WORKSHOP & TRAINING (RESIDENTIAL)

THE INDIAN FRESHWATER FISHERIES SECTOR

How to scale up preventive approaches to minimise antibiotic use

Setting the context

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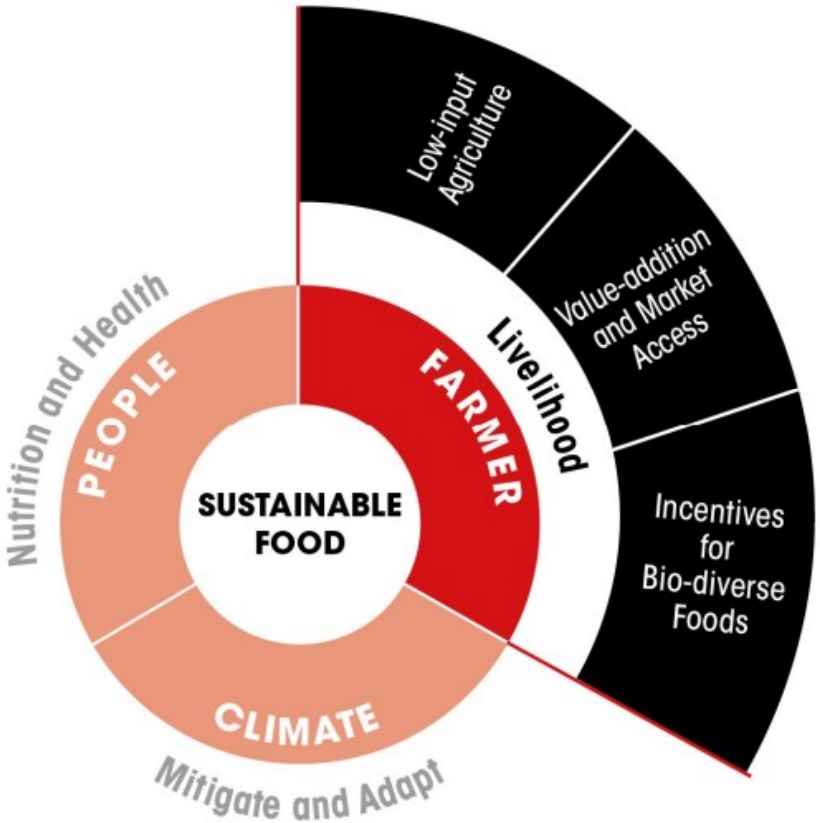
Connecting food-climate-farmer-consumer

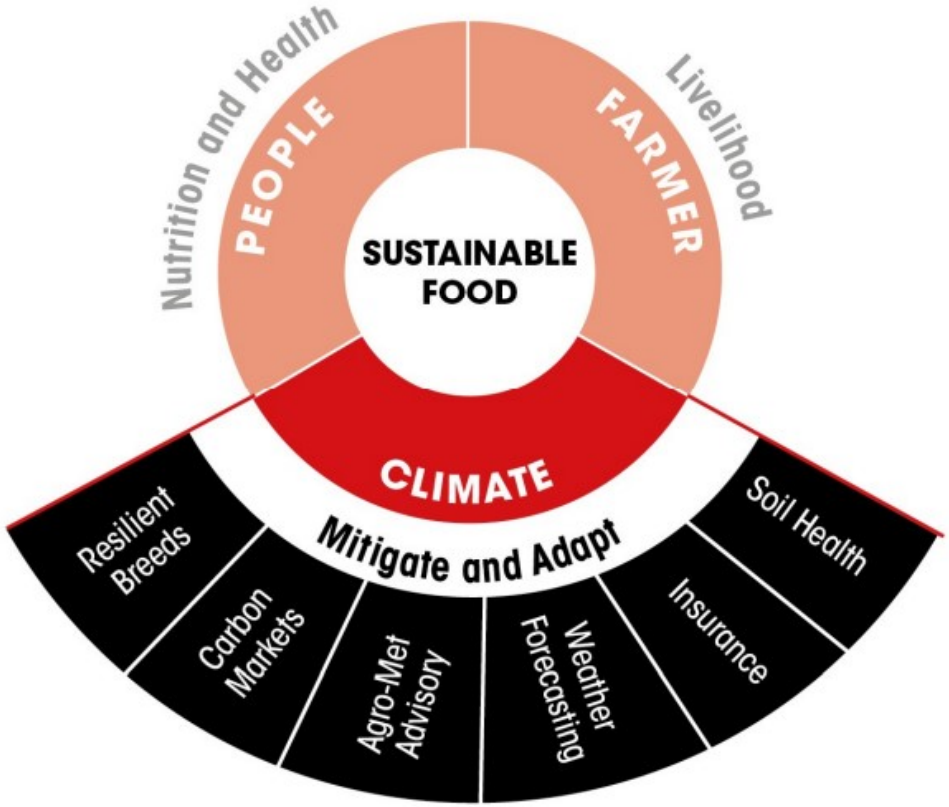
The Livelihood Connect

- **Putting more money in the hands of farmers** means building food systems that will rebuild nature so that there is sustainability; less cost
- Today farmers discount nature; destroy fertility; deplete groundwater; then add costs for chemicals and inputs; this makes them even more vulnerable when the next storm comes
- **Need systems that invest in nature**; low cost but high value Need nutrition for local food security
- **Need producers to connect to markets**



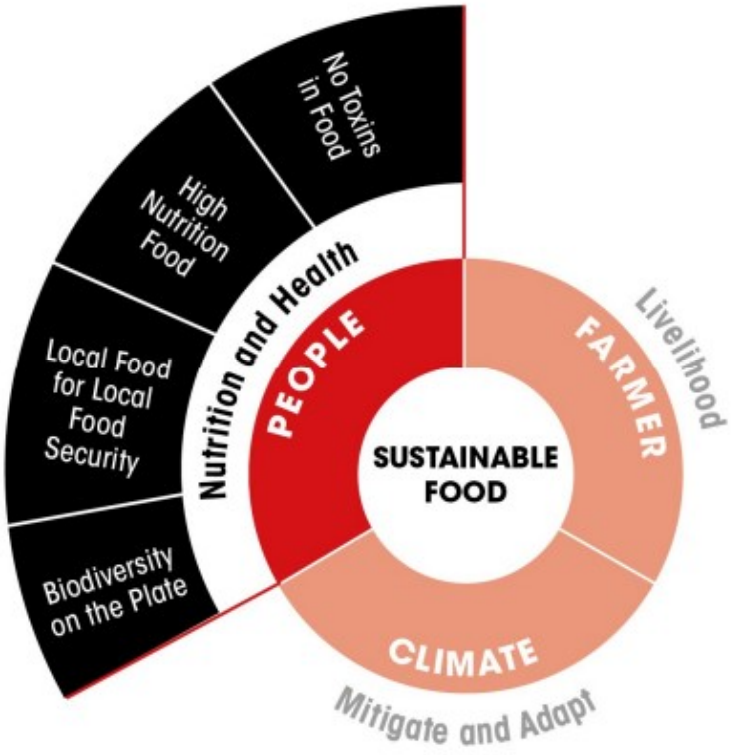
The Climate Connect

- **Agriculture is impacted because of climate change** but this sector is also a major cause of climate change. Biodiversity is about resilience
- Adaptation will only work if farmers have **timely and accurate information about weather anomalies**.
- **Farmers need safety nets** designed for extreme weather and climate impacts.
- **They need insurance systems** that will be designed for uncertain times and high risk.
- **We need carbon markets** to work for producers and not auditors.

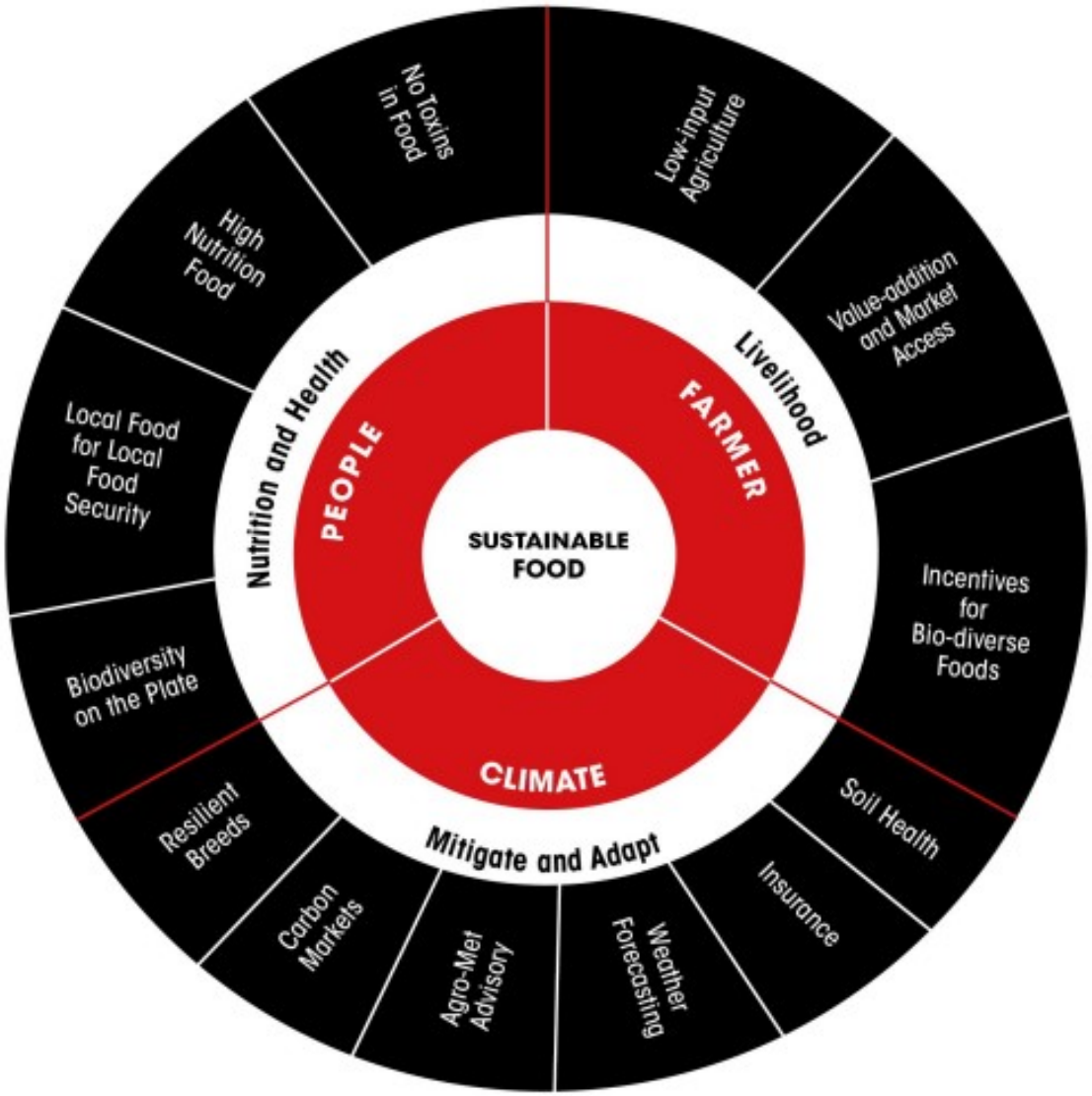


The People Connect

- **What we eat determines our health.** Food is about nutrition food is about medicine. Toxins used for producing food add to our health burden
- If agriculture is redesigned so that there is more money in the hands of producers they will not discount our health and nature.
- **We need not just food; but nutritive food that reaches everyone for food security**
- We need to junk the junk; obesity and NCD is about regulating industry.



Sustainable Food Systems



Sustainability in food systems

- Sustainability is about who grows – local food for livelihood security
- Sustainability is about how we grow – less intensive and less toxic
- Sustainability is about what we grow – biodiversity rich and nature-friendly
- Sustainability is about what we eat – less processed and more bio-diverse and local

Focus 1:

Agro-ecology, agri-climate connections, resilience and livelihoods

Focus 2:

Animal and environmental dimensions of antimicrobial resistance (AMR)

Why should we worry? Triple crisis of AMR!

Crisis 1: Antibiotics are becoming ineffective

- **Critically important antibiotics** losing power to kill bacteria
- **Expensive** antibiotics used
- Treatment options **reducing**

Crisis 2: The antibiotic development crisis

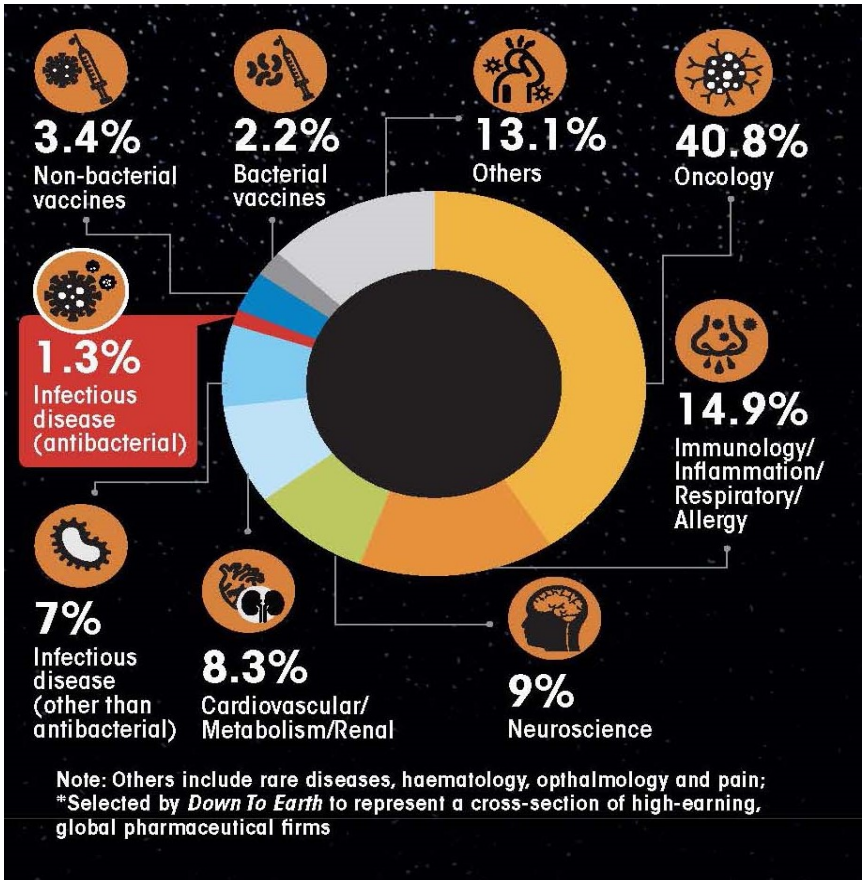
- **No new class of antibiotics developed since 1980s**
- Those developed over last decade inadequate to treat growing **unmet need; growing resistance**

Crisis 3: The issue of antibiotic access

- **Existing** and **newer** antibiotics
- Bigger problem in **LMICs**

Hollow pipeline !

Market failure or commercial interest ?



Out of **1007 molecules** in clinical pipeline of 15 global pharmaceuticals, **only** 13 **are antibacterial** candidates, being developed by **four companies.** 8 out 13 are by one company (GSK).

As on 2022

Impact is beyond human health; more in low- and middle-income countries (LMICs)

Human Health

1.14 M deaths in 2021 (attributed directly)

4.7 M deaths in 2021 (associated with AMR)

- Estimated to go upto 8.2 M by 2050
- About 85 per cent of deaths estimated in countries of Asia, Africa, Latin America

AMR **killed more people than HIV/AIDS** (0.7 M) or malaria (0.6 M) in 2021

Can kill nearly **1.9 million** each year by 2050

Livelihood, Economy, Development

AMR in livestock can cause **global GDP loss of USD 575 billion**

Annual livestock production losses by 2050 due to AMR is expected to equal consumption needs of **746 million** people

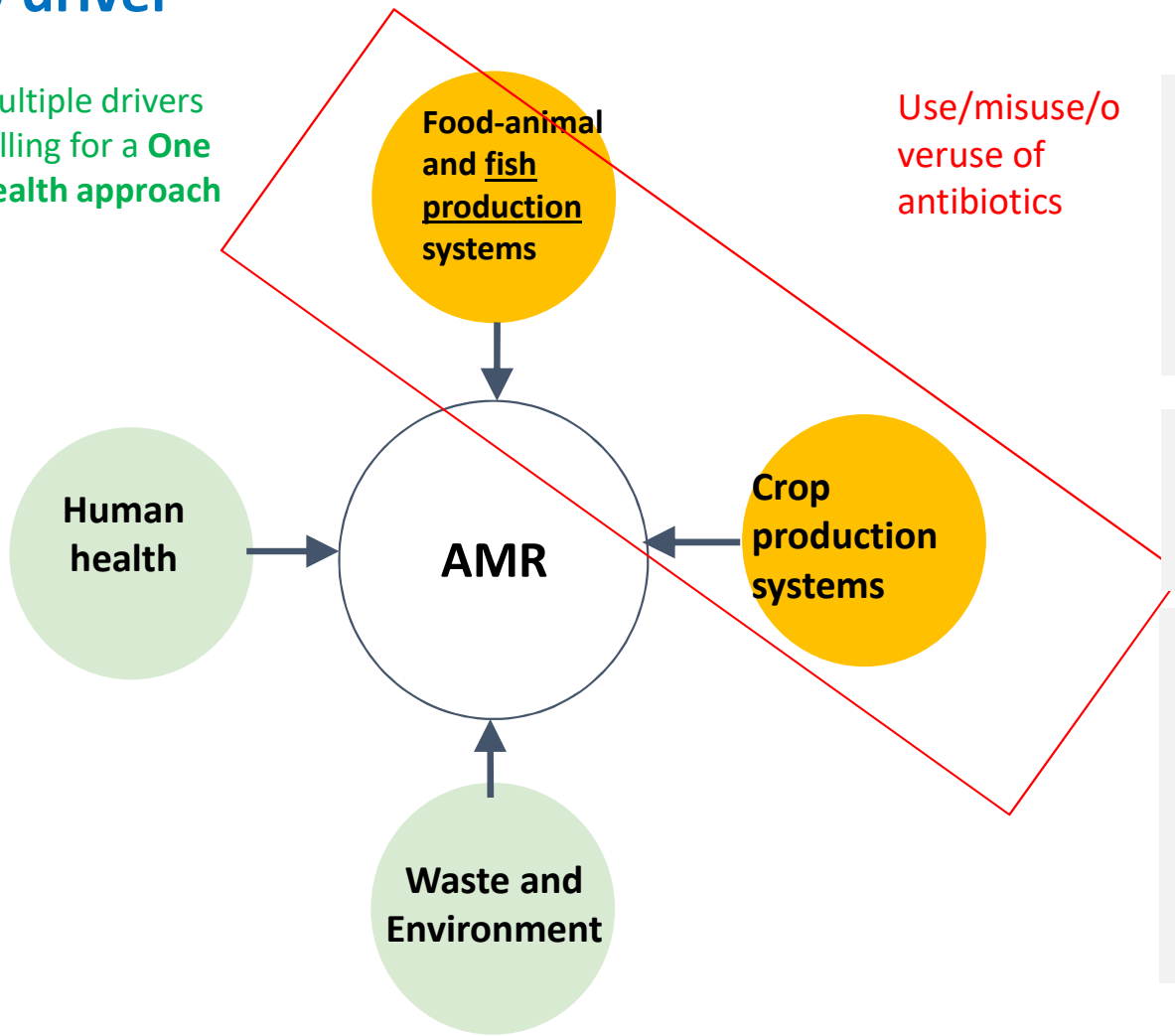
By 2030

Additional 24 million people into extreme poverty; most in LMICs

AMR could derail achievement of several SDGs by 2030

One-Health nature of the AMR problem, and food systems a key driver

Multiple drivers calling for a **One Health approach**

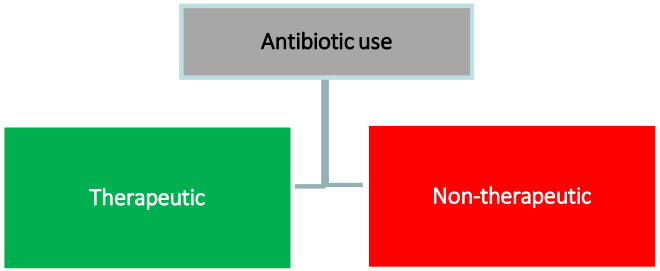


Key sectors
- **Fish for meat**
- Poultry (eggs and meat)
- Buffalo and cattle (milk and meat)
- Bee-keeping for honey
- Crops (food, feed)

AMR determinants
- Antibiotic resistant bacteria
- Antibiotic resistance genes
- Antibiotic residues

Intensive fish farming systems
- Large-scale units
- High stocking density-high stress
- Genetically selected similar breeds for productivity
- Dependence on commercial feed, inputs

Three key issues w.r.t. antibiotic use in food production systems



- **Therapeutic doses**
- **Clinically diagnosed infectious disease**

Growth promotion

- Increase the **rate of weight gain**
- Increase **efficiency of feed utilization**
- **Mass, routine use** (largely through feed at sub-therapeutic doses)

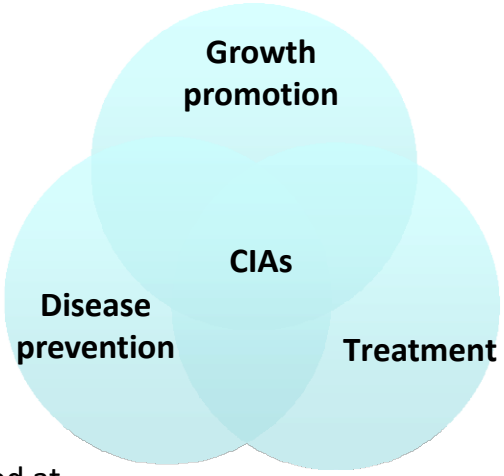
Prevention (prophylaxis)

- Individual or group of animals/fish
- With no clinical sign
- Often routine use

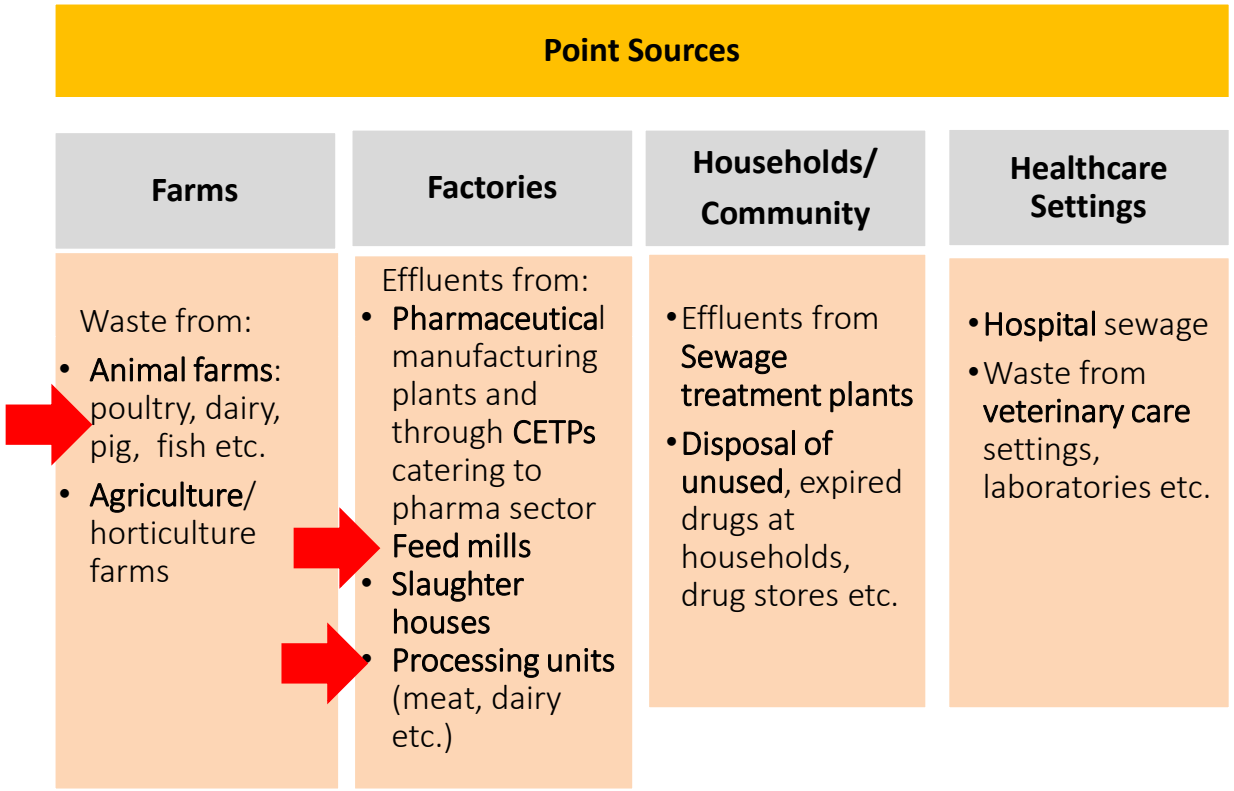
- **Though non-therapeutic, now being positioned as therapeutic by some agencies. Not 'real' prevention.**

Prevention – (control / metaphylaxis)

- In a **group of healthy animals** (presumed to be infected/may have already been sub-clinically infected because they are at risk of infection), **where one or more animal is already infected**



The environmental connect



Non-point sources/reservoirs

- Rivers, Reservoirs
- Groundwater
- Agricultural soil

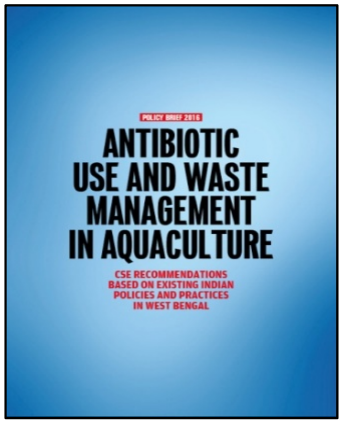
- **Complex and cross cutting** problem
- **Three determinants** travel across the systems, sectors: antibiotic residues, resistant bacteria, AMR, resistance genes
- Nature of waste, AMR determinants, **concentrations vary by sectors**

CSE's work on Antimicrobial Resistance

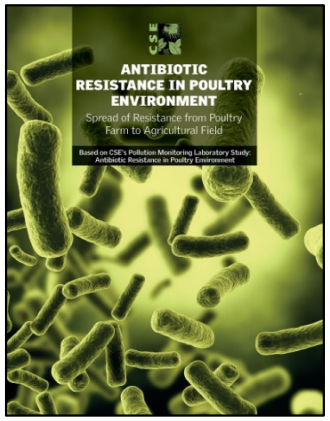
AMR | Food and environment aspects | India

Antibiotics in honey, 2010

Antibiotic use in poultry, 2014

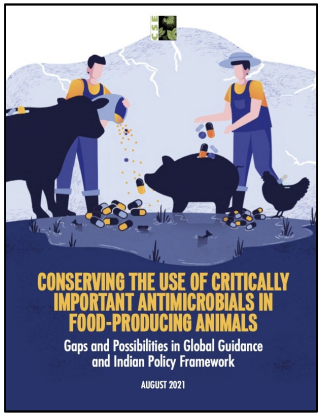


Antibiotic use in aquaculture, 2016

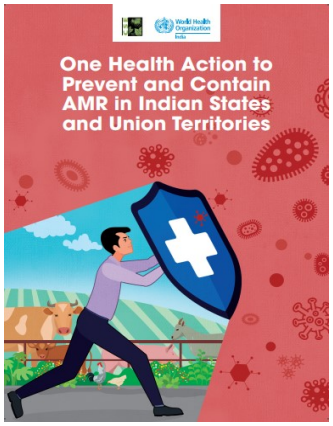


AMR in poultry environment, 2017

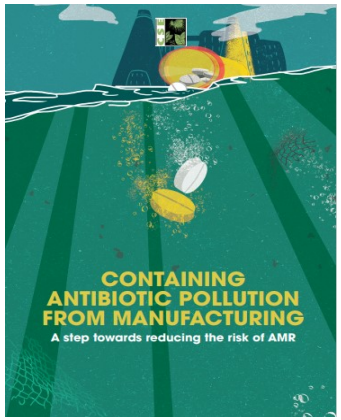
Antibiotic use in fast food supply chain, 2017



Conserve the use of critically important antimicrobial, 2021



One health action to prevent and contain AMR, 2024



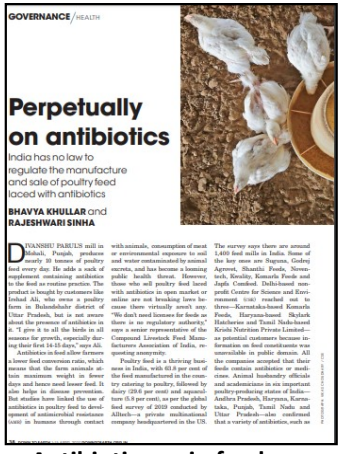
Containing antibiotic pollution from manufacturing to reduce the risk of AMR, 2024

AMR | Food and environment aspects | India

Disposal of pharma manufacturing waste, 2017

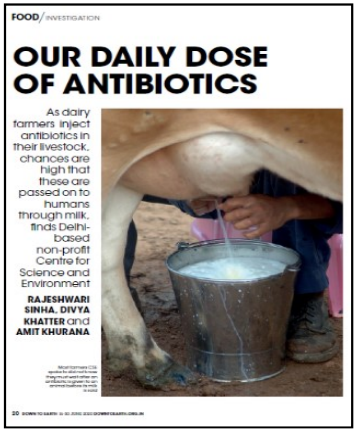
Antibiotic use in crops, 2019

Disposal of unwanted drugs, 2019



Antibiotic use in feed, 2020

Antibiotic use in fast food supply chain, 2020

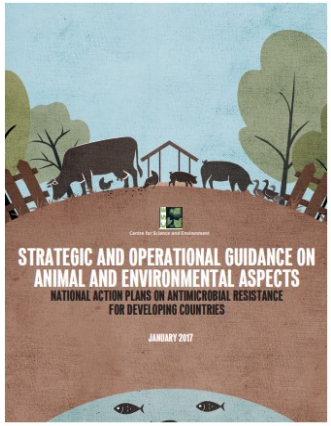


Antibiotic use in dairy, 2020

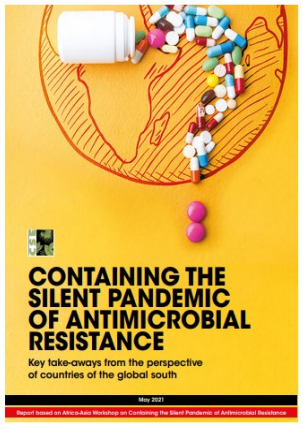
Use of ethno medicines in dairy sector, 2022

Reducing antibiotic use in poultry sector, 2024

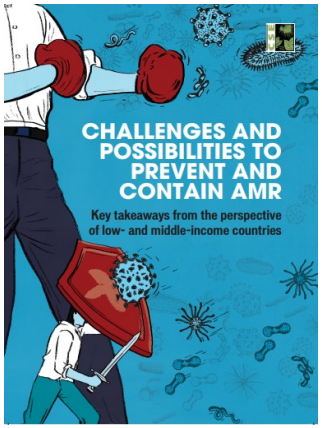
AMR containment | LMICs, global, Zambia



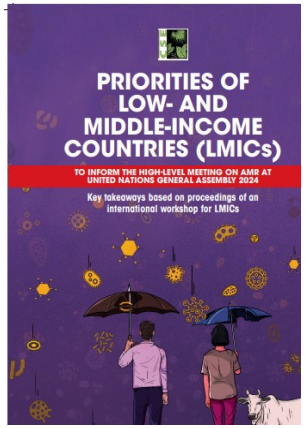
2017



2021

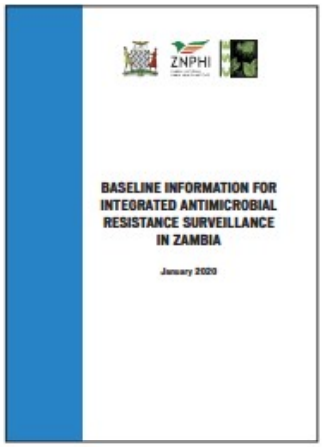


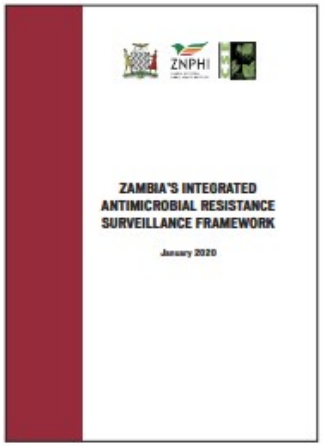
2024

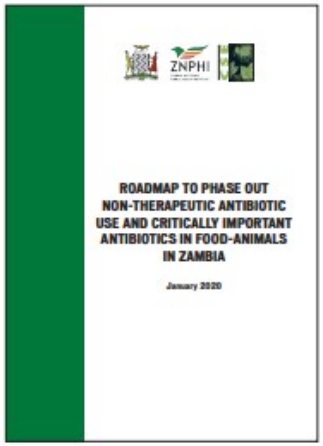


2024

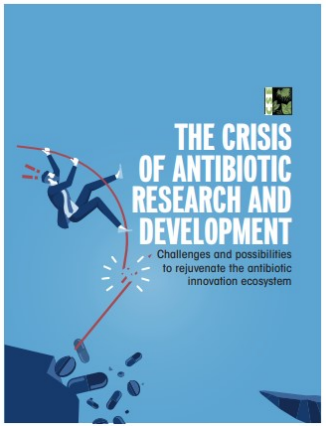
LMIC priorities to contain AMR







Supporting Zambia's NAP-AMR 2019-20



The global crisis of antibiotic R&D, 2023

Why fisheries?

- **Indian fisheries sector is a big and growing part of its food-animal production system; perhaps more growth in intensive production**
- **India is second largest** fish producing country; contributes about **8 per cent to** global fish production
- **Second largest** aquaculture producing country
- Plays an important role in **national economy**
- Plays an important role in **food, livelihood, nutrition and income** of about **28 million fishers and fish farmers** at the primary level
- **Big government focus –** Flagship scheme **Pradhan Mantri Matsya Sampada Yojana (PMMSY)** with total budget of Rs 20,050 crore for five years (2020-21 to 2024-25); new sub-scheme of PMMSY with an investment of ₹6,000 crore announced in 2024 for 4 years (2023-24 to 2026-27)
- Union Budget 2025-26, proposed the **highest ever** total annual budgetary support of Rs. 2,703.67 crores for the fisheries sector.

Why prevention?

Preventing an occurrence of a disease which eventually reduces the need (and subsequent use) of antibiotics

Benefits

- **Cost effective**
- **High returns on investment**
- **Suitability** for a country like India (with a high number of small farmers; growth conditions, less resources)
- **Scale up possibility** if it has incentives
- **Sustainable and transformative**
- Perhaps the only **prudent approach going forward for growing fisheries sustainably**

Thank you!

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