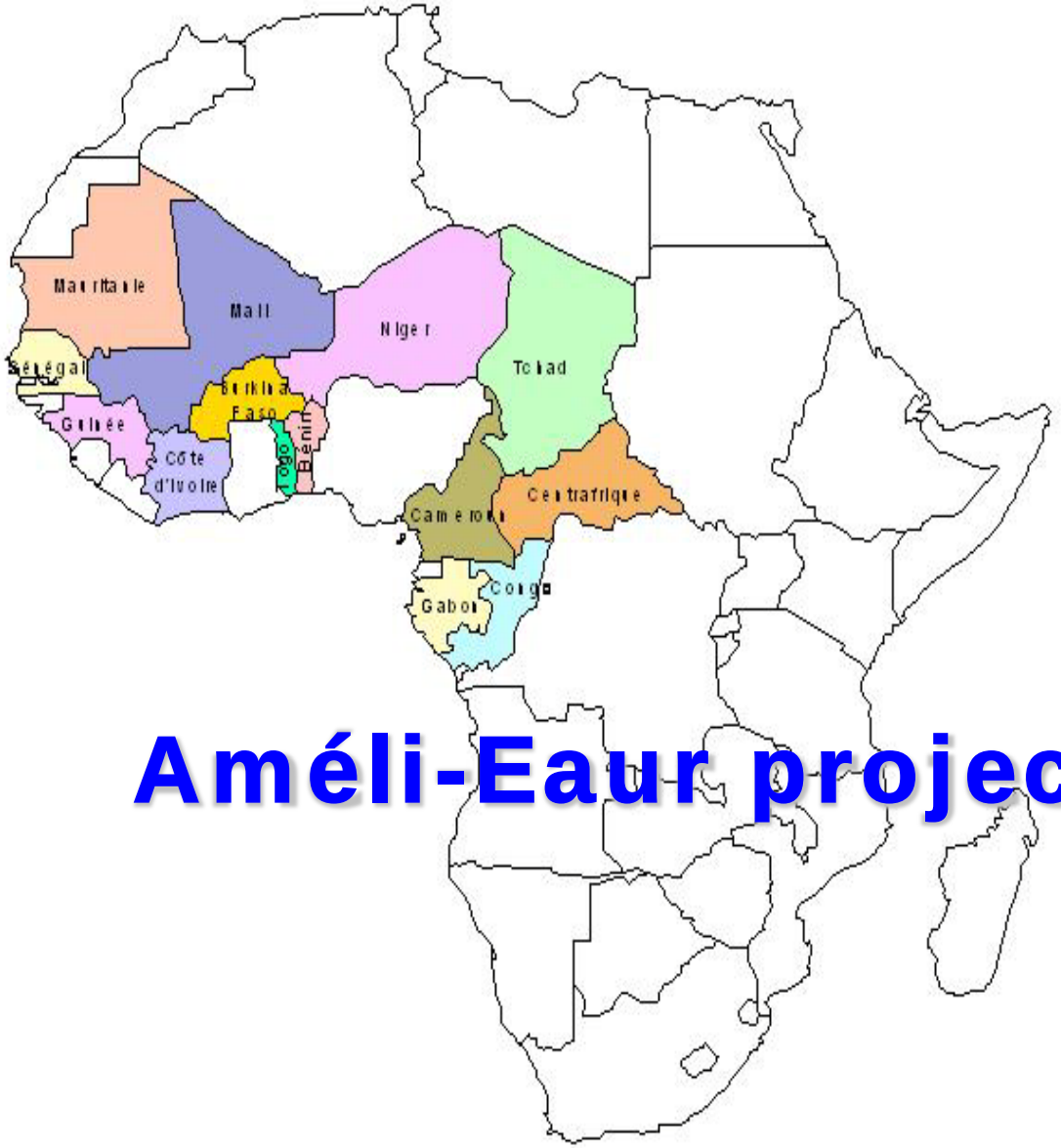


Améli-Eaur project

JST-JICA Research Project (2009-2014)

Laboratory on Engineering for Sustainable Sanitation, Hokkaido University

Toward the Expansion of an Integrated Water Management System

Naoyuki Funamizu

HOKKAIDO UNIVERSITY
GRADUATE SCHOOL OF ENGINEERING
DEPARTMENT OF ENVIRONMENTAL ENGINEERING

My topic today is

Bangalore India

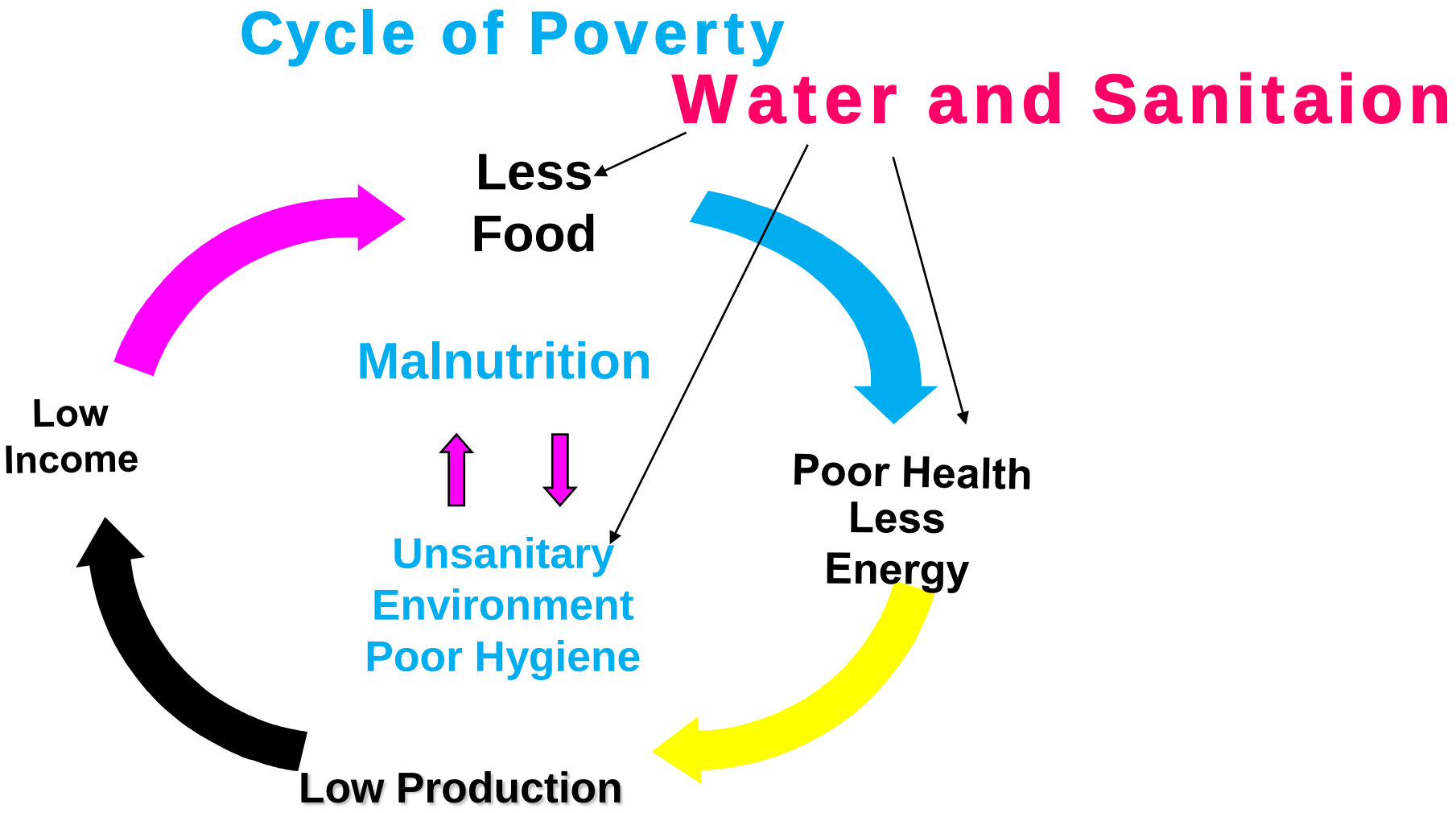
My topic today is

- **Why do we have to develop a new idea for water and sanitation ?**
- **What is our role ?**

well

Bangalore India

How to attack the Cycle of Poverty?



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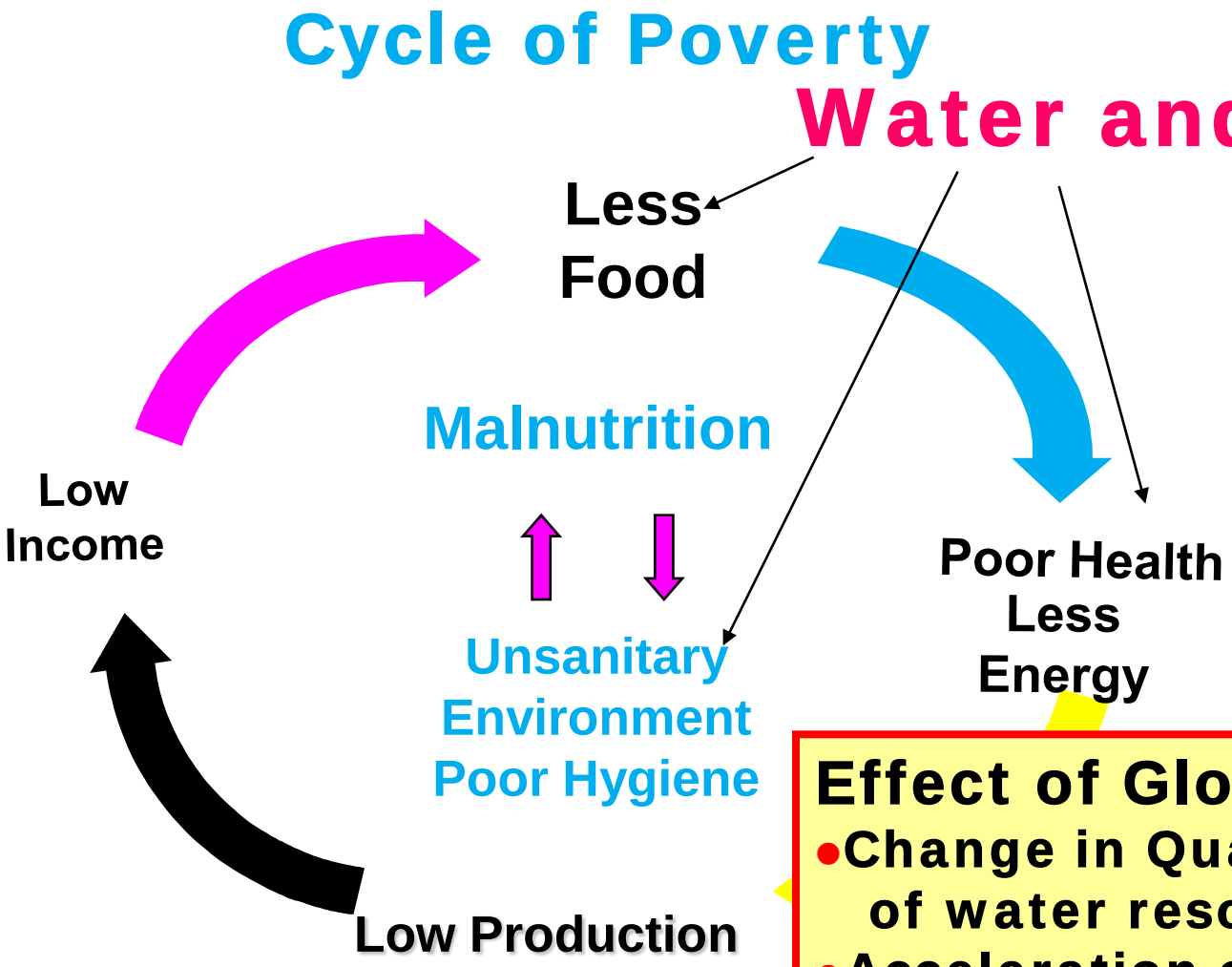


Effect of Global warming

- Change in Quality and Quantity of water resources
- Acceleration of Cycle of Poverty

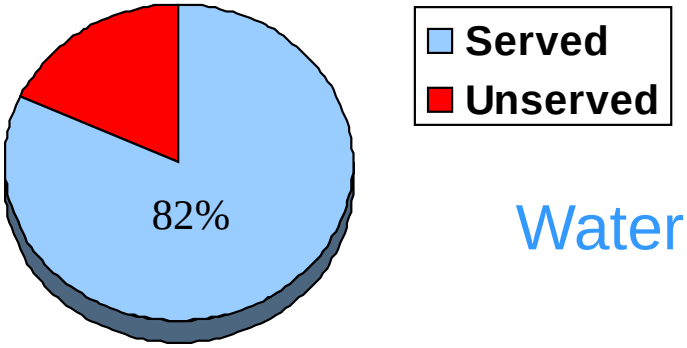

More than 1.2 million tons of fresh excreta deposited in the environment and water sources each day

unicef

To achieve the Millennium Development Goals

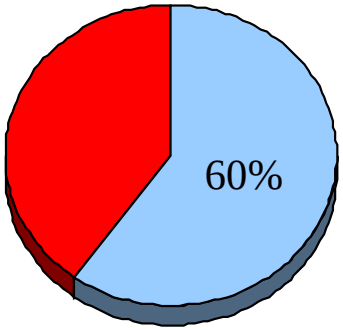
Water Supply and Sanitation 2000

>1 billion lack access to safe water



Water

2.5 billion lack sanitary means for excreta disposal



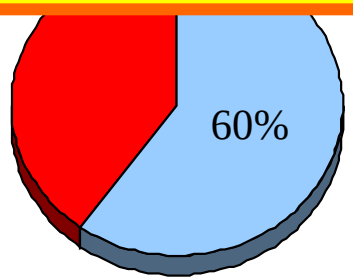
Sanitation

To achieve the Millennium Development Goals

Water Supply and Sanitation 2000

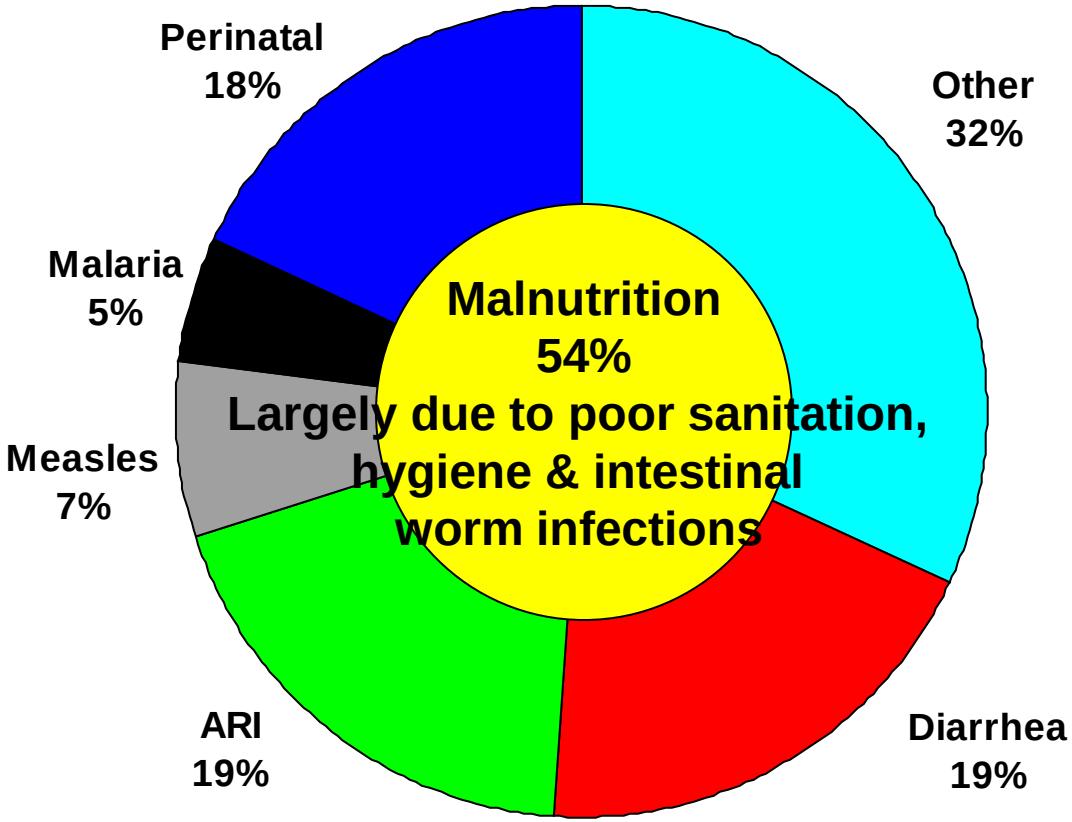
Up to 5.5 billion people will be without sanitation by the year 2035, if sanitation provisions continue to be installed based on the current standards.

sanitary means for excreta disposal



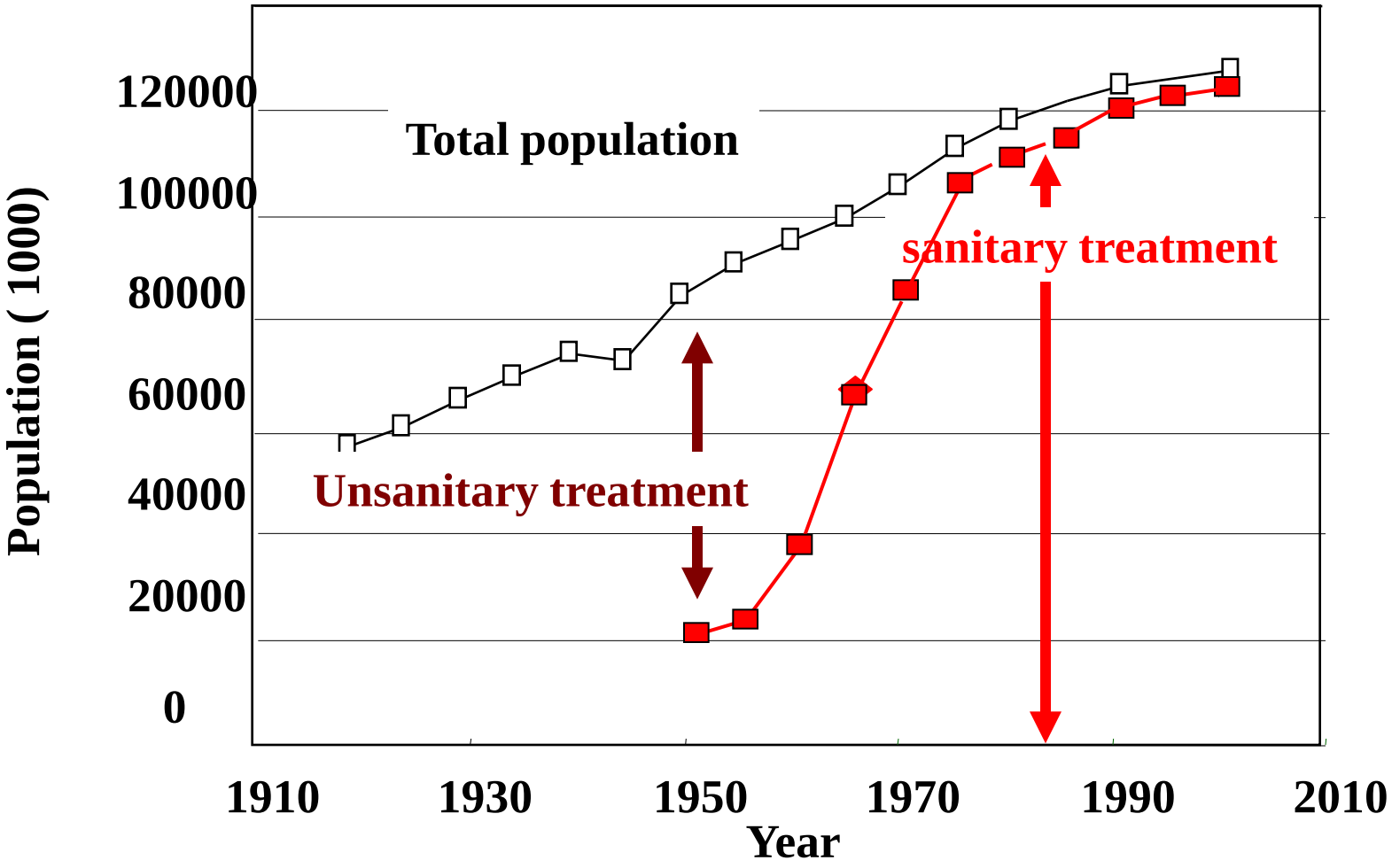
Sanitation

Major Causes of Under-Five Mortality



Source: WHO 1995

How Japan has overcome the water-borne disease ?



By Prof. Magara

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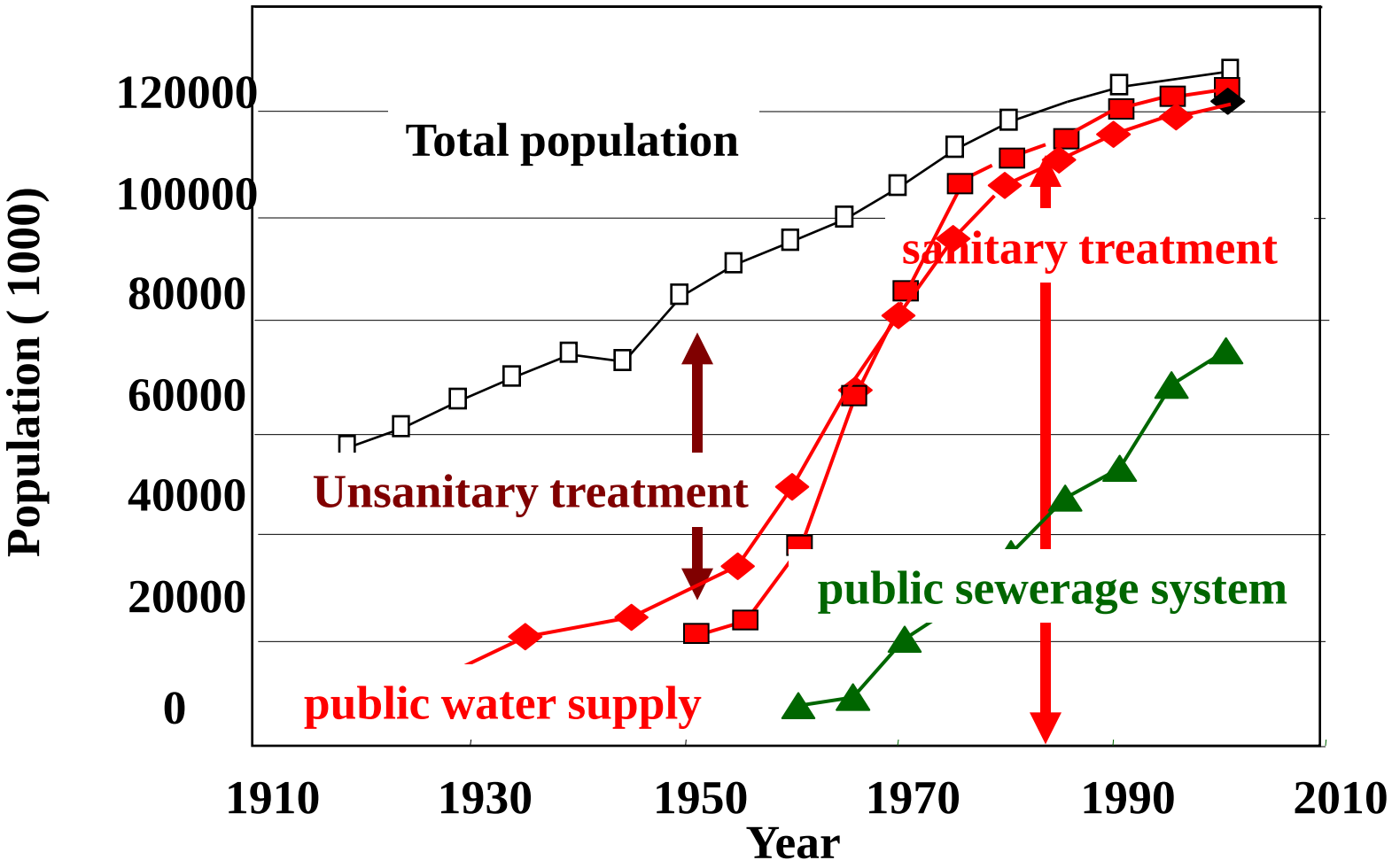

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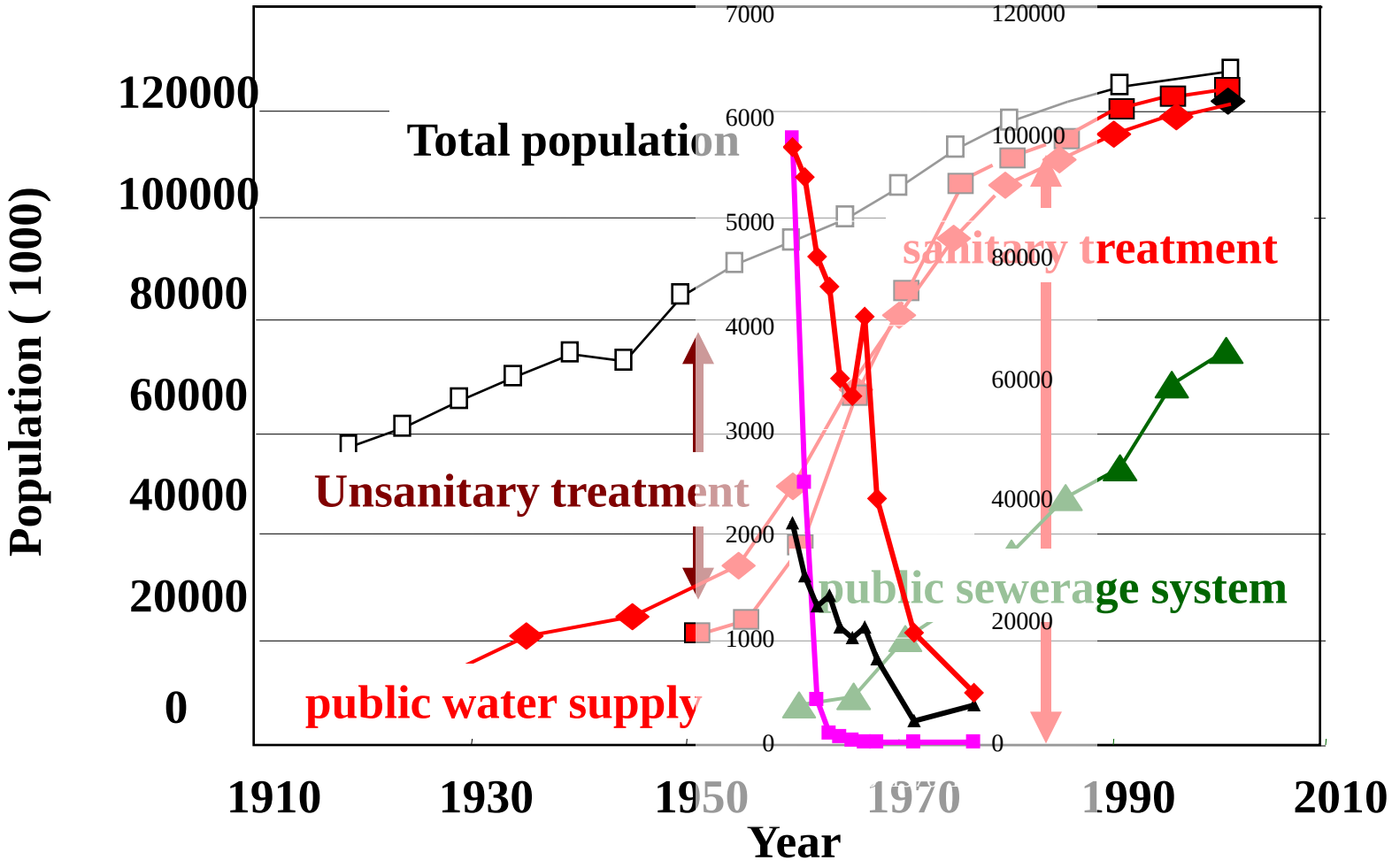

By Prof. Magara

Economical Issues (Peter Wildere, 2002).

- It becomes evident that the capacity of the global money market would not be sufficient to cover the need for investment capital for centralized system
- The rehabilitation cost for the piping system in Germany is estimated to be in the range of 100 billion euros
- The cost of the installation of the pipe system is almost one order of magnitude higher than the cost of building the treatment facilities

Economical Issues (Peter Wildere, 2002).

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- The cost of the installation of the pipe system is almost one order of magnitude higher than the cost of building the treatment facilities

Water Resource
Don't collect

- A significant amount of the drinking water is used as a means to transport the pollutants
- Reuse wastewater by retaining water near the point of origin

Resources in wastewater
Annual discharge from one person

- Nitrogen (N) 4.5 kg
- Phosphorus (P) 0.6 kg
- Potassium (K) 1.0 kg
- Organic matter (BOD) 35 kg

By Prof. Jensen

Managing raw wastewater quality to recycle nutrients and to use simple treatment process

Appliance	Volume	COD	NH_4-N	NO_3-N	PO_4-P	TSS
WC	**31%**	**44%**	**97%**	**3.8%**	**80%**	**77%**
Kitchen sink	13%	23%	0.3%	38%	9.4%	10%
Wash Basin	13%	1.7%	0.1%	11%	1.3%	2.1%
Bath	16%	2.5%	0.6%	15%	1.1%	1.3%
Shower	12%	6.4%	0.7%	25%	4.1%	5.1%
Washing machine	16%	22%	1.2%	7.6%	4.3%	4.0%

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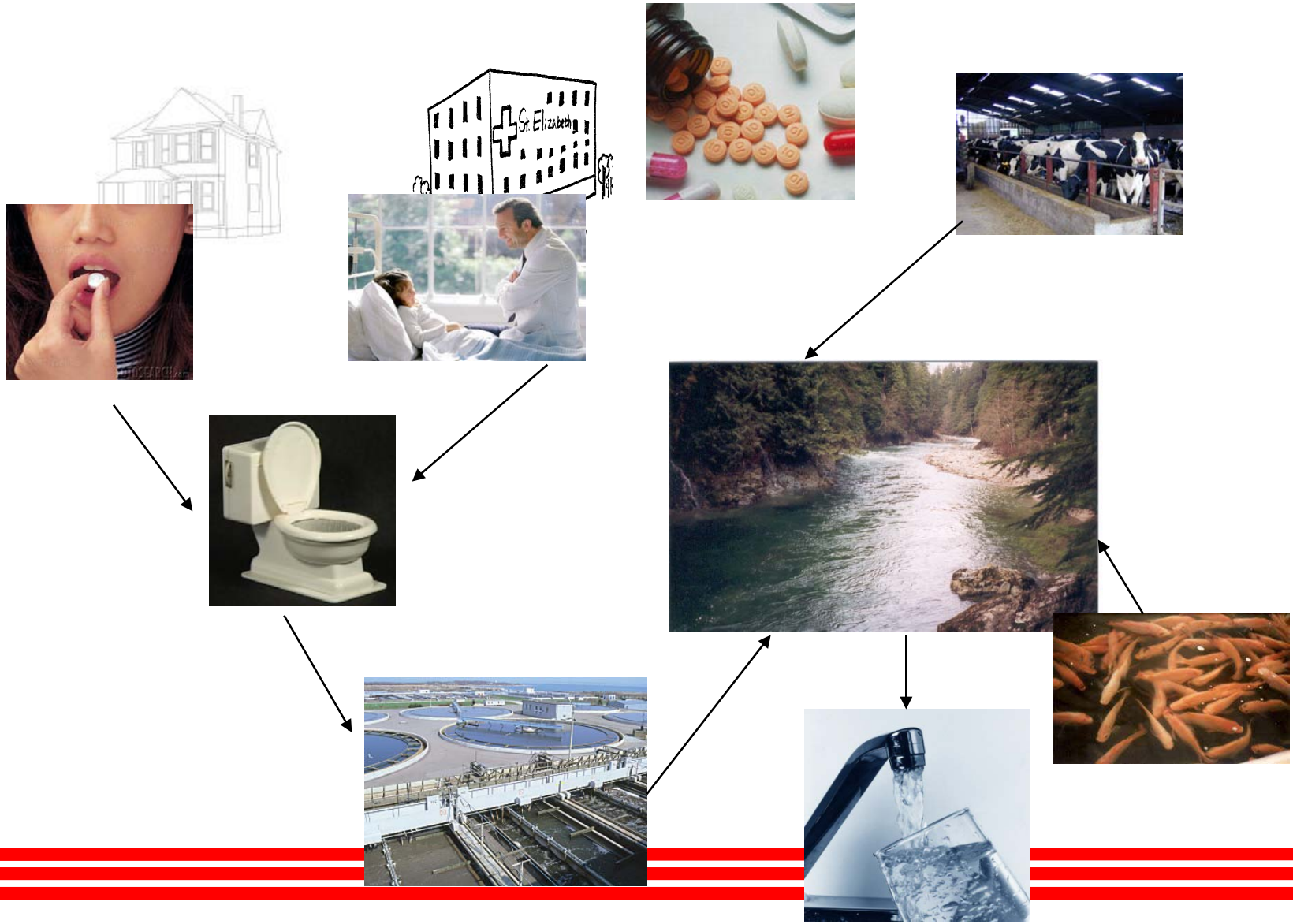
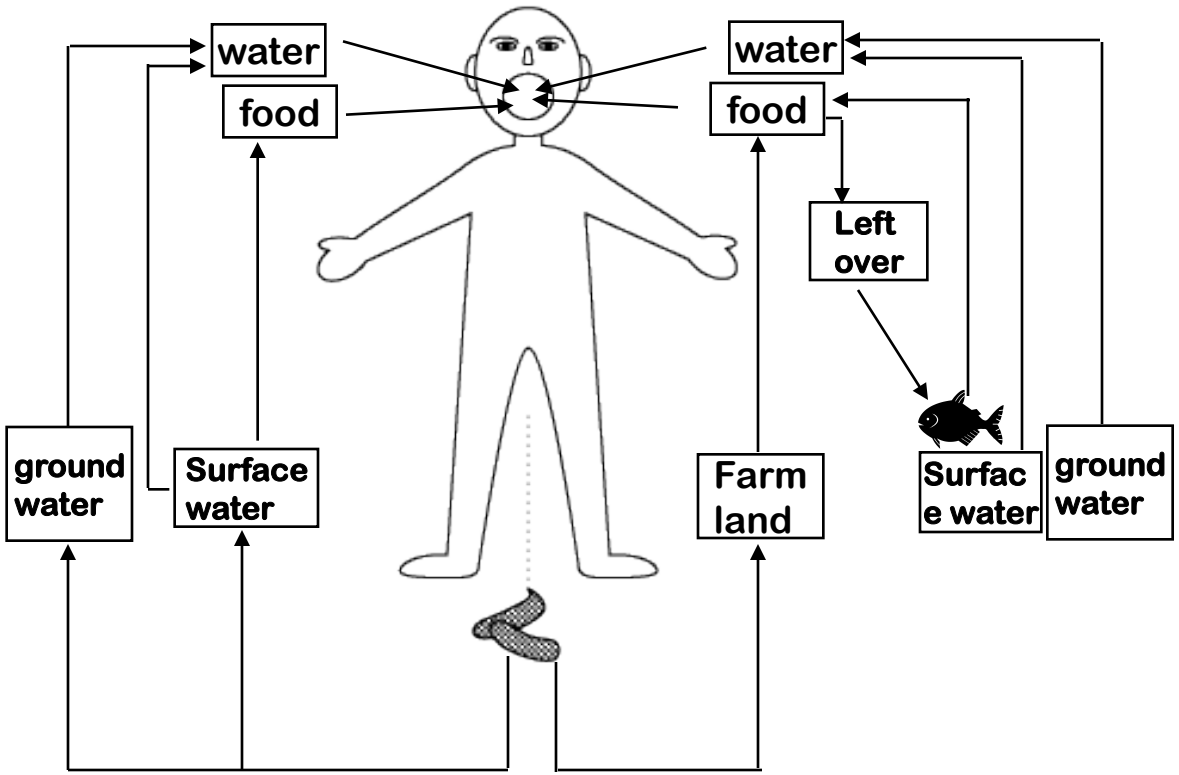
Don't Mix

Controlling micro-pollutants



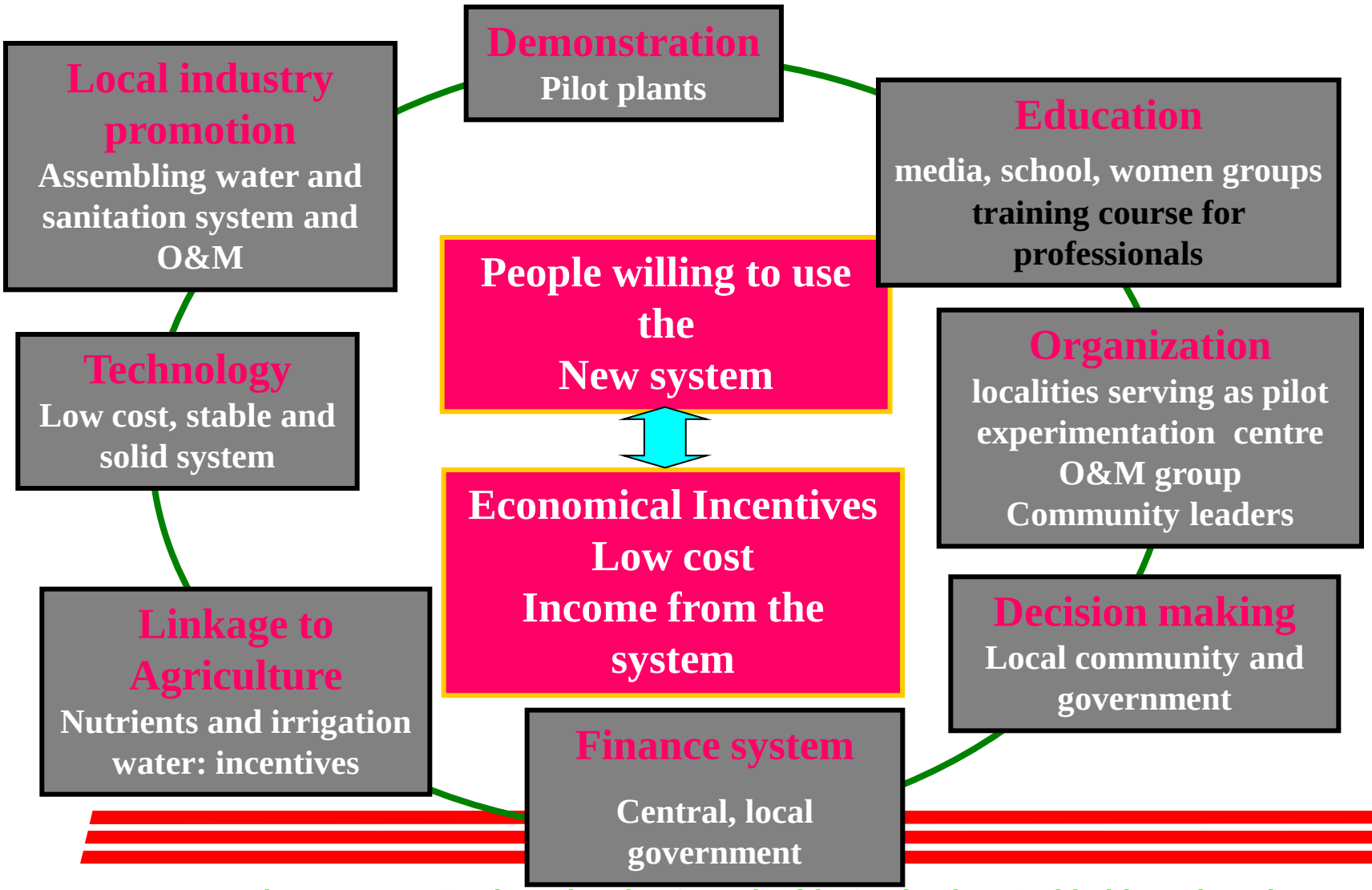
Feces Philia Culture vs Feces Phobia Culture

Feces Phobia Culture ← | → **Feces Philia Culture**



This figure is modified from Professor Kada's original by Funamizu

Integrated approach for socialization of new system is essential



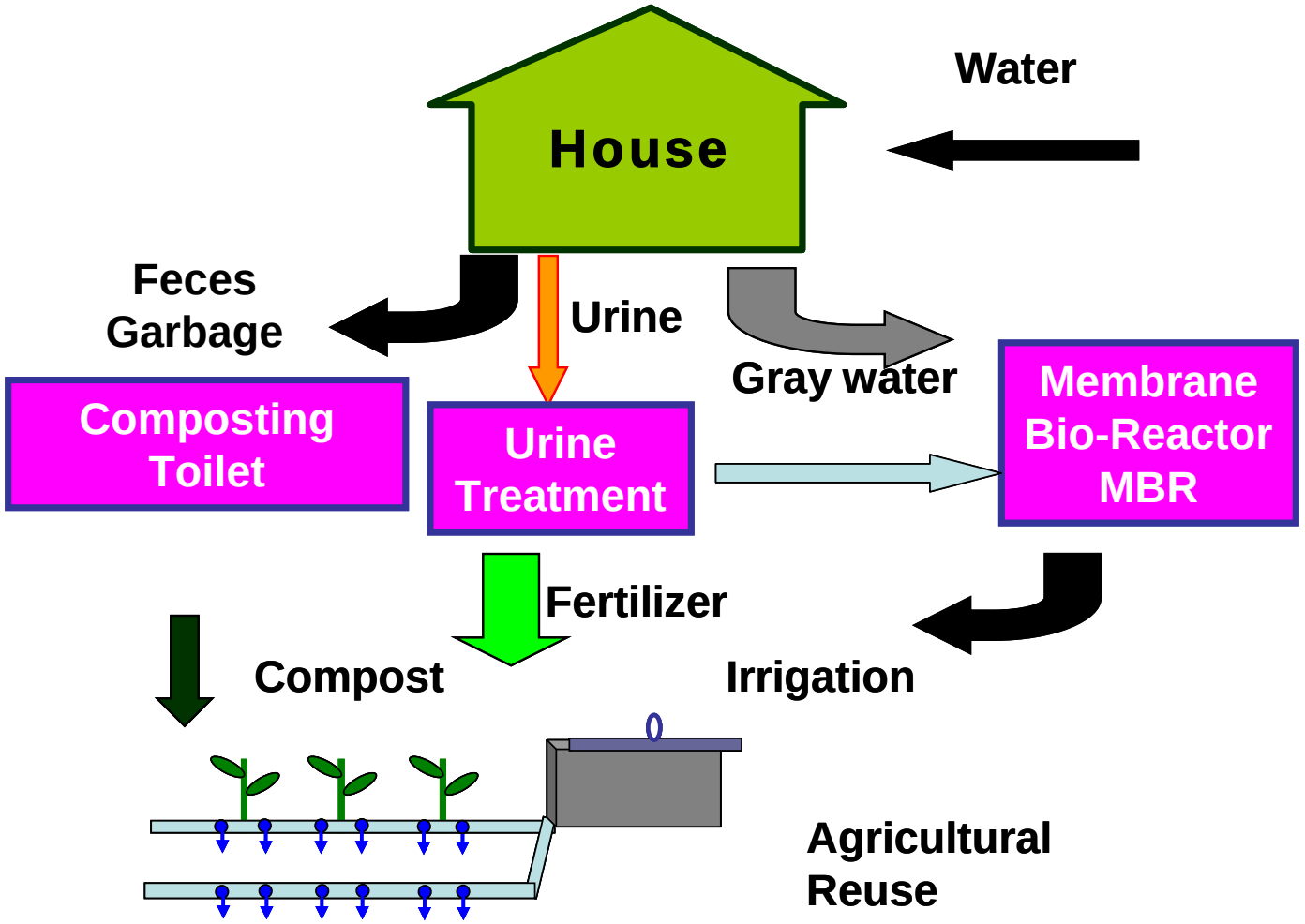
Technology should adapt to the social conditions and culture.

What kinds of systems we should consider for the different situations ?

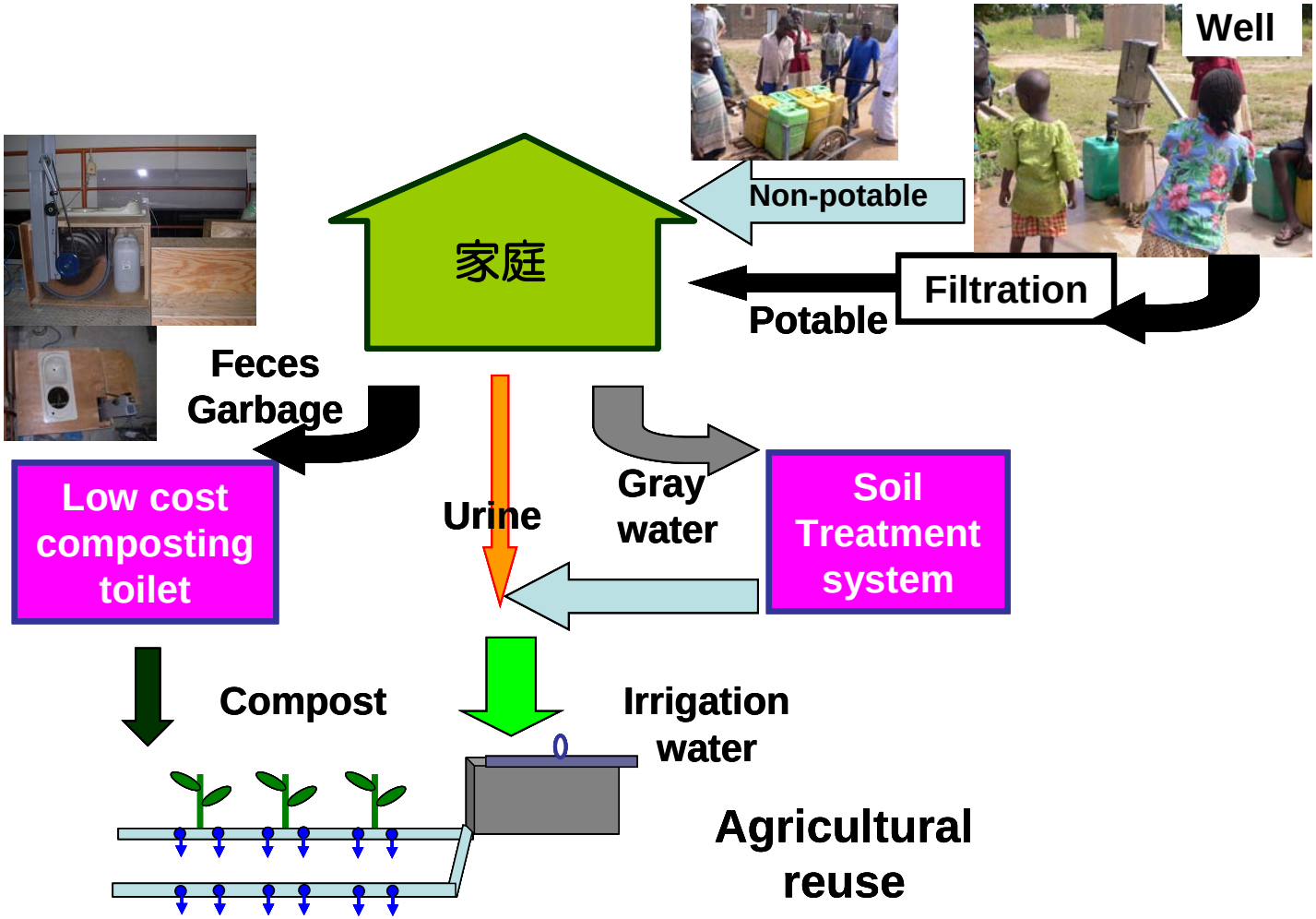
- 1 US$/day/capita society
- 10 US$/day/capita society
- 100 US$/day/capita society

- Rural, urban, slum areas

Model for rural area in Japan



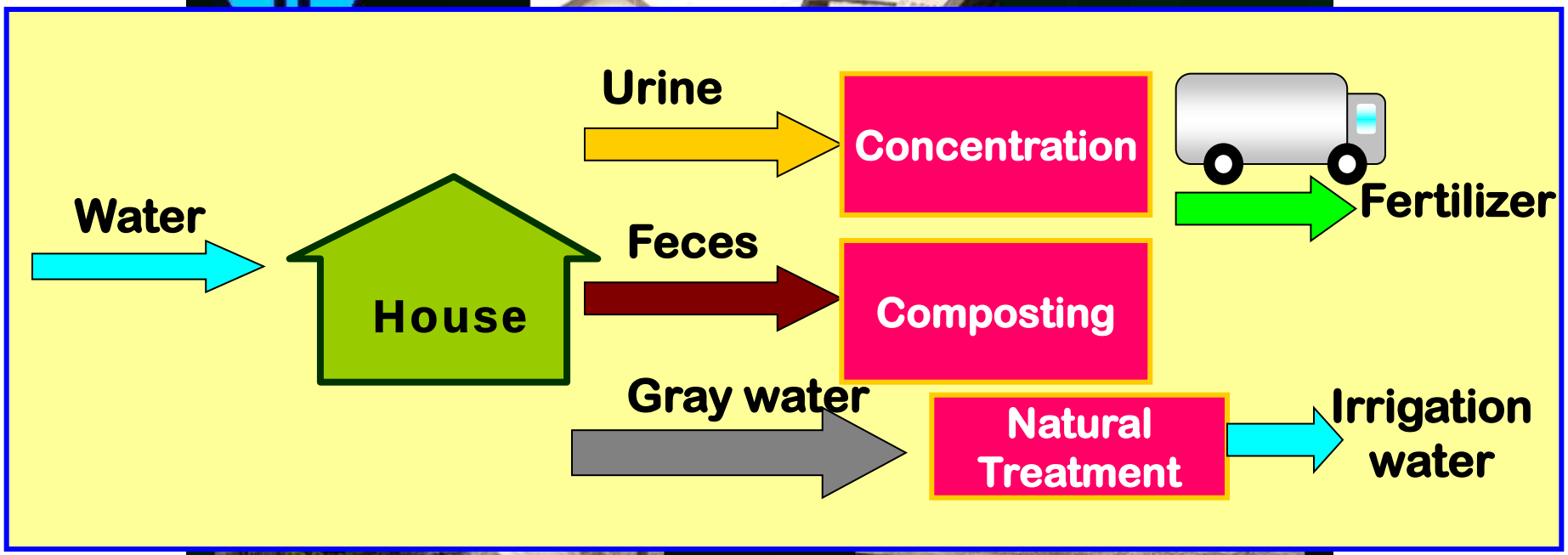
Model for rural area in developing countries



Model for Urban Slum area in developing countries

Dr.Neni:7th Conference of the Asian Council of Science, Japan, 2007

Model for Urban Slum area in developing countries



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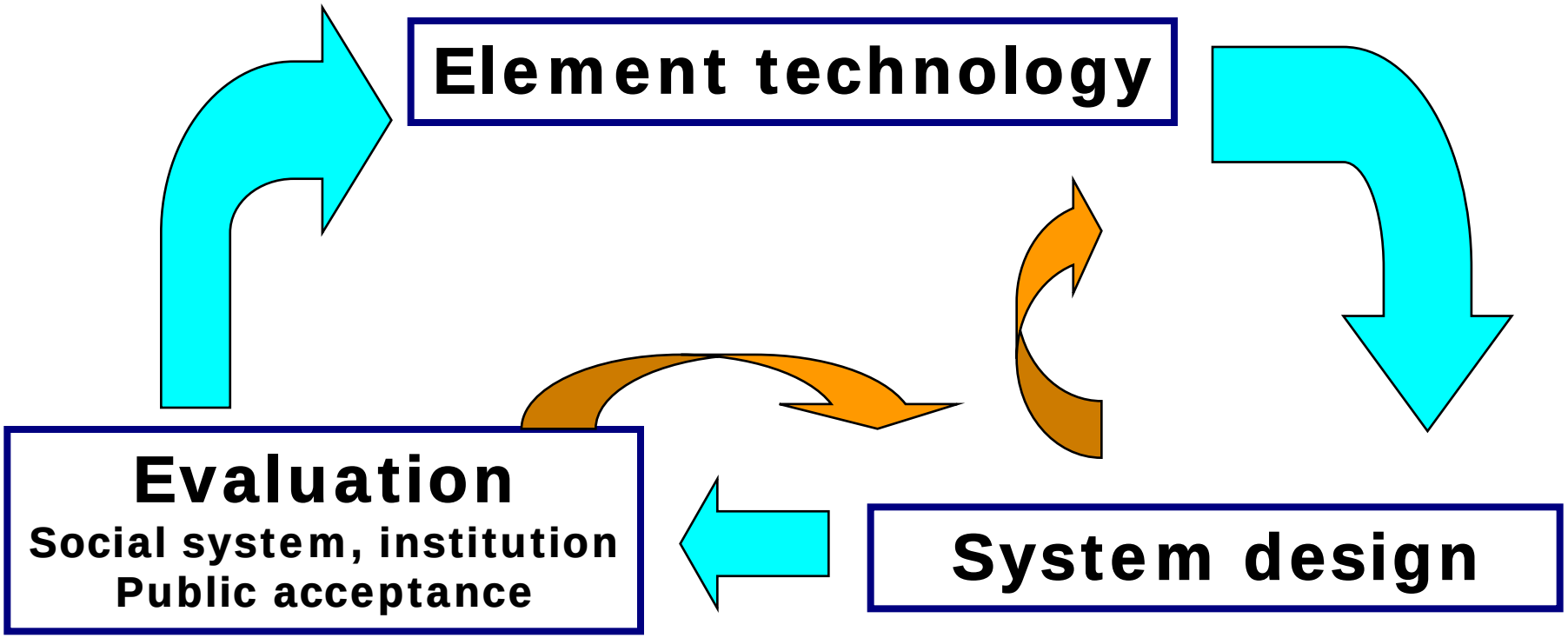
Innovation cycle of technology

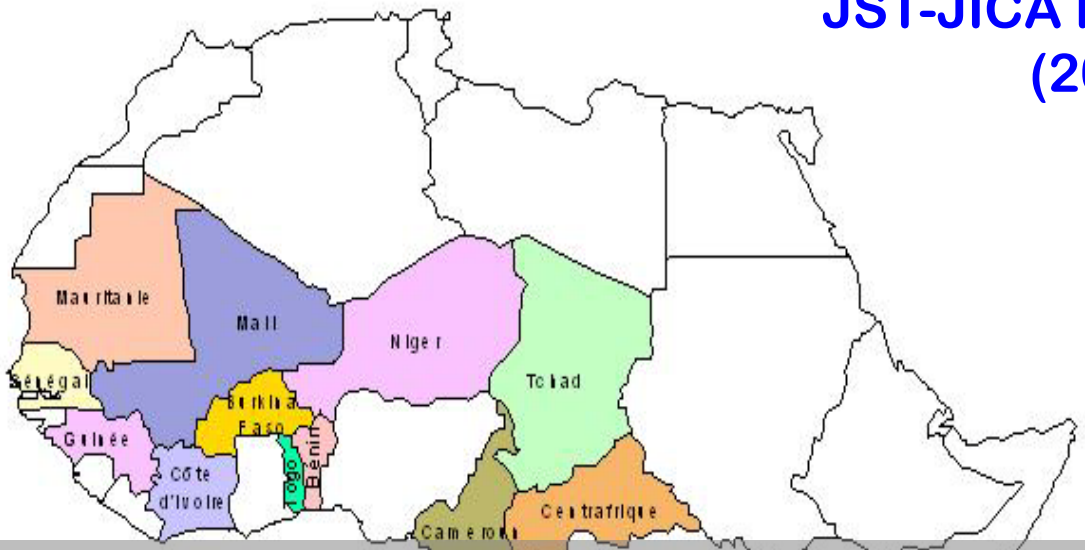


Role of policy

Discrimination by gender, social and cultural aspects, handicap needs to be overcome by participatory approach.

We should give access to adequate education, income and health care to all the people.

JST-JICA Research Project
(2009-2014)



Improving Sustainable Water and Sanitation systems in Sahel Region in Africa: Case of Burkina Faso

東京大学
THE UNIVERSITY OF TOKYO

HOKKAIDO UNIVERSITY
FOUNDED 1876

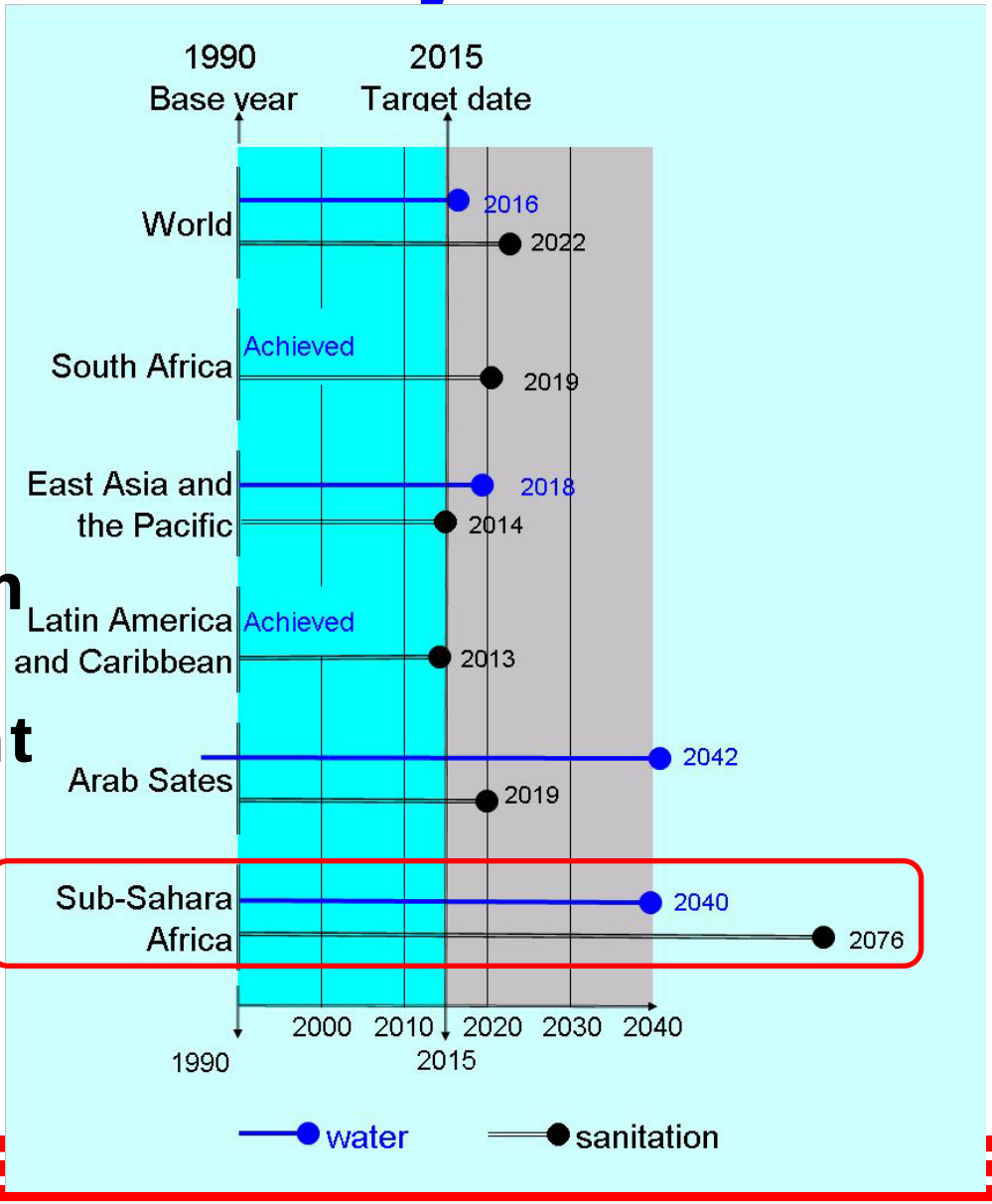
2iE
Groupe
EIER-ETSHER

Laboratory on Engineering for Sustainable Sanitation, Hokkaido University

Final goal of the Project

Contributing to the achievement of the Millennium Development Goals (MDGs) in water and sanitation

(1)Research
(2)Capacity development
(3)Socialization



Summary

- **The role of technology:**
  - **Technologies and social, institutional system should adapt to the social conditions.**
  - **Water technology should be a resource recovery technology, not a treatment technology.**

Summary

- **The role of policy :**
  - **Discrimination by gender, social and cultural aspects, handicap needs to be overcome by participatory approach.**
  - **We should give access to adequate education, income and health care to all the people, and consider how to include the poorest of the poor.**
  - **We should have the long term perspectives to how to adapt the change in developing countries from the society with one dollar per capita per day of GDP to the society with ten dollar and then a hundred dollar per capita per day.**

Summary

- **The role of Science:**
  - **The speed of the technological, economical and demographical changes taking in place in the current worlds must be slowed down to have a time for the scientific evaluation of these solutions.**