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MIDST CZO

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MIDST CZO uses critical zone science to improve decision making on land and water use in a broad range of regions in China through the development and deployment of decision support tools aligned to the needs of farmers, advisors and policy-makers.

This newsletter update includes a report on the Annual UK team meeting in Lancaster January 2020 on the second page, along with an update on the stake holder workshop in Nanjing in November 2019.

Autumn Workshop in Nanjing

MIDST Co-hosted the "Symposium on the experience and problems of the efficient use of soil, fertiliser and water in the Yangtze River Economic Belt" along with the Station of Farmland Quality and Agricultural Environment Protection of Jiangsu Province in Nanjing, China between November 21st and 23rd. The meeting was attended by 300+ people comprising mainly applied agricultural scientists.

Our symposium had 10 talks that covered new fertilisers, machinery, environmental concerns and farmer engagement. Dr Ying Zheng finished the session by providing an overview of the MIDST project, summarising the work of the UK-China CZO programme. The practical challenges and policy relevance of our research was emphasised by our invited speaker, Director Du Sen of the Ministry of Agriculture. All talks were in Mandarin to ensure full engagement of the Chinese audience. We followed the talks with an open panel session discussion which provided the floor with the opportunity to ask all speakers questions. This included a targeted discussion on research needs for DST development in China.

MIDST had an Exhibition Stand throughout the entirety of the event. This had an animation of one of our functional DSTs, computers running other DSTs that we have tested for application in China, and pamphlets in both English and Mandarin summarising the project and aimed at either users or researchers. There was considerable 1:1 discussion, reaching over 100 people. To enable guided discussion, questionnaires were given to participants to ask about their knowledge, experience, perceptions and needs for DSTs. The MIDST post docs and 2 PhD students managed to get conference participants to complete 65 individual questionnaires.

On Day 2, MIDST collaborator Prof Yongguan Zhu provided a talk that celebrated his very recent award as a CAS Academician. This was followed by another discussion forum on challenges facing agriculture and soils in China. Both Paul Hallett and Ying Zheng participated on stage to provide their insight and to guide questions towards DST development.

A number of actions have been guided from the knowledge exchange gained from the Nanjing forum:

1. Greater inclusion of applied agricultural scientists in DST development and deployment.
2. Reinforcement of our desire to integrate environmental and economic analysis into agriculturally focussed DSTs.
3. Re-evaluation of project activities to ensure that unique CZO understanding (e.g. deep nutrient leaching and water pollution) is integrated in our DST development.
4. Targeting of applied users in future Stakeholder events, which can draw on large commercial agricultural conferences taking place in China in 2020.

Contact s.j.dennis@leeds.ac.uk for more information about either meeting for minutes and presentations.

Lancaster UK MIDST project meeting -14th January 2020

At the start of the second year of the project, the UK participants of the MIDST project met in Lancaster, UK to review the work completed in the first year, understand where we are at in relation to the proposed work in the proposal and set actions for the year ahead. The meeting was attended by 15 people in the room with 5 more joining via Zoom.

After a brief introduction and staffing update from Paul Hallett, the 4 post docs from Glasgow, Aberdeen, Exeter and Rothamsted presented updates of their current work and outputs.

Ying Zheng updated on the Knowledge Exchange aspect of Phase 2. She has worked with a range of stakeholders to establish the needs for DTS in China. The Social Science Survey has been carried out in the Loess Plateau following the work done in Phase 1 at the Karst CZO. She highlighted the need to communicate with higher level government first because policy making is top down in China and that we aim to speak to industry stake holders in 2020.

Joe Oyesiku updated work on what DSTs are appropriate for Chinese Agriculture. The tools must focus on environmental protection or crop yield, be simple, transparent, and use readily available input data. A lit review provided 420 potential tools which Joe had investigated further and is currently writing up for publication. By combining DSTs for productivity and profit with environmental outcomes, the famers will have incentive to use the environmental tools.

Boyi Liang updated work on the WOFOST DST which simulates crop production. He has been parameterising for maize, rice, tobacco, soya bean and potatoes. This work is currently in process of publication.

Huiyi Zheng showed details about the critical zone ecosystem service integrated system model for the Loess Plateau. Rothamsted highlighted that this is a DST for government and policy makers. They also have a slimmed down version which can be used by famers.

After the post doc updates, Co-Is were given the opportunity to comment on the progress and on what areas of the CZO project need to be considered further. The feedback from the CoIs was positive. Main points to focus on were: a) ensuring good integration between the different strands of work and to demonstrate we have a strong trail between the outcomes from the social surveys and the DST work. b) Soil and hydrology needs to be integrated along with the current crop yield focus. For instances, irrigation, pollution risks, deep leeching and emissions of Nitrogen. c) can we engage with the policy community more?

The afternoon breakouts groups discussed these comments further and after reflecting on the limited staff time and project length came up with action plans. Decisions were made on where extra support for the key post docs could come from CoI's and be used to greatest effect.

Key Action points:
Andy Binley has data he can provide to Huiyi to help bring Nitrogen into the model to help add the Critical Zone part to the Loess DST. He has invited Huiyi to Lancaster for a few days to work on this together and get it done.

While Boyi is in the UK he will make use of Ian Bateman's experience and incorporate investment model into his work.

The DST work will be linked back to the 1D conceptual model of the Critical Zone.

Knowledge Exchange working group established an action table with a full plan for progress over the next year. They are looking to record webinars and Minute Earth Videos and animations explaining two topics: What is a CZO? (Phase 1); The value of DST's (phase 2). Interviews will be expanded to include existing a news policy contacts and to repeat the social science survey in Peri urban region.

Short Updates

Weekly online postdoc meetings are continuing helping collaboration across the project.
All Midst Co-Is are invited to the Monthly catch up meeting on the 1st Tuesday of every month

Next Steps:

Focusing on a coherent trail of impact from the Knowledge Exchange work to the developed DSTs.