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An evaluation of fruit and vegetable market development research in north-western Vietnam

4

ACIAR OUTCOME EVALUATION SERIES

An evaluation of fruit and vegetable market development research in north-western Vietnam

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ACIAR

2022

The Australian Centre for International Agricultural Research (ACIAR) was established in June 1982 by an Act of the Australian Parliament. ACIAR operates as part of Australia's international development assistance program, with a mission to achieve more productive and sustainable agricultural systems, for the benefit of developing countries and Australia. It commissions collaborative research between Australian and developing-country researchers in areas where Australia has special research competence. It also administers Australia's contribution to the International Agricultural Research Centres.

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Foreword

The Australian Centre for International Agricultural Research (ACIAR) brokers and funds international research partnerships between scientists from Australia and partner countries in the Indo-Pacific region to improve the productivity and sustainability of agriculture, fisheries and forestry for smallholder farmers.

This outcome evaluation reviews a cluster of inter-related agribusiness research projects that ran between 2006 and 2018 in north-west Vietnam. The ACIAR Agribusiness Program focuses on research and adoption of innovations to improve business outcomes for smallholder farmers, their communities and their industries at all points along the agricultural, forestry and fisheries value chain. The projects evaluated here were designed to improve vegetable production for women and ethnic minority smallholder farmers in Sơn La and Lào Cai provinces and to improve their access to fruit and vegetable markets.

I have met a number of the women leaders who have become entrepreneurs selling their branded produce into high value markets in Hanoi, employing more local people and buying their own trucks for distribution. They are very proud of what they have achieved for their communities and describe these ACIAR-funded projects as transformative.

As a learning organisation, ACIAR is committed to understanding the diverse outcomes delivered by the research collaborations we develop, to demonstrate the value of investment of public funds, to continuously improve research design and to increase the likelihood that ACIAR-funded research improves the lives of farming communities in our partner countries. An important mechanism for achieving our aims is to work closely with the wider Australian aid program to develop promising research into improved agricultural practices and profitable enterprises at scale. The outcome evaluation series draws together the longer-term impacts and learnings from our projects, celebrates successes and informs future program development.

An evaluation of projects run over such an extended period will, and should, reveal opportunities for on-going improvement in project design and implementation. Above and beyond that, this evaluation has found that there were many enduring and positive impacts for the women and ethnic minority smallholder groups involved with these ACIAR projects in Vietnam.

Andrew Campbell
Chief Executive Officer, ACIAR

Abbreviations and acronyms

ACIAR	Australian Centre for International Agricultural Research
CIAT	International Center for Tropical Agriculture
KAP	knowledge, attitudes and practices
KEQ	key evaluation question
NIMM	National Institute of Medicinal Materials
SFRI	Soils and Fertilizers Research Institute
VNUA	Vietnam National University of Agriculture

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Summary

This report presents the findings from the evaluation of the cluster of research projects funded by the Australian Centre for International Research (ACIAR) focused on developing fruit and vegetable markets to benefit smallholder farmers in north-western Vietnam between 2006 and 2018. The projects targeted women and ethnic minorities in Sơn La and Lào Cai provinces:

- **Increasing the safe production, promotion and utilisation of indigenous vegetables by women in Vietnam and Australia (AGB/2006/112)**. This project aimed to improve farm income in rural areas of Vietnam by increasing the skills of women in the safe production, promotion and utilisation of indigenous vegetables, including investigating market opportunities and challenges for indigenous vegetables.
- **Improved market engagement for sustainable upland production systems in the north-western highlands of Vietnam (AGB/2008/002)**. This project sought to increase smallholder engagement in competitive value chains associated with maize and temperate fruit-based farming systems and to improve land and crop management to develop sustainable and profitable farming systems
- **Towards more profitable and sustainable vegetable production systems in north-western Vietnam (AGB/2012/059)**. This project focused on women and ethnic minorities engaged in horticultural value chains in Sa Pa and Bac Ha districts in Lào Cai Province, where it aimed to enhance the profitability and sustainability of smallholder vegetable farmers through improved market engagement and integrated resource- and disease-management practices.
- **Improving smallholder incomes in the north-western highlands of Vietnam by increasing access and competitiveness in regional temperate and subtropical fruit markets (AGB/2012/060)**. This project aimed to improve the income and livelihoods of ethnic minority households in north-western Vietnam through increased access to and engagement in Asian temperate fruit markets.

The evaluation assessed the contribution of these 4 projects to outcomes of improved vegetable production and marketing practices of women and ethnic minority smallholder farmers in north-western Vietnam. It also examined the assumptions underpinning the design of the projects that would lead to those outcomes and sought to identify lessons in the development of agrifood value chains, including mechanisms through which more inclusive value chains might support development outcomes for women and other minority groups.

An overarching program logic was developed for the evaluation to identify intended outcomes and set out the assumptions in the projects' design. The evaluation team facilitated that process, which included a workshop with several significant research stakeholders from the projects. The evidence supporting the evaluation included a systematic desktop review of 45 documents associated with the cluster of projects, including project reports and independent end-of-program reviews. Interviews were conducted with 29 participants in Vietnam. The interview group was made up of farmers, on-ground delivery partners (including extension workers) and value-chain operators. A further 8 interviews were completed with lead and support researchers from Australia and Vietnam.

A significant limitation of this evaluation is the time that has elapsed since the projects were delivered. This has made it difficult to find evidence for certain outcomes and to assess the contribution of the projects to outcomes that were identified and have endured.

Key findings

1

Contribution to outcomes

The contribution of the 4 projects was evaluated against 3 ultimate outcomes identified in the program logic: women and ethnic minority smallholder farmers in target locations achieve improved livelihoods; fruit and vegetable markets and value chains in target locations operate more inclusively; and policy, practice and capacity improvements endure beyond the life of the research projects. There is substantial evidence that the projects contributed to the first 2 outcomes, but limited evidence about the projects' contribution to policy and capacity improvements for Vietnamese institutions.

Women and ethnic minority smallholder farmers in target locations achieve improved livelihoods

Substantial evidence was identified of women and ethnic minorities who participated in the research projects having **improved livelihoods through improved farm production practices and greater participation in target markets and value chains**. Livelihood improvements were possible through increased incomes resulting from improved production, better quality crops and broadening of the range of crops produced and sold to markets and the value chains they accessed. Those changes also led to more stable incomes, and participant farmers had the capacity to take up opportunities and respond to market changes. There is also evidence that some practices taken up by the smallholder farmers reduced the time they spent on farming, enabling them to undertake other activities. Families of smallholder farmers also benefited from nutritional improvements from changes to crop production, particularly of indigenous vegetables.

The practices trialled and adopted by participant farmers also produced environmental outcomes leading to more **sustainable farming systems**, improved erosion-control practices and better pest and weed management on their farms.

Smallholder farmers who participated in the projects were supported by the **application of existing science knowledge to new situations and in new ways**, as reflected in the program logic. Through tailoring the research activities to the needs of the women and ethnic minority farmers who participated, there were also **substantial capacity outcomes for the researchers and delivery partners involved**, who witnessed improvements to farm production practices firsthand as a result of the project's participatory model.

Fruit and vegetable markets and value chains in target locations operate more inclusively

While there is evidence that women and ethnic minority members who participated in the research projects are engaging more competitively in value chains, there is **limited evidence that the projects contributed in any enduring or meaningful way to governments and sector stakeholders making policy decisions** that facilitate female and ethnic minority farmers' participation in markets. At best, the projects' efforts to map the value chains and collect information about consumer preferences may have led to government institutions having information to make informed decisions. However, it is unclear how that information was communicated to the institutions or whether there was any ongoing capacity to update market information that quickly becomes outdated.

Policy, practice and capacity improvements endure beyond the life of the research projects

The evaluation has found substantial evidence that project outcomes for participating women and ethnic minorities have endured, particularly livelihood and capacity outcomes, thereby demonstrating that they have been **empowered by the research process**. There is substantial evidence that the smallholder farmers who participated in the projects have continued to benefit from the project outcomes, particularly through the use of the farm production practices that were introduced and the knowledge about and access to the markets and value chains. However, the evaluation has not been able to find evidence about the projects' contribution to changes to policy, practice and capacity improvements at an institutional level. Likewise, there is limited evidence that the approach taken by the projects and the best practice development models used to support target markets and communities have endured within the institutions responsible for ongoing delivery. This may be due to the time that has elapsed between the projects' delivery and subsequent projects advancing the use of the development models.

Gender, social inclusion and empowerment

By focusing their research activities on women and ethnic minorities in targeted locations, the projects have contributed to **gender and social inclusion outcomes at the micro scale**; that is, at the level of the individual and, possibly, the targeted community. This was achieved by identifying the types of agriculture in which women and ethnic minorities performed significant roles (such as growing indigenous vegetables) and focusing market development research and extension to women and ethnic minorities.

Beyond working with women and ethnic minorities, it is unclear how the projects sought to contribute to gender and social inclusion outcomes. As a result, the evaluation has not been able to determine whether the design of the projects, which involved **targeting their research activities to those groups**, was an effective way to achieve such outcomes.

2

Design of the projects

Accuracy of the assumptions underpinning the design logic

The key design assumptions underpinning the relationship between the participatory design logic of the projects and the enduring benefits to participating farmers proved to be substantially correct in this context. The assumptions that linked the participatory process and the successful application of development models to policy (particularly in relation to participation in markets), practice changes and the capacity of in-country institutions were found to be incorrect or unsubstantiated by the available evidence.

Lessons learned about the projects' design from their delivery

These projects were ambitious in their scope and required a complex range of knowledge and resources to accommodate the complex and varied needs of the participating women and ethnic minority farmers in farm production and market engagement. That led to communications and coordination challenges, and the projects required substantial modification to their scope and the renegotiation of time lines to make them manageable. That may have limited the capacity of the project teams to give **sufficient attention to policy and institutional outcomes** that may have led to more enduring outcomes for Vietnamese institutions that had been identified in the projects' designs.

3

Lessons about catalysing inclusive markets

While the projects worked directly with the 2 groups excluded from the markets and encountered several constraining factors relating to market development, those factors do not appear to be specific to fostering inclusive market development. Rather, the issues that arose appear to relate to the development of markets in general and are not specific to fostering inclusivity, such as continuity of supply, the importance of focusing on different market segments and having timely access to information about changes occurring in the market due to trade restrictions or consumer preferences.

The projects identified important factors that could assist women and ethnic minorities **to engage more effectively in the markets**, which they incorporated in their project activities. Knowledge of the structure of the value chains and an understanding of how the markets operate, including how consumer preferences could affect those markets, enabled participant farmers to make informed decisions about the crops they produced and how they might approach other value-chain actors. Participants gained experience through engagement with other value-chain actors and through responding to real conditions.

The later projects focused more on aspects of **leadership and the entrepreneurial drive of successful farmers and value-chain actors**, which enabled them to become more commercially business oriented.

Two identified issues that may have constrained the access of women and ethnic minorities to markets relate to the practical problems that those groups experience, including lack of transport and the languages used to access markets. Those issues were acknowledged but do not appear to have been addressed by the projects.

Introduction

This report

This report presents the findings and recommendations resulting from the evaluation of the cluster of research projects funded by the Australian Centre for International Research (ACIAR) and focused on the development of fruit and vegetable markets for the benefit of women and ethnic minority smallholder farmers in the Northwest Region of Vietnam between 2006 and 2018.

The report is structured as follows:

- Summary
- Introduction (this section)
- Evaluation findings
- Conclusion
- Appendices.

This evaluation

This evaluation focuses on a cluster of 4 research projects carried out in north-western Vietnam between 2006 and 2018. It assesses the outcomes of improved vegetable production and marketing practices of women and ethnic minority smallholder farmers in north-western Vietnam. The evaluation also sought to identify lessons on the development of agrifood value chains, including mechanisms through which more inclusive value chains might support development outcomes for women and other minority groups.

To understand and assess the outcomes and lessons learned, the evaluation assessed the extent to which improved practices were adopted and sustained, and whether those practices translated into improved market access when 1) combined with improved capacity to engage with value-chain actors and 2) supported by structural incentives informed by appropriate market analysis.

The evaluation was also commissioned to understand the extent to which the projects:

- contributed to scientific capacity outcomes and to furthering scientific knowledge and practice
- engaged with issues of gender equity and social inclusion in the resource system dynamics they were studying and whether that influenced the institutional capacity of engaged partners
- contributed to intended medium-term development outcomes (such as changes in institutional capacity and households' adaptive capacity).

The evaluation sought to answer a set of 3 focused key evaluation questions (KEQs) (Table 1). The KEQs were finalised during the planning meeting for this evaluation on 22 February 2022.

Table 1 Key evaluation questions

Key evaluation questions	Sub-questions
Outcomes	
1. **To what extent, and how, did the project deliver science and development outcomes?**	a. What science, capacity and livelihood outcomes did the research contribute to? b. What gender and social inclusion and empowerment outcomes did the projects contribute to? c. To what extent have project outcomes been enduring? d. Were there any unintended outcomes from the project activities?
Design	
2. **How appropriate was the design of the projects?**	a. To what extent were the assumptions underpinning the design logic accurate?
Learning	
3. **What can ACIAR learn from the projects about inclusive market development?**	a. What aspects of the projects catalysed inclusive market development? b. What aspects of the projects, if any, constrained or did not foster inclusive market development?

The fruit and vegetable research cluster

The 4 projects in the research cluster are characterised by their focus on **fruit and vegetable sector development in north-western Vietnam for the benefit of women and ethnic minorities**. The projects were as follows:

- **Increasing the safe production, promotion and utilisation of indigenous vegetables by women in Vietnam and Australia (AGB/2006/112)**. The aim of this project was to improve farm income in rural areas of Vietnam by increasing the skills of women in the safe production, promotion and utilisation of indigenous vegetables. The project also analysed and quantified existing and potential market opportunities, assessed factors that could improve the competitiveness of those vegetables in the marketplace, and developed supply chains that could continue to support the development of community-based indigenous vegetable production.
- **Improved market engagement for sustainable upland production systems in the north-western highlands of Vietnam (AGB/2008/002)**. The aim of this project was to increase smallholder engagement in competitive value chains associated with maize and temperate fruit–based farming systems. Market engagement was also used to improve land and crop management in these rapidly transforming sectors for the development of sustainable and profitable farming systems.
- **Towards more profitable and sustainable vegetable production systems in north-western Vietnam (AGB/2012/059)**. This project aimed to enhance the profitability and sustainability of smallholder vegetable farmers in north-western Vietnam through improved market engagement (domestic and export) and integrated resource- and disease-management practices. The project focused particularly on women and ethnic minorities engaged in horticultural value chains in Sa Pa and Bac Ha districts in Lào Cai Province.
- **Improving smallholder incomes in the north-western highlands of Vietnam by increasing access and competitiveness in regional temperate and subtropical fruit markets (AGB/2012/060)**. This project aimed to improve the incomes and livelihoods of ethnic minority households in north-west Vietnam. It aimed to increase their access to, and competitiveness in, Asian temperate fruit markets through more strategic market-driven industry planning and development. The project evaluated consumer and market dynamics; supported government-led planning, coordination and development; overcame barriers to the adoption of improved varieties and cultivation techniques; and developed competitive consumer-driven value-chain and marketing models for engagement with more profitable markets.

Although these projects dealt with different issues, focused on diverse geographical areas and sought to achieve diverse outcomes, they shared a common intent of using research to catalyse tangible changes for smallholder fruit and vegetable farmers and collectives, and targeted women and ethnic minorities.

The projects were predicated on the use of a **best practice development model**, drawn from the Farmer Field Schools approach, which is recognised by the Food and Agriculture Organization of the United Nations and has been successfully applied in other countries. The Farmer Field Schools approach is described as a participatory education approach that brings together groups of small-scale food producers to solve production problems through sustainable agriculture. Farmers participate in the research process, from identifying the issues to be addressed (such as farm management practices or environmental issues) to applying existing science to address those issues. For this research cluster, the projects sought to modify this model to accommodate the focus of these projects beyond farm production to include market engagement.

Methodology

Development of an overarching program logic

The projects were not designed with program logics to identify intended outcomes or capture the assumptions underpinning their design and implementation. To be able to assess the projects' contribution to the outcomes sought (KEQ 1) and test whether the projects' design assumptions were accurate (KEQ 2), the evaluation team facilitated a process to develop a program logic for the cluster during the evaluation planning phase.

The narrative and diagrammatic representation of the theory of change is set out below.

Evidence collection and analysis

Table 2 outlines the evidence collected and analysed to inform this evaluation's findings and recommendations.

The collected data were analysed using the following methods:

- **Documentary evidence** was analysed using an evidence table structured according to the KEQs.
- Interviews were recorded and transcribed for analysis. IndoChina Research Vietnam conducted 29 out of 31 interviews with in-country stakeholders, including a field visit to Sơn La Province where researchers interviewed 7 farmers, 2 delivery partners and 4 value-chain operators (cooperative members and one collector); and a field visit to Lào Cai Province where they interviewed 5 farmers, one delivery partner and 2 value-chain operators (one cooperative member and one restaurant owner).
- **Qualitative evidence** collected through interviews was thematically analysed using the Dedoose qualitative data analysis software suite.
- All evidence was synthesised against the KEQs in a **results pack**. A **sense-making workshop** was held to collaboratively review and validate the evidence and test the key findings.

Limitations of this evaluation

It is important to acknowledge factors that may have limited the comprehensiveness and rigour of the findings of this evaluation. Those factors include the following:

- The scope of the evaluation included projects that commenced as far back as 2006. Stakeholders who were involved with some of those earlier projects could not always recollect project details and outcomes with clarity. Stakeholders recognised this limitation and typically qualified their responses in such cases. However, this results in less certainty about the outcomes of some of the projects.
- Several projects were concurrently delivered in these regions by different countries as part of their international development programs, undertaking similar activities and achieving similar outcomes. As a result, it is not possible to obtain a clear picture of the contribution of this cluster of projects to the identified outcomes.
- ACIAR and other international research and development organisations have continued to deliver projects seeking similar outcomes since the completion of the cluster of 4 projects. It is not possible to separate the contribution of this cluster of projects to the identified outcomes.
- The documentary evidence this evaluation had access to (particularly project reports) primarily documented project outputs rather than project outcomes. It was not always possible to assess the extent to which project outputs led to intended or unintended outcomes or the degree to which such outcomes may have endured.
- Efforts were made to engage a diverse group of stakeholders. However, as contact lists of participant farmers and on-ground delivery partners from these projects were not available, the evaluation team relied substantially on snowball sampling methods in which known stakeholders provided further contact details of other project stakeholders.

Table 2 Evidence collected as part of this evaluation

Data collection method	Stakeholders	Number of documents reviewed / interviews
Document review		**45** documents, including project proposals, annual and final reports and end-of-program reviews
Semistructured interviews	Participating farmers, researchers	**13** interviews (6 female, 6 ethnic minority, and 1 male, non-ethnic minority)
	Lead and support researchers	**8** interviews
	On-ground delivery partners (including extension workers)	**9** interviews
	Value-chain operators	**7** interviews
Total number of interviews		**37**

Research cluster program logic

Program logics provide a way of identifying the expected outcomes from a project and the pathways of change from the activities and outputs to the ultimate outcomes. While program logics were not developed as part of the design processes for these projects, an overarching program logic for the cluster of projects has been developed for this evaluation to answer questions about the outcomes and the assumptions underpinning the design of the projects.

To develop the program logic, the evaluation team drew on information from the review of project documents followed by a facilitated workshop with significant research stakeholders from the projects. During the evaluation, only one change was made to the wording of one ultimate outcome. Below is the narrative describing the cause-and-effect relationships underlying the logic model for the research cluster, followed by a program logic model providing a diagrammatic representation of the pathways of change implicit in the design of the research projects (Figure 1).

Program logic narrative

The **broader goal** is that 'women and minority smallholder farmers achieve secure livelihoods within a sustainable and profitable farming system'. This is an ambitious, society-level goal that the projects were not expected to achieve on their own; rather, the theory of change describes how the projects were expected to **contribute towards** that broader goal.

The projects within this cluster were expected to contribute to the broader goal through 3 **ultimate research outcomes**:

1. Women and ethnic minority farmers in target locations achieve improved livelihoods.
2. Fruit and vegetable markets and value chains in target locations operate more inclusively.
3. Policy, practice and capacity improvements fostered by the research and supporting activities are institutionalised and thereby continue to provide benefit beyond the life of the research projects.

Those outcomes were expected to be a direct result of the projects in the cluster: although they might not have been fully achieved during the life of the projects, it is expected that the project activities will have affected the conditions for these outcomes to occur, and the long-term results should be observable in this post-project evaluation.

Diverse **intermediate outcomes** contribute to the achievement of the ultimate outcomes. The third of the above outcomes was expected to be achieved primarily by establishing an evidence base for best practice development models to appropriately target markets and communities, by embedding and institutionalising capacity improvements and practice changes engendered by project activities, and by empowering women and ethnic minority farmers through the research process.

The empowerment of women and ethnic minority farmers, alongside their ability to improve on-farm management practices and to engage more competitively in value chains, contributes to their achievement of improved livelihoods.

Lastly, the projects were expected to contribute to the more inclusive operation of fruit and vegetable markets and value chains by enabling governments and sector stakeholders to make evidence-based policy decisions that facilitate female and minority farmers' participation in markets and by enabling effective government-led planning, coordination and development to strengthen targeted industries.

The cluster's intermediate outcomes were expected to be achieved through a set of **influence activities** presented towards the bottom of the program logic model. Those activities were chiefly:

- trialling a series of interventions to improve smallholder farming practices and participation in markets among female and minority farmers (improving the product and the ability to sell it)
- partnering with government, private-sector and other stakeholders to trial interventions that aim to strengthen markets and value chains (ensuring that markets and value chains are accessible and amenable to female and minority farmers' participation)
- engaging local researchers and institutions in designing, delivering and analysing the results of these trials and in the technical research that underpins them.

Those influencing activities were underpinned by a series of **foundational activities**, which do not in themselves lead to change but which must be in place before the influence activities can be done. These include analyses of markets and supply chains; knowledge, attitude and practice (KAP) assessments and the establishment of any other relevant baselines to measure change; scientific and technical assessments; the design of the interventions to be piloted; the selection of participants; and the review of previous initiatives and relevant literature.

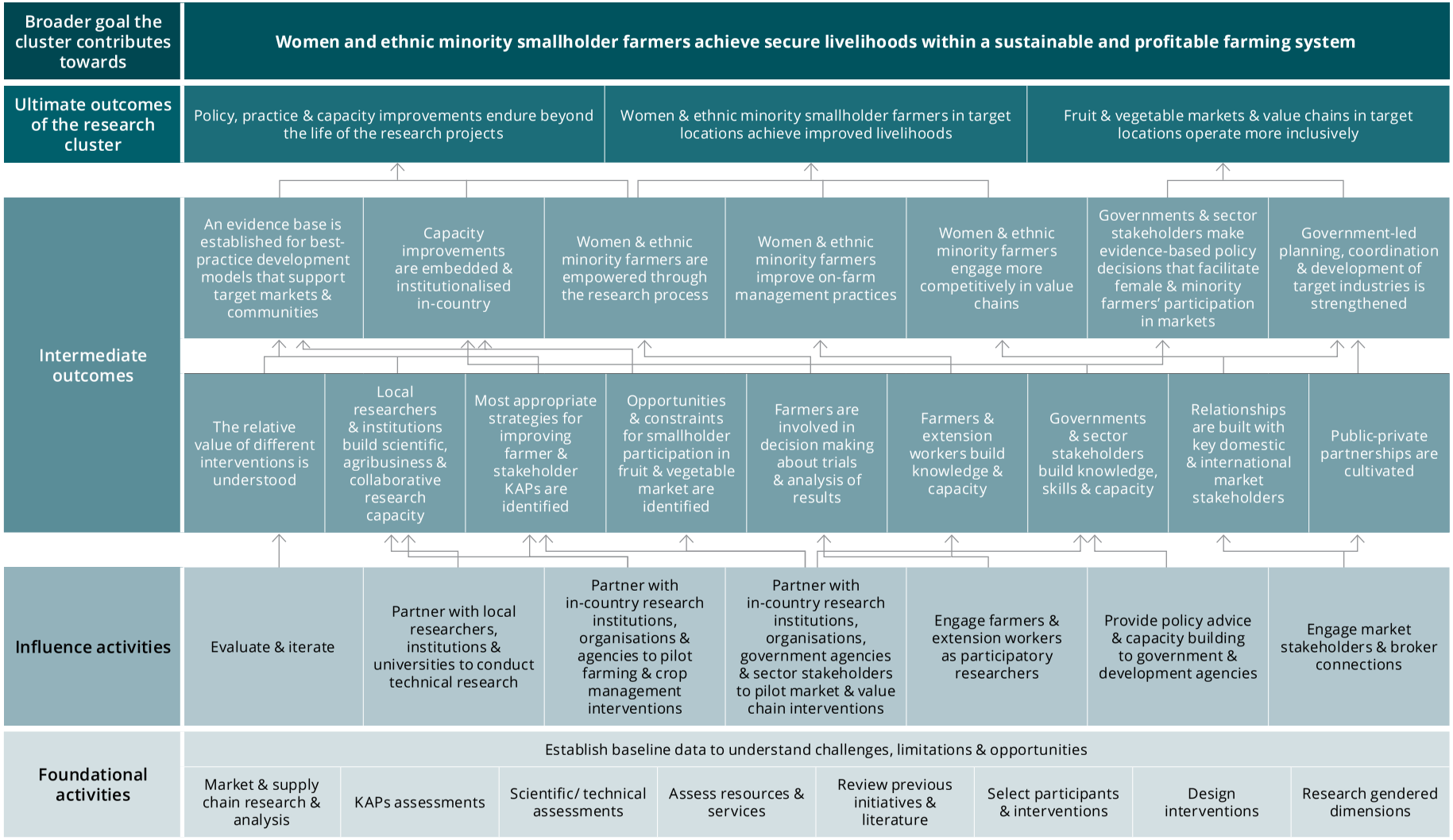

Figure 1 Program logic model for the fruit and vegetable market development to benefit women and ethnic minority farmers research cluster

Evaluation findings

This section presents the evaluation findings, which are broadly structured according to the KEQs (see Table 1) and sub-KEQs. The program logic developed for the research cluster is used as a reference point to ensure that findings about outcomes and the accuracy of the assumptions underpinning the design can be presented in a structured way.

Illustrative quotes are provided throughout this section, and participant codes are provided to indicate the stakeholder type (R# represents a researcher, D# a delivery partner, FR# a participating farmer and VA# a value-chain actor) and the number of interviewees who spoke about a point.

1. To what extent, and how, did the project deliver science and development outcomes?

Science, capacity and livelihood outcomes

This section discusses the contribution of the research projects to 2 ultimate outcomes identified in the program logic:

- Women and ethnic minority smallholder farmers in target locations achieve improved livelihoods.
- Fruit and vegetable markets and value chains in target locations operate more inclusively.

Evidence is also presented in relation to the projects' contribution to securing a more sustainable farming system in the longer term.

The projects' contribution to those higher level outcomes was enabled by the achievement of intended and unintended science and capacity outcomes. This section first discusses the evidence of the projects' contribution to livelihood improvements for the participating women and ethnic minority farmers and the ways in which science and capacity outcomes supported those improvements and then looks at the projects' role in supporting the more inclusive operation of markets and value chains.

Women and ethnic minority smallholder farmers in target locations achieve improved livelihoods

Key findings

This evaluation has found substantial evidence that the women and ethnic minorities who participated in the research projects have **improved livelihoods** as result of new farm production practices and greater participation in target markets and value chains. Livelihood improvements were possible through **increased incomes** resulting from improved production, better quality crops, a broadening of the range of crops produced and sold to markets and the value chains that farmers accessed. Those changes also led to more **stable incomes** and participant farmers having the capacity to take up opportunities and respond to market changes. There is also evidence that some practices taken up by the smallholder farmers **reduced the time** they spent on farming, enabling them to undertake other activities. Families of smallholder farmers also benefited from **nutritional improvements** resulting from changes to crop production, particularly of indigenous vegetables.

The practices trialled and adopted by participant farmers also produced **environmental outcomes** leading to **more sustainable farming systems**, including improved erosion-control practices and better pest and weed management on their farms.

Supporting the smallholder farmers who participated in the projects has led to the **application of existing science knowledge to new situations and in new ways**, as reflected in the program logic. Through tailoring the research activities to the needs of the women and ethnic minority farmers who participated, there were also **substantial capacity outcomes for the researchers and delivery partners involved**, who witnessed improvements to farm production practices firsthand as a result of the projects' participatory model.

This evaluation has found substantial evidence that women and ethnic minority smallholders who had participated in the research projects had **improved their livelihoods**.

There is evidence that most participant farmers experienced increased incomes from their crops and 'more stable lives' by giving them options to change farming practices and select different crops to take advantage of opportunities in the market. Five farmers (FR2, FR6, FR7, FR8, FR9, FR12) and 3 value-chain actors (VA2, VA4, VA5) pointed to improved quality of their produce resulting from practice changes, which led to the farmers obtaining higher prices, increased demand for their produce, and increased their agency when negotiating within value chains.

> *'After a 3-year project, many households have more income, from vegetables. Some of them bought motorbikes or musical instruments for their kids. Their household finances have changed after 3 years; more assets, machines, and many households had changed from growing rice to vegetables. That is the biggest change I see thanks to the project.'*
>
> — (VA5)

Participation in the projects has led some farmers to diversify their crops, including moving away from reliance on rice crops to vegetable production, which has enabled them to increase their income from their properties.

> *'There's this move out of a very rice-intensive system that was not very income-generating. Rice farming in the northern highlands is not going to be very profitable. The idea from the beginning was, can we help people transition into a vegetable crop that is significantly more profitable? And I think our project was successful in bringing some groups to shift more into vegetable production. I think that was a pretty significant increase in their incomes.'*
>
> – (R7)

In addition to increased or more reliable incomes, other livelihood improvements were also achieved, including reducing the time required to manage crops and taking advantage of the different vegetables grown to enable nutritional improvements for families.

Practices introduced during the project that reduced the labour and time required to produce crops included taking up no-till methods of cultivation of crops and regular pruning of fruit trees.

> *'No-tillage can save a lot of man-hours of labour. An effective farm process can also save on labour, increase profits, and productivity.'*
>
> – (D2)

Reducing the time and labour required to manage production gives farmers greater choice about how they invest their time, opening up the possibility of a range of livelihood benefits.

Some farming families appear to have taken advantage of the diverse range of vegetables they grew to improve their family's nutrition. This outcome from farmers participating in the projects was the focus of a PhD thesis (Genova 2019).

> *'…I would also say that there were nutritional improvements. We did hear about that because they grew different vegetables. They were feeding some of that to their children. But also, I had a PhD student … work on looking at households who grow more diverse vegetables, do they feed those to their children and does that result in nutritional outcomes.'*
>
> – (R5)

These livelihood outcomes were achieved as a result of the research successfully supporting **women and ethnic minorities to improve their on-farm practices**. There is substantial evidence of the research cluster contributing to capacity outcomes for smallholder farmers who participated in the projects.

Project activities were delivered in a highly participatory way, providing substantial opportunities for **learning by doing** for the smallholder farmers who participated in the projects. Farmer participants (FR2, FR5, FR6, FR4, FR9, FR11) identified **a range of farm management practices** they acquired during the projects and continue to use, including pruning, fertiliser application, intercropping techniques, crop rotation, mulching and soil improvement, as well as crop diversification and reductions in ploughing and burning.

Much of the knowledge farmers gained about those practices was acquired while trialling new production methods in their own fields, supported by the project teams. Those new technical capabilities led to increased production and improved post-harvest practices.

> *'That model resulted in main outcomes on the farmers' technical capability. Based on that, they knew about field-related issue control; soil and nutrient management in fields; soil treatment; post-harvest storage; and market access. This series of learnings was closely linked to each other, and the key beneficiaries were farmers. They acquired the knowledge by conducting the farm practices in fields by themselves, and thus improved their capacity.'*
>
> – (D7)

The final report for AGB/2008/002 notes that farmers were able to trial practices (such as minimal tillage and mulching) that were acceptable to them due to the undemanding nature of the practices, with the added advantage of reducing the labour needed for soil preparation (van de Fliert and Nicetic 2018). The farmers' preference for minimum tillage over no-till techniques provided an example of the benefits of the participatory methodology being used. The farmers were able to experience the advantages and disadvantages of the no-till system promoted by the project but chose to adopt minimum tillage as a step towards more sustainable cropping practices.

The improved farm management practices that smallholder farmers were exposed to during the projects also delivered improved **environmental outcomes**, which are important contributions to securing sustainable farming systems over time.

Three participating farmers (FR1; FR3; FR7) identified environmental benefits from improved practices. Those benefits included reduced soil erosion or agricultural run-off resulting from a combination of reduced burning, reduction and/or more appropriate use of herbicides, and the use of mulching and organic fertilisers.

> *'Together with what I learned from the project, I also applied my experience with the maize to coffee growing: not to burn the grass but to cut it short and leave the base there. Because if I burnt the grass, the rain would wash the soil away … If the land is too steep, rain will wash away everything, and fertiliser will not be absorbed into the soil properly.'*
>
> – (FR1)

> *'When I participated in these classes, I learned about the negative effects of herbicides and pesticides, and of their residues in soil and on vegetables, so I will remove the contaminated parts. If the residues remain in soil and vegetables for a long time, I will stop using them. That was the most meaningful lesson that I have learned.'*
>
> – (FR9)

This substantiated reported environmental outcomes detailed in project reports and resulting from farmers adopting **better erosion-management practices**. Other environmental outcomes noted in project reports include:

- preserving biodiversity within the project regions through wider planting of indigenous vegetables (Johnson et al. 2018:42)
- improvements to soil and crop nutrient management from increased plant biomass, leading to the availability of crop residues that can be returned to the soils to protect the soil surface and help to control erosion (Johnson et al. 2018:43)
- the replacement of some maize crops on slopes by fruit-tree orchards, which has had a positive impact on managing soil erosion and reduced the use of pesticides and herbicides, particularly atrazine (Nicetic et al. 2021:88).

While many other factors will ultimately affect the sustainability of the farming systems in which the projects operated, it is reasonable to conclude that the practices introduced by the projects and subsequently adapted and sustained by the farmers make a positive contribution to this broader societal goal.

The program logic developed for the research cluster indicates that these livelihood and environmental outcomes were expected to be achieved through the **application of existing science knowledge to new situations and in new ways**. The evaluation has found that this is indeed the case, as the project teams began by researching the specific needs of the women and ethnic minority smallholder farmers they were working with and tailored their research activities to meet those needs and the specific conditions found in the targeted regions (R3, R4, R6, D6, D7, D9).

> *'We even did research about farm practices among farmers, by collecting information about how many crops do they have every year. What fertilisers do they use? How much is the concentration? Do they use fertilisers or pesticides? Is their practice suitable or not? How do they amend garden soil after a crop harvest? Based on that, experts analysed the effects of these farming practices on soil quality as it is related directly to the quality of trees and products.'*
>
> – (D7).

Focusing on applying existing knowledge to the new contexts in which the women and ethnic minority smallholder farmers operate meant that project activities and outputs did not lead to major publications in academic journals. In fact, publications from the projects' activities reflected the applied nature of the research in the publication of guidelines and manuals and the production of videos.

> *'We published a lot of guidelines: training manuals, videos, [the lead researcher] would say, very successful for videos, training videos. We did whole manual for managing erosion. We [have] done one for fruit, about the nurseries.'*
>
> – (R2)

However, new knowledge was produced about the production and marketing of the vegetables (including indigenous vegetables) and fruit grown by the villages targeted by the projects (Newman and Hien 2011:12). Indigenous vegetable production knowledge was documented, and production constraints were identified through a wide range of production trials (Newman and Chau 2012:3). The projects also documented whole-farm management practices to improve sustainability, productivity and household livelihoods in rice–vegetable and vegetable-only systems (Johnson et al. 2018:9–10).

Research was undertaken on the pests and diseases encountered in the region, including trials to control clubroot for vegetable growers (Johnson et al. 2018:42).

> *'I remembered there was a disease named Plasmodiophora brassicae causing clubroot, faced by farmers in many years. Farmers did not know the way to treat it completely. They cured with traditional method, which was passed down generations verbally. Even state agencies have not done any research or examination on the treatment, but the project did it. Disease samples were collected in field surveys during the growing process, and they observed the farming practices to identify the causes. The scientists conducted the whole research process very well.'*
>
> – (D7)

The one unintended outcome (KEQ 1d) identified from this cluster of projects has led to **improvements in the capacity of Vietnamese soil-testing laboratories** that were achieved through the work of one researcher, enabling soil testing to be standardised (R5, R7, R9). This Australian researcher undertook training of laboratory staff, sourced new equipment and established standard samples to measure soil samples against.

> *'… the soil-testing labs themselves couldn't produce reliable test results. And nobody knew that very well until [the Australian researcher] came and kind of tried to do these reference samples to show, well, are your testing results any good … And the results were so off that probably that was resulting in a lot of bad recommendations going out and information programs and projects in ways that probably are very not good. And so I think when [the researcher] went in and built the capacity there and kind of did these reference samples to benchmark their results against other results, and then developed calibrations so that the results that they have against the reference sample are now going to be consistent.'*
>
> – (R7)

These projects required the active involvement of local researchers and institutions, and there is evidence that the local researchers and institutions involved have **built scientific, agribusiness and collaborative research capacity from their involvement in the projects**. The projects deployed an 'experiential learning model' rather than using top-down extension approaches, which predominated in Vietnam at the time. This highly participatory methodology also enabled the local delivery partners to work in a different way, which required capacity building.

> *'That's a relatively different approach of doing things than a typical Vietnamese research institute might otherwise have done it. And I think that that was a pretty important change for the people who participated in it … but I think that was an important capacity that we had to build through the project because not all of our partners had done something like that before.'*
>
> – (R7)

Significant improvements were observed in the capacity of staff from several organisations, including the Northern Mountainous Agriculture and Forestry Science Institute, the Plant Protection Research Institute, the Center for Agrarian Systems Research and Development and Thai Binh University, through their engagement in and facilitation of the participatory research. Delivery staff developed and implemented research protocols and gained experience in collecting, managing and analysing data (van de Fliert and Nicetic 2018:76; Hetherington et al. 2018:36). In addition, seven PhD and master degree students were supported and funded through AGB/2012/059 for research work related to the project (Johnson et al. 2018:45)

The focus on capacity building in AGB/2008/002 led to the drawing together of different Vietnamese organisations, target communities, practitioners and researchers from different disciplines and fostered collaborative work that led to tangible and sustainable impacts in the field. Capacity outcomes resulting from the intensely collaborative approach and numerous training events were particularly apparent among the projects' field researchers from partner organisations and participating farmers (van de Fliert and Nicetic 2018:7).

Existing partnerships were strengthened, new partnerships were established and networks were broadened during the delivery of the projects (R3, D6, D7), including with research institutions, provincial governments and organisations such as the Vietnam Women's Union.

> *'Stakeholder cooperation, including state agencies, institutes, organisations, … which participated, worked, and supported one another in the projects. Through these projects, they established a network among themselves, those not having known much about the others, for relevant activities like these. As a result, when I work on a specific topic in the future, I will know who to contact, and cooperated better.'*
>
> – (D7)

These findings point to strengths and limitations in using this pathway of change for women and ethnic minorities to achieve improved livelihoods. The projects rightly focused their activities and outputs on the achievement of outcomes for the participant farmers, who benefited from improved livelihoods. However, it is unclear whether the organisational capacity required to scale up the delivery of projects using this participatory model would be feasible. Nevertheless, what the evidence suggests is that the approach taken is an effective way of contributing to participant farmers having the means available to sustain the improved livelihoods they have achieved.

Fruit and vegetable markets and value chains in target locations operate more inclusively

Key finding

While there is evidence that women and ethnic minorities who participated in the research projects are **engaging more competitively in value chains**, there is limited evidence that the projects contributed in any enduring or meaningful way to **governments and sector stakeholders making policy decisions** that facilitate female and minority-farmer participation in markets. At best, the projects' efforts to map the value chains and collect information about consumer preferences may have led to government institutions having information to make informed decisions. However, it is unclear how that information was communicated to the institutions or whether there was any ongoing capacity to update market information, which quickly becomes outdated.

There is some evidence that **women and ethnic minorities are engaged more competitively in value chains**. Participants used information produced through the projects about specific markets and market niches (including consumer research and the mapping of existing value chains) to produce appropriately priced, high-quality products and take measures to improve post-production techniques to maintain the quality of their produce. Participants also connected to other value-chain actors, negotiating access and pricing (FR1, FR7, FR8, FR12, VA1, VA2, VA4, D1, D4, D6, D7, R5)

> *'I am very confident that the 059 project helped women farmers that participated in the project, totally engaged in the value chain in terms of understanding what the market wanted, including their local, very basic markets in – let's just call it local markets, so in their little village. And they were able to think strategically about what they could grow and how they could – what they needed to do to post-harvest. After they harvest the vegetables – what they could grow in terms of different types of vegetables and also, varieties of vegetables and what they could do on-farm to make those vegetables better quality. And then, after they harvested the vegetables, techniques they could do to make the vegetables better quality and in more demand for the market. It changed the types of vegetables they produced, the varieties of vegetables they produced and how and where they marketed those vegetables.'*
>
> – (R5)

Participating farmers also began to use the information about market opportunities to modify crop selection and decide which practices to modify to achieve the quality expected by certain market segments. The projects enabled participant farmers (FR2, FR9) and value-chain actors (VA1, VA5) to seek out new channels of distribution when they had limited influence in existing channels (such as supermarkets).

> *'Because the project didn't have much influence on [existing] channels, as they also have their own business plans. With the project, farmers would increase production and product output. When the existing channels were not enough to distribute the increased output, more effective channels were sought out.'*
>
> – (VA5)

> *'After the project, [the collectors and wholesalers] are still buying goods from the farmers. The chain is still growing while they don't need to instruct farmers what to do. Farmers in that area need to sell to them, and all they need to do is to buy and make very high profit.'*
>
> – (D9)

With greater knowledge of the markets, farmers could identify out-of-season crops to produce, which attract higher prices, leading to increased incomes.

> *'Now, we focus on off-season vegetables, making use of the weather well. If the weather is cool, we can grow off-season vegetables all year round. For the main seasons, we only focus on local vegetables. For other vegetables, we just grow them mainly during off season, not in their main seasons.'*
>
> – (D10)

The training provided to participant farmers included business skills and information, which were supported by field trips and visits to retailers. That support enabled smallholders to identify the knowledge they needed to interact with relevant markets and value chains, as well as to establish new connections with value-chain actors and the business skills needed to interact with other value-chain actors. Three farmers (FR7, FR9, FR12) indicated that the information and connections enabled them to think strategically about what they grew and receive higher prices for their produce, or prompted them to change what they produced.

> *'I got trained a lot of times in classes and projects by the department, from [the researcher]. I know that they would organise on-field study trips, visits to supermarkets, where our products were sold. Vegetables were green here, but after transportation, they were not as good as before. From that, we had more experience for better post-harvest handling to avoid moisture loss and physical damage.'*
>
> – (FR9)

Capacity was built through participants gaining new knowledge and experience by undertaking project activities, both on-farm and with value-chain actors. This finding demonstrates the effectiveness of the approach for achieving the intermediate outcome identified in the program logic: that **women and ethnic minority farmers are empowered by the research process**.

Due to the dynamic nature of the markets that these actors are engaged in, participants recognised the need for updated market information about changes taking place across the value chain and about the actors involved and trade access, such as access into the Chinese market for plums (D9, D6). As a result, some value-chain outcomes were short-lived, and participants were required to make substantial changes beyond the life of the projects.

Across the cluster of projects, **substantial knowledge was generated** about consumer behaviours, existing markets and value chains. The knowledge generated contributed to greater engagement in the value chains and the outcomes achieved by some value-chain partners, including farmers. Knowledge generated included:

- trials to identify improvement needs for post-harvest handling and packaging (Umberger et al. 2019:6)
- testing potential approaches to value-chain development (Newman and Chau 2012:1; Umberger et al. 2019:6), including tasting events, product fairs, networking and the development of production timing calendars
- a consumer survey of 2,000 urban households to understand consumer preferences, food expenditure, shopping behaviour and willingness to pay (Umberger et al. 2019:5)
- the mapping and analysis of vegetable value chains (Johnson et al. 2018:46).

Notably, through AGB/2012/059, a range of activities provided new knowledge to enable smallholder farmers to engage more fully in the value chain. This included:

- the development and promotion of marketing models that meet consumer demand and benefit smallholders (particularly women and ethnic minorities); the models were trialled but required scaling and flexibility to capitalise on regional growth (Johnson et al. 2018:8)
- improvements in technology and market access that were demonstrated and extended, with considerable scope for wider uptake (Johnson et al. 2018:11).

Because a significant focus of the projects was on increasing the knowledge available about specific value chains and the markets for the participant farmers' products, **in-country researchers and delivery partners gained experience in market analysis and consumer research.**

> *'As a facilitator, I was involved in many parts of the project and contacted with many people including the marketing component and capacity building … Therefore, I was more into capacity building. About marketing, I did field research, supply-chain actor interviews with sellers, retailers or farmers.'*
>
> – (D7)

Recognising that markets constantly evolve, researchers highlighted the skills farmers had developed, which allowed them to identify opportunities along the value chain and connect with parts of the value chain that they could effectively engage with.

> *'But what is important here is critical skill development. It's not about us linking them with, but it's about them getting the – developing the skills about, you know, knowing about opportunities, doing an economic analysis, doing – kind of enhancing their business skills to be able to connect to whatever part of the value chain works for them.'*
>
> – (R4)

The evidence collected during the evaluation suggests that the projects focused on providing information to smallholder farmers and building the capacity of delivery partners and in-country researchers to support their involvement along the value chains and in the markets. However, it is unclear how the projects intended to contribute to **governments and sector stakeholders making evidence-based policy decisions that facilitate female and minority-farmer participation in markets** and whether they did contribute to that outcome.

Gender, social inclusion and empowerment outcomes

Key finding

The evaluation has found evidence that, by focusing their research activities on women and ethnic minorities in targeted locations, the projects have **contributed to gender and social inclusion outcomes at the micro scale**; that is, at the level of the individual and, possibly, the targeted community. This was achieved by identifying the types of agriculture in which women and ethnic minorities performed significant roles (such as growing indigenous vegetables) and focusing market development research and extension to women and ethnic minorities.

Beyond working with women and ethnic minorities, it is unclear how the projects sought to contribute to gender and social inclusion outcomes. As a result, the evaluation has not been able to determine whether the design of the projects, which involved targeting their research activities at those groups, was an effective way to achieve gender and social inclusion outcomes.

The program logic for this cluster of research projects does not identify specific gender or social inclusion outcomes beyond seeking to **contribute to livelihood outcomes for women and ethnic minorities**. Beyond livelihood outcomes, the stated objectives of the projects did not identify specific gender and social inclusion objectives or outcomes. The project proposal for AGB/2006/112 stated that women farmers 'are the key beneficiaries of the project, with likely livelihood impacts'. There are no references to gender or social inclusion objectives or outcomes in the project proposal for AGB/2008/002. AGB/2012/059 and AGB/2012/060 targeted ethnic minorities in the regions where the projects focused their activities. The overall aim of AGB/2012/059 was 'to enhance the profitability and sustainability of smallholder vegetable farmers in Northwest Vietnam through improved market engagement and integrated resource and disease management practices' (Yi D, n.d.:8). For AGB/2012/060, the overall aim of the project was 'to improve net income and livelihoods of ethnic minority households in NW provinces of Vietnam' (Nicetic et al., n.d.:7).

Although there are examples of individual women who had begun to establish themselves as successful value-chain actors and leaders in their communities when the projects began, the extent to which the projects contributed to their successes is unclear. Overall, researchers (R1, R3, R5, R7) and delivery partners (D6, D7, D8) suggested that the focus of the projects was on understanding and improving market access and sustainable vegetable and fruit production, and that outcomes for gender and social inclusion and empowerment were not actively considered.

> *'The project developed around 2013 did not incorporate gender or minorities. It was not the fashion in 2013. If you want to have a successful project, you should have a very focused target. If you stretch yourself too thin, you achieve nothing. And the problem is that, within the last several years, the strategy of the Australian development agencies has shifted. There's more emphasis on gender and minorities now; they're in fashion. So now the leaders of Asia start putting pressure on the projects: What have you done with gender? What have you done with minorities?'*
>
> – (D7)

As a result, some of the basic barriers to involving women, such as transport limitations, were not addressed by the projects and may have acted as limiting factors when the projects were seeking improved gender and inclusion outcomes.

> *'The project team also tried to encourage the female farmers, but they kept pushing the task to the males because they were afraid of taking risks, for example, riding a motorbike. For the H'mong, the percentage of women who can ride a motorbike is very low. Harvesting plums from the hill and bringing them down is not an easy task. In meetings and seminars, everyone wanted more women to participate, but they are not confident.'*
>
> – (D1)

Likewise, challenges for some ethnic minorities were identified by one researcher (R3) and 4 delivery partners (D1, D4, D7, D9), including language differences and a lack of confidence to engage in trade activities.

> *'The ethnic minority people barely speak the Kinh [Vietnamese] language, which prevents them from communicating with others. The second is their confidence. They are not confident because their language, and their knowledge of communication is not good.'*
>
> – (D1).

It is unclear how the projects sought to research ways to overcome potential barriers to inclusive market development within the projects or to research ways to address language barriers to market engagement more broadly.

Further, the research teams sought to modify their focus on women smallholders, recognising the role that men play as decision-makers in some situations (R1, R3, R7, D6). To achieve value-chain outcomes, the projects modified their approach and began to include the key decision-maker of the household regardless of gender.

> *'But when it came time to expanding the role of vegetables in their overall farming system, it turns out the men of the household are making that decision. And by not including them in how we reach the household more, we kind of got blocked out of that decision … I think we changed how we deliver the Farmer Business School based on that.'*
>
> – (R7)

These projects have demonstrated that valuable livelihood improvements can be achieved for individuals by targeting sectors and the skills and knowledge of producers of particular genders and ethnic minorities. However, truly inclusive market development models at scale will need to account for structural disadvantage and unconscious bias and prejudice. In this case, evidence suggests that livelihood outcomes are best achieved through a considered analysis of household and community power relationships and gender roles as well as production systems to best tailor the development of skills, capacities and networks to the context.

Extent to which outcomes have been enduring

This section considers the contribution of the research projects to the third ultimate outcome identified in the program logic:

- Policy, practice and capacity improvements endure beyond the life of the research projects.

This was expected to be achieved primarily by establishing an evidence base for best practice development models to appropriately target markets and communities, by embedding and institutionalising capacity improvements and practice changes engendered by project activities, and by empowering women and ethnic minority farmers through the research process.

This section discusses the extent to which practices and capacity endured for farmers, and then examines the projects' legacy within research partners and government policy.

Key finding

The evaluation has found substantial evidence that project outcomes for participating women and ethnic minorities have endured, particularly livelihood and capacity outcomes, thereby **demonstrating that they have been empowered by the research process**. There is substantial evidence that the smallholder farmers who participated in the projects have continued to benefit from the projects' outcomes, particularly through using the farm production practices that were introduced and the knowledge about and access to markets and value chains. However, the evaluation has not been able to find **evidence** about the projects' **contribution to changes to policy, practice and capacity improvements at an institutional level**. Likewise, there is limited evidence that the approach taken by the projects and the **best practice development models used to support target markets and communities** have endured within the institutions responsible for ongoing delivery.

The evaluation has found significant evidence that some project outcomes for participant farmers and value-chain actors have endured to this day, suggesting that **women and ethnic minorities have been empowered through the research process**.

Three delivery partners (D2, D6, D7) and two participant farmers (FR2, FR9) identified practices and techniques that the farmers trialled during the projects and that they continue to use. As the projects used an applied and highly targeted approach to improving farm management practices, this appears to have been an effective way for **participating farmers to build their capacity and willingness to learn new techniques and experiment with alternative practices during the projects**.

> *'The lasting impact can be understood in 2 ways. Firstly, the farmers have the knowledge and skills, which they used in their farming. There are different approaches. The project approach was a trial-and-error cycle, in which the farmers experimented in the field, then improved on their techniques, then kept doing/ experimenting and improving, again and again.'*
>
> – (D1)

> *'It was [the lead researcher's] workshop on funnel-shaped pruning because the method encourages high fruit load and promotes larger plums. I still apply it to this day. In the past, too many branches produced small fruit.'*
>
> – (FR2)

Some farmers continue to benefit from diversifying their crops and ensuring a steady income across the year. Those changes have enabled them to engage with markets more effectively.

> *'Before we mostly grew maize. Currently we have planted many crops, from plums, mangoes, to different vegetables, from cabbages, beans … so that we have income in many different months. After receiving money from plums, we get money from cabbages next month … And we reduce the risk of losing all if the price of one crop decreases.'*
>
> – (FR10)

There is also evidence that some **cooperatives and trading organisations established during the projects have continued to operate and have integrated well into value chains**. There were external developments (including transport infrastructure) that coincided with the projects, particularly in Mộc Châu, Sơn La. Those developments have enabled some participants to continue to benefit from improved access to markets (R6, R9).

Many cooperatives have been established since 2000 with the support of the provincial governments, enabling farmers to get certification and negotiate with larger retailers.

> *'It's easier for us to get the certificate such as (VietGap or GlobalGap) if we are a cooperative. Also, it is easier for us to negotiate as a buyer as a cooperative.'*
>
> – (VA4)

> *'In Mộc Châu, people have seized the opportunity of the market demand, that was clearer for everybody, including the local authorities.'*
>
> – (R9)

The evidence above shows that the projects' approaches were successful in delivering enduring benefits to the participant farmers. However, there is insufficient evidence to indicate that the practice changes that were demonstrated through active involvement in the projects were embedded in the in-country institutions. It is also unclear what, if anything, was done to assess the capacity of those institutions to operate in such a participatory way. In fact, one delivery partner (D6) suggested that Vietnamese institutions may be reliant on international research projects to provide the capacity and opportunities to undertake similar projects. Further, this approach also required a substantial cultural change within the Vietnamese institutions, which have operated competitively rather than collaboratively.

> *'I think it's particularly difficult in the Vietnamese context where institutions do specialise, and even funding streams inside of an institution are like – they don't cross over. They don't share staff. It's competitive. The natural tendency is to compete against each other across institutions and even inside your institution, across disciplines. We're fighting that culture through the entire life of the projects.'*
>
> – (R7)

The evaluation did not find evidence of the **projects' contribution to changes in policy, practice and capacity improvements at an institutional level**. Likewise, there is limited evidence that the approach taken by the projects and the best practice development models used to support target markets and communities have endured within the institutions responsible for ongoing delivery. That may be due to the time that has elapsed since the projects' delivery, insufficient time devoted to government and policy engagement (discussed further in KEQ 2) or inadequate understanding and analysis of policy opportunities.

2. How appropriate was the design of the projects?

This KEQ is addressed in 2 ways: 1) discussing the lessons learned from the implementation of the projects' transdisciplinary and participatory approaches; and 2) through an assessment of the assumptions underpinning the projects' design through the pathways of change set out in the program logic.

Lessons learned about the projects' design from their delivery

Key finding

These projects were ambitious in their scope and required a complex range of resources to accommodate the complex and varied needs of the participating female and ethnic minority farmers in farm production and market engagement. That led to **communications and coordination challenges**, meaning that projects required substantial modification to their scope and the renegotiation of time lines to make them manageable. This may have limited the capacity of the project teams to give sufficient **attention to policy and institutional outcomes** that may have led to more enduring outcomes for Vietnamese institutions that had been identified in the projects' designs.

The **scope of these projects was complex and wide-reaching**, encompassing a broad range of farming practices encountered in the regions they targeted and requiring an understanding of and responses to market opportunities for produce from those regions. The breadth of identified activities and the participatory approach to delivery created challenges for project teams and their delivery partners.

> *'I think, in terms of the design, I think what might have been underestimated was the complexity of delivering this kind of all-encompassing program in that we were doing everything from strategic market research down to developing an extension program.'*
>
> – (R7)

To accommodate the scope, which included on-farm practices, post-harvest requirements and market knowledge, several partners were needed to bring in specialist knowledge, ranging from biological sciences and chemistry (soil analysis), agronomy and behavioural sciences to market and social research and communications. As a result, **significant resources and skills were needed to manage the projects** and integrate the contributions of the partners.

> *'And I think what was underestimated was the complexity of bringing all that together and coordinating it. If you look at how much time was spent managing things, or just getting people to talk to each other, that was probably the vast majority of the project work, as project leadership.'*
>
> – (R7)

The necessity to renegotiate time and budget allocations as well as project activities over the course of the projects suggests that ACIAR, the project teams and Vietnamese partners all underestimated the resources needed to navigate projects with this degree of complexity.

Transdisciplinary research success factors

All 4 projects required transdisciplinary collaboration to address the broad scope of the projects. Project reports, reviews and informant interviews all point to the importance of effective leadership, a cohesive and well-integrated team, and mechanisms to coordinate research activities as key enablers of successful transdisciplinary research.

The importance of a **strong team, effective leadership** and a deep commitment to 'go the extra mile' in Australia and Vietnam was identified (Johnson et al. 2018:55).

> *'I think she was the one that built that core team to go there, and kind of built the way of working that kind of spilled over into the second phase of the project. And I think she was really the nexus or the critical point across the vegetable projects in Lào Cai.'*
>
> – (R7)

Beyond strong leadership, project reviewers also recognised the value of a **cohesive project team** with a positive, reflective attitude among the team (Hetherington et al. 2018:37). The teams ensured that Australian partners made critical contributions while being **well integrated with Vietnamese partners** (Hetherington et al. 2018:37), which was frequently facilitated by spending substantial time in Vietnam.

The project teams also introduced several **mechanisms to coordinate research**, including annual workshops and 3-monthly meetings of the leaders of the various research components (Newman and Chau 2012:25).

In managing the complex network of relationships, the teams appear to have been mindful of the **importance of existing relationships** and the need to mitigate the risks to project continuity of failing to transition those relationships carefully, as one researcher reflected.

> *'And I think maybe a risk that was in the design was that when that critical cornerstone leaves, the replacement is not just doing labour or it's not just tasks that a leader does, but you're stepping into a nexus of relationships. And if those relationships aren't easily substituted, it's not like a super robust implementation …'*
>
> –(R7)

Factors that enabled the implementation of transdisciplinary research in this instance included **strong leadership, team integration, continual communication and reflection** and respect for relationships.

Transdisciplinary research challenges

During implementation, the transdisciplinary collaboration sought was not always successful. The challenges appear to have resulted from several factors, including the number of partners involved, the ways in which Vietnamese institutions operated, and the tendency of researchers to focus on their discipline rather than work across disciplines.

One researcher acknowledged the complexity of the projects and the challenges in **managing and integrating the work of different partners** with specialist knowledge and skills.

> *'It's a very ambitious project in my opinion … And then, in order to resource it, they also had this idea of let's get everybody specialised, like this partner is really good at markets, this partner is really good at post-harvest, this partner is really good at this. And then we ended up with seven or eight different partners. And I think that was designed in partnership with ACIAR to do this very comprehensive and also very difficult delivery mechanism of partnerships to execute.*
>
> – (R7)

Likewise, the end-of-program review for AGB/2008/002 pointed to **'an unusually large number of partners and collaborating institutions in Vietnam'**. That was understood to have created challenges for forming a common vision, agreeing on approaches and methodologies, and coordinating project activities (Stur et al. 2013:25). However, the report recognised that the need to coordinate numerous partners was a result of design decisions by ACIAR and the Vietnamese Government when the project was developed.

One end-of-project review also raised concerns that some **researchers maintained a disciplinary focus rather than engaging across disciplines**. As a result, it was sometimes unclear how results from the different reports had fed into other activities. The review stated that the **'technical and social science knowledge and understanding generated by different partners would have gained from being better combined into transdisciplinary research'** (Hetherington et al. 2018:38).

Participatory methodologies

The projects adopted a **highly participatory approach that appears to have benefited the participating farmers and value-chain actors**, who developed the skills and confidence to work things out for themselves.

> *'Part of our project was to develop that outreach mechanism, and we did that through this, what we call the Farmer Field and Business School, which is an experiential learning model where you take people through, basically through preparing the soils, planting, growing, up to marketing and working out the economic analysis. But it also includes, particularly for our [participating farmers] and I think that's a skill that every farmer should have, and many do have, is how to do a small experiment, how to figure things out for yourself.'*
>
> – (R4)

However, the first project (AGB/2006/112) encountered implementation difficulties because the Vietnamese project partners had limited experience and understanding of participatory approaches. Despite the partners holding a strong belief in the benefits of the approach, its implementation posed significant difficulties (Brunton et al. 2009:16).

Accuracy of the assumptions underpinning the design logic

Key finding

The key assumptions underpinning the relationship between the participatory design logic of the projects and the enduring benefits to participating farmers proved to be substantially correct in this context. The assumptions that linked the participatory process and the successful application of development models to **policy (particularly in relation to participation in markets), practice changes and the capacity of in-country institutions** were found to be incorrect or unsubstantiated by the available evidence.

The design of this cluster of projects made a number of assumptions about how outcomes would be achieved. This evaluation examined the validity of those assumptions in this context in order to inform the design of future research for development projects.

Assumptions related to outcomes for farmers

The fundamental design logic of these projects was the assumption that a participatory research process, targeted skills development and improved networks would empower women and ethnic minority farmers to sustain improved on-farm management and engage competitively in value chains.

The ambition of the projects was focused intentionally on supporting the economic empowerment of target groups through increasing profits at the farm level. The Organisation for Economic Co-operation and Development defines economic empowerment as **'the capacity of women and men to participate in, contribute to and benefit from growth processes in ways that recognise the value of their contributions, respect their dignity and make it possible to negotiate a fairer distribution of the benefits of growth'** (OECD 2011). It also notes that this is one of the most fundamental components of achieving equality and empowerment more broadly.

As active research participants, working with the project teams to identify farm production issues and trialling technical solutions, the farmers (including women and ethnic minorities) were able to improve their income and make choices about their livelihoods. The evaluation has found that, as a result of the projects, women and ethnic minorities were able to incorporate new farm production practices and become involved along the value chain, achieving livelihood benefits that endure to this day. This suggests that the major design assumption was correct.

The evaluation also highlights a range of structural barriers and power dynamics that were unaddressed by the projects' design, but consideration of which would have enhanced the projects' ability to support the dignity, distributive and equality components of empowerment more effectively.

Assumptions related to institutionalising approaches

The project design logic assumed that evidence of a model that delivered livelihood outcomes for marginalised farmers, along with the experience of co-delivering that model successfully, would result in the use of the model being institutionalised in research partners' practices and enabling government policy.

The evaluation found that, in this context, those factors alone were **insufficient to influence institutional policy, capacity and practice changes**. Literature suggests that evidence alone is unlikely to inspire institutional policy or practice change, and the projects appear to have responded to that with a design that sought to foster those changes through experiential learning. However, research also indicates that the structures, norms and mores of institutions are also extremely influential in determining the adoption or otherwise of a policy or change agenda. Policy process analysis further points to the need to understand the drivers and opportunities within policymaking processes and to deliberately and strategically engage with coalitions of interests in those processes in order to successfully influence an outcome. In this context, it is possible that institutional structures and norms, as well as the limited available resources to undertake policy engagement, combined to prove this assumption incorrect.

3. What can ACIAR learn from the projects about inclusive market development?

Aspects of the projects that catalysed inclusive market development

Key finding

By working directly with two groups that were excluded from markets to some degree, the projects were able to identify important factors that could assist those groups to engage more effectively in the markets. **Knowledge of the structure of the value chains** and an understanding of how the markets operate, including how consumer preferences could affect those markets, enabled participant farmers to make informed decisions about the crops they produced and how they might approach other value-chain actors. Participants gained experience through practical engagement with other value-chain actors and through responding to real conditions.

The later projects focused more on aspects of leadership and the entrepreneurial drive of successful farmers and value-chain actors, which enabled them to become more commercially business oriented.

Two aspects of the projects appear to have catalysed inclusive market development: 1) the projects focused on identifying the needs of people who were currently excluded from the markets (women and ethnic minorities from specific regions); and 2) the active support they received to engage in the markets, gain greater knowledge of the markets, and directly experience negotiations with other value-chain actors.

The projects provided support to participating farmers and value-chain actors through collecting and communicating information about consumer habits and preferences, existing markets, the quality and pricing for different segments of those markets, and the structure of the existing value chains in which the target groups sought to engage. That information was important for participating farmers to help them make decisions about what they produced and how they would negotiate with other value-chain actors.

> *'But our research probably gave information that maybe led to behaviour change because they had this new market information that they didn't have before and I think it did help them think through when they could ultimately market and where and that there were market opportunities in, for example, and they didn't have to ship everything to Hà Nội. And it identified some of the quality issues but, to be really honest, a lot of those quality issues we knew about from some of the post-harvest work. It was just identifying them.'*
>
> – (R5)

> *'In the fruit tree project, FAVRI [the Fruit and Vegetable Research Institute] participated in collecting marketing information on prices per production costs and from the collectors and supermarkets, then compared them to understand the spread. Then we discussed our findings with the agriculture department and the production side so that they had the information to better negotiate the price between the buy and sell prices and reduce the difference. Before, the farmers did not know how much the fruits sold for in Hà Nội.'*
>
> – (D1)

The information provided to participant farmers enabled them to make production and post-production changes to meet specific market requirements and determine the most effective ways to access those markets. One example of information being used to create a market opportunity was the identification of a potential market for Mộc Châu plums in Hà Nội.

> *'At first, Mộc Châu plums were only known in Mộc Châu and the central provinces, while Hà Nội and Hồ Chí Minh City knew very little about them. Then, in the process of project intervention, the data collected from all markets in Hồ Chí Minh City and Hà Nội indicated that there was a massive demand for their products. Even in the nearby city of Hà Nội, not many people knew about Mộc Châu plums. For this reason, we advised them [that] the market potential was clearly very substantial, and we introduced to them an approach to bring products to the market through the high-quality system of supermarkets and stores, rather than through wholesale markets, to raise the brand value and to obtain premium prices.'*
>
> – (D1)

The information provided also enabled farmers to consider different options to fresh markets if the quality of the products and the challenges of transportation did not lend themselves to providing fresh produce.

> *'... to help the farmers plan better by proposing what crops and varieties are suitable for each locality, and which regions better produce fresh products, and which regions are better for processed products. And so, several processing and manufacturing factories have moved to Sơn La Province. Sơn La is now a centre of interest. In the near future, the highways connecting Hà Nội and Mộc Châu, Sơn La will be constructed, and the connection to the markets will be good.'*
>
> – (D1)

The projects also recognised the need to create connections with other value-chain actors, and delivery partners played an active role in identifying and establishing connections for participants.

> *'The core partners are those in the distribution channels, from retailers to wholesalers, supermarkets, and hypermarkets. We need to connect the farmers to the key actors, so farmers don't have to go through too many intermediaries before reaching the end-consumer.'*
>
> – (D1)

Overall, with the information provided and connections established, the projects enabled participating farmers and value-chain actors to engage with markets. However, it was acknowledged that individual successes along the value chain had as much to do with the drive and innovation of the participants themselves. That realisation led to a shift in thinking in later projects to understand the role of attributes such as leadership and entrepreneurial drive among the successful participants, and to help them see market opportunities, understand the value chain and become more commercially business oriented (R5).

> *'Farmers are very innovative. Many of them become traders and collectors in their villages. And we've seen it in vegetables, in fruits; they trade multiple products. And when they see opportunities, if they can't enter, they'll find another one. So, the plum sector has grown quickly in the last 10 years, expanding in area and volume. So that's largely down to innovation in the sector. Being innovative to lead not only farmers, but collectors and traders also. In the second project, we worked with small [processors] and traders. So, those collectors and traders linked with the Chinese importers and traders. That happened by itself and had nothing to do with the project. In the end, thankfully, there was a shift in thinking in the project, with leadership and mindset. So, it took a broader stance. The project did the right thing as researchers researched and understood what was going on.'*
>
> – (D6)

These findings do not identify factors that catalyse inclusive market development but, rather, how those who were previously excluded needed to become involved in existing markets. The findings demonstrate that those who wish to engage in markets require access to and understanding of information about value chains and markets. They are also likely to benefit from developing skills such as negotiation and relationship building to engage successfully in the markets, However, it is unlikely that the skills and knowledge held by individual farmers or value-chain actors will lead to more inclusive market development without other, more targeted, interventions.

Aspects of the projects that constrained or did not foster inclusive market development

Key finding

While the projects encountered several constraining factors relating to market development, those factors do not appear to be specific to **fostering inclusive market development**. Rather, the issues that arose appear to relate to the development of markets in general and are **not specific to fostering inclusivity**, such as continuity of supply and the importance of focusing on different market segments and having timely access to information about changes occurring in the market due to trade restrictions or consumer preferences.

Two identified issues that may have constrained the access of women and ethnic minorities to markets relate to the practicalities those groups experience, including lack of transport and the languages used in those markets. Those factors were acknowledged but do not appear to have been addressed by the projects.

The teams encountered several constraining factors during the delivery of the projects. Those factors included the prevalence of poor-quality produce that was inappropriate for the target market segments and the capacity to supply the volumes required to build on market opportunities.

'The original idea was that if we could develop a value chain of high-quality food to the supermarkets, so that farmers would get a premium because of the high quality. Modern supply chains would offer a higher price compared to the traditional wet markets. A higher premium would incentivise the farmers to invest more in production to improve food quality. The supply chain definitively grows. One positive impact is that we have developed a brand for Mộc Châu plums within this modern segment, building up the image of Mộc Châu plums.'

– (D4)

Different segments of a market should be considered. A focus on niche or high-value market segments might not be appropriate for the climatic and geographical conditions that participating farmers operate under.

'There was little bit of a hiccup with the choice of location, a mismatch between value chain and location. During that time, for the first few years, they always had this fixed idea of connecting these farmers to the niche premium market selling high-quality plums. However, in Phiêng Luông, the plums could never achieve premium quality because of the geography and climate. They tried their best, but success was limited because during the last 18 months of the project, we said, 'Well, we will have to redirect.' In the end, there was a strong focus on finding a suitable market for the plums, which were more like the immature green plum sent to China.'

– (D6).

When project activities go beyond the investigation of market opportunities, the capacity to supply those market segments becomes important.

'It sounds easy to say; however, until now, the objective has not been achieved due to poor market management. It has not been able to create the market for the food product. During the discussion phase, partners said that they were willing to participate in the value chain. During pilots with small volumes of products, the market seemed okay, but when the supply increased, there was not enough demand.'

– (D1)

One significant exclusion from the projects identified during the evaluation (and that might not have been relevant during the period in which they were delivered) was the lack of attention to online information sources and marketing activities.

'I mean in the past 10 years, trading has been facilitated more through information technology, mobile access, the internet and e-banking. Then I ask my children and grandchildren to take pictures of my beautiful mangoes and send these pictures to them. We will discuss the price and if it is agreed, they will deposit 1–2 million VND [Vietnam dong] and collect them when they can arrange a truck. If there are many collectors and buyers, I will only sell to those who have made a deposit. That is an improvement.'

– (FR7)

Those sources of up-to-date market and consumer information and communications and a developing marketing method identified by farmer participants have since become important tools for value-chain actors.

'In terms of forecasting, it was quite short-term. For example, it did not consider the impact of technology on farmers, or else we would have incorporated it into Component no. 4 [Capacity building], or into Component no. 2 [Market development], taking advantage of social platforms for market access, rather than relying on the traditional distribution channels. It was hard for us to forecast such technology explosion. Therefore, we should have had a component to prepare farmers for digitalisation. That is one of the weaknesses.'

– (D7)

Ultimately, external factors coinciding with the delivery of the projects appeared to have been more successful in Sơn La Province, where factors critical to market development in general (such as transport infrastructure) were developing at the same time, enhancing opportunities for the participant farmers and value-chain actors.

Conclusion

Based on the evidence collected for this evaluation, there is little doubt that the participating farmers have benefited from the projects. The participatory project approaches have ensured that the knowledge and skills trialled during the projects have been taken up and continue to influence the decisions they make, the farm production practices they use and the ways they engage with other value-chain actors.

Despite the participatory involvement of Vietnamese researchers and delivery providers, there is little evidence that their involvement and the projects have contributed to embedding the changes within the institutions to underpin the delivery of future projects, despite their gaining of new knowledge and experiences during the projects' delivery. As a result, there is a question about the capacity of the delivery partners and researchers to ensure that the outcomes from the projects endure and contribute to the ways subsequent projects are delivered by their institutions. Do those institutions have the resources to undertake such a participatory approach? Further, have these projects been able to address the existing culture within the institutions in a way that would enable such an approach without the guiding support and drive of external research partners funded by an organisation such as ACIAR?

In terms of design, this evaluation consistently found both challenges and opportunities posed by the complexity and broad range of disciplines required to address the targeted but simultaneously broad-ranging needs that this project cluster sought to address. Accommodating such complex and ambitious research aims and participant needs may have distracted the project teams from enabling the policy, capacity and practice change lessons to be addressed by the institutions that could benefit from the lessons. However, it is also possible that those lessons have been adopted by project teams and their partner institutions for projects delivered after the research cluster finished its work in Vietnam. This evaluation has demonstrated the value in capturing the evidence that would demonstrate a project's contribution to such outcomes and demonstrating how it has contributed through the pathways of change mapped out in a program logic.

The research cluster's contribution to gender and social inclusion outcomes has been difficult to assess beyond the economic empowerment and livelihood outcomes identified for the participating smallholder farmers. As it stands, those outcomes could apply equally to any participating smallholder farmers and value-chain actors, and the project design and available data make commenting on the contributions to broader dimensions of empowerment and equity challenging. When considering future investments targeted at improving equitable outcomes for marginalised genders and socially excluded groups through market mechanisms, clearer design intention to accommodate those dimensions may be needed.

References

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Genova C (2019) 'The effect of smallholder vegetable production on children's diet quality and nutritional outcomes: evidence from Vietnam', The University of Adelaide, submitted for examination May 2019.

Hetherington S, Chau MN and Biénabe E (2018) *Improving smallholder incomes in the north-western highlands of Vietnam by increasing access and competitiveness in regional temperate and subtropical fruit markets – end of project review report* (AGB/2012/060), University of Queensland, Brisbane (not published).

Johnson G, Sen LTH and Vinh NT (2018) *Towards more profitable and sustainable vegetable production systems in north-western Vietnam – end of project review report* (AGB/2012/059), The University of Adelaide, Adelaide (not published).

Newman S and Chau DTM (2012) *Increasing the safe production, promotion and utilisation of indigenous vegetables by women in Vietnam and Australia – end of project review report* (AGB/2006/112), ACIAR, Canberra (not published).

Newman S and Hien PT (2011) *Increasing the safe production, promotion and utilisation of indigenous vegetables by women in Vietnam and Australia – annual report 2011* (AGB/2006/112), ACIAR, Canberra (not published).

Nicetic O, Wandschneider T and Newman S (no date) I*mproving smallholder incomes in the north-western highlands of Vietnam by increasing access and competitiveness in regional temperate and subtropical fruit markets – project proposal final variation* (AGB/2012/060), ACIAR, Canberra (not published).

Nicetoc O, Tram DT and Nga Le (2021) *Improving smallholder incomes in the north-western highlands of Vietnam by increasing access and competitiveness in regional temperate and subtropical fruit markets – final report* (AGB/2012/060), ACIAR, Canberra (not published)

OECD (Organisation for Economic Co-operation and Development) (2011) *Issues paper on womens' economic empowerment*, retrieved from Women's economic empowerment – OECD, accessed 11 October 2022.

Stur W, Sen LTH and Lienhard P (2013) *Improved market engagement for sustainable upland production systems in the north west highlands of Vietnam – end of project review report* (AGB/2008/002), ACIAR, Canberrra (not published).

Umberger W, Yi D and Dumbrell N (2019) *Towards more profitable and sustainable vegetable production systems in north-western Vietnam – final report* (AGB/2012/059), ACIAR, Canberra (not published).

van de Fliert E and Nicetic O (2018) *Improved market engagement for sustainable upland production systems in the North West Highlands of Vietnam – final report* (AGB/2008/002), ACIAR, Canberra (not published).

Yi D (no date) *Towards more profitable and sustainable vegetable production systems in north-western Vietnam – project proposal variation 3* (AGB/2012/059), ACIAR, Canberra (not published).

Appendices

Appendix 1: Evaluation framework

Key evaluation questions	Sub-questions	Information needs	Data sources
Outcomes			
1. To what extent, and how, did, the projects deliver on science and development outcomes?	a. What science, capacity and livelihood outcomes did the research contribute to?	• Outcomes of project activities such as training activities, information materials produced, and approaches introduced and tested • Any change/s in government-led industry planning, coordination & development • Any ongoing collaboration in participatory research • Examples of value-chain development developed through project activities • Outcomes of Farm Business Schools	• Project reports • Interviews with participating farmers • Interviews with project staff
	b. What gender and social inclusion and empowerment outcomes did the projects contribute to?	• Representation of and participation by female and ethnic minority farmers in project activities • Instances where project activities engaged with and specifically benefited female and ethnic minority farmers	• Project reports • Interviews with project staff • Interviews with participating farmers
	c. To what extent have project outcomes been enduring?	• Reflections on the extent to which the knowledge and practices fostered by the projects has been embedded into country and development partner organisations • Instances of ongoing partnerships and collaboration in research • Any ongoing impacts of gender equity and social inclusion and empowerment outcomes of the projects	• Interviews with project staff, particularly researchers and on-ground delivery partners with insight into longer term country and development partner knowledge and practices • Interviews with participating farmers
	d. Were there any unintended outcomes from the project activities?	• Health, community, and environmental outcomes beyond those aimed for by the projects • Other unintended outcomes (positive and/or negative)	• Project reports • Interviews with project staff • Interviews with participating farmers

Key evaluation questions	Sub-questions	Information needs	Data sources
Design			
2. How appropriate was the design of the projects?	a. To what extent were the assumptions underpinning the design logic accurate?	• Identification of any implicit or explicit assumptions underpinning project design • Extent to which any assumptions turned out to be accurate • Post-implementation stakeholder feedback on project design	• Project reports • 'Review of review' discussion notes • Interviews with project staff
Learning			
3. What can ACIAR learn from the projects about inclusive market development?	a. What aspects of the projects catalysed inclusive market development? b. What aspects, if any, of the projects constrained or did not foster inclusive market development?	• No specific information needs beyond those outlined in preceding sections; the evidence collected to respond to preceding KEQs will be analysed to distil lessons about what enabled or hindered the success of the village-based approaches	• All data sources listed in preceding sections.

Appendix 2: Associated student researchers

AGB/2012/059

Student	Project	Gender
Christian Genova, PhD – The University of Adelaide	Does vegetable production lead to improved diet quality? The case of Lao Cai Vietnam	Male
Pham Thi Hanh Tho, PhD – University of Canberra	Participatory action research for vegetable quality guarantee and smallholder income improvement	Female
Le Thanh Son, PhD – University of Newcastle	Grafting to improve bitter melon productivity and quality in Vietnam and Australia	Male
Nguyen Anh Duc, formerly master, upgraded to PhD in 2016 – The University of Adelaide	Consumption patterns in urban Vietnam	Male
Nguyen Thi Thu Hien, master – Flinders University	Agricultural program interventions in Sa Pa: analysis of gender impact towards improving nutrition practices for women and children	Female
Nguyen Thi Binh, PhD – The University of Queensland	Understanding the role of trace minerals in improving vegetable crop productivity, nutrient use efficiency and food quality	Female
Jesmin Rupa, PhD – The University of Adelaide	Socioeconomic influences on food security, dietary diversity and diet quality in developing countries: evidences from rural Bangladesh and urban Vietnam	Female
Tran Thi Minh Thu, PhD – Vietnam Academy of Agricultural Sciences	Investigating limiting factors of the soil for cabbage production in Lao Cai Province	Female

Appendix 3: Research outputs

AGB/2008/002

	Lead author gender	Lead author nationality
Scientific journals		
Nicetic O, Le HH, Trinh DN, Nguyen HP, Kirchhof G, Pham TS, van de Fliert E, Le QD (2012) 'Impact of erosion prevention methods on yield and economic benefits of maize production in northwest Vietnam'. In: Mulvaney MJ, Reyes MR, Chan-Halbrendt C, Boulakia S, Jumpa K, Sukvibool C and Sombatpanit S (eds), *Conservation agriculture in Southeast Asia and beyond*, special publication no. 7, World Association of Soil and Water Conservation, Beijing, China. ISBN 978-0-615-73926-7.	Male	Australian
Nguyen HN, Nicetic O, Hinthorne L and van de Fliert E (2013). Assessing the contribution of participatory approaches to sustainable impacts of agricultural research for development in the Northwest Highlands of Vietnam. *Development Bulletin*, 75: 89–91.	Male	Vietnamese
Nguyen HN, van de Fliert E and Nicetic O (2015). Towards a holistic framework for impact assessment of agricultural research for development – understanding complexity in remote, culturally diverse regions of Vietnam. *Australasian Agribusiness Review*, 23 12–25.	Male	Vietnamese
Conference papers		
van de Fliert E, Pham TV, Hien DTM and Thomas P (18–22 July 2010) 'Narrowing gaps and building bridges: the role of participatory communication in transdisciplinary research for sustainable development', *IAMCR 2010 Conference*, Braga, Portugal.	Female	Netherlands
Kirchhof G, Nguyen HP, Trinh DN and Nicetic O. (10–15 December 2012) 'Farmer-friendly erosion control measures in maize-based systems of the northern mountainous region of Vietnam', *Proceedings of the 3rd International Conference on Conservation Agriculture in Southeast Asia*, Hanoi, Vietnam, 2012.	Male	Australian
Nguyen HN, Nicetic O, Hinthorne L and van de Fliert E (10–15 December 2012) 'Assessing the contribution of participatory approaches to sustainable impacts of agricultural research for development in the northwest highlands of Vietnam', *Proceedings of the 3rd International Conference on Conservation Agriculture in Southeast Asia*, Hanoi, Vietnam.	Male	Vietnamese
Nicetic O, Lugg A, Pham TS, Le THN, Le HH and van de Fliert E (10–15 December 2012) 'Farmers' perception of soil erosion as a risk to their livelihood – scenario analysis with farmers in the northern mountainous region of Vietnam', *Proceedings of the 3rd International Conference on Conservation Agriculture in Southeast Asia*, Hanoi, Vietnam.	Male	Australian
Pham TS, Le HH, Do SA, Dang VC, Trinh VN, Nicetic O, van de Fliert E and Le QD (10–15 December 2012) 'Adaptive participatory research to develop innovations for sustainable intensification of maize-based farming systems in the northern uplands of Vietnam', *Proceedings of the 3rd International Conference on Conservation Agriculture in Southeast Asia*, Hanoi, Vietnam	Female	Vietnamese
Van de Fliert E, Pham TS, Nicetic O and Le QD (10–15 December 2012), 'Framework, dynamics and challenges of transdisciplinary research for development on sustainable land management in the north-western highlands of Vietnam', *Proceedings of the 3rd International Conference on Conservation Agriculture in Southeast Asia*, Hanoi, Vietnam.	Female	Dutch
Van de Fliert E., Thi Vuong P, Thi Minh Hien D, Thomas P and Nicetic O (4–7 July 2010) 'Out of comfort zones, into realities: research for development with upland ethnic minority communities in North West Vietnam'. In: Darnhofer I and Grötzer M (eds), *Building sustainable rural futures: the added value of systems approaches in times of change and uncertainty*, 9th European IFSA Symposium, Vienna, Austria, 330–342.	Female	Dutch

Appendix 3: Research outputs (*cont.*)

AGB/2006/112

	Lead author gender	Lead author nationality
Scientific journals		
Parks SE and Spohr LJ (2013) 'Sap nitrate in frozen-thawed and refrigerated stems of *Amaranthus tricolor* is indicative of nitrate fertilizer supply', *Journal of Plant Nutrition*, 36(8):1307–1314).	Female	Australian
Parks SE, Irving DE and Milham PJ (2012) 'A critical evaluation of on-farm rapid tests for measuring nitrate in leafy vegetables', *Scientia Horticulturae* 134: 1–6.	Female	Australian
Parks SE, Murray CT, Gale D, Al-Khawaldeh B and Spohr LJ (2012) 'Propagation and production of Gac (*Momordica cochinchinensis* Spreng.), a greenhouse case study', submitted to *Experimental Agriculture*, 30 March 2012..	Female	Australian
Smith M and Newman S (2011) 'Working with the Vietnam Women's Union – why a social-political organisation makes a good research partner', *Extension Farming Systems Journal*, 7(2):123–125.	Female	Australian
Conference papers		
Newman S (21–24 November 2011) 'Indigenous vegetables – for household and food security', *APEC Workshop on Collaboration on the Promotion of Indigenous Vegetables for Coping with Climate Change and Food Security*, Taiwan.	Female	Australian
Parks SE and Murray CM (September 2011) 'The potential of bitter melon and Gac fruits as greenhouse crops in Australia', *Horticulture for the Future Conference*, Lorne, Victoria, Australia.	Female	Australian
Tho PTH, Newman S, Anh DT and Doan VV (13–15 October 2011) 'Developing a customer driven value chain for indigenous vegetables produced by women farmer group in Lao Cai province', *7th Asian Society for Agricultural Economists (ASAE) International Conference*, Hanoi, Vietnam.	Female	Vietnamese
Newman SM, Bo NV, Hien PT and Muller PT (eds) (2009) *Revitalisation Workshop* proceedings.	Female	Australian
Extension publications (Australia)		
Parks SE and Murray CM (2011) *Leafy Asian vegetables and their nutrition in hydroponics*, NSW Government.	Female	Australian
Industry publications and newsletters		
Hien PT (2009) 'Project updates: redesign of the indigenous vegetables project' *ACIAR in Vietnam Newsletter*, December, 7.	Female	Vietnamese
Hien PT (2010a) *ACIAR Indigenous Vegetables Project Newsletter – January 2010*.	Female	Vietnamese
Hien PT (2010b) *ACIAR Indigenous Vegetables Project Newsletter – March 2010.*	Female	Vietnamese
Hien PT (2010c) *ACIAR Indigenous Vegetables Project Newsletter – May 2010.*	Female	Vietnamese
Hien PT (2010d) *ACIAR Indigenous Vegetables Project Newsletter – October 2010.*	Female	Vietnamese
Hien PT (2011a) *ACIAR Indigenous Vegetables Project Newsletter – April 2011*.	Female	Vietnamese
Hien PT (2011b) *ACIAR Indigenous Vegetables Project Newsletter – December 2011*.	Female	Vietnamese
McBride R (2011) 'Preferences and promotion of indigenous vegetables in Lao Cai province', *ACIAR in Vietnam Newsletter*, August, 16–19.	Female	Australian
Newman S (2011) Project update: change in the marketing and production of indigenous vegetables?', *ACIAR in Vietnam Newsletter*, January, 14–15.	Female	Australian

AGB/2006/112

	Lead author gender	Lead author nationality
Parks S (2010) 'Exploring the production of bitter melon in Australia', *Vegetables Australia*, May/June, 36.	Female	Australian
Farmer Business School manuals		
Doan VV and Newman P (2013) *Planning and budgeting*, Vietnam Women's Publishing House, Hanoi.	Male	Vietnamese
Hoi DV, Thieu ND and Muller F (2013) *Cai bap xoe trainer's guide – theory*, Vietnam Women's Publishing House, Hanoi.	Male	Vietnamese
Hoi DV, Thieu ND and Muller F (2013) *Cai meo trainer's guide – theory*, Vietnam Women's Publishing House, Hanoi.	Male	Vietnamese
Hoi DV, Thieu ND and Muller F (2013) *Khoai tang trainer's guide – theory*, Vietnam Women's Publishing House, Hanoi.	Male	Vietnamese
Hoi DV, Thieu ND, Ha NTT and Muller F (2013) *Muop dang trainer's guide – theory*, Vietnam Women's Publishing House, Hanoi.	Male	Vietnamese
Kien CD and Smith M (2013) *Cai meo trainer's guide – practical*, Vietnam Women's Publishing House, Hanoi.	Male	Vietnamese
Kien CD and Smith M (2013) *Khoi tu trainer's guide – practical,* Vietnam Women's Publishing House, Hanoi.	Male	Vietnamese
Kien CD, Smith M (2013) *Cai bap xoe trainer's guide – practical*, Vietnam Women's Publishing House, Hanoi.	Male	Vietnamese
Son LT, Cong DQ and Binh NT (2013) *Khoi tu trainer's guide – theory*, Vietnam Women's Publishing House, Hanoi.	Male	Vietnamese
Tho PTH, McBride, Hien PT, Doan VV, Sau NT, Thoa DTV, Nga PTT and Newman S (2011) *Value chains – why I should work with others?* [DVD set].	Female	Vietnamese
Linh DTN, Thoa DTV, Nga PTT and Hien NTT (2013) *Microfinance*, Vietnam Women's Publishing House, Hanoi.	Female	Vietnamese
Thoa DTV, Nga PTT, Hien NTT, Toan L and Smith M (collected and edited), *Games*, Vietnam Women's Publishing House, Hanoi.	Female	Vietnamese
Toan L and Smith M (2013) *Khoai tang trainer's guide – practical*, Vietnam Women's Publishing House, Hanoi.	Male	Vietnamese
Toan L, Smith M (2013) *Muop dang trainer's guide – practical*, Vietnam Women's Publishing House, Hanoi.	Male	Vietnamese
Toan L, Smith M and Muller F (2012) *Composting trainer's guide – theory*, Vietnam Women's Publishing House, Hanoi.	Male	Vietnamese
Toan L, Smith M and Muller F (2012) *Composting trainer's guide – practical*, Vietnam Women's Publishing House, Hanoi.	Male	Vietnamese

Appendix 3: Research outputs (*cont.*)

AGB/2006/112

	Lead author gender	Lead author nationality
Reports on project outputs		
Fresh Studio Innovations Asia (2009) *Market assessment for indigenous vegetables*.		Dutch and Vietnamese
Parks S, Smith M and Murray C (2010) *Darwin field trip to investigate Asian vegetable production and markets*.	Female	Australian
Thai BT, Binh NQ, Nham LT and Hung NQ (2009) *A market study: establishing economic benchmarks and the market potential of selected indigenous vegetables in Xuan Dai, Xuan Son and Minh Dai communes*.	Female	Vietnamese
Value chain appraisal: *Khoai tang, Muop dang and Bo Khai, Phu Tho and Cai meo, Bap cai xoe and Khoi tu, Lao Cai* (English and Vietnamese).	Male	Vietnamese
Dam TTV and Dao HT. (2010) *The Vietnam Women's Union – case studies of encouraging practice change.*	Female	Vietnamese

AGB/2012/059

	Lead author gender	Lead author nationality
Journal articles		
Bui LB, Le HMT, Bui AH, Do PD and Milham P (2016) 'Preparation of a soil reference sample', *Journal of Vietnam Agricultural Science and Technology*, 1(2):130–134.	Female	Vietnamese
Nguyen HN, Nguyen TTH, Nguyen TDN, Pham VH, Pham KM, Ninh XT and Yi D (2018) 'Improved vegetable farming systems and marketing for small-scale producers in Bac Ha District, Lao Cai Province', *Vietnam Journal of Agricultural Sciences*, 16(9):847–858.	Female	Vietnamese
Bich LB, My HTP, Dinh RP, Minh TP, Trong TD, Harper S, Wuhrer R, Huang Q, George L, Holford P, Zhao CC, Mitchell C and Milham P (2019) 'Trace metal contamination during grinding of plant samples', *Communications in Soil Science and Plant Analysis*, 50(1):102–107.	Female	Vietnamese
Rupa J, Umberger WJ and Zeng D (2019) 'Does food market modernisation lead to improved dietary diversity and diet quality for urban Vietnamese households?', *Australian Journal of Agricultural and Resource Economics*, 59:1–22. Available via open access: https://onlinelibrary.wiley.com/doi/full/10.1111/1467-8489.12308.	Female	Bangladeshi
Rupa J, Umberger WJ and Zeng D (2020) 'Understanding food westernisation and other contemporary drivers of adult, adolescent and child nutrition quality in urban Vietnam', *Public Health Nutrition*, 23(14):2571–2583.	Female	Australian
Nguyen-Anh D, Umberger WJ and Zeng D (2020) 'Understanding Vietnamese urban consumers' nutrition label use, health concerns, and consumption of food and beverages with added sugars', *Nutrients*, 12(11):3335, https://doi.org/10.3390/nu12113335.	Male	Vietnamese
Genova C, Umberger W, Newman S and Peralta A (2022) 'Understanding food choice factors of rural households from northwest Vietnam', *Journal of Agribusiness in Developing and Emerging Economies*, in press, doi:10.1108/JADEE-12-2021-0320.	Male	Philippine
Genova C, Umberger W, Peralta A, Newman S and Zeng D (2022) 'The indirect impact of smallholder vegetable production on children's nutrition outcomes in rural Vietnam', *Frontiers in Sustainable Food Systems*, 6, https://doi.org/10.3389/fsufs.2022.900625.	Male	Philippine
Papers (contributed and refereed) presented at academic and professional meetings		
Newman S (17–22 August 2014) 'Maximising the market potential of indigenous vegetables', Indigenous Vegetable Symposium, *International Horticultural Congress*, Brisbane, Australia.	Female	Australian
Genova C, Umberger WJ, Newman S and Peralta A (7–10 December 2016) 'Understanding the relationship between a household's food choices, the Household Food Insecurity Access Scale (HFIAS), and the body mass index (BMI) in rural Vietnam', *AgriFood Research Network Conference*, Adelaide, Australia.	Male	Philippine
Nguyen AD and Yi D (7–10 December 2016), 'Price differences and spatial market integration: a study of vegetable markets in Hanoi', *AgriFood Research Network Conference*, Adelaide, Australia.	Male	Vietnamese
Genova C, Umberger WJ, Newman S and Peralta A (7–10 February 2017) 'Linking smallholder vegetable production to household diet quality: evidence from rural Vietnam', *Australian Agriculture and Resource Economics Society 61st Annual Conference*, Brisbane, Australia.	Male	Philippine

Appendix 3: Research outputs (*cont.*)

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	Lead author gender	Lead author nationality
Genova C, Umberger WJ, Newman S and Peralta A (31 July –1 August 2017) 'To market, to market: does smallholder vegetable production lead to increased children's dietary diversity and improved diet quality? Empirical evidence from northwest Vietnam' *Agricultural & Applied Economics Association Meeting*, Chicago, United States.	Male	Philippine
Zeng D, Umberger WJ and Rupa JA (31 July –1 August 2017) 'Implications of supermarket revolution on weight outcomes of Vietnamese urban consumers', *Agricultural & Applied Economics Association Meeting*, Chicago, United States.	Male	Chinese
Genova C, Umberger WJ, Newman S and Peralta A (22–24 November 2017) 'To market, to market: does smallholder vegetable production lead to increased children dietary diversity? Empirical evidence from north west Vietnam'. *Australian Centre for International Agricultural Research North-West Vietnam Research Symposium*, Hanoi, Vietnam.	Male	Philippine
Genova C, Umberger WJ, Newman S, Peralta A and Zeng D (22–24 November 2017) 'Do farmers reap what they sow? Impact of smallholder vegetable production on child nutrition in rural Vietnam', *Australian Centre for International Agricultural Research North-West Vietnam Research Symposium*, Hanoi, Vietnam.	Male	Philippine
Umberger WJ, Dumbrell NP, Nguyen AD and Zeng D (22–24 November 2017) 'Consumer preferences and consumption patterns for fruit & vegetables in urban Vietnam', *Australian Centre for International Agricultural Research North-West Vietnam Research Symposium*, Hanoi, Vietnam.	Female	Australian
Dumbrell NP, Umberger WJ, Zeng D, Nguyen AD and Pagliuca L (22–24 November 2017) 'The role of market research in agricultural development for northwest Vietnam: the case of fruit and vegetables', *Australian Centre for International Agricultural Research North-West Vietnam Research Symposium*, Hanoi, Vietnam.	Female	Australian
Nguyen AD, Umberger WJ, Zeng D and Dumbrell NP (22–24 November 2017) 'Concerns and valuation of food quality and food safety in urban Vietnam', *Australian Centre for International Agricultural Research North-West Vietnam Research Symposium*, Hanoi, Vietnam.	Male	Vietnamese
Tran N, Truong T and Yi D (22–24 November 2017) 'Interprovincial trade opportunities for indigenous and conventional vegetables Lao Cai', *Australian Centre for International Agricultural Research North-West Vietnam Research Symposium*, Hanoi, Vietnam.	Male	Vietnamese
Yi D, Nguyen NH and Nguyen HTT (22–24 November 2017) 'Smallholder participation in vegetable value chains in Lao Cai Province', *Australian Centre for International Agricultural Research North-West Vietnam Research Symposium*, Hanoi, Vietnam.	Male	United States
Bui LB, Do P, Pham RD, Pham MT, Le HMT, Bui HA, Mai HT, Phung HMT, Tran TM, Phan HT and Milham P (22–24 November 2017) 'Nutrient sufficiency and management: benefits of high quality laboratory analysis', *Australian Centre for International Agricultural Research North-West Vietnam Research Symposium*, Hanoi, Vietnam.	Female	Vietnamese
Chu M, Tesoriero L, Phan HT, Dang H and Hoang L (22–24 November 2017) 'Managing clubroot disease of cabbage in Sa Pa', *Australian Centre for International Agricultural Research North-West Vietnam Research Symposium*, Hanoi, Vietnam.	Female	Vietnamese

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	Lead author gender	Lead author nationality
Do TT, Tran TMT, Bui HA, Nguyen TT, Tran TM, Luong DV, Nguyen BT and Harper S (22–24 November 2017) 'Vegetable responses to fertilizer in Lao Cai Province', *Australian Centre for International Agricultural Research North-West Vietnam Research Symposium*, Hanoi, Vietnam.	Male	Vietnamese
Nguyen BT, Tran TMT, Bui AH, Tran TM, Phung HMT, Luong DV and Harper S (22–24 November 2017) 'Nutrient status of vegetable crops in Lao Cai Province', *Australian Centre for International Agricultural Research North-West Vietnam Research Symposium*, Hanoi, Vietnam.	Female	Vietnamese
Nguyen AD and Yi D (6–9 February 2018) 'Price differences and market integration: a study of vegetable markets in Hanoi, Vietnam', *Australasian Agricultural and Resource Economics Society 62nd Annual Conference*, Adelaide, Australia.	Male	Vietnamese
Pagliuca L, Dumbrell NP, Umberger WJ and Zeng D (6–9 February 2018) 'Drivers of changing meat expenditure and consumption patterns in urban Vietnam', *Australasian Agricultural and Resource Economics Society 62nd Annual Conference*, Adelaide, Australia.	Female	Chilean

Appendix 3: Research outputs (*cont.*)

AGB/2012/059

	Lead author gender	Lead author nationality
Genova C, Umberger WJ, Newman S and Peralta A (6–9 February 2018) 'The impact of smallholder vegetable production on child nutrition in rural Vietnam', *Australasian Agricultural and Resource Economics Society 62nd Annual Conference*, Adelaide, Australia.	Male	Philippine
Rupa J, Umberger WJ and Zeng D (6–9 February 2018) 'Food market modernization, dietary diversity and diet quality: evidence from urban Vietnam', *Australasian Agricultural and Resource Economics Society 62nd Annual Conference*, Adelaide, Australia.	Female	Bangladeshi
Rupa J, Umberger WJ and Zeng D (28 July – 2 August 2018) 'Does food market modernisation lead to improved diet quality for urban Vietnamese households?', *30th International Conference of Agricultural Economists*, Vancouver, Canada.	Female	Bangladeshi
Peralta A, Umberger WJ and Genova C (5–7 August 2018) 'Spousal agreement and women's participation in decision making in rural Vietnam', *Agricultural & Applied Economics Association Meeting*, Washington DC, United States.	Female	Colombian
Bui LB, Phung HTM, Pham RD, Pham MT, Do TT, Harper S, Holford P and Milham P (18–23 November 2018) 'Trace metal contamination during grinding of plant samples', *Joint Conference of Soil Science Australia and the Australasian Soil and Plant Analysis Council*, Canberra, Australia.	Female	Vietnamese
Bui LB, Phung HTM, Pham RD, Pham MT, Do TT, Harper S, Wuhrer R, Holford P, Huang E, George L, Zhao CC, Mitchell C and Milham P (2019). 'Trace metal contamination during grinding of plant samples', *Communications in Soil Science and Plant Analysis*, 50:102–107.	Female	Vietnamese
Theses		
Nguyen AD (2016) *Price differences and market integration: a study of vegetable markets in Hanoi* [unpublished master's thesis], The University of Adelaide, Adelaide, Australia.	Male	Vietnamese
Phan CC (2017) *Off-season vegetable production development in Sa Pa commune, Sa Pa District, Lao Cai Province* [unpublished undergraduate thesis], Vietnam National University of Agriculture, Hanoi, Vietnam.	Female	Vietnamese
Le TS (2018) *Grafting to improve bitter melon* (Momodica charantia *L.*) *productivity and fruit quality* [submitted for examination], University of Newcastle, Newcastle, Australia.	Male	Vietnamese
Rupa J (2019) *Analysing drivers of food security, dietary diversity and diet quality in transition economies: evidences from rural Bangladesh and urban Vietnam* [unpublished PhD thesis], The University of Adelaide, Adelaide, Australia.	Female	Bangladeshi
Genova (2019) *The effect of smallholder vegetable production on children's diet quality and nutritional outcomes: evidence from Vietnam* [submitted for examination], The University of Adelaide, Adelaide, Australia.	Male	Philippine

Project outputs	Lead author gender	Lead author nationality
Component 1 – Market analysis		
Tran NTT, Truong TTT, Nguyen ATT, Pham LD, Nguyen TC, Nguyen HL, Le TN, Tran LV and Yi D (2017) *Interprovincial trade opportunities for vegetables in NW Vietnam* [unpublished project report], Hanoi, Vietnam.	Male	Vietnamese
Tran NTT, Truong TTT, Nguyen ATT, Pham LD, Nguyen TC, Nguyen HL, Le TN, Tran LV and Yi D (2016) *Vegetable markets and trading systems in Hanoi, Vietnam* [unpublished project report], Hanoi, Vietnam.	Male	Vietnamese
Nguyen AD, Yi D, Pham HV, Nguyen NDT, Ninh TX and Tran LV (2018) *Price differences and market integration: a study of vegetable markets in Hanoi* [unpublished project report], Vietnam National University of Agriculture, Hanoi, Vietnam.	Male	Vietnamese
Dumbrell NP, Umberger WJ, Pagliuca L, Nguyen AD and Zeng D (2018) *The Vietnam Urban Food Consumption & Expenditure Study Factsheet Series*, The Centre for Global Food and Resources, The University of Adelaide, Adelaide, Australia. Available online at: https://www.adelaide.edu.au/global-food/research/internationaldevelopment/vietnam-consumer-survey/.	Female	Australian
Component 2 – Market development		
Nguyen NH, Nguyen HTY and Yi D (2018) *Marketing and farmer group case studies in northwest Vietnam* [unpublished project report], Vietnam National University of Agriculture, Hanoi, Vietnam.	Female	Vietnamese
Nguyen VH and Underhill S (2018) *Towards more profitable and sustainable vegetable farming systems in north-western Vietnam: postharvest report* [unpublished project report], Fruit and Vegetable Research Institute, Hanoi, Vietnam.	Male	Vietnamese
Other outputs produced by projects to create awareness of the relationship between seasonality of supply and market prices: • Production/price calendar for Bac Ha farmers selling to Hanoi • Production/price calendar for Sa Pa farmers selling to Hanoi.	Female and male	Vietnamese
Component 3 – Farming systems		
Soils and Fertilizer Research Institute (SFRI) and National Institute of Medicinal Materials (NIMM) (2014) *Baseline report: Farming systems in northwest Vietnam* [unpublished project report], SFRI and NIMM, Hanoi, Vietnam.	Female and male	Vietnamese
Vietnam National University of Agriculture (VNUA) (2014) *Baseline report:* Socio-economic *characteristics and vegetable production systems of farm households in Sa Pa and Bac Ha districts, Lao Cai Province, Vietnam* [unpublished project report], VNUA, Hanoi, Vietnam.	Female and male	Vietnamese
Chu MT, Phan HT, Hoang LTD, Dang HT and Tesoriero L (2014) *Farming system baseline report: Pests and diseases* [unpublished project report], NIMM, Hanoi, Vietnam.	Female	Vietnamese
Phan HT, Daniel R, Chu MT, Hoang LTD, Dang HT and Tesoriero L (2018) *Towards more profitable and sustainable vegetable farming systems in Northwest Vietnam: Plant pathology research report* [unpublished project report], NIMM, Hanoi, Vietnam.	Female	Vietnamese
SFRI and NIMM (2018) *Report on farming system sub-component VNUA (2017): Farming system transition in Lao Cai Province, Vietnam* [unpublished project report], Vietnam National University of Agriculture, Hanoi, Vietnam.	Female and male	Vietnamese

Appendix 3: Research outputs (*cont.*)

Project outputs	Lead author gender	Lead author nationality
Component 4 – Outreach and capacity building		
Pham HMT (2016) *Farmer business school in Southeast Asia and its modification and adaptation to Vietnam* [unpublished project report], CIAT–Asia, Hanoi, Vietnam.	Female	Vietnamese
Pham HMT (2018) *Sustaining and scaling Farmer Business School (FBS)* [unpublished project report], CIAT–Asia, Hanoi, Vietnam.	Female	Vietnamese
Pham HMT and Le HTT (2019) *Farmer Business School – Learning manual for business skills – Facilitator's manual (Vietnamese)*, ISBN 978-604-56-6567-1, Women's Publishing House, Hanoi, Vietnam.	Female	Vietnamese
Pham HMT and Le HTT (2019) *Farmer Business School – Learning manual for business skills – Facilitator's manual (English)*, online report.	Female	Vietnamese
Le QA, Do TT and Bich LB, (2018) *Laboratory capacity building, Soils and Fertilizers Research Institute, Hanoi* [unpublished project report], Soils and Fertilizers Research Institute, Hanoi, Vietnam.	Female	Vietnamese

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	Lead author gender	Lead author nationality
Peer-reviewed extended abstracts		
Nicetic O, Wandschneider T, Nga LTH and Anh LQ, 'Trends, patterns and implications of the cross-border plum export trade from Vietnam to China'.	Male	Australian
Nhuan NH, van de Fliert E and Nicetic O, 'The role of collaborative learning in the adoption of soil erosion management strategies in maize production and improvement of smallholder livelihoods'.	Male	Vietnamese
Sen PT, Nicetic O and Rogers G, 'Horticultural crops as drivers of profitable smallholder farming'.	Female	Vietnamese
Phượng ND, Lâm VH, Quyến LN, Chung NV, Nga LTH, Cung HT, Sen LTH, Hải NN, Ch NV, Sến PT and Nicetic O, 'Main barriers to adoption of technical innovations for temperate fruit production by smallholder farmers'.	Male	Vietnamese
Hung PV, Wandschneider T, Nga NTD, Huyen NTT, Trung NX, Long TV, My PK and Nicetic O, 'Market prospects for Vietnamese pear and implications for government intervention'.	Male	Vietnamese
Wandschneider T, Nga NTD, Hung PV, Huyen NTT, Trung NX, Long TV, My PK and Nicetic O, 'Supply seasonality and competitive advantage: the case of plums in Vietnam'.	Male	Portuguese


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