

# Integrated Systems Research for Sustainable Smallholder Agriculture in the Central Mekong

Achievements and challenges of implementing integrated systems research

**Edited by:** L. Hiwasaki, A. Bolliger, G. Lacombe, J. Raneri, M. Schut and S. Staal



RESEARCH  
PROGRAM ON  
Integrated Systems  
for the Humid  
Tropics



# Integrated systems research for sustainable smallholder agriculture in the uplands of mainland Southeast Asia: Achievements and lessons learned

## Chapter 5

Lisa Hiwasaki<sup>1\*</sup>, Adrian Bolliger<sup>2</sup>, Guillaume Lacombe<sup>3</sup>, Jessica Raneri<sup>4</sup>, Marc Schut<sup>5</sup>, Steve Staal<sup>6</sup>

<sup>1</sup>World Agroforestry Centre (ICRAF)

<sup>2</sup>International Center for Tropical Agriculture (CIAT)

<sup>3</sup>International Water Management Institute (IWMI)

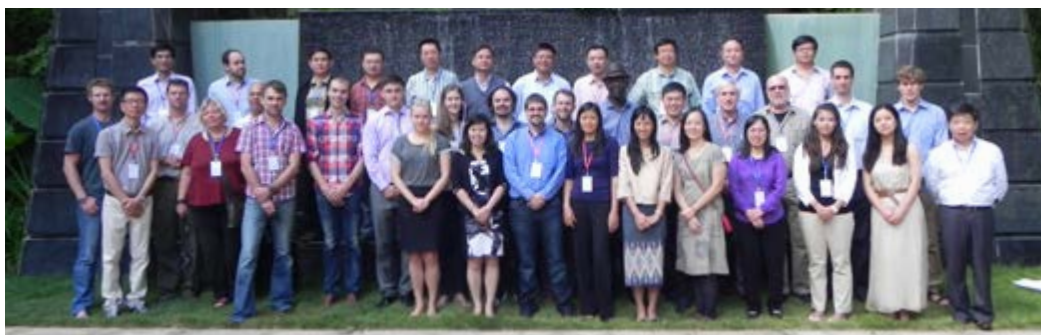
<sup>4</sup>Bioversity International

<sup>5</sup>International Institute of Tropical Agriculture (IITA) and Wageningen University and Research (WUR)

<sup>6</sup>International Livestock Research Institute (ILRI)

\* Corresponding author: l.hiwasaki@cgiar.org

## Summary



**Photo 5.1** Participants of Humidtropics Central Mekong Action Area 2015 planning meeting in Xishuangbanna, China. Photo credit: ICRAF/Thanh Tu Mai

After introducing the objectives and outcomes of Humidtropics, and some institutional constraints the research program faced, this chapter offers a synthesis of achievements, gaps and challenges of agricultural research for development activities implemented in the Humidtropics Central Mekong Action Area,

as well as a discussion of the challenges faced. This chapter provides lessons learned from implementing agricultural research for development in this region, and offers insights and recommendations that could support integrated agricultural systems research in the Mekong region and elsewhere.

# 1. Introduction

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## 1.1 Humidtropics strategic objectives and development outcomes

Humidtropics, a CGIAR Research Program on Integrated Systems for the Humid Tropics, was one of three systems research programs among the 15 CGIAR Research Programs (CRPs) of the CGIAR consortium. Officially launched globally in mid-2012, the program aimed to help poor farm families in tropical Africa, Asia and the Americas boost their income and livelihoods through partnership-based research on integrated agricultural systems for agricultural development. In 2013, Humidtropics research was restructured into a new programmatic framework, as seen in Figure 1.1 (Chapter 1). Humidtropics' Intermediate Development Outcomes (IDOs) were derived directly from its four Strategic Objectives (SOs) of 1) Livelihoods Improvement; 2) Sustainable Intensification; 3) Women and Youth Empowerment; and, 4) Systems Innovation. Each Strategic Objective related directly to one or two IDOs. For each IDO, indicators were defined with targets to be reached by 2023 (Humidtropics 2014).

Strategic Objective 1 addressed the goal of improved livelihoods in terms of income and nutrition for rural farm families, and was further defined by IDO 1 on income and IDO 2 on nutrition. The aim of IDO 1 on income was to increase the income earned by smallholders, and obtain more equitable sharing of profits in the value chain as a result of Humidtropics system interventions. IDO 2 on nutrition aimed to increase consumption of diversified and quality foods by the poor, especially among nutritionally vulnerable women and children (Humidtropics 2014).

Strategic Objective 2 on sustainable intensification focused on increasing total farm productivity while respecting integrity of natural resources. It was further detailed in IDOs 3 and 4 on productivity and environment. However, sustainable intensification is an overarching theme also addressed through contributions from the other Humidtropics IDOs. IDO 3 on productivity concerned the total farm-level productivity through sustainable intensification and diversification. IDO 4 on environment was about reversing land degradation and other negative environmental effects brought about by agricultural intensification through monocropping; it explicitly aimed to restore more natural ecosystem functions and services. Together, the overall aim was to optimize returns from the farm, sustainably manage biodiversity, soil fertility and ecosystem services, and enable the land to remain productive (Humidtropics 2014).

Strategic Objective 3 concerned empowering women and youth through better control over and benefit from integrated production and marketing systems. It was directly linked with IDO 5 on gender. This IDO focused on transforming women's status and position through Humidtropics system interventions. This IDO also addressed youth and marginalized groups' empowerment as an essential component to ensure their improved access to and control over the benefits from integrated systems interventions (Humidtropics 2014).

Strategic Objective 4 addressed enhanced capacity for systems innovation and corresponded to IDO 6 on capacity to innovate. This IDO supported systems interventions to achieve impact at scale. It involved building capacity among actors to innovate within the livelihood system, and creating a more enabling policy, business or development environment for scaling innovations (Humidtropics 2014).

## 1.2 Constraints of implementing Humidtropics in the Central Mekong Action Area

As described above, Humidtropics as an integrated systems research program had ambitious goals based on a 15-year timeframe, with indicators and targets to be reached by 2023. At the beginning of the CRP, four Action Areas were defined globally as 'tier 1', to be further expanded into 'tier 2' countries at a later stage. Unfortunately, the CGIAR consortium decided to close all three systems CRPs by the end of 2016, and thus the research for development (R4D) activities did not move beyond 'tier 1' areas. Below, we provide an overview of some constraints the CRP faced globally, as well as in the Central Mekong Action Area.

The first constraint was related to budget. The Humidtropics budget was repeatedly cut, with a smaller budget allocated each year. Although all 15 CRPs suffered budget cuts, these cuts affected some CRPs more than others. Such uncertainties in core funding made many Humidtropics international partners shift their priorities, which inevitably left Humidtropics and other systems research CRPs with even less resources to achieve their ambitious goals.



**Photo 5.2** Focus group discussion with male farmers in Son La, Viet Nam. Photo credit: ICRAF/Lisa Hiwasaki

A second constraint was structural and related to how Humidtropics R4D activities were managed. According to the CRP program structure (Figure 5.1), it would have been logical for systems analysis (described in Chapter 2) to be implemented before testing innovations related to integrated systems improvement on natural resource management, productivity, institutions and R4D on scaling (described in Chapters 3 and 4) at Action Sites and Action Areas. However, when activities commenced, funding for all activities was provided to each core partner simultaneously. In practice, this often meant that integrated systems improvement, scaling, and institutional innovation activities had to begin before entry themes and entry points were identified through situational analyses, and before priorities were set through multistakeholder platforms. Although this was an inevitable result of launching a CRP with multiple international research organizations involved, each with their own research agenda and local partners, these preconceived agendas, short timeframes and pre-existing local partner landscapes hindered the promotion of truly bottom-up, demand-driven and integrated research.

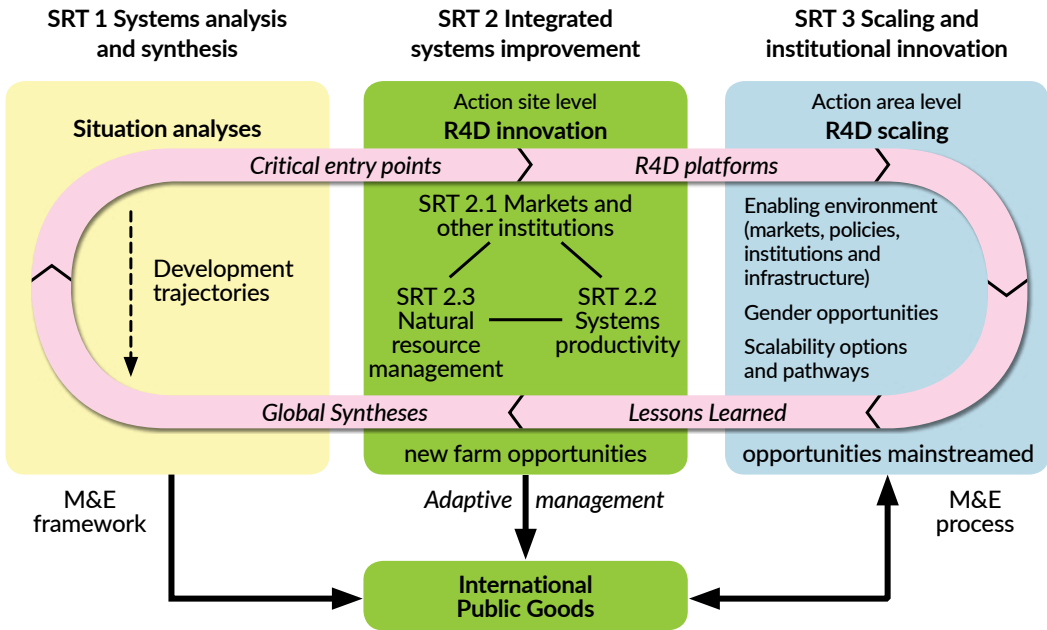


Figure 5.1 Humidtropics program structure

Third, although eight Humidtropics core partners were involved in R4D activities in the Central Mekong Action Area, not all core partners had offices and staff based in the region. The establishment of a Core Team with a representative from each core partner was crucial to provide a management structure that enabled a joint decision-making process to prioritize, plan and implement R4D activities in line with Humidtropics objectives. Because Humidtropics funds were allocated to each Humidtropics core partner directly from the lead institute based in Africa (International Institute of Tropical Agriculture (IITA)) – including accompanying reporting obligations to IITA and not to the Action Area coordination team

— such a management structure was indispensable to enable coordination of activities at the Action Area level. However, the physical absence of some core partners in the region resulted in less than optimal coordination and at times fragmented approaches to implementing some thematic activities that required close collaboration among the local and international partners involved. This may also have played a role in why nutrition was not raised as a priority intervention area more frequently in the Central Mekong, as discussed in Chapter 4.

## 2. Implementing agricultural systems research for development in the Central Mekong: Synthesis of achievements, gaps, and challenges

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We begin this section by outlining overall accomplishments of Humidtropics in the Central Mekong, followed by key achievements organised by the Humidtropics' Strategic Objectives.<sup>1</sup>

First, we obtained a much better understanding of the biophysical and social contexts in which rural and agricultural development is taking place. The situational analysis results clearly illustrate the diversity of agricultural and rural development settings across Humidtropics sites in the region. Contrasting features include: i) differentiated development levels, including both infrastructure and agricultural technology; these somewhat reflected national development differences; and, ii) in some cases (Thailand, China) population levels have stabilized while elsewhere, such as in Viet Nam, population growth continues (see Chapter 2 for more information on each Action Site, and Annex I for reports and other publications produced in each country).

However, strong commonalities were also apparent, reflecting some of the shared cultural history as well as similar physical terrain and agricultural traditions. Among the commonalities are: i) mountainous terrain characterized by some relatively remote and thinly settled locations in elevated areas, but also settled valley locations with better market access; ii) linked to this, strong disparity in income between urban and rural populations; iii) a significant presence of ethnic minority communities, many of which are socially, politically, economically and geographically marginalized, particularly in the case of women; iv) a mix of agricultural market types, including both strong local demand but also longer distance and cross-border markets for specific products, some of which are high value; and, v) the relatively strong role of the State. In all sites, most of the population is rural and agriculture still plays the dominant role in livelihoods.

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<sup>1</sup> Due to the shorter than expected timeframe of Humidtropics activities in the Central Mekong Action Area, insufficient quantitative data was collected to track achievements against IDO targets. We thus rely primarily on qualitative evidence, but provide quantitative evidence where possible.

It proved extremely useful to characterize the agro-ecological and social systems of our field sites through situational analyses, characterizing the farm households through baseline surveys, and using various tools to identify and prioritize entry points in each Action Site. Although the process was lengthy, costly and at times cumbersome, obtaining a comprehensive image of the field sites before starting agricultural R4D activities played a key role in bringing the project closer to the farmers. The different innovations trialled at each field site were direct outcomes of this process. Furthermore, the information and data obtained will remain an important resource for others working on agricultural development and R4D in the region, as they will be openly available through the community of practice (<http://community.humidtropics.org/>).

Second, modest funds allocated to local partners through the Multistakeholder Platform Research Project Funds were successful in generating locally relevant, integrated agricultural R4D activities. Three such projects were implemented in the Central Mekong: one in Northwest Viet Nam, another in the Central Highlands of Viet Nam, and a third in Thailand. Although small in scale, the integrated approach and close attention paid to these projects had concrete impacts on the ground. Qualitative impact assessment not only demonstrated that impacts were reported by farmers, but also showed that unanticipated project outcomes were observed. Smallholder farmers, most notably ethnic minority women farmers in the Central Highlands of Viet Nam, perceived as meaningful that they now had more time and opportunities to interact with neighbours and other farmers to talk about the project and share experiences due to the time- and labour-saving interventions introduced, which are described below in section 2.1.<sup>2</sup> Furthermore, these projects were critical to energizing the multistakeholder platforms. As the platform research projects were led by local organizations, they played a major role in generating broad partnership engagement in R4D activities (Hiwasaki et al 2017). Moreover, these projects were effective in filling gaps in existing agricultural activities implemented through CGIAR's research projects (Schut et al 2016).

Third, collaboration among international agricultural research organizations working in the region was substantially improved. Organizations that had not previously worked together were brought together as part of multistakeholder platforms established in various Action Sites and the resulting platform research projects, and also through joint implementation of R4D activities in the different field sites that would not have been possible otherwise. An example is the joint International Water Management Institute (IWMI)–World Vegetable Center (WorldVeg) field testing of crop and water management practices for home-based vegetable production in Northwest Viet Nam. This partnership resulted in establishing a demonstration site for home-based vegetable production during the dry season using rooftop harvested rain as the primary water resource. Based on field surveys and water balance modelling, a rainwater harvesting system was designed with an optimized storage volume that minimizes both costs (mostly due to the dimension of the storage tank) and risks of water shortage. Other farmers in the village have since scaled out home-based vegetable production without any support from the project.

<sup>2</sup> During qualitative impact assessment undertaken by ICRAF Viet Nam, 20–24 June 2016.

Furthermore, partnerships were strengthened between international agricultural research organizations and local partners, especially through the platform research projects. Local institutions worked jointly to implement these integrated agricultural R4D activities, enabling joint learning not just from the international research organizations but also from each other.

## 2.1 Strategic Objective 1: Livelihoods improvement

Mainland Southeast Asia is undergoing intense social and economic changes, such as expanding infrastructure and markets, and government policies and programs that promote rural and agricultural development. These offer many economic opportunities to improve farmers' livelihoods (King 2008, Kelly 2011). Monoculture cash crop plantations such as rubber, coffee, maize and cassava grown for regional and global markets have increased household incomes for farmers. However, this has been at the expense of local food production and thus has not necessarily led to positive livelihood outcomes with improved food and nutrition security. This development has also been at the expense of sustainable natural resources management and has led to severe land degradation and issues with access to and quality of fresh water.

The commercialization of 'safe' vegetables<sup>3</sup> or off-season vegetables in home gardens in Northwest Viet Nam, implemented by WorldVeg and the Fruits and Vegetables Research Institute (FAVRI), aimed to enhance local food production while promoting improved dietary diversity and diet quality. Another relevant intervention was the introduction of forage grass and home gardens in the Central Highlands of Viet Nam, with evidence that livelihoods improved after just one year of activities. Farmers we interviewed<sup>4</sup> said that before the grass VA06 was introduced, they would spend up to four hours a day cutting grass for their cattle. They had to go far from their homes to find feed for their cattle, incurring fuel costs at approximately 1 USD per day. With forage grasses grown in small land parcels around their house and close to where their animals were kept, they would only spend one hour per day to maintain and cut the grass, with no fuel costs. Home gardens were also popular, and farmers commented that instead of going to the market to buy vegetables, they now grew a wide range of vegetables for their daily meals such as cabbage, tomato, lettuce, cucumber, green bean, squash, pumpkin and eggplant, sometimes enough to share with their neighbours. Thus, instead of buying vegetables from the market every day, only money to buy seeds every 3-4 months was necessary. What became evident from our conversations with farmers was they felt the Humidtropics R4D activities had positive impacts on their lives. Even if their incomes did not increase, they were saving money and time by growing grass for their livestock and vegetables for their own consumption.

<sup>3</sup> In Viet Nam, the term 'safe' is used to signify vegetables produced under a process that ensures safety for consumers. The details of such processes tend to differ among the producers, but the standards set by VietGAP (Vietnamese Good Agricultural Practices, a national certification for agricultural products), is what farmers generally strive to follow.

<sup>4</sup> During qualitative impact assessment undertaken by ICRAF Viet Nam, 20-24 June 2016.



Despite these achievements, a notable gap in Humidtropics activities in the region was the lack of private sector involvement, both in the multistakeholder platforms but also in the R4D activities implemented. Local and national research partners were reluctant to involve the private sector in multistakeholder platforms that were still in the early phase of conducting situational analyses, baseline studies and identifying entry points for innovation. As a result, links with the private sector remained weak, even when concrete agricultural R4D activities were implemented, and very few activities focused on creating market linkages for farmers. This was unfortunate, especially because it was identified as a gap from the beginning through situational analysis (ILRI 2014) and stated in IDO 1.

## 2.2 Strategic Objective 2: Sustainable intensification

The unprecedented speed at which agriculture has been transformed in mainland Southeast Asia has compromised longer-term land productivity and ecosystem integrity. Government policies have enforced rapid conversion to accommodate specialized and intensified forms of agriculture, in particular monoculture cash crop plantations, as well as increased use of inputs for intensified agricultural production. This has resulted in environmental degradation, including rapid deforestation and erosion of farm land; loss of biodiversity; inequitable access to natural resources, including water; and, degrading ecosystem services, with particularly negative impacts on the poor (Drahmoune 2013). Such changes in northern Laos and southwestern China are described and analysed in Chapter 3. Not only do conversions to teak plantations (in northern Laos) and rubber (in southwestern China) replace traditional subsistence farming systems, the loss of natural resources (e.g. soils through erosion) jeopardizes land productivity over the long term, especially if tree plantations are to be converted back to food production (Ahrends et al 2015). Food-producing crops have lower rooting depth than trees, and consequently are less productive on the over-depleted soils that usually result from years of tree plantations.

Considering that conversions to commercial monocropping of maize or cassava from traditional subsistence farming are wide-spread in Northwest Viet Nam, the multistakeholder platform research project there introduced forage grasses, organic composting, and safe vegetables to smallholder farmers. Multistakeholder platform meeting discussions indicated a parallel interest and demand for small-scale diversification for subsistence and income. During interviews with farmers<sup>5</sup>, one of the most common observations was they felt the environment had become “cleaner” and the project had helped them “protect the land”. They felt that planting grass strips on the hills had reduced soil erosion and was protecting the land, especially when intercropped with coffee, maize or cassava. Furthermore, using less fertilizer as a result of organic composting and growing safe vegetables also presumably contributed to lessening water pollution, thus the farmers’ perception of a “cleaner” environment.

<sup>5</sup> During qualitative impact assessment undertaken by ICRAF Viet Nam, 26-29 September 2016.

The relatively rapid changes in land use, and unsustainable agricultural intensification in a region characterized by steep terrain, require innovations to improve soil conservation within evolving production systems. Such innovations can be both technological (e.g. new cropping practices including planting hedges) and institutional in nature (e.g. alternative land tenure arrangements). The case studies in Chapter 3 demonstrate how processes to facilitate identifying, designing and testing innovations – either technological or institutional – are context-specific, leading to divergent trajectories towards achieving the different IDOs. For example, in northern Lao PDR, we showed that the ongoing expansion of teak tree plantations, often mentioned as part of the efforts to enhance soil and water conservation through so-called reforestation, is actually increasing erosion and compromising long-term sustainability of cropping lands. Through discussions with farmers and local authorities, recommendations were formulated. Several agroforestry cash crops used as understorey in teak plantations were suggested to reduce soil erosion and some were tested. Similarly, in the Central Highlands of Viet Nam, smallholder coffee farmers faced with a double burden of low coffee productivity from aging trees grown on marginal soils and volatile coffee prices, sought ways to diversify production and restore or improve soil fertility. This was addressed, for example, by working with farmers and local government extension agents to develop cut-and-carry forage grass systems that could enhance the productivity of ruminant livestock on the farms, while decreasing the time and fuel cost involved in collecting feed for the animals. Such systems allowed animal manure to be collected more effectively, composted and applied to vegetable home gardens, or to coffee, pepper or cashew plantations. By actively involving commune extension workers in the process, they became facilitators for interaction between farmers and helped spread forage innovations to other villages and hamlets. Thus, integrated agricultural systems research based on multistakeholder processes and partnerships is one way to realize a region's potential. However, implementing multistakeholder processes has its challenges in this region, as will be discussed in section 3.

### 2.3 Strategic Objective 3: Women and youth empowerment

The Mekong region is characterized by considerable ethnic diversity. Ethnic groups, particularly those living in upland areas, are usually disadvantaged. They tend to have less material wealth, lower school attendance rates, lower literacy levels, and fewer job opportunities and market access (ILRI 2014, Hammond et al 2015). Their interactions with their natural surroundings, including traditional farming practices, differ from the lowland population, which forms the political core of the countries that comprise the region. Until recently, socialist States classified minority groups according to their perceived development level and justified the central government's expansion to exert control over remote regions (Fiskesjö 2006, Harrell 1995).

Situational analysis in Northwest Viet Nam (ILRI 2014; also see Chapter 2) demonstrated that ethnic minorities also have relatively poor access to extension services and markets. It was concluded that interventions targeting ethnic minorities and women can have greater impacts to alleviate poverty and inequalities. Focusing on women would be relevant especially for dietary diversity and nutrition, as women are the main decision-makers on food served at the table (ILRI 2014).



**Photo 5.3** Researchers sharing results of discussions at Humidtropics Central Mekong Action Area 2016 planning meeting in Hanoi, Viet Nam, November 2015. Photo credit: ICRAF/Lisa Hiwasaki.

Despite the tremendous ethnic diversity and inequitable development in the region, agricultural R4D activities implemented and interventions proposed under the framework of Humidtropics in the Central Mekong Action Area did not specifically address marginalized groups, most notably ethnic minorities. For example, out of more than 30 R4D activities implemented in the region in 2015, only two directly contributed to the IDO on Gender. Moreover, only one activity specifically mentioned ‘ethnic minority’. This meant that within existing activities, ethnic minorities were either left out, not recognized, or subsumed by the ethnic majority. Thus, the benefits of Humidtropics research and interventions may not have reached the poorest smallholder farmers in the region, and if they did, may have been inappropriately designed and potentially led to exacerbated negative impacts on cultures and livelihoods by introducing new technologies that go against social norms, rules and ways of engaging in agriculture (Kawarazuka 2016).

To address this gap, a research component focusing on marginalized groups – most notably ethnic minorities – began in the region in 2015. It resulted in a gender norms study, two literature reviews, two policy briefs, draft journal articles, and ‘Guidelines to Engage with Marginalized Groups in Agricultural Research for Development in the Greater Mekong’. The Guidelines were piloted in Lao PDR and Viet Nam, and further revised with contributions from various scientists and practitioners. Thus, a unique product was developed that will be useful for scientists implementing agricultural R4D in the Mekong region; it is included in Annex II of this book.

## 2.4 Strategic Objective 4: Systems innovation

Through multistakeholder processes, Humidtropics strived to implement bottom-up research in which farmers and other stakeholders guided the agricultural R4D agenda. Such participatory research would support collaboration between researchers, extension workers and farmers to jointly develop solutions towards sustainable agricultural development (Klerkx et al 2012). To realize the aim of using participatory approaches and multistakeholder platforms to build capacity to innovate among all platform members, capacity for platform facilitation had to be established first. Two three-day capacity development workshops were organized, targeting facilitators and those supporting them. A document intended to guide establishment and improve the functioning of multistakeholder platforms was also developed. Despite such efforts, managing and facilitating multistakeholder processes was difficult, and ensuring that such processes functioned well was challenging, especially considering the region's cultural and institutional contexts, as described and analysed in detail in section 3.

During the qualitative impact assessment of the multistakeholder platform research projects in both Northwest and Central Highlands of Viet Nam, we found that while some actors commented on how these Humidtropics projects were “closer to the farmers” than other projects they had experienced, these projects continued with the technology transfer model, in which researchers develop technologies that are then transferred in a top-down manner by project staff or extension staff to farmers. Development actors played no role in these projects, and the farmers continued to be in ‘receiving mode’, expecting to be ‘taught’ technological innovations. These projects did not have an element of building farmers’ capacities to innovate on their own, nor was there room for non-technological innovation. This was perhaps inevitable after years of top-down imposition of technology, as well as the sociopolitical context in Viet Nam. However, it is evident that in the timeframe of Humidtropics in the Central Mekong Action Area, adoption of multistakeholder platforms did not lead to widespread changes in the enabling environment that determines how agricultural R4D is conducted.

Furthermore, these platforms did not lead to scaling of innovations. Although we found pockets of success in the design and testing of innovative technologies (as described in Chapter 3) and tools (as described in Chapter 4), development impact through scaling out or up was not yet achieved in the Central Mekong Action Area. This reflected the limited timespan during which the platforms were effectively operating, but may relate to wider questions about the extent to which such local platforms can benefit the livelihoods of many thousands of farmers in developing countries (Dror et al 2016). Only if local platforms are closely linked with existing public and private extension mechanisms and networks can the technologies and other types of innovations scale out or up beyond the original scope, geographical focus or intended audience of the platform.

### 3. Multistakeholder processes and partnerships: Key lessons learned

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Humidtropics adopted a multistakeholder approach that focused on bringing research, government, development and business partners together to i) identify and analyse key constraints, and ii) to prioritise, design and implement innovations to overcome these constraints. To facilitate this, Humidtropics facilitated the launch of multistakeholder platforms in China, Viet Nam and Thailand. These multistakeholder processes had different degrees of success. In Northwest Viet Nam, for example, stakeholders identified entry themes which were further jointly narrowed to entry points, which in turn formed the basis for a platform research project. This project focused on agricultural diversification through intercropping coffee–fruit trees–grass strips, and fruit trees–vegetables, in a predominantly maize monocropping system. The R4D activities proved effective in bringing together numerous research institutes working in the region to implement research and share the results (Hiwasaki et al 2017). Unfortunately, although four other multistakeholder platforms were launched in 2014, two did not continue beyond 2015 so did not lead to joint activities or outcomes. Below, we offer five reasons why this may have happened.

The first reason is the limited understanding by Humidtropics partners of how multistakeholder processes can be effectively implemented and facilitated. It was evident from how funding, support, and other resources were allocated by the core partners that establishing these platforms in and of itself became an important objective. Limited attention was given to questions of what functions platforms actually needed to perform in linking different stakeholder groups, working across scales, and whether this required new platforms to be established as opposed to building on existing partnerships in the region.<sup>6</sup> Thus, even though platforms were established, financial and human resources did not follow to enable their continued implementation and facilitation. This is unfortunate, as a training needs assessment preceding a capacity development workshop for multistakeholder process facilitators in November 2014 showed that approximately 70 percent of the Humidtropics partners in the Central Mekong Action Area had very limited experience facilitating multistakeholder processes.

Second, all platforms were supported through or facilitated by (inter)national research organisations, which may have contributed to deterring truly demand-driven agricultural R4D agenda setting and implementation. As Humidtropics functioned as an umbrella, it relied on bringing together different existing projects under the integrated systems approach, with limited resources to initiate new activities. Many existing projects had not necessarily been designed as systems research projects. Nor did their predetermined foci and activities always match the demands of specific stakeholders. Furthermore, institutional mandates and geographical focus as well as personal expertise and preferences sometimes created obstacles to responding adequately to demands of farmers and other stakeholders (see also Schut et al 2016).

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<sup>6</sup> It should be noted that it was not only the Central Mekong Action Area that was facing such challenges, as similar patterns were observed in the Humidtropics Action Areas in Africa (Schut et al 2016).

Third, although the platform research projects were critical to energize the multistakeholder platforms and forge collaboration, they were not entirely effective in filling gaps where multistakeholder platform members did not have expertise, mandates or resources. Modest funds were provided by Humidtropics management as seed funding to fill agricultural R4D gaps and to respond to the difficulties of meeting stakeholder demands.

Fourth, sociopolitical contexts in the Central Mekong made it difficult to adapt the multistakeholder process and platform approach in the region. The multistakeholder platform approach was piloted by the Forum for Agricultural Research in Africa (FARA), under the Sub-Saharan Africa Challenge Programme (SSA-CP) (Adekunle and Fatunbi 2012) and the Dissemination of New Agricultural Technologies for Africa (DONATA) project. These pilot platforms may have influenced the design of Humidtropics platforms to be more suitable for the socio-economic and institutional contexts where they were first tested, and may help explain why the platforms took off more smoothly in the African Action Areas. These programs had already shown some tangible impacts and thus secured stakeholder buy-in, as well as identified gaps on which Humidtropics tried to build. This experience was largely absent in the Central Mekong Action Area.

Also, many of the resource materials such as facilitation guides were published in English and French, and case studies mainly originated from the African continent, which may have caused poor resonance and limited understanding for facilitators from the Mekong. To overcome such barriers, Innovation Platform Practice Briefs developed under Humidtropics were translated into Mandarin, Thai and Vietnamese and used in the capacity development workshops for platform facilitators (see Annex I for information on where to download them).

Fifth, and closely related to the above point, is that the Mekong sociopolitical context is very different to that in the African platform locations. In the Mekong region, the strong role of the State, especially in countries such as China and Viet Nam, means the role and mandate of civil society organisations are commonly less clear. There is typically less enthusiasm for grassroots action, and what is regarded as 'participatory'. In these environments, multistakeholder processes functioned in a top-down manner, driven by government and national research institutions, with little or no participation by civil society or the private sector. As such, it is difficult to address, let alone challenge, existing power dynamics and to enable multistakeholder processes to present different perspectives, debate issues, evaluate options and incite collective action (Hiwasaki et al 2017).

For multistakeholder platforms to be effective in generating innovative and sustainable solutions to complex agricultural challenges, resources need to be allocated to facilitate and implement these platforms outside of meetings, with attention given to what functions such platforms actually need to fulfil. It is challenging to realize demand-driven agricultural R4D agenda-setting and implementation when multistakeholder platforms are supported by agricultural research organizations whose agendas are already set. An important lesson here is the need for guidance on how to operationalize multistakeholder processes in a global research program across different sociocultural and political contexts. Overall, not enough attention was paid to adapting the multistakeholder process approach to specific

sociocultural and political contexts in the Mekong, nor was there enough discussion about whether multistakeholder platforms would be the best approach to implement R4D activities and achieve development outcomes in the Central Mekong Action Area (Hiwasaki et al 2017).

## 4. Reflections on challenges

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In this chapter we have synthesized the achievements, gaps, and challenges from the Humidtropics research in Central Mekong Action Area. Here, we offer some reflections.

First, it was unfortunate that our activities were constrained by general trends within the agricultural R4D system. Agricultural R4D is increasingly funded to achieve development objectives, with increasingly short-term outcomes expected from donors. Implementing integrated agricultural research, which entails longer timelines, was greatly hampered by short project cycles of donor-funded bilateral projects.

Second, fostering innovation in the agricultural system is a complicated process that requires long-term commitments and partnerships. Unfortunately this was not to be realized under Humidtropics, due to the program's premature closure at the end of 2016.

Furthermore, there are challenges in implementing integrated systems agricultural R4D as part of a global research program. Although Humidtropics was a global research program, it initially lacked clear guidelines on research methods and tools, which resulted in different international research organizations using diverse tools and methods. This complicated cross-site comparison, analysis and learning. Moreover, a much smaller budget and lower priority was placed on the Central Mekong, and Central America and Caribbean Action Areas, compared with the two African Action Areas. The research program was originally designed with a larger budget (including bilateral projects), making it difficult for Action Areas without the critical mass to implement activities in a similar manner.

## 5. Conclusions and recommendations

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Through this book we have demonstrated that significant research and development achievements resulted from our four years of integrated agricultural R4D activities in the Central Mekong Action Area, despite the constraints under which the activities were implemented and the challenges discussed above. The partnerships and collaborative relationships established through our work, particularly the collaborative work with local partners to identify and test innovations, will continue beyond Humidtropics, and may be scaled up in other CRPs in the second phase. We believe the lessons learned through the Humidtropics experience will contribute to strengthening the collective effort towards improving the livelihoods of poor farmers through sustainable agricultural development. Based on these achievements, gaps and challenges, we put forward recommendations for implementing future agricultural R4D in the Central Mekong region.



**Photo 5.4** Farmer cross visit in Son La, Viet Nam. Photo credit: ICRAF/Pham Duc Thieng

We claim that agricultural R4D to **improve livelihoods** of smallholder farmers would have more impact if it goes beyond simply focusing on agricultural production and includes agricultural R4D activities that strengthen farmers' roles in the value chain. This might take the form of connecting smallholder farmers to markets, supporting the development of entrepreneurship and agribusiness, building social networks for agribusiness, or by improving farmers' capacities to improve product quality and processing. As discussed in Chapter 2, local traditional products, crops and livestock exhibit untapped potential for high-value markets beyond the region, due to their unique characteristics and the value placed by consumers on their origin. It was evident from agricultural R4D on safe vegetables in Northwest Viet Nam that producers have the potential to earn much higher incomes, as long as they are connected to the market. Taking a public-private partnership approach to develop market-driven branding and certification systems could significantly contribute to improving livelihoods, especially of smallholder farmers in upland areas.

Based on the agricultural R4D activities implemented in the Mekong region, we recommend that future R4D activities for **sustainable intensification** prioritize techniques that concurrently meet several criteria: i) the generation of short-term additional incomes; ii) limited initial investment needs; and, iii) long-term conservation of natural resources (e.g. water and soils). One example is the conversion of monoculture plantations to agroforestry



polycultures that both generate short-term incomes (e.g. cardamom or broom grass as understorey crops in teak plantations) and long-term incomes (timber and latex from the teak and rubber trees, respectively), and that also protect the soil against erosion: the understorey both reduces the erosive power of raindrops hitting the soil and improves runoff infiltration. Another example is integrated coffee and livestock farming systems, where farmers diversify their coffee production by planting forage grasses and legume species (which can help with intensification of animal production, reduce soil erosion and build soil fertility). The animal manure can be used to increase the productivity and quality of coffee.

To ensure agricultural R4D in the Central Mekong **empowers women, youth and other marginalized groups**, we recommend that inequity be addressed, not just in agricultural development but also in how agricultural R4D is conducted. Special attention should be devoted to increasing the capacity of women and ethnic minorities to adopt appropriate agricultural innovations, while understanding how policies and biophysical constraints positively or negatively affect their development. Increasing their limited and inequitable market access and rectifying disadvantaged roles in the value chain are also important. Agricultural R4D that fully and meaningfully engages marginalized groups and reflects their interests and needs can transform the social inequality of these groups and result in social and technical systems interventions that can contribute to all the IDOs.

As for promoting **institutional innovation**, while bottom-up participatory approaches are often perceived as the most promising for innovation and scaling of innovation, they may not be sufficient. In some situations, it is conceivable that people only have a partial view of the range of technical and institutional options that could contribute to improving their livelihoods. For this reason, as argued in Chapter 3, R4D should account for both local knowledge and state-of-the-art innovations (scientific knowledge). This combination may contribute to raising the innovation capacity of the targeted populations over the long term.

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Cattle in a *Thai* ethnic minority house in Viet Nam. Photo credit: ICRAF/Lisa Hiwasaki

