Organic agriculture and agro-ecology in Myanmar: opportunities, constraints and strategies for TOA partners (2017)

Final report

Prepared by Ko Myat Thu

Prepared for Myanmar partners of Towards Organic Asia

11 August, 2017

Main findings at a glance

Eco-farming and organic agriculture in Myanmar are not well documented. Joint or coordinated action is limited. In this report, Towards Organic Asia (TOA) partners in Myanmar have collated their experiences relating to eco-farming and organic agriculture. Data has also come from consultations with 26 key stakeholders and a review of literature. The main findings presented include a situation description, a compilation of case study experiences and an outline of opportunities and constraints. Potential strategies for joint action are proposed.

Situation description

Definition and labels

Definitions often are not holistic and include a range of economic, environmental and social aspects, and not just how the product is grown (or recorded, its consistency with standards, and such). In particular, 'Social' needs to be included and this includes fair trade, valuing small-scale farming families, better linkages between producers and consumers, mutual respect, health and well-being. 'Environment' includes Gaia and deep ecology, mimicking natural eco-systems, having fewer externalities, and integrated pest, weed & disease management. 'Economic' includes *Mindful Markets*, livelihood security, true-cost (not with hidden externalities), resilience and less dependence on external actors and agri-food corporations. In addition, definitions need to cover agriculture, livestock, aquaculture, forestry and forest products.

'Eco-farming' or 'natural' or 'chemical-free' are used as labels by partners more than 'organic', which in practice means 'certification'. Current domestic certification schemes are fragmented and ineffective, and are seen as limiting the potential of organic production. Participative Guarantee Systems (PGS) are an important alternative to certification, to promote trust and assurance that the product is genuine. Partners are interested in developing PGS. They are also interested in farming practices that use systems approaches and natural inputs. Note that 'Organic by default' is not a large opportunity in Myanmar as many farms are currently using agricultural chemicals.

Small-scale producers

Some producers are highly motivated to try eco-farming, largely because of perceived health and environmental benefits. There are genuine constraints, including availability and price of inputs (e.g. manure, labour and local seeds), transition period to become organic, climate risks, markets and levels of debt. Too much emphasis may be placed on short-term yields for individual crops, as opposed to longer-term yields and an integrated farming system approach. Also, often the true cost of products is not shown in each (i.e. relating to externalities or un-priced environmental and health impacts).

Profitability at the farmer level for eco-farming is mixed. Some rice producers report higher gross margins, whereas other commodity producers reported losses. Some banana producers found that certain organic methods did not work well in their context. Overall, knowledge of agronomy is important – weeds, pests and diseases still have to be managed. Indiscriminate use of biological

alternatives to chemicals also brings risks, hence there is a need to understand Integrated Pest Management (IPM). Nutrient cycles are important. Knowledge here includes local and traditional knowledge as well as 'scientific' knowledge.

Value chain and markets
Domestic markets are limited – most in the study are internal and needed market facilitators and/or social enterprises not seeking to maximize profits. Established organic/specialty markets exist for products such as coffee. There are opportunities for export markets, which generally need overseas certification and specialised/larger operations.

Value chain perspectives not well utilized as there are gaps between producers, consumers and other market actors. Shorter value chains with few actors are easier than longer chains with many actors. There are handling and segregation issues in mainstream markets for eco-farmed products.

With regards to prices, most say there is a need for >20% premium for organic products to cover additional costs and lower yields. Quality of product is considered important. Fair trade / fair share is seen as important in considering social benefits.

Consumers
Food safety and consumer protection are becoming important. However, awareness and behaviour may differ - few appear willing to pay a premium. Consumer preferences are not well known and many assumptions are made without direct evidence. Trust levels are low and there is scepticism of product that is called *organic* because of limited traceability and abuses or imitations. Overall, there are weak linkages between producers and consumers.

Policy
Government policies are not conducive to eco-farming and they tend to prioritise commercialized farming and large agri-businesses. There are many relevant policy issues that need to be addressed, including land, seed, investment and consumer protection. There is a perceived need to join with broader networks to be effective at influencing policy – that is joining with a range of actors and networks, not just organic networks or trying to act alone. Bio-fertilisers and bio-pesticides need to comply with relevant laws.

Other
Limited data is available to generate a detailed situation description. Stakeholders consist of many individuals, generally fragmented. The study has helped to bring together TOA partners and their commitment is significant.

Case study overview

Experiences are described by several case studies that relate to market intervention, support to producers and policy advocacy. Main motivations and lessons of each are presented.

Market intervention

1. Providing incentives, a fair price and market outlet for organic produce (examples: Metta Natural Rice, Kachin Baptist Convention (KBC) Organic Rice, Metta Ginger Tea). Their main motivation is creating success for their huge pools of farmers trained in organic production methods. Their main lessons include: farmers receive a higher price than market; marketing is internal and a challenge; it is small-scale and it is not financially self-reliant yet.

2. Market facilitation and producer-consumer dialogue (example: Gaia Sustainable Management Initiative, GSMI). Their main motivation is in connecting producers and consumers that gives benefits to both. Their main lessons are: high trust levels can be established; consistent supply is hard; and a market facilitation role is voluntary.

3. Improving value-chains (example: Karuna Mission Social Solidarity, KMSS Banana). Their main motivation is to take a value chain perspective. Their main lessons are: market is external; quality and consumer preferences are vital; segregation of organic product is hard; relationships are needed with market actors along the chain; and it is hard to cover the entire value chain.

Support to producers

4. Enhancing production and capturing local knowledge (examples: Metta Garlic; also Metta Rice, KBC Organic Rice, Metta Ginger Tea, KMSS Banana, Kalyana Myitta Foundation, KMF). Their main motivation is that technical skills are vital. Their main lessons are that there are genuine constraints for production (especially labour and input availability).

5. Empowering young farmers (example: KMF). Their main motivation is to invest in future farmers! Their main lessons are that they energetic and enthused; need certain skills and support

Policy Advocacy

6. Lessons for engagement (example: Food Security Working Group, FSWG). Their main motivation is to influence policy well. Their main lessons are that the engagement processes, along with their timing, correct inputs and good relationships, are all vital

Opportunities and constraints for TOA and promoting eco-farming

Opportunities

- High commitment by partners and desire to work collaboratively
- Holistic approaches covering economic, environmental and social
- Increasing focus on food safety and consumer protection
- Development of PGS as an alternative to certification
- Large potential export markets
- Increasing attention on value chains and marketing
- Increasing contract farming
- Increasing networking and use of social media
- Alignment with Organics 3.0 and Agro-Ecology and regional networks

Constraints

- Limited data and fragmentation of stakeholders
- Limited policies supportive of organic agriculture and eco-farming
- Lack of marketing and business skills by partners
- Very small-scale examples by TOA partners (is it better to look at networks of small examples rather than scaling up?)
- Limited domestic markets
- Limited financial returns without price premiums
- High certification costs and lack of widely recognised certifiers
- Limited traceability of products to provide assurance to consumers
- Limited contacts with government and private sector operators
- A narrow definition of agriculture in Myanmar. Eco-farming needs to also consider livestock, aquaculture, forestry and forest products, at the least.

TOA Myanmar is part of a wider regional network. There are some process lessons that can be helpful for other countries that are considering doing their own assessments, including:

- Capturing experience is useful for network building
- Limited data probably will be a constraint
- Have a clear purpose and have a team to oversee studies to keep these on track. Developing suitable frameworks can assist in this
- Conduct studies in a way that honours the principles and that gives 'voice' to participants as far as possible

Potential TOA partner strategies

Initial strategies emerge from considering the situation description, case study findings, capturing opportunities and addressing constraints. These include:

1. **Enhancing data availability on eco-farming**. Without rigorous data about production, markets, value chains or benefits, there will not be convincing arguments to influence mainstream policies or actors. Widening the scope of this study by including other case studies would be a good first step. Further actions, collectively or individually, should also aim to contribute to the available data (through action research), supported by appropriate scientific and economic studies

2. **Continuing to highlight social, environmental and economic aspects** of eco-farming. In particular, TOA partners make a very important contribution of describing social aspects, including fair trade, inclusion of small-scale farming families, informed choice, mutual respect and increased well-being. Economic aspects need further attention

3. **Actively connecting to a range of networks in Myanmar** to progress advocacy on related policy issues (e.g. consumers, seed, land, agro-ecology, etc.) that impact immensely on smallholder farmers and market participants. These networks are necessarily broader than just with other organic actors, in order to increase influence. The main engagement with government and private sector can be through these networks rather than as a TOA network. Connections should also utilise social media

4. **Actively connecting to regional and international networks**, including those related to Organics 3.0 and Agro-Ecology

5. **Jointly researching and progressing local seed availability and use**, as local seeds are not likely to be reliant on heavy external (chemical) inputs. This will include participative investigation and trialling of suitable varieties, developing collection and conservation mechanisms, promoting and marketing seeds and enhancing learning between different actors

6. **Seeking opportunities for collaboration with Yezin Agricultural University**, to enhance policy engagement, technical input and to develop human resources for eco-farming

7. **Improving core competencies in social enterprise and value chain development**. Vital initial steps are to access the range of skills needed, through partnership and recruitment of qualified people, and to ensure interventions cover a range of value chain actors. It is also essential to develop quality marketing and business plans, have an external market focus and scale-up to have a broader impact. Increasing links with the private sector is likely to be a part of this strategy

8. **Trialling Participatory Guarantee Systems**, perhaps by converting some of the current 'internal' market examples described in this study to meet IFOAM guidelines, expanding current farmer rice seed production systems, or by developing new examples. This strategy reflects a commitment to creating trust between producers and consumers, whilst avoiding some of the pitfalls with certification

9. **Seeking ways to address constraints**, especially input availability and labour, as well as encouraging access to markets and understanding of value chains. It is noted that there are no easy answers here

10. **Maintaining this network and building on its commitment**. TOA partners can build on their current partnerships and the momentum already established during this study. Further analysis and further development of these strategies by Myanmar partners is needed. These strategies and findings should be presented to other partners in other TOA countries and also bring in their experience

Recommendations for TOA partners

1. *For TOA partners in Myanmar to discuss and analyse these findings and potential strategies, and develop a strategic plan for promoting socially-just eco-farming in Myanmar*

2. *For TOA partners in Myanmar to commission a translation of relevant parts of this report into Myanmar language and make it available to partners, so they can prepare for relevant workshops and engage wider audiences*

3. *For TOA partners in Myanmar to convene a national workshop for sharing and progressing these findings. TOA partners should present their case studies, as well the findings and initial strategies*

4. *For TOA partners in Myanmar to engage TOA regionally, and other networks, by sharing these findings with them*

Contents

Main findings at a glance ii
Situation description ii
Case study overview iv
Opportunities and constraints for TOA and promoting eco-farming v
Potential TOA partner strategies vi
Recommendations for TOA partners vii
Contents viii
Acknowledgements ix
1. Introduction 1
1.1 About Towards Organic Asia – regionally and in Myanmar 1
1.2 About this study 2
1.3 Methods used and limitations 3
1.4 Report structure 5
1.5 Reflections by partners on the process 5
2. Partner case studies 6
A) Ayeyarwaddy Natural Rice 6
B) Kachin Organic Rice: "market opportunities and incentives" 12
C) Banana value chain study 17
D) Natural ginger tea 24
E) Organic garlic production 28
F) Market facilitation, consumer-producer dialogue and PGS 34
G) Young farmers and eco-farming in action at Inle 37
H) Learning from policy engagement examples 39
3. Definition 40
3.1 Summary 40
3.2 Partner experience 40
3.3 Consultations 41
3.4 Literature 42
3.5 Further analysis 45
4. Smallholder rural producers 47
4.1 Summary 47
4.2 Partner experience 47
4.3 Consultations 48
4.4 Literature 49
5. Value chain and markets 51
5.1 Summary 51
5.2 Partner experience 51
5.3 Consultations 52
5.4 Literature 53
6. Consumers 54
6.1 Summary 54
6.2 Partner experience 54
6.3 Consultations 54
6.4 Literature 55
7. Policy 56
7.1 Summary 56

7.2 Partner experience 56
7.3 Consultations 57
7.4 Literature 58
8. Opportunities and constraints 59
9. Potential TOA partner strategies and recommendations 60
Recommendations for TOA partners 61
10. References 63
Cited references 63
Other references 66
Annex 1 Participants in the study 69

Acknowledgements

- TOA partners participated well in the study – their contributions are gratefully acknowledged (details of individuals are in an annex)
- Many people responded to requests for interviews and provided excellent comments (details of individuals are in an annex)
- The study was hosted by Metta Development Foundation, which provided logistical support and kept momentum going over a long period. Special contributions were by U Gum Sha Awng and his passion is inspirational
- Ms. Marja Kool provided research assistance, particularly in reviewing international literature, consulting with market actors, supporting the workshops with partners and commenting on the report
- U San Thein, independent consultant, conducted interviews with government related stakeholders in Naypyitaw and Yezin
- The study was funded by Comité Catholique Contre la Faim et Pour le Développement-Terre Solidaire
- Responsibility for findings and errors lay with the lead author alone and not with partners nor participants.

Front cover: The photograph is of a natural rice grower from Ayeyarwaddy Division; photo supplied by Metta Development Foundation.

1. Introduction

1.1 About Towards Organic Asia – regionally and in Myanmar

Towards Organic Asia (TOA) is a social movement: a partnership of more than 21 organisations from five countries in the Mekong Region (Cambodia, Vietnam, Laos, Myanmar and Thailand) and Bhutan. Partners are local non-governmental organisations and social enterprises promoting and practising agro-ecology, organic agriculture and rural development. Their aims are to enable transformation and enhance well-being.

TOA was officially launched in January 2012 at Chulalongkorn University, Bangkok, Thailand. TOA is currently supported by the School for Wellbeing Studies and Research, an international organisation which arose from a partnership from three organisations: Sathirakoses Nagapradipa Foundation (SNF), Chulalongkorn University and the Center for Bhutan Studies in Bhutan. The mission of TOA is to strengthen an organic network in Asia among diverse stakeholders, in order *to promote a common understanding and cooperation in agro-ecology and social well-being*.

TOA can contribute to developing dynamic Asian models of agro-ecology for influencing policy and inspiring a wider movement within the region and beyond. Four principles underpin TOA, which have also been endorsed by the International Federation of Organic Agriculture Movements (IFOAM) in 2005:

- Health (healthy soils, crops, livestock, people)
- Ecology (agro-ecology, diversity, recycling)
- Fairness (ecological and social justice, Fair Trade)
- Care (precaution, protect current and future generations).

The original TOA partners in Myanmar are Metta Development Foundation (Metta), Gaia Sustainable Management Institute (GSMI) and Kalyana Myitta Foundation (KMF), and these have been joined for this study by Karuna Mission Social Solidarity (KMSS), Kachin Baptist Convention (KBC) and Food Security Working Group (FSWG). Partners are both faith-based and secular. Partners come together as peers in a network for sharing and encouraging each other. This study shows a commitment by the Myanmar partners to become an 'action-focused' network, particularly to engage in policy advocacy, although they do not wish to become too formalised.

More broadly, Myanmar is experiencing many political, economic and social changes. Many stakeholders are interested in Myanmar and how it is changing. These changes, both positive and negative, are reinforcing the desire to work in partnership rather than in isolation. This study tries to build upon these partnerships.

1.2 About this study

The study aims to:

- Obtain a clear description of organic agriculture and agro-ecology in Myanmar, including relevant opportunities and constraints
- Develop a strategy for this consortium, based on this description, including actions to be taken in country and those through networking with TOA
- Identify lessons for TOA partner country networks

The description includes the views of producers, consumers, market participants and policy makers. This study is, in effect, a participatory situation assessment, facilitated by external consultants. It particularly tries to capture the experiences of TOA partners, review relevant literature and include the perspectives of multiple stakeholders. The study is part of a region-wide assessment. To date, Bhutan has produced an assessment, and other countries want to use the experience gained by Myanmar partners in their assessments. The findings of this report have been presented at a regional TOA meeting in March 2017, and further activities are planned (see recommendations).

Originally the study was called a *"multi-stakeholder national assessment on organic agriculture and agro-ecology in Myanmar"*. The original intentions also prioritized action-research, and enabling partners to participate, in order to contribute to the TOA movement in ways consistent with its ideology. The study soon found that there is a general lack of data and significant fragmentation amongst stakeholders, which meant that a national assessment is not possible with the available resources. Hence, the study became less grand in its scope.

Some significant boundaries are placed on the study:

- Priority is given to smallholder experiences rather than large-scale agribusiness (mainly as the latter can "take care of themselves").
- The study is selective in coverage. It is partner-focused, and influenced by ideology. It is not inclusive of all perspectives (although these are acknowledged to the extent possible). For example, case studies describe what partners are doing rather than what others, including commercial operations, are doing. Similarly, there is more emphasis on trust and dialogue rather than on external certification, as will be presented.
- Farming systems and geography reflect partner operations. Thus the study cannot cover all crops/animals/products and regions. Indeed, the preference has been not to limit the study to any one commodity. The major commodities covered are rice, fruit and vegetables and spices. Experience with organic coffee in Myanmar, for example, is referred to rather than highlighted, as it is largely outside of partner experience.

Other limitations to the study are presented below. The implication of the boundaries for the study mean that these findings represent a sub-set rather than providing a full assessment of the current situation in Myanmar.

1.3 Methods used and limitations

The overall framework that guided the study is a set of five headings, namely:

- Definition of 'organic' and 'agro-ecologic'
- Smallholder rural producers
- Value chain and markets
- Consumers
- Policy

The three main data sources and methods used in the study are:

1. Myanmar-based and international literature - review
2. Stakeholder views – consultations and observations
3. Capturing experiences of partners – guided case studies

Process and timeframe

Design

Myanmar partners took part in a design workshop in October 2016 to set the framework for the study, share their experiences, develop a stakeholder mapping (including their own contacts) and identify literature. The design workshop also defined the case studies, focal areas, contributors and questions of interest. Note that the framework emerged from a series of discussions between partners and consultants, preceding October, in order to define the items of interest. The initial terms of reference for the study were developed in March 2016, but could not be progressed quickly for various reasons.

Data collection

External consultants undertook a continuous review of literature, as it became identified by partners, key stakeholders and through searches, including in Myanmar (very few books and articles) and English. A list of relevant references is provided in Annex 1. These concentrate on either organic/agro-ecology or value chain studies.

Consultants have interviewed 18 identified actors: 4 government, 7 private and 7 civil. In addition, partners conducted 8 regional interviews: 2 private, 4 individual producers and 2 producer-processors-social enterprises. This gives a total of 26 interviews, and details are provided in Annex 2. The opportunity was also taken to observe the Kandawgyi Organic Markets and speak with vendors and customers, and to visit other retail outlets like Citymart, Ocean and Sharky's in Yangon.

Partners conducted data collection for their case studies. The people interviewed in this process are recorded under each case study, and involved between 2-30 people each, depending on topic and methods chosen. Guidance and editing has been provided by consultants/facilitators, particularly relating to value chain components, financial analysis and English language expression.

Eight case studies have been conducted in total, as shown in Table 1. This shows the partner (alphabetically), topic, location and contribution to the study (which part of the framework is addressed). The geographic areas covered included Yangon and surrounds, Ayeyarwaddy Division, Southern Shan State and Kachin State. The commodities covered rice, fruit, vegetables and spices.

Table 1: Overview of case studies

Partner	Topic	Location	Commodity focus	Framework focus	Notes
FSWG	Lessons from recent policy engagement	National	n/a	Policy	
GSMI	Producer-consumer dialogue and market facilitation	Yangon and surrounds	Vegetables	Value chain and market, definition (producer, consumer)	
KBC*	Kachin organic rice market	Kachin State	Rice	Value chain and market	Internal market
KMF	Young farmer experiences with eco-farming	Inle, Southern Shan State	Vegetables, mainly	Producer	Alumni groups
KMSS	Value-chain analysis of bananas in Yangon region	Yangon and Ayeyarwaddy	Banana	Value chain, definition	External market. Not organic, but some lessons
Metta	Ayeyarwaddy natural rice	Yangon and Ayeyarwaddy	Rice	Value chain, producer, definition	Internal market
Metta	Natural ginger tea	Bago Centre, also Southern Shan State	Ginger	Value chain, producer, definition	Internal market, small scale
Metta	Organic garlic	Naung Kham Centre, Southern Shan State	Garlic	Value chain, producer, definition	Internal market, small scale

* Case study conducted after the analysis workshop

Analysis

Then, partners participated in an analysis workshop in December 2016. Partners presented their case studies as discrete units and these were discussed. Using the framework, presentations were made by the consultants about findings from literature and consultation. Then, a joint analysis was made of what each of the three sources of data said about each heading in the framework, and overall conclusions were drawn. Potential strategies were developed.

Writing

These conclusions and strategies, along with an iterative process of compiling and presenting the case studies, have been written up and included in this report.

Limitations

- The topic is very broad and at times it has been a struggle to maintain focus. The data available is limited and fragmented
- Partners are all very busy on their own activities and it has been hard to maintain momentum. There have been delays between design, data collection, analysis and writing
- Identification of stakeholders for consultation has been difficult, as with actually making appointments to see them. The total sample is not large and reflects the fragmented nature of stakeholders (and who knows who)
- Consultations, as well as partner workshops, have been conducted in a mix of Myanmar and English, which means some points might not have been captured adequately

- Case studies tries to capture "partners' voices" only, but some is lost in the process and, inevitably, the author's voice dominates. Other case studies have not been sought, even though these could contribute to a better understanding of the existing situation in Myanmar (this is an area for further research)
- As mentioned, although this is a national study, the examples only come from certain states and regions and for certain commodities

1.4 Report structure

Partner case studies are presented first (Chapter 2). This is to emphasise their voices.

The framework mentioned provides the main report structure:

- Definition (Chapter 3)
- Small scale rural producers (Chapter 4)
- Value chain and markets (Chapter 5)
- Consumers (Chapter 6)
- Policy (Chapter 7)

For each of these chapters, a consistent presentation is used:

- summary
- partner experience, including case studies
- consultations
- literature
- further analysis and research needs (author's opinions)

Then, opportunities and constraints are presented (Chapter 8) and potential strategies (Chapter 9). Various annexes support the main text.

1.5 Reflections by partners on the process

Partners gave reflections in the analysis workshop that:

- It is good to get a whole picture, even if it is rough, which has not been put together before. It shows there are still gaps and details are missing. This big picture is good both for partners' knowledge and understanding, but also for motivations and feelings. Also it shows it is not just one organisation involved but many. Networking has been good
- This study is a first step, and there is a long way to go. It has been good to build on the current experience and to develop next steps (note the findings of this study give a foundation for the next steps)
- Case studies are good for learning and have led to improved relations between partners and their participants. One partner now has increased confidence in how to approach and connect with others
- Partners need good records and then we also need to make use of them. Partners need to capture our own experience
- Value chain is important, yet what is here is not yet a complete description or analysis. It is more than just production (traditional focus) and includes links with consumers, connections, information and relationships

2. Partner case studies

A) Ayeyarwaddy Natural Rice

Natural rice product

Natural rice grower in Yae Twin Gon village

Metta has operated a "Natural Rice" enterprise since 2014. "Natural" is used rather than "organic" as it is not certified. The objectives are to:

- Improve farmers' income
- Reduce external inputs by farmers
- Produce safe food for the consumers.

The case study focuses on 2 actors: producers and Metta. The value chain is largely internal to Metta except for input suppliers and producers (Figure 1).

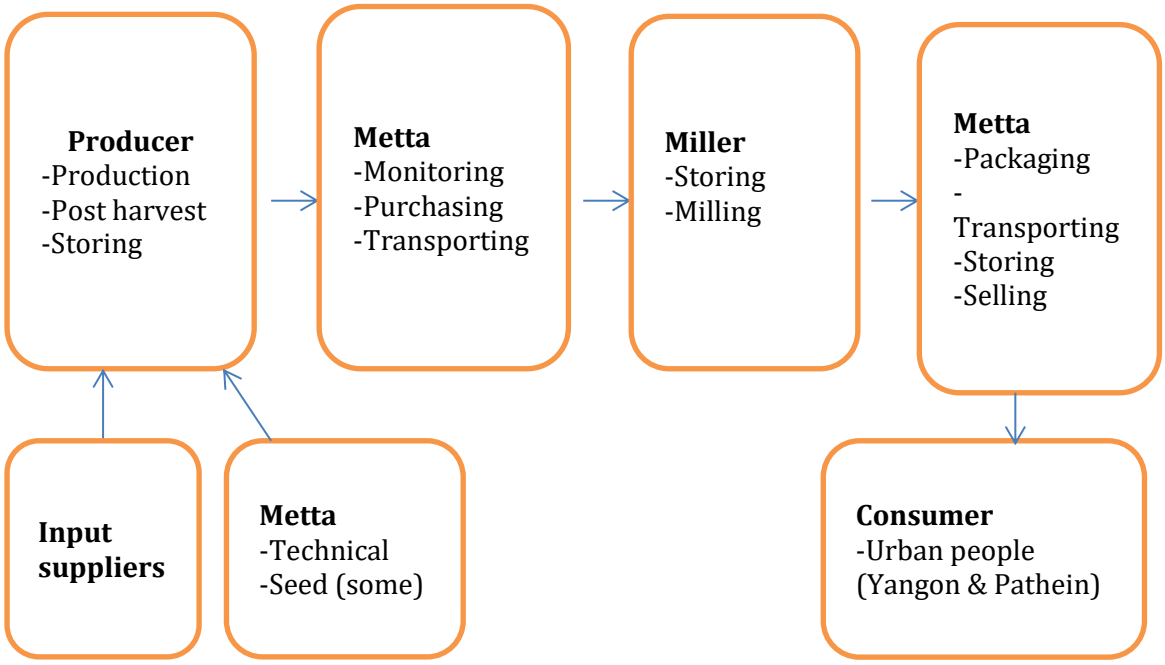

Figure 1 Ayeyarwaddy natural rice value chain

Background

The Ayeyarwady (delta) region is known as the "rice bowl" of Myanmar. Paddy is the major crop. Other important crops include pulses, sesame, jute, and groundnut along with plantation crops such as mango, coconut, banana, and betel nut and leaf. Livestock is important both as a source of food and as draught animals for agriculture.

According to the community, before 1985 rice is grown one time for a year in rainy season. All of the farmers grow organically. Their production is not high but is enough for the family. Their rice fields are diversified with the local varieties. They are not facing the problem of pest and disease. But after 1985, the government introduced summer rice and made the farmers grow it at some areas in Myanmar. At that time the external input cost is very cheap through government subsidy and, following that, the whole Delta follow and practice cultivation of summer rice. For around fifteen years farmer benefitted because their rice yield had increased through general chemicals used. But year by year the general production cost increased and the rice price also is not stable (decreased) during harvesting time, and farmers started facing the problems of pests and diseases. Most of the farmers are indebted.

Metta implemented an integrated sustainable rural development project by a farmer field school approach, from 2009 to 2013. The purpose of the project was to provide the target communities with necessary skills and material support to be able to improve their rice production in a sustainable manner. It is called FFS Phase-1. Following that project Metta started another integrated sustainable rural development project by people-led development approach, from February 2014 to January 2017. It is called FFS Phase-2. The three main area of focus are: (1) helping farmers improve sustainability of their rice-based production system, (2) enhancing climate change resilience and adaption and (3) strengthening farmer groups and community based organizations, as well as farmer's control over local seed production.

During the project period farmers reduced general chemical fertilizer in their field cultivation crop by 50% to 100%. Some of the farmers reduced external inputs and used compost; some try to produce quality rice seed and sell their seed to improve their income generation and some farmer try to produce *natural rice* to improve their income.

Metta organized an organic farming workshop in 2014 and around forty farmers from six townships in project area participated. Farmers formed, by themselves, five organic grower groups across six townships. In 2014, a total of 37 farmers are participated in organic grower groups according to the criteria of organic production, and they cultivated 82.5 acres of land. In 2015, a total of 44 farmers participated and they cultivated 113 acres of land according to the criteria. Metta is the buyer for the rice. In 2014 rainy season Metta bought 800 baskets and 2015 rainy season Metta bought 2665 baskets of rice from farmers.

The main motivations for participating farmers are: better family health, more sustainable agriculture (without chemicals) and better income. Some farmers have grown organically for 3-5 years, and have about 2-3 acres. The main crop in rainy season is rice and black gram and green gram are in the summer season. Farmers are keen to share their experience with others through training, village meetings and exchange visits. Some of these are interested but others are not.

The main challenges and opportunities mentioned by farmers are:

Challenges	Opportunities
- No other organic product market except Metta. - Rice quality is decreased because sometimes it rains before and during harvesting.	- Farmer has raw material to make compost to improve soil quality. - Farmer have land to cultivate organically - Farmer has knowledge about how to produce natural product. - Farmer has local rice varieties available.

The practice method of farmer - producers


Seedling bed


Transplanting (SRI) method by women group


Weeding


Before harvesting


Harvesting


Threshing with cattle

After threshing farmer keep their rice in bags

Natural rice growers

Comparing financial returns for organic and inorganic rice

Farmers participating in this study produced a comparison of organic and inorganic production (Table 1).

Table 1: costs and returns for organic and inorganic rice

Item	Organic	Inorganic	Difference
Income per acre			
Yield (baskets/acre)	50	55	-10%
Price (per basket)	8,000	7,000	13%
Gross income (yield x price)	**400,000**	**385,000**	**4%**
Variable costs per acre			
1. Seed	6,250	10,000	-60%
2. Land preparation (machine)	15,000	15,000	0%
3. Land preparation (labour)	3,500	3,500	0%
4. Seedling bed preparation	3,500	3,500	0%
5. Uproot seedling	3,500	3,500	0%
6. Transplanting	42,000	42,000	0%
7. Manure/fertiliser	5,000	25,000	-400%
8. Weeding	14,000	0	100%
9. Harvesting	42,000	42,000	0%
10. Threshing	25,000	25,000	0%
11. Transportation for rice	14,000	14,000	0%
Total variable costs	**173,750**	**183,500**	**-6%**
Gross Margin per acre	**226,250**	**201,500**	**11%**
GM/income	**57%**	**52%**	**7%**

* Note rounding errors with percentages.

The Gross Margin is slightly higher for organic, although both are quite similar, as:

- The yield difference is low (10% lower for organic) and the product price is higher (13% higher for organic). In earlier years, whilst making a transition, yield differences were much higher.
- The inorganic production overall has higher costs mainly because of the higher chemical fertilizer costs. For organic, the cow manure is available on farm and thus is not costed. If the cow manure would be purchased, then the cost would have been about 40,000 per acre for two applications – and this would have

directly decreased the gross margin. The organic producers also make their own compost. The organic production used hand weeding and the inorganic production did not need herbicide application or weeding. The inorganic production used a much higher seeding rate. At times, there is a need to control case worm, which adds costs to both organic and inorganic for pesticides (the organic bio-pesticides are based on a tobacco mix and costs about 3000 per acre whilst the inorganic used chemicals at about 6000 per acre). Otherwise, all other costs are the same.

These figures are averaged – individual cases will vary. There are some assumptions like the land is equally as fertile and selling is at the same time. If a farmer stores for longer then a higher price can be gained, or conversely, if a farmer has to sell fast to pay off debts, then a lower price will result. There is also no inclusion for pest control. Further research would be needed to find out how many of the 44 farmers achieved these results and whether the inorganic data is different with other producers in the region.

Other parts of the value chain

The chain is almost internal to Metta, except for contracting out the milling. The milling process gives about 40% milled grain (*san*) – the rest is kept by the miller in addition to the fee of 360 MMK/basket. Packaging and transportation are organised by Metta, and one staff member is allocated full time to the rice enterprise.

The participants in the study nominated the following challenges and opportunities for Metta.

Challenges	Opportunity
-Organic market is limited. -Some consumers are not aware about organic rice.	-Participating farmers have more interest to produce natural rice. -Land is available for farmers to grow organically.

The costs and returns for Metta are shown in Table 2. The gross margin is low, and would not cover administration and other costs, but it totally reflects the aim to keep the returns to farmers high (fair-trade, or economic justice). This is an extra cost of about 2,665,000 MMK (based on paying 8000 rather than 7000 per basket). Metta knows that their marketing is limited and it is mostly an internal value chain. The data suggest that Metta would have to charge a much higher price to consumers if this would generate substantial income.

Table 2: Annual costs and returns for Metta, based on 2016 quantities

	Unit name	Unit	Unit price	Total
Gross income: rice sales	kg	25584	1,000	25,584,000
Variable costs				
1. Rice	basket	2665	8,000	21,320,000
2. Transportation (total)	basket	2665	300	799,500
3. Milling cost	basket	2665	300	799,500
4. Packaging costs	bag	479	300	143,700
5. Salary for one staff	month	12	200,000	2,400,000
Total variable costs				25,462,700
Gross margin				121,300

Consumers
In 2015, about 60 households purchased rice – these are mainly urban people in Yangon and Pathein, and a significant number are expatriate. They mainly buy regularly. Participants said that they buy as there is personal trust (of "the Metta Brand") and they value safe food and environmental benefits. Some consumers have given feedback that the natural rice lasts longer after cooking, as compared to inorganic rice, but of course is more expensive.

Reflections
The returns to farmers are good for organic rice, mainly because of lower costs and a higher price that offsets the small yield difference compared to inorganic. Also, farmers receive technical advice from Metta. However, the result also highlights the need for farmers to have their own cow manure which is often listed as a constraint. To truly assess organic production, a whole of farming system approach is needed.

In effect, the enterprise works through a participatory guarantee system (PGS), where it is the brand name of Metta that provides the trust on the product for consumers rather than external certification.

For Metta, the enterprise does not generate surplus profits – but it is able to meet its objectives of increasing farmer income, reducing external inputs and providing safe food[1]. The social benefits are high (fair-trade), environmental benefits are likely to arise from reduced chemical use, and the financial benefits are minor. The last puts a major constraint on expansion.

This case study was compiled through interviews and discussions with: 3 groups of organic growers (total 18 farmers), 1 miller, Metta staff (including 1 who buys rice from farmers), an organic rice seller and -2 consumers. It was prepared by Saw Nay Blute Htoo and edited by Ko Myat Thu.

[1] The relative safety for consumption of organic and inorganic rice is assumed rather than described here.

B) Kachin Organic Rice: "market opportunities and incentives"

Introduction

In 2015, Kachin Baptist Convention (KBC) brought together two unique internal market segments: a large number of trained farmers in organic (eco-farming) methods and a large number of consumers wanting quality rice. An organic rice market business was set up in response. The aims are to run a business that gives market opportunities and increased livelihoods for organic rice producers, as well as to encourage other farmers within KBC to adopt organic practices. In turn, members can have a healthy life. The health benefits of not consuming chemicals are highlighted in marketing materials.

The idea was suggested by farmer leaders in 2013, an assessment made in October 2014, and it started as a project in March 2015. KBC had implemented Farmer Field Schools (FFS) with Metta Development Foundation since 2004, and by themselves from 2008. Over 3,000 farmers have been trained. Their rice yields have increased, and they use more environmentally-friendly methods, but their marketing options are limited.

Internally, KBC has a large demand for rice, including students at the Kachin Theological College and Seminaries (1200 students; with 55 students at its Sustainable Development Diploma Program, which lasts for 2 years), various education centres, a church-based shop, a drug user rehabilitation centre, an IDP camp (not all), and other. In 2016, about 102 tonnes of organic rice has been sold to these places, up from 63 tonnes in 2015. This is not touching all of KBC's potential internal market, as in 2011, there were over 300,000 members of KBC in over 350 local churches. Note it is difficult to be precise on membership now due to displacement, etc.

The project's business is funded from two sources: shareholders and from in-kind contributions from KBC, such as staff time. There are 361 shareholders, with 629 shares and a capital of 94,350,000 MMK (about 70,000 USD). There have been two share issues: the first (March-September 2015) saw 277 shareholders, holding 446 shares, and the second saw another 84 shareholders, holding 183 shares. The capital is

used to purchase rice and run the business. All shareholders are local church members of KBC: some are farmers whilst others are not. There are no external donors.

The business is governed by a Board, comprising of 4 KBC central Development Department staff, 4 Zonal Development Department directors and 5 shareholders – all selected, not elected. To date, the Board has met once, in March 2016, mainly due to the conflict situation and many tasks for those concerned, but the intention is to have 6-monthly meetings. The board has made some significant decisions, including giving a dividend to shareholders. Most other decisions are taken by management and staff. Currently there are 5 paid dedicated staff (three milling, a marketing promotor and an accountant). Unpaid staff and volunteers include managers and a coordinator within KBC, as well as volunteers in the zonal eco farm groups.

Over 70 producers have sold paddy to the business, which include both FFS participants and non-participants. These farmers come from Dumbang, Mam Pang, and Nam Ya in Hpakant, Jahkrau and Kahtang Yang in Ka Mai, Waingmaw, Nawng Ing in Moenyin and Hopin Townships. This covers 4 zonal associations. Purchases are generally between November and December each year, but some paddy has been purchased in other months depending on demand. There are two varieties that are included in the business: Ngwe Toe and Sin - 3 (at different prices for each).

KBC pays a market price plus a bonus depending on production: for farmers that use System of Rice Intensification (SRI) then the bonus is 1300 MMK per basket, for those who use improved methods plus organic fertilizer (e.g. cow or chicken manure) then the bonus is 500 MMK per basket.

Rice is not sold with a certificate, as such, but there is trust in KBC. This is almost a Participatory Guarantee System, although the market is internal. Quality is monitored through zonal eco-farm coordinators and local farmer field school committees (who visit the rice field, check the quality of paddy, collect the paddy from the producer and send it to KBC).

KBC owns one mill (in Myitkyina) and receives services from two mills in Waingmaw and Moenyin townships, as needed. Other assets belonging to the business include a meter box and a storehouse.

Income from sales

Rice is sold at market rates – i.e. not at a premium. Otherwise there would be no perceived incentive to buy, as there is not a defined market for organic rice. For the combined years of 2015 and 2016, total sales are 116,340,935 MMK (163,458 kg).

Sales prices 2016

Weight per bag	Ngwe Toe variety, Price/bag (MMK)	Sin-3 variety, Price/bag (MMK)
44kg*	30,000-34,000	28,000-32,000
24kg	15,000-17,000	14,000-16,000
12kg	7,500-8,500	7,000-8,000

*At the start, KBC only used 44kg bags. Some gave feedback that this is too big, so KBC introduced smaller bags. There are also 66kg bags available.

Costs

Rice purchased

The major cost is the rice purchased (77% of sales). For both years 2015-16, there have been 13,630 baskets purchased at a total of 89,890,000 MMK (average price of 6,600 per basket, but the range is 5,000-8,000, depending on timing and variety). The quantities purchased have increased each year, from 5,106 to 8,524 baskets, with the 2017 purchases already 7% higher (at 9,122 baskets as at February).

Milling and transport

- Milling costs = 200 per basket
- Transportation costs = 500 per basket
- Labour (for both milling and transport) = 500 per basket
- Total = 1,200 per basket. For 2015-16, about 16,356,000 MMK (14% of sales).

Notes

*SRI rice gives a much higher milling percentage (>70%) compared to improved production methods.

*For transportation, some savings from Hpakant are due to backloading rates being available.

Other costs

- Packaging (plastic, rice bag with logo) = 250/bag
- Staff costs for transportation to deliver rice bags to shops and consumers
- Staff salary costs are not included (in-kind contributions)

Profits

The business is not run to maximize profits, but rather to achieve its aims to provide market opportunities and incentives. For March 2015 to October 2016, the profits were about 3,700,000 MMK (about 2,750 USD), which would have been less if all in-kind contributions had been valued.

Dividends to shareholders

The profits from March 2015 to October were paid back as a dividend to the first issue shareholders (8,300 per share, about 5.5% of the share price, paid in November 2016). Actually, the original intention was to pay 70% of profits as dividend and reinvest 30%, but many shareholders have been suffering financially so the decision was taken by the Board to make 100% of profits available. Future dividends are likely to be at the 70% level. Second issue shareholders have not yet received a dividend.

Constraints and opportunities

The main opportunities are a sizeable demand for rice (not specifically organic rice) and the strong network among farmers with space for discussion and learning. The main constraints are that KBC cannot purchase all of the organic production nor all varieties.

Other income generation activities and future plans

KBC runs other income generation activities including mustard oil, groundnut oil, soap and shampoo making, and various micro-finance schemes. In 2015, it marketed oranges. Future plans are to place all income generation related activities of KBC within a special unit, and to hand over as much as possible of each business to the zonal associations rather than running a centralized scheme. This has already occurred with Waimaw Association taking on the orange trading enterprise, and KBC is also in progress with handing over the mustard oil and organic rice enterprises. KBC

Development Department would then take on a coordination rather than an implementation role.

Reflections

KBC uses the terms *organic* and *eco-farming* interchangeably. There is a large internal market, but this is not specifically for organic rice. Could an increased awareness lead ultimately to a higher willingness to pay? Otherwise, as a business it will be hard to give bonuses/higher prices back to farmers and create the incentives that are desired. KBC finds it difficult to manage the variations in and gaps between supply and demand, and to know and manage the running costs (and not all of these are included).

Product labels

Rice bags

Ploughing

Planting

Weeding

Growing








Photos: production (top four), harvesting (next two), granary (above) and milling (right)

C) Banana value chain study

This case study takes a value chain perspective of bananas produced and sold in the Ayeyawaddy and greater Yangon regions. Figure 1 shows the value chain that emerges from this study, with the components shaded being specifically considered. The bananas are not all being produced organically – but there are lessons that apply for the TOA study.

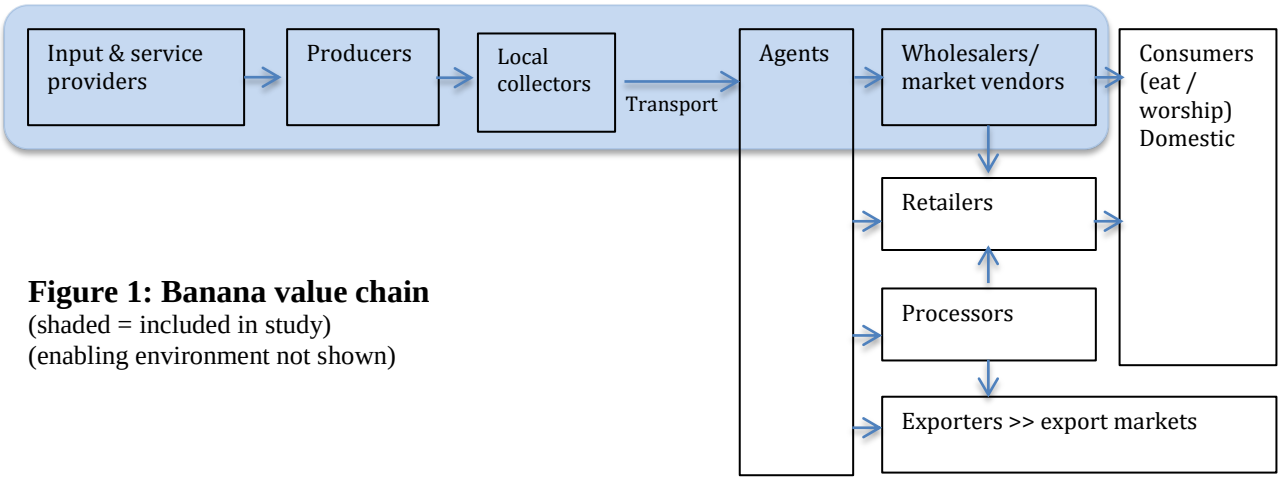

Figure 1: Banana value chain
(shaded = included in study)
(enabling environment not shown)

The KMSS project behind the case study aims to increase income and employment opportunities for poor producers in Myanmar through participation in competitive value chains. The target area is villages within Maubin Township, Ayeyarwaddy Region.

Two Ways to Sell Bananas

Farmers describe how the main way to sell bananas is to transport directly to Yangon to the wholesale market of Bar Ka Yar Market. This is with small numbers of banana bunches, using brokers to negotiate deals with wholesalers and traders. The alternative way is to sell to local collectors who are situated within villages. These local collectors buy the entire banana plot one month before harvest begins. With this method, farmers and collectors can negotiate prices between each other, with collectors also able to offer credit and even insurance to farmers in case of wind or theft.

Farmers Have Little Ability to Set Prices

Price-setting is largely dominated by wholesalers and traders, and farmers must compete with each other. When selling to traders, farmers sell individually rather than by collectively bargaining with buyers. Buyers have numerous other options rather than any one farmer. Farmers also usually sell small quantities in one transaction, selling their entire crop over four months in a few transactions. Storage facilities are lacking and hence farmers must sell plants once they are ready, otherwise fruit would spoil, which stops farmers from selling larger amounts in a single transaction. Finally, most farmers must use a broker to sell their bananas to buyers paying 10% commission, and do not attend negotiations between brokers and buyers. All these factors combine to reduce the negotiating power of banana farmers.

Different Prices and Uses for Bananas

Especially for Gold bananas, an eye-catching bunch of ornamental red banana fruit has more than 5 to 7 fingers, good spacing of fingers, reddish color and a big size of the fruit. However, customers did not mention invisible qualities of fruit such as high nutrition potassium, anti-oxidation, good smell and taste. So it means that these kind of banana are used as offerings to gods, spirits and honourable persons rather than being consumed. In Myanmar, bunches of green bananas surrounding a green coconut in a tray form an important part of traditional offerings to the Buddha and Nats (spirits).

Climate Change Effects on Banana Plantation

Banana trees are vulnerable to destruction by high winds, such as tropical storms or cyclones. Especially Gold banana has a longer life span than other bananas, at 13 months, so it has to pass all three seasons. During the monsoon period of June and July, damage of bunches and collapse of plants could be high if the bunches are still on the plants. Banana farmers avoid tough seasons by cultivating a late season in December. But then they have to put much effort on the survival of plants by irrigation for five months. According to suggestions of a banana specialist, farmers should plan to grow systematic wind-breaks. However, farmers have cut down big shade-trees such as mango and bamboo. Producer groups or associations can organize and plan for growing westerly and southerly wind breaks.

Contrasting Trends in Banana Production

In response to changing weather and market conditions, trends in banana production in the villages are changing. In Pho Yar Wel village, farmers are reducing production of bananas and switching to seasonal crops. Losses caused by heavy winds have forced farmers to grow less risky crops. Many farmers are now only planting half-acres of bananas rather than full acres, as they did since Cyclone Nargis. In contrast, in Let Pan Gone village, there has been a steady increase of banana production since Nargis. Prices for bananas have increased over the last several years in response to the impact of Nargis. Supply was severely cut by Nargis as many banana plantations were destroyed and many farmers throughout the region chose not to replant bananas. This has made bananas one of the most profitable crops despite its exposure to loss from heavy winds.

Disease is Severely Limiting Banana Production

The banana specialist engaged in this project also claims that disease is destroying large proportions of bananas in target villages, limiting farmer income and wasting farmer investment. Disease-infected plants cannot bear fruit, with 10% of new plants being disease-ridden and 20-30% of old plants being infected. The specialist largely attributes this to the propagation method whereby suckers or infant banana plants that sprout out of mature plants are transplanted to grow new plants. These suckers catch disease from mature plants and spread it to every sucker that is grown from them. The specialist advises the use of new suckers grown from tissue-cultures so as to stop propagation of disease. Tissue-cultures provide an affordable way to grow plants, with each new sucker costing 500 MMK. Furthermore, the advice to farmers is to segregate 10% of their land to a banana nursery, where new suckers can be planted and used to produce disease-free suckers in later years.

Panama Disease 10% to 20% of plantations have Panama disease. This disease is caused by a fungus in the soil. It makes the leaves break. If you cut the banana plant, the apparent trunk is coloured brownish red. There is no cure; however, its effect can be minimized by planting only tissue culture plants (in vitro propagation), controlling aphids, and immediately removing and destroying infected plants. In some countries, commercial propagation occurs by tissue culture, which is preferred since it ensures disease-free planting material. When using vegetative parts such as suckers for propagation, there is a risk of transmitting disease.

Applying Fertilizer

Farmers are not aware of standards for application ratios of N:P:K for banana plants. The local ratio used (3:2:1) is very different compared to international standard ratio of (1:1:2). Most of banana farmers are overusing Nitrogen which leads to soil degradation and weak resistance to pests and diseases. In this region, soil fertility is favourable if farmers use fertilizer with recommended rates (i.e. annual rate/plant: 300g Nitrogen, 300g Phosphorus, 600g Potassium and 500g Dolomitic limestone).

Technical Knowledge, Low Capital and Seasonality

Farmers are weak in technical knowledge about cultivation practice, plant treatment and inputs, which leads to low quality and yields. As a result, farmers receive less benefit from input usage. With a lack of capital for investment in inputs, there are further quality and yield losses. Also farmers can not manage timely production to obtain high prices (see calendar below). Land is available, however, due to lack of initial investment, farmers do not have the chance to increase production.

J	*F*	*M*	*A*	*M*	*J*	*J*	*A*	*S*	*O*	*N*	*D*
Peak production			*Decline production*			*Low production*			*Increase production*		
			High price						*High price*	*High price*	

30% of small scale (less than 0.5 acre) banana farmers receive loans for inputs with a high interest rate (10 – 15%) from local collectors or money lenders. They cannot afford to purchase all required inputs due to high cost. 50% of larger banana farmers (0.5 – 3.0 acre) use credit (10% interest rate) from input suppliers for input used. They also cannot afford to purchase all required inputs.

Planting and Cultivation Practices

Practices that are applicable for the local situation include multiplication practices, selection of small plants and tillers, method of raising soil or refilling earth at the bottom of the plants and spacing of growing plants (10'x10') or (9'x9') and digging of ridges. Selection of best suckers is very important. The offshoot that farmers planted is called the parent plant. Four months after planting, they cut away all the suckers that have sprouted except one. They cut the suckers off at the ground level or below the surface of the ground to keep the best sucker which is the best placed. About 12 months after planting, the parent plant produces fruit and these are harvested. The best quality suckers need systematic seedling methods and tissue culture.

Individual Interview with Banana Farmer (Lat Pan Gone village)

U Khu Aye used Organic method for cultivation of Yae Thi bananas in 2015. He used organic compost and farm yard compost for a total of 900 banana trees (2.5 acres). Labour for collecting farm waste and water pumping costs 250,000 MMK and other labour for land preparation, clearing grass, planting and fertilizing costs 500,000 MMK for 900 plants. 15% to 20% was lost to pests and diseases. 6 to 7 fingers per bunch could be produced if the plant was treated well. Bunches were collected every 2 or 3 days during the harvest season. Actually, this Yae Thi variety is not highly demanded in the market and few banana farmers grow it. He sold his production between 3500 - 5000 MMK per bunch. In 2014, he lost 400 banana trees because of strong wind.

Individual Interview with Banana Farmer (Pho Yar Wel village)

U Htay Win used organic bio-fertilizer in 2011 but this was ineffective and it delayed harvest by three to four months. This led to fruit-bearing plants to be exposed to heavy pre-monsoon winds. Since early 2012, he has been changing to Good Agriculture Practice (GAP) and farmyard organic methods in his banana cultivation. He cultivated 300 Hpee Gyan banana plants on a half acre in 2015 and he sold his production at an average of 3700 MMK per bunch.

Opportunities Seen by Farmers

Amongst farmers, there is now a widely accepted belief that farmyard organic methods make the soil more fertile and is more sustainable in the long-run. Yields are similar and some farmers even report that the colour and health of the banana plants are much better. Four years ago when GAP was first introduced by KMSS-Yangon, there were only five farmers willing to use it. Now, there are twenty-five farmers in the target villages collecting and applying farmyard manure and green compost. Local advocates amongst farmers are also beginning to encourage organic methods fervently, with one farmer visiting villages and giving demonstrations on his own time.

Constraints

Currently, adoption of GAP and organic fertilizers are stymied by labour costs due to manure being collected outside of target villages and the difficulty of collecting large quantities of both manure and green compost needed to fulfil farming needs. Cow manure is in short supply in the target villages as cows are no longer reared within the villages. In conjunction, the amount of organic fertilizer needed to fertilize an acre of banana plants is nine times larger than chemical fertilizer. Many farmers, especially larger-scale ones, are continuing to use chemicals as the labour costs associated with collection and application.

Individual Interview with Transporter (Pho Yar Wel village)

U Kyaw Kyaw is a transporter from Pho Yar Wel village. There are eight transporters in that area. He uses a 1 tonne truck for transporting banana bunches and other seasonal crops. For bananas he can carry 120 to 150 bunches. His final destinations are to Bar Ka Yar market and Thiri Mingalar (vegetable wholesale market) in Yangon. He charges 400 MMK per banana bunch based on the size and weight of the products' load. Normally he transports every day in

peak season, March and November, and every other day otherwise. He connects and shares with fellow transporters if his car is overloaded, especially in peak production seasons.

There are many steps of transportation: farm to village road, village road to main road and main road to market. There is poor infrastructure, slow transportation, careless labour and often multiple loading/unloading. This can give handling damage and, as a result, a lower selling price for the farmers.

Brokers and Traders from Bar Ka Yar Market

In the highest demand seasons, March to April and October to November, the demand is double other months. Normally, traders could not store for many hours since they do not have enough space and storage facilities. Government support is needed. Customers demand good quality product but it could not be supplied by farmers. Only 15 out of 100 bunches have good quality, with limitations from damage and bruising during transportation, climate conditions, pests and diseases, weaknesses in agricultural technical skills, inability to afford timely irrigation and applications of fertilizer. Banana farmers could not get a high price for their products. From the traders' side, they have to sell by mixing good and bad quality to wholesalers and retailers. There are challenges as an estimated 50% of shops who give tax to government have difficulties in spacing, because of crowding and sanitary conditions, compared with the other 50% of illegal brokers.

Reflections

Farmers are increasingly interested in GAP and farmyard organic methods. Labour costs and availability of cow manure are large constraints, which means a widespread transition to organic production is unlikely. Some farmers have tried organic methods but found that they did not work well. Banana production can be profitable, though it is risky due to the long growing season, prevalence of diseases and susceptibility to high winds and damage. Farmers need more technical skills around fertilizer application and propagation methods, access to capital and capturing high price seasons.

Local collectors and brokers play a large role in the value chain. Quality of product is important and good storage and transportation options are limited. Most of the high value bananas are used in offerings rather than eaten.

More Details on Participants in the Study

The case study built on program interventions over the last three years, but specifically a focus group discussion was held in Pho Yar Wel village (4 producers from that village and one other), with individual interviews conducted with two other farmers (one from Lat Pan Gone village). An individual interview was conducted with a transporter (Pho Yar Wel village). A focus group discussion was held with 3 brokers and traders from Bar Ka Yar Market, Yangon.

More Detailed Production, Prices and Cost data

Average price of banana per bunch

Gold banana	-	5000 to 13000 MMK
Thee Mway	-	3000 to 7500 MMK
Ya Thi	-	2500 to 4500 MMK
Hpee Gyan	-	3000 to 7000 MMK

Average cost per tree (one season)

Gold banana	-	Around 1000 MMK
Thee Mway	-	Around 1000 MMK
Ya Khai	-	Around 500 MMK
Hpee Gyan	-	Around 300 MMK

Average Cost and Return Per Acre for Gold (Shwe) Banana Plantation (Pho Yar Wel village)

Shwe Banana	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total Year
Cash out														
Cleaning grass	36,000													36,000
Land preparation	84,000					84,000								168,000
Seed & transport	150,000													150,000
Plantation labor	15,000													15,000
Labor - cleaning & general		15,000		15,000		15,000		15,000		15,000	60,000	40,000	30,000	205,000
Fertilizer 1 T super Phosphate	*25,000*													25,000
Fertilizer 2 Nitrogen		11,000	11,000	11,000	11,000	11,000	11,000	11,000	11,000	11,000	11,000			110,000
Fertilizer 3 Potassium				22,000	22,000	22,000	22,000	22,000	22,000	22,000	22,000			176,000
Lime	*5,000*													5,000
CarboFuran	*9,000*													9,000
Irrigation						54,000	54,000	54,000	54,000	54,000	54,000	54,000		378,000
Bamboo (wind control)												150,000		150,000
Harvest labour fee													120,000	120,000
Transport fee													240,000	240,000
Total Cash out expected	**324,000**	**26,000**	**11,000**	**48,000**	**33,000**	**186,000**	**87,000**	**102,000**	**87,000**	**102,000**	**147,000**	**244,000**	**390,000**	**1,787,000**
Cash in														
Sells banana													3,600,000	
Total Cash in expected	-												**3,600,000**	**3,600,000**
NET CASHFLOW														**1,813,000**

D) Natural ginger tea

သဘာဝဂျင်းလက်ဖက်ရည်

NATURAL GINGER TEA

OUR STORY

The enterprise represents a business partnership between Metta Development Foundation and Naung Kham farmers, in Southern Shan State. It is based on collaboration between two of Metta's research and training centres: Bago and Naung Kham. The enterprise covers organic ginger production, post-harvest processing and market linkages. The ginger is grown in Southern Shan state with ecological farming methods, using organic fertilisers and natural pest control. The farmers, who have been trained at Metta's farmer field schools, are paid fair prices for their ginger. The tea is produced at the Bago Centre with a low-impact process, using renewable energy sources like rice paddy husks. It utilizes service facilities and equipment including storage, grinding, blending and packing.

AN ECOLOGICAL LIVING
Bago Centre
ပဲခူးဂေဟရိပ်သာ

OUR PRODUCT

The product is natural ginger tea, organically grown, and a healthy alternative to coffee, carbonated beverages and other sugary drinks. It is natural drink with no artificial colors/flavors/preservatives/additives. This product has been arrived at through testing different formulations with guests at the Bago centre, over a one year period.

WHY CHOOSE GINGER TEA?

OUR PRODUCERS

OUR CONSUMERS

Health-conscious local and expatriate people… at present, those with connections to the Bago Centre.

Some Details

Producer		
1.	How many acre do you have (total acre)? And How many acre grow ginger?	4 acre (grow only ginger)
2.	How much raw ginger do you harvest in season?	4,375 kg (in season)
3.	What is the price if you sell to buyer in your area?	MMK 500 per Kg
4.	How many farmers grow ginger in the area and How many acre do they grow?	(2) farmer, total (6)acres
5.	What kind of variety of ginger do you grow?	Local
6.	How do you grow? (technical) and what kind of input do you use? (fertilizer and others?)	Used only manpower (plough), natural fertilizer
7.	What kind of purpose do you grow ginger?	For family income
8.	Do you received any input support from outside?	Not (family investment)
9.	What can be challenges and opportunities?	Pest outbreak, good market
Processor (Bago Centre)		
1.	Where your raw materials come from?	From Pinlong Township, Southern Shan State
2.	What kind of raw material?	Ginger
3.	How do you store?	Store (Bago Centre)
4.	How much ginger you buy and price per Kg?	200kg, MMK 2,000
5.	How many kilogram can you produce in a day?	8kg/day
6.	How many worker do you use?	3 pax
7.	What other ingredient do you put in ginger tea?	Sugar only
8.	How many month shelf life?	1 year
9.	What is your total production cost?	1,500MMK/Bottle
10.	What kind of marketing channel do you use?	By centre, organization, and coffee shop and store
11.	How many bottle do you supply?	60 bottle/month
12.	How do you received your purchase order?	By email and telephone
Consumer		
1.	What are the benefits of ginger tea - why do you use it?	Good for health
2.	Where do you buy? How much?	At Metta and some store
3.	What kind of comment do you want to give?	Good if produce pure ginger powder
4.	What kind of other ginger tea verities do you want?	Ginger lemon honey tea

Costs and returns (50 Bottles)

Item	Details	No. Units	Unit price	Total
Income: Sales		**50**	**2,500**	**125,000**
Expenses				
Raw material				
Ginger	10 Viss = 16.3 kg	10	2,000	20,000
Sugar	As above	10	2,000	20,000
Packing costs	Bottle, sticker, inner liner, plastic packing	50	273	13,650
Labour	3 casual staff days	3	6,000	18,000
Firewood		1	10,000	10,000
Total expenses*				**81,650**
Surplus/deficit				**43,350**

*not including Admin and selling costs

Future plans

To expand to 8,000 bottles per year. This will require 1,600 Viss (2.6 tonnes) of ginger per year, so many more farmers are needed. The selling price is about 4 times outside price at farm gate level, so it should be attractive. Farmers will be contracted. Sourcing all of this ginger as organically produced will be a challenge. Experience in operating a larger scale social enterprise is needed.

This case study was prepared by interviewing 4 producers and 2 consumers, and documenting processing methods along with their costs. Ko Wai Zin prepared the case study, edited by Ko Myat Thu.

E) Organic garlic production

Introduction to the Naung Kham Centre
Naung Kham Centre is situated in Hsihseng Township, Southern Shan State. The Centre was established by Metta Development Foundation since 2003 as a learning centre for ecology-sound, appropriate technology, to support a sustainable development process. The centre aims to:

- host training and workshops to engage people who work for sustainable community development.
- create a learning space and environment to produce non-toxic farming product.
- conduct action research based on community needs and disseminate seeds, tools, methods and agriculture technology to local farmers

The Centre supports many types of vegetables for use in the Centre Kitchen and provide seeds for farm. All fruits, vegetables and products are produced with natural compost make by farm wastes, and by using bio-pesticide. (Vegetables include: Chinbaung, Kazunyweit, Monhnyin, Pumpkin, Gourd, Cucumber, Salad, Egg Plant, Lady Finger, Mustard, Charyoke, Bean, Long Bean, Radish and Carrot. Spices include: Garlic, Onion, Ginger, Chilli and Lemon Grass. Annual and perennial crops include: Papaya, Banana, Tea, Coffee, Mango, Macadamia, Avocado and Dragon Fruit. Seasonal crops include Gum, Corn and Rice. For livestock keeping the Centre raises Pig and local Chicken.

This Organic Garlic case study aims to document one of the Centre activities and to distribute information of organic farming situation.

Organic Garlic
The Centre has produced organic garlic since 2009 to supply safe food for the Centre's Kitchen that feeds the people who visit or stay at the Centre.

Post-Harvest Management (garlic kept in a warehouse)

Inputs and production

The main farm inputs for organic garlic are composts made of cow dung, chicken dung and straw. Chicken dung is obtained from chicken producers nearby Taunggyi. Cow dung and its labour force depend on cattle sheds near the Centre.

Naung Kham Centre had produced Garlic without chemical fertilizers and pesticides for several years. Seasonal crop production uses a crop rotation system for lowland and rain-fed agriculture. In lowland fields area garlic is cultivated after lowland rice and in rain-fed systems, after corn. All crop production used cow dung, chicken dung, straw compost, plants fermented juice and bio pesticide for soil and pest management. For soil management the Centre staff make compost with cow dung, chicken dung, straw, fermented plant juice and indigenous Micro Organism, mixed together and kept 2-3 days and then broadcast in the field during land preparation. Land preparation uses a tractor once for ploughing and twice for harrowing.

The seed used in Centre is from Kan Ke' village (variety is Taunggyi White One Layer Glove). The Centre keeps the garlic seed for the next year's production. The Centre use bigger seeds (Htoo-3-5) for good germination and healthy plant.

The Garlic varieties used in Naung Kham (Taunggyi White One Layer Glove)

Table 1: Cropping pattern for Naung Kham organic garlic production (2012-2016)

Year	Land Area	Type of Soil	Production Method	Cropping Pattern	Seed (Viss)	Product (Viss)
2012-13	0.35	Lowland	Mai Pan Method	After lowland Rice plantation	30	150
2013-14	0.25	Rain fed	Broadcasting on 4 feet wide band	After Corn production	40	180
2014-15	0.4	Rain fed	Seeding in line on 4 feet wide band	After Corn production	110	580
2015-16	0.75	Rain fed	Broadcasting on 4 feet wide band	After Corn production	210	404.5

When comparing the four years from 2012 to 2015, 2015 was the largest area and the lowest yield, due to fungal disease during plant growing stage. This arose from climate conditions (cloudy and raining, after 1-2 months from cultivation). One significant consequence apart from the lower yield, was a smaller product, which meant higher costs and lower sales price. The yields in other production years were normal. The highest production was 2014. The production capacity for the centre is about 1000 Viss, so the potential is not being met.

Broadcasting cultivation method with 4 feet wide soil band

The Centre utilities water resources from water springs. When cultivation is on upland fields, supplementary irrigation is applying water 3 times per month and 12 times per one cultivation season, with diesel engine water pump. When cultivation on lowland rice fields the staff have to manage water 3 times maximum per season.

Harvest is between 130-150 days after sowing. The plant is removed by its stem by hand, and dries in the sun in the field for 1-2 days. Then they are bunched and the upper leaf cut, and tied with bamboo string. The garlic is kept in a cool and dry warehouse. The stem is cut and the garlic is graded in 3 categories, (lat Char = smallest, Htoo 1&2 = medium, Htoo 3-4 = bigger). After grading garlic is put into a bag and kept in storage from April to December, or until sold. Each bag is 20-30 Viss and is without labelling. There are no special marketing activities because it is mainly for the centre, staff and visitors that come to attend trainings and workshops.

Returns and costs

In 2015-16 the income per acre was 1,303,900, the costs were 1,071,600 and the gross margin was 232,300. As mentioned, the yield was lower – maybe ½ of what was expected, which decreased the gross margin. The percentage costs are presented in Table 2, and more detail is given later as part of a comparison. The most significant costs are seed, labour, (organic) fertiliser and harvesting, followed by irrigation and land preparation.

Table 2: Production costs (%) for organic garlic

No.	Cost item	% total cost
1	Land preparation	8%
2	Seed	27%
3	Labour for crop management	22%
4	Fertiliser	18%
5	Pesticide	0%
6	Irrigation	9%
7	Harvesting	15%
8	Transportation	1%
Total		100%

A comparison with inorganic garlic production is partially possible (Table 3) with two fields in nearby villages. Note there are no price differences between organic and inorganic garlic as such. All prices depend on the local market and sales. The smallest ones were sold to local broker and the medium and bigger ones were sold to the Centre's kitchen, visitors and kept for seeds. Any price differences therefore are due to size and time of sale (lowest at harvest time, rising after that).

Table 3 Comparison of income, costs and gross margins (1 acre, 2015-16)

Item	Organic (Naung Kham Centre)	Inorganic 1 (Kone Kyaung village)	Inorganic 2 (Lwe Taw village)
Income			
Yield	539	1224	700
Price	2,418	1,300	2,700
Total income	**1,303,300**	**1,591,200**	**1,890,000**
Variable costs			
Land preparation	86,000	21,600	49,000
Seed	293,330	224,000	405,000
Labour (crop management)	240,000	176,000	105,000
Fertiliser	189,330	113,600	95,000
Pesticide	0	12,000	10,000
Irrigation	96,000	0	66,000
Harvesting	156,000	108,240	90,000
Transportation	10,930	52,480	40,000
Total variable costs	**1,071,590**	**707,920**	**860,000**
Gross margin	**231,710**	**883,280**	**1,030,000**
Gross margin / income	18%	56%	54%

The first inorganic field was a lowland rice field, and very fertile. It had a correspondingly high yield (showing the difference to upland and less fertile fields). It had a lower sales price as the farmer had to sell quickly after harvest to pay debts (showing the importance of timing of sales for income). The land production costs were lower (land preparation, irrigation and harvesting, see Table 4).

The second inorganic field was also upland, but it was planted by hand rather than broadcast, and was not as affected by mould so had a higher yield. It also had a higher selling price (bigger product?). The costs were lower (land preparation, labour and harvest, see Table 4).

The labour costs are far higher at the centre than outside (field condition), and this restricts a direct comparison. That is, it is not good to compare a demonstration farm to a village farm situation, as the demonstration farm is providing other services other than just production. Both farming families had sufficient own labour, which maybe is not correctly valued (e.g. using an opportunity cost or shadow price). In addition, the mould meant that a smaller product, which in turn meant that it took longer to harvest, also increasing costs.

Other costs like fertilizer are far less for the inorganic producers than the chicken dung (coming from far away).

Garlic markets and consumption

Of the 2015-16 production, about 9% was used in the kitchen, 5% sold to visitors, 20% used by the Bago Centre, 22% sold to broker, and 44% retained for seeds.

Feedback from consumers is that the organic garlic is tastier and better smell than garlic grown with chemicals. It is can keep longer and has more weight (normally) than chemical products. The cooks prefer big cloves because it is easy, quicker and saves time to remove the hard skin.

Challenges, opportunities and plans.

Three challenges in organic garlic production are: farm workers being available on time, decreasing availability of cow dung or organic fertilizer and at higher prices, and climate change effects so that being cloudy and rain in cultivation season favours fungal diseases. Another challenge is that farmers cannot hold onto the product to get higher prices but need to sell quickly to pay off debts.

There is potential to produce organic garlic with local farmers if the price is stable and fair. There are 3 villages around the Centre and networking is possible. Consumers are becoming more aware of the effects of chemicals on human health and environment, but the market is not developed. Brokers may not be interested in handling smaller volumes (and needing to keep it segregated), without an incentive from consumers and markets. The potential of selling to an organic market in Yangon is being investigated, though this will also have higher transportation costs.

The next year's production plan (2016-17), is to produce much more than 1000 viss of garlic with 180 viss of seed. Production will use Mai Pan Cultivation method in a lowland field without ploughing. The Centre is planning to sell with fixed price based on the production cost and yield.

Reflections

Organic garlic production is predominately for an internal market to Metta (Naung Kham Centre and visitors, Bago Centre) with limited external sales. The production area has increased but is small. The case study reveals important constraints for organic production: labour, cost and availability of manure and managing climate extremes. These translate into higher costs, though it is difficult to say how much extra due to the limited ability to compare a centre and village field set-up. It also shows the importance of growing condition (e.g. soil fertility, upland vs lowland, presence/absence of mould) for yield, and time of sale for price. Informal feedback suggest the organic product is tastier and lasts longer (storage). The external markets for organic produce need further investigation.

This case study was produced by Metta's staff based on records and internal consultations. Two farmers helpfully participated by providing comparisons for their (inorganic) products. Khun Wai Lar prepared the case study with editing by Ko Myat Thu.

F) Market facilitation, consumer-producer dialogue and PGS

Introduction – why market facilitation and PGS?

Some consumers do not know where their food comes from, its quality and the basics of food production. Price and convenience guide purchases rather than an informed choice based on a range of social, environmental and economic criteria. Some producers use farming systems that are not efficient without consideration of this full range of criteria. Producers often only deal with local collectors and brokers, and do not know about their products' consumers. Enhancing links between producers and consumers can enable mutual understanding, respect and fairness, and a system that is not just based on the lowest price. Enhancing links can also contribute to the overall movement that is known as *community supported agriculture* (CSA). This is best at small scale.

At the same time, consumers want to have certainty of the integrity of their purchased product. If it is called '*organic*', then they want to trust that. Participatory Guarantee Systems (PGS) are held up as an alternative to expensive third party certification schemes. A PGS is built on trust – which comes when there is better communication between producers and consumers. Usually that trust is enhanced through respected market facilitators.

Market facilitation is one service offered by Alin Ein Development Centre. Facilitation involves enhancing producer-consumer dialogue, providing market facilities, managing the PGS and networking with other actors.

What does market facilitation look like?

See Figure 1. The main actors are producers, consumers and a market facilitator. The roles of the facilitator are shown. As part of mutual respect and understanding, both the producer and consumer shows care for each other.

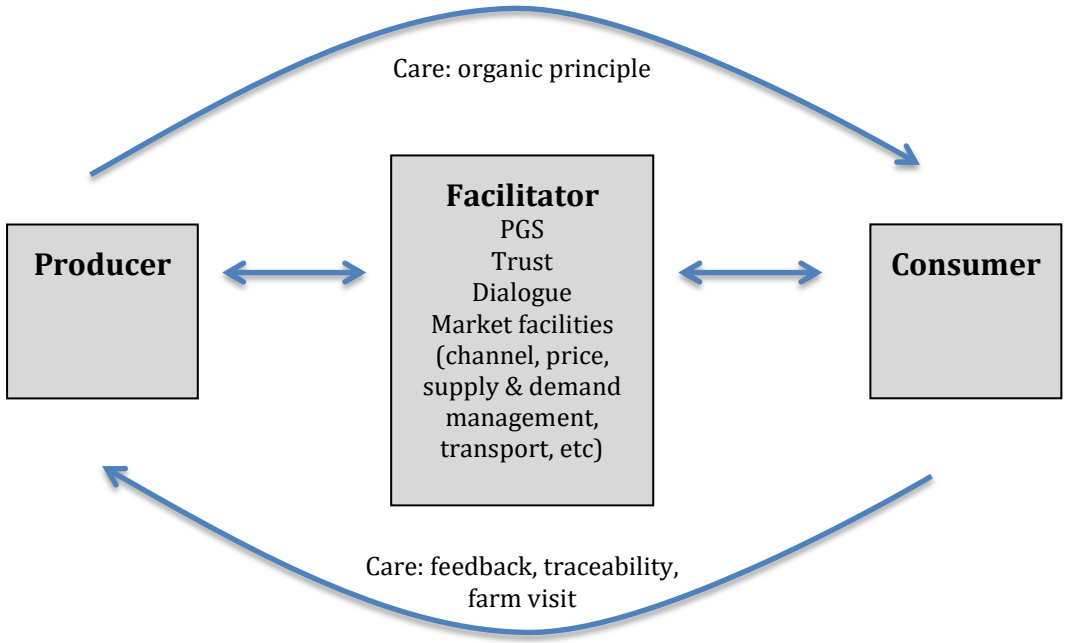

Figure 1: Facilitating consumer-producer links and PGS

Findings and Alin Ein's experience

Motivations and perceived benefits

"Producers sell at a low price but consumers buy at a high price – who gets the benefit?"

Alin Ein wants to see increased benefits for both producers and consumers. Healthy and affordable food (and goods) for all people, chemical-free, with a fair market for all. This market should be at a small scale to achieve these benefits.

There is a high degree of *trust* evident with both producers and consumers. Participants have satisfaction. Local seeds are used and local product is consumed. Producers often have increased their own consumption of nutritious foods, too, and know of the environmental benefits of their production.

Who is taking part?

There is a network of 13 producers. The emphasis is on food, such as fish paste, fish sauce and vegetables, but it also includes non-food items, like soaps and herbal medicines. Most producers are organic, but some are in transition and are progressively reducing their chemical applications. Some producers have off-farm income as their major livelihood means. Products are sold directly to consumers (mainly about 50 households with members working with non-government organisations) and those through two small outlets (one roadside shop and one market stall). The fish products, chilli and tomatoes are sold out almost every time, but other vegetables are harder to sell and stay fresh only for a short time.

Consumers put in orders for regular purchases. The dialogue also allows for consumers to give feedback as well as learn about production. Consumers are aware that the product is organic and thus mostly will pay a different price. They have a high degree of trust now and admire that the product is fresher and lasts longer, with no smell of chemicals. Visits by consumers to producers have been arranged almost once per year (each time with 5-15 people). The option for quality checks is there but has not been used because there is seen to be sufficient feedback mechanisms.

Alin Ein provides training in natural fertilisers and pesticides (pesticides that drive away rather than kill pests), as well as raising consumer awareness.

Challenges

Participation is difficult – producers often need to prioritise livelihood rather than giving time for dialogue, and consumers live mainly in urban areas with their own household and livelihood tasks. Consumer feedback includes having better packaging, more regular selling and a higher variety of products to be included. However, it is difficult to grow vegetables all year round, especially with natural wet and dry seasons, so there is still some way to go with consumer awareness. Transportation costs and labour costs are high for producers. More consumers could be found if there is more product available.

For Alin Ein, only a low investment was needed (4-5 Lakh). The sales cover product costs and their transport costs, but not labour costs for the facilitation. That is, the facilitation role is not paid and it is voluntary. This implies that market facilitators need some other income source or livelihood to meet their family needs, rather than be full time facilitators.

Alin Ein thinks the way forward is to go *"hand-in-hand together for success"*. The case study shows that trust can be built between producers and consumers, with attention needed on enabling participation and returns for the time spent on market facilitation.

How we prepared the case study

GSMI contacted two members of the market facilitator, three producers within the network, a related social enterprise and 4 consumers. TOA partners provided comments on the initial design and findings. For the producers, we asked about products and varieties, quantities, price, objective, experience, needs, challenges and lessons. For consumers we asked about why they choose these products, their experiences, trust levels and suggestions. For the facilitator we asked about their role, history, benefits, challenge, networks, skills and the PGS (experience, rules and regulations, trust, dialogue, pricing, costing, market channel, management including transportation and labour). Ko Myat Thu facilitated the writing process.


Trainings


Farm visit


Producer-consumer gatherings


Selling at roadside

G) Young farmers and eco-farming in action at Inle

Young farmers are of special interest for TOA. They are motivated, active and adaptable. Over the last 3 years, KMF (Yangon) has trained 101 young farmers in Southern Shan State and Ayeyarwaddy Division, including 55 in the Inle district in eco-farming, land tenure and seed laws. A network has been established so they can continue to learn and draw encouragement from each other. Many of these farmers are applying what they are learning regarding **eco-farming**. Some of the products being produced include rice, tomato, mustard, chilli, garlic, beans, eggplant, gourd, and other vegetable crops. Many have just started. One alumni is selling produce to Yangon (see also the *Alin Ein* case study). Some alumni are linked to a shop managed by KMF and other alumni to sell their produce when it becomes available. Some are considering small scale processing based on the experiences of other organic processors (not KMF alumni), e.g. tomato paste, fruit jam and dried jackfruit. The value chain includes: input suppliers, producers, collectors, processors and two market channels (selling via shops to consumers and selling directly to consumers from processing). This value chain mostly revolves around different sets of alumni undertaking different roles. See the photographs of alumni in action.

Some alumni share their knowledge to others through trainings and exposure trips. They are working together for public awareness raising about Seed Law.

Their motivation: after training many alumni are motivated to be eco-farmers and apply their knowledge. They are mindful of the sake of other people and future generations.

Their successes: alumni are establishing demonstration plots and are trying to apply their practices little by little on their own farm. They have more confidence and creativity. Some alumni have made bio-fertilizer and bio-pesticide on their own farm.

Their difficulties: as young people, they require more trust and belief by parents and neighbors. Then, many still need to have organizing skill, facilitation skill and self-confidence when they share techniques on training to others. Financial support is still needed especially during the transition stage. They do not know much yet about the costs and markets.

Lessons learned and future actions: a model farm is seen to be a good way to demonstrate the eco-farming practices. Alumni from seven communities will establish model farms in their communities and also initiate "Self-Reliance Cooperative Farming Economy Systems". Also, young farmers need more awareness of policy issues such as farmers' right, land right, local seed conservation and marketing and agri-business management. So KMF will continue its support to build capacity for young farmer alumni, such as giving online information, and some volunteers will work in communities and conduct leadership trainings. A young farmers' forum is seen as a good platform for information sharing and mutual learning.

This case study has drawn on interviews with both KMF alumni and others, including a group of 6 producers, as well as individual interviews 2 processors, and with 2 other joint producer-processors. KMF staff contributed as did volunteers concerned with the Inle shop. The case study was prepared by Ma Thi Thi Win with editing by Ko Myat Thu.

Exposure trip – chemical-reduced farm

Alumni meeting to prepare for case study

Interview to individual organic farmer

Chemical reduced farming by KMF alumni in Ayeyarwaddy Division

Sharing and discussion on local issue in agriculture (organized by alumni)

Extension training (organised by alumni)

H) Learning from policy engagement examples

Two recent examples of policy engagement by FSWG have relevance for TOA partners, namely for the revisions to Farmer Protection and Seed Laws.

Policy engagement is more successful when:

- Outputs can directly be used in the process of revising laws. That is there is a timing issue, so that information is available when needed, but also a presentation issue, where the analysis and recommendations is in a useful 'informatics' form
- Direct engagement occurs with members of parliament and policy makers through meetings and not just through publications
- An effective research committee guides the process (committed, available, giving useful inputs at key stages including terms of reference, design, analysis and recommendations). Gaining participation from government in research committees has been difficult, generally
- A broader input from members of FSWG is gained and not just driven by external consultants (even if these consult with members). Good contract management and clear terms of reference, are very important to ensure consultant input is maximised
- Adequate time is available for a good research process

Meetings with policy makers meant there was more success in preparing the briefing paper to support the revision of the Farmer Protection Law. In contrast, the recommendations for the analysis on Seed Law prepared by consultants are seen to be sound, but they did not come in the period of revision of seed law and they were not discussed widely with policy makers (even if they received the research reports and briefing papers in the research launching events or other events of FSWG).

Lessons by Dr Khin Pa Pa Wai, FSWG Coordinator, facilitated by Ko Myat Thu. See also the separate list of laws and policies, and relevance to organic agriculture, prepared by FSWG.

3. Definition

The framework starts with **definition** – as this is a large point of contention and fragmentation amongst different actors in Myanmar. What is it that we call organic, or agro-ecological? In this section, an overall summary is provided, then partner experience, and findings from consultations and literature. Further analysis by the author is offered, based on the study's findings.

3.1 Summary

- 'Eco-farming' or 'natural' or 'chemical-free' are used by partners more than 'organic', which in practice means 'certification'.
- The definition needs to be holistic and include a range of economic, environmental and social aspects, and not just how the product is grown (or recorded, its consistency with standards, etc)
- Participative Guarantee Systems (PGS) are an important alternative to certification.
- 'Organic by default' is not a large opportunity in Myanmar
- Partner commitment is significant
- The main interests for TOA partners are in informal certification or PGS, for farming practices using systems approaches and natural inputs

3.2 Partner experience

Terminology: *organic* has significant limitations because it is only associated with certification, in practice. Other terms are used for convenience, especially *eco-farming*, *natural* and *chemical- free* (see the case studies). Agro-ecology is seen to be better than organic, but is not relied on. TOA's stance is to reclaim the term organic, to allow its meaning to be sufficient and suitable, whereas that seems difficult in Myanmar. In local language, *thabawa*, or natural, is used, or the English words are used.

As a counterpoint, partners referred to the terms traditional and conventional. Previously, traditional would have meant organic, especially before the green revolution. Now it is less clear. What is called conventional now typically means "high external and chemical input".

Meaning: partners agree with the TOA principles of health, environment, justice and care. Throughout the study, partners have particularly emphasized holism, and social and environmental aspects in addition to economic aspects. This is one contribution to the broader debate, which relies more on production methods and meeting standards, relevant documentation and such. Social included fair prices to farmers, as well as increased understanding by both producers and consumers of food systems (and countering the increasing disconnects between them) and their well-being (especially no exploitation and less reliance on external inputs, especially those in the domain of multi-national companies). Within economic, partners stressed what were the real costs of food (as many negative environmental externalities from chemicals are not reflected in the price of food, for example). For environment, partners highlight sustainability, a systems approach, and thinking based on *Gaia* or deep-ecology.

Partners saw a spectrum between agro-ecological (holistic), organic (certified), informal (PGS) and inorganic (itself containing a divide between reduced chemical use and responsible practices and irresponsible chemical use). One partner added another category of "Good Agricultural Practice (GAP) plus farmyard organic (composting)", as GAP has two perceived advantages: a commitment to lower chemical use and higher emphasis on farm records and documentation. Note there are many suspicions of GAP, as will be discussed in consultations and literature sections.

Types of relevant production systems include:

- Green or natural input. Non-synthetic or chemical free. Includes compost (straw), cow dung, organic pesticides
- System/rotation, including green manure crops, etc.
- No external inputs, mostly for perennials, sometimes for annual. This includes production with natural cycles of water (e.g. when water recedes across a floodplain, dry season fallows, etc.).

Two implications of the different meanings attached is that commitment is essential (a key influence of ideology?) and that stakeholders are fragmented, and are mainly acting as individuals.

The main dissatisfactions with certification are due to the high costs, the fragmentation and lack of recognition between different certifying bodies, scepticism as to its effectiveness (many abuses) and the lack of addressing social issues in a holistic way. It is not seen as rewarding the right things and, whilst it can provide extra assurance to consumers, it does nothing to connect them with producers, and such.

Participatory Guarantee Systems are considered one of the bright alternatives to certification, as these are based more on trust and making connections. One PGS has been established for a few years (see case study) and, in effect, organisations like Metta and KBC are providing a PGS through their brand name (see their case studies). Consumers trust that these organisations are doing what they say.

3.3 Consultations

Consultations also reveal a general dissatisfaction with formal certification schemes in Myanmar, largely due to fragmentation and ineffectiveness, though it is important to capture the importance of standards and quality. For export markets, then generally international certification is needed in any case, and Myanmar-based schemes are not sufficient. Many stakeholders hope PGS can be a good alternative for domestic markets. One stakeholder outlined two tracks: one for big players (export focused) and involving certification and the other PGS for smaller players (domestic focused).

In Myanmar, the two main certifiers had been Myanmar Organic Agricultural Group (MOAG), now struggling, and the government (through their version of GAP). The Department of Agriculture states how they have issued GAP certificates to 25 mango growers, and their plan is to extend this for other crops.

Individual producers gain international certification in order to join various export markets (particularly Europe, Japan, Korea and the United States).

Some stakeholders wanted to take a more purist approach, and insist that *organic* can not be used for products unless it is documented, produced according to standards, certified and monitored. Why water it down? If it is not certified, then how can consumers trust it, and in turn pay a higher price for it?

In general, other stakeholders emphasized definitions more about the health and environmental aspects (avoiding pollution) as opposed to social (discussed more under production).

One additional point coming from consultations is that bio-technology can be a natural complement to holistic production systems, particularly to mimic natural growth processes and by using natural products. This is at the opposite end of the spectrum of using no inputs. Obviously, not all bio-technology is seen as desirable, as with using genetic modification. So it was more about using natural fertilisers, growth stimulants, immunity system builders and bio-pesticides, but harnessing science to be more effective.

All stakeholders agreed that there is limited data regarding organic production in Myanmar but it is very small in total. There are only a handful of known commercial *organic* (certified or not) fruit and vegetable producers, for example, but with many more non-commercial producers who did not apply chemicals, for various reasons. By definition, if they are non-commercial then they are small scale but also not selling product far outside of their own immediate family's use.

3.4 Literature

A common starting point for definitions use that of the Food and Agriculture Organisation (FAO):

> *"Organic agriculture is a holistic production management system which promotes and enhances agro-ecosystem health, including biodiversity, biological cycles, and soil biological activity… It emphasises the use of management practices in preference to the use of off-farm inputs, taking into account that regional conditions require locally adapted systems… accomplished by using, where possible, agronomic, biological, and mechanical methods, as opposed to using synthetic materials, to fulfil any specific function within the system." (FAO/WHO Codex Alimentarius Commission, 1999).*

In Myanmar language literature, definitions revolve around using ecological processes (see Myint Lwin, 2016; Min Win Htun, 2016), perhaps reflecting the authors' focus within the Department of Agriculture. They mention the need to follow strict rules to be called organic.

In contrast, Towards Organics Asia (TOA) upholds the IFOAM definition, with its four organic key principles of health, ecology, fairness and care. Apart from production management and ecological aspects, this definition includes social issues (Lenoir, 2014). Fair payments and good living conditions are included (Niggli et al. 2014), for a start.

The full IFOAM definition is:

> *"Organic agriculture is a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved." See www.ifoam.org/growing_organic/definitions/doa/index.html*

Other definitions include differing attention to economic, environmental and social factors. For example, SwissAid (n.d.) includes social and economic aspects via "Ecological farming aims to create globally sustainable land management systems through agro-ecology practices and principles and… importance of maintaining biodiversity in food production and farming end products. Ecological farming follows the principles of agro-ecology – ecological soundness, economic viability, and societal and cultural respect."

Regarding coffee, the Smithsonian Group in 1998 included quality of life in its definition, and suggested that, "Sustainable coffee is produced on a farm with high biological diversity and low chemical inputs. It conserves resources, protects the environment, produces efficiently, competes commercially and enhances the quality of life for farmers and society as a whole" (quoted in Chapman 2001).

Social aspects are also included in descriptions of agro-ecology (see IFOAM EU Group *et al*, 2012), particularly to capture autonomy of actors and their decision making within food systems. Agro-ecology at times is presented as a social movement (*ibid*). These authors prefer to define a set of guiding principles rather than use a fixed definition, to allow for diversity.

Ferrand and Htet Kyu (2017) define different schools of agro-ecology (with organic being one of six). They see that it is not new, but highlights different agri-food systems, that are diversified, guarantee autonomy of farmers and achieve food sovereignty, include local knowledge and knowledge diversity, and such. However, their definition of organic is limited to ecological processes, using production standards and certification. They see organic agriculture as quite new in the region, except for Thailand, and marginal in terms of volumes and areas planted.

There are many debates in the literature about certification, and PGS, mirroring stakeholder comments above. Certification provides trust to consumers and traders, however it is expensive for farmers. Smallholder farmers often cannot afford the cost of external certifications. Note certification can be first, second, third party, but only third party is talked about. MOAG is the only national organisation to issue organic certificates in Myanmar other than foreign certification agencies (Castella and Kibler, 2015), and in 2014, they certified 40 organic farms, mostly rice producers, and 2 input providers (fertilisers). MOAG points out that products naturally grown without using inputs or without inorganic chemicals cannot be recognised as organic, because it is not fully correct. Rather, there needs to be reference to standard procedures with a complete management system that includes checks and balances and traceable

records. Then it needs bias-free third party verification or certification. Their standards are based on internationally accepted standards (EEC 834/2007, EEC 1235/2008 and ISO 65; U Hnin Oo presentation, MOAG).

Good Agricultural Practices (GAP) standards, originally promoted by FAO, aim at recognising good practices in the absence of agricultural product certification. But there are different versions and GAP has been criticized by many for being a cover used by agrochemical companies in their promotion of conventional practices using GMO seeds and/ or chemical fertilisers and pesticides (see Castella and Kibler, 2015).

Note that the ASEAN Standard for Organic Agriculture (ASOA) was formally adopted in late 2014 (Willer and Lernoud, 2015), and GLOBALG.A.P is intending to invest in developing appropriate systems in Myanmar (MCRB and Prime Agri Ltd, 2016). So the attention on GAP may increase over time, along with more analysis of its acceptability to markets, especially export[2].

An alternative is PGS, as presented by May (2008), also (IFOAM 2006), IFOAM (2007) and Willer and Lernoud (2015)[3]. These are *quality assurance initiatives that are locally relevant, emphasize the participation of stakeholders, including producers and consumers and operate outside the frame of third party certification*. A PGS certifies producers based on active participation of stakeholders and are built on a foundation of trust, social networks, direct communication and knowledge exchange. In PGS, farmers have a shared control over the certification process and are claimed to be able to produce far more credible and effective system of quality assurance compared to third party certification. GRET has built up a PGS for quality paddy seed in the Delta region (see GRET n.d.).

For the definition, one category commonly referred to is "organic by default" – where (usually subsistence) producers do not apply chemicals or cannot afford it (e.g. Lenoir 2014). If claims are correct that 80% of production in Myanmar uses chemicals (Lenoir 2014), then the organic by default is not a significant category. Gaia (2016) found that in their small sample, 99% had used chemical fertiliser or herbicides. Thein & Thin (2016) refer to the dependency of many producers on agro-chemicals, due to sale promotions by private agribusiness companies and government crop intensification targets in the 1980s. In addition, van Elzakker and Eyhorn (2010), and Niggli et al. (2014) claim that organic by default is unlikely to be sustainable or profitable in any case. So there should be some caution about putting too much attention to it.

IFOAM, or Organics International, has outlined a new definition or phase for organic agriculture, called Organics 3.0 (see Niggli *et al.*, 2014; IFOAM, 2015; Arbenz *et al*., 2016). This emphasizes a whole systems approach, with participation of farmers, researchers and other practitioners in providing food

[2] For some, investing in farmers meeting an acceptable Global standard is preferable to trying to upgrade a Myanmar standard (see MCRB and Prime Agri Ltd, 2016).
[3] Another approach used by some stakeholders is Community Supported Agriculture (CSA), see Willer and Lernoud (2015), but only PGS is described here.

and ecosystem services, according to the four principles mentioned earlier (health, ecology, fairness and care). It integrates ecology, economy, society, culture and accountability, based on continuous improvement (Arbenz *et al.* 2016). It is differentiated from previous phases of Organics 1.0 (original pioneers practicing organic farming) and Organics 2.0 (certification and premium market based). In particular, certification-based approaches alone have not achieved participation by small-holder farmers and have excluded worthy practices and initiatives that are not certified but can achieve similar goals. Closer alignment with this Organics 3.0 is one of the opportunities identified for TOA partners.

3.5 Further analysis

One of the strongest findings is the need for labels and definitions need to highlight economic, environmental and, especially, social aspects (Figure 2). 'Social' includes fair trade, valuing small-scale farming families, better linkages between producers and consumers, mutual respect and well-being. These considerations are vital to include. Partners tended to use the labels eco-farming and agro-ecological farming, rather than 'organic', as well as natural and chemical-free for products.

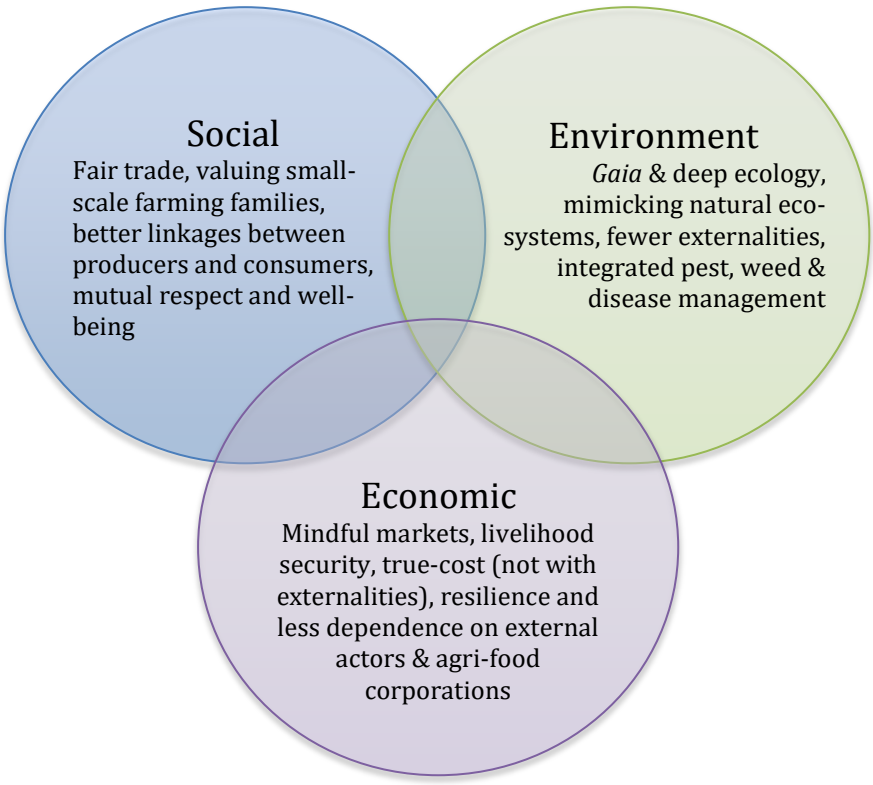

Figure 2: social, environmental and economic considerations

Partners often did not formally define eco-farming beyond 'chemical free', but recognised many different variables, such as the extent of: inputs, guarantee (assurance the product is genuine), environmental enhancement, social inclusion (fair trade, mutual respect, etc), financial return (hobby vs social enterprise vs commercial), broader economic considerations including health (food safety, worker health) and environmental cost inclusion (externalities). At a micro-scale, it also included the extent of soil health (e.g. organic matter, nutrients and micronutrients, structure/aeration, microbiological activity, invertebrate presence, soil cover, pH, water holding capacity, etc.), which is limited by low soil testing levels in Myanmar.

Figure 3 considers variation on two axes: farming practice and guarantee. The shaded cells are of particular interest to TOA (informal/PGS; using systems approaches and natural inputs). These overlap with the interests of Organics 3.0. Some other cells may be of interest to other stakeholders (e.g. for those promoting GAP, or for those promoting agro-ecology). Also note the cells should be seen as a gradient rather than having firm boundaries.

Figure 3 TOA partners' interest in eco-farming

Degree of….		Organic/AE practice				
		Bio-tech organic (not GMO)	Systems	Natural inputs	No/ limited inputs	Synthetic/ chemical inputs (responsible vs not)
Organic guarantee & documentation	Formal certified (third party)					(Good Agricultural Practice?)
	Informal / PGS (first, second, third party)	Organics 3.0	TOA partners' interest; Organics 3.0	TOA partners' interest; Organics 3.0		Nutrient balancing, Integrated Pest Management
	Not guaranteed				Subsis-tence	Mainstream Green Revolution farming

4. Smallholder rural producers

Originally, the 'producer' heading also included 'rural communities', but quickly this was seen as being too broad. For partners, engaged producers act more as networked individuals rather than based on geographical communities[4]. Also, producers are part of value chains, and marketing in a part of their interests, so there is some overlap in the framework headings. As mentioned, the focus is on smallholders, not large-scale agribusiness. The section presents a summary, then partner experience, consultations and literature.

4.1 Summary

- There are genuine constraints to eco-farming, including availability and price of inputs (e.g. manure, labour and local seeds), transition period to become organic, climate risks, markets and levels of debt
- Even so, some producers are highly motivated to try eco-farming, largely because of health and environmental benefits
- Too much emphasis may be on short-term yields for individual crops, as opposed to longer-term yields and a farming system approach. Also the true cost of products is not shown in each (i.e. relating to externalities or un-priced environmental and health impacts)
- Some banana producers had found that certain organic methods did not work well in their context
- Profitability at the farmer level for eco-farming is mixed
- Knowledge of agronomy is important – weeds, pests and diseases still have to be managed. Indiscriminate use of biological alternatives to chemicals also brings risks, hence there is a need to understand Integrated Pest Management (IPM). Nutrient cycles are important

4.2 Partner experience

Inputs are central – are they available at a reasonable cost? This "makes or breaks" eco-farming systems, financially. Often, inputs can be difficult. The key inputs are local seed, animal manure and labour. In general, the numbers of animals for production (e.g. for cultivation) has decreased in Myanmar, along with an increase in mechanization, which also has meant animal manure is sometimes not available at or near the farm, dramatically increasing costs. Also, in general, eco-farming requires more labour for managing weeds and pests. Myanmar has seen a decrease in family labour along with migration (some seasonal), and an increase to average wages. Availability of local seed has also decreased for many reasons. In contrast, chemical fertilisers and pesticides are readily available, and often with associated credit schemes.

Higher input prices affect overall costs and returns (the returns aspect is discussed more in the following section relating to markets and prices received). The Metta rice case study showed lower production costs due to the availability

[4] An alternative experience would be Winrock's work with Myazedi village in Southern Shan State (coffee). Metta's rice is sourced from limited areas close to Pathein. Partners emphasised the importance of rural communities, just that it is not central to discussions about smallholder organic production, apart from issues of scale (having enough producers within value chains).

of sufficient on-farm animal manure and labour. Other examples all showed higher costs. Weeds, pests and diseases still need to be managed. It also shows the need for quality technical advice on application of inputs, too, and managing extremes of climate and seasonal factors. Crop rotations are important. The technical support provided by partners in the case studies should not be underestimated. For remote and very small scale producers, then managing technology well can be difficult.

Yields are important and there is a lot of variation (both between organic and inorganic, but also between different organic producers). Metta and KBC have seen increases to many producers in both short and long term yields in Kachin state, due to System of Rice Intensification (SRI), for example. This is less pronounced in other areas (e.g. in the Delta case study, which has a small decrease in yield) and for other commodities, and more variable. Farmer field schools (FFS) have been extensively used by some partners (Metta, KMSS, KBC) to have more sustainable yields. Quality is also variable (which affects price).

Whilst some producers are sceptical, others are motivated to learn about eco-farming. The KMF case study highlight a high motivation by young farmers, for example.

The main eco-farming products identified by partners are:

1. Annuals: rice, green gram, legumes, melon, peanuts, chili, corn/maize, potato (Shan), garlic, ginger, tomato (Inle), kitchen garden (e.g. cucumber)
2. Perennials: avocado, mango, tea, coffee
3. Non Timber Forest Products (NTFP): bamboo shoots
4. Fish and livestock (pig, cow, chicken, goat, buffalo, duck, eggs)

4.3 Consultations

Stakeholders generally are more sceptical of the financial costs of eco-farming, and some gave examples and more detailed comparisons between using animal manure and bought in fertilizer (e.g. up to 10 times the cost in Southern Shan State, due to higher amounts being needed of animal dung relative to inorganic fertilisers and higher transportation costs). Alternatively, it only suited some that had animal manure available, for example. Other inputs like labour have a much higher requirement for organic farms. As mentioned, there are only a few commercial producers in some commodities. Some farmers needed alternative income sources (or higher prices, see next section) to be viable. Overall, many commented on the commitment levels needed to engage in eco-farming as it is not an *easier* option, especially over time.

Technology and knowledge are seen to be vital for organic systems. For example, comments are that some farmers may apply bio-pesticides indiscriminately (killing beneficial insects as well), which goes against IPM (see also Swissaid, undated, here). Also, applications of animal manure still need to be able to match the requirements for nutrient balancing. As nitrogen, phosphorus and potassium are taken off in crop and animal products, unless there is application/replacement, then general fertility will decline.

4.4 Literature

FSWG (2015) refers to a trend since before 1980's regarding chemical fertilizer usage in the Ayeyarwaddy Division (see also FSWG 2014):

> Until 1980s farmers either used no fertiliser or organic fertiliser. Organic fertiliser was made of cow dung in combination with rice straw. During the 1980s yields were going down in the delta and it was difficult to get enough organic fertiliser, because they had fewer animals when machines replaced these. Initially when farmers started using chemical fertiliser, the yields improved. In 1980 the yield was 40 baskets per acre (2.4 t/ha) without fertiliser. In 1985, 10 kg fertiliser per acre was used and the yield had gone up to 75 baskets per acre (4.5 t/ha). After that the yield stabilised, or became a bit less, while the fertiliser application continued to be increased (60 kg/acre in 2000, 110 kg/acre in 2015). This is a typical trend in tropical regions where fertiliser applications are done sub-optimally. The loss of organic matter often is one of the most important factors. Another reason that is mentioned is bad quality of fertiliser. (Note that the report recommends rationalising fertiliser application, based on soil analysis, but not specifically relating to organic fertiliser use)

It is not the purpose here to present the arguments for and against the Green Revolution… but rather to comment on increasing chemical use.

Gaia (2016) in their 'listening paper' refer to associated changes in production systems (in this case for upland, Northern Shan State), including:

- More cash crops (vs own consumption) and an increase in areas planted (from about 3 acres per family to 5-15 acres)
- Less own seed
- Higher labour charges (less family labour and young people migrated), especially for weeding
- Less animals and hence less animal manure at higher prices
- Easy to access chemical fertilisers, herbicides and pesticides (credit available). Note most chemicals come from China, with Chinese labels (some are repacked and reprinted in Burmese, but most do not seem to know or follow application rates). In addition, only few said they store chemicals properly, as most are kept within the house.

One factor highlighted in the literature is the importance of credit, especially given the increased indebtedness of Myanmar's farmers. (BRiLSS, 2016; Lift 2014). TinMaungShwe and Vokes, R (2015) have also observed how labour scarcity is continuing to increase, due to migration, which will limit organic production (also Rattanasuteerakul and Thapa 2012, in Thailand).

Some Myanmar language literature give details about individual practices that make up organic farming (see Myint Lwin 2016, for example). Other literature discusses some of the constraints (e.g. transition periods, yield differences, input availability), though mostly this is for other countries rather than for Myanmar specifically (see for example Setboonsarng (2015). There is some debate about whether short or long term yields decrease apart from the transition period. It is interesting to compare Setboonsarng (2015), who found that yields for organic systems do not decline and in some cases are significantly higher, with the studies quoted in Niggli et al. (2014) which conclude yields are lower based on over 300 comparisons of organic vs inorganic production. Rattanasuteerakul

and Thapa (2012) also show how the financial consequences of lower yields in Northern Thailand are exacerbated when there is no price premium for the product. Hence, most production was small scale and mainly for household consumption. Most would agree that to obtain high yields under organic production among smallholder farmers in marginal areas, farmers should have access to organic inputs and training. Cervantes (2016) proposes that supporting smallholder farmers in seed production, pest management and market support is essential, speaking in a Philippines context.

As an aside, literature supports the experience of partners and interviewed stakeholders that manure fertilisers are needed in very large quantities in comparison to compound fertilisers to offset their lower quality (for example, Alterra/WUL and SoilCares, 2016). In the studies quoted by Niggli *et al.* 2014, a lack of nitrogen and phosphorous limited yields in organic systems.

Kaufman (2015) talks of the importance of worldview of farmers. This mirrors the observation by partners and stakeholders interviewed that commitment is an important characteristic of smallholder eco-farming. Use of farmer knowledge is vital (see Niggli *et al.* 2014).

5. Value chain and markets

Value chains and markets cannot be neglected. The section presents a summary, then partner experience, consultations and literature.

5.1 Summary

- Markets are limited – most in the study were internal and needed market facilitators and social enterprises not seeking to maximize profits
- Established organic and specialty markets exist for products such as coffee
- There are opportunities for export markets, which generally need overseas certification and specialised/larger operations
- Prices: most say need >20% premium for organic to cover costs and lower yields. Quality of product is important.
- Fair trade / fair share is important in considering social benefits
- Value chain perspectives not well utilized as there are gaps between producers, consumers and other actors. Shorter value chains with few actors are easier than longer chains with many actors. There are handling and segregation issues in mainstream markets

5.2 Partner experience

Partners have highlighted the importance of producers receiving a fair price (fair trade) – and three case studies show higher prices or incentives. Working against farmers having to sell quickly to pay off their debts is important to raise overall prices received, and to improve post-harvest storage. Critical mass is also seen as important, and groupings/collectives of smallholders are better than acting as individuals. Overall, partners have little experience with markets, and often they have intervened to create a small internal market (see four case studies; although in all of these, a marketing plan has not been developed). The potential to grow more would come if there were better markets and more certain prices, along with more consistent quality. Experience with markets is also a perceived weakness for many rural smallholder producers.

Partners also highlight the importance of relationships between producers and consumers (Figure 4). This has been highlighted in the case studies, both regarding PGS as well as the importance of branding, or relying on the 'name' of partners. There is trust already established by these organisations over a long time of operations (at least 10 years, but sometimes more). These organisations that are trusted by their constituents and local communities can market rice and other products in a way that a commercial supermarket, for example, could not. Also, it is seen to work much better when there are shorter value chains.

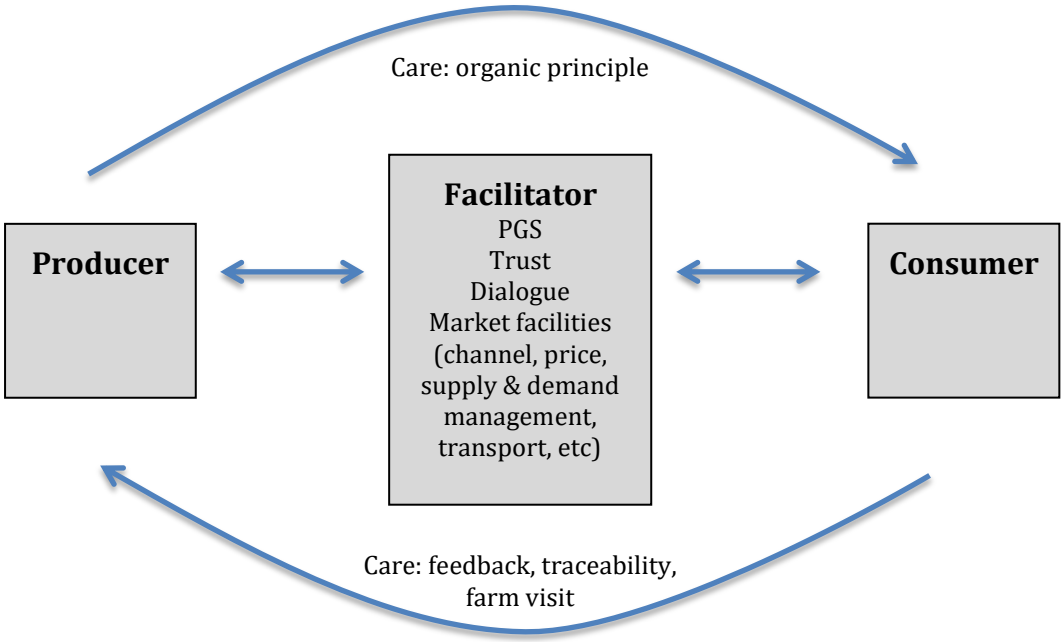

Figure 4 Producer-consumer connections and market facilitation

Taking a value chain perspective is valued, but a full value chain study has not been completed by partners and this is seen as a weakness. More contact with the private sector is important. Brokers can play important roles. Quality is important. Partners have paid some attention to processing, but much more is needed. Also, good transportation and roads are essential.

Partners present a spectrum between Non-Government Organisation (NGO) and Social Enterprise and Fully Commercial approaches (overlapping circles). For market facilitation, often the NGOs are becoming social enterprises, which may be beyond their mandate and experience. Social Enterprises are sometimes defined as enterprises having "profit for a cause"; with emphasis both on the profit and the cause (the social outcomes desired). In general, partners see they are weak on business planning.

5.3 Consultations

Stakeholders also stress the importance of marketing and value chain approaches. In general, a price premium of 20-50% is needed in order to offset higher costs (especially with certification) and potentially lower yields. In this respect, formal certification can help. Also, certification can help with access to credit. There are large export market opportunities available but these require large-scale specialized producers to access them. Some market opportunities for organic products are seen to come from increased processing, though this is also seen as specialized and beyond the capacity of smaller individual producers. Some see the weak nature of demand for quality products as being an impediment for increasing domestic markets. In general, improving value chains is seen to give large financial returns.

Private actors emphasized the differences between value chains with many actors and short chains (e.g. with contract farming for fresh produce). The options for keeping organic produce separate with wholesaling are seen to be limited, given the degree of mixing and repacking that is evident.

5.4 Literature

Markets are emphasized in literature… especially for 'mindful markets', where consumers are aware of the true costs of production and pay regularly and in advance for products that are traceable/have history (van Willenswaard, 2015). Linkages between producers and consumers is vital, as is having fair prices that enable good living conditions (Niggli et al. 2014).

Value chains are also emphasized in literature. One study presents that restaurants, supermarkets and retailers who do have direct relationships with farmers experience "better quality" produce (TNS Myanmar/Mercycorps, 2015). In terms of individual components, rice milling is seen as a constraint for Myanmar production (irrespective of organic/inorganic), especially compared to other ASEAN countries, and small improvements here would lead to large benefits, potentially for producers (World Bank, 2014). Swissaid (2016) present potential increases to gross margins when simple processing is undertaken, such as drying and grading. Concentrating on improving existing value chains, such as mango, could see large returns within 5 years (e.g. Houtman, 2015). IFOAM has supported the production of a handbook to develop sustainable value chains with smallholders (Elzakker and Eyhorn, 2010).

Whilst organizing farmers into collectives is often promoted, it does not automatically lead to generating lasting incomes in smallholders' incomes. An entrepreneurial and educated leader, access to markets and a well-functioning business model is important (see LEAP201, 2014).

PGS is seen as a bright spot to improve marketing, especially as an alternative to third party certification. Indeed, there has been no negative comments found in the literature about PGS. Please refer to earlier discussions on PGS.

6. Consumers

The section presents a summary, then partner experience, consultations and literature. There is some overlap in the discussion of markets and consumers, so some material is not repeated here.

6.1 Summary

- Drivers are food safety and consumer protection
- Awareness and behaviour may differ - few appear willing to pay a premium
- Consumer preferences are not well known and many assumptions are made without direct evidence
- Trust levels are low and there is scepticism of product that is called *organic* because of limited traceability and abuses or imitations
- Weak linkages between producers and consumers

6.2 Partner experience

Partners referred to the growing awareness of food safety and health. However, they ask is organic just for the rich people? Can it be more available for all? Does the awareness translate into practice? Are their differences between rural-urban, high and low socio-economic classes? In general, there are more questions about consumers than answers. One case study showed the intentions to have consumers engaged receiving quality services and providing feedback; other case studies showed only some limited consumer feedback. Here one of the primary messages back is about consistency of supply and product availability. Some thought the price was too high. All partners emphasized the weak link and lack of coordination between producers and consumers, and the importance of engaging with consumers.

6.3 Consultations

Stakeholders confirm an increasing food safety focus and awareness, which translates into an opportunity for organic produce. There is an increased focus on consumer choice, consumer rights and consumer protection. Consumers are seen to want assurance of the safety of their food, but certification may or may not contribute to this goal.

The main constraints are:

- Price is higher
- Trust is difficult (traceability limited and product imitations)
- There are conflicting messages: consumers want health and taste and appearance and price – but 1) it is hard to meet all of these with organic produce and 2) consumer preferences are not really known but are largely assumed. Even large supermarkets rely on orders placed and sales to gauge demand, rather than surveying consumer preferences.

6.4 Literature

Studies on consumers are limited. Thein and Thin (2016) claim there is currently little demand for organic products. They claim that people express more concern about food safety since vegetables are treated with excessive pesticides. Organic products are at present more expensive and often less presentable. Prices for organic fruits and vegetables at Kandawgyi market are 25% – 200% more expensive than at regular markets.

TNS Myanmar (2015) researched consumer preferences for vegetables in Yangon, Mandalay, Taunggyi and Pathein. They found that shelf life is important for retailers and consumers, and vegetables should look fresh, but taste is less important. Consumers believe that chemicals are bad for their health. The organic concept has strong appeal, but is not well understood. They saw that it may be possible to grow demand for organic, or chemical-free, produce but a willingness to pay more for that produce needs to be developed also. There is growing concern over the safety of vegetables due to chemical usage but little understanding of what chemical-free/organic produce would cost or look like. (This was translated into a need to educate consumers, retailers and other actors in the supply chain about vegetable quality and safety and fill information gaps).

7. Policy

The section presents a summary, then partner experience, consultations and literature.

7.1 Summary

- Limited policy attention is paid to organic, but there are many disincentives and a wide range of 'related issues'
- There is a perceived need to join with broader networks to be effective at influencing policy (not just organic networks; nor acting alone)
- Bio-fertilisers and bio-pesticides need to comply with relevant laws

7.2 Partner experience

FSWG prepared a list of relevant laws that relate to organic agriculture, including:

- The Fertilizer Law (October, 2002) and The Amended Fertilizer Law (March, 2015)
- The Seed Law (January, 2011) and The Amended Seed Law (February, 2015)
- The Pesticides Law (May, 1990) and The Amended Pesticides Law (January, 2016)
- The Law of Protection of the Farmer Rights and Enhancement of their Benefits (October, 2013) and Amended Law (November, 2014)
- The Environment Law (March, 2012)
- The Consumer Protection Law (March, 2014), being revised
- The National Food Law (March, 1997) and The Amended Law (August, 2013), being revised
- The Vacant, Fallow and Virgin Land Investment Law (March, 2012)
- Plant Variety Protection Law (January, 2016)
- Investment Law (October, 2016)
- The Land Law (March, 2012)
- The Forest Law (April, 2009)
- Prevention from Danger of Chemical and Associated Materials Law (August, 2013)

Of these, it is the fertilizer and pesticide laws that directly refer to organic agriculture. In short, the provisions for bio-fertilisers and bio-pesticides are exactly the same as for inorganic products. This is a risk area for the sector, as confirmed by several stakeholders. There are many related issues, such as seeds, land, investment and such that apply both to organic as well as to inorganic agriculture.

Partners recounted their experience of government policy, including:

- Previous governments have emphasized industrialization and increased production (mono-cropping, high inputs somewhat subsidized, crop targets). Governments are not ensuring inclusion of un-priced

environmental externalities. The current government is over-emphasizing investment (perhaps due to donor pressure?)

- Many policies are being developed in a rushed way that is not including a wide input, particularly from local farmers (some consultation seems to stop at international organisations, and be done in English, for example)
- Existing policies encourages inorganic… need to change to encourage organic
- The Organic Zone at Naypyidaw is "not a good example" of how organic production can be promoted[5]
- GAP is emphasized now
- There is increasing policy attention to consumer protection, food safety and environment
- There has been deficient research, teaching, laboratories, extension, information and communication to producers. Government curricula and departments focus on industrialised agriculture. There is also deficient infrastructure (markets, roads, etc.). These deficiencies apply to all forms of agriculture, but they particularly discourage organic
- It is more than just agriculture (crops), but also livestock and animal products, fish and aquaculture, and non-timber forest products
- Producer associations and groups are better for advocacy rather than individuals

7.3 Consultations

Stakeholders concur that government policies in Myanmar have not focused much on organic agriculture. The current government is revising policy, which has not been finished (see next section). Stakeholders also included the need to include infrastructure, research, extension, laboratories, communication and such.

The Asian Development Bank is building the capacity of the Department of Agriculture to develop PGS in Myanmar, with appropriate standards.

Yezin Agriculture University Horticulture Department offers an organic agriculture course, and some students conduct research on related topics. However, the thrust is on inorganic agriculture and there are limited resources to dedicate to it. This means that there is limited technical support available for organic farmers.

In government, there is a division of interests relevant to organic agriculture between the Department of Agriculture (fresh products, not retail) and Food and Drug Administration (processed, labelled and retail/consumer). These are in different ministries, which means the line is not so clear to all? The pending Consumer Law is expected to provide a further focus on Food Safety.

[5] A media article describes the establishment by the Department of Agriculture of an organic farming zone, provide technical assistance and help the entrepreneurs for the availability of organic certification and local and foreign marketing (New Light of Myanmar Volume XXI, Number 284, 25 January 2014).

7.4 Literature

Rundgren (2008) considers research across 7 countries, and concludes that early drivers for an organic sector are NGOs and the private sector; governments have rarely played a role. However, they have an important role, and need to work closely with civil and private actors. Rundgren promotes specific policy recommendations for organic agriculture including to gather data about production and markets, to have a specific organic action plan, to promote consumer awareness and organic marketing, and have inclusion in education curricula and research programmes. Several of these are relevant to Myanmar.

Swissaid (2016) also warns that specifications for organic fertilizers may not meet international norms or the items under the Fertiliser law, including management of fertilizer use, production, distribution.

The main clause of interest in the Agriculture Sector Policy (MOALI 2016) is:

> "To implement good agriculture, livestock and fishery practices – such as conservation agriculture, *organic agriculture*, good agriculture practices - GAP, development and use of biotic-abiotic stress tolerant varieties (heat tolerance, salt tolerance, drought tolerance, deep water tolerance), land use management, green water management, good animal husbandry practices – GAHP" (emphasis added).

This is in the context of promoting climate resilient agriculture. Perhaps organic agriculture can enhance climate resilience? Similarly, partners might focus on how local seeds can do the same (see MinAung 2015). Other linkages to the policy may be through cooperatives and collective action, improving farmer organisations and linking with the National Land Use Policy. As mentioned though, the main focus in agricultural policy is on attracting investment. Improving rural infrastructure is also important (MOALI 2016; ADB 2013). The agricultural policy now recognizes the contributions to the economy of smallholder farmers, which is positive.

One media article quoted the director general of the Department of Agriculture (U Ye Tint Tun) as saying that there is a move toward the eventual introduction of organic production (Myanmar Times, 14 October 2016). Later it became clear he was referring to GAP. The Agricultural Minister, Dr Aung Thu, speaking at the Upper House session said that he would promote organic farming and educate people of the benefits of eating organic crops. He added that the Ministry had educated farmers to use good agricultural practices from seeding to harvesting to protect consumers from chemical residues on vegetables and fruits. The Ministry certified 27 private farms in Shan State, Mandalay and Sagaing regions for practicing GAP. The Ministry also taught farmers how to produce organic fertilisers and pesticide (Myanmar Times, 22 December 2016).

Some reports have an uncertain status, such as the NESAC White Paper, strategies by FAO and the Agriculture Development Strategy (being revised). They do not emphasise organic agriculture[6].

[6] This is in contrast to Thailand, for example, which is seen as having a more supportive policy framework for organic agriculture (see Kramol *et al.*, 2013; challenged by Rattanasuteerakul and Thapa, 2012). There are also gaps in Myanmar between these strategies and espoused policy.

8. Opportunities and constraints

The main emerging opportunities and constraints are:

Opportunities

- High commitment by partners and desire to work collaboratively
- Holistic approaches covering economic, environmental and, especially, social
- Increasing focus on food safety and consumer protection
- Development of PGS as an alternative to certification
- Large potential export markets
- Increasing attention on value chains and marketing
- Increasing contract farming (in effect a shortening of supply chains to enhance quality and traceability, although this may not be a benefit to small holders because of scale issues)
- Increasing networking and use of social media
- Alignment with Organics 3.0 and Agro-Ecology

Constraints

- Limited data and fragmentation of stakeholders
- Limited policies supportive of organic agriculture and eco-farming
- Lack of marketing and business skills by partner NGOs and social enterprises
- Very small-scale examples by TOA partners (is it better to look at networks of small examples rather than scaling-up?)
- Limited domestic markets
- Limited financial returns without price premiums
- High certification costs and lack of widely-recognised certifiers
- Limited traceability of products to provide assurance to consumers
- Limited contacts with government and private sector operators
- A narrow definition of agriculture in Myanmar. Eco-farming needs to also consider livestock, aquaculture, forestry and forest products, at the least.

The opportunities and constraints nominated are predominately those facing TOA partners, although some are mentioned that relate to the sector as a whole. For example, export markets are not likely to be the first priority for TOA partners to try to tap into, although some of their communities they work with are based in relatively remote areas near to the border where exporting product may be more viable.

Ways of capturing these opportunities and addressing constraints are described in the next section.

9. Potential TOA partner strategies and recommendations

Initial strategies that emerge from the process to date, that can capture the opportunities and address constraints, include:

1. **Enhancing data availability on eco-farming**. Without rigorous data about production, markets, value chains or benefits, there will not be convincing arguments to influence mainstream policies or actors. Widening the scope of this study by including other case studies would be a good first step. Further actions, collectively or individually, should also aim to contribute to the available data (through action research), supported by appropriate scientific and economic studies

2. **Continuing to highlight social, environmental and economic aspects** of eco-farming. In particular, TOA partners make a very important contribution of describing social aspects, including fair trade, inclusion of small-scale farming families, informed choice, mutual respect and increased well-being. Economic aspects need further attention

3. **Actively connecting to a range of networks in Myanmar** to progress advocacy on related policy issues (e.g. consumers, seed, land, agro-ecology etc) that impact immensely on smallholder farmers and market participants. These networks are necessarily broader than just with other organic actors, in order to increase influence. The main engagement with government and private sector can be through these networks rather than as a TOA network. Connections should also utilise social media

4. **Actively connecting to regional and international networks**, including those related to Organics 3.0 and Agro-Ecology

5. **Jointly researching and progressing local seed availability and use**, as local seeds are not likely to be reliant on heavy external (chemical) inputs. This will include participative investigation and trialling of suitable varieties, developing collection and conservation mechanisms, promoting and marketing seeds and enhancing learning between different actors

6. **Seeking opportunities for collaboration with Yezin Agricultural University**, to enhance policy engagement, technical input and to develop human resources for eco-farming

7. **Improving core competencies in social enterprise and value chain development**. Vital initial steps are to access the range of skills needed, through partnership and recruitment of qualified people, and to ensure interventions cover a range of value chain actors. It is also essential to develop quality marketing and business plans, have an external market focus and scale-up to have a broader impact. Increasing links with the private sector is likely to be a part of this strategy

8. **Trialling Participatory Guarantee Systems**, perhaps by converting some of the current 'internal' market examples described in this study to meet IFOAM guidelines, expanding current farmer rice seed production systems, or by developing new examples. This strategy reflects a commitment to creating trust between producers and consumers, whilst avoiding some of the pitfalls with certification

9. **Seeking ways to address constraints**, especially input availability and labour, as well as encouraging access to markets and understanding of value chains. It is noted that there are no easy answers here

10. **Maintaining this network and building on its commitment**. TOA partners can build on their current partnerships and the momentum already established during this study. Further analysis and further development of these strategies by Myanmar partners is needed. These strategies and findings should be presented to other partners in other TOA countries and also bring in their experience

Recommendations for TOA partners

These are initial strategies. TOA partners want to enter strategic and program planning, to develop these strategies.

Recommendation 1:

> *For TOA partners in Myanmar to discuss and analyse these findings, and develop a strategic plan for promoting socially-just eco-farming in Myanmar*

As part of this, findings need to be available and accessible, particularly in Myanmar language.

Recommendation 2:

> *For TOA partners to commission a translation of relevant parts of this report into Myanmar language and make it available to partners, so they can prepare for relevant workshops and engage wider audiences*

Sharing the results with others is important. TOA partners should also engage with a wider set of actors in Myanmar, including other likeminded organisations and networks, farmer representatives (farmer associations?), private sector operators, plus champions from government, in which to share the findings of this study, generate a wider analysis and consider joint strategies. The selection of participants is important. There are many strategic connections that should be made, especially to be able to influence the mainstream discussions. Who to connect with? Who to invite? The people consulted as part of this study can be a starting point, but obviously it needs to be broader. This engagement with a wider set of actors can be concurrent to the partners' own strategic planning (e.g. by holding it on days 2 and 3 of a 4 day workshop), or separately.

Recommendation 3:

> *For TOA partners in Myanmar to convene a national workshop for sharing and progressing these findings. TOA partners should present their case studies, as well the findings and initial strategies.*

TOA Myanmar is part of a wider regional network. In addition to these findings, there are some process lessons that can be helpful for other countries, including:

- Capturing experience is useful for network building
- Limited data probably will be a constraint
- Have a clear purpose and have a team to oversee studies to keep these on track. Developing suitable frameworks can assist in this
- Conduct studies in a way that honours the principles and gives 'voice' to participants as far as possible

Recommendation 4:

> *For TOA partners in Myanmar to engage TOA regionally, and other networks, by sharing these findings with them.*

10. References

Cited references

Publications

Arbenz, M., Gould, D. and Stopes, C. (2016) Organic 3.0 – for truly sustainable farming and consumption, IFOAM Organics International and SOAAN, Bonn.

Asian Development Bank (2013) Myanmar: Agriculture, natural resources, and environment initial sector assessment, strategy, and road map. Mandaluyong, Philippines

BRiLSS/SwissAid (2016) Agricultural valuechain and market assessment in Southern Shan State Myanmar. SwissAid (Building Resilient Livelihoods in Southern Shan)

Burke, A. (2015) What holds vegetable farmers back? Conflict, Governance and Markets Assessment. Mercycorps (Making Vegetable Markets Work for Smallholders Program, Myanmar)

Castella, J. and Kibler, J. (2015) Towards an agroecological transition in Southeast Asia: Cultivating diversity and developing synergies. GRET

Cervantes, C. (2016) Diagnosing and Providing the Support Systems Needs of Small Scale Organic Rice Farmers in Bicol Region, Philippines. *Journal of Agricultural Technology* 12(5): 811-826

Chapman, K. (2001) Introduction to the First Regional Round-table on Sustainable Organic and Specialty Coffee, Production Processing and Marketing

Elzakker, B. van and Eyhorn, F (2010): The Organic Business Guide. Developing sustainable value chains with smallholders. 1st edition. IFOAM

FAO/WHO Codex Alimentarius Commission (1999) (see www.FAO.org/organicag/)

Ferrand and HtetKyu (2017) Agroecology, a diversity of concepts, definition and practices. Presentation to Regional Academic Conference on Agroecology in the Mekong Region, Yezin Agriculture University, Myanmar, 24-25 January 2017

FSWG (2014) An Analytical Study on Food Safety Issues in Different Stages of Vegetable Production from Farm to Table (Research by NuNuYi, ThetOo, MaungMaung, HlaShwe and YanLin)

FSWG (2015a) Chemical and organic fertilizer in relation to the interests of small farmers in Myanmar (Research by P Roelofsen and team)

FSWG (2015b) Food Security Related Policy Analysis Myanmar (Research by M Mirschandani and LeLeWin)

FSWG (2015c) Report on the Policy Analysis of the Myanmar Seed Law and Seed Policy (Research by P Roelofsen and team)

Houtman, R. (2015) Inclusive value chains for sustainable agriculture: some lessons from the fields of Cambodia, Lao PDR and Myanmar (June 2015). Food and Agriculture Organisation

IFOAM (2006) Organic Agriculture and Participatory Guarantee Systems: Marketing and Support for Organic Smallholders

IFOAM (2007) Participatory Guarantee Systems: Shared Vision, Shared Ideals, Diverse

IFOAM (2015) Into the Future – Consolidated Annual Report of IFOAM – Organics International

IFOAM EU Group, TP Organics and ARC 2020 (2012) What is agro-ecology? Agro-Ecological Innovation

Kaufman, A. (2012) Organic Farmers' Connectedness with Nature: Exploring Thailand's Alternative Agriculture Network. *Worldviews* 16: 154–178

Kirchner, C. (2014) Overview of Participatory Guarantee Systems in 2014, Willer, Helga and Julia Lernoud (*Eds.*) (2015) The World of Organic Agriculture. Statistics and Emerging Trends 2015. FiBL-IFOAM Report

Kramol, P, Villano, R, Kristiansen, P and Fleming, E (2013) Productivity differences between organic and other vegetable farming systems in northern Thailand. *Renewable Agriculture and Food Systems*: 30(2); 154–169

LEAP201 (2014) Bridges to Impact: A New Paradigm for Agri-Social Enterprises in Cambodia and Myanmar

Lenoir, P. (2014) Literature Review on Mekong Region Agriculture and on Bhutan. Towards Organic Asia

LIFT (2014) Dry Zone Devlopment Porject Scoping Mission: Annex 3 Marketing and Value Chains in the Central Dry Zone

May, C. (2008) How Participatry Guarantee Systems can develop and function: PGS Guidelines. IFOAM

MinAung (2015) Developing Competitive Seed Industries in CLMV (Cambodia, Laos, Myanmar, Vietnam) Countries, in Stillman, G and Rillo, A (*eds*) Boosting Agriculture in the Lower Mekong. Asian Development Bank Institute

Ministry of Agriculture, Livestock and Irrigation (2016) Agricultural Sector Policy and Thrusts for second five year short term plan (October 2016)

National Economic and Social Advisory Council (NESAC) (2016) From Rice Bowl to Food Basket: Three Pillars for Modernizing Myanmar's Agricultural and Food Sector. White Paper

Niggli, U; Baker, B; Rahmann, G; Cuoco, E; Möller, C; Ssebunya, B; Hossain, S; Wivstad, M; Chang, J; Soto, G; Gould, D; Lampkin, N; Chander, M; Mapusua, K; Wynen, E; Qiao, Y; Ardakani, M; Hartmann, M; Oyama, T; Schmid, O and Willer, H (2014) A Global Vision and Strategy for Organic Farming Research. Working paper, Technology Innovation Platform of IFOAM/ FiBL, Frick Switzerland

Pimbert, M. (2009) Towards food sovereignty: reclaiming autonomous food systems. CAFS, IIED and RCC, London and Munich

Rattanasuteerakul, K. and Thapa, G. (2012) Status and financial performance of organic vegetable farming in northeast Thailand. *Land Use Policy* 29: 456–463

Rundgren, G. (2008) Best Practices for Organic Policy: What developing country Governments can do to promote the organic agriculture sector, UNCTAD (ref. UNCTAD/DITC/TED/2007/3)

Setboonsarng, S and Markandndya, A. ((2015) Organic Agriculture and Post 2015 development goals: Building on the comparative advantage of poor farmers. Asian Development Bank, Manila

SWISSAID (n.d.) BRiLSS Principles & Approaches

SWISSAID (2013) Ecological Farming Programme Review and Development

SanThein and AungThin (2016) Agro-ecology Transition in Myanmar : Issues, Status and Stakeholder Mapping. Study for GRET/AFC

TinMaungShwe and Vokes, R (2015) Agricultural Productivity in Myanmar, in Stillman, G and Rillo, A (*eds*) Boosting Agriculture in the Lower Mekong. Asian Development Bank Institute

TNS Myanmar (2015) Vegetable Consumption , Preferences and Supply Chain Myanmar Final Report, Mercycorps

Willenswaard, W van (ed.) (2015) Mindful markets : producer-consumer partnerships towards a new economy, Suan Nguen Mee Ma, Bangkok

World Bank (2014). Myanmar: Capitalizing on rice export opportunities, World Bank, Economic and Sector Work, report No 85804

Myanmar language

Gaia/GSMI (2016) Farmers' voices (including "excerpts of mini research on chemical farming in Northern Shan State")

MinWinHtun (2016) Principles of Organic Farming, 2nd printing, Queen Publishing House, Yangon

MyintLwin (Dr.) (2016) Organic Agriculture Technologies: Organic Farmer Handbook, 2nd printing, Myanmar Organic Agriculture Group

Other

-U Hnin Oo, MOAG, Organics Powerpoint Downloaded 26-09-2016
-http://www.elevenmyanmar.com/local/7107 22 Dec 2016

Other references

(not directly cited, but used as part of mapping and orientation)

Altieri M. (2001) Non-Certified Organic Agriculture in Developing Countries. In N. Scialabba and C. Hattam (*eds*) Organic Agriculture, Environment and Food Security, Rome FAO.

Asian Development Bank and SNV (2012) Developing the Business Case for Investing in Inclusive Business in the Mekong

Auld, G (2010) Assessing Certification as Governance: Effects and Broader Consequences for Coffee. *Journal of Environment & Development* 19(2): 215-241

Aung Kyaw Lwin (2015) Family farming in Myanmar. Memoirs of Physical and Natural Sciences, National Academy of Sciences Vol. 39: 259-266

Bassi, A, Gallagher, L and Helsingen, H (2016) Green Economy Modelling of Ecosystem Services along the "Road to Dawei", *Environments* 3(3), 19

Belton, B, AungHein, KyanHtoo, L.SengKham, Nischan, U, Reardon, T and Boughton, D (2015) Aquaculture in Transition: Value Chain Transformation, Fish and Food Security in Myanmar. International Development Working Paper 139, Michigan State University

Cardenas, V. and Bellin, J. (2013) Assessment of Current Capacities and Needs for Institutional and Individual Capacity Development in Agricultural Innovation Systems in Asia, Southeast Asian Regional Center for Graduate Study and Research in Agriculture, The Philippines

Chhani, L (2016) The Potential Impact of ASEAN Economic Community (AEC) 2015 on the Small Farmers of Myanmar. *Asian Business Review* 6(2):91-96

Department of Agriculture, Ministry of Agriculture, The Royal Government of Bhutan (2006) National Framework for Organic Farming in Bhutan

Gould, D. (2015) The Organic Market Framework: Becoming Organic 3.0 in Willer, H and Lernoud, J (Eds.) The World of Organic Agriculture. Statistics and Emerging Trends 2015. FiBL-IFOAM Report

GRET (2016) Participatory guarantee system for Quality Paddy seed in the Delta. Unpublished report

Hilbeck, A and Oehen, B (*eds*) (2012) Feeding the People: Agroecology for Nourishing the World and Transforming the Agri-Food System, IFOAM EU Group

Joeffre, O and MoeAung (2012) Prawn Value Chain Analysis in Rakhine State, Myanmar, prepared for Livelihoods and Food Security Trust Fund, Myanmar

MCRB and Prime Agri Ltd (2016) Roundtable: Towards a Myanmar Food Safety & Responsible Sourcing Initiative (Primary Agricultural Production, Post Harvest, and Food Processing), Conference Report, Nay Pyi Taw, 8-9 November (see http://www.myanmar-responsiblebusiness.org/news/food-safety-responsible-sourcing-initiative.html)

Ministry of Agriculture, Livestock and Irrigation (2016) "Myanmar – GAP, Good Agricultural Practice (Fruits and Vegetables)", Division of Horticulture and Biotechnology, Department of Agriculture, Myanmar. 2nd Revision

MOAG (2011) Guideline for Organic Agriculture Production

RadaKhoy, Nanseki, T, Chomei, Y (2016) Profit Efficiency of Rice Farmers in Cambodia The Differences between Organic and Conventional Farming. *Journal of Sustainable Development* 9(6)

Sahota, A (2009) The Global Market for Organic Food & Drink, in Willer, H. and Kilcher, L. (*eds*) (2009): The World of Organic Agriculture. Statistics and Emerging Trends 2009, FIBL-IFOAM Report

Stillman, G (2015) Overview: Regional Synthesis of Reforms in CLMV (Cambodia, Laos, Myanmar, Vietnam) Agriculture, in Stillman, G and Rillo, A (*eds*) Boosting Agriculture in the Lower Mekong. Asian Development Bank Institute

Thapa, G and Rattanasuteerakul, K (2011) Adoption and extent of organic vegetable farming in Mahasarakham province, Thailand. *Applied Geography* 31: 201-209

Towards Organic Asia (n.d.) Organic Food for All: Organic Agriculture at the Heart of Global Transformation. Brochure

Willer, H. and Kilcher, L. (Eds.) (2009): The World of Organic Agriculture. Statistics and Emerging Trends 2009, FIBL-IFOAM Report

Willer, H. and Lernoud, J (Eds.) (2015) The World of Organic Agriculture. Statistics and Emerging Trends 2015. FiBL-IFOAM Report.

World Bank Group (2016) Myanmar: Analysis of farm production economics. Economic and sector report No. 100066-MM

Myanmar language

NB Gaia/GSMI work to "make available literature/ ideas in Burmese for a wider audience"

IFOAM (2015) "Organic 3.0", translated by AungMoeHein, Gaia/GSMI (2016)

Pinan Consumer Association (Malaysia) (n.d.), "The other side of consumer culture", translated BeinBein, Gaia/GSMI (2016)

Annex 1 Participants in the study

From partner organisations (alphabetically)

- FSWG: Daw Kawt Kaythi, Dr Khin Pa Pa Wai
- GSMI: Daw Lay Phyu, Daw Ohnmar Shwe, U Thet Nai
- KBC: Daw Htu Sam Palawng
- KMF: U Bo Bo Lwin, Daw Chan Let Mon, Daw Thi Thi Win
- KMSS: U Dominic Htein Linn, U Richard Aung, U Richard Htwe, U Richard Ko Ko Htoo, Daw Patricia Wai Wai
- Metta: Daw Cho Myint Naing (part), U Gum Sha Awng, U Khin Maung Latt, U Saw Nay Blute Htoo, U Khun Wai Lar, U Wai Zin

Guests at the analysis workshop

- Ms. Narumon Paiboonsitikun, TOA, Thailand
- Daw Sandar Myo, Empower (part)

Those interviewed include:
Government/public

- Department of Agriculture: Dr. Hla Hla Myint and Dr. Khin Thanda, Horticulture Division
- Food and Drug Administration: Dr. Ohnmar Soe Win
- Yezin Agricultural University: Dr. Daw Khin Thida Myint
- Member of Parliament: U Yan Lin

Private

- Citymart: U Kyaw Kyaw Myint, Fresh Food and Production Manager
- Myanmar Fruit and Vegetable Producers/ Empower: Daw Sandar Myo
- Myanmar Fruit and Vegetable Producers: U Hla Min (adviser)
- Myanmar Organic Growers and Producers Association (MOGPA): Dr Than Than Sein
- Shan Maw Myae: U Nyan Lin
- Sharky's: U Ye Htut Win
- Shwe Pa Zun: U Khin Maung Tint

Civil/NGO/Donor

- GRET/ ALISEA: Dr Htet Kyu
- LIFT: Dr Harald Kreuscher, Daw Myat Su Win
- Myanmar Consumers Union: U Maung Maung Win
- MEDA: Ms. Cavelle Dove, Daw Mi Mi
- Swissaid: Ms. Claire Light
- Winrock: Ms Anne-Claire Degail

Regional

- U Aung Moe Hein (Inle; organic producer and processor),
- U Hla Myint Kyaw (Aung Ban; organic producer and processor)
- U Lisu Peter (Pyin Oo Lwin; organic vegetable producer)
- U Saw Mana She (Yangon; organic vegetable and bread producer)
- U Myo Swe (Delta; organic vegetable producer)
- U Naythargay (Yangon; organic vegetable producer)
- Daw Phyu Phyu (Taunggyi, United Nilar Agribusiness Company Limited)
- U Pi Saug (Taunggyi, Loi Kham Non Toxic Farm, Diamond Rose Mining Co. Ltd)