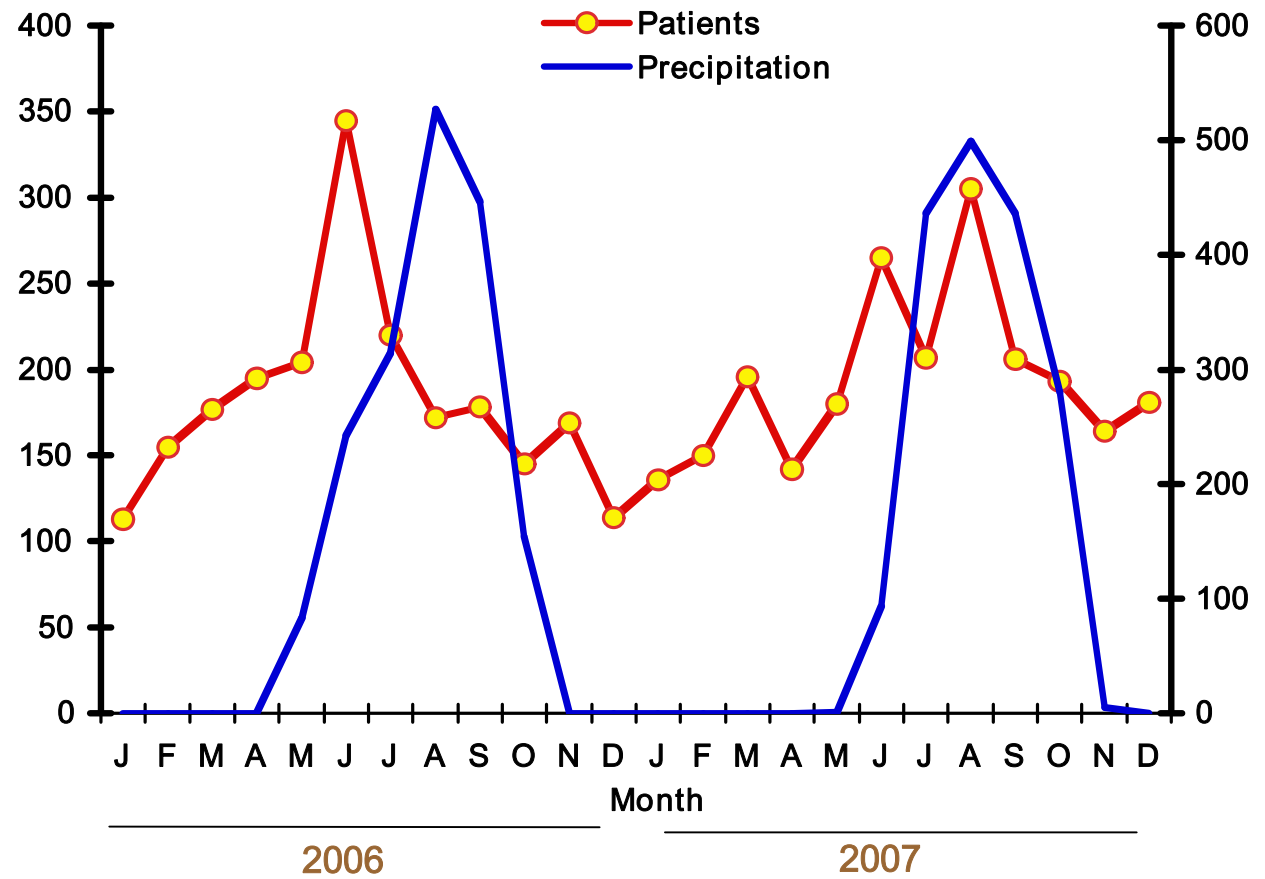


WATER NETWORK?

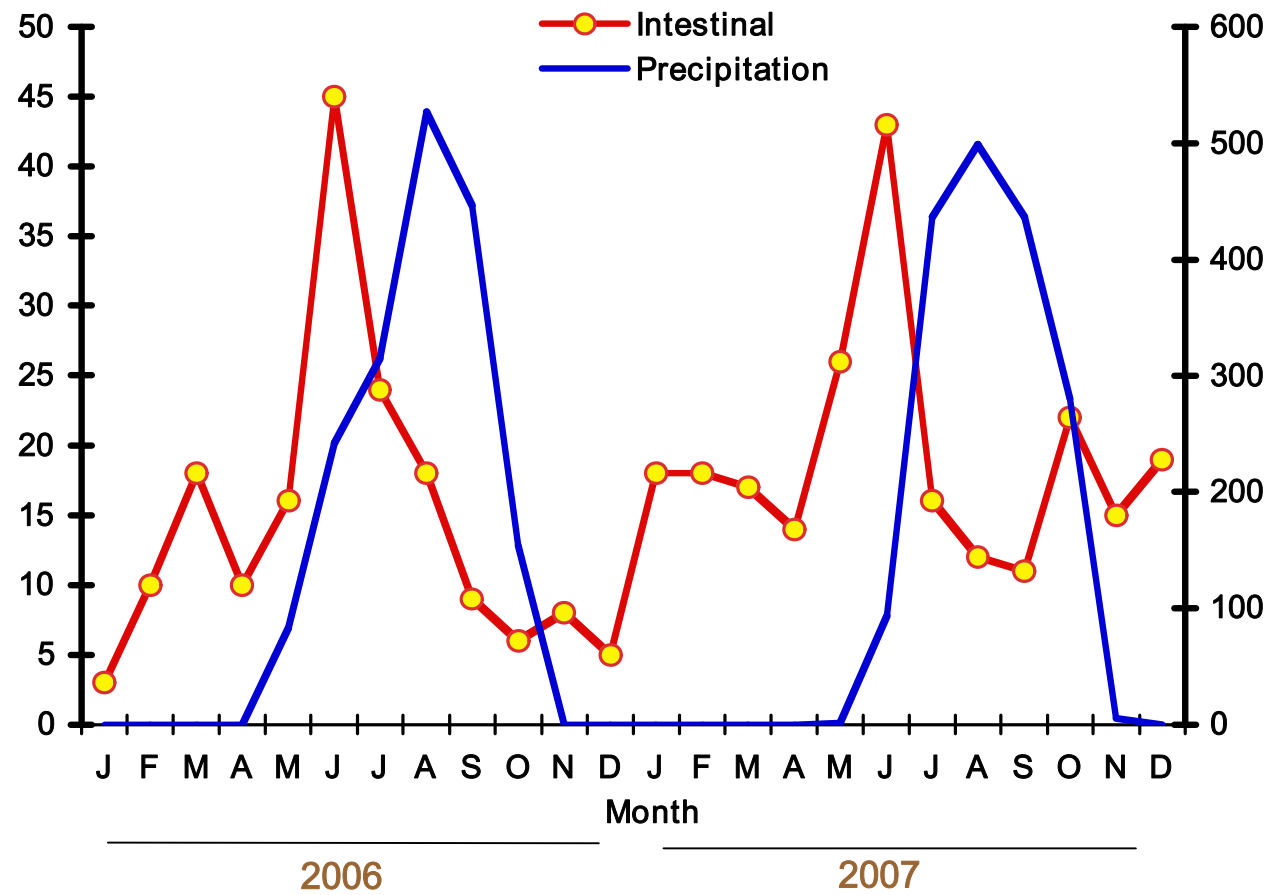


PRECIPITATION & DISEASE

Bolama 2006/07



PRECIPITATION & DISEASE



CHILD MORTALITY



Malaria	35%
Respiratory infections	15%
Diarrhea	15%

CHOLERA EPIDEMICS



1986, 1987,
1994, 1996, 1997,
2002, 2003, 2005

2008

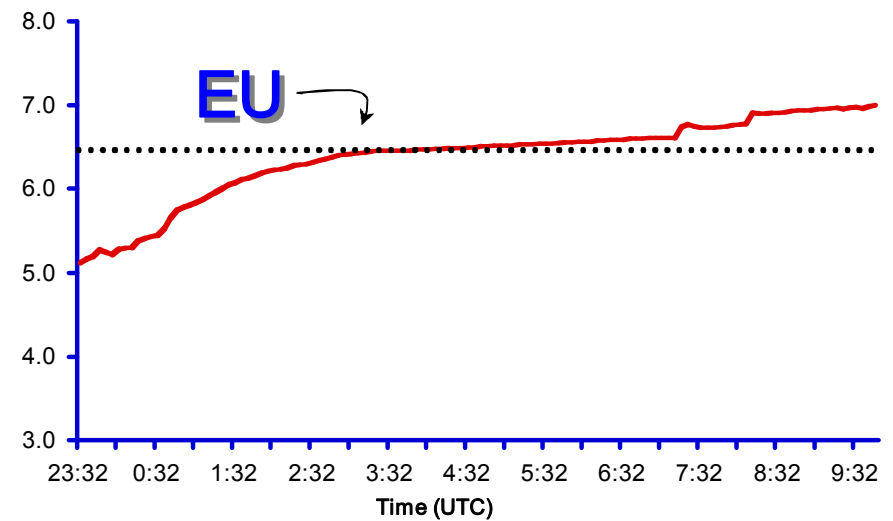
PROBLEM

Acidic water

SOLUTIONS



400 g of oyster shells



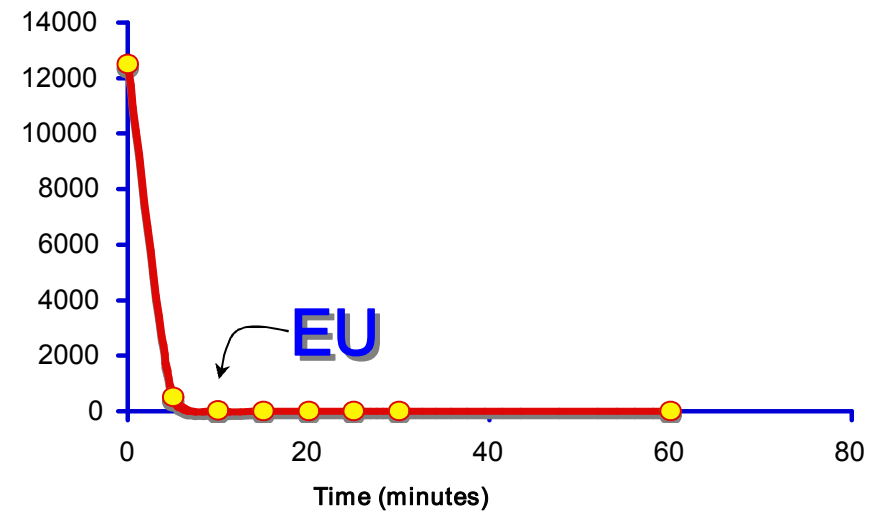
PROBLEM

Fecal materials

SOLUTIONS



1 drop *bleach* in one liter of water



MORE SOLUTIONS

wells



MORE SOLUTIONS

latrines





acknowledgments

AMI - International Medical Assistance
Portuguese Embassy - Bissau
AIDA - Spanish Cooperation
Bolama Regional Health Authority
ICBAS - University of Porto
IPO - Porto
