

## Country Update: China

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## Contribution to Croplands Research Group activities

- **Proposed a GRA N<sub>2</sub>O Flagship project:** Identification and Assessment of Locally Effective Mitigation Options Using Process-Oriented Biogeochemical Models (e.g., DNDC, CNMM-DNDC) as Tier3 Tool(s) (leader: Yong Li );
- **Submitted a research proposal on the topic of the above GRA N<sub>2</sub>O Flagship project to the NSFC-UNEP Cooperation Program:** Optimization and adoption decision-making of agricultural management practices for mitigating N<sub>2</sub>O emissions in upland farming systems (leader: Yong Li; Several GRA members involved; Failed; To submit again);

## Contribution to Croplands Research Group activities

- **Implementation of the running NSFC-UNEP joint research project:**
  - Completed the first fund payment to Kenya for launching field experiment on GHG emissions;
  - Published a paper on DNDC-based field management optimization for a multiple-crop rotation system (summer maize, winter wheat, cotton) cultivated in a calcareous soil ([Zhang et al., 2019, Biogeosciences](#));
  - Two participants attended a workshop in Africa.
  - One participant attended a summer school in Finland and the Asia Flux Conference in Japan.

## Contribution to Croplands Research Group activities

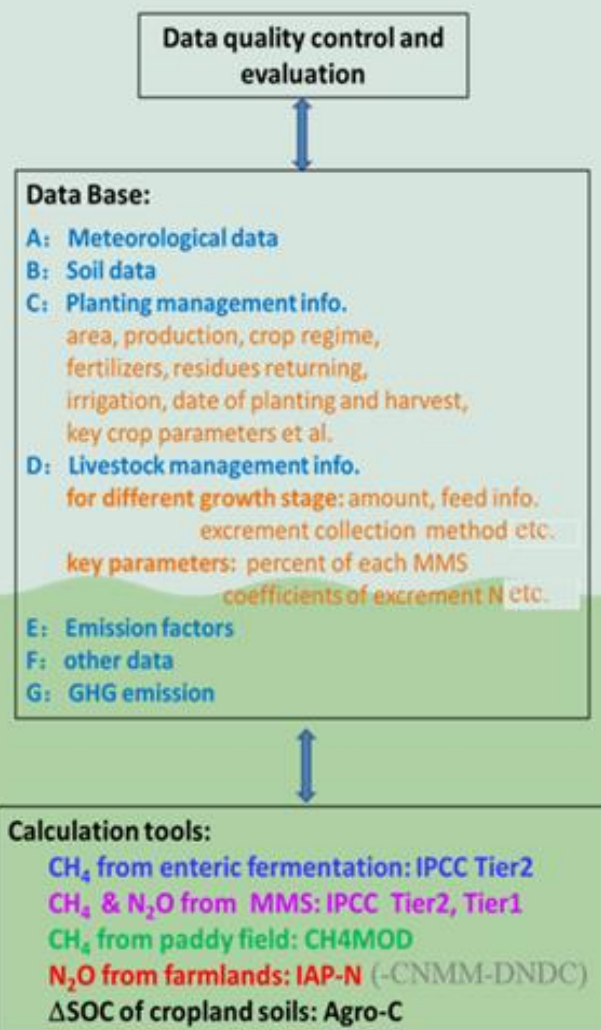
- **Education of international students:** 1 Ph. D (Ethiopian), graduated in 2019; 1 master (Pakistani) enrolled in 2019;
- **Planning to attend academic communication:** e.g., 8<sup>th</sup> International Nitrogen Conference (INI2020, in Germany), the Gordon Research Conference (GRC) in USA (2020);
- **Promotion of the Landscape Management of Agricultural System Network:** through development of the core model -- CNMM-DNDC;
- **Design of an internet online GHG calculation system for agricultural enterprises/farms:** Agro-GHG Platform

## A GHG Calculation System

for Cropping and/or Livestock Enterprises/Farms



- **Potential users:**
  - Agricultural enterprises/farms
- **Uses:**
  - To guide GHG mitigation;
  - To report GHG emissions.
- **Key features:**
  - Calculation using same methods and quality control criteria;
  - Compatible with governmental inventories;
  - Easier for user operation.





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## GHG Calculation Methods and Tools:

CH<sub>4</sub> from enteric fermentation: IPCC Tier2

CH<sub>4</sub> & N<sub>2</sub>O from MMS: IPCC Tier2, Tier1

CH<sub>4</sub> from paddy field: CH4MOD (IPCC Tier3)

N<sub>2</sub>O from farmlands: IAP-N (IPCC Tier2)

ΔSOC of cropland soils: (Agro-C IPCC Tier3)

1	Rice	Gas	CH <sub>4</sub>	N <sub>2</sub> O	ΔSOC	Energy_CO <sub>2</sub>
		Model	CH4MOD	IAP-N	Agro-C	<u>En_cal</u>
2	Wheat/Maize/Rapeseed	Gas		N <sub>2</sub> O	ΔSOC	Energy_CO <sub>2</sub>
		Model		IAP-N	Agro-C	<u>En_cal</u>
3	Dairy/Pig	Gas	Enteric_CH <sub>4</sub>	MMS_CH <sub>4</sub>	MMS_N <sub>2</sub> O	Energy_CO <sub>2</sub>
		Method/model	IPCC Tier2	IPCC Tier2	IPCC	<u>En_cal</u>
4	Crop-livestock	Gas	1+3 or 2+3			
		Method/model	1+3 or 2+3			

## Opportunities to participate in CRG activities

- **Models available to contribute CRG initiatives:**

- CH4MOD: as a Tier 3 tool, daily CH<sub>4</sub> emission from rice paddy fields and wetlands, from plot, farm to national scales;
- Agro-C: as a Tier 3 tool, daily carbon fluxes, annual cropland carbon stock change, from plot, farm to national scales;
- CNMM-DNDC: a process-oriented model, hourly to daily fluxes of CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, NH<sub>3</sub>, NO, N<sub>2</sub>, nitrogen runoff/leaching, seasonal NPP, annual soil carbon stock change, from plot to national scales.
- Agro-GHG: an online GHG calculation system at the enterprise/farm scale (near being available).

## Opportunities to participate in CRG activities

- **Bilateral cooperation project:** e.g. NSFC-DFG, NSFC-UNEP, NSFC-NSF, ... (the National Natural Science Foundation of China has cooperation agreement with the foundations of many countries or international organizations);
- **Scholarships:**
  - University scholarships; UCAS scholarship: **Open to Ph. D and master students of any country.**
  - TWAS scholarship, B&R scholarship: **Specially open to Ph. D students and master students of developing countries.**
- **National or CAS postdoc programs:** **Open to young scientists of any country.**