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## **GLEAM-X: An online application to support sustainable transformation of livestock systems towards lower emissions**

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### **Abstract**

Livestock provide valuable nutritional benefits and supports livelihoods and the resilience of families and communities. At the same time, livestock systems are currently responsible for about 11 percent of all anthropogenic emissions and there are concerns about increasing emissions from the sector with the increased demand for animal products in the future (globally projected to be around 40 percent by 2050) so that ambitious action is needed to reduce emissions per unit of product (meat, milk, and eggs) and absolute emissions. At the same time, consumers are increasingly interested in environmental footprints related to animal products to make informed food choices.

Designing climate action and providing information for consumers requires sound, state-of-the-art, scientifically based data at very high level of detail and this need to easily accessible and should be able to demonstrate how different decisions in livestock production systems impact emissions. Building on existing tools, we have developed a prototype of GLEAM-X, a web application of the Global Livestock Assessment Model (GLEAM) that simulates emissions from different sources along the entire production chain and for different gases (CH<sub>4</sub>, N<sub>2</sub>O, and CO<sub>2</sub>). Using projections for demand in animal products, the system simulates future emissions under a business-as-usual scenario and allows users to simulate the impact of specific interventions (improvement in feed quality, animal health, manure management) and productivity changes on total emission in the future. The system also generates UNFCCC compliant reports for emissions that can be used by countries to assess and report climate action for international commitments (such as the Paris agreement and the global methane pledge) and thereby support the transition of the sector towards lower emissions while minimising the environmental impacts.

**Keywords:** Climate change, livestock greenhouse gas emissions, methane, mitigation