

## **Weed risk assessment in countries with porous borders: a case study in Bhutan**

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**Summary** Weed risk assessment systems have been successfully tested and implemented in Australia, NZ and the USA. They have not been implemented in developing countries, particularly those with porous borders. The assumption is that effective management of the movement of goods and people across borders cannot easily occur in these latter situations. To test this we used the Australian Weed Risk Assessment (AWRA) system and applied it to Bhutan, a developing country with an open and porous border with India, as a case study.

Firstly, we examined the risk and determined that there were two risks, being the risk that a species could be (i) introduced, and (ii) establish if introduced. The AWRA system only really addressed the second risk. Assessment of the introduction pathways relative to the porous nature of the border showed that the first risk could not be effectively managed. As an alternate

approach, we propose a modified risk assessment model tailored for Bhutan, in which specific sectors that intentionally import the bulk of plant species are targeted (i.e. the nursery, forestry and agriculture sectors) to undertake an ARWA approach. Secondly, a modified weed risk management (WRM) approach is used to assess (i) plant species which have the ability to be dispersed into Bhutan from India as well as to assess new incursions and retro assess existing ones to determine their risk and priority for management. We consider this hybrid risk assessment approach to be a step in helping improve the biosecurity concerns in developing countries with open and porous borders.

**Keywords** Developing countries, open and porous border, modified risk assessment model, retro assess, hybrid weed risk assessment approach, biosecurity.