WORKSHOP & TRAINING (RESIDENTIAL)

THE INDIAN FRESHWATER FISHERIES SECTOR

How to scale up preventive approaches to minimise antibiotic use

The crisis of antimicrobial resistance: global and national response

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Global and national response to AMR: countries working together at global platforms

Global

- **United Nations** (UNGA high level meetings in 2016 and in 2024)
- **G7 and G20 nations**
- **Global Leaders Group** on AMR - advocating for political momentum
- **Quadripartite**
  - World Health Organization
  - Food and Agriculture Organization
  - World Organisation for Animal Health
  - United Nations Environment Programme

National

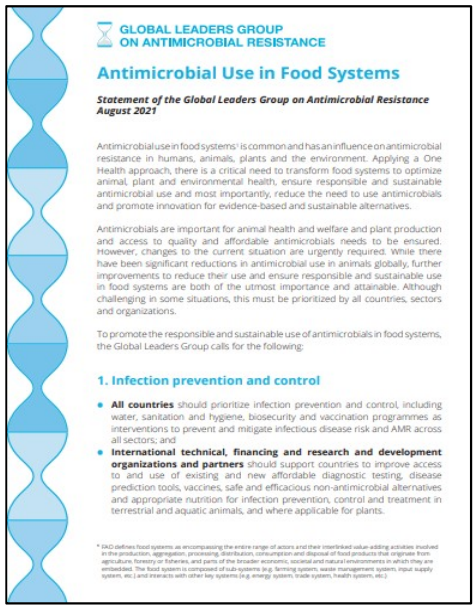
- National and state **governments**
- **Ministries/departments** of animal husbandry, agriculture, **fisheries,** pollution control, human health etc.

….along with civil society, industry, scientific community (e.g., World Fish), media, professional associations

Global response

Responses from global governance mechanisms/structures

Global Leaders Group on AMR, 2021



GLOBAL LEADERS GROUP ON ANTIMICROBIAL RESISTANCE

Antimicrobial Use in Food Systems

Statement of the Global Leaders Group on Antimicrobial Resistance August 2021

Antimicrobial use in food systems[*] is common and has an influence on antimicrobial resistance in humans, animals, plants and the environment. Applying a One Health approach, there is a critical need to transform food systems to optimize animal, plant and environmental health, ensure responsible and sustainable antimicrobial use and most importantly, reduce the need to use antimicrobials and promote innovation for evidence-based and sustainable alternatives.

Antimicrobials are important for animal health and welfare and plant production and access to quality and affordable antimicrobials needs to be ensured. However, changes to the current situation are urgently required. While there have been significant reductions in antimicrobial use in animals globally, further improvements to reduce their use and ensure responsible and sustainable use in food systems are both of the utmost importance and attainable. Although challenging in some situations, this must be prioritized by all countries, sectors and organizations.

To promote the responsible and sustainable use of antimicrobials in food systems, the Global Leaders Group calls for the following:

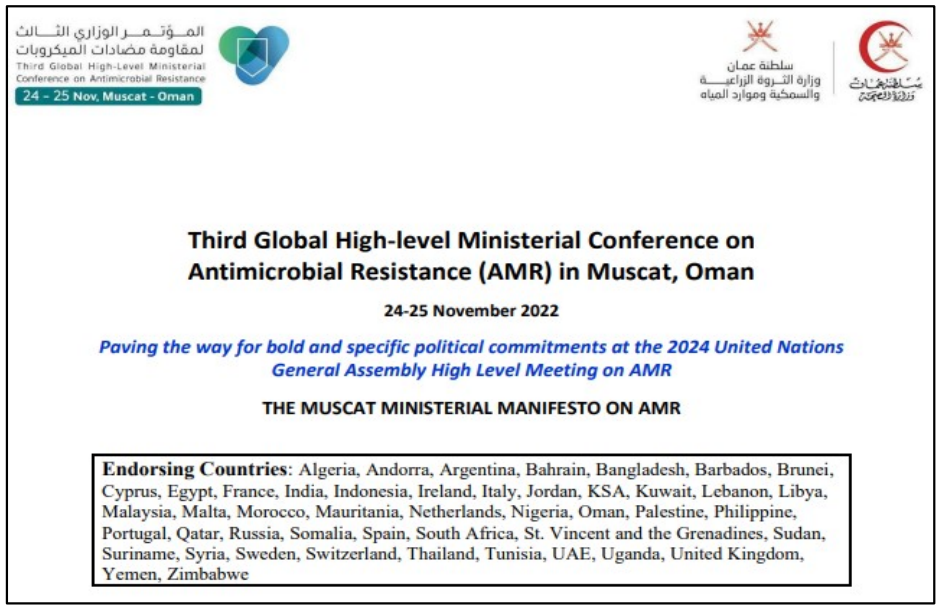
1. Infection prevention and control

- **All countries** should prioritize infection prevention and control, including water, sanitation and hygiene, biosecurity and vaccination programmes as interventions to prevent and mitigate infectious disease risk and AMR across all sectors; and
- **International technical, financing and research and development organizations and partners** should support countries to improve access to and use of existing and new affordable diagnostic testing, disease prediction tools, vaccines, safe and efficacious non-antimicrobial alternatives and appropriate nutrition for infection prevention, control and treatment in terrestrial and aquatic animals, and where applicable for plants.

[*] FAO defines food systems as encompassing the entire range of actors and their interlinked value-adding activities involved in the production, aggregation, processing, distribution, consumption and disposal of food products that originate from agriculture, forestry or fisheries, and parts of the broader economic, societal and natural environments in which they are embedded. The food system is composed of sub-systems (e.g. farming system, waste management system, input supply system, etc.) and interacts with other key systems (e.g. energy system, trade system, health system, etc.).

Reduce overall use of antimicrobials, particularly HPCIAs; Limit antimicrobial prophylaxis and metaphylaxis in terrestrial/aquatic animals

Muscat Ministerial Manifesto on AMR, 2022



المـؤتـمـر الوزاري الثـالث لمقاومة مضادات الميكروبات
Third Global High-Level Ministerial Conference on Antimicrobial Resistance
24 – 25 Nov, Muscat - Oman

سلطنة عمان
وزارة التـروة الزراعيـة والسمكية وموارد المياه

Third Global High-level Ministerial Conference on Antimicrobial Resistance (AMR) in Muscat, Oman

24-25 November 2022

Paving the way for bold and specific political commitments at the 2024 United Nations General Assembly High Level Meeting on AMR

THE MUSCAT MINISTERIAL MANIFESTO ON AMR

Endorsing Countries: Algeria, Andorra, Argentina, Bahrain, Bangladesh, Barbados, Brunei, Cyprus, Egypt, France, India, Indonesia, Ireland, Italy, Jordan, KSA, Kuwait, Lebanon, Libya, Malaysia, Malta, Morocco, Mauritania, Netherlands, Nigeria, Oman, Palestine, Philippine, Portugal, Qatar, Russia, Somalia, Spain, South Africa, St. Vincent and the Grenadines, Sudan, Suriname, Syria, Sweden, Switzerland, Thailand, Tunisia, UAE, Uganda, United Kingdom, Yemen, Zimbabwe

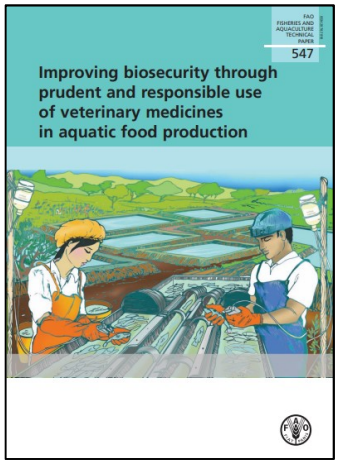
Countries (47) committed to reduce antibiotic use in agri-food systems by 2030

Bracing for Superbugs, 2023, UNEP

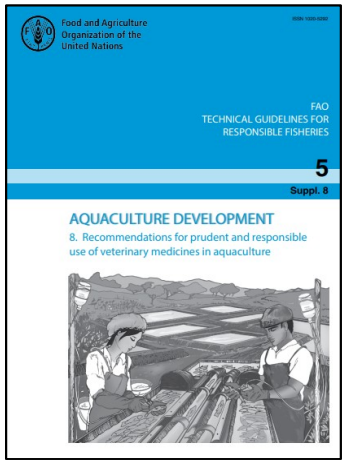
Agriculture, including aquaculture-identified as one of the key sectors contributing to environmental dimensions of AMR

Sectoral response of intergovernmental organizations: FAO, WOAH

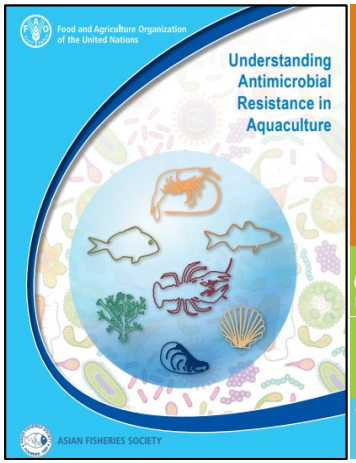
FAO



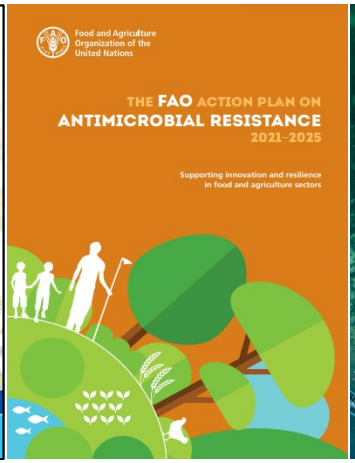
2012



2019

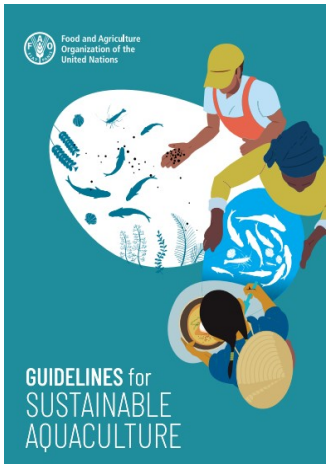


2020



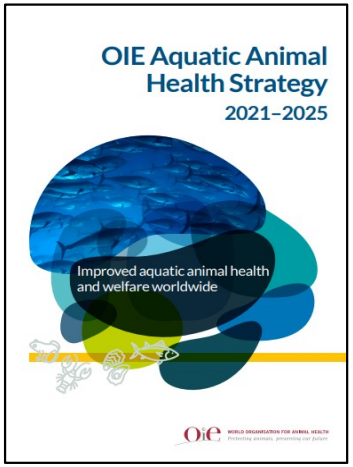
2021

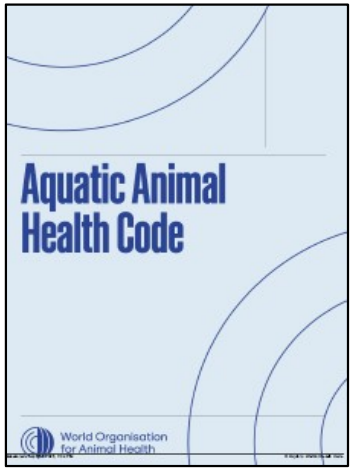
2022

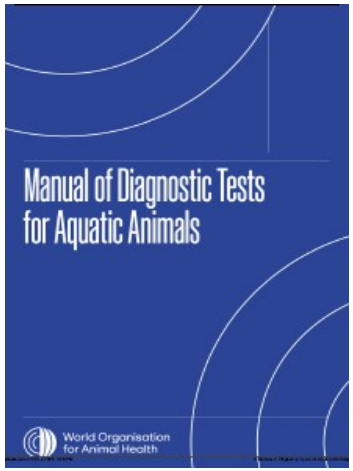


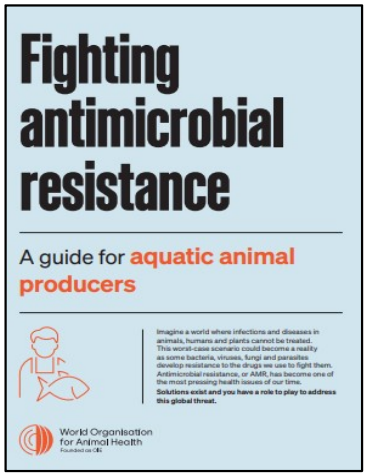
2025

WOAH



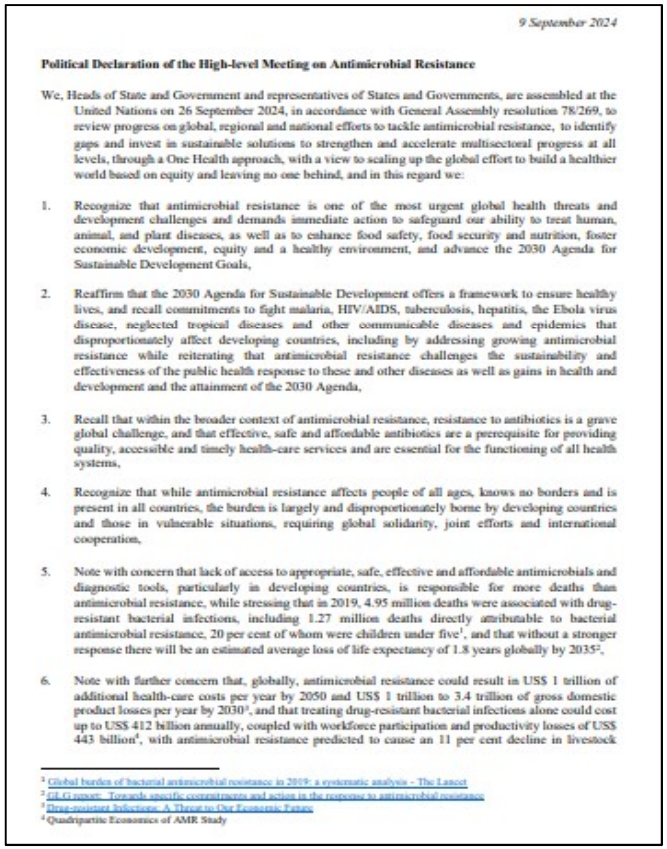






2021

Political Declaration of the High-Level Meeting on AMR, 2024



9 September 2024

Political Declaration of the High-level Meeting on Antimicrobial Resistance

We, Heads of State and Government and representatives of States and Governments, are assembled at the United Nations on 26 September 2024, in accordance with General Assembly resolution 78/269, to review progress on global, regional and national efforts to tackle antimicrobial resistance, to identify gaps and invest in sustainable solutions to strengthen and accelerate multisectoral progress at all levels, through a One Health approach, with a view to scaling up the global effort to build a healthier world based on equity and leaving no one behind, and in this regard we:

1. Recognize that antimicrobial resistance is one of the most urgent global health threats and development challenges and demands immediate action to safeguard our ability to treat human, animal, and plant diseases, as well as to enhance food safety, food security and nutrition, foster economic development, equity and a healthy environment, and advance the 2030 Agenda for Sustainable Development Goals,

2. Reaffirm that the 2030 Agenda for Sustainable Development offers a framework to ensure healthy lives, and recall commitments to fight malaria, HIV/AIDS, tuberculosis, hepatitis, the Ebola virus disease, neglected tropical diseases and other communicable diseases and epidemics that disproportionately affect developing countries, including by addressing growing antimicrobial resistance while reiterating that antimicrobial resistance challenges the sustainability and effectiveness of the public health response to these and other diseases as well as gains in health and development and the attainment of the 2030 Agenda,

3. Recall that within the broader context of antimicrobial resistance, resistance to antibiotics is a grave global challenge, and that effective, safe and affordable antibiotics are a prerequisite for providing quality, accessible and timely health-care services and are essential for the functioning of all health systems,

4. Recognize that while antimicrobial resistance affects people of all ages, knows no borders and is present in all countries, the burden is largely and disproportionately borne by developing countries and those in vulnerable situations, requiring global solidarity, joint efforts and international cooperation,

5. Note with concern that lack of access to appropriate, safe, effective and affordable antimicrobials and diagnostic tools, particularly in developing countries, is responsible for more deaths than antimicrobial resistance, while stressing that in 2019, 4.95 million deaths were associated with drug-resistant bacterial infections, including 1.27 million deaths directly attributable to bacterial antimicrobial resistance, 20 per cent of whom were children under five[1], and that without a stronger response there will be an estimated average loss of life expectancy of 1.8 years globally by 2035[2],

6. Note with further concern that, globally, antimicrobial resistance could result in US$ 1 trillion of additional health-care costs per year by 2050 and US$ 1 trillion to 3.4 trillion of gross domestic product losses per year by 2030[3], and that treating drug-resistant bacterial infections alone could cost up to US$ 412 billion annually, coupled with workforce participation and productivity losses of US$ 443 billion[4], with antimicrobial resistance predicted to cause an 11 per cent decline in livestock

[1] Global burden of bacterial antimicrobial resistance in 2019: a systematic analysis - The Lancet
[2] GLG report: Towards specific commitments and action in the response to antimicrobial resistance
[3] Drug-resistant Infections: A Threat to Our Economic Future
[4] Quadripartite Economics of AMR Study

- **Global political commitment** to tackle AMR
- Adopted at **UN General Assembly HLM-AMR** on 26 September 2024
- Endorsed by all **193 UN Member States**, including **India**
- Countries committed to **reduce antibiotic use in agri-food-systems** by 2030, including aquaculture
  - Calls for meaningful reduction of unnecessary and non-therapeutic use of antimicrobials in agri-food systems
- Emphasis on **prevention first**

National response

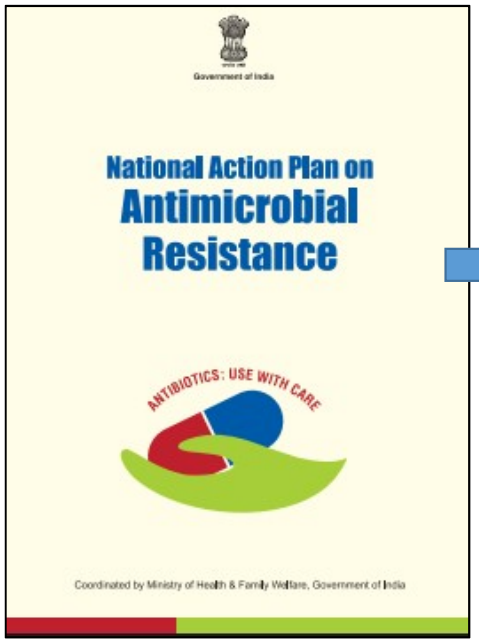
Fisheries sector in India

- Total production (2024–25): **~197.75 lakh tonnes (106 per cent** rise since 2013-14)
  - Annual average growth rate: **6.30 per cent** over last five years
- Much of this growth comes from **Inland fish production**
  - **76 per cent** of total fish production
  - **7.33 per cent growth** from 2021-22 to 2023-24
  - Share of **freshwater aquaculture** in inland fisheries in recent years has increased to **75 per cent**
- **Fifth** largest exporter of fish and seafood products
  - Exported **all time high** of marine products in 2023-24

Key Programmes/Initiatives

- Pradhan Mantri Matsya Sampada Yojana (2020)
- Pradhan Mantri Matsya Kisan Samridhi Sah Yojana (2024)
  - National Fisheries Digital Platform
- Fisheries and Aquaculture Infrastructure Development Fund (2018)
- Kisan Credit Card for Fisheries

National Action Plan on AMR 2.0



2017-2022

2025-2029

- **Sector specific focus**
  - *'In the fisheries sector also, the Department remains committed to supporting AMR containment. This includes reducing the incidence of infections through effective preventive measures and better management of aquatic environments'*
- **Sector specific plan**
- Efforts for **awareness** generation, **surveillance**, **optimize antibiotic use, preventing infections**, promote **research i**n fisheries sector in view of reducing AMR
- **Focus on prevention**
- **Calls upon states** to establish AMR as a state-level priority by developing and implementing State Action Plans on Containment of AMR

NAP- AMR 2.0 | Specifics for fisheries sector

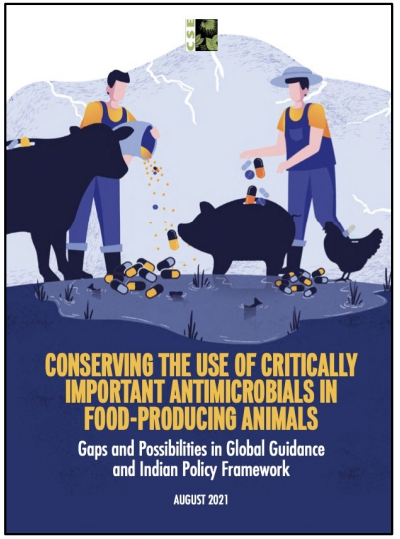
- Review, revise **curricula and modules** of professionals/para-professionals
- **In-service trainings** for all professionals/paraprofessionals
- Establish **reference laboratories** for AMR surveillance; **strengthen labs** for AMR detection
- Develop, implement **plan for targeted surveillance** of AMR
- Develop, implement and monitor **infection prevention and control** programme
- Develop/update national **guidelines/standards on IPC**
- Establish **antimicrobial use and consumption** surveillance system
- Develop and implement plan for **phasing out antibiotic use for growth promotion and disease prevention**; replace by **alternatives/ethno-veterinary medicine**

National responses to AMR

- **Ministry of Health and Family Welfare (MoHFW)**
  - **Food Safety and Standards Authority of India (FSSAI):** Standards for residual antibiotics in fish
  - Several other critically important antibiotics banned from use in fisheries (**FSSAI, CDSCO)**
- **Ministry of Fisheries, Animal Husbandry and Dairying**
  - **Coastal Aquaculture Authority :** Prohibited select antibiotics in coastal aquaculture, permitting few
  - Fisheries Secy letter to Chief Secy (Fisheries) of all states on antibiotic use in the aquaculture sector
  - **Dept of Fisheries**: Several guidelines for different fish species (e.g., Tilapia, *L. vennamei*)
- **Ministry of Agriculture and Farmers' Welfare: ICAR** led surveillance data on AMR (INFAAR) in fisheries**,** with FAO support
- **Ministry of Commerce and Industry**
  - Antibiotics banned from use in aquaculture in view of trade requirements as well as AMR
  - **MPEDA**: Certification programme for farms, hatcheries; registration of aquaculture inputs

Antibiotic use/overuse/misuse is a reality

- Largely used for **preventive purposes** (which is not true prevention and non-therapeutic)
- **Antibiotics of medically important classes (including critically important antimicrobials) are used, such as:**
  - Quinolones and fluoroquinolones: ciprofloxacin, enrofloxacin, oxolinic acid
  - Tetracyclines: tetracycline, oxytetracycline, doxycycline
  - Sulfonamides: trimethoprim, sulfamethoxazole
  - Nitrofurans: furazolidone
  - Cephalosporins (1st and 2nd generation): cefalexin
- **Antibiotic residues, resistant bacteria** and **genes** found in fish and fish environment
- **Water** and **fish** both can be a potential pathway for **resistance transfer**



Antibiotic classes banned/prohibited from use in food animal production in India, including fisheries

	FSSAI(2024)	MoHFW (2019 and 2025)	CAA (2024)	Ministry of Commerce (2025)
Sector	Production of meat and meat products, milk and milk products, poultry and eggs, **aquaculture and its products**	Animal use; food animal production	Coastal Aquaculture	Aquaculture
Antibiotic classes	**Three classes** • Glycopeptides • Nitrofurans and its metabolites furazolidone (AOZ), nitrofurazone (SEM), furaltadone (AMOZ) and nitrofurantoin (AHD) • Nitroimidazoles including- (A) Dimetridazole (B) Ronidazole and its metabolite 2-hydroxymethyl-1-methyl-3 nitroimidazole (C) Ipronidazole and its metabolite Hydroxyipronidazole (D) Metronidazole and its metabolite 3 hydroxymetronidazole	**Nine classes** • Ureidopenicillins • Siderophore cephalosporins • Carbapenems • Penems • Monobactams • Glycopeptides • Lipopeptides • Oxazolidinones • Glycylcyclines	**Five classes** • Nitrofurans including: Furaltadone, Furazolidone, Furylfuramide, Nifurprazine, Nitrofurantoin, Nitrofurazone • Dimetridazole, Metronidazole, Ronidazole, Ipronidazole and other nitroimidazoles • Sulfonamide drugs(except approved Sulfadimethoxine, Sulfabromomethazine and Sulfaethoxypyridazine) • Fluroquinolones • Glycopeptides	**Twelve classes** • Carboxypenicillins • Ureidopenicillins • Combinations of cephalosporins with beta-lactamase inhibitors • Siderophore cephalosporins • Carbapenems • Penems • Monobactams • Glycopeptides • Lipopeptides • Oxazolidinones • Glycylcyclines • Phosphonic acid derivates

Antibiotics banned/prohibited from use in food animal production in India, including fisheries

	FSSAI(2024)	MoHFW (2019 and 2025)	CAA (2024)	Ministry of Commerce (2025)
Sector	Production of meat and meat products, milk and milk products, poultry and eggs, **aquaculture and its products**	Animal use; food animal production	Coastal Aquaculture	Aquaculture
Antibiotics	**Five antibiotics** • Carbadox • Chloramphenicol • Colistin • Streptomycin (and its metabolite dihydrostreptomycin) • Sulphamethoxazole	**Nine antibiotics** Prohibited in 2019 food producing animals, poultry, aqua farming and animal feed supplements • Colistin Prohibited March 2025 from use in any food producing animal rearing • Nitrofuran, chloramphenicol Prohibited May 2025 in animal use • Ceftobiprole • Ceftaroline • Fidaxomicin • Plazomicin • Eravacycline • Omadacycline	**Five antibiotics** • Chloramphenicol • Neomycin • Nalidixic acid • Sulphamethoxazole • Dapsone	**Six antibiotics** • Ceftobiprole • Ceftaroline • Fidaxomicin • Plazomicin • Eravacycline • Omadacycline

Gaps

- **No data on antibiotics used** in fisheries in public domain (total, antibiotic types etc.)
- Preventive approach to disease management still **not mainstreamed; less recognized**
- **No audit/check** on use of restricted/prohibited antibiotics
- Stakeholder **awareness/capacity** needs to promote/adopt sustainable rearing practices
- **Incentives/subsidies/support** for farmers to adopt sustainable practices (alternatives, vaccines, biosecurity etc.)
- Productivity/growth versus sustainability

Big Gaps

- **No overarching policy** for freshwater fisheries
- **Limited fish vets/doctors/fishery professionals** who are authorized to prescribe
- **Limited field support** for diagnosis/antibiotic stewardship/treatment guidelines
- **Limited adoption and scale up of new technologies** – (e.g. RAS, BFT, waste management tech, affordable/effective diagnosis)

Specific Gaps

Thank you!

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