



Australian Government

**Australian Centre for
International Agricultural Research**

Final report

<i>project</i>	Improving livelihoods in Myanmar and Vietnam through vegetable value-chains
<i>project number</i>	AGB/2014/035
<i>date published</i>	5 th October 2022
<i>prepared by</i>	Gordon Rogers
<i>co-authors/ contributors/ collaborators</i>	Liam Southam Rogers, Nguyen Thi Hung, Rene van Rensen, Luyen Cao Hong, Vu Thanh, Ha Thi Lan Anh, Oleg Nicetic, Liam Southam-Rogers, Rodd Dyer, Nga Le, Isabel Vagneron, Estelle Bienabe, Bùi Văn Tùng, Bùi Thị Hằng, Pham Thi Sen, Shoon Lae, Floortje Jacobs
<i>approved by</i>	Mr Howard Hall
<i>final report number</i>	FR2022-022
<i>ISBN</i>	978-1-922787-42-2
<i>published by</i>	ACIAR GPO Box 1571 Canberra ACT 2601 Australia

This publication is published by ACIAR ABN 34 864 955 427. Care is taken to ensure the accuracy of the information contained in this publication. However, ACIAR cannot accept responsibility for the accuracy or completeness of the information or opinions contained in the publication. You should make your own enquiries before making decisions concerning your interests.

© Australian Centre for International Agricultural Research (ACIAR) 2022 - This work is copyright. Apart from any use as permitted under the Copyright Act 1968, no part may be reproduced by any process without prior written permission from ACIAR, GPO Box 1571, Canberra ACT 2601, Australia, aciar@aciar.gov.au.

Contents

1	Acknowledgments	4
2	Executive summary	5
2.1	Background and Project Objectives.....	5
2.2	Main research findings	5
	Vietnam	5
2.3	Achievements and Impact.....	6
2.4	Reflections	7
2.5	Conclusions.....	9
2.6	Recommendations	10
2.7	What remains to be done	10
3	Background.....	12
3.1	Rationale for the project.....	12
4	Objectives and research questions	16
5	Methodology	18
5.1	Overview of the research strategy	18
5.2	Where was the research undertaken?	19
5.3	Who was involved – project partners and collaborators?	19
5.4	Major research activities	20
6	Achievements against activities and outputs/milestones	26
7	Key results and discussion	27
7.1	GAP in Vietnam and Myanmar: Was it the right approach?	27
7.2	A new vegetable industry in Vietnam.....	30
7.3	Farmers' perspective: What did they value?.....	31
7.4	Retailers' perspective: What did they like and where to improve	31
7.5	Women, girls and ethnic minorities	31
7.6	Building capacity	32
7.7	Reflections on project development and implementation	33
7.8	Spill over effects and supporting projects	34
7.9	Summary response to Mid-term Review.....	35
7.10	COVID-19 impacts	36
7.11	Where to from here?	36
8	Impacts	37
8.1	Scientific impacts – now and in five years	37

8.2	Capacity impacts – now and in five years.....	37
8.3	Community impacts – now and in five years	39
8.4	Communication and dissemination activities	43
9.	Conclusions and recommendations	45
9.1	Conclusions.....	45
9.5	Recommendations	47
9	References	50
10.1	References cited in report	50
9.2	List of publications produced by project.....	50
10	Appendixes	51
11.1	Appendix 1 (a) and 1(b): MTR review report and response.....	51

1 Acknowledgments

We acknowledge with gratitude the assistance, support and contributions of many people in Australia, Vietnam and Myanmar, including colleagues in academia, government officials, industry personnel, farmers, market agents and traders, who helped us to successfully complete this research project.

We especially thank Dr Quoc Le Doanh, vice minister for Agriculture, Dr Pham Thi Sen and Dr Quynh from NOMAFSI for ongoing high-level support in Vietnam and Dr Hla Hla Myint from DOA and Dr Khin Thida Myint from Yezin Agricultural University for similar support in Myanmar.

We thank all the project staff, and especially the co-authors of this report, and the ACIAR research program managers Dr Rodd Dyer and Howard Hall and their highly efficient ACIAR support staff.

We would also like to thank the project reviewers for both the Mid Term Review and the End of Project Review for their valuable insights and suggestions.

2 Executive summary

2.1 Background and Project Objectives

In Vietnam, the project idea originated from a AusAID-funded and CARD-funded project in Vietnam which was aimed at creating new markets for vegetables in the Vinh area of central Vietnam. In our dealings with the supermarket in Hanoi, the possibility of developing certified vegetables for the supermarket sector in Hanoi supplied from the Moc Chau region was suggested.

The first project (AGB/2009/053) focused on supporting and piloting farmer groups to supply certified safe vegetables to retailers in Hanoi and this project (AGB/2014/035) was focused in Vietnam on scaling. The other component of this project in Myanmar had similar aims to the previous project in Vietnam.

The overall objective for Vietnam was to understand how the VietGAP certified vegetable model developed in project AGB/2009/053 could be scaled, and for Myanmar to test the idea of using MyanmarGAP to improve vegetables safety and improve farmer livelihoods.

2.2 Main research findings

Vietnam

In Vietnam, we think the approach has worked and will continue to expand in the Son La province. Farmers were receiving a 30-40% price premium for vegetable sold to supermarkets, which require VietGAP compared to the wholesale markets and there is significant unmet demand for certified produce, well packaged and supplied in good condition.

While the size of the total market for VietGAP certified vegetables in modern retail is still relatively small, it is growing rapidly. In Vietnam in 2022 about 10% of total grocery sales are from modern retail and growing rapidly¹ – vegetables will likely follow groceries.

For farmers involved directly in the ACIAR projects the benefits have been significant. The 10 project villages in 2021 (176 farmers) were producing 3,300 tonnes of VietGAP vegetables per year compared to 31 tonnes in 2011. The average household income rose 15-fold from 11 million VND to 176 million VND per year (AU\$10,000). This increase in net income was due to a 5-fold increase in average yields, a 30-40% price premium for VietGAP certified produce and more vegetable production instead of rice or maize.

The end of project impact study estimated the total tonnage from Moc Chau to modern retail at 7,000 tonnes per year, so that means only half of the VietGAP certified vegetables were coming from the project villages, another 3,700 tonnes per year were coming from real growth outside the project.

From a regional perspective, there is a new vegetable industry with 8,000 - 10,000 farmers producing 70,000 tonnes of vegetables annually valued at about AU\$30.5 million net farm income, which did not exist when the project started.

Average farm incomes in Moc Chau have increased 5-fold from 11 million VND to 56 million VND per year (AU\$3,400), mainly due to a 30-40% price premium for VietGAP, doubling of average yields and growing vegetables instead of rice or maize.

¹ Sakata, Shozo ed. 2022. Development of Inclusive Food Value Chain in the Mekong Region. BRC Research Report. Bangkok Research Center. JETRO Bangkok / IDEJETRO.) [Link](#)

Myanmar

In Myanmar, two pilot value chains were set up to test the idea that supplying GAP certified vegetables to speciality markets in Myanmar can improve farm incomes and provide consumers with high-quality safe-to-eat vegetables, were:

1. **Nyaungshwe** (Taung Poet Gyi, Za Yat Gyi) to **Yangon** – supplying peppers and tomatoes
2. **Pindaya** (Pway Hla, Set Kyar Goan) to **Yangon** – supplying tomatoes

While the pilots only supplied a small volume (about 30 tonnes) before COVID-19 and the coup effectively stopped supply, the benefits to farmers were strong and clear, with price premiums to farmers normally in the range 40-150% higher than the wholesale market.

Seventy percent (70%) of the farmers thought the project helped them increase their income, while 30% thought the contrary. Among the farmers who thought that the project helped them increase their income: 30% attributed this to lower production costs, 16% to higher yields and 14% to higher prices for their products. The average increase in income estimated by the farmers was 20%.

2.3 Achievements and Impact

Vietnam

In Vietnam by the end of the project, there was a new 70,000 tonne vegetable industry where 10,000 farmers produced 70,000 tonnes of vegetable per year, generating AU\$30.5 million of new net farm income which did not exist in 2011 when the preceding project (AGB/2009/153) started. Average farm incomes in Moc Chau increased 5-fold from 11 million VND to 56 million VND per year (AU\$3,400), mainly due to a 30-40% price premium for those following VietGAP, a doubling of average yields and growing vegetables instead of rice or maize.

In 2021, the ten project farmer groups (176 farmers) were producing 3,300 tonnes of VietGAP vegetables per year compared to 31 tonnes in 2011. The average household income has risen 15-fold from 11 million VND to 176 million VND per year (AU\$10,000).

By project end there were many new vegetable value chains operating in Moc Chau including the direct supply of VietGAP-certified vegetable from Moc Chau to retailers in Hanoi, including AEON, Big C, VinMart, Mega Market, Big Green and Bactom. We estimate 10% or 7,000 tonnes per year of the Moc Chau produce was being sold through this direct value chain, which included direct communication between farmers and retailers. There are many more local traders in Moc Chau and Van Ho – at least 89 as well as specialised safe vegetable wholesalers, processors and distributors

The new vegetable industry is a significant employer of women and ethnic minority groups. In 2021 in Moc Chau and Van Ho, 55% of the farmers were women fully engaged in running businesses, planning, decision making and marketing. There are also many Hmong, Muong and Dao farmers engaged in this new industry, especially in the Van Ho district. According to Van Ho Peoples' Representative Committee, the rate of poor households fell from 20-30% to 7% with vegetable production being a major contributor.

International support has increased, with international agribusiness firms and development support organisations, including Gautier Semences, Agrico, Semillas FITO, Rijk Zwaan, LimGroup, BVB Substrates, Royal Brinkman and Fresh Studio. These firms, and others are now supplying seed, growing media, greenhouses, and expertise to Moc Chau and Van Ho farmers.

Project staff, farmers, district staff and agriculture staff have been trained in VietGAP-compliant techniques and the latest agronomic and crop protection techniques, supported

by new best practice guides and information. Three project staff have undertaken postgraduate study in Australia.

Myanmar

In Myanmar two new value chains were operating out of four project villages supplying Myanmar GAP certified vegetables to retail outlets in Yangon.

1. **Nyaungshwe** (Taung Poet Gyi, Za Yat Gyi) to Yangon – supplying peppers and tomatoes
2. **Pindaya** (Pway Hla, Set Kyar Goan) to Yangon – supplying tomatoes

Farmers groups from the Nyaungshwe and Pindaya districts were supplying the supermarket chain City Mart with tomatoes and peppers via collection points in Heho using cool storage and refrigerated transport to Yangon. Seventy percent (70%) of project farmers reported an increase in income from the project.

Four villages achieved Myanmar GAP certification, opening access to premium markets via distributors and retailers serving Yangon. The training program in agronomy and Myanmar GAP directly improved the practical farming skills of 123 farmers. The YAU staff and students involved in the field trials have improved their skills in establishing and running trials on farmers' properties.

Farmers reported that their health and safety was significantly improved by the agronomics and GAP training, and this was the most significant outcome from the project.

Farmers were able to identify when and why chemicals needed to be used, allowing them to use much less product, improving their safety and the safety of the vegetables they sell. A video was produced showing human health benefits of GAP to farmers and consumers and will be available on the [AHR website](#).

2.4 Reflections

The following section is a distillation of the key messages that came out of the project, and suggested implications for ACIAR, partner counties and project leaders.

2.4.1 What did the farmers value most from the project?

The training and technical support was highly valued by farmers in both Vietnam and Myanmar in all the feedback. Access to new markets for farmer groups was valued, especially when those markets paid a premium price. The farmer groups themselves were also valued. Pest management advice by project and extension staff who had specialist knowledge on pest management (identification, control methods) was valuable.

Farmers everywhere are in business to make money – it is why they do what they do. Project leaders should understand this key motivation, as it pervades everything and drives adoption.

2.4.2 What did retailers value?

The retailers want consistent good quality product, with orders supplied in full. They want attractive, appropriate packaging with labelling that gives basic information about the crop (harvest date, location). QR codes are good. Point of sale materials with stories about the farmers and the region are also valued.

2.4.3 Did women, girls or ethnic minority groups benefit?

In overview, the vegetable sector development has help to empowered women. In Myanmar, 80% of women surveyed said involvement in the project helped them to participate in decision-making. In Vietnam where 55% of the farmers were women, they were engaged in running businesses, planning, decision making and marketing. Ethnic

Kinh and Thai women were more likely to take on a decision-making roles, and H'mong women were taking on leadership and decision-making roles, which are traditionally male roles in H'mong culture.

There is evidence ACIAR project activities have directly contributed to women's empowerment and changing roles, especially for Hmong women, who have improved their knowledge and techniques and become more confident to exchange their experiences.

2.4.4 Building capacity

Building the capacity of farmers, research staff, extension staff and other support staff is a major benefit of ACIAR projects in developing countries. The training provided by project staff country and in Australia was highly regarded by farmers, project and extension staff and made a significant contribution in building capacity in both Myanmar and Vietnam.

2.4.5 Project development and design

This section contains some thoughts and experiences of the project leadership relating to project design and implementation that may be useful in the design and implementation of future projects.

Project design: Project designs which are very prescriptive, with project activities fully described at the start, lock the project team onto a path that becomes difficult to change. A far better model would be to have a staged approach to design, with a focus on the theory of change approach with the ability to vary activities during the project to improve delivery of outcomes as projected in the Theory of Change.

First, define what you are actually expecting to happen as a result of the project. In year one, commission foundational and information gathering activities, and then once these results are in, understand what these studies have found and then plan the remaining project activities. Trust the project partners to revise the design as the project develops.

Project reviews: mid-term and end of project reviews: These reviews are highly valuable and provide the project team with a very important external view of opportunities, project focus and opportunities. Project staff can easily become too focussed on the detail and day-to-day operation of the project and miss the bigger picture issues.

Selection of project partners: Two main issues were identified with partners, selection of partners and contracting. Project partners should be selected based on need and skills, not simply because they were part of a previous project or are 'known' to the leadership. Leaders should cast the net widely to assess available talent.

Contracting project partners: Major partners are currently contracted directly with ACIAR for the length of the project, with budgets. Trying to change these contracts after the project has started, especially if it involved a reduction in money they receive, or an increase in activities is very difficult, and is a major impediment to project responsiveness. Contracts should be with the Commissioned Organisation (not ACIAR) and should be focussed on the next deliverables only - negotiated annually.

Under performance of project partners: Some project partners underperform but still demand payment. E.g., over two years late with foundational reports, unwilling to be flexible in delivering what was required especially after the mid-term review, being unable to travel due to COVID-19 but still demanding full payment, including travel, and simply not doing what they were contracted to deliver. Annual sub-contracts would be a solution.

Postgraduate training John Allwright Fellowships: Selecting key project staff for John Allwright Fellowship postgraduate training can mean a key project team member is lost to the project. While it's very beneficial for the candidates development it's akin to shooting yourself in the foot. One suggestion would be to approve JAF proposals for promising candidates but stipulate they must remain active in the current projects until it is completed.

Importance of a local coordinator in country: Leading projects from Australia is difficult, and where this occurs, there really needs to be a full-time leader in-country, as was suggested by the project mid-term review team.

Multiple countries in the one project: We think there needs to be a clear reason for multi country projects, and clear synergies or reasons for including more than one country, otherwise they would be better as separate projects.

2.5 Conclusions

2.5.1 Vietnam

There was absolutely no doubt that farmer incomes could be improved by targeting modern retail with VietGAP certified vegetables, which can enable project farmers to increase their incomes (for example in this project - in this project 15-fold from 11 million VND to 176 million VND per year (AU\$10,000)). Simply by growing vegetables instead of rice or maize, farm incomes have increased 5-fold.

The VietGAP approach is working in terms of reducing pesticide residues, based on the testing on retail markets done by the project team. Fifty five percent (55%) of the farmers supplying VietGAP vegetables are women, and they are fully engaged in running businesses, planning, decision making and marketing. There are also many Hmong, Muong and Dao farmers engaged in this new industry, especially in the Van Ho district

The ACIAR project can take full credit for the benefits seen by the 10 farmer groups that have been involved in the project, described above. In terms of the regional benefits and the new vegetable industry in Moc Chau, some credit should go to the GREAT program and other donor activities in the region.

2.5.2 Myanmar

The overall aim was broadly achieved in that the project showed farmer incomes could be improved by targeting modern retail with MyanmarGAP certified vegetables. The project developed two successful vegetable value chains from Nyaungshwe and Pindeye to Yangon through prominent distributors and retailers.

Quality assurance is the way of the future, and as the modern retail sector develops, demand for GAP produce will increase and farmers will need to comply if they want a share of that market. The Myanmar government (DOA) could consider a scaled GAP approach that is easier to implement and would deliver 80% of the benefits of the full MyanmarGAP system.

2.5.3 ACIAR

Future projects should include a locally based coordinator. The project design should include flexibility so that activities are actually informed by what is found in foundational activities and ensure results are delivered on schedule. Project delivery partners should be chosen on merit and not simply because they were involved in a previous project, although capacity building should be considered in selections.

Training and capacity building were highly valued at all levels including farmers, project partners, extension and research staff. Capacity building should remain a key focus of ACIAR activities and perhaps thought could be given to how these capacity benefits can be preserved and amplified, e.g., working more with universities and training organisations to help build their capacity.

2.6 Recommendations

The project includes 14 recommendations covering Vietnam, Myanmar and ACIAR generally. These are explained fully in the recommendations section of the report, but briefly summarised below:

1. **Appoint a local full-time coordinator** when project leadership is in Australia.
2. **Use a staged project design approach.** Include flexibility and ensure project design is actually informed by what is found in foundational activities so as to ensure projected results are delivered on schedule.
3. **Flexible subcontracts with the Commissioned Organisation** and not ACIAR. Empower the project leader to direct the project properly and make changes as required.
4. **Select project partners on skills, track record and need**, balanced by the capacity building outcomes in developing countries.
5. **Design projects for impact and efficiency.** Use a theory of change approach to project design and keep it as simple and efficient as possible.
6. **Training and capacity building** is highly valued by in country partners and should remain a key focus of ACIAR projects.
7. **Project duration.** Aim for 4-5 year maximum for projects unless there is a specific need for longer projects.

Vietnam specific

8. **Improve VietGAP compliance and traceability, especially for export.** Currently the system is largely paper based, with little actual verification and traceability
9. **Promote the VietGAP model and benefits more widely in Vietnam.** The economic, social and food safety benefits of a functional GAP system in Vietnam are significant. Use project findings, insights, resources and expertise to benefit the Vietnamese people.
10. **Improve vegetable extension services in Vietnam.** Farmers use government funded extension for help with agronomy, pest control and postharvest. DARD and district government should train and support more extension staff.
11. **Postharvest management and cool chain** remains a need in vegetable supply chains, and all fresh produce chains, and may benefit from future investments by ACIAR or other donors, especially in relation to building local capacity.

Myanmar specific

12. **Resume project operations focused on piloting the use of MyanmarGAP or a staged GAP approach when possible.** Future project design would improve competitive advantage by enhancing the performance of the “whole chain” and making it more market and shopper responsive.
13. **Investigate how to make better use of project outputs** and use them to inform subsequent activities.
14. **Gender equity.** Government should incentivise firms to involve women in modern supply chains and assist rural women to access skills, education, assets and finances.

2.7 What remains to be done

In Vietnam there are some significant issues that should be addressed if the industry is to develop in an orderly way to meet its potential. The Moc Chau vegetable industry is still only 3% of the national production compared to the Red River Delta which is 30% and Da

Lat at 10%. Some improvements are needed, especially in supermarkets, to increase demand. These include:

- Better packaging, labelling and marketing
- Improved postharvest handling, cool chain, quality, grading and supply
- Point of sale materials to promote Moc Chau and VietGAP to consumers
- Improved VietGAP compliance and regulation, including traceability
- Stop conventionally grown vegetables being sold as VietGAP compliant
- Strengthen the extension support for farmers provided by district and regional level government
- Learn from the Da Lat experience

In Vietnam, an SRA (AGB/2021/153) *Piloting digital monitoring of VietGAP compliance and quality in Vietnam vegetable value chains* is currently underway and is evaluating the use of digital tools to improve the traceability and compliance with reporting requirements of VietGAP certified vegetables from Moc Chau to Hanoi. The lack of traceability has been confirmed as an issue currently facing fresh produce chains connecting farmers and retailers in Vietnam. More broadly, the concept of digital traceability will be tested on VietGAP or GLOBALGAP certified fruit, targeting the export markets.

A concept note for project AGB/2022/114 (*Digital monitoring of VietGAP compliance, quality, logistics and handling and retail point of sale compliance (to specifications) with feedback to producers and their producer groups in Vietnamese horticultural value chains was submitted*) has been approved for development into a full project proposal.

In Myanmar the recommendation from the review team was to continue with more work in that country. At the time of writing, further activity in Myanmar will not be possible due to the military coup.

3 Background

This project idea originated from a AusAID-funded CARD-funded project in Vietnam which was aimed at creating new markets for vegetables in the Vinh area of central Vietnam. The CARD project developed markets and supported the production of VietGAP-certified watermelons and cabbage in Vinh for sale in a Metro supermarket in Hanoi.

In our dealings with the supermarket, the possibility of developing certified vegetables for the supermarket sector in Hanoi supplied from the Moc Chau region was suggested. The concept was supported by ACIAR and this led to the first Moc Chau safe vegetable project.

The first project (AGB/2019/053) focused on supporting piloting farmer groups to supply certified safe vegetables to retailers in Hanoi and this project (AGB/2014/035) was focused in Vietnam on scaling. The other component of this project in Myanmar had similar aims to the previous project in Vietnam.

3.1 Rationale for the project

3.1.1 Rationale in Vietnam

In summer, the Hanoi market for temperate vegetables (e.g., tomatoes, cabbage, beans, lettuce) is largely supplied from Da Lat, 1,000 km away (2-days by road) or imported from China.

The opportunity was for Moc Chau, which is only 200 km from Hanoi (4-hour road trip), to supply vegetables to markets in Hanoi in summer, becoming the 'Da Lat of the north'. Moc Chau is elevated (800 m) and is cool enough to grow temperate vegetables in summer. There is a good road to Hanoi, adequate arable land (40,000 ha) and water for irrigation.

The modern retail markets in Hanoi are looking for a local supply of temperate vegetables in summer and require either a Safe Vegetable Certification or the more rigorous VietGAP certification and, in return, offer a premium price to growers.

These premium markets want some sort of certification of food safety and quality because of problems with high levels of pesticide residues and cases of pesticide poisoning from vegetables in the past.

So why wasn't Moc Chau already supplying Hanoi?

They were to some extent. There was a very small vegetable industry, supplying through traders. There was no direct connection between the Hanoi markets and the farmers in Moc Chau. Farmers were focussed on production, not what consumers wanted and were 'price takers' with no control over the prices they received. Farmers were poor with the average household income in Moc Chau only 11 million VND per year (AU\$660).

The first project (AGB/2019/053) focused on supporting piloting farmer groups to supply certified safe vegetables to retailers in Hanoi. It helped to establish four farmer groups and promoted strong linkages to supermarkets and specialty safe vegetable stores.

Before the first project started in 2011, all vegetable marketing from Moc Chau was either to the local markets or to Hanoi via traders, and unsafe production techniques were widely practiced (Figure 1).

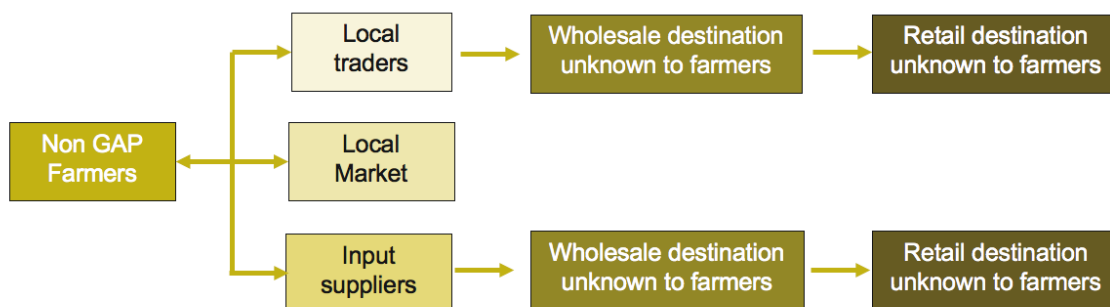


Figure 1. Moc Chau vegetable value chain before intervention by the project.

By the end of the first project, the new value chains supported by the project had established effective direct trading relationships and two-way communication between the farmers and with the supermarkets and specialty, high-quality vegetable stores in Hanoi (Figure 2).

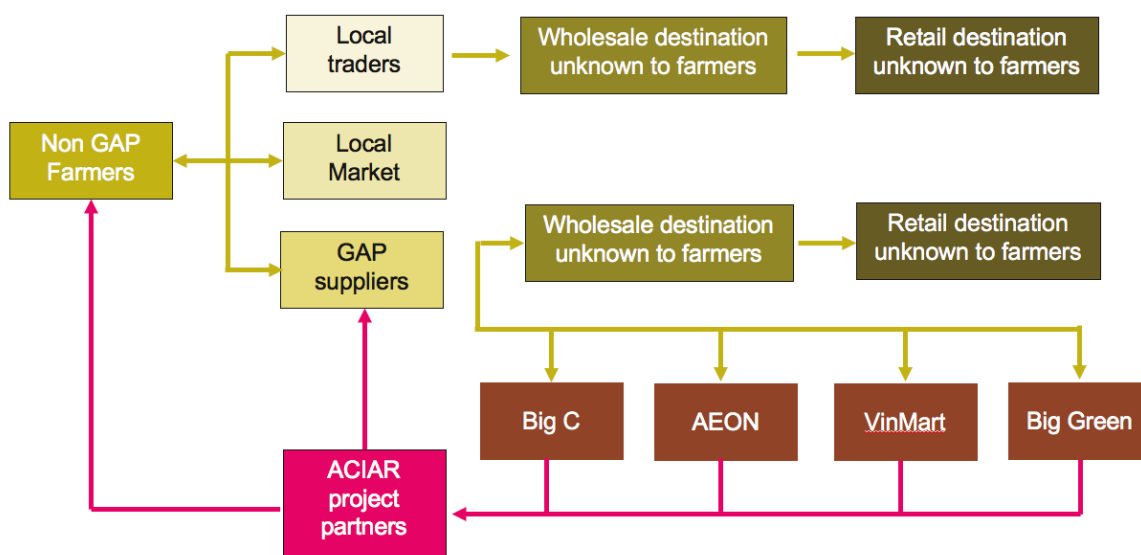


Figure 2. Moc Chau vegetable value chain after intervention by AGB/2009/053.

In 2016, 68 farmers (71% female and 10% Hmong) in four villages were producing about 800 tonnes of certified high-quality vegetables per year. Participating farmers from the Tu Nhien village in Moc Chau earned an average net income of 300 million VND (AU\$18,000)² per ha in 2015. This compares with an average net household income of 120 million VND (AU\$7,560) per ha for non-project vegetable farmers in the village, which is an increase of 150% in net income.

In the neighbouring project village of Van Ho, Hmong farmers had been producing vegetables for only one season, recording a net income from vegetables of 116 million VND (AU\$7,300) per ha per year. Alternative land uses, such as growing maize or rice, return a net income to the farmer of about 20 million VND (AU\$1,260) per ha per year, only 17% of the income they could make from certified high-quality vegetables.

² Tu Nhien cooperative data.

The first project showed that supplying these specialty markets in Hanoi was more profitable for farmers and also beneficial for the retailers and other participants in the value chain. The end of project review recommended a follow up project with a focus on scaling and finding ways to help the industry develop in these key areas:

1. How to develop and scale up a self-sustaining and inclusive model for producing high-quality vegetables.
2. How farmer groups could operate in a way that is sustainable with self-funded ongoing technical support for agronomic information and VietGAP compliance.
3. Understand and quantify the vegetable market, existing and new value chains established by the ACIAR project and other projects, e.g., the Aus4Equality GREAT program.
4. Encourage increased overall production capacity so that markets could be adequately supplied, and financial benefits more widespread.
5. Improve the postharvest handling skills of farmers and cool chain capacity so that produce arrives in Hanoi in better condition.
6. Improve the communication between farmers and retailers with effective 2-way communication.
7. Improve the validation of VietGAP compliance to ensure residue testing and produce marketed as VietGAP compliant actually is compliant.
8. What are the economic, social and environmental benefits available to Vietnamese smallholder farmers?

The second project (AGB/2014/035) then focussed on these areas.

3.1.2 Rationale in Myanmar

The idea behind the Myanmar project was to apply the learnings from the first Vietnam project to address similar vegetable food safety issues in Myanmar by using the MyanmarGAP system to lead adoption in the modern retail sector, which would hopefully flow into the broader wholesale market system.

In any case, we expected that the modern retail sector, while still small in Myanmar, would eventually follow the developed world and become a major market channel for fruits and vegetables.

Pesticide residues in vegetables are an important issue in Myanmar. In 2002, 2.3% of the Myanmar population were being affected by pesticides each year, including poisoning by ingesting food contaminated with high residues, and farm workers exposed to insecticides through unsafe application practices and lack of protective equipment.

Vegetable farmers use outdated agrochemicals from China and Thailand, and are often unable to read the foreign language usage directions. Traders often recommend farmers apply pesticides and other chemicals more frequently and at higher rates than are necessary.

A national vegetable industry forum in 2014 identified and prioritised the key issues limiting the vegetable industry in Myanmar. The forum and an ACIAR scoping study identified the following issues:

- Lack of market and consumer information available to farmers
- Poor pesticide practices and high residues in vegetables
- Limited access to vegetable production best practice information
- High postharvest losses
- Weak vegetable seed sector.

The project planned to address these issues by identifying or establishing a number of value chains that would grow and supply MyanmarGAP certified vegetables to modern retail markets such as supermarkets and restaurants, who were demanding certified safe-to-eat produce.

These value chains would be showcased to the broader farm and retail sectors to promote the economic and biophysical benefits that were available to small holder farmers if they adopted the model. This was essentially following the Vietnam approach, which had been successful in that country.

This approach required a number of activities to be undertaken. In summary:

1. Understand the Myanmar vegetable industry's existing value chains including transport and infrastructure.
2. Engage with the government agencies implementing MyanmarGAP re certification and feedback on the strengths and limitations of the current system.
3. Identify farmer groups who were willing to participate in the project and get their agreement to participate.
4. Support the farmer groups to achieve MyanmarGAP certification.
5. Provide technical support for the farmer groups to produce safe-to-eat crops in an efficient manner.
6. Identify suitable markets and link these with the farmer groups.
7. Provide ongoing local support to make sure the farmers, retailers and other chain participants are working together effectively.
8. Understand the economic, social and environmental benefits available to Myanmar smallholder farmers.
9. Learn from the Vietnam experience
10. Showcase the outcomes and impacts to drive adoption.

4 Objectives and research questions

The aim of the project was to improve farmer incomes and livelihoods by developing sustainable and inclusive high-quality vegetable value chains in Vietnam and Myanmar.

The research questions that were considered are outlined below under the relevant objectives that were framed to answer these questions. In retrospect, the project attempted to answer too many research questions, and they were more fundamentally different between Vietnam and Myanmar than we realised at the start of the project. Below, **M** indicates Myanmar and **V** indicates Vietnam.

Objective 1. To identify new market opportunities for smallholder vegetables produced under quality assurance systems.

1. Do the current Moc Chau vegetable production standards and trademark protocols increase consumer trust and willingness to pay more for vegetables, and if so, how much? What other market opportunities exist for vegetable production and certification systems? (V)
2. What are the current vegetable production and market situation and trends? What are the current and potential market and institutional opportunities, and drivers, for accredited, high-quality vegetable production? (M)

Objective 2. To develop sustainable and inclusive smallholder farmer group-governance model(s) (*Vietnam only*)

1. What institutional and community arrangements should be drawn from Moc Chau farmer groups to form effective and sustainable smallholder farmer groups? (V)
2. What are the current levels of transparency, fairness, gender equity engagement and distribution of benefits in Moc Chau farmer group organisations and governance arrangements? How can these be strengthened and improved? (V)
3. How can farmer groups better coordinate and support production scheduling, post-harvest management and transport, and marketing coordination to ensure consistency of supply and quality to end markets? (V)
4. What training is required to support the sustained transition of farmers into group suppliers of accredited, high-quality vegetables to markets? (V)

Objective 3. To develop sustainable and inclusive smallholder vegetable value-chain models and quality assurance systems.

1. How do high-quality vegetable standards and trademark protocols translate into improved quality, traceability and reduced pesticide residues, heavy metal contamination, pathogenic microorganisms and nitrate residues at the point of sale? (V)
2. How can the management and compliance of high-quality vegetable standards and trademark protocols be improved and made more sustainable? (V)
3. Are current chemical usage and pesticide levels, and pathogenic microorganism levels in vegetables likely to be a risk factor? What quality assurance and certification options and systems exist for high-quality vegetable production? What lessons about vegetable systems can be applied from Vietnam to Myanmar? (M)

Objective 4. To scale out and evaluate the smallholder vegetable value chain models and quality assurance systems to new farmers and villages.

1. What are the *constraints* or *impediments* to women, and to ethnic minority farmers engaging with the modern retail sector in Vietnam and Myanmar (V, M)?

2. What success factors and approaches should be considered when scaling out high-quality vegetable production systems to new villages? (V & M)
3. How should project methodologies and scaling out strategies be adapted to account for gender roles and increase the participation and leadership of women and ethnic minorities? (V & M).
4. What policy framework is required to facilitate adoption of smallholder vegetable value-chain models and quality assurance systems? (M)

5 Methodology

5.1 Overview of the research strategy

5.1.1 Vietnam

The overall objective for this project was to understand how the VietGAP certified vegetable model developed in project AGB/2009/053 could be scaled. The project team evaluated different farmer group governance models and interventions aimed at assisting scaling more widely in Moc Chau and Van Ho, and possibly other regions. The project selected a further six farmer groups in Moc Chau and Van Ho, and continued support for the four groups established in the initial phase.

The main activities involved interim and long-term technical support for the new farmer groups, market development, vegetable value-chain and farmer group-governance model development, followed by evaluations of the social, economic and agronomic impacts of the model(s) for scaling out in new situations.

The previous project (ABG/2009/053) focused on the modern retail sector in Vietnam, and this project continued with that theme, seeing modern retail as a leader of change.

Farmer-driven participatory agronomic and post-harvest research was used to solve technical issues as they arose, and there was social science research into group governance and value chains. There was social research into gender-sensitive approaches for engaging farmers, adapting materials and training for new communities, including ethnic minority groups.

Key to the long-term impact of the project is the involvement of both private- and public-sector organisations. Private-sector marketing institutions (e.g., market traders, supermarkets and vegetable retailers) were needed to drive economic incentives for smallholders. Involvement of relevant private and public sector organisations was one of the key means by which the self-sustainability and persistence of the new value chains could be achieved.

5.1.2 Myanmar

The research strategy in Myanmar was to apply the same principles that were used in the first Vietnam first project, i.e., using GAP as a way to improve vegetable safety, targeting modern retail markets. These markets required GAP certification and are willing to pay a premium for compliant product, providing a financial incentive for farmers to adopt the GAP approach. The project aimed to demonstrate the benefits, hopefully providing safer products for consumers and a safer work environment for farm workers by using pesticides properly.

The project identified traders who specialised in supplying supermarkets or the food service sector. It also established links to retailers such as City Mart, Metro, Marketplace, Orange, Gandamar Wholesale and Future Glory who could sell the MyanmarGAP certified produce for a premium price. The idea was to leverage existing trading relationships and give the cooperating traders an advantage, because they will be supplying certified safe vegetables to their customers. Consumers will pay more for certified safe vegetables, and the financial benefits we hoped would be shared between the traders and farmers.

The Myanmar Department of Agriculture (DOA) helped with Myanmar GAP certification, Fresh Studio and East-West Seeds (EWS) were chosen to train pilot farmer groups to achieve Myanmar GAP certification, and to improve farming skills.

The Yezin Agricultural University (YAU) were asked to run agronomic trials aimed at improving production methods. This approach was intended to allow DOA to refine and

improve the Myanmar GAP accreditation system, by “road testing” it with real farmers, traders and customers.

The French Agricultural Research Centre for International Development (CIRAD) and YAU evaluated the value chain and gender programs to inform project activities and measure impact.

We wanted to strengthen capacity of institutions in Myanmar, especially DOA and Yezin Agricultural University by transferring skills, knowledge and capacity developed in Vietnam, through links with research institutions and the private sector in Vietnam and Australia, specialist NGOs and international experts.

5.2 Where was the research undertaken?

In Vietnam the project was focussed on the Moc Chau and Van Ho districts in the Son La province of northwest Vietnam. The retail focus was mainly supermarkets and specialty safe fruit and vegetable stores in Hanoi, but there have also been significant market activities in Son La and Moc Chau local markets.

In Myanmar, the project focused on the Inle Lake area in the Southern Shan State central dry zone, for production and the markets were mainly in Yangon.

5.3 Who was involved – project partners and collaborators?

5.3.1 Vietnam

The approach in Vietnam was essentially to use a similar team to that used in the first project but add capability in the areas of farmer group governance, value chain economics and gender studies.

The main focus of this project (AGB/2014/035) was to support and understand scaling, whereas the first project focused more on proof of concept. While this approach was reasonably successful, the expectation that project partners in Phase 1 will continue in Phase 2 remained a challenge for the project throughout, and will be further discussed in a later section of this report. The project team included:

- The Northern Mountainous Agriculture & Forestry Science Institute (NOMAFSI) as the project lead in Vietnam because they had staff in the Moc Chau region and the necessary skills and experience with the farmers.
- CIRAD because of their value chain skills and staff in Vietnam.
- Fresh Studio because they have agronomy, consumer marketing and GAP skills with an office in Vietnam
- The University of Qld, specifically Oleg Nicetic, for farmer group governance and sociology skills
- Gender specialist Nozomi Kawarazuka (International Center for Tropical Agriculture)
- Focus Group Go (Rodd Dyer) because they had staff in Vietnam and could operate during the COVID-19 pandemic
- Applied Horticultural Research as the commissioned organisation.

Ten farmer groups were involved in the project, four from Phase 1 plus an additional six from Phase 2. The Moc Chau and Van Ho Peoples committee were strongly supportive of the project from the start. They provided extension staff to assist farmer groups, provided some financial assistance and encouraged farmer groups involved in the project to form cooperatives.

The retail partners included: Metro, Big C, VinMart (VinEco), AEON. Specialty safe fruit and vegetable stores in Hanoi were also involved, notably Big Green and Bactom.

The project team linked with the Aus4Equality GREAT project has a similar goal to this project, i.e. scaling VietGAP certified vegetable value chains to new villages in Son La. Supporting the GREAT project farms was a deliberate action by the ACIAR project team as this was seen as a good way to achieve the scaling that was a focus of both projects – i.e. combining efforts and trying to support each other. The ACIAR team provided vegetable agronomy, marketing and VietGAP expertise to the GREAT farmers.

Another good collaboration was with the Aus4Innovation program. Aus4Innovation invested AU\$300,000 to pilot low-cost cool rooms and cool trucks in the Moc Chau region using the innovative CoolBot technology which allows low-cost air conditioners to provide the cooling power for cool rooms. The cool room gives farmers flexibility to be able to store harvested product on farm, and improves the quality of vegetables arriving at retail stores in Hanoi from Moc Chau and Van Ho.

Finally, the Department of Agriculture and Rural Development DARD have also been very supportive of the project, especially by assisting with VietGAP certification of farmer groups and also supplying extension support.

5.3.2 Myanmar

The project team undertook a scoping study before the project started, which provided valuable insights into where to focus project activities. The study identified key potential partners, described the wholesale and modern retail setup for Myanmar vegetable industry and confirmed the need for improvements in the food safety aspects of vegetables in Myanmar, especially in relation to pesticides.

The project team included:

- Myanmar Department of Agriculture (DOA) because they manage the MyanmarGAP system
- Yezin Agricultural University (YAU) the only agricultural university in Myanmar, were keen to be involved and had the necessary skills
- CIRAD because they have value chain skills and could work in Myanmar
- Fresh Studio because they have agronomy, consumer marketing and GAP skills and have an office in Myanmar
- East-West Seeds because they have vegetable agronomy skills and experienced staff in Myanmar
- Applied Horticultural Research as the commissioned organisation

The project focused on the Inle Lake area in the Southern Shan State central dry zone and worked with farmer groups trained as part of the Livelihoods and Food Security Trust Fund (LIFT) project by EWS and MercyCorp. Linking with MercyCorp/East-West Seeds and the LIFT project leveraged project funds in Myanmar.

5.4 Major research activities

More detailed methodologies for the various project activities are included in the country specific reports, and even more detailed methods in the actual study reports themselves. The section below is intended as an overview of what was done.

5.4.1 Foundational activities

Baseline surveys in Myanmar: Ten villages (171 farmers) inside and outside the project were surveyed, and the survey was designed by the socio-economic team with specialist

gender input and collected information about farming practices, farm income and expenses, and social information.

Baseline surveys in Vietnam: A baseline socio-economic and agronomic skills survey was conducted with 60 farmers (32 men and 28 women) from the six farmer groups newly supported by the project, including 47 already part of the groups and producing vegetables in 2018-2019. There were also surveys conducted at the start and end of AGB/2009/053 which provide other useful reference points.

Desktop research on market and consumer preferences, Myanmar and Vietnam: This study reviewed available studies on the vegetable sectors to identify market opportunities and knowledge gaps for future market and consumer research. It provided guidance on marketing opportunities and likely consumer preferences in various vegetable markets.

Market and consumer research, Myanmar: Fresh Studio surveyed 400 consumers and interviewed retailers for a marketing and consumer study to understand consumers' budgets, willingness to pay a premium for high quality, safe-to-eat vegetables and their understanding of the Myanmar GAP brand.

Market and consumer research, Vietnam: A Moc Chau brand survey was undertaken using a consumer intercept survey method in retail stores and markets. Price data was collected from wholesale markets in Moc Chau and Hanoi for a wide variety of vegetables including tomatoes, white cabbage, French beans, lettuce, potatoes, carrots, zucchinis and mustard.

Institutional mapping, Vietnam and Myanmar: An institutional mapping study was carried out in Vietnam in 2018. It tended to focus more on the government sector and not enough on the private sector. A similar study was undertaken in Myanmar.

5.4.2 Gender focussed studies and activities

Gender analysis in Moc Chau CARE and UQ Regional Gender workshop, Vietnam: Questions regarding the role of women and men in vegetable production were examined through gender division of labour. Analysis of access and control over resources was applied to find out the answers to questions regarding how families spend money, who is the decision maker and how decision-making dynamics influence vegetable production.

Gender workshop and study in Myanmar: A 2-day workshop was hosted by Nozomi Kawarazuka focusing on the impact of gender in ACIAR projects in Myanmar. The project was represented by Win Pa Pa (Fresh Studio, predecessor to Shoon Lae) and the YAU project team. A gender study was carried out under the project area of Southern Shan State in Myanmar, located in the east. Shan State covers 155,800 km², almost a quarter of the total area of Myanmar.

5.4.3 Training, capacity building and farmer-focussed resources

Manual on how to establish of VietGAP safe vegetable cooperatives in Vietnam: The manual was originally compiled by Helvetas (CRED) as part of project AGB/2009/053. It was then comprehensively reviewed and revised by NOMAFSI (led by Dr Sen). The manual is written in Vietnamese language and is intended for use by farmers, extension staff and other operational staff. The manual has been distributed to project farmers, district government, DARD, GREAT project team and farmer groups to assist them in group governance and scaling.

Production techniques for VietGAP vegetables, Vietnam: This is a detailed concise production guide in Vietnamese language and distributed to project farmers, district government, DARD and GREAT. It contains detailed requirements for vegetable production, pest management, harvesting, post-harvest handling and includes the requirements for achieving VietGAP certification. The manual also includes resource material for training farmers.

Agronomic guides, Vietnam: A series of 25 concise production guides have been updated, printed in Vietnamese and distributed to farmers. They cover specific crops, fertilization, irrigation, seedlings and how to use sticky traps to monitor insects. There is also a summary version in English available for the English-speaking review team.

Agronomy and GAP training to farmers and extension staff, Vietnam: NOMAFSI and Fresh Studio trained all farmer groups and extension staff on record keeping, safe vegetable production, pests and diseases, meeting organisation, inspection skills and technical writing. They also organised a 2019 end-of-season meeting to summarise production and marketing with farmers, leaders and vegetable traders.

Agronomy Training Myanmar: East-West Seeds led farmer training sessions in the four project villages between April 2019 and October 2019. Agronomic training was held for the production of cabbage, cauliflower, tomato and capsicum. There were a total 123 farmers trained, as well as local Department of Agriculture extension staff (train the trainer). Farmers were provided with certificates for agronomic training.

Myanmar GAP Training: Fresh Studio led the Myanmar GAP training, in conjunction with the agronomic training led by East-West Seeds. There were four separate training sessions per village. Farmers were provided with certificates for their GAP training.

MyanmarGAP certification: The project assisted farmers to achieve Myanmar GAP certification of all willing project farmers. Myanmar GAP certification needs to be renewed annually and opens access to premium markets such as modern supermarkets, online retailers and the hospitality industry. Villages were certified as groups, which is more cost-effective for annual renewal and promotes self-regulation among members.

5.4.4 GAP compliance monitoring

Checking pesticide residue levels, Vietnam: Fresh Studio carried out pesticide residue testing in Hanoi on vegetables produced by Moc Chau farmers. There were some positive results, and where this occurred, samples were sent for more detailed analysis, and the results communicated back to the farmers in question. Farmers in Moc Chau also do their own voluntary testing using the rapid test. The quick test method is limited and detects only carbamate and organophosphate insecticide residues but cannot detect fungicides or other classes of insecticide.

Myanmar GAP Accreditation: The project sponsored Myanmar GAP certification for all willing project farmers. The DOA was funded to collect soil and plant samples which were analysed at the plant protection laboratory in Nay Pyi Taw. Myanmar GAP certification needs to be renewed annually and opens access to premium markets such as modern supermarkets, online retailers and the hospitality industry. Villages were certified as groups, which is more cost effective for annual renewal and promotes self-regulation.

Pesticide monitoring, Myanmar: Project officer Shoon Lae collected random samples for testing from vegetable consignments. The samples were tested for pesticide residues using the GT Pesticide Kits (quick tests) at the farm gate, so, immediate feedback could be given to farmers who were not adhering to Myanmar GAP protocols. GT Pesticide Kits test for organophosphate and carbamate groups, organochlorines, synthetic pyrethroids, and cholinesterase inhibitors³.

Electronic traceability training for farmers, Vietnam: This activity was an assessment of digital record-keeping apps aimed at farmers conducted by NOMAFSI in the final year of the project. Training was provided on the use of these apps.

³ http://www.gtttestkit.com/gtttestkit_eng/

5.4.5 Agronomy and postharvest trials

On farm agronomy trials, Vietnam: The project team supervised farmer-focussed, on farm agronomy trials aimed at providing local information to help farmers solve local issues and make informed decisions. They are part of the participatory approach the project has adopted and are an important learning tool. Farmers have been encouraged to continue with these trials after the project has been completed.

Postharvest trials, Vietnam: NOMAFSI has completed trials on optimum harvest time, transport and packing materials, washing methods, and retaining wrapper leaves. Temperature and quality were monitored in transit to Hanoi supermarkets. The results were analysed, reported and communicated to ACIAR and GREAT farmers.

Postharvest trials and market survey, Myanmar: There were postharvest trials on cauliflower at Pindaya in 2019. There was a postharvest study in Aungban, Yangon and Naypyidaw where 30 wholesalers and 30 retailers were visited to assess the postharvest management practices and extent of losses at each stage along the supply chain of sweet pepper and tomato grown in the project area, and to identify the principal causes of losses at each level along the chain.

5.4.6 Farmer group governance and value chain activities

Pilot value chains in Vietnam: Based on a recommendation from the mid-term review, we established two pilot value chains in Moc Chau, which were to be the focus of better engagement with the retailers and to showcase the benefits. The villages chosen were Ta Niet in Moc Chau and Bo Nhang on Van Ho. The farmers were supplying AEON, Big C and Big green in Hanoi. Focus Group Go assisted with the marketing and packaging in their stores and the value chain study assessed these pilot chains.

Pilot value chains in Myanmar: Two farmer groups were selected for pilot value chains:

1. Nyaungshwe (Taung Poet Gyi, Za Yat Gyi) to Yangon – peppers and tomatoes
2. Pindaya (Pway Hla, Set Kyar Goan) to Yangon – supplying tomatoes

The pilot value chains supplied the following markets: *Future Glory*, a wholesaler specialising in GAP-certified fruit and vegetables; *Farm Shop*, an online retailer based in Yangon; *METRO*, grocery distributor in Yangon; *Country Fresh Myanmar (CFM)*, an online vegetable retailer in Yangon and *City Mart*, 27 supermarkets across Myanmar.

Value chain and Transport study, Myanmar: A value-chain and logistics study covering the Southern Shan State, Yangon and Mandalay was conducted in December 2018 and January 2019 by CIRAD and YAU. Vegetable value chains were followed from farm to retail and are documented in detail in the study report.

Governance and operation of safe vegetable cooperatives, Vietnam: This study was a critical analysis of various farmer group governance models in Vietnam that were used by the 10 farmer groups involved in the ACIAR project aimed at understanding the impact cooperatives/groups have on overall smallholders' production and marketing systems.

Value chain and market study of vegetable production and trade in Moc Chau and Van Ho, Vietnam (end of project): The study focused on distribution channels that supply both "traditional" and "modern" markets in the summer and winter seasons. This major study used the rapid market appraisal method to quantify production areas, volumes and values for the major types of vegetable in Moc Chau and Van Ho. It also mapped and analysed vegetable value chains originating in Moc Chau and Van Ho and identified vegetable market issues and recommend improvements.

Value chain study of pilot value chains, Vietnam: Conducted a value chain analysis and assessed market development opportunities for the pilot farmer groups of Bo Nhang and Ta Niet.

Showcasing Event, Myanmar: A networking and showcasing event was hosted in Aungban between 5-6 September 2019, where local traders, project farmers and project staff shared findings, achievements and goals of the project. Presentations were made in English and translated into Myanmar language. An illustrator produced drawings to help communicate key aspects of the project to the farmers.

5.4.7 Project management and COVID responses

Local co-ordinator in Vietnam: Following the mid-term review, workplans for each organisation were revised to accommodate the recommendations of the mid-term review. Workplans were simplified with links to each work plan below. In addition to the workplans, a system of monthly Zoom meetings was initiated, and this worked well for the last two years of the project. The detailed responses to the MTR recommendations are included in the Results and Discussion section

Local coordinator in Myanmar: Shoon Lae was hired in 2019 as local project coordinator, based in Nyaungshwe, Southern Shan State, to visit each village weekly to support farmers transition to Good Agricultural Practice. Shoon Lae supported the formation of two pilot value chains and provided assistance to farmers with record keeping, pesticide testing, agronomic advice and tracking consignments.

Simplified workplans and monthly meetings in Vietnam and Myanmar: Based on a recommendation from the mid-term review, we created simplified workplans for both Vietnam and Myanmar and also began monthly Zoom meetings with the project staff.

COVID-19 responses: It was not possible to travel to either Vietnam or Myanmar from late 2019 until the project ended in late 2021 – 2 years! This was a major challenge for the project teams. We addressed this by continuing with monthly meetings for all project partners. Liam had weekly meetings with Shoon Lae in Myanmar. The regular meetings, checking progress against workplans and sorting out issues as they arose, worked well. The other main thing is that AHR engaged Focus Group Go in Vietnam to assist, especially on retailer engagements and impact studies, using unspent travel money to fund this appointment.

5.4.8 Interaction with other projects

Aus4Equality GREAT program in Vietnam: The project team in Vietnam engaged with the GREAT program because they commissioned seven projects for safe vegetables in Moc Chau and the Lào Cai province with a focus on scaling. It became clear that we should work with the GREAT projects, to assist them in scaling activities and provide support from the ACIAR project with resources and skills.

Aus4Innovation project in Vietnam: Aus4Innovation invested AU\$300,000 to pilot low-cost cool rooms and cool trucks in the Moc Chau region using the innovative CoolBot technology which allows low-cost air conditioners to provide the cooling power for cool rooms. This gives farmers flexibility to be able to store harvested product on farm, and improves the quality of vegetables arriving at retail stores in Hanoi from Moc Chau and Van Ho. The ACIAR project team worked closely with Aus4Innovation on the project on training and post-harvest studies as it provided the missing vegetable cool chain.

5.4.9 Measures of impact

End of project impact assessment, Vietnam: Focus group discussions (FGDs) were held with over 40 vegetables farmers and a series of 30 in-depth key informant interviews (KIIs) were conducted with farmers, input suppliers, traders, and institutional representatives. These methods are described further below. Both Focus Group Data and Key Informant Data were disaggregated by gender and often for ethnic group. The study provides insights and key lessons for the design and implementation of research-for-development projects aiming at livelihood, market, and value chain impacts at scale in complex environments.

End of project assessment, Myanmar: The end of project survey was carried out in the four villages of the project. The survey was scaled down with 54 farmers being surveyed due to travel restrictions on project staff, potential political instability and COVID-19 risks. The interviews were carried out either face-to-face or by phone, depending on the security situation at the time of the survey.

5.4.10 Mid-term review responses

Vietnam: The mid-term review in 2019 emphasised the importance of the project engaging chain partners with consumers, i.e., testing the efficacy and demand for VietGAP certified and branded and better-packaged vegetables in the modern retail chains in Hanoi. This required designing and piloting farm-to-market value chains as demonstrations with case studies to capture lessons learnt.

Myanmar: A series of critical recommendations were outlined to the project team for adoption and application during the final 2-year phase of the project.

- Apply the knowledge about markets and farmer extension capacity (developed in the first phase) to access new consumer markets
- Create a new market chain (two demonstration pilots) connecting farmers to fresh vegetable consumers in modern wholesale and retail markets
- Test how farmers could gain distribution access, fulfil market requirements, and receive commercial and economic benefits from safe vegetables.

6 Achievements against activities and outputs/milestones

For this section, please refer to the separate Vietnam and Myanmar detailed end-of-project reports.

7 Key results and discussion

The aim of this section is to give an overview of the main results of the Vietnam and Myanmar sides of the project – what were the key learnings, what worked and what didn't. The project team was lucky enough to have a mid-term review which provided a valuable 'outside' perspective on the project, and then an end of project review by the same reviewers, which provided a useful continuum. The reviewers' comments and recommendations are incorporated into the discussion below.

There are detailed results in the separate Myanmar and Vietnam reports, which are more a collection of the results from individual project activities rather than an overview which addresses the bigger questions the project aimed to address.

7.1 GAP in Vietnam and Myanmar: Was it the right approach?

Developed economies around the world use a Good Agriculture Practice (GAP) approach to ensure the quality and safety of fresh produce that is sold to consumers. There are many of these systems in operation, for example GLOBAL GAP internationally, ASEAN GAP, focussed on Asian countries, and FreshCare in Australia. They are all based on a similar set of crop production and handling criteria, including traceability.

GAP is different to HACCP. The Hazard Analysis Critical Control Point (HACCP) system is designed to apply to processed food, including processed fruits and vegetables, while Good Agricultural Practices (GAPs) apply just to fresh produce. HACCP is required by law for producers of meat and poultry, seafood and juices, but is not required by law for other food products⁴. GAP is not required by law anywhere. Compliance is voluntary but driven by the market. Suppliers must comply if they want to supply markets that demand GAP.

Vietnam and Myanmar have developed their own GAP systems, VietGAP and MyanmarGAP, based on ASEAN GAP⁵ but adoption by farmers is lagging because they lack a strong modern retail (supermarket) sector that demands compliance. Most fruit and vegetables are still sold through the traditional wholesale market system.

However, supermarkets will come to dominate the sale of fruit and vegetables in Asian countries, as they have in all other developed countries around the world. Our idea for the project has been to use the GAP systems as a leader of change and make use of the current price premiums available to farmers who supply this sector to motivate them to produce GAP certified produce.

So, did it work?

7.1.1 Vietnam

In Vietnam, we think the approach has worked and will continue to expand in the Son La province. Farmers can receive a 30-40% price premium for vegetable sold to supermarkets, which require VietGAP compared to the wholesale markets^{6, 7} and there is significant unmet demand for certified produce, well packaged and supplied in good condition. The EOPR report for Vietnam estimated a 5% price premium for GAP certified

⁴ <https://ncfreshproducesafety.ces.ncsu.edu/ncfreshproducesafety-glossary-and-faqs/ncfreshproducesafety-frequently-asked-questions-faqs/>

⁵ <https://www.fao.org/publications/card/en/c/CB1303EN/>

⁶ [AGB/2014/035 Price monitoring study](#)

⁷ [Impact evaluation study of ACIAR vegetable research in Moc Chau, Vietnam](#)

vegetables, based on anecdotal information. The more rigorous project data does not support this figure.

While the size of the total market for VietGAP certified vegetables in modern retail is still relatively small, it is growing rapidly. In Vietnam in 2022 about 10% of total grocery sales are from modern retail and growing rapidly⁸ – vegetables will follow groceries.

For farmers involved directly in the ACIAR projects, the benefits have been significant. The 10 project villages in 2021 (176 farmers) were producing 3,300 tonnes of VietGAP vegetables per year compared to 31 tonnes in 2011. The average household income has risen 15-fold from 11 million VND to 176 million VND per year (AU\$10,000). This increase in net income was due to a 5-fold increase in average yields, a 30-40% price premium for VietGAP certified produce and more vegetable production instead of rice or maize.

Table 1. Moc Chau project farmers reap the benefits from project engaged farmers

	2011	2014	2021	Comments
Households producing VietGAP Vegetables	30	50	176	55% female
Vegetable production area (ha)	3.2	16.4	60.4	From project engaged groups (10) for 12 months
Vegetable production (tonnes)	31	344	3,300	
Average Yield (tonnes/ha)	9.7	21.0	54.6	Total of 3 crops per year
Net Income – project farmers (mVND)	317	1668	29,383	= \$1.77 million AUD
Net income per household (mVND/hh/yr)	11	33	167	= \$10,000 AUD 15 x increase

Why: 5 fold higher yields, 30-40% price premium for VietGAP, more vegetable production

The end of impact study estimated the total tonnage from Moc Chau to modern retail at 7,000 tonnes per year, so that means that only half of the VietGAP certified vegetables are coming from the project villages, another 3,700 tonnes are coming from real growth outside the project.

The mid-term reviewers suggested focussing on two pilot villages to try to get some market pull going on. We did do this, and there is a report in the value chain study and two case studies being developed. We struggled to get support from NOMAFSI for this as they preferred to support all 10 farmer groups. Fresh Studio thought this was outside of the scope for their role. Focus Group Go did some work with the retailers, but this was not well reported.

At the end of the project, the review team were critical that this aspect had not progressed as it had in Myanmar. Our observations were that there is good 2-way communication between the retailers and farmers, especially Ta Niet and AEON, but this was not well reported. There is also excellent communication between Tu Nhien, Greenfarm, An Thai and their retailers. The Bo Nhang group have moved away from a vegetable focus, so it was difficult to work with them.

7.1.2 Myanmar

The two pilot value chains set up to test the idea that supplying GAP certified vegetables to speciality markets in Myanmar can improve farm incomes and provide consumers with high-quality safe-to-eat vegetables, were:

1. **Nyaungshwe** (Taung Poet Gyi, Za Yat Gyi) to **Yangon** – supplying peppers and tomatoes

⁸ Sakata, Shozo ed. 2022. Development of Inclusive Food Value Chain in the Mekong Region. BRC Research Report. Bangkok Research Center. JETRO Bangkok / IDEJETRO.) [Link](#)

2. Pindaya (Pway Hla, Set Kyar Goan) to Yangon – supplying tomatoes

Farmers' groups from the Nyaungshwe and Pindaya districts supplied the supermarket chain City Mart with tomatoes and peppers via collection points in He Ho, using cool storage and refrigerated transport to Yangon. Consignments were also shipped directly to Clean Fresh Myanmar (CFM) via the public bus network. The project started supplying Myanmar GAP vegetables into City Mart in June 2021, after the main customer Future Glory reduced, and eventually ceased, orders after the military coup.

There was a strong demand for Myanmar GAP certified tomatoes and capsicums (sweet peppers) from both townships (Nyaungshwe and Pindaya). Snow peas were supplied from Pindaya in small volumes, at the request of Future Glory. Demand for cabbage and cauliflower was low, as these are traditionally over supplied in Myanmar, which presented a challenge for the Pindaya value chain, as these are their primary crops.

While the pilots only supplied a small volume (about 30 tonnes) before COVID-19 and the coup effectively stopped supply, the benefits to farmers were strong and clear, with price premiums to farmers normally in the range 40-150% higher than the wholesale market.

Seventy percent (70%) of the farmers thought that the project helped them increase their income, while 30% thought the contrary. Among the farmers who thought that the project helped them increase their income: 30% attributed this to lower production costs, 16% to higher yields and 14% to higher prices for their products. The average increase in income estimated by the farmers was 20%.

7.1.3 What support do farmers need to keep supplying supermarkets?

In Vietnam, the farmers need technical support in agronomy, e.g., new varieties, pest and disease management, VietGAP compliance and certification, postharvest handling, record keeping, etc. This ongoing need was also recognised by the review team. The project team has trained extension staff so they are able to provide this support, but we always hoped the farmer groups would pay for these specialist services from the additional profits they are making.

The project assistance to farmers stopped mid-2021 and they are supplying and expanding as of September 2022, so it does seem to be self-sustaining. A key factor in maintaining supply is the price premium from supermarkets. Once the price premium inevitably drops away, a different model will be needed but hopefully by that time supermarket market share will be large enough to drive compliance.

In Myanmar, this support was coming from the project team and the project coordinator. Without the project support, it is unlikely that the farmer groups will continue, especially given the cost of MyanmarGAP certification. The relationship between farmers and Future Glory was good and, if the relationship continues, they may continue to supply modern retail.

7.1.4 Public confidence in GAP

The problem is that GAP systems are designed to be run 'in the background' and rely on retailers to require farmers to comply as a condition of doing business with them. It's not designed to provide confidence to the general public about food safety. In developed countries, I doubt consumers would even be aware of the existence of GAP systems.

It's a tricky situation. We think in Vietnam VietGAP has been publicised in an effort to give consumers confidence about the safety of vegetables. So, maintaining or building public confidence is important. In Myanmar, I expect the public awareness of MyanmarGAP is very low, and consumers would be unlikely to pay a premium for MyanmarGAP certified produce.

However, if you are going to expect consumers to value GAP, then they need to have confidence in its integrity. We have doubts about the integrity of GAP system in both countries, and we think the main issues are:

- insufficient checking on pesticides usage and observation of withholding periods
- insufficient testing for pesticide residues at markets
- mixing crops from certified and non-certified farms and marketing it all as certified
- paper based system that lacks objective validation and tracking
- high cost of certification and auditing is a disincentive to get involved
- high standard required to achieve certification, discouraging participation.

Developing countries may need to consider a staged or partial system that will address 90% of food safety issues but is easier and cheaper to adopt. The less rigorous Vietnamese Safe Vegetable Certification is a good example of such a system.

7.2 A new vegetable industry in Vietnam

In 2011, farmers in Moc Chau were poor with average household incomes in Moc Chau of only 11 million VND per year (AU\$660). At the same time, emerging modern retail markets in Hanoi required certified Safe Vegetables or VietGAP certified vegetables, and were offering a premium price. In the summer 'off-season,' the only areas that could supply temperate vegetables (e.g., tomatoes, beans, lettuce, brassicas) to Hanoi were Da Lat (two days by road) or China.

Fast forward ten years to 2021 after two ACIAR investments (AGB/2009/053 and AGB/2014/035), and there is now a new vegetable industry with 8,000 - 10,000 farmers producing 70,000 tonnes of vegetables annually valued at about AU\$30.5 million net farm income, which did not exist when the project started.

Average farm incomes in Moc Chau have increased 5-fold from 11 million VND to 56 million VND per year (AU\$3,400), mainly due to a 30-40% price premium for VietGAP, doubling of average yields and growing vegetables instead of rice or maize (Table 2).

There are 90 new traders in the region and multiple new value chains supplying multiple markets, including direct supply from farm to supermarkets.

Urban consumers in Hanoi and provincial markets have also benefited from increased supplies of affordable, high-quality certified safe vegetables. We estimate that currently 10% of the vegetables produced in Moc Chau are now VietGAP certified.

To put this in perspective, the total vegetable production in Vietnam is about 10 million tonnes per year, the Red River Delta is about 3 million tonnes and Da Lat is about 1 million tonnes. So, Moc Chau is still only producing less than 1% of the national production, and only 7-10% of what Da Lat produces, so there is room for expansion.

Table 2. A new \$30 million, 70,000 tonne Moc Chau vegetable industry has been created. Safe vegetable production plus new conventional production.

	2011	2021	Comments
Households producing vegetables	30	10,000	55% female (est)
Vegetable production area (ha)	3.2	3,420	
Vegetable production (tonnes)	31	70,000	10% VietGAP
Average Yield (tonnes/ha)	9.7	20.5	
Net Income – all farmers (mVND)	317	506,688	= \$30.5 million AUD
Net income per household (mVND/hh)	11	56	= \$3,390 AUD 5 x higher
Why: 110% higher yields, 30-40% price premium for VietGAP, more vegetable production \$30.5 million AUD additional income per year compared to 2011			

7.3 Farmers' perspective: What did they value?

Training and technical support was highly valued by farmers in both Vietnam and Myanmar in all the feedback.

Direct access to new markets for farmer groups was rated highly, especially when they pay a premium price. Often, individual farmers do not know how to access modern retail markets. The retailers are not willing to deal with individual farmers but will deal with farmer groups.

Cross visits to other areas and visits to retail stores were highly valued, e.g., farmers from Myanmar visiting Vietnam, farmers from Moc Chau visiting Da Lat. Access to new varieties and crops, especially when they are trialled on farmers' properties and assessed by the project team, was also highly valued.

Pest management advice by project and extension staff who had specialist knowledge on pest management (identification, control methods) was valuable.

In Myanmar, 91% of the project farmers considered the farmer group was useful for them. The remaining 9% either did not belong to the farmer group or were not aware that there was a farmer group in the village. The main benefits provided by the farmer groups include: the sharing of information, knowledge and experience (mentioned by 36% of the farmers); price negotiation (23%); collective marketing (17%); the ability to work together (11%); the access to loans (9%) and the access to inputs at a better price (8%).

Record keeping was generally not well done, and the benefits that can come from using this data to understand their businesses better was not always valued.

7.4 Retailers' perspective: What did they like and where to improve

The retailers liked the fact that the crops had GAP certification. They also like point-of-sale material, photos, etc, that could be used to link the crops to the region, and even better to the farmers themselves.

In relation to filling orders, when the quality was good and the orders were filled as expected, they were happy. Often orders could not be filled, or only partially filled, and that was a problem. Poor quality such as postharvest rots, too old, temperature effects and poor grading were common problems. These issues limit the growth potential in Vietnam, and retailers in Hanoi have said they would order more from Moc Chau if the supply and quality were better.

In Vietnam, packaging and labelling of Moc Chau produce was an issue. Basic and unattractive packaging, and unattractive labels. Retailers want information about the crop, harvest date, origin, etc, on the label. QR codes are well regarded because consumers can scan them. The Moc Chau logo is terrible, the text is too small and it's not attractive. There is poor consumer recognition (based on a project consumer study).

In Myanmar, the issues were similar except the farmers did a better job of grading and filling orders. Production always exceeded orders, so supply was not an issue. The Myanmar farmers are more used to grading and supply, which is a strong basis for developing their trade in the modern retail sector.

7.5 Women, girls and ethnic minorities

In Myanmar, 80% of women surveyed said that involvement in the project has helped them to participate more in decision-making within their household. They mainly participated in farming decisions (e.g., record-keeping, post-harvest process, fertilizer and

pesticide application and handling). Some women also mentioned participating more in marketing decisions.

In Vietnam, the new vegetable industry is a significant employer of women and ethnic minority groups. In Moc Chau and Van Ho, 55%⁹ of the farmers are women and they are fully engaged in running businesses, planning, decision making and marketing. There are also many Hmong, Muong and Dao farmers engaged in this new industry, especially in the Van Ho district.

It is clear, however, that both men and women are actively involved in vegetable production, marketing activities and decision making. However, ethnic Kinh and Thai women, are much more likely to maintain a leadership and decision-making role. Women, in general, manage the finances and make decisions regarding growing and marketing vegetables. In contrast, while Hmong men and women are involved in vegetable production, it is the men that take the key leadership and decision-making role.

Women also appear to participate more in training on vegetable techniques, which is not the case for fruit growers. However, women's participation in training also depends on ethnic group. Kinh and Thai women take part in training more than men, but Hmong men take part more than women.

There was no explicit evidence that men were "taking over" leadership, decision-making and control from women as their businesses became more commercially oriented and financially successful. More so, it appeared from multiple sources, to be a case of men working with their wives and assisting them by taking on manual task such as land preparation, chemical application, irrigation, transporting and net-house construction. In FGDs some men expressed pride for what their wives had achieved, and their significant contribution to household livelihoods.

While the ACIAR project didn't set out to explicitly target women, it was an implicit goal of the project along with the livelihood improvements of the poor and minority households. However, women's active role in vegetable production was a key part of the project rationale. Therefore, the benefits of vegetable sector development accrued not just to the entire household, but also empowered women. As the key informants from the Van Ho Agricultural Service Centre noted, there is evidence the ACIAR project activities have directly contributed to women's empowerment and changing roles, especially for Hmong women. Through project training, technical support, and group interactions, Hmong women have improved their knowledge and techniques and become more confident to exchange their experiences. Previously, Hmong people rarely communicated with strangers but now they have become more confident to talk.

7.6 Building capacity

This is a major benefit of ACIAR projects in developing countries. Four project staff have been trained at Australian Universities as part of the John Allwright fellowship program (one PhD and three Masters' degrees). Project staff have also been trained in agronomy, crop protection, GAP, gender awareness, postharvest science and passed these skills on to farmers, extension staff and other staff in their institutions.

The project staff have also learned how to lead projects successfully, new research skills and been exposed to a large number of international visitors.

In Vietnam, the project team delivered a staggering 68 separate training events to farmers and extension staff over the four years of the project. The training included VietGAP, agronomy, crop protection, postharvest, business skills, marketing, sorting and grading

⁹ Dyer, R. (2022) Impact evaluation study of ACIAR vegetable research in Moc Chau, Vietnam Focus Group Go, Vietnam.

and measuring pesticide residues. In most cases, the farmers and DARD extension staff were included in the training which was mainly delivered by Fresh Studio and NOMAFSI staff.

In Myanmar, the training focussed on agronomy and Myanmar GAP and was delivered by East-West Seeds and Fresh Studio. There were 16 separate training events conducted on farmers' properties and directly improved the practical farming skills of 123 farmers. Topics included safe handling of pesticides, improved crop establishment, seedling production and many other skills that will help farmers improve productivity and produce safe, high-quality crops. Refer to the project impact videos for direct comments from project farmers in these areas.

The training was highly regarded by farmers, project and extension staff and made a significant contribution in building capacity in both countries.

7.7 Reflections on project development and implementation

This section contains some thoughts and experiences of the project leadership relating to project design and implementation that may be useful in the design and implementation of future projects.

Project design: The project was developed as a Phase 2, following on from project (AGB/2009/053) which was focussed on piloting the use of VietGAP to improve vegetable production, engaging with supermarkets which would pay a premium for GAP certified vegetables.

The end-of-project review of Phase 1 was strongly supportive of a Phase 2, with a focus on scaling. Phase 1 showed the approach worked, and the idea was that Phase 2 would try to understand the best way to support scaling.

In hindsight, this objective was rather vague and broad, and as a result the project as designed was also rather vague and broad. Many activities were included in the design, as can be seen by the large number of outputs produced, but how these activities were related and how the output from one activity would be used in other activities was unclear in the design. In many cases, outputs were not really used at all. The mid-term and end-of-project reviews also identified this as a weakness in the project and suggested ways in which information collected could be better used.

Because so many outputs were specified in the design, these had to be contracted at the start of the project, which had a major negative impact on flexibility and responsiveness as the project developed. It would have been much better to specify Year 1 activities, and then plan subsequent activities based on the findings of these foundational activities. Instead, the whole project was planned in detail from the start! I think this is a common problem with ACIAR projects, and it would be better to trust the project partners to revise the design as the project develops. Currently, this requires a 'variation' which is seen in some ways as a failure if required – i.e., why didn't you design it right in the first place?

The theory-of-change approach to project design that is now more popular would have been a much better guide to the design of the project. Define what you are actually expecting to happen as a result of the project and figure out how you are going to achieve that outcome, and measure impact. The expected outputs in this project were vague and really not well thought through. It was too much more of the same for the Vietnam side. The Myanmar project was better in that it followed a model that worked in Vietnam, and it worked well given the external constraints, especially post mid-term review.

Project partners: There is an expectation among project partners that if they have been involved in a Phase 1 then they should also be involved in a Phase 2. While the reasons for this from a delivery partner perspective are obvious, I believe the team designing the project should look at what each delivery partner can deliver against what is required and not just keep the same or similar team. The ACIAR model does not help and sometimes

the RPMs push for inclusion of certain partners. There is also the capacity building aspect, so it's not as simple as just finding the right organisation for the job. In hindsight, I think for this project, the delivery team was too similar to Phase 1, and lacked some crucial value chain, market skills and scaling skills.

Major partners are contracted directly with ACIAR and they expect to be paid as per the agreed contract to provide the services described in the proposal. Trying to change these contracts after the project has started, especially if it involved a reduction in money they receive, or an increase in activities is very difficult, and is a major impediment to project responsiveness. The review team was critical of project leadership around changing activities mid project, but the issues like this can make these mid-stream changes difficult.

Performance of project partners: Some project partners underperformed in my opinion. For example, being up to two years late with foundational reports, unwilling to be flexible in delivering what was required especially after the mid-term review, being unable to travel due to COVID-19 but still demanding full payment, including travel, and simply not doing what they were contracted to deliver. This may also be partly a project leadership issue, and it would be helpful if the project leader had more control of the sub-contracting, and perhaps more flexibility in expectations. Annual sub-contracts may be a solution.

Postgraduate training of key project staff: Towards the end of the first project, Dr Hung, who was the project leader in Vietnam, left for 3.5 years to do his PhD. This had a significant impact on the project, especially with continuity. While the postgraduate training is an important outcome of these projects, taking key in country staff out of leadership roles during projects is a significant challenge. One suggestion would be to approve JAF proposals for promising candidates but stipulate they must remain active in the current projects until it is completed. In our case, Dr Hung actually left the project six months before the JAF started, for English training in Vietnam.

Project leadership: My view is that we have struggled with project leadership in this project, especially in Vietnam. The issue described above re JAF scholarships did not help. Dr Hung was such an intuitive and engaged leader in Vietnam that his loss from the project left a major gap. He was the local coordinator in Vietnam in Phase 1. The review team identified that local coordination was lacking in both Vietnam and Myanmar in Phase 2. I think this highlights the difficulty of leading projects from Australia, and there really needs to be a full-time leader in-country, as was suggested by the review team. This worked very well in Myanmar when Shoon Lae was appointed.

COVID-19 meant that we could not travel to either country for two years, which was a major challenge for the leadership and for staff on the ground trying to deliver the project with local travel restrictions. It did mean that virtual meetings became the norm, and these worked quite well under the circumstances. I think monthly virtual meetings with project partners plus full-time local project coordinators should become essential parts of project management, perhaps with fewer trips by the project leadership from Australia to reduce travel costs. More leadership time in Australia would also be beneficial. Liam led the Myanmar component and I led the Vietnam component – I think Liam was more focussed on the role and did a better job.

Multiple countries in the one project: The rationale for including Myanmar in the project was to apply the learnings from Vietnam to Myanmar. In reality, there were significant differences between the two countries, and it was more like two separate projects. We think there needs to be clear synergies between countries for multi country projects to be effective.

7.8 Spill over effects and supporting projects

The ACIAR project has spawned new programs such as the Australian AID Aus4Equality (GREAT program) and Aus4Innovation which have together invested more than AU\$3.5 million in helping the new vegetable industry to scale.

On-farm cool rooms are now more common, with at least eight in the area, and at least one farm in Moc Chau has a state-of-the-art vacuum cooler to remove field heat and improve the quality of crops arriving at the market.

There are a range of international companies now providing services and inputs such as seed, growing media, greenhouses and expertise to Moc Chau and Van Ho vegetable farmers that were not operating in the region in 2011. Examples include:

- BVB-Substrates (Dutch): Seedling media
- New seed companies: e.g., Gautier Semences (French): lettuce seeds; Agrico (Dutch): Potato seeds; Semillas FITO (Spanish): Beefsteak tomato seeds; Rijk Zwaan (Dutch): Tomato seeds; LimGroup (Dutch): Asparagus seeds
- Royal Brinkman (Dutch): Greenhouse technologies
- Fresh Studio providing agronomic support and various other services to farmers and retailers.

7.9 Summary response to Mid-term Review

A project mid-term review was conducted in 2019 and this resulted in some fundamental changes to the project in Myanmar and Vietnam. There were 20 separate recommendations and the detailed response to these is included in a separate review document and in the Vietnam final report. The detailed response can be [accessed here](#).

The workplans for each organisation were revised to accommodate the recommendations of the mid-term review. Workplans were simplified with links to each work plan below.

Key changes to the approach in Vietnam included:

- Split the project from the Myanmar component
- Efforts were focussed on supporting two pilot value chains and measuring the impact compared to business as usual. The pilots were the Bo Nhang and Ta Niet farmer groups
- AHR to take a more hands-on approach to project management. Workplans were revised and simplified, and monthly meetings held with all partner groups to monitor progress and address issues
- We worked more closely with GREAT. AHR and NOMAFSI took on a mentoring role with the GREAT vegetable projects and tried to support them with project skills and resources to assist their projects with scaling VietGAP-certified safe-to-eat vegetables produced in Moc Chau and Van Ho
- The project worked more closely with the retailers to re-establish direct contact with farmer groups, assist with packaging, labelling and displays. We also undertook postharvest monitoring of quality from Moc Chau to Hanoi
- The project team undertook detailed value chain studies: Rapid Market Appraisal and value chain study of the Moc Chau and Van Ho value chains. The team also completed a detailed impact study at the end of the project
- Linked with an Aus4Innovation project on piloting low-cost CoolBot cool rooms and cool trucks in Moc Chau and Van Ho, then showcased the benefits.

In Myanmar, there were also a large number of recommendations from the mid-term review. The full account of recommendations and responses is [available here](#) but in summary, the changes that were made to the project in response to the recommendations included:

- Split the project from the Vietnam component

- Two pilot value chains were established from Taung Poet Gyi and Za Yat Gyi to Yangon, via distributors such as Future Glory and METRO
- Shoon Lae was employed as a local coordinator to establish value chains supplying retailers and distributors. Shoon Lae was responsible for day-to-day communication with farmers. She held fortnightly meetings with the project lead in Australia to discuss project progress and objectives. Regular (monthly) Zoom meetings were held with all project partners
- Each project partner was provided with clear guidelines on tasks, objectives and in some cases time allocations. Workplans were developed. Monthly meetings were held with the project team in Myanmar
- Sales forecasts, farm gate prices and volumes were recorded, which allowed farmers to see the benefits of selling through Myanmar GAP value chains, despite the increased costs of grading and packaging
- MyanmarGAP continued to be used by the project, as this was demanded by the retailers and distributors that the project engaged with. The project supplemented MyanmarGAP with frequent on-farm testing of pesticide residues, which was well received by retailers and distributors.

7.10 COVID-19 impacts

The COVID-19 pandemic greatly affected the production, supply, and consumption in both countries. COVID-19 disruptions on the market demand and supply chains meant that farmers had more difficulty selling their products and were less optimistic about the market. During 2020 and 2021, vegetables could not be collected and transported easily.

The price of fertilizer and pesticides also increased significantly during the pandemic. There were also disruptions to fertilizer and pesticide supply chains and deliveries. Prices of vegetables were also constantly changing.

In response to increasing costs and volatile prices, many farmers reduced their levels of input use, reduced their vegetable production areas or number of crop cycles for the season. Farmer incomes were significantly reduced.

Input suppliers and traders were also affected by COVID-19 disruptions. It was a lot more difficult for traders and collectors to collect vegetables. COVID-19 safe procedures increased the time and cost of collection and transport. Demand for fertilizer from input suppliers was reduced.

7.11 Where to from here?

In relation to the Myanmar side of the project, the recommendation from the review team was to continue with more work in that country. At the time of writing, further activity in Myanmar will not be possible due to the military coup.

In Vietnam, an SRA (AGB/2021/153) *Piloting digital monitoring of VietGAP compliance and quality in Vietnam vegetable value chains* is currently underway and is evaluating the use of digital tools to improve the traceability and reporting requirements of VietGAP certified vegetables from Moc Chau to Hanoi. This lack of traceability was confirmed as an issue currently facing farmers and retailers in Vietnam. More broadly, the concept of digital traceability will be tested on VietGAP or GLOBALGAP certified fruit, targeting the export markets.

A concept note for project AGB/2022/114 (*Digital monitoring of VietGAP compliance, quality, logistics and handling and retail point of sale compliance (to specifications) with feedback to producers and their producer groups in Vietnamese horticultural value chains was submitted and approved for development*) has been approved for development into a full project proposal.

8 Impacts

The impacts described below are summarised from the two country-specific reports. For more details, please refer to these reports.

8.1 Scientific impacts – now and in five years

Vietnam

The project applied a strategic, research for development approach, phased over two project cycles, that identified, evaluated, and then promoted adoption of critical good agricultural practice (GAP), upgrading options and technologies for safe-certified off-season vegetable production. Some of these innovations included improved varieties and agronomy capability, developing linkages to high-value markets, development and implementation of safe production protocols and certification, pest and disease management, record keeping, branding, and labelling, packing and handling, group establishment and governance.

A key recognised component of the ACIAR work was the facilitation of linkages between safe vegetable grower groups and high-value vegetable supermarkets. This required improving grower technical capability and output, initiating contacts, facilitation cross-visits, guidance of production scheduling to meet customer product requirements, feedback sharing, supporting ability of groups to meet quality, packaging, and labelling requirements. Use of mobile, SMS and social media platforms between chain actors has been critical.

The group governance study provided important insights into how the Vietnamese co-operatives really work. They function much more like a commercial company, and do not effectively share wealth among 'cooperative' members. There is a need for greater flexibility in farmer governance structures to adapt to customer needs, e.g., quality feedback, new and greater diversity of varieties, and information flow between supermarkets and grower groups.

The understanding and successful implementation of safe vegetable certification and the production and record keeping protocols underpinning the certified Moc Chau safe vegetable trademark within ACIAR project groups was fundamental for accessing and growing the supply of higher-value vegetables to supermarket outlets. Initial project groups have continued to expand their membership, output and supply of these and other markets, some ten years after establishment.

Myanmar

The value chain and transport study should be published and available to retailers, traders, farmers and other projects in Myanmar, but it would be up to CIRAD to publish this report. It has been translated into Burmese.

8.2 Capacity impacts – now and in five years

Vietnam

By the end of the project there were many more local traders in Moc Chau and Van Ho than when the project started. At least 89 traders plus specialised safe vegetable wholesalers, processors and distributors.

International support organisations, including Gautier Semences, Agrico, Semillas FITO, Rijk Zwaan, LimGroup, BVB Substrates, Royal Brinkman and Fresh Studio, supplying seed, growing media, greenhouses and expertise to Moc Chau and Van Ho farmers.

Eight on farm cool rooms were operating in Moc Chau by the end of the project, and at least one farm in Moc Chau has a state-of-the-art vacuum cooler to remove field heat and improve the quality of crops arriving at the market.

We estimate 200 farmers in the Moc Chau and Van Ho districts were VietGAP certified and producing safe vegetables according to the VietGAP protocols in a safe and sustainable way by project end, compared to none when the project started in 2011.

NOMAFSI staff, farmers, district PCs staff and DARD were trained in VietGAP-compliant techniques and the latest agronomic and crop protection techniques, supported by new best practice guides and information.

Development of Moc Chau **Rau An Toan Moc Chau** safe vegetable brand provided the opportunity for Moc Chau Peoples' Committee to advertise and promote safe vegetables to the market, facilitating the development and expansion of safe vegetable production areas, creating job opportunities and improving farmers' livelihoods.

Staff training: The following staff were trained as part of the ACIAR John Allwright Fellowship postgraduate training program:

- Dr Nguyen Phi Hung (NOMAFSI) has completed a PhD program in climate change and policy in Australia and Vietnam from the University of Sydney. Dr Hung was awarded a John Allwright Fellowship which supported his study in Australia
- Ms Bui Tui Hang (NOMAFSI), a Moc Chau based project team member, was awarded a John Allwright Fellowship to study for a master's degree in agriculture at the University of New England in Australia
- Mr Bui Van Tung (NOMAFSI), a Moc Chau based project team member, was awarded a DFAT Australia Awards Scholarship to study Master of Science in Agriculture (Agribusiness) at the University of New England in Armidale, NSW.

Dr Nguyen Quoc Hung, now director of NOMAFSI, was trained in Australia under the John Dillon program.

Scaling: The ACIAR project spawned new programs such as the Australian AID Aus4Equality Gender Responsive Equitable Agriculture and Tourism (GREAT program) and Aus4Innovation. Together these programs invested more than \$3.5 million in helping the new vegetable industry to scale in Son La and Lao Cai, including seven vegetable projects modelled directly on this ACIAR project. The ACIAR project team is advising GREAT on technical aspects of implementation to support the six GREAT vegetable projects and organising a workshop to support them.

Myanmar

Four villages were Myanmar GAP certified, opening access to premium markets via distributors and retailers serving Yangon.

Aye Aye Thwe (YAU) was awarded the John Dillon Scholarship for a study tour to Australia in April 2020. Unfortunately, border restrictions prevented her visiting Sydney as planned.

Isabelle Vagneron and Frederic Lancon (CIRAD) provided a mentorship to the YAU economics team throughout the project term. The teams conducted multi-week surveys together. This included baseline surveys of farmer knowledge and incomes, and the transport and value chain survey in December 2019. CIRAD also provided guidance to the YAU team for the end of project survey.

The training program in agronomy and Myanmar GAP have directly improved the practical farming skills of 123 farmers. This includes safe handling of pesticides, improved crop establishment, seedling production and many other skills that will help farmers improve productivity and produce safe, high-quality crops. Refer to the project impact videos for direct comments from project farmers in these areas.

The YAU staff and students involved in the field trials have improved their skills in establishing and running trials on farmers' properties. The lead on this activity for YAU Horticultural team, Dr Saw Hto, said this project was the first time he has worked directly with farmers on trials, learning a great deal from this experience.

8.3 Community impacts – now and in five years

ACIAR's investment in vegetable research for development in Son La province occurred over 10 years between 2011 and 2021 and the current project is a direct continuation of the initial project AGB/2009/053 "*Improved market engagement for counter-seasonal vegetable producers in north-western Vietnam*" that ran from 2011 to 2016.

The new 70,000 tonne per year vegetable industry is a significant employer of women and ethnic minority groups. In 2021 in Moc Chau and Van Ho, 55%¹⁰ of the farmers were women fully engaged in running businesses, planning, decision making and marketing. There are also many Hmong, Muong and Dao farmers engaged in this new industry, especially in the Van Ho district.

Before growing vegetables, smallholder farmers in both Moc Chau and Van Ho mainly planted rice, maize and canna (*Canna indica*). Vegetables were introduced into a "maize-vegetable" or a "rice-vegetable" rotation cropping system, mainly on unirrigated land.

During the second half of the ACIAR investment, the Australian government invested in vegetables in the region via other programs with a focus on scaling and gender equality, e.g., the Aus4Equality GREAT program and the Aus4Innovation program. Therefore, impacts presented in this section should be attributed to not just the current project, but also to these programs. Supporting investments by the Vietnamese district and provincial government, should also be recognised, and these investments were very effective.

8.3.1 Economic impacts

Vietnam

On a regional basis, in 2021 there was a new vegetable industry where 10,000 farmers produced 70,000 tonnes of vegetable per year, generating AU\$30.5 million of new net farm income which did not exist in 2011 when the project started. Average farm incomes in Moc Chau had increased 5-fold at the end of the project from 11 million VND to 56 million VND per year (AU\$3,400), mainly due to a 30-40% price premium for those following VietGAP, a doubling of average yields and growing vegetables instead of rice or maize.

In 2021, the ten project farmer groups (176 farmers) were producing 3,300 tonnes of VietGAP vegetables per year compared to 31 tonnes in 2011. The average household income had risen 15-fold from 11 million VND to 176 million VND per year (AU\$10,000). This was mainly due to a 30-40% price premium for VietGAP, 5-fold increase in yield, and replacing rice or maize with vegetable production.

Importantly, at the project end, there were many new vegetable value chains operating in Moc Chau including the direct supply of VietGAP-certified vegetable from Moc Chau to retailers in Hanoi, including AEON, Big C, VinMart, Mega Market, Big Green and Bactom. The impact evaluation study¹⁰ estimated 10% or 7,000 tonnes per year of the Moc Chau produce is being sold through this direct value chain, which included direct communication between farmers and retailers.

¹⁰ Dyer, R. (2022) Impact evaluation study of ACIAR vegetable research in Moc Chau, Vietnam Focus Group Go, Vietnam.

Vegetable production and trading was providing higher incomes to around 8,000-10,000 smallholder farming households and over 90 traders in these two districts. Vegetable production also provided many other business and employment opportunities related to input supply, harvesting, grading and packaging, and transportation. Women and ethnic minority families were beneficiaries of this industry with 55%¹¹ of farmers women and Hmong, Muong and Dao farmers engaged in this new industry, especially in the Van Ho district.

According to a Moc Chau Agricultural Service Centre representative, the average income per hectare doubled from 28 million VND (AU\$1,750) per hectare to 60 million VND (AU\$3,750) per hectare since 2011, with vegetables being the main driver of the change.

At the household level, vegetable production was providing a major and regular source of income, resulting in significant increases in household income. Between 2011 and 2021, farmers in Moc Chau established and expanded vegetable production, improved quality and linked to higher value markets. For example, in an impact evaluation case study, only 20% of Tu Nhien farmer, Ms Houg's 2011 household income was generated from vegetables, returning about 40-50 million VND (~ AU\$3,000). However, by 2016 vegetables and plums each contributed 50% to her household income, returning around 300 million VND each (~AU\$18,000).

Similar changes also occurred from around 2016 in Van Ho district. Mr Lo from Ban Xã commune, Vân Hồ district, started growing vegetables as part of the ACIAR project in 2016. This is how he reflected on the changes to his life.

Vegetables [have] changed my whole family life.....Vegetables [are] the reason [for] increased income, and [being able to] repay debt. [My] children had more nutritional food, enough warm clothes for winter and had [a] better chance to go to school. I have built a new house and bought all household items. Vegetables now give daily money.

In 2011, Mr Lo had only 360 m² of land planted to vegetables, but now has 1 ha. In the past, cultivating rice on 1000 m² produced an income of 2.5 million VND/year (AU\$150). Since Mr Lo changed to growing tomatoes, he can earn 60 million VND/summer season (AU\$3,600) and vegetables now provide 30% of this household income.

Before 2017, the household income of Mr Thanh, an ethnic Dao farmer in Van Ho, was derived from corn (~40%), rice (~30%), livestock (~20%) and arrowroot (~10%). In 2021, the majority of his income came from vegetables (~50%), with the remainder from rice (~20%), wages from outside labour (~10%), fruit trees (~10%) and livestock (~10%).

Myanmar

Two value chains were operating out of four project villages and supplying Myanmar GAP certified vegetables to retail outlets in Yangon.

- 1. Nyaungshwe** (Taung Poet Gyi, Za Yat Gyi) **to Yangon** – supplying peppers and tomatoes
- 2. Pindaya** (Pway Hla, Set Kyar Goan) **to Yangon** – supplying tomatoes

Farmers groups from the Nyaungshwe and Pindaya districts were supplying the supermarket chain City Mart with tomatoes and peppers via collection points in Heho using cool storage and refrigerated transport to Yangon.

¹¹ Dyer, R. (2022) Impact evaluation study of ACIAR vegetable research in Moc Chau, Vietnam Focus Group Go, Vietnam.

More than 30 tonnes of Myanmar GAP certified vegetables were supplied to distributors and retailers including Future Glory, METRO, Farm Shop, CFM, and City Mart. Tomato and capsicum were the most sought-after vegetables, followed by cabbage, cauliflower and snow peas. Approximately 1,300 viss (2.1 tonnes) of GAP certified vegetables were supplied each month. Seventy percent (70%) of project farmers reported an increase in income from the project.

The project was on a strong trajectory until the military coup in February 2021, despite COVID-19 restrictions. Close relationships were forged between farmers, distributors and retailers.

Future Glory was the prominent customer for project farmers and has adapted well to the new political situation. They have a collection point at Heho where vegetables are sorted, cleaned and packed for refrigerated transport to population centres. Future Glory proved to be the most reliable customer of tomato and capsicum, purchasing 700-1,400 viss per month at 550-650 MMK/viss, which is double the price at Aungban market. Vegetables are supplied into City Mart, Capital Hypermarkets, Makro and other retailers in Myanmar. Future Glory is also seeking to expand their export opportunities into South East Asia.

METRO was a regular customer of the project's farmers, assisted by a close working relationship with Fresh Studio. METRO orders rapidly contracted from March 2021 as their refrigerated trucks were unable to travel due to military action and unfortunately, METRO exited the Myanmar market in October 2021. Before this, METRO was ordering 100-200 viss per month.

Farm Shop is an online retailer that grew rapidly during the lockdowns of 2020. Farm Shop purchased relatively small volumes of 90 viss (144kg) per month, however, paid a good premium of up to 1,700 MMK per viss for top grade tomatoes, compared to 300-350 MMK/viss at Aungban market.

8.3.2 Social impacts

Vietnam

The new vegetable industry is a big employer of women and ethnic minority groups. In Moc Chau and Van Ho, 55%¹⁰ of the farmers are women and are fully engaged in running businesses, planning, decision making and marketing. There are also many Hmong, Muong and Dao farmers engaged in this new industry, especially in the Van Ho district.

Increased income at the household level allowed children to attend school, increased expenditure for food and health insurance, and improved housing. There was a significant reduction in the number of poor households, especially for ethnic minorities. According to Van Ho Peoples' Representative Committee, the rate of poor households fell from 20-30% to 7% with vegetable production being a major contributor¹⁰.

According to the Women's Union in Van Ho, most women have been participating in vegetable production hence, substantially contributing to an increase in family income and resulting in women being more economically empowered. "Women are stronger, and they raise their voice", increase their participation in social activities, training and participation in new projects. According to Van Ho Agricultural Service Centre representative, Ha Mong, women have improved their knowledge and skills and have become more confident to communicate with people outside their kinship group.

Myanmar

Farmers reported that their health and safety was significantly improved by the agronomics and GAP training, and this was the most significant outcome from the project. They had not previously received formal training in how to use pesticides correctly.

Training and continued on-farm support provided the farmers with the knowledge and confidence to minimise pesticide use and practice integrated crop management.

Farmers are now able to identify when and why chemicals need to be used, allowing them to use much less product, improving their safety and the safety of the vegetables they sell. A video was produced showing human health benefits of GAP to farmers and consumers.

8.3.3 Environmental impacts

Vietnam

The main environmental benefits include the area of safe vegetable production significantly increasing, and farmers practicing safe use of pesticides and increasing their knowledge of identifying pests and diseases, and correctly applying pesticides. Significant improvements have been made in handling, collection and disposal of pesticide containers and other packaging material.

Farmers improved their irrigation practices reducing run-off and soil degradation. Farmers stopped using fresh manure in vegetable production, which also reduced the general usage of untreated fresh manure because farmers learned how to treat manure for their vegetable production. Some key impacts include:

- Reduced pesticide use, by following VietGAP protocols, and using less toxic, modern crop protection products at correct rates
- Improved vegetable food safety and product quality
- Lower rates of fertiliser, likely resulting in less nitrate and phosphorus leachate into waterways and ground water.

There has been a switch from rice to vegetables in the Moc Chau region, leading to a possible climate change impact. Rice farming is known to be a major contributor to climate change, but new research suggests it is a far bigger problem than previously thought. Recent research has shown that greenhouse gas emissions in rice are 45 times higher than previously thought due to an underestimation of nitrous oxide emissions¹².

Vegetable farming results in much lower greenhouse gas emissions than rice, especially if nitrogen and irrigation are well managed¹³ (Hung et al, 2019 pers. comm). A change from rice to vegetables in Vietnam and Myanmar may have significant environmental benefits as well as economic benefits.

Myanmar

Reduced pesticide use in Taung Poet Gyi and Zayetgyi has a direct impact on the water quality of Inle Lake. Agronomic and GAP training provided farmers with knowledge to better match crop requirements, limiting excess nutrient runoff into the lake. Myanmar GAP also requires farmers to use less toxic pesticides, which is especially relevant for tomatoes grown on floating beds in Inle Lake. Khaung et al found that areas of Inle Lake, where Myanmar GAP certified farmers operate, contain less pollutants such as nitrogen and phosphorus¹⁴.

¹² Kritee et al. (2018) High nitrous oxide fluxes from rice indicate the need to manage water for both long- and short-term climate impacts *PNAS* 115 (39) 9720-9725

¹³ Hung et al, 2019 pers. comm

¹⁴ Khaung, T., Iwai, C.B. and Chuasavathi, T., 2021. Water Quality Monitoring in Inle Lake, Myanmar from the Floating Garden Activity. *Malaysian Journal of Fundamental and Applied Sciences*, 17(5), pp.593-608.

8.4 Communication and dissemination activities

Articles

John Baker (2021) Covid-19 stimulates innovation in retail training delivery. Asia Fruit magazine June, pp 41-43. [Asia Fruit article retail training p.42-43](#)

Good Agricultural Practice programs secure farm-to-plate safety [ACIAR Partners 2021 Issue 2](#)

Accredited 'safe' vegetables help Vietnamese farmers earn more [ACIAR Partners 2020 Issue 1](#)

Quality vegetables find their markets [Quality vegetables find their markets Partners Issue 4 2018](#)

Rogers, G. S., Yi., D. and Pham, Thi Sen (2017) Vegetable farming systems in North West Vietnam [North West Vietnam Research Symposium](#)

People power forges new Myanmar supply chain (2020) [ACIAR Partners magazine Issue 3 pp. 8-9](#)

Videos

Moc Chau delivers safe, fresh vegetables: English version

<https://www.youtube.com/watch?v=DcFI86wGTa4>

Moc Chau delivers safe, fresh vegetables: Vietnamese version

<https://www.youtube.com/watch?v=5fAeru-XyyU>

Postharvest train the trainer video presentations aimed at managing cool chains in Vietnam:

Vegetable Postharvest Physiology <https://www.youtube.com/watch?v=alydEWvTKzk>

Managing Temperature <https://www.youtube.com/watch?v=aYcYNhz3810>

Managing Cooling <https://www.youtube.com/watch?v=VVDvVHa7xVA>

Myanmar GAP Vegetable Supply Chains: Video intended for an international audience, highlighting the achievements of a value chain driven approach to improving the livelihoods of small holder farmers in Myanmar.

Benefits of Myanmar GAP: Video intended for local Myanmar farmers considering achieving Myanmar GAP certification.

Showcasing events

A networking and showcasing event was hosted in Aungban in December 2018, where local traders, project farmers and project staff shared the achievements and goals of the project. [Posters](#) were produced in Myanmar language for the farmers' benefit.

Showcasing event in Hanoi – 2019

Factsheets

[Improving livelihoods in Myanmar and Vietnam through vegetable value chains](#). A factsheet was produced for the ACIAR website featuring Vietnam and Myanmar.

[How to establish safe vegetable value chains in Myanmar](#) Case Study 2022

Facebook

Fresh Studio published key outcomes and outputs of the project on Facebook. Facebook has extremely high market penetration in Myanmar, and for many people it is the only access they have to the internet, as data is free when accessing Facebook.

Fresh Studio Myanmar

Send Message
Following
Q
...

Send Message
Following
Q
...

Page transparency See all
Facebook is showing information to help you better understand the purpose of a Page. See actions taken by the people who manage and post content.

Page created – 24 October 2018

Add your business to Facebook
Showcase your work, create ads and connect with customers or supporters.

Create Page

Privacy · Terms · Advertising · Ad choices · Cookies · More · Meta © 2021

Fresh Studio Myanmar

29 July ·

English Version Below!

Fresh Studio Myanmar သည် ACIAR စီမံကိန်း တစ်ခု ဖြစ်သည့် အနက်ရိက္ခာ ဖွံ့ဖြိုးရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်း သည့် စိုက်ပျိုးရေး ထုတ်ကုန်များ ထုတ်လုပ် ဖြန့်ဖြူး တောင်းသူများ၏ ဝင်ရောက် လှူဒါန်းဖြင့် ပြုတိုးတက်ရေး စီမံကိန်းကို ဆောင်ရွက်လျက် ရှိပါသည်။

စီမံကိန်း၏ အဓိကရည်ရွယ်ချက်မှာ ဘေးအန္တရာယ်ကင်းရှင်းပြီး အရည်အသွေးမြင့် ဟင်းသီးဟင်းရွက် တစ်မျိုးဖြင့် ဈေးကွက်တွင်အက် ဖွံ့ဖြိုးရေးလုပ်ငန်းများ လုပ်ဆောင်ရန်ဖြစ်ပါသည်။

“စီမံကိန်းမှတစ်ဆင့် ကျွန်တော်တို့ စိုက်ပျိုးရေးဆိုင်ရာအလေ့အကျင့်တစ်ခု ဖြစ်သည့် လုပ်ငန်းစဉ်များ ပြုပြင်ဆင်ခြင်မှုများ ပြုလုပ်ခြင်းဖြင့် စားသုံးသူအတွက် အကျိုးရှိအောင်လုပ်ဆောင် နေစေတော့မည်ဖြစ်ပါသည်။ စားသုံးသူအတွက် လိုအပ်သည့်အချက် အလျောက် စားသောက်ကုန်တွေ ထုတ်လုပ်ပေးနိုင်တာကို ဂုဏ်ယူစေသောမိမိတို့အား အစရှိ ကျွန်တော်ထုတ်ကုန် ခရမ်းချဉ်သီးတွေက GAP အသိအမှတ်ပြု လက်မှတ်ရ ထုတ်ကုန်တွေဖြစ်နေပြီဖြစ်ပြီ။ ဝယ်လက်အသစ်တွေနှင့် လည်း ချိတ်ဆက်နိုင်နေပါ ပြီ။ နောက်ပိုင်းမှာလည်း ထပ်မံပြီး ဝယ်လက်အသစ်တွေနှင့် ချိတ်ဆက်သွားနိုင် ဖွဲ့ ယ်ကြည့်မိပါသည်။” ဟု စီမံကိန်းတွင် ပါဝင်ခဲ့သည့် တောင်သူ ဦးဝင်းဇော်နှင့် မှ စီမံကိန်းမှ ရရှိသော အတွေ့အကြုံများကို ဝေမျှပေးခဲ့ပါသည်။

ယခုဖြစ်ပေါ်နေသော အခက်အခဲကာလအတွင်း Fresh Studio မှ Local Coordinator မန္တလေးအောင်မှ တောင်းသူများ၏ ဈေးကွက် ဆက်သွယ်မှုများ အဆင်ပြေစေရန်အတွက် ကူညီချိတ်ဆက်ပေးခဲ့ပါသည်။

မကြာမီအချိန်အတွင်း စီမံကိန်းပြီးမြောက်တော့မည်ဖြစ်သည့်အတွက် စီမံကိန်းနှင့် ပတ်သက်သော အကြောင်းအရာများကို <https://myanmarveg.com/> တွင် ဝင် ရောက်ကြည့်ရှုနိုင်ပါသည်။

“The project really changed some of my farming habits; I now know how to apply fertilizer and pesticides responsibly. It makes me really proud that I can produce safe products for consumers from now on.”

U Win Htay Naing, one of the vegetable farmers who took part in the Australian Centre for International Agricultural Research (ACIAR)-funded vegetable value chain project, explains how the work impacted his farming business. “I can also sell my tomatoes as real GAP-certified products now. This means that I’m selling my produce to new buyers, but I’m also more confident that I can sell my produce to higher-end buyers in future.”

Despite the difficulties in Myanmar, Fresh Studio’s Shoon Lee continued to facilitate market linkages during a crucial time. The project is now coming to an end – read more about its impact on <https://myanmarveg.com/>

Page 44

9. Conclusions and recommendations

9.1 Conclusions

The overall project aim was to improve farmer incomes and livelihoods by developing sustainable and inclusive high-quality vegetable value chains in Vietnam and Myanmar. The comments below relate to how well this aim was achieved and what was found.

9.4.1 Vietnam

In Vietnam, there was absolutely no doubt that farmer incomes could be improved by targeting modern retail with VietGAP certified vegetables. Farmers involved in the project have been able to increase their incomes 15-fold from 11 million VND to 176 million VND per year (AU\$10,000), mainly due to a 30-40% price premium for VietGAP, 5-fold increase in yield, and replacing rice or maize with vegetable production.

On a regional basis, by just growing vegetables instead of rice or maize, farm incomes have increased 5-fold from 11 million VND to 56 million VND per year (AU\$3,400), mainly due to a 30-40% price premium for those following VietGAP, a doubling of average yields and growing vegetables instead of rice or maize. Greater yield increases are possible if the broader vegetable growing sector further improves practices, as the project farmers have shown is possible.

The VietGAP approach is working in terms of reducing pesticide residues, based on the testing on retail markets done by the project team. The small number of residue detections were due to farmers using non VietGAP compliant insecticides, but residue levels did not exceed maximum residue limits. There are significant social benefits from growing VietGAP certified vegetables and 55% of the farmers are women. They are fully engaged in running businesses, planning, decision making and marketing. There are also many Hmong, Muong and Dao farmers engaged in this new industry, especially in the Van Ho district.

The ACIAR project can take full credit for the benefits seen by the 10 farmer groups that have been involved in the project, described above. In terms of the regional benefits and the new vegetable industry in Moc Chau, some credit should go to the GREAT program and other donor activities in the region. Probably more importantly, normal commercial development is undoubtedly also a major factor, with farmers, traders and input suppliers seeing an opportunity and investing. Surely this is a good thing, and what we were hoping at the start.

There are some significant issues that should be addressed if the industry is to develop in an orderly way to meet its potential. The Moc Chau vegetable industry is still only 3% of the national production compared to the Red River Delta which is 30% and Da Lat at 10%. Some improvements are needed, especially in supermarkets, to increase demand. These include:

- Better packaging, labelling and marketing
- Improved postharvest handling, cool chain, quality, grading and supply
- Point of sale materials to promote Moc Chau and VietGAP to consumers
- Improved VietGAP compliance and regulation, including traceability
- Stop conventionally grown vegetables being sold as VietGAP compliant
- Strengthen the extension support for farmers provided by district and regional level government
- Learn from the Da Lat experience

There has been significant private investment in vegetable related support industries including seed, greenhouses, crop protection and technology, especially from international companies.

9.4.2 Myanmar

The overall aim was broadly achieved in that it was shown that farmer incomes could be improved by targeting modern retail with MyanmarGAP certified vegetables.

The project developed two successful vegetable value chains from Nyaungshwe and Pindeye to Yangon through prominent distributors and retailers. Training and support have increased the capacity of farmers from the four targeted villages to grow high-quality vegetables in a safe and sustainable way.

Project partners have produced high-quality research on transport and value chain networks in Myanmar, and a strong mentor relationship between CIRAD and YAU economics teams was created. Farmers have been introduced to the value of cool chain storage and transport.

There needed to be a 3rd party aggregator or trader engage to make this happen, it was not possible in this project to achieve direct trading with retailers. There were some innovative approaches such as the safe vegetable market at Yangon and online trading that looked promising.

The impacts of COVID-19 plus the coup meant that operations were very limited and really shut down before they had a chance to build momentum. This was a shame but it left a good framework and learnings in place should there be an opportunity to restart activities in the future.

The training was very well regarded by farmers and they were all able to achieve MyanmarGAP certification and supply the standard of crop that was required by the modern retail sector.

Success of the vegetable value chains is largely dependent on the outcome of the political situation in Myanmar. Research from 2019 showed a quarter of Yangon consumers were willing to pay a 25% premium for safe and high-quality vegetables. However, a UN report estimated half the Myanmar population will fall below the national poverty line by 2022, if strong corrective action is not taken by a government of Myanmar¹⁵.

The vegetable market was gradually stabilising as of November 2021, freedom of travel and communication is returning, and the pilot farms had a new major customer, City Mart. How this market develops will depend on the political situation in Myanmar.

It seems doubtful whether the cost and effort required to obtain MyanmarGAP certification would be viable if it were not for the project. Apart from the limited modern retail sector who were willing to pay a premium for GAP produce, it is difficult to see how this approach can solve the pesticide residue issues in vegetables in the short to medium term. The wholesale market does not seem to be willing to pay a premium, and it is difficult to differentiate GAP produce from conventional.

However, quality assurance is the way of the future, and as the modern retail sector develops, demand for GAP produce will increase and farmers will need to comply if they want a share of that market.

The Myanmar government (DOA) could consider a scaled GAP approach that is easier to implement and would deliver 80% of the benefits of the full MyanmarGAP system.

9.4.3 Broader conclusions

From an ACIAR perspective, future projects should include a locally based coordinator. The project design should include flexibility so that activities are actually informed by what is found in foundational activities and ensure results are delivered on schedule. Project

¹⁵ https://www.asia-pacific.undp.org/content/rbap/en/home/library/democratic_governance/covid-19-coup-d-etat-and-poverty-impact-on-myanmar.html

delivery partners should be chosen on merit and not simply because they were involved in a previous project, although capacity building should be considered in selections.

Training and capacity building were highly valued at all levels including farmers, project partners, extension and research staff. Capacity building should remain a key focus of ACIAR activities and perhaps thought could be given to how these capacity benefits can be preserved and amplified, e.g., working more with universities and training organisations to help build their capacity.

9.5 Recommendations

ACIAR across similar projects / regions

1. Appoint a local full-time coordinator

Appointing a full-time local project coordinator, answerable directly to the project leader made a huge difference in Myanmar, and was also highly effective in Vietnam, especially in the first project.

2. Staged project design

While it is important to plan the project as much as possible, it is also important to use the findings of foundational activities in the subsequent delivery of the whole project. Rigid project design, with activities specified and allocated to delivery partners at the start, is an impediment to the responsiveness of the project. The project design should include flexibility so that activities are actually informed by what is found in foundational activities and ensure results are delivered on schedule.

3. Flexible contracting

When delivery partners are contract for the length of the project directly with ACIAR, it becomes very difficult to changing these contracts, especially if the change involves a reduction in funding for the delivery partner. We recommend that subcontracts are with the Commissioned Organisation and not ACIAR, and that they are staged. E.g. 1 year contracts at the start, then to the mid-term review point and then for the remainder of the project. This is essential to give the project leader the freedom to direct the project properly and make changes mid-stream.

4. Select project partners on skills, track record and need

Project partners should be selected on skills, track record and the project needs rather than any expectation that because they were involved in a phase one or similar earlier project, that they should be included as part of the delivery team. This should be made clear to the prospective partners by the project leader and that it is about matching skills and capacity to need. This should be balanced by the capacity building outcomes in developing countries.

5. Design projects for impact and efficiency

The expected long, medium and short term goals or outcomes of the project should be clear in the minds of the project design team from the start, and be clear in the project documentation. This is essentially understanding the impact pathway and applying the theory of change approach to project design and should be the guiding principle for all aspects of project design. Project designs should as simple and efficient as possible. Many projects have complicated and onerous activity schedules which can sometimes cloud the final goal. Keep project designs as simple as possible: *if in doubt, leave it out.*

6. Training and capacity building

Training and capacity building were highly valued at all levels including farmers, project partners, extension and research staff. Capacity building should remain a key focus of ACIAR activities and perhaps thought could be given to how these capacity benefits can be preserved and amplified, e.g., working more with universities and training organisations to help build their capacity.

7. Project duration

The project reviewers suggested a 4-5 year maximum for projects unless there is a specific need for longer projects. Aim to achieve short term goals within this window.

Vietnam

8. Improve VietGAP compliance and traceability, especially for export

There is a need to improve VietGAP compliance and verification of vegetables and fruit, especially for export. Currently the system is largely paper based, with little actual verification and traceability. There should also be more independent testing for pesticide residues at retail store and wholesale markets, using modern analytical techniques (e.g. HPLC, Mass Spectroscopy) by government agencies to ensure consumer safety.

9. Promote the model and benefits of the VietGAP model more widely in Vietnam

The economic, social and food safety benefits of a functional GAP system in Vietnam and a strong modern retail sector are significant and the project findings, insights, resources and expertise deserve to be better used for the Vietnamese people. We suggest running showcasing events, presenting project results at relevant industry events, communicating with the emerging retailers, case studies and/or videos in Vietnamese language and maybe point of sale materials could all help spread the message and promote adoption.

10. Improve vegetable extension services in Vietnam

Farmers rely on government funded extension services for information about agronomy, pest control, postharvest handling, packaging etc. They do not seem to be willing to fund this support themselves. DARD or district government expenditure on strengthening and training extension staff in vegetable growing regions would help farmers adopt the model, improve incomes and produce safer vegetable crops for consumers.

11. Postharvest and cool chain is a gap

Postharvest handling, packaging, labelling, and an effective cool chain are all areas where farmers could improve and as a result, supply better quality produce to retailers and consumers. Some of these improvements could come from the private sector, driven by retailer demand, but the technical skills and knowledge in the postharvest area may benefit from future investments by ACIAR or other donors, especially in relation to building local capacity.

Myanmar

12. Resume project operations focussed on piloting the use of MyanmarGAP or a staged GAP approach

The project was effective in that it showed a way in which MyanmarGAP or a staged GAP approach could be used to help farmers supply safer produce and identified markets that would be willing to pay a premium for early adoption. It would be beneficial for Myanmar to develop appropriate systems now that will be needed later on, once modern retail takes hold in the fresh produce sector. Such investments would not be feasible under the

current political situation. New investments could explore other types of value chain pilots and more on the ground data collection, including walking the chain.

The reviewers suggested Future project design would improve competitive advantage by enhancing the performance of the “whole chain” and making it more market and shopper responsive.

The reviewers also said: Depending on the access, horticulture value chains in Myanmar are primed for expansion to new rural communities and enabled to access emerging foodservice, organised retail, industrial manufacturing, and online distribution channels. There have been significant learnings and new relationships established which could be diagnosed and prioritised to achieve ACIAR research and development objectives

13. Investigate how to make better use of projects and reports

There were some very good project outputs such as marketing and consumer studies, a value chain and transport study and the results from the value chain pilots that would be useful in Myanmar. Investigate how these resources could be communicated and used.

14. Gender equity

Market reforms could also contribute to greater female empowerment through employment, income and direct access to incomes earned, as modern horticultural value chains increase processing, grading, sorting and other activities. Government should incentivise firms to involve women in modern supply chains and assist rural women to access skills, education, assets and finances.

9 References

10.1 References cited in report

These are included in the sub-project reports

9.2 List of publications produced by project

All outputs are available in a Dropbox.

10 Appendixes

11.1 Appendix 1 (a) and 1(b): MTR review report and response

Project report: Vietnam

Project report: Myanmar

Mid-term Review Vietnam

Mid-term Review Myanmar

End of Project Review Vietnam

End of Project Review Myanmar