

Category	: International Rice Research Conference
Select Theme	: Disruptive technologies and innovations
Endorsement email	:
Keyword 1	: Satellite technology and remote sensing
Keyword 2	: Innovation systems
Keyword 3	: Public-private partnerships
Title of Entry	: Remote Sensing to Verify Improved Rice Farming to Scale in Vietnam
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Select only one type of presentation	: 15 minute oral presentation
Abstract	: Traditional flooded rice production produces high levels of methane (CH <sub>4</sub> ), a highly damaging greenhouse gas (GHG). 80% of GHG emissions from rice come from Southeast Asia, where smallholder farmers are slow to adopt improved water management and fertilizer practices. The AgResults Initiative is a \$122 million multi-donor fund set up to test the idea that results-based monetary prizes can incentivize the private sector to address market failures. The Vietnam GHG Emissions Reductions Pilot rewards Vietnamese companies that can 1) prove the viability of their improved on-farm rice management practices that reduce GHG emissions while increasing yields, and 2) promote those practices to the most smallholder farmers. To verify results we will use innovative technologies adapted from compliance and voluntary rice cultivation emissions offset protocols and NASA supported research. The protocol allows large-scale rice farmers to sell emissions offsets through improved farming practices, which are quantified using a DeNitrification-DeComposition (DNDC) model. Rice production and water management is verified using remote sensing at field and regional scales. The challenge for AgResults is to adapt this process for use in northern Vietnam, where smallholder farmers drive production. The verification methods will be put to test in the next phase of AgResults, which begins in 2019 after the second test crop season. It will use elements of proven technology (radar remote satellite sensing that can penetrate cloud cover and track flooding dynamics; DNDC modeling) as well as customized mobile apps and a webGIS database management system to allow the verification team to geolocate the fields that it will then remotely monitor and model to quantify yield and GHG impacts of the AgResults technologies as the basis for awarding prizes. A potential outcome of the verification model, once developed, is to use it for carbon accounting in

global carbon markets. This could provide additional incentive for companies to continue scaling improved practices and sell those GHG offsets. Either the AgResults donors or the Government of Vietnam, a key partner in the Vietnam Pilot, could explore maintaining and expanding the innovative verification system through private sector carbon market linkages.

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