2. Operationalising One Health to Manage Antimicrobial Resistance and Support the Green Recovery

Antimicrobial resistance (AMR) is a key One Health issue recognised by governments and intergovernmental institutions across the Greater Mekong Subregion (GMS). Southeast Asia is a major hotspot for the development and spread of AMR. This has significant effects on the health sector, where it decreases the effectiveness of antibiotics and leads to poorer health outcomes across the population. In agriculture, ineffective antimicrobials increase the cost of livestock and aquaculture production, and ultimately decrease productivity and profitability. Over-use of antibiotics in food production causes food contamination by chemicals and resistant bacteria, and decreases food safety. The spread of AMR leads to restriction of domestic and export trade, and can inhibit the economic development of the agricultural sector across the region. Environmental contamination by waste pharmaceuticals and resistant bacteria is a major issue that directly affects conservation objectives, including maintaining healthy and productive soils and waterways. Such contamination also spreads AMR back into the human population and agriculture/livestock sectors, perpetuating the issues described above.

The emergence and impact of AMR is affected by communities' socioeconomic status, rapid changes in the livestock, agriculture and aquaculture industries, urbanisation, and existing models of managing human and animal health; these issues are also interdependent. One Health is a paradigm that describes how different sectors, including health, livestock/agriculture and the environment, can work together to manage cross-sectoral issues such as AMR, and simultaneously achieve sector-specific objectives, including strong livelihoods, good health, nutritious and safe food, sustainable agricultural development and environmental conservation.

Existing One Health efforts to address AMR in the GMS have tended to include cross-sectoral surveillance activities (to describe antimicrobial use and occurrence of AMR), laboratory capacity development, and development or updating of national action plans and associated policy. With the scene set, efforts are turning to implementation across all sectors affected by AMR. One Health is needed to ensure all relevant stakeholders in AMR mitigation are included. For example, even though it is key in the transmission of AMR and is directly affected by it, the environment sector has not always been strongly included in AMR mitigation plans to date.

One Health is also relevant because it helps shows *how* AMR management can become more efficient, for example by coordinating prescribing regulations between the human and animal sectors. Adopting AMR strategies provides the opportunity to implement sector-specific practices with their own direct benefits, such as vaccination plans, health service delivery, updated infection prevention and control, improved animal husbandry, waste management, and increased environmental monitoring, management and response. These additional benefits are critical if the GMS is to 'build back better' after the disruption of the COVID-19 and achieve a green recovery.

Using One Health to identify and deliver these benefits can strengthen the case for AMR management to policymakers and stakeholders; for example, livestock industries might be more willing to sign on to AMR mitigation strategies if they can see that measures to reduce antibiotic use also reduce costs and improve productivity. This support is vital when cross-sectoral efforts to decrease AMR will need investments in workforce capacity and infrastructure, strong sectoral coordination, plus policy and regulatory support and enforcement. The challenge now is to use One Health to help identify the next steps to manage AMR sustainably, efficiently and equitably alongside the social and economic recovery of the region.