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CAN MARKET SYSTEMS DEVELOPMENT BUILD RESILIENCE IN FRAGILE CONTEXTS?

***A Case Study of Making Vegetable
Markets Work in Myanmar***

SEPTEMBER 2017



Executive Summary

Mercy Corps' Making Vegetable Markets Work for Smallholder Farmers in Southern Shan and Rakhine States (MVMW) aims to ensure smallholder farmers in Myanmar benefit from economic growth opportunities arising during a period of rapid market liberalization following the end of military rule. Using a market systems development (MSD) approach, the program partnered with market actors to increase access to production technology and services, and improve farmers' connections with input suppliers and buyers. In its first phase, the program focused exclusively on Southern Shan State, which is the focus of this assessment. At the time of this assessment, MVMW farmers in Southern Shan State had seen positive results with evidence suggesting that 20% of farmers had seen a 50% increase in income and a 25% increase in production values over the 3-year implementation period. Despite this promising growth, these farmers remained vulnerable to economic and ecological shocks and stresses, including volatile price fluctuations, pests and disease, unpredictable rainfall and soil degradation, all of which hinder their ability to achieve their long-term development goals.

Through this assessment, Mercy Corps worked to assess the program's impact on risk reduction in Southern Shan State, to identify opportunities for strengthening resilience among smallholder farmers and for enhancing the program's long-term economic impact in fragile contexts.¹ The following key recommendations emerged:

Assess risks holistically across market actors to inform partner selection and MSD intervention design

The analysis of MVMW revealed that while farmers were consistently vulnerable to market price shocks, pest and disease outbreak and climate variability, market actors at all levels were threatened by shocks and stresses. The programs' limited awareness of a large export company's sensitivities to global commodity price shocks in the vegetable market led a no contract farming partnership with local farmers to falter. Similarly, initial uptake of improved agricultural technology stalled because the program did not recognize how social ties and trust among existing input suppliers manifested as essential debt reduction and support in difficult seasons, helping farmers manage risk. These challenges highlight the critical need to assess vulnerability at all levels, and to understand how risk factors into market actors' decision-making. Such analysis can help programs select or appropriately support private sector partners and tailor design interventions that facilitate risk reduction for farmers and across the market system.

Identify and leverage social networks to enhance markets' risk-reducing potential

Cost off-setting measures such as vouchers were found to be less effective at expanding market linkages and building access to new technology when they required farmers to forego long-standing, trusted input supply chain networks that provided access to low-interest loans or loan deferral in hard seasons. Initially, when the program partnered with centralized input suppliers outside of beneficiaries' trusted networks, the poorest farmers did not have access to embedded credit and were thus unable to pay the remaining costs. MVMW's early challenges around contract farming also highlighted the importance of social capital between private sector partners and farmers. Farmers' distrust and uncertainty around a contract farming company's extension services and pricing structure increased their reluctance to shift their agricultural practices, ultimately decreasing the quality of their produce.

Leverage transitional smart subsidy models to develop markets for risk-reducing products and services in fragile contexts

MSD programs have long used smart subsidies to reduce investment risk. This analysis suggests that smart subsidies can reduce a range of ecological and market-related risks for producers and other market actors in

¹ This assessment examined only Southern Shan State, though the findings can be applicable in Rakhine State and other fragile market contexts.

the short term by incentivizing the trial and adoption of new, risk-reducing technology. This can have cascading benefits, by fostering market access to resilience-building products and services critical in volatile, shock- and stress-prone environments. In Southern Shan State's fragile vegetable market system, MVMW ultimately adapted its sliding scale subsidy model for agricultural inputs to improve farmers' awareness about more resilient agricultural production models, and to encourage farmers to experiment with new technology. The new subsidy model further allowed agricultural input wholesalers and retailers to expand their businesses in selling agricultural products and technologies that improved farmers' resilience. The assessment also found that such smart subsidy models would be most effective for resilience building if based on a comprehensive risk analysis that includes farmers' social, ecological and economic incentives and risks.

Enhance markets for resilience-building extension services alongside those for improved technologies

Without access to extension services—and the information and training they provide—many farmers employ poor agricultural practices that reinforce cycles of low yields, quality and salability, factors which ultimately undermine their vulnerability and lower their resilience. Acknowledging that increasing farmers' access to markets for improved technologies can only increase productivity and build resilience if they have the right knowledge and skills and see the benefits of applying these practices, MVMW partnered with East-West Seed to promote good agricultural practices. This partnership targeted an information gap unfilled by input supply networks. High participation rates—coupled with significant replication of practices among those who did not attend—signaled a significant demand for information and training among farmers. Beyond enhancing market access to agricultural technologies for resilience, this local demand for extension services may signal a willingness to pay for market-based models for advice, despite current activities being subsidized through MVMW.

Identify and address information asymmetries within all systems—ecological, economic and social—to ensure farmers can understand and comprehensively plan for shocks and stresses

Because farmers lacked the information necessary to plan effectively or make calculated decisions about how to manage potential ecological and economic risks, market volatility and climate variability continued to limit the effectiveness of agricultural extension interventions—and productivity of the new technologies MVMW introduced. While addressing information asymmetries has been a core component of MSD work, this analysis highlights farmers' need to access a holistic package of information, including climate and ecological, market fluctuation, and agricultural information (i.e., techniques, products and services). When input sellers have access to and use this same information in decision-making, they stand to build both their resilience and that of the farmers who rely on their products.

Overall, findings from MVMW underline the potential of the market systems development approach to have wide-reaching benefits for resilience. By facilitating farmers' market access to affordable, risk-reducing technology and improving their knowledge and skills in risk-reducing agricultural production techniques, the program helped build key resilience capacities that helped farmers better manage shocks and stresses. However, the analysis also found that MSD program outcomes could potentially yield greater results for both MSD and resilience if interventions better consider the full set of complex risks and related incentives that drive decisionmaking and behavior change among farmers and other market actors. Program interventions could have also considered additional resilience capacities such as facilitating access to market and climate information more holistically to support greater dividends for resilience to strengthen market outcomes.

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List of Acronyms

ESS	Effective Seed Storage
EWS	East -West Seed
FGD	Focus Group Discussions
GAP	Good Agriculture Practices
KII	Key Informant Interviews
MMK	Myanmar Kyat
M-RED	Managing Risk for Economic Development
MSD	Market Systems Development
MVMW	Making Vegetable Markets Work

Why Study the Links Between Market Systems Development and Resilience?

Contextualizing This Case Within the Larger Assessment

Mercy Corps has traditionally worked to achieve lasting poverty reduction at scale in complex contexts through a market systems development (MSD) approach. MSD helps teams analyze supply and demand for goods and services—ranging from farm products to water supply systems—that can support economic growth and improve social outcomes. The approach guides teams to identify barriers that prevent this supply and demand exchange from working effectively on behalf of the poor, as well as specific market-based solutions. Finally, the process leads teams to identify and develop partnerships with the local, national and regional actors critical to addressing these constraints and creating the right conditions for markets to deliver improved products or services sustainably.

Foundational to the MSD approach is the tenet that project implementers should adopt a light-touch role, creating linkages between market actors and stimulating market systems to deliver the selected product or service over the long-term, rather than having the project team deliver these directly within its short lifespan. MSD has evolved into a well-established, impactful model for achieving transformational change in economic systems that has led to sustained income growth and improved economic well-being among poor and marginalized populations in many cases.

More recently, Mercy Corps has developed a resilience approach to project design and implementation. The approach evolved in response to growing concerns that frequent and often cyclical shocks and stresses have reversed development gains—particularly in politically and ecologically fragile geographies. The resilience approach draws on the systems thinking embedded in MSD, but provides a broader lens for understanding the social, economic and ecological systems within which communities live and identifying shocks and stresses that contribute to fragility and unpredictability in these systems. The resilience approach also seeks to understand who is most vulnerable to these shocks and stresses, and what resilience capacities are required to prevent risk from undermining progress toward development goals.

While both MSD and resilience take a systems perspective—focusing on how to improve system performance for the benefit of marginalized or underserved communities—recent research and

Two Systems-Based Approaches

Systems-based approaches draw on systems thinking to unpack complex systems elements and form a greater understanding around their interconnectedness and interdependencies. Mercy Corps defines market systems development and resilience—two systems-based approaches—as follows:

Market Systems Development: An approach to working through public and private sector actors to address the underlying systemic constraints that hinder target populations' access to, and participation in, the market. Because locally embedded actors have wide-reaching connections with local populations, they can reach more people and change norms in market systems well beyond the life of the program.

Resilience: The capacity of households and communities in complex socio-ecological systems to learn, cope, adapt and transform in the face of shocks and stresses. Mercy Corps takes a systems approach to identifying which shocks and stresses pose the biggest threats to relief, recovery or development goals in a given context; who is most vulnerable and how; and what capacities households and communities need to stay on track and get ahead.

programmatic learning suggest they are not synonymous, or even automatically reinforcing.² MSD traditionally focuses on improving economic outcomes for the poor (e.g., increased income among a target population), more recently under the assumption that these outcomes can help the poor improve social well-being. On the other hand, resilience building is a means or pathway to sustaining and enhancing a broad range of development goals (e.g., income, social empowerment, health, food security) in a given complex risk environment—even in the face of intensifying shocks and stresses. For Mercy Corps, introducing the resilience approach into a relatively well-established MSD approach provides opportunities to enhance program impact for the poor, but the requirements of considering multiple systems and risks can be challenging, as they introduce a new level of complexity into a relatively high-performing and bounded MSD model. To better understand where and how practitioners can better apply resilience and MSD approaches together in a way that is mutually reinforcing, this research set out to assess the relationship between them in three unique contexts. Over a period of 6 months, Mercy Corps asked the following questions aimed at better understanding the synergies, challenges and trade-offs that emerge when attempting to build resilience and achieve market systems outcomes:

- › Can MSD—with a primary focus on increasing market access and incomes—help build resilience in fragile contexts? If so, which elements of an MSD approach support resilience?
- › What are the risks of applying an MSD approach to poverty alleviation in fragile contexts without considering resilience?
- › Can applying a resilience approach to MSD programs implemented in fragile contexts help ensure their long-term success and sustainability?
- › Can the principles of MSD strengthen Mercy Corps’ resilience approach?

Mercy Corps explored these questions through three MSD-oriented programs in its South and Southeast Asia portfolio, each of which integrated resilience theory in their design to varying degrees: 1) Making Vegetable Markets Work for Smallholder Farmers (MVMW), an MSD program in Myanmar with no explicit resilience analysis or component in its design, and the subject of this case study; 2) Effective Seed Storage (ESS), a food security program in East Timor with a central intervention focused on developing markets for seed silos to help address food security risks; and 3) Managing Risk through Economic Development (M-RED), a program in Nepal’s Far West Region designed to build resilience to natural disasters using a market-based approach. This set of programs provides three distinct vantages from which to examine the implications of, and determine recommendations for, applying MSD and resilience approaches in fragile contexts.

Introduction

Making Vegetable Markets Work for Smallholder Farmers in Southern Shan and Rakhine States (MVMW) uses a market systems development (MSD) approach to provide marginalized vegetable farmers with opportunities to increase their incomes. In thin markets—like Southern Shan State—where market actors remain highly vulnerable to a range of social, political, economic and ecological risk factors, applying a resilience lens to a program like MVMW can reveal opportunities to avoid unintended consequences and increase the likelihood of achieving the program’s development goals.

² Mercy Corps’ [More Than Markets](#) paper explores the limitations of a pure MSD approach in Northern Uganda, ultimately making a case for the critical role of resilience in achieving the full benefits of market systems work.

Methodology

Following a secondary data review focused on MVMW evaluations, annual reports and other program documents, the assessment team conducted a resilience orientation and program mapping exercise with the MVMW team to inform field data collection. Because MVMW had no explicit resilience element in its design and the team's exposure to and experience with resilience varied widely, the program team received an initial orientation on Mercy Corps' resilience approach and assessment tools. This orientation emphasized how shocks and stresses can limit or reverse income growth. The assessment team then worked with program team members to map key shocks and stresses and their drivers in the program context, to identify connections between them, and to reflect on how they affected program stakeholders. The mapping exercise, discussions with the MVMW team and a literature review helped reveal appropriate market actors for key informant interviews (KIIs) and focus group discussions (FGDs), helping shape the assessment questionnaire. Field interviews helped explore: 1) which elements of the MSD approach build resilience, 2) the effectiveness and trade-offs of applying a resilience lens to MSD programs in fragile contexts, and 3) the ways in which MSD principles can strengthen resilience.

Program Context: Understanding Fragility in Southern Shan State

Systemic Constraints

In developing MVMW, the team identified a number of systemic constraints—persistent, endemic challenges and barriers impeding development—that limited opportunities for farmers to improve their incomes. Specifically, farmers in Southern Shan State experience immense pressure as land becomes scarcer, indebtedness rises, scarce water availability limits productivity and input costs increase, among other issues. Vegetable farming in Myanmar remains a particularly risky business—although highly profitable if farmers can avoid shocks and stresses. While the context is evolving quickly, historically farmers received little or no investment support and production costs appear to be rising. In this context, the program team noted that growth remains fragile after decades of minimal investment, poor regulations and enforcement, and limited support services (e.g., limited access to accurate market information, finance, high-quality inputs and extension services), leaving farmers to grow high-risk crops despite their low profit potential. Not only do these constraints have an impact on farmers' ability to participate in the market system and limit their benefits from Myanmar's transitioning economic context, they leave farmers more vulnerable to shocks and stresses.

Shocks and Stresses

This assessment found that interconnected economic and ecological shocks and stresses significantly impact smallholder farmers' ability to get ahead. Price volatility, largely a result of production and price swings in other

Understanding Risk and Fragility

Using systems mapping, interviews, focus groups and secondary research, the program team identified the following as key drivers of fragility and risk.

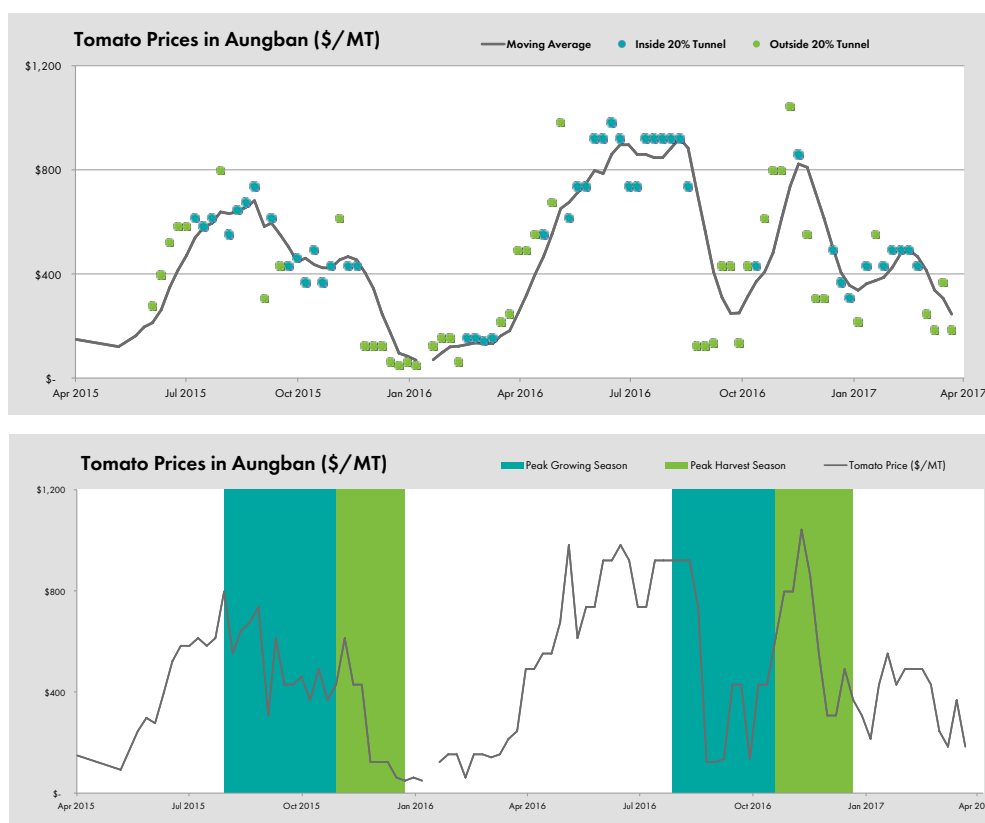
Systemic Constraints

- › Limited government accountability and resources
- › Poor policies, regulations, and enforcement
- › Limited provision of quality extension services and production advice
- › Insufficient direct access to central markets or opportunities to export produce
- › Asymmetric and poor market information
- › Weak farmer and sector associations
- › Restricted formal financial access
- › Inadequate land management

Shocks and Stresses

- › Volatile market prices for vegetables
- › Weather/rainfall variability
- › Pests and disease
- › Land degradation
- › Extreme and unpredictable weather trends

regions of Myanmar and bordering areas, emerged as a major shock in discussions with market actors. Climate change is intensifying weather-related shocks and stresses, from delayed rains and high temperatures, to rainfall variability and drought. Because vegetable farmers in Southern Shan State had limited access to information about these unpredictable climate and weather trends and why their prices shift from season to season, they often make poor decisions about what to plant and when. Poor market information leads to surpluses or shortages because all farmers shift to plant the same crops at the same time. Appendix B includes a more complete list of systemic constraints, shock and stresses.



Program Description

Even as Myanmar continues a remarkable transition toward a functioning market-based economy, much work remains to ensure new growth benefits the rural poor. While many families are considerably better off on average than they were a generation ago, farmers are unable to invest in improved agricultural practices in the face of these numerous barriers and risks. Mercy Corps' MVMW program uses an MSD approach to partner with market actors in Southern Shan State to facilitate market conditions that increase farmers' access to new agricultural technologies and services, as well as their connections to buyers, while promoting more inclusive business models.

MVMW program activities were centered around three core market interventions:

- Promoting improved technology uptake through vouchers and input supplier partnerships:** To increase farmers' access to and promote the uptake of improved input technologies, MVMW partnered with eight local input suppliers to distribute vouchers to farmers, subsidizing the costs of improved agricultural inputs such as seedling trays, plastic mulch, trellis netting and personal protective equipment, all of which were designed to reduce production variability and improve yields. The vouchers were designed as a "smart subsidy," increasing the affordability of these improved technologies to incentivize farmers to experiment with them. Once farmers experienced the benefits of new technologies, the program encouraged them to use their savings to make additional technology purchases through markets to which they were newly connected as a result of the voucher strategy. At the time of this writing, 1,509 farming households had redeemed vouchers and purchased 2,496 improved technologies, and the total program investment for vouchers was MMK 45.55 million (33,130 USD) with farmer investment at MMK 81.86 million (59,540

USD). The intervention now includes 14 local input dealers in Southern Shan State.

› **Improving practices through extension services/demonstration plots:** MVMW also partnered with East-West Seed (EWS), a seed sales company with a social enterprise mission, to promote improved agricultural practices in its target areas of Southern Shan State. MVMW collaborated with EWS to establish 502 plots for demonstrating new technologies and techniques. The company's services were a part of its social mission, but were ultimately intended to drive farmer purchase of its improved seed varieties. Through the partnership, 18,568 farmers have gained access to services focusing on improved agricultural techniques.

› **Promoting exports and improving production quality through pilot contract farming:** To promote farmers' involvement in export markets and improve the quality of their production, MVMW partnered with a few companies, including firm Big M, to pilot contract farming for vegetables initially with 67 farmers. Big M provided extension services and inputs on credit to farmers, and offered them a pre-set price based on quality specifications at harvest.



Key Findings

Understanding the Synergies Between Market Systems Development and Resilience

The evaluation of MVMW yielded insights into synergies—where the MSD model benefited both market and resilience outcomes—and challenges, strategies and processes that resulted in unanticipated consequences for resilience. These lessons explore both the substance of these approaches—what the team focused on—and how they implemented the approaches. Findings from MVMW underline how the potential of the market systems change approach could have wide-reaching benefits for resilience. However, the assessment concluded that program outcomes could potentially yield greater results for both MSD and resilience if interventions comprehensively considered the complex risks and related incentives that drive decision-making and behavior change among farmers and other market actors. This section provides a case narrative exploring the synergies, challenges and trade-offs in making market systems development work for resilience.

Appropriately crafted subsidies foster long-term market access for risk-reducing products and services

MVMW developed its vouchers for improved agricultural inputs on a sliding scale: farmers could receive up to three vouchers, the first with a 40% subsidy, the second with 20% and the third 10%. Farmers had to pay full price for the fourth purchase. Based on lessons learned, the program evolved its voucher distribution approach. Initially, MVMW team members marketed and distributed the vouchers, and managed the mobile money payment

platform. Over time, the team collaborated with the wholesaler to integrate voucher marketing and distribution into their core business model, allowing them to sell and collect payments for the inputs through local agricultural businesses and entrepreneurs. Wholesalers were also encouraged to pay for part of the sliding subsidy, better incorporating the voucher scheme into their core outreach and promotion practices. At the time of this writing, more than 1,509 farmers had purchased \$85,000 of improved agricultural inputs that helped them mitigate threats to agriculture, while increasing their productivity. The total value of the purchases was 60% farmer-funded, with the 40% discount shared between Mercy Corps and the private sector partner. As the input wholesaler observes the success of the voucher approach in expanding its customer base, the program is working with the company to help it wrap this subsidy into their product promotion and business expansion approach completely, helping the program reach farmers far beyond its beneficiary base.

Importantly, the products promoted through the voucher scheme helped protect crops against torrential rain, hail and frost and included improved, safer pest management mechanisms, all of which increased yields in an area where rapid land degradation is a major stress affecting production. Promoting these products also supports resilient behavior, increasing farmers' awareness of what production technology they use and how they use it—competencies critical in an environment where agri-inputs are unregulated and poor production techniques combined with ecological and economic risks have long undermined farmers' potential for income growth and development. Access to these products, and their application in this fragile context, ultimately equips farmers with critical resilience capacities they needed to better manage their risk. Farmers can also save income from improved yields to cope with unexpected events or reinvest in profitable opportunities, improving their resilience over the long run. Changes in the market systems that make improved technologies increasingly accessible and affordable to farmers can thus help create an overall environment for risk reduction.



Photo Credit: Myanmar/Ezra Millstein

Understanding how farmers use social capital to reduce their risks can help MSD approaches build resilience

The MSD approach helped the team identify both technologies that could provide viable profit incentives for farmers and the market channels for broad uptake of these technologies. However, examining the factors limiting farmers' use of vouchers in the initial phases of the program helped the team understand opportunities where a resilience lens could strengthen the MSD approach—specifically, understanding farmers' decision-making in a complex risk environment and how they rely on market actors to cope. For example, Mercy Corps' analysis revealed how critical social capital—the relationships and trust between farmers and input sellers—is to mitigating risk and avoiding indebtedness. Vegetable farmers reported that they rely heavily on low or no-interest informal credit and flexible payment terms from their local input suppliers to fund and maintain their production in difficult seasons. Most already had access to these flexible funding and payment terms through their local preferred suppliers at the outset of the program.³

³ Formal financial access is limited by a number of factors, including access, inappropriate loan products, and the need for formal land registration as collateral.

High levels of trust between these input sellers and their farming customers made this flexible financing possible, resulting in lower default rates. When farmers' crops failed due to unpredictable rain patterns, floods, or pests and disease, these trusted local input sellers helped absorb the temporary financial hit by allowing farmers to delay their payments or providing them additional inputs without interest.⁴ In particularly difficult cases, they have forgiven debts. Many input suppliers offered this support when farmers were in crisis as part of their larger business model—one that helps them secure customer loyalty in a competitive input market. Because input sellers receive stock (e.g., fertilizers, pesticides) on credit from large input supply companies, they also had the liquidity to provide inputs on these terms.

Mercy Corps' analysis suggests vouchers for new technologies like those offered through MVMW could enhance existing social capital-driven credit and payment systems if farmers were able to redeem them with local suppliers they knew and trusted. However, MVMW initially offered these vouchers through the program's field team members who were connected to centralized input suppliers, rather than through local retailers within the farmers' typical networks (an approach the team subsequently changed). In Southern Shan, rural farmers often purchased inputs and technologies from sub-dealers, who bought their stock from the more central input suppliers MVMW originally selected as partners. During assessment interviews, farmers and input suppliers noted that some farmers did not redeem the vouchers because they did not want to jeopardize their relationships with trusted input suppliers. In addition, poorer farmers did not have sufficient cash to pay for the unsubsidized portion of the voucher products, a problem that could have potentially been mitigated through their local supplier networks.

Selecting the right partners can help MSD contribute to resilience

Price volatility in raw commodities is one of the most significant shocks affecting farmers. This is especially true in horticulture which is fragile and perishable. The team knew farmers' inability to negotiate consistent prices was affecting their incomes and ability to expand production. To help address this, MVMW promoted farmers' involvement in export markets, working to improve their production quality and meet international standards by partnering with contract farming companies capable of providing inputs on credit, giving production advice, and offering farmers guaranteed prices for their produce.

Because input suppliers have the capacity to help farmers make production decisions that minimize losses, control risk when investing in new technologies, and recover from shocks to their livelihoods, selecting the right private sector partnerships is critical to MSD. The challenges MVMW faced in selecting a private sector partner for a contract farming relationship also highlights this point. MVMW brokered a relationship with one contract farming company, Big M, which offered pre-set prices to farmers based on pre-set quality specifications. However, Big M was also vulnerable to price shocks, and the company could not consistently negotiate prices through its relationships with foreign buyers, forcing it to turn frequently to the volatile domestic market to sell its produce.

Additionally, Big M struggled to improve farmers' production quality, in part because the company had not developed the social capital necessary for farmers to heed its production advice, and did not invest in the necessary resources required to provide high-quality extension services to farmers. Low production quality combined with insufficient price level guarantees had a negative impact on farmers' profitability. As a result, Big M lost money on its contract farming business with some farmers leaving crops rotting in the fields rather than harvesting them. The company noted that 10% of its farmers faced cancelled contracts each year due to their inability to pay back costs of inputs.

⁴ Input suppliers are largely able to provide these services because the shocks and stresses most prevalent in Southern Shan State are somewhat idiosyncratic—they do not affect all farmers at the same time, or in the same way. When shocks affect large numbers of farmers in a locality at once (such as a hailstorm which occurred in April 2016), some input suppliers will temporarily delay restocking while they wait for payment from customers.

While the partnership faltered under these conditions, the experience yielded important learnings for the MVMW team. Of particular importance is the need to understand shocks and stresses affecting market actors at all levels, and assess how risks along the value chain can affect producers. It also emphasized the need to analyze the quality of relationships among farmers and the private sector, and facilitate social capital. Fortunately, by applying an adaptive management approach the team has turned this experience into a potentially positive shift. MVMW's implementation experience and deeper understanding of the vulnerability of market actors at all levels has led the team to refocus its interventions on linking farmers to private sector-based extension services alongside building their market access to improved, risk-reducing agricultural technology through the voucher scheme.

Facilitating market access for risk-reducing technologies is more effective when coupled with extension services

Increasing farmers' access to markets for improved, risk-reducing technologies can only increase productivity if farmers have the right knowledge and skills and see the benefits of applying these practices. In Southern Shan State, MVMW partnered with EWS to promote good agricultural practices, targeting an information gap unfilled by input supply networks, who typically do not offer advice on crop selection and production techniques. At the time of writing, 9,676 farmers in Southern Shan State had received EWS training in Southern Shan State, including 94% of those who redeemed vouchers for improved inputs. Farmers learned about proper application of pesticides and fertilizer and techniques for addressing pest infestations, which can increase soil quality and reduce the stress of rapidly declining land conditions on agricultural systems.

The high participation rates in these trainings, which far outweighed those accessing the market through vouchers, indicate demand for production information at the community level remains strong. Based on interviews, at least some of this demand in Southern Shan State stems from vegetable farmers' need to adapt to shocks—most commonly cited as pests and disease and rainfall variability—and stresses such as soil degradation. Specifically, farmers acknowledged that they often overuse pesticides and fertilizers when coping with land degradation and pests, and that this misuse contributes to soil degradation and increases pest outbreaks over time. Unfortunately, extension and sales agents from chemical companies have few incentives to educate farmers about this overuse. These impacts limit the salability of farmers' produce in the very export markets that stand to decrease their vulnerability to domestic price shocks. Combined, these factors entrap farmers in a cycle that reinforces their vulnerability and lowers their resilience.

To gauge the sustainability and spread of these practices and their impact on long-term resilience, the assessment identified whether and how farmers were replicating the new agricultural techniques. In focus groups, many farmers reported adopting new techniques on their plots, although some expressed reluctance to adopt practices requiring financial investments or additional labor (e.g., application of organic fertilizer).⁵ Importantly, farmers reported that for every individual applying techniques learned through EWS trainings, roughly one additional farmer was copying these behaviors. This information sharing and replication has occurred mostly within MVMW communities but in some cases it has extended to nearby communities as well. Participants in many communities report that farmer group members have also begun sharing production information with each other as a result of the program. This partnership with EWS illustrates local demand for extension services and early signs that market-based models for advice have potential, despite the fact that current activities are subsidized through MVMW.

Linking market and climate information to extension services can strengthen resilience building

While MVMW was successful in facilitating the dissemination of extension information that translated to risk-reducing agricultural practices, the assessment team found that the complex risk environment in which farmers

⁵ Many of these focus groups were conducted with communities that had joined MVMW just before the monsoon season.

operate also requires information on market trends, climate and production patterns. Farmers could use this information to decide when and what to plant, reducing their—and other market actors’—vulnerability to shocks and stresses (e.g., rainfall and price shock variability). Though this information is inconsistently available in rural areas, the assessment team found a few leading input retailers that track weather and production trends regularly, combining historical knowledge of climate trends with basic weather information to determine when planting should occur, which crops will be popular and which shocks are likely to impact farmers each season. Using this analysis, they buy stock in advance of each season, reducing their own risk of stock outs and price hikes for products in high demand over the short term.

For example, one input seller in Aung Ban noted that he typically uses weather information to stock at least $\frac{1}{3}$ of his products in advance of each growing season, helping him regulate input costs in the face of climate-related swings in demand. This existing knowledge could also be used to improve marketing to customers as well, but currently remains untapped. There may also be unrealized potential to share this climate and market information across input supply and additional networks, which could provide a strong leverage point for spreading the information farmers need to limit their exposure and vulnerability to shocks and stresses. Ultimately, improving these information flows can build the resilience of local market actors and the larger market system.

Conclusion and Recommendations

In this historic period following roughly four decades of dictatorship and military rule, when Myanmar’s economy has opened to the outside world, smallholder farmers remain vulnerable to economic and ecological shocks and stresses. These include price volatility, unpredictable rainfall, soil degradation, pests and disease, all of which have the potential to derail their progress toward long-term development goals. Using a market systems development (MSD) approach, the MVMW program partnered with market actors in Southern Shan State to increase access to production technology and services, and improve farmers’ connections with input suppliers and buyers. Given the continued vulnerability of farmers in Southern Shan State, Mercy Corps’ analysis of MVMW identified several potential synergies, trade-offs and challenges in ensuring an MSD program focused on increasing farmers’ incomes can contribute to resilience.

The following recommendations synthesize the key findings, providing a set of considerations for ensuring program design and implementation maximize both resilience and economic outcomes.

Assess risks holistically across market actors to inform private sector partner selection and MSD intervention design

The analysis of MVMW revealed that while farmers were consistently vulnerable to market price shocks, pest and disease outbreak and climate variability, market actors at all levels were threatened by shocks and stresses. The programs’ limited awareness of a large export company’s sensitivities to global commodity price shocks in the vegetable market led a contract farming partnership with local farmers to falter. Similarly, initial uptake of improved agricultural technology stalled because the program did not recognize how social ties and trust among existing input suppliers manifested as essential debt reduction and support in difficult seasons, helping farmers manage risk. These challenges highlight the critical need to assess vulnerability at all levels, and understand how risk factors into market actors’ decision-making. Such analysis can help programs select or appropriately support private sector partners and tailor design interventions that facilitate risk reduction for farmers and across the market system.

Identify and leverage social networks to enhance markets' risk-reducing potential

Cost off-setting measures such as vouchers were found to be less effective at expanding market linkages and building access to new technology when they required farmers to forego long-standing, trusted input supply chain networks that provided access to low-interest loans or loan deferral in hard seasons. Initially, when the program partnered with centralized input suppliers outside of beneficiaries' trusted networks, the poorest farmers did not have access to embedded credit and were thus unable to pay the remaining costs. MVMW's early challenges around contract farming also highlighted the importance of social capital between private sector partners and farmers. Farmers' distrust and uncertainty around a contract farming company's extension services and pricing structure increased their reluctance to shift their agricultural practices, ultimately decreasing the quality of their produce.

Leverage transitional smart subsidy models to develop markets for risk-reducing products and services in fragile contexts

MSD programs have long used smart subsidies to reduce investment risk. This analysis suggests that smart subsidies can reduce a range of ecological and market-related risks for producers and other market actors in the short term by incentivizing the trial and adoption of new, risk-reducing technology. This can have cascading benefits, by fostering market access to resilience-building products and services critical in volatile, shock-and stress-prone environments. In Southern Shan State's fragile vegetable market system, MVMW ultimately adapted its sliding scale subsidy model for agricultural inputs to improve farmers' awareness about more resilient agricultural production models, and encourage farmers to experiment with new technology. The new subsidy model further allowed agricultural input wholesalers and retailers to expand their businesses in selling agricultural products and technologies that improved farmers' resilience. The assessment also found that such smart subsidy models would be most effective for resilience building if based on a comprehensive risk analysis that includes farmers' social, ecological and economic incentives and risks.

Enhance markets for resilience-building extension services alongside those for improved technologies

Without access to extension services—and the information and training they provide—many farmers employ poor agricultural practices that reinforce cycles of low yields, quality and salability, factors which ultimately undermine their vulnerability and lower their resilience. Acknowledging that increasing farmers' access to markets for improved technologies can only increase productivity and build resilience if they have the right knowledge and skills and see the benefits of applying these practices, MVMW partnered with East-West Seed to promote good agricultural practices. This partnership targeted an information gap unfilled by input supply networks. High participation rates—coupled with significant replication of practices among those who did not attend—signaled a significant demand for information and training among farmers. Beyond enhancing market access to agricultural technologies for resilience, this local demand for extension services may signal a willingness to pay for market-based models for advice, despite current activities being subsidized through MVMW.

Identify and address information asymmetries within all systems—ecological, economic and social—to ensure farmers can understand and comprehensively plan for shocks and stresses

Because farmers lacked the information necessary to plan effectively or make calculated decisions about how to manage potential ecological and economic risks, market volatility and climate variability continued to limit the effectiveness of agricultural extension interventions—and productivity of the new technologies MVMW introduced. While addressing information asymmetries has been a core component of MSD work, this analysis

highlights farmers' need to access a holistic package of information, including climate and ecological, market fluctuation, and agricultural information (i.e., techniques, products and services). When input sellers have access to and use this same information in decision-making, they stand to build both their resilience and that of the farmers who rely on their products.

Overall, findings from MVMW underline the potential of the market systems development approach to have wide-reaching benefits for resilience. By facilitating farmers' market access to affordable, risk-reducing technology and improving their knowledge and skills in risk-reducing agricultural production techniques, the program helped build key resilience capacities that helped farmers better manage shocks and stresses. However, the analysis also found that MSD program outcomes could potentially yield greater results for both MSD and resilience if interventions better consider the full set of complex risks and related incentives that drive decision-making and behavior change among farmers and other market actors. Program interventions could have also considered additional resilience capacities (such as facilitating access to market and climate information) more holistically to support greater dividends for resilience to strengthen market outcomes.

Appendix A: Glossary

- › **Crowding-in:** Similar or competing market players copy and diversify pro-poor changes supported by an intervention.
- › **Demonstration effect:** Independent replication of a particular behavior, or uptake of a technology or practice, as a result of observing the benefits of someone else exhibiting these same behaviors or practices.
- › **Embedded credit:** Lending arrangements between market actors engaged in business (e.g. arranging delayed payment for goods such as inputs or pre-financing business activities such as agricultural production).
- › **Facilitation or a facilitative approach:** Refers to temporary interventions to stimulate and strengthen (rather than displace) market functions and players in ways that create system-wide benefits for the poor.
- › **Farm gate prices:** The net value of the product when it leaves the farm, after marketing costs have been subtracted.
- › **Market systems development:** Market systems development works by identifying actors that can serve as leverage points for generating widespread, sustainable change in market systems.
- › **Market systems change:** A change in the way supporting functions and rules perform that ultimately improves the poor's participation in a market system.
- › **Resilience:** Mercy Corps defines resilience as the capacity of communities in complex socio-ecological systems to learn, cope, adapt and transform in the face of shocks and stresses.
- › **Resilience Capacities:** The ability to deal with shocks and stresses. The means by which households, communities, and groups of communities cope, adapt and transform in the face of shocks and stresses. Target beneficiaries would need to overcome these threats.
- › **Shocks:** Sudden onset, unexpected, high-impact events. These are dangerous natural phenomena, human activities, or conditions that may cause loss of life, injury, or other health impacts; property damage; loss of livelihoods and services; social and economic disruption; or environmental damage.
- › **Social capital:** The quality and quantity of relationships and networks that people have.
 - **Bonding social capital:** How people connect within a group, based on shared characteristics. This could include gender, caste, or being part of the same neighborhood.
 - **Bridging social capital:** Connections across groups and communities to create horizontal networks.
 - **Linking social capital:** How people connect with district, regional or national institutions and those in power.
- › **Stresses:** Ongoing pressures or seasonal factors—such as land degradation, unemployment, ongoing conflict, price instability, or climate variability—that undermine resilience capacities.
- › **Systemic constraints:** Broad and generalized conditions endemic to a development context such as poor mobility, weak governance, or social inequality.
- › **Systems-based approach:** A development program approach that recognizes the complexity, interdependence, and dynamism of social, political, economic, and ecological conditions in a particular context, and seeks to leverage or transform these conditions to achieve lasting development outcomes for poor and vulnerable populations.

Appendix B: Resilience Context

Systemic Constraint	Description
Governance Limitations	Inadequate budget allocations, poor service delivery, poor coordination between ministries and departments, and few accountability mechanisms
Poor Policies, Regulations, and Enforcement	Policies on land, production, procurement and price, foreign exchange, and subsidy inhibit the sector's competitiveness. The excessive controls inherent in these policies, coupled with their erratic implementation, are seen to create a general atmosphere of uncertainty and unpredictability in the economy and an erosion of the government's credibility. For instance, the Farmland Law and the Vacant, Fallow, and Virgin Land Law leave farmers vulnerable to land grabs by businesses, and the potential distortion of farmer incentives and control over production stemming from the draft Farmer Benefit Act. Though good quality products are available, widespread use of cheap pesticides and fertilizer of unknown and likely poor chemical composition contribute to short-and long-term production deficiencies. Most products are imported from China and quality controls are all but nonexistent.
Limited Provision of Quality Extension Services and Production Advice	Extension services provided through input supply companies are limited to product marketing. There is minimal government support for extension, and other crops are the priority for using limited resources. Information on good agricultural practices, disease control, and technologies exists in the public extension system, but simply does not reach the farmers. One of the challenges of public extension systems is reaching "the last mile" to farmer households, as extension officers are under-resourced and unable to travel to the areas they should be servicing. Transport costs, or the time required for travel, result in extension service workers generally reaching only to villages near main towns.
Limited Direct Access to Central Markets or Opportunities to Export Produce	Southern Shan State has a wide network of collectors and traders that feed produce into centralized markets, but farmers have limited direct interaction. As a result, they have a limited understanding of the dynamics affecting vegetable prices and new market opportunities.
Asymmetric Information	Farmers are typically knowledgeable and make rational choices but have limited access to impartial information on new methods or the effectiveness of different inputs. Market information is generally available, with some specific exceptions in remote areas or where short-term fluctuations are impossible to predict.
Weak Farmer and Sector Associations	Until recently, most non-governmental or civil society group activity was banned including unions and farmer networks. There were few initiatives to support farmer groups outside sanctioned (and often derided) government bodies and small, informal community structures. This legacy is a serious constraint.
Rural Finance	Limited access to affordable credit is a major constraint for farmers and for farm-related businesses.

Systemic Constraint

Description Cont.

Additional Constraints	Land and water are two major factors for farming and in both cases concerted action is needed if vegetable farming is to progress significantly. Further constraints include transport, the differential treatment of some minority groups, and a general lack of government support for rural households. All of these factors make most farmers understandably conservative. The risks of crop failure that could lead to intractable debt or the loss of inherited land are too great for many farmers to bear. As a result, technical solutions to farming methods or improved information provision may not be effective without other steps that reduce the risks facing farmers.
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Shock/Stress

Description

Volatile Market Prices for Vegetables	The market prices farmers receive are volatile, largely driven by production and price swings that result from unpredictable supply levels in other regions of Myanmar, and across nearby borders. Because vegetable farmers in Shan State have limited access to information about why the prices they receive shift from season to season, they often make poor decisions about what to plant and when. Poor market information leads to surpluses or shortages because farmers shift to plant the same crops at the same time (see callout box).
Pests and Disease	Increasing incidences of pests and disease are a consistent problem for vegetable farmers in Southern Shan State and are partially a result of overuse or misuse of agro-chemicals that build resistance over time. Overuse of agro-chemicals also affects the quality of production and its marketability through formal supply chains.
Land Degradation	Driven by the unregulated use of agro-chemicals in Southern Shan State, land degradation has undermined consistent supply and quality of produce. This stress has limited the potential for exports—a key means of reducing market price fluctuations
Extreme and Unpredictable Weather Trends	Delayed rains and associated high temperatures exacerbate pest outbreaks, while high levels of rainfall increase the likelihood of crop disease. Unpredictable rainfall particularly affects farmers who still depend on rain-fed irrigation—which means all farmers in Southern Shan State. In May 2016, large hailstorm damaged crops in some townships of Southern Shan State while other townships faced more severe consequences of damaged houses and casualties. On the other hand, climate impacts on other parts of Myanmar were beneficial for vegetable growers of Southern Shan State. Heavy rainfall and flooding in the western part of Myanmar in 2015 lowered the vegetable supply, soaring the price for vegetables from Southern Shan State. Extreme rainfall and drought are also parallel to disease and pest infestations.
Migration	Migration is occurring across Myanmar. Within Southern Shan State, migration occurs in three levels: Across sectors from agricultural sector to the construction industry and the upland opium farms; rural to urban hubs like Yangon and Naypyidaw as well as urban enclaves of Southern Shan State and cities bordering China and Thailand; and out of country when they are unable to pay their debts and lose their property.

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