



# Thailand: Antimicrobial Resistance in the Environment

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# NO TIME TO WAIT: SECURING THE FUTURE FROM DRUG-RESISTANT INFECTIONS

REPORT TO THE SECRETARY-GENERAL  
OF THE UNITED NATIONS  
APRIL 2019



## ONE HEALTH RESPONSE TO ANTIMICROBIAL RESISTANCE



Humans



Food & Feed



Plants & Crops



Environment



Terrestrial &  
Aquatic Animals

Antimicrobial resistance is a global crisis. There is no time to wait. A sustained One Health response with a shared vision and goals is essential to tackle antimicrobial resistance and achieve the Sustainable Development Goals.

### Intergency Coordination Group on Antimicrobial Resistance Recommendations

ACCELERATE  
PROGRESS  
IN COUNTRIES

INNOVATE TO  
SECURE THE  
FUTURE

COLLABORATE FOR  
MORE EFFECTIVE  
ACTION

INVEST FOR A  
SUSTAINABLE  
RESPONSE

STRENGTHEN  
ACCOUNTABILITY AND  
GLOBAL GOVERNANCE

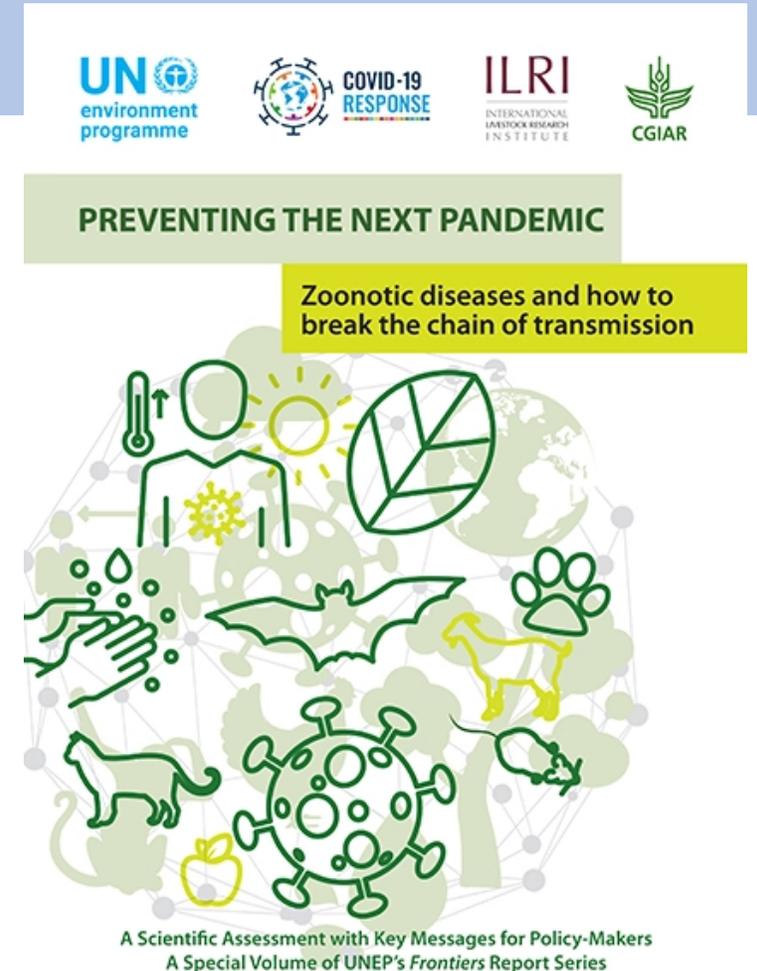
## SUSTAINABLE DEVELOPMENT GOALS



# The One Health Approach

- The 'One Health' term refers to the interconnectedness of human, animal, plant and environmental health.
- Addressing AMR therefore must take a multi-sectoral, multi-disciplinary approach and ensure communication, collaboration, and coordination among all relevant ministries, agencies, stakeholders, sectors, and disciplines, for optimal action.
- Adopting a 'One Health' approach, which unites medical, veterinary and environmental expertise, helps governments, businesses and civil society achieve enduring health for people, animals and environments alike.

<https://www.unenvironment.org/exploration-topics/chemicals-waste/what-we->



<https://www.unenvironment.org/resources/report/preventing-future-zoonotic-disease-outbreaks-protecting-environment-animals-and>

# AMR and the environment

- The environmental dimension of AMR has received comparatively less focus than AMR in human or animal health. However, the natural environment is an important reservoir of AMR.
- Water, and potentially soil, may be major modes for AMR development and spread.
- Strong evidence indicates that releases of antimicrobial compounds to the environment are driving bacterial evolution and the emergence of more resistant strains.
- Wildlife that come into contact with discharge from wastewater treatment plants, or livestock farms can also be colonized with drug resistant organisms.

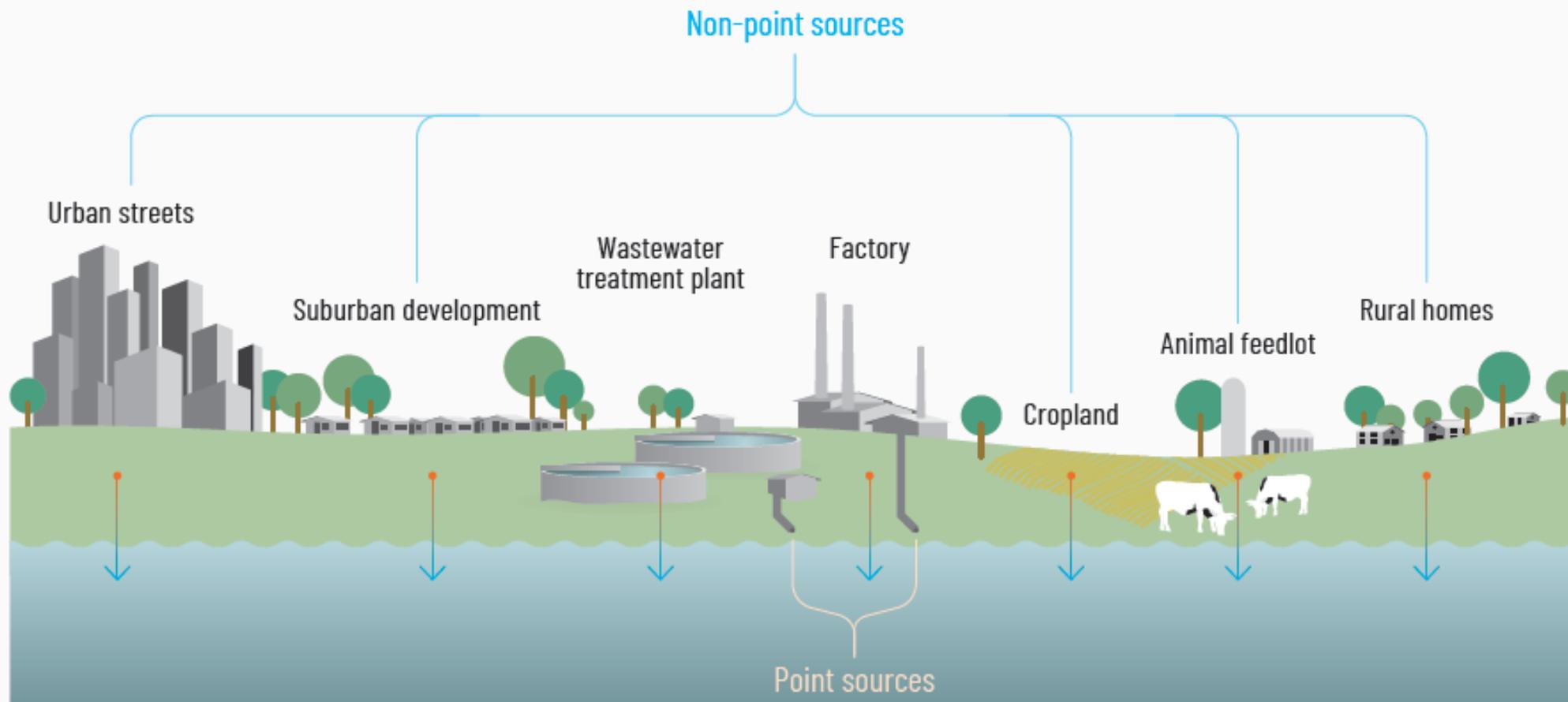
<https://www.unenvironment.org/explore-topics/chemicals-waste/what-we-do/emerging->



[https://www.who.int/water\\_sanitation\\_health/publications/wash-wastewater-management-to-prevent-infections-and-reduce-amr/en/](https://www.who.int/water_sanitation_health/publications/wash-wastewater-management-to-prevent-infections-and-reduce-amr/en/)

# Antimicrobial residue pollution enters the environment from different sources

Potential sources of chemical water pollution (adapted from Arefin and Malik 2018, p.100)



# Thailand's international commitments on AMR

- Thailand hosted the first Asia-Pacific Regional Forum on Health and Environment held in Bangkok in 2007. The 2016 Declaration included AMR as an environmental health concern for the region.
- In 2011, Thailand adopted the Jaipur Declaration on AMR, a commitment among WHO South-East Asia Member States that encourages a multi-sectoral approach to the prevention and containment of AMR.
- Thailand was also one of the lead countries for the Global Health Security Agenda (GHSA) action packages in 2014 for strengthening laboratory and health workforce capacities while contributing to the AMR package.
- Thailand was one of the founders of the Alliance of Champions for the promotion of awareness, engagement, and leadership on AMR among health ministers during the World Health Assembly in 2015.

# Thailand's National Strategic Plan (NSP) on Antimicrobial Resistance 2017-2021

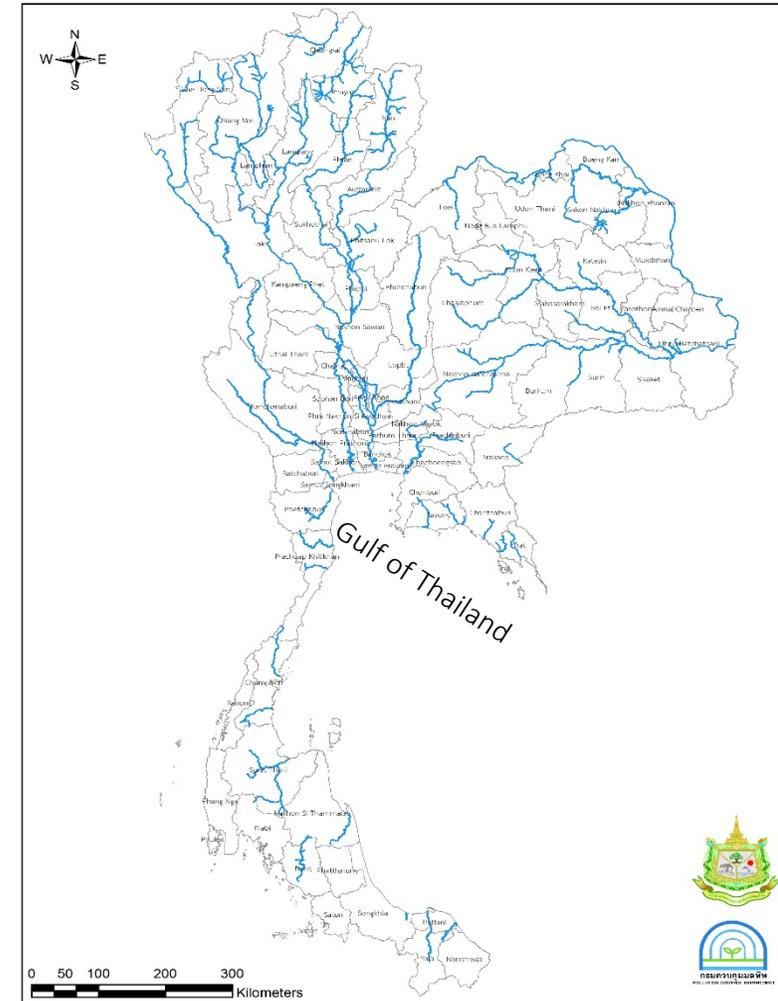
- Highlighted the collaborative, participative, and multi-sectoral nature of the One Health approach
- Follows the concept, “the triangle that moves the mountain” or solving complex issues through collaboration from multiple sectors
- NSP strategies
  1. **AMR surveillance using the One Health approach**
  2. regulation of antimicrobial distribution
  3. antimicrobial stewardship initiatives in humans
  4. AMR prevention and control in animals and pets
  5. public awareness campaigns on AMR
  6. governance mechanism for sustainability

# Governance for AMR in the environment: Ministry of Natural Resources and Environment (MoNRE)

- Pollution Control Department (PCD) - assigned as the national focal point for the environment side of AMR in Thailand
  - The Inland Water Sub-division of the PCD monitors water monitoring specifically for water basin and rivers in Thailand.
- Areas of work under the PCD on AMR in the environment
  - Monitoring of extended-spectrum  $\beta$ -lactamase- (ESBL-) producing *Escherichia coli* in rivers in Thailand (working closely with the Ministry of Public Health (MoPH) for laboratory support).
- National Strategic Plan for Environmental Health has been the main collaboration of the MoPH and MoNRE to tackle environmental health issues in Thailand.

# Why is AMR such an issue to the environment sector in Thailand?

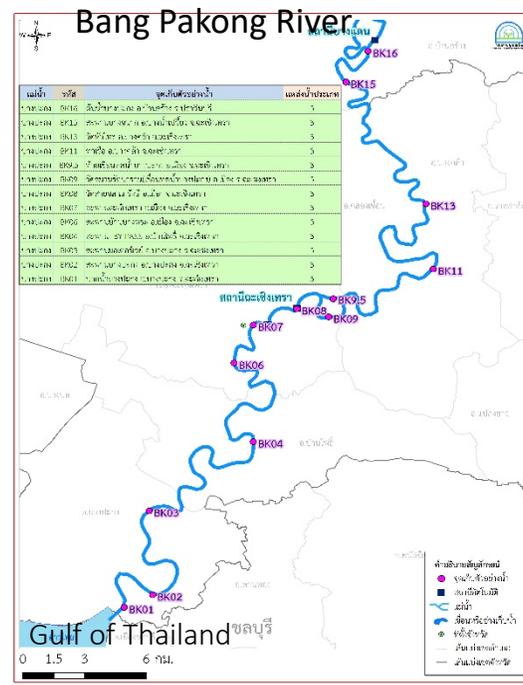
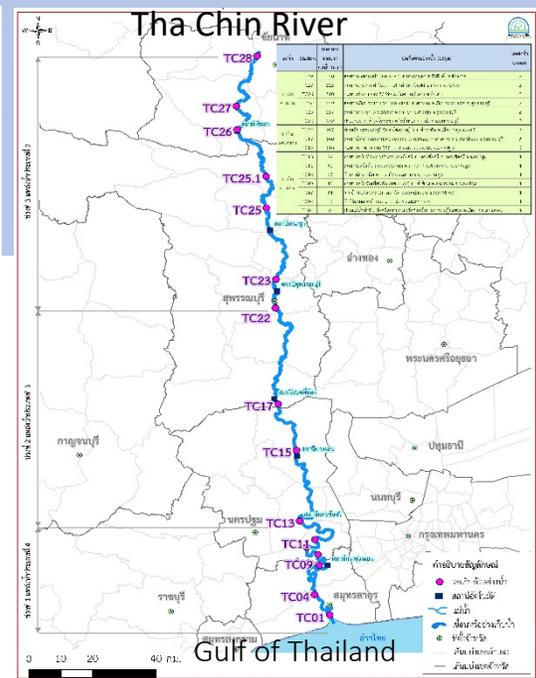
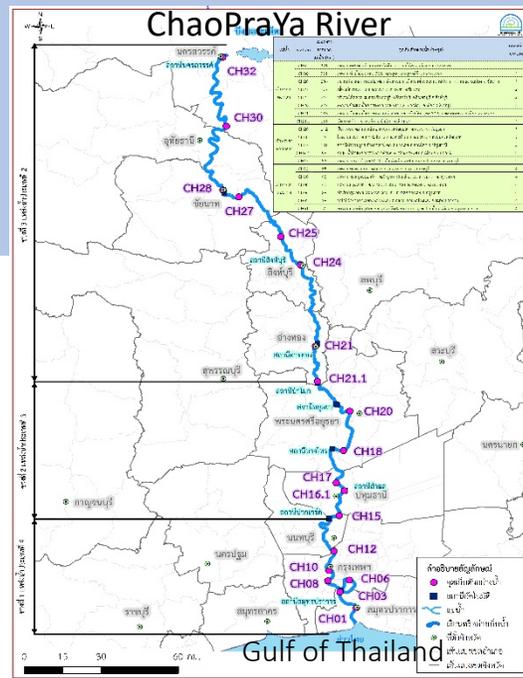
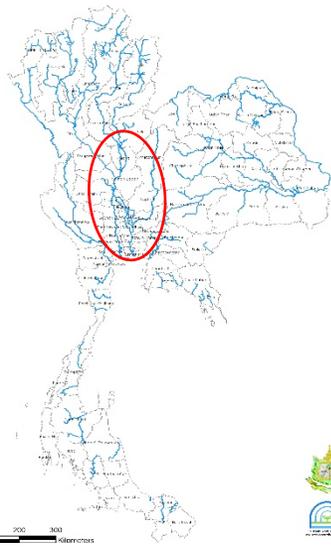
- Most of the rivers around Thailand end up in and water ends up in the Gulf of Thailand. Thus, baseline knowledge on AMR and the environment is needed.
- The exposure of AMR from the environment back to humans and animal has to be studied.
- Following the precautionary principle, we want to start regulation parallel to the research.



# Monitoring and Surveillance

## Challenges

- Dilution of samples occurs as they handle large amounts of water in rivers
- Similar problem encountered in the monitoring of pesticides
- Antimicrobial resistant organisms or antimicrobials can be present from effluent from domestic wastewater treatment, farms, hospitals, and the pharmaceutical industry.
- However, the issue with antimicrobials is the unknown rate of degradation of these chemicals similar to pesticides



# Thank you



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