

CABI Briefing: Climate change

2 Pest risk early warning systems in a changing climate

Key messages:

- Farmers need timely, accurate, and clear advice on how to manage pest risks
- Digitally-enabled early warning systems can help farmers adapt and minimize losses
- The complex interactions between pests, plants, and the environment under future climate change scenarios need further research to determine best practices
- Scaling digital climate information services will require a sharp focus on equity and inclusion

Pest and disease threats are increasing and spreading to new areas as climate change creates new niches for them to thrive and attack crops and livestock (FAO/IPPC, 2021). Climate change is also affecting pest management strategies, with more erratic rainfall, changing seasonal patterns, and weakening plant resistance to attack. **Pest and disease risks can undermine climate adaptation and mitigation efforts**, particularly by causing tree mortality, crop loss, and land degradation (IPPC, 2021).

To cope with the dual threat of direct climate change impacts and increased pest and disease risks, farmers require timely, accurate, and clear advice on management strategies. This includes **early warning of likely pest attacks**, as well as when and how best to apply control products and methods, including biocontrol products and integrated pest management (Taylor, et al., 2021).

The Global Commission on Adaptation (GCA, 2021) has identified in its Investment Blueprint the critical role that digital climate information services can play in helping smallholder farmers to adapt to climate change impacts. CABI, through a range of initiatives and technologies, has been helping farmers minimize the effects of climate change and pest risks. Using CLIMEX modelling, **CABI scientists provide important information to governments and to farmers to assess the risk of further invasion by pests and weeds, under present and future climate conditions.**

The Pest Risk Information Service (PRISE) is a system pioneered by CABI and its partners Assimila and CEDA. It uses satellite earth observation data combined with climate change data and pest development models to provide tailored, accurate advice to farmers on when pest surges may occur, and clear advice on how and when to apply low-cost biopesticides to minimize crop damage. This **comprehensive end-to-end approach** ensures that information is received by those who need it most, when they need it most.

The ability to scale these approaches to wider regions and millions more smallholder farmers will require investment in the underlying digital data infrastructure, improved sensitivity and granularity of earth observation instruments, and the bundling of early warning systems with complementary services, including climate-smart agricultural advisory services, and affordable finance products (Casey, 2021). It will also require a sharp focus on equity: an individual's ability to use and benefit from digital services is dependent upon their level of literacy and numeracy; their access to finance, land and labour; their power and control over the decision-making process; their confidence level; and their experience (Staub, Fara, Clarkson, & Casey, 2021).

To find out more and discuss opportunities to work together, please email us: enquiries@cabi.org