



Status, policies and perspectives on farm waste and environment management in India

**International Workshop on National Action Plan
on Antimicrobial Resistance for
Developing Countries
November 10–11, 2016**

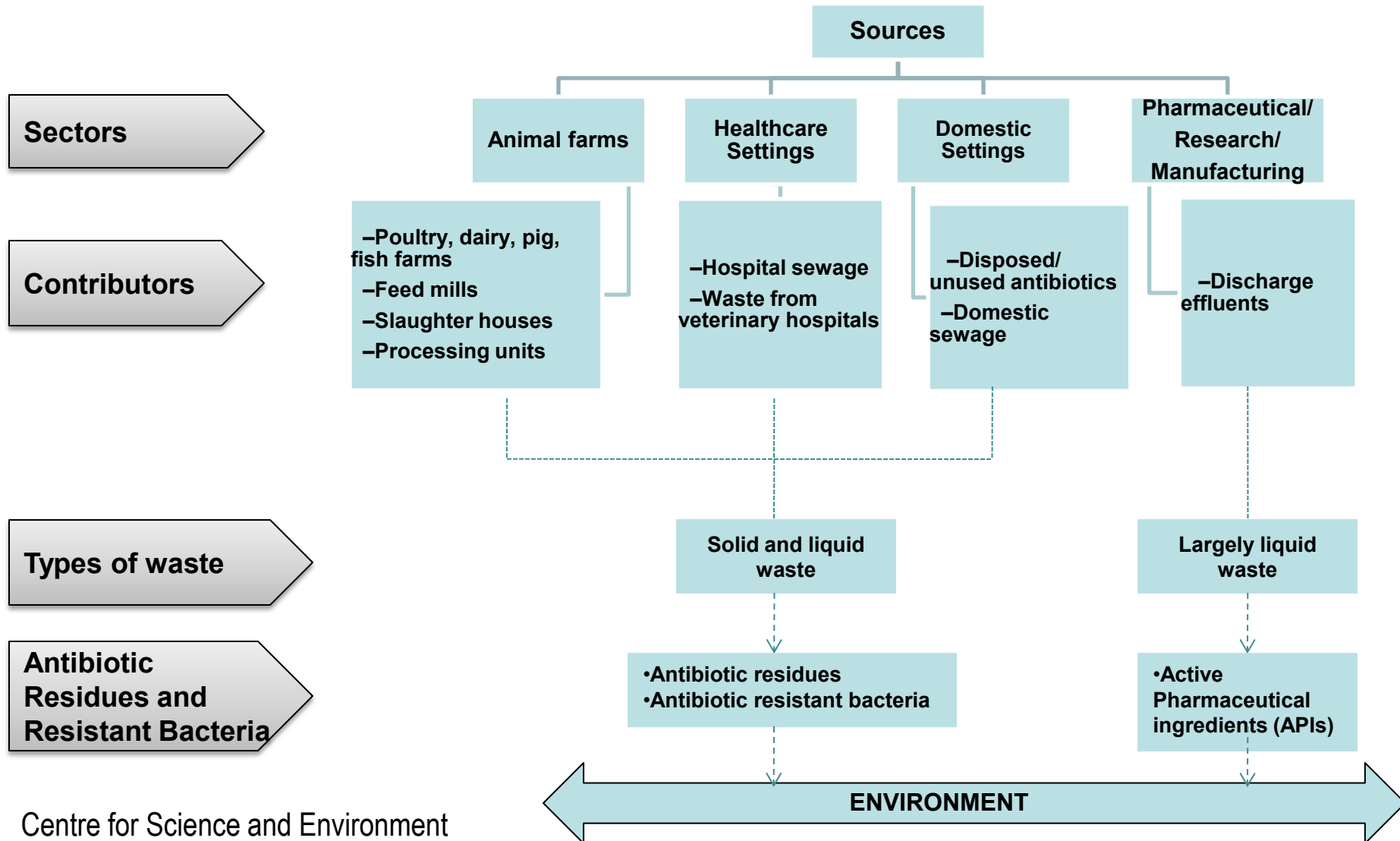


Environmental spread of AMR: need for greater focus

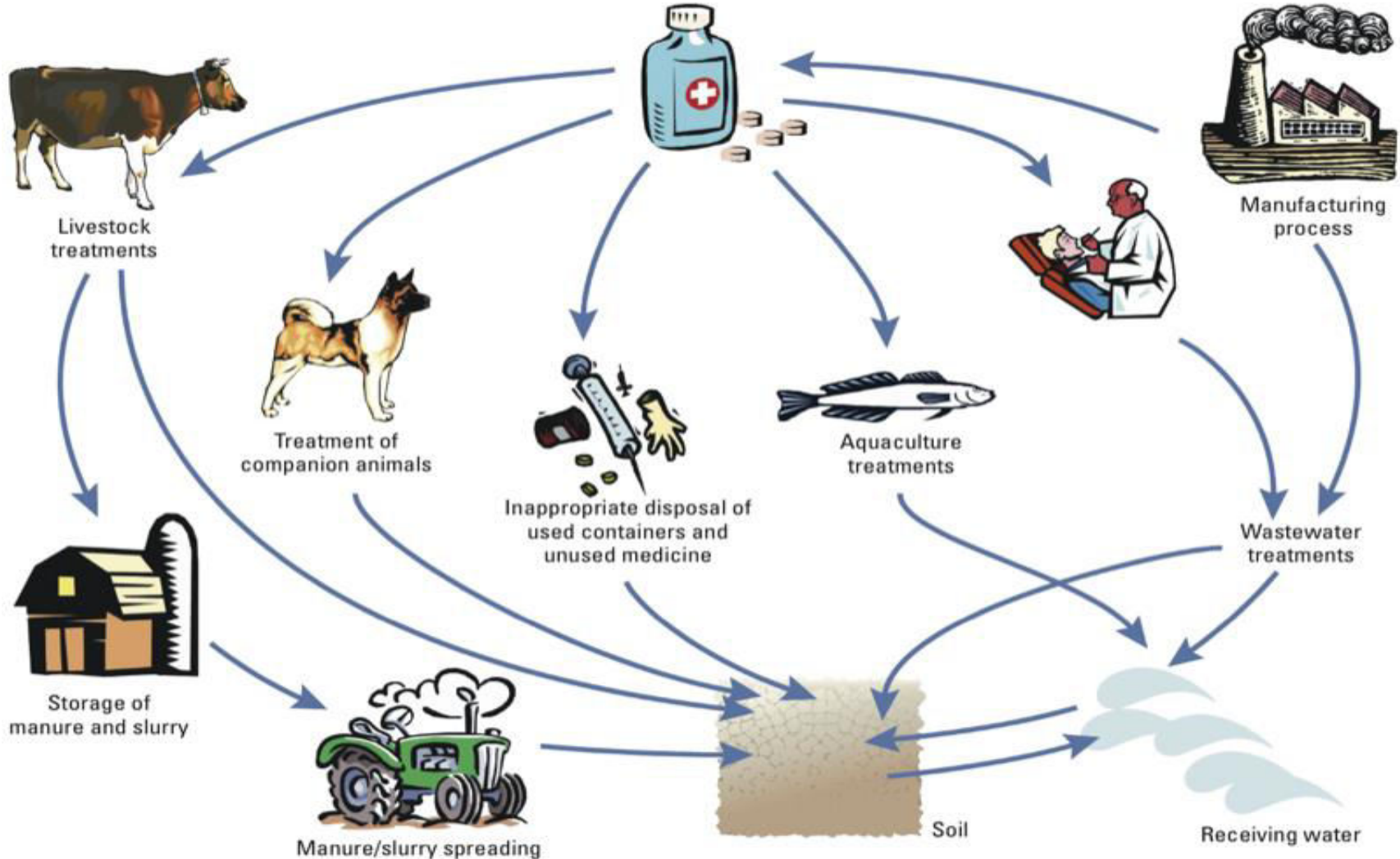
- **AMR –‘One Health’ issue encompassing humans, animals, agriculture and the environment**
- **The Global Action Plan adopted by the WHO in 2015, recognizes the need to contain the environmental spread of resistance**
 - Awareness
 - Generation of evidence based standards and guidance
 - Secretariat Action specified
- **National Action Plans are initiating efforts to address the environment issue**
 - Developed countries: focus on research and environmental monitoring
 - Developing countries: focus so far on bio-security and infection, prevention and control
- **Need for greater global guidance; better articulation of how countries should move ahead**



Sources of antibiotic residues and resistant bacteria reaching the environment



The environmental linkages to AMR



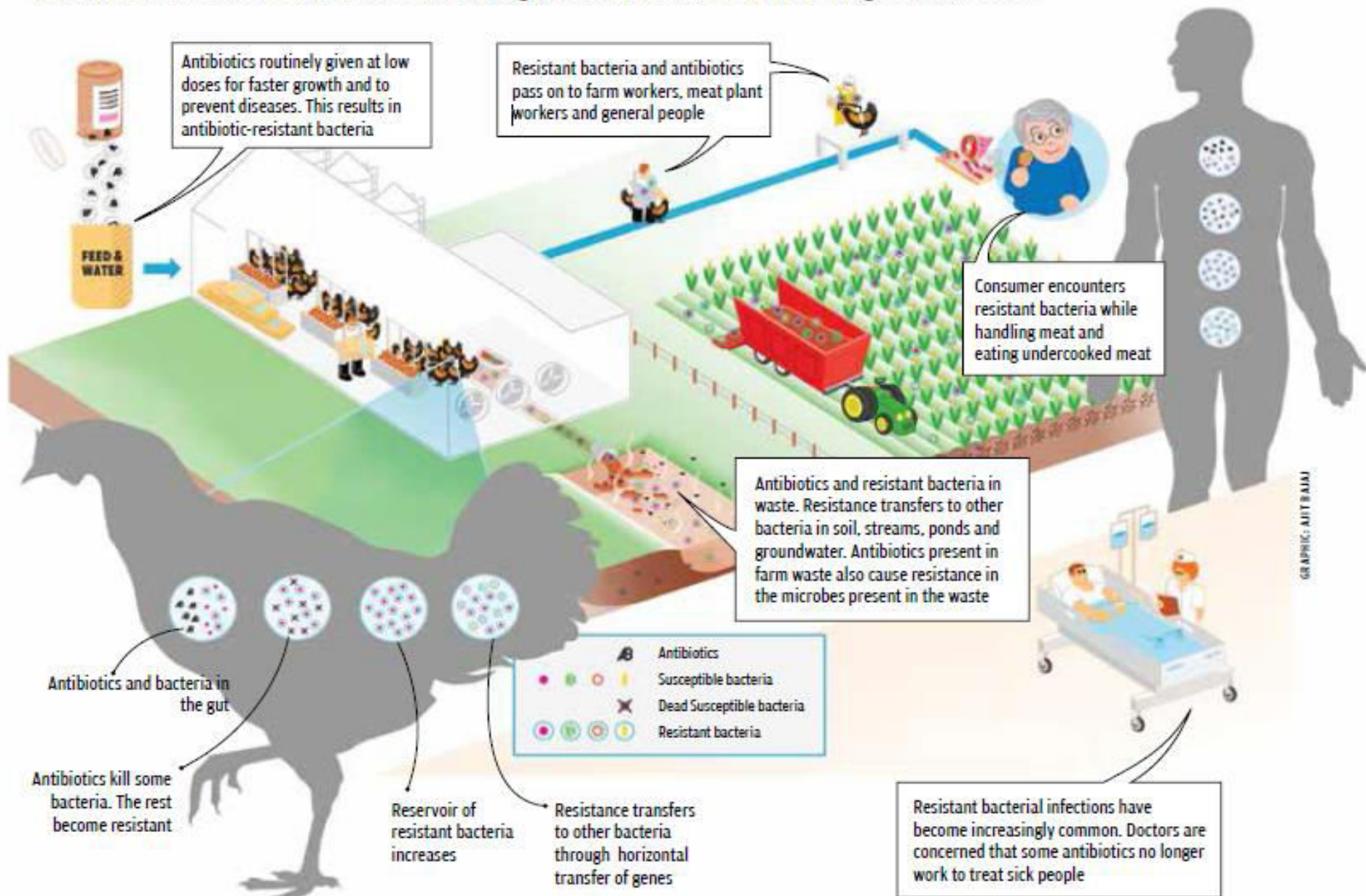


Waste disposal practices at poultry farms (1/2)

- *Observations based on CSE visit to poultry farms in Haryana and stakeholder inputs*
- **Disposal methods followed**
 - Largely solid waste
 - Litter and manure is mostly spread on agricultural fields
 - Litter and manure sometimes used directly in aquaculture farms
- **No–limited biosecurity measures; variations across different farm types**

Smart moves of a deadly microbe

As a microbe become resistant, it influences other microbes present in the gut of the chicken and then those in the environment, making them resistant to a wide range of antibiotics





Waste management practices at fish farms (1/2)

- *Observations based on a CSE study in West Bengal and inputs from stakeholders from other states*
 - **Largely liquid waste**
 - **Fate of untreated wastewater from aquaculture farms**
 - Discharged into canals from which the water was sourced
 - Reused in broodstock ponds
 - Released into agricultural fields
 - Let out in sewage drains



Waste management practices at fish farms (2/2)

- **Effluent Treatment System (ETS) is largely missing**
- **No framework for freshwater culture**
- **Solid waste, including expired antibiotics and chemicals are disposed by burying in pits**
- **Other factors contributing to environmental pollution**
 - Agricultural lands converted for aquaculture purpose
 - Farm registration a lesser priority
 - Minimal supervision by concerned officials



Pharmaceutical pollution and AMR (1/2)

- **India, China– hubs of pharmaceutical manufacturing**
- **Hyderabad, the centre of bulk drug manufacturing industry in India**
- **Several case studies have highlighted the impact of antibiotic pollution in the environment**
 - Non-compliance with environmental regulation; implementation gaps
 - Wastewater discharged into the domestic sewage network without any treatment
 - High pharmaceutical concentrations in the water samples tested
 - Lakes in vicinity of pharmaceutical manufacturing hubs affected by direct dumping of pharmaceutical waste

DRUG RESISTANCE THROUGH THE BACK DOOR:

HOW THE PHARMACEUTICAL INDUSTRY IS FUELLING THE RISE OF
SUPERBUGS THROUGH POLLUTION IN ITS SUPPLY CHAINS



*Effluent pollution in Musi River in Hyderabad, a major pharmaceutical manufacturing hub;
Copyright: Nordea Asset Management 2016*



*Chemical pools in lakebed at Kazipally lake, Hyderabad;
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Key gaps in policy and standards (1/3)

- **Current effluent standards not suitable to address AMR**
 - General waste water standards there as per E(P) Rules do not cater to AMR
 - Standards for slaughter house or pharmaceutical industry are confined to summary parameters such as the BOD, suspended solids, oil and grease
 - No specific standard on antibiotics present
 - Standards do not adequately address the issue bacterial load either



Key gaps in policy and standards (2/3)

- **Waste from farms is not considered polluting enough; hence monitoring not mandated**
 - Farms considered a part of agriculture than industry
 - No specific standards exist for wastewater discharge from aquaculture
 - Poultry farm bio-security guidelines developed by CPCB (such as on siting criteria, waste disposal) do not factor-in monitoring; not pushed for enforcement by states



Key gaps in policy and standards (3/3)

- **No provisions related to handling of expired drugs**
 - No Extended Producer Responsibility (EPR) for pharmaceutical industry in India
- **No surveillance or monitoring of waste from pharmaceutical industry, intensive animal farm, hospitals for antibiotic residue or resistant bacteria**



Way ahead: Research and Awareness (1/4)

- **Develop programme for coordinated research and evidence generation for environmental spread of AMR**



Way ahead: Infection Prevention and Control (2/4)

- **Good farm management practices should be followed to control infection and stress among the flock**
- **Bio-security guidelines for poultry, aquaculture, dairy should be developed, improved and applied to all farms**
- **Capacity of small farmers must be enhanced so that they can comply with the guidelines**



Way ahead: AMR Surveillance (3/4)

- **Develop framework and monitor AMR in farm waste and environment**
 - enhance capacity and infrastructure for monitoring waste from food animal production settings
- **The annual monitoring report should feed into the integrated AMR surveillance report to guide policies on antibiotic use and management of farm waste and environment**



Way ahead: Controlling waste from pharmaceutical industry, animal and aquatic farms (4/4)

- **Recognize wastewater discharge from pharmaceutical industry, livestock and aquaculture as a trade effluent**
 - Recognize these as polluting activity
 - Necessary modifications in law
- **Set standards for antibiotics in all trade effluents at below detection limits**
- **Develop criteria and enforce suitable management of solid waste from poultry and livestock farms**



Thank you!

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