



'Effectuating innovations to tackle Antimicrobial Resistance in agriculture and aquaculture: An expert opinion.'

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Abstract : Antimicrobial resistance (AMR) is a global threat to human and animal health. This article mainly highlights the importance of employing innovations in our day to day practices in order to tackle Antimicrobial Resistance (AMR) in agriculture and aquaculture, for food and environment security form an integral part of sustainable development. Through this article the authors present practically feasible solutions

to effectively tackle the problem of AMR. **Keywords:** Antimicrobial resistance, agriculture, aquaculture.

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I. INTRODUCTION

Antimicrobial resistance (AMR) is a global threat to human and animal health because of its implications on food safety, food security and the economic wellbeing of millions of farming households¹. In 2019, 1.27 million deaths were attributed to bacterial AMR² making it a leading cause of death globally³. Estimates of antibiotic consumption in global agriculture vary from 63,000 tones/year to over 240,000

tones/year¹. The total consumption of antimicrobials in the livestock sector is projected to rise by 67% by 2030 to 105,596 tons with greatest increase in Brazil, Russia, India, China and South Africa¹. About 80% of antibiotics given to fishes are excreted into water and spread rapidly through water systems¹. Poor surveillance and lack of information on the health and economic impacts of livestock and fisheries related AMR in developing countries, call for effectuating innovations to tackle AMR in agriculture and aquaculture.

II. AIM:

To recommend practically feasible innovations to tackle AMR in agriculture and aquaculture.

III. METHODOLOGY:

This is authors' expert opinion on the current status and future scope of the field under discussion.

IV. RECOMMENDATIONS:

Restructuring of existing human resources and infrastructure in India for developing a 'task force' to tackle AMR and ensure realtime monitoring via incorporation of digital technology (The digitalized One-Health Approach):

Krishi Mitra^{4*} (KM) (One KM per village) will have a database of the crops, cropping pattern and livestock belonging to farmers in the particular village.

KM will conduct visits to the farms in his village on weekly basis.

The farmers will have to report about the diseased crop/livestock to the KM.

KM will send the snap of the diseased crop, details of the disease caused to the livestock, details of the pesticides/ drugs used on the crop to the Agriculture assistant' (AA) at the district level via a mobile based application – 'Krishi Sathi'.

The prescription of the required drug would be sent online via the app by the AA to the shopkeepers in the farmers' vicinity.

The farmer will be notified about the availability of the medicine in the shops in his vicinity.

Once the farmer buys the prescribed medicine from one shop, the prescription will automatically be disabled from other shops preventing repeat use of the same prescription.

The medicines/ pesticides sold by the shopkeeper will be cross- matched with the prescriptions and total medicines/pesticides supplied to the shop. This 'prescription-based system' will aid in monitoring 'over-the-counter' sale as well.

- Similar mechanism can be implemented in tackling AMR in agriculture and aquaculture at the global level.
- Initiation and potentiation of Behaviour Change Communication (BCC) among farmers via the 'KM'.
- Awarding 'Best Practices' at the 'Krishi Mela'.

V. CONCLUSION AND SCOPE FOR FUTURE STUDY:

- The innovative 'digitally enhanced task force strategy' along with BCC and awarding the best practices would aid in tackling AMR in agriculture and aquaculture.
- Unleashing implementation research to effectuate these innovations would further help us to grapple with AMR.
- The approach will ensure uniform and cost-effective distribution of genuine medicines/ pesticides.
- The app will be a tool for the government to keep a check on judicious use of medicines/ pesticides in the agricultural sector.
- It is important for each and every one of us to inject a sense of emergency and act responsibly to curb AMR by adopting the digitalized 'One-Health Approach' and achieve the Sustainable Development Goals by 2030.

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