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Strengthening participatory veterinary epidemiology and one health education networks for sustainable livestock based socio ecological systems

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Abstract

Livestock systems play a critical role in rural livelihoods, food sovereignty, and socio ecological resilience, particularly in low and middle income countries. However, infectious animal diseases, environmental degradation, and limited access to veterinary and One Health expertise undermine sustainable natural resource management and disproportionately affect smallholder and marginalised farming communities. Addressing these interconnected challenges requires participatory, transdisciplinary approaches that integrate animal health, agroecology, and social systems.

The Asia Pacific Consortium of Veterinary Epidemiologists (APCOVE) offers a collaborative Global South–North education and research model that strengthens veterinary epidemiology and One Health capacity to support sustainable livestock systems and improved quality of life. Funded by the Australian Department of Foreign Affairs and Trade, APCOVE brings together animal health professionals from Australia, New Zealand, and eight Indo Pacific partner countries. The initiative focuses on building locally embedded capability to prevent, detect, and respond to animal disease threats that impact livestock productivity, wildlife conservation, public health, and rural livelihoods.

Between 2024 and 2028, APCOVE is implementing four integrated activities: (1) applied frontline field epidemiology training centred on participatory outbreak investigations and surveillance in livestock and wildlife systems; (2) intermediate training combining multilingual, open access eLearning with mentored field projects addressing locally defined priorities; (3) applied One Health training emphasising systems thinking, intersectoral collaboration, community engagement, and leadership; and (4) faculty development for epidemiology educators to strengthen long term regional teaching capacity. Training design is co produced with country partners using participatory methods, ensuring relevance to national agro ecological, socio economic, and cultural contexts.

To date, APCOVE has produced 36 freely available training modules in six languages, supported over 200 trainees, and facilitated community and institution led field projects addressing livestock disease, wildlife health, and biosecurity. Early outcomes indicate strengthened local capacity, enhanced collaboration across agriculture, environment, and health

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sectors, and improved preparedness for disease events that threaten livelihoods and natural resources. APCOVE demonstrates how participatory education networks can support agroecological livestock systems, advance One Health operationalisation, and contribute to poverty alleviation and sustainable rural development.

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