

## ***Changing institutional culture: PM&E in transdisciplinary research for development***

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**Abstract:** Agricultural research in Vietnam is typically disciplinary in nature and conducted in specialised research centres following research agenda that are predominantly determined by national priorities rather than local agendas. Such a research culture has not served the mountainous northwest of Vietnam very well, a region that is characterised by an ethnically diverse population, a large proportion of which live below the poverty line. The main source of income, and also the main opportunity to overcome severe poverty in this region, is maize cultivation, which, however, is often practised on steep slopes causing considerable soil erosion resulting in unsustainable production. To address this serious natural resource management issue within the complex socio-economic context, a transdisciplinary and development oriented approach towards research is required.

From 2009-13, the Australian Centre for International Agricultural Research (ACIAR) invested in a research for development project addressing these complex issues in the northwest of Vietnam. The Australian partners introduced a system's approach and as such initiated the formation of collaborative transdisciplinary teams involving a range of Vietnamese organisations including Northern Mountainous Agriculture and Forestry Sciences Institute, Centre for Agrarian Systems Research and Development, Plant Protection Research Institute, Hanoi University of Agriculture and Tay Bac University from Son La to conduct participatory research activities. This research firstly aimed at understanding all aspects of the existing farming system and subsequently attesting sustainable soil management practices and finding suitable crops to diversify production. This paper will describe the use of a Participatory Monitoring and Evaluation system as the key method providing researchers with the opportunity to experience the realities of the farming systems under study and understand how farmers manage the system as a whole rather than in fragments. This experience allowed both researchers and farmers in the team to operationalise the transdisciplinary nature of the project design, which targeted the need for a sustainable and diverse production system appropriate for the socio-economic realities of the communities. A very important step for the successful use of the PM&E system was the transformation of the concept as introduced by the international research partners in the project to a formulation of terms and exercises that resonated better with the Vietnamese ways of operationalising participation.

**Keywords:** Transdisciplinary research for development, participatory monitoring and evaluation, Northwest Vietnam

## Introduction

It has become widely acknowledged that, to address the complexities of farming in today's rapidly changing world, agricultural research needs to be transdisciplinary in nature to apply science to farmer realities and sustainability requirements (e.g. Pohl, 2005; Lieblein *et al.*, 2008; Van de Fliert *et al.*, 2010). This particularly applies to research organisations that, like in Vietnam, serve a large number of smallholder farmers who manage their farms under highly variable biophysical and socioeconomic conditions to meet a range of life objectives. Vietnam has a large and highly diverse rural population that faces multiple constraints in achieving sustainable and equitable outcomes from rural development. This is particularly the case in the relatively poorer mountainous areas in the northwest and central highlands characterised by high ethnic diversity, small-scale, mixed farming systems and lack of investment capital.

In order to conduct transdisciplinary research to address the complex realities and sustainability criteria of diverse farming communities, a shared understanding of these complexities among biophysical, agricultural, economic and social scientists, as well as development practitioners, farmers and their communities is needed as basis for the development of a common research methodology. Such a methodology, while still requiring disciplinary research methods, allows for the crossing of disciplinary boundaries in setting the research agenda, posing complementary research questions, and aligning methodologies of the various disciplinary activities. The questions relating to one discipline will need to reckon with the implications of its answers for the other disciplines. Accordingly, methods chosen across the disciplinary activities will need to be compatible and complementary.

Operationalising a transdisciplinary research approach requires a mechanism to be put in place that facilitates collaboration and exchange to come to a common understanding of issues, design a shared methodology, and analyse implications of research outcomes for farm realities. This mechanism can be provided by a comprehensive participatory monitoring and evaluation (PM&E) system that is tailor-made to a certain research initiative. This paper will discuss the experiences of a Vietnamese-Australian research team to conduct transdisciplinary research for a development project in Northwest Vietnam (NW Project) facilitated by a PM&E system. This project was funded by the Australian Centre for International Agricultural Research (ACIAR) with the objective of developing a market-driven maize-based farming system that would utilise sustainable soil cultivation methods to minimise erosion.

## Research for development on maize based farming systems in Vietnam's northwest

### The maize based farming system of NW Vietnam

Since the 1990s, production of maize has been the major driver of land use change in Vietnam's northern highlands. Between 1992 and 2012 maize production increased more than six fold from a total output of 748,000 to 4.8 million tonnes. The total area planted to maize increased from 478,000 to 1.2 million ha (US Department of Agriculture, 2014). Apart from the significant increase in area planted, the rapid increase in maize production was also due to the use of hybrid varieties and fertilisers that more than doubled productivity. This expansion of the production area was mainly on steep slopes, leading to higher rates of erosion and making maize production unsustainable. However, a long period of high market demand for maize, together with high, stable prices is driving this unsustainable production and has resulted in a near monoculture of maize in some areas of northwest Vietnam, with many households receiving as much as 70% of their household income from maize (Dao *et al.*, 2004, Nicetic *et al.*, 2012a).

Alongside the development of maize production many nationally and internationally funded research programs were conducted to address erosion problems on sloping lands. Unfortunately,

even though effective erosion management methods were developed, scaling up of the developed sustainable production systems is slow and challenging (Le *et al.*, 2003; Ha *et al.*, 2003). The slow change of established unsustainable cultivation practices is partly due to a significant increase in labour input needed to introduce most erosion management systems and a lack of readily available mulching material. Most sustainable practices result in a lower net income in the introductory year, which is a big disincentive for farmers (Nicetic *et al.*, 2012a), especially when farmers perceive that soil degradation is a long term problem that will have to be solved by the next generation and that increased fertiliser use can mitigate the problem in the short term (Nicetic *et al.*, 2012b).

### **The actors in research for development in Northwest Vietnam**

The national agricultural research system is organised following a traditional structure, with most research institutes either being commodity-based (rice, maize, food crops, vegetables and fruit, livestock) or with a disciplinary focus (genetics, plant protection, soil and fertilisers, social sciences). The activities of the major research institutes are coordinated by the Vietnamese Academy of Agricultural Science (VAAS) but research is governed and administrated by the Ministry of Agriculture and Rural Development (MARD). Only a few institutes have a regional mandate, such as the Northern Mountainous Agriculture and Forestry Sciences Institute (NOMAFSI), which operates in the northern highlands of Vietnam; however, the internal structure is still disciplinary and little collaboration exists among researchers across different departments.

Social science is typically underrepresented in most institutions, and systems thinking is not part of the institutional cultures of the partner organisations (see Section 2.3).

Research agendas tend to be driven by national priorities related to economic growth and export opportunities rather than location specific needs. Consequently, the research findings mostly comprise of technical solutions to specific problems presented as standard, one-size-fits-all packages, rather than comprehensive practice systems providing a range of options for farmers to choose from accompanied by learning mechanisms to enhance their decision making capacity. As a result, extension services are unsuccessful in introducing more complex practice changes including sustainable cultivation on sloping land.

At the time the ACIAR NW Project started in 2009 it had become apparent to ACIAR that new participatory and transdisciplinary approaches to research and extension were necessary to develop a sustainable maize based production system that would be environmentally and economically viable and enable farmers to make gradual practice change towards sustainable maize production.

### **The ACIAR Northwest Vietnam project**

The NW Project is the first, albeit reluctant, joint attempt by ACIAR and MARD to implement a participatory and transdisciplinary project. It involved five partner institutions Northern Mountainous Agriculture and Forestry Sciences Institute (Lead partner), Centre for Agrarian Systems Research and Development, Plant Protection Research institute, Hanoi University of Agriculture and Tay Bac University from Son La. The methodology involved three phases which were planned to be consecutive but were overlapping: the first phase assessed needs and opportunities within the target communities, the second phase involved participatory trials to develop sustainable maize based production systems, and in the third phase promising production systems were tested on larger areas using adaptive trials and a model was developed to scale up successful production systems. The final outcome was a set of improved land and crop management practices adapted to smallholders' agro-ecological and socio-economic realities and an outreach model to enable extension services to facilitate learning processes that, if implemented, will enable smallholders to acquire the knowledge and skills to adopt these practices.

The integrated and transdisciplinary nature of the project required strong collaboration among the five research institutes involved and between these research institutes and the provincial Departments for Agriculture and Rural Development (DARD) and associated provincial extension centres. It was planned that researchers and field staff would be allocated to project activities across the partner institutions in order to maintain adequate levels of a transdisciplinary perspective in each component. It was envisioned that detailed methods and protocols for agronomic experiments, which would reconcile with market and value chain development opportunities, would be developed and refined at the Inception Workshop and subsequent annual Reflection and Planning Workshops. However, after the initial two workshops it became apparent that this approach was not working because the attempt to change a disciplinary research tradition that had been institutionalised for a long time into a transdisciplinary research culture was too sudden and too ambitious. Another reason for the confusion and frustration experienced among research partners in the first year of the project was the need to commence all activities at the same time rather than in sequence. Ideally market and consumer research and the diagnostic phase should have been conducted the year before commencement of field experiments. The only activity for which inter-institutional teams were formed was the need and opportunity assessment during the diagnostic phase and feedback from all researchers involved was very positive. However, the concept of a diagnostic phase was new for most of the Vietnamese researchers involved, and hence not entrenched in their previously established habits. After the first year of the project and an extensive external and internal review, the disciplinary boundaries were acknowledged and a well-coordinated interdisciplinary mode of operation evolved.

## **Participatory Monitoring and Evaluation as a tool for facilitating transdisciplinarity**

### **Facilitating transdisciplinary agricultural research for development**

As indicated in the introductory section above, a transdisciplinary mode of research for development is based on a shared understanding of the implications of each relevant discipline on the complexities of the issue the research intends to target, and hence a shared methodological framework and aligned research methods and questions. In addition to the standard academic disciplines, roughly divided into the “hard” and the social sciences, development should be considered a relevant discipline, as the development paradigm and objectives a research project falls under determine the epistemological approach of the research. In addition, the development discipline would also bring in other stakeholder groups such as farmers, local governance bodies, service providers and the private industry in the collaboration.

To achieve a shared understanding among all those stakeholders, formulate aligned research questions, and develop a shared methodological framework, a well-designed communication platform is required that allows exchange of perspectives on problems, potential solutions, methods and results among researchers, development practitioners and farmers. Communication in this sense is not about sending messages from one to the other, but about facilitating dialogue and sharing power in decision making.

Communication methods that facilitate the operations and collaborations of a transdisciplinary research project can be effectively embedded in a participatory monitoring and evaluation (PM&E) system. Each project, however, requires a tailor-made design, training of all stakeholders involved, and a designated team member to coordinate the implementation and documentation of the activities. The section below will describe how the ACIAR NW Project operationalised this system and where it did and did not work.

### **PM&E system applied in the ACIAR Northwest Vietnam project**

A PM&E system was developed for the Northwest Vietnam project as a mechanism for communication between researchers, farmers, local leaders and extension officers to ensure that field trials were conducted in a participatory way. The PM&E system consisted of: (1) A participatory field trials planning meeting with the objective to reach an agreement among researchers, farmers, extension officers, commune and village leaders on objectives of the trials, trial design and implementation details. Farmer researchers were chosen at community meetings at the start of the project. Criteria for selection included their interest to participate in trials, having fields on slopes appropriate for trials and their agreement to engage with other farmers in the community to discuss progress and outcomes of field trials. There were five farmer researchers in each of the seven project sites and their role was to design and implement trials together with researchers and extension officers; (2) Regular review meetings with farmer researchers and extension officers to monitor progress of trial implementation. Monitoring was performed every 2-3 weeks depending on the development stage of the crop. The main researcher responsible for a particular trial, the extension officer (one extension officer per trial) and the farmer researchers (five people per site) monitored all trial plots together, recorded progress of the crop and observed and discussed results of trial treatments and the economic implications for their farms; (3) A community feedback meeting around harvest time with the objective to capture the opinions of the community on trialled farming practices and how they may be included in existing farming systems. Community interactions consisted of field visits and discussions with farmer researchers, extension officers and researchers. Field visits were followed by discussions in the community hall of the village where researchers and farmers presented together; (4) Participatory assessments of yield in experimental plots with the objective to estimate yield together with farmers, extension officers and the village leader. In larger experimental plots researchers were leading the estimation of yields based on 2 m<sup>2</sup> area with farmer participation. Once yields were calculated farmers discussed results and if they disagreed with them the process was repeated. If agreement was reached then that result was recorded. In smaller experimental plots the whole crop was harvested and measured by farmers with the researchers' assistance.

This activity was introduced in the second year of the project after disagreement between farmers and researchers about the estimated yields of experimental treatments. Farmers were claiming that the yield of new practices was overestimated by researchers; (5) Participatory evaluation of a field trial with the objective to evaluate economic and environmental performance of experimental treatments and to compare experimental treatments with farmers' own fields. Participatory evaluation was done with farmers, village and commune leaders and extension officers. Data from experimental fields were analysed by researchers and then presented to farmers. Farmers then commented on data compared them with the production on their own fields and most importantly they compared the performance of experimental treatments in relation to their ability to provide material inputs (farmer financial situation) and labour. Outputs of the evaluation session were recommendations for next season's experiments and identification of barriers for adoption of trialled new practices. By the end of the project, as some of the experimental practices and more sustainable farming systems were adopted on a large scale, the outputs of evaluation became recommendations for provincial DARD and extension centres to support scaling up.

After the first year of PM&E system implementation it was concluded that PM&E was a successful mechanism that enabled researchers to conduct field experiments with farmers, not merely on farmers' fields. Some researchers, particularly younger ones, became good facilitators of dialogues with farmers and were able to couple scientific information with farmers' practical knowledge, which enabled development of innovations that were feasible in the agro-ecological and socio-economic context of specific communities. This is succinctly expressed by a young lecturer from Tay Bac University who stated: "We listened to farmers' voices and all activities

were designed to answer farmers' needs and wishes. This is a highly valuable approach that we would like to adopt in the future".

As the project progressed it became clear that PM&E also provided opportunities for researchers to better experience the farming systems they worked in. Researchers became aware that farmers manage a system, not fragments in separation, hence forcing them to look beyond their discipline to be able to deal with the questions and issues raised by farmers and community leaders during PM&E activities. Evaluation of experiments went beyond measuring just yield and soil loss due to erosion to include socio-economic and agro-ecological aspects of farming systems. The soil management practice that was previously considered the best because it resulted in the highest yield and lowest level of soil loss, was rejected due to the labour requirements that were beyond farmers' means without incentives such as government subsidies.

An important moment in the development of the PM&E system was, when after the first year of implementation, a senior NOMAFSI researcher took leadership over the process. Initial PM&E guidelines developed by the Australian team followed the logic based on western conceptualisation of farmer participation that gives "farmer researchers" equal status to researchers and extension officers. The PM&E process, after modification by the Vietnamese partners, still enabled farmers to be heard and their realities acknowledged and acted upon, but with researchers and extension officers leading the process and suggesting the final decisions that were then agreed upon by farmers. This "power arrangement" between farmers and "experts" was productive, more comfortable for all parties involved and was the main contributor to development of intensified sustainable farming systems that were implemented over a relatively large area within the life of the project. The Vietnamese-modified PM&E system has been internalised by NOMAFSI and is now being used in other projects.

### **Lessons learned**

1. Institutional cultures and existing inter-institutional relationships need to be recognised and understood before deciding the level of disciplinary integration to commence at. In our case we tried to operate within a transdisciplinary framework, which was not feasible given the existing institutional arrangements and mindset of Vietnamese and Australian researchers involved.
2. The participatory monitoring and evaluation system was an effective mechanism that provided opportunities for researchers to experience farming systems and led them to acknowledge the need for transdisciplinarity, which traditionally they don't incorporate in their own research designs.
3. For PM&E systems to be effective, the local research partners have to take ownership over the process. The level of participation and power relationships between researchers and farmers had to be negotiated between the Vietnamese researchers and the Australian partner, who each had a different conceptualisation of what "participation" means in research for development. While the Australian partners perceived themselves as impartial facilitators of the collaborative research process, they realised after a while that there was no point imposing their own idea of participation on the engagement mechanisms among the various Vietnamese partners. All parties learned from sharing ideas and convictions, and a locally suitable collaborative mechanism was established towards the end of the project. This is illustrated by the following comment made by Mr Song, a Dao farmer from Moc Chau: "It started with project officers coming to the village's hall to discuss with farmers to help farmers understand more [...] Officers apply 3-together rules: firstly, they made a plan with farmers and we carried out the activities together we exchanges discussions and ideas and finally, we drew lessons learnt to implement the project's plans

better The officers were very open to ask us questions and we were happy to carry out the activities. Then we learnt the lessons together [...] This project is important because it meets with the farmers' demand; if farmers only grow maize, their income will not be enough for living expenses, we learned to intercrop maize under the plum's branches or intercrop maize with soya bean or pumpkin to get more profit.”

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