

# Plenary III: Summary and Outcomes from MLS and DS of June 18 (Global TraPs Pre-Conference Day)

Spotlights and Orientations from the MLS and DS  
(Transdisciplinarity in Action) Day, Plenary Discussion.

June, 19, 8 – 9am

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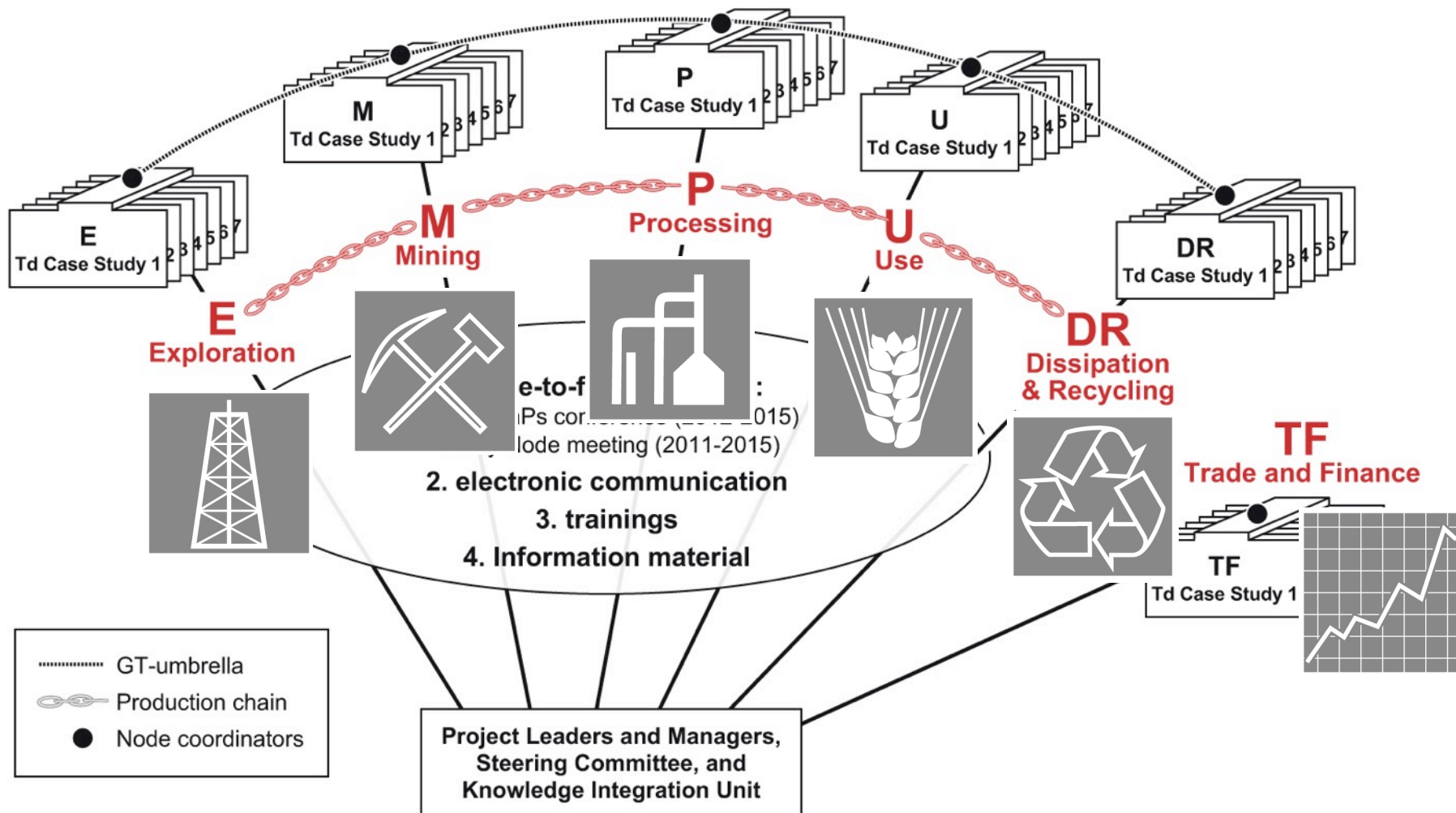
- **Policy Orientations**
- **Knowledge and implementation demand**
- **Follow-up activities**

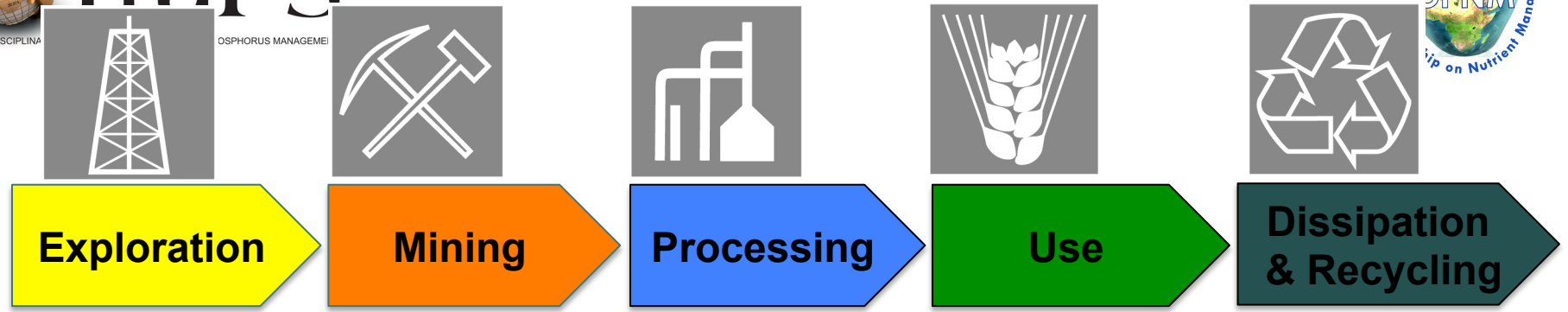


# Internal communication of results

- ❖ Summary of discussion
  - ❖ Policy options
  - ❖ Knowledge and implementation demand
  - ❖ Follow-up activities
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- Will be sent to all participants of the sessions
  - Short summaries: Newsletter

# Supply-demand chain view on three levels





**MLS 2.5**  
Mining

Smaller farmers  
access to P fertilizer

**MLS 1.4**  
Vegetable

**MLS 1.5**  
Crops

**MLS 1.1**  
Manure

**MLS 1.2**  
Biotech

**MLS 1.3**  
Sewage

**MLS 2.1**  
Kenya

**MLS 2.2**  
Vietnam

**MLS 2.3**  
Malaysia

**MLS 2.4**  
Manila

**DS 3.3**  
Supply Security

**DS 3.5**  
Fertilizer Innovation

**DS 3.1**  
Subsidies

**DS 3.2**  
Recycling Policy

**DS 3.4**  
Recycling Innovation



# MLS 2.5 Mining & DS 3.3 Supply Security

- ❖ The Mining MLS may take place in October



# MLS 2.5 Mining & DS 3.3 Supply Security

Three blocks/perspectives

1. **Sustainability**
2. **Transparency and Forecasting**
3. **Block: Mining Efficiency**



# MLS 2.5 Mining & DS 3.3 Supply Security

## Sustainability

- ❖ What **externalities** should we be concerned about? Two kinds of issues:
  - Environmental issues: *Eutrophication, gypstacks, land disruption, greenhouse gases*
  - Future scarcity: *Food insecurity, geopolitical conflict, environmental*
- ❖ What **actions** are needed and at what time scales?
  - Ongoing: *Improve agricultural PUE; improve mining efficiency; phosphogypsum utilization*
  - Needed now: *Recycle manure (#1 priority) and sewage sludge; mine reclamation*
  - Longer term: *Population control; changes in diet*
- ❖ How can these actions be **encouraged/forced/etc.**? (In order of preference)



# MLS 2.5 Mining & DS 3.3 Supply Security

## 2. Transparency and Forecasting

- a) When Peak „P“ occurs, how do/will we deal with the problem?
- b) 318 years with today's resources. What about the total resources?  
How long?
- c) How to delay the depletion of phosphate rock?
  - ❖ A:-- increase recycling by finding an optimum taking in externalities
  - ❖ -- more efficiency: -- plant
  - ❖ -- soil- rational P application
  - ❖ -- mining and beneficiation
  - ❖ -- food waste --- education
  - ❖ -- make recycling economic
  - ❖ -- unconventional resources (phosphorite nodules e.g.)
  - ❖ -- increase soil fertility



# MLS 2.5 Mining & DS 3.3 Supply Security

## 3. Block: Mining Efficiency

- ❖ Efficiency in mining industry
  - Efficiency is needed on every level: What are the propositions for mining, beneficiation, fertilizer production, agriculture
- ❖ How can mining efficiency be improved and extended to lower grade ores?
- ❖ What is the potential efficiency of a P operation (e.g. quality of rock, lab work)?
- ❖ Best practice sharing? Is it possible to “standardize”?
- ❖ Water problematic
- ❖ How can we improve removal of impurities (e.g. Cd, radionuclides, Hg etc.)
- ❖ Direct application of poor quality RP?



# DS 3.3. Supply Security

## Policy Orientations

*Recycling:* There should be higher environmental regulations and governments should be increasingly regulating them. Companies should give guidance to farmers on “how” and “when” to recycle in order to achieve higher yields with lower environmental risks.

*Industry involvement:* Thanks to their knowledge, industrials need to contribute to the discussions and will be part of the solution. Profit earnings as well as social responsibility are of course key questions. There are tax issues concerning chemical fertilizers –the idea of tax the “bad behaviour” not the products themselves.

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## Future research demand

- *Recycling*: There is a question about the cost of disposal of “by-products” (e.g: gypsum, clays, flotation material). Recycling has to be profitable and is dependent on available technologies.
- *Chinese phosphate rock*: There is not much (if any) transparency on numbers. Are the figures available “official” or “un-official” and how much exploration is actually being carried out? A greater number of publications translated into English language would be ideal.
- *China’s reserves & resources*: China’s production figures are surprisingly high! Are they being exported, stockpiled or used domestically and for how long can these rates be sustained before decline occurs? How are the China’s reserves & resources reporting classified?



## Policy Orientations

There is an increasing need for manure management and also new potential because of increasing numbers of CAFOs (Concentrated Animal Feeding Operations) in China. This calls for a re-coupling of animal and plant production on an altered scale, for technology development, for spatial planning, and even nutrient balances including utilizing the organic matter.



# MLS 1.1 Manure

## Future research, development, and implementation demand

- ❖ Reuse of water that avoids water scarcity and environmental pollution
- ❖ Development of composting and other treatment technologies
- ❖ Pelletization
- ❖ Meaningful biogas and other energy production
- ❖ System view, including feed and resulting manure optimization
- ❖ Proper health protection, production, hygienization, and use
- ❖ Proper government policy processes for transition (spatial planning, subsidies, recycling)

## Policy Orientations

- ❖ Increase global sanitation to prevent pollution and disease, and enable recovery and recycling of resources from sewage.
- ❖ A requirement, or targets, for P recovery from waste streams according to state-of-the-art options.
- ❖ Establish an independent, multi-stakeholder working group to produce and frequently update state-of-the-art documents for P recovery and recycling.
- ❖ End users (including fertilizer industry, farmers etc.) to produce a definition (catalogue) of their requirements of recycled P products.
- ❖ Greater support for piloting and demonstration of novel technologies, including financial support and increased flexibility of emissions standards during trial periods.

## Policy Orientations

- ❖ Concerning the issues of P management for smallholder farmers it is necessary to take into account other nutrients like N or K that are strongly connected to P in the production of vegetables.
- ❖ There is little individual incentive for farmers to improve their P management beyond improving their finances. Policies for improvement need to capture the externalities associated with low P efficiency. These could include financial incentives for conservation practices or marketing assistance for “eco friendly” production.



## Policy Orientations

- ❖ Develop better partnerships between government agencies and the fertilizer industry for delivery of the best fertilizer products in addition to the proper information related to fertilization practices. Transparency is needed. Thus fostering the exchange of existing data about soil conditions, optimal fertilizer composition and fertilizer applications between governmental and industrial institutions could lead to a more efficient usage of organic and chemical fertilizers.
- ❖ The coordination of existing knowledge, e.g. by sharing the insights from different cases across the globe is needed. Starting and maintaining a dialog according with necessary stakeholders while pooling and transferring knowledge could potentially encourage the provision of educational materials.



## Knowledge gaps

- ❖ There is a lack in the transfer of knowledge between research results and the farmers, especially about soil conditions.
- ❖ There is also a knowledge gap between fertilizer producers, sellers and farmers concerning the “best” fertilizer formula. This is often indebted by the producer’s motivation to sell the most profitable fertilizer and not the most appropriate and efficient ones.
- ❖ The application of manure is often characterized by a lack of knowledge about the composition and amounts of different nutrients.



# MLS 1.5 Crops

- ❖ The group concluded there are opportunities for adoption of more adequate farm practices and policies for the peri-urban and wider region. Such advancements would lead to higher efficiency and less environmental problems. It follows the policy orientations suggested by the group:
- ❖ Clear identification of each nutrient's (N,  $P_2O_5$ ,  $K_2O$ , etc) content in bags of fertilizer (organic and inorganic) and not just the content of total nutrients.
- ❖ Requirement for soil testing as a means to recommend the addition of nutrients on farms.
- ❖ Adoption of demonstration trials as a means to educate farmers on adequate management strategies.
- ❖ Study social-political-ecological implications of possible changes in terms of management and policies.



# MLS 1.5 Crops

- ❖ Study feasibility for constructing a production plant for blends of organic and inorganic fertilizers, leading to products of higher quality and nutrient content that are free of antibiotics and heavy metals and that could be transported over longer distances more economically than fresh or liquid manure. Products should be specific for different crops.
- ❖ Educate farmers in terms of value of different management strategies, including the value of evaluation and control of soil fertility.
- ❖ Review current fertilizer subsidy policies.
- ❖ Study feasibility of reducing the size of bags of inorganic fertilizers (farmers tend to apply more than needed in their land; many times one bag (50 kg) is too much for them).
- ❖ Get university engaged in plans and education aiming towards more adequate soil fertility evaluation and control in the region.



# MLS 2.1. Kenya & MLS 2.2. Vietnam

syngenta foundation  
for sustainable  
agriculture



## Policy Orientations

- ❖ Identifying the sources of declining yields
- ❖ Improving the efficiency of the fertilizer supply chain
- ❖ Any subsidies should be a kick-starter and not squeeze out other market players
  
- ❖ Transdisciplinary capacity building for the whole value chain: Who could do this sustainably?

# MLS 2.3 Malaysia & DS 3.5 Fertilizer Innovation

## Policy Orientations

- ❖ Provide safety standards to the different sources of P applied to soil.
- ❖ Be flexible to provide room for innovation and stimulate it. (That create the necessary variety of product that can be applied in different circumstances).
- ❖ Create awareness of consequences of food consumption and unbalanced diet.
- ❖ Address recycling to avoid negative environmental impacts; make use of the secondary resources to extend phosphate reserves.
- ❖ Avoid dissipation of phosphorus in industrial flows (cement, coal fire plants).



## MLS 2.4 Manila

Due to the low participation the Stakeholders the participants agreed to focus on further research orientation and agreed NOT to commit to policy orientations yet.

**Policy orientation** has remained the same and the case will continue to pursue the hypothesis:

- ❖ STPP in Detergents should be reduced to counteract Eutrophication in Laguna de Bay.

### Future research demand

- ❖ An accurate quantification **has to** be made available in order to create an orientation that serves to depict detergent impacts on Eutrophication.





## MLS 2.4 Manila

**Future research demand** (considering the use of STPP in detergents):

- ❖ Ban them completely and substitute with Phosphonate, Polymers, Silicon, Zyolite.
- ❖ Reduce Phosphate levels in Detergent in accordance to total Phosphorus contribution and possible future scenarios.
- ❖ Continue with current scenario.





# DS 3.2 Recycling Policy & DS 3.4 Recycling Innovation

## Policy Orientations

- ❖ Creating synergies by linking the P challenges to other problems and issues (eg. Water management). Multi-stakeholder and transdisciplinary approaches can foster these processes by including all relevant sectors (not only science) on each level in a transparent way.
- ❖ Flexibility in legislation can enhance innovations in the long term by establishing dynamic policies in contrary to static regulations. The integration in and the adaption to the existing legislation is crucial to planning reliability and investments.



# DS 3.2 Recycling Policy & DS 3.4 Recycling Innovation

## Knowledge gaps

- ❖ *First approach*: One step could catalyze the process / step by step (short term) → Good example can catalyze the process dynamics.
- ❖ *Second approach*: Covering the whole system (long-term) → Understanding of the long-term interconnectedness (drivers ...).

## Examples/Fields:

- ❖ Knowledge gaps in real business cases: eg. payback time of technologies
- ❖ Lack of long-term risk assessment
- ❖ Price development primary and second market
- ❖ Access problems to the companies data
- ❖ Transfer knowledge to developing countries
- ❖ The role/implications of subsidies



## Policy Options

- ❖ The principle should be the support of farmers and not the support of the product (fertilizer).
- ❖ The support of the use of specific fertilizer has to be based on the assessment of local soil conditions.
- ❖ There is the need to widen the range of policies for supporting farmers - there is the possibility of supporting yields (food production), infrastructure (road, storage, etc.) and education (so that farmers are able to choose appropriate measures). Bundling of various kinds of subsidies might also be helpful.



## DS 3.1 Subsidies

### Knowledge Gaps

- ❖ There is a need to have actual data on costs and benefits of subsidizing fertilizer as there is the possibility of fertilizer overuse and decreasing yields.
- ❖ Good practices of soil management (including e.g. manures) around the world and conditions for success have to be identified if efficient and effective subsidy programs shall be developed.



# Outlook

- ❖ We will make an internal document out of this
- ❖ Instead of „critical questions“, now a “Focus points, policy options and research demands“ (the Td-support team and the KIU will process this list; not yet to the web-site)
- ❖ The Global TraPs Steering Board will discuss when and in what form this will be dissiminated and discussed with what politicians in what countries (integrated with the panel’s results)