Food System Innovations:

Building safe vegetable supply chains into traditional markets of Vietnam

MASTER'S CAPSTONE

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CAPSTONE

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Abstract

A population size of 95 million and a GDP over 200 billion (USD), Vietnam is one of the fastest growing countries in South East Asia, quickly transitioning from a low to a low and middle-income country (World Bank, 2018). The rapid-growth has brought new challenges and opportunities for the Vietnamese food system such as increased trade, consumer diet and demand changes, value-chain restructuring, etc. This project aimed at contributing to a better understanding of the current state of the food system in Vietnam. By documenting and interpreting available data and pointing to additional data needed, it supports informed policy decisions and effective interventions to ensure a safer and more sustainable food system. The second phase findings implicate a need for improved, consistent, valid food safety communication, and additional education efforts to minimize information asymmetries and enable consumers to make informed purchasing decisions.

Acknowledgements

I want to thank Dr. Kristin Kiesel who has played a significant role in my education and development in such a short amount of time. She inspired me to continue to explore behavioral economics as it pertains to consumer choices and food system transformations. Her commitment to her coursework design, one on one engagement, and how she translates her research to practice encouraged me during times of doubt the past two years. I would also like to thank Dr. Stephen Boucher and Dr. Stephen Vosti who were always available for advice, project feedback, and willingness to connect me to the answers or additional resources when needed. I appreciated their perspective and pushback throughout this process. I would also like to especially thank Dr. Thai Thi Minh and Charlotte Flechet for the unwavering support, despite the distance, they were always available. From the first day I met them in Vietnam I have been inspired by their research, dedication, and practice to building a safe, healthy, and equitable food system in Vietnam. I am forever grateful for giving me the opportunity to take my research further with your support and partnership.

I would also like to thank CIAT Vietnam and our supervisor Stef De Hanh as well as the faculty at the University of Michigan: Leslie Hoey, Colin Khoury, Andrew Jones, and Martin Heller.

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Capstone Introduction

My research was originally intended to be a three-month research project with the International Center for Tropical Agriculture (CIAT) in Vietnam and researchers from the University of Michigan, Ann Arbor. Upon completion of my three-month RIFA fellowship and motivated by our findings, I decided to continue this research. The second phase allowed me to dive deeper into a food system innovation and focus on consumer behavior.

Phase one of this research was completed in collaboration with three University of California graduate student researchers, the International Center for Tropical Agriculture (CIAT), and the University of Michigan, Ann Arbor. The research collaboration was designed to support the CGIAR research program, Agriculture for Nutrition and Health (A4NH), Flagship 1: Food Systems for Healthy Diets. Myself and my fellow UC student researchers were responsible for the first of four research phases to answer the following original research question:

*How can **existing data** and insights into the policy process be leveraged to inform decision-making on where and how to intervene to **effectively shift multiple axes of food systems** toward enhancing the sustainability of diets?*

I spent three months on the ground in Hanoi to contribute to the following deliverables:

(i) Compilation of data sources from online and in-person references
(ii) A novel conceptual framework for characterizing data and indicators
(iii) Stakeholder workshop to identify priority indicators and intervention points

Phase two of the research was a consumer baseline study in collaboration with Rikolto Vietnam, and with support from CIAT and faculty from the University of California, Davis. I designed and conducted a consumer survey and semi-structured interviews with food policy makers and stakeholders to inform a market trial. The market trial will evaluate the efficacy of the Participatory Guarantee System in bringing safe vegetables to traditional markets.

The following report will primarily focus on the research design, findings, and future research recommendations from the second phase of this research.

Motivation

Vietnam is one the fastest growing countries in South East Asia, it has experienced a rapid transformation from a low-income country to one of the most dynamic emerging economies in the world. The country is at a crossroads to ensure that its rapid urbanization and economic transformation is not at the cost of environmental and public health. Diets in Low Middle-Income Countries (LMIC's), such as Vietnam, and the food systems that underlie them are changing rapidly through increased urbanization and globalization (Downs et al., 2017). The rate of economic growth, urbanization, and increased participation in global markets has led to a

transition of Asian diets, a transition away from staples and increasingly towards livestock, dairy products, fruits and vegetables, as well as fats and oils. Pingali (2006) argues that the process of diet transformation in Asia can be seen in two separate stages: (1) income-induced diet diversification and (2) diet globalization and westernization. However, these changes in demand provide a significant challenge for currently operating informal distribution channels and, food outlets, as well as smallholder producers. They require transformations of value chains and add new pressures on production systems.

In addition, pesticide use in agriculture increased nearly threefold between 1990 and 2008 (Phung et al., 2013). This intensification of agricultural production is being met by an increase in consumer safety concerns and a widespread perception that harmful chemicals are being overused (Van Hoi, Mol & Oosterveer, 2013; Wertheim et al., 2014). These concerns are not only affecting regional consumers and local government but are also of importance to international buyers as Vietnam's participation in the global market increases. Much work has been done by the government, NGO's, cooperatives, etc. to improve production and distribution of agricultural goods and to manage the safety of foods and mitigate outbreaks. However, concerns and perceptions can pose a threat to local diets, farmer income, and the local economy overall.

Food modernization policies in South East Asia are actively promoting a transition towards modern food retail outlets as a strategy to ensure access to safe food. While Reardon (2005) considers supermarkets instrumental for realizing improvements to food safety such as management systems and standards, policymakers are not considering that supermarket expansion along with the reorganization and reduction of the widely preferred traditional markets could lead to unintended consequences. Recent studies from other South East Asian countries indicate that a decrease in traditional markets pose threats to healthy diets and limit access to affordable and accessible fruits and vegetables (Banwell et al.,2013; Kelly et al.,2014). Traditional markets have significant cultural meaning and continue to be widely preferred by consumers in Vietnam. They are more accessible, affordable, and allow for daily personal interactions that developed trust among consumers. Polices that exclusively focus on the development of supermarkets might be overlooking the capabilities of traditional markets to be upgraded.

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Phase I Findings

Through the participation of diverse stakeholders, analysis of existing datasets, and consultation of the scientific literature, a conceptual framework for sustainable diets was developed. It is relevant to Vietnam and can potentially be generalized to other LMICs. The framework supported a data characterization process which revealed important data gaps within certain domains, such as food loss, which limits data informed policy interventions. The framework enabled identification of key leverage or intervention points that are likely to provide benefits across multiple domains supporting sustainable diets. These formative findings are an essential starting point for enhancing evidence-based policymaking in Vietnam and can inform next steps.

Next steps for the EATS research team likely include the facilitation of in-depth interviews to learn more about policy mechanisms that may be encouraging or hindering sustainable diets, the clarification of data gaps, and the development of aggregate data profiles to communicate priority indicators to decision-makers. One of the main outputs will be a customizable framework and country profile that defines publicly available data to inform leverage points for sustainable diets in LMICs.

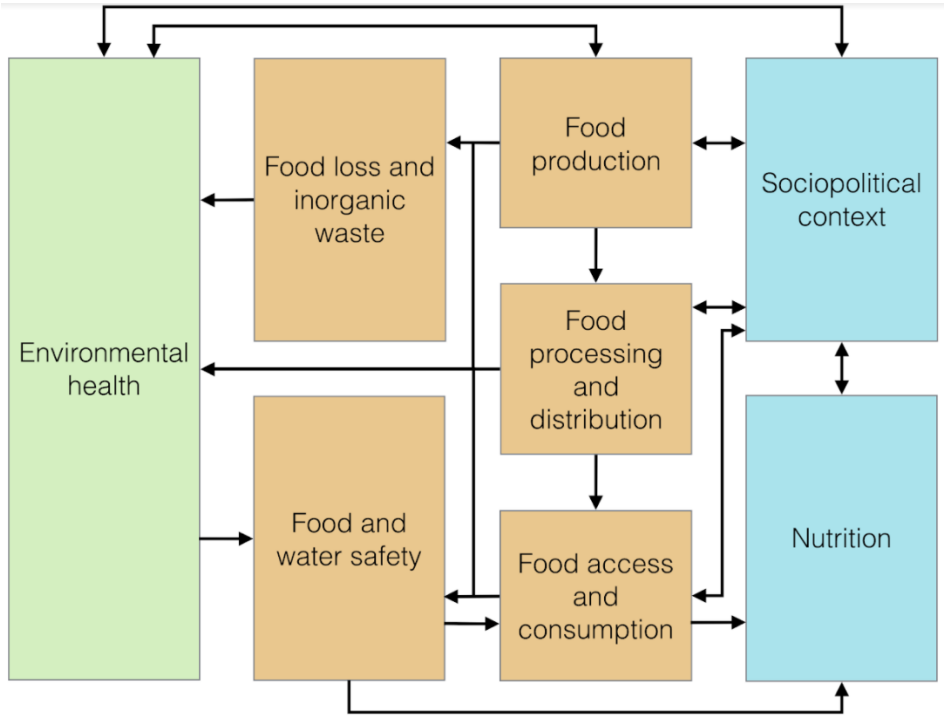


Figure 1*:* Conceptual framework for sustainable diets in Vietnam, EATS team 2017

Figure 1 is the final conceptual framework that was developed and used by the EATS team to characterize data, define indicators, and identify potential leverage and intervention points. The framework is a product of a literature review on existing frameworks for sustainable diets and stakeholder consultation. Of the identified food system concerns, food safety emerged as one of the most common threads amongst the participating stakeholders. Figure 2 summarizes food safety related concerns across multiple domains. The grey stars represent indicators that were recognized as a priority for both domain experts and outside stakeholders.

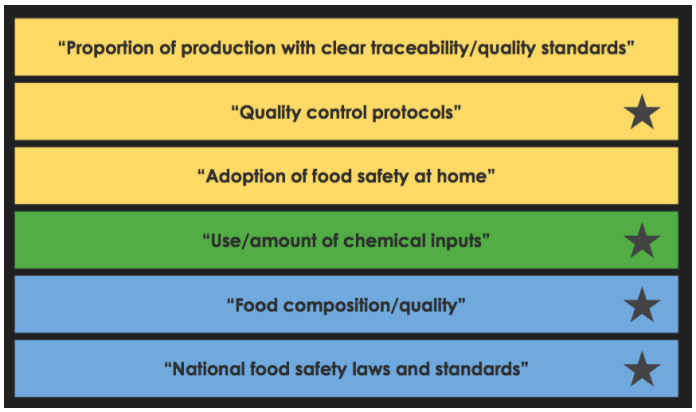


Figure 2*:* Compilation of stakeholder prioritization of food safety

Stakeholder prioritization of food safety was of interest to the UC researchers as many of us wanted to further explore food safety as a leverage point from various domains, be it food access and consumption, environmental health, or food production. I took the lead on designing a second phase of research that would allow me to further explore how food safety, particularly labels, can serve as a food system innovation that brings positive outcomes to two domains: (1) Food safety and water quality; (2) Food access and consumption (Figure 1).

Phase II: A Food System Innovation: PGS Safe Vegetable Labels in Traditional Markets

Study Objectives and Deliverables

The objective of the second phase of research was to prepare for a more formal market trial of food safety labels to directly evaluate the costs and benefits for diverse stakeholders operating along the supply chain as well as for consumers. The focus of this intervention is unique in that it proposes implementing these labels in traditional markets. In partnership with Rikolto Vietnam and CIAT, I developed a baseline consumer study to inform the future market trial design and communication strategy for Rikolto's Participatory Guarantee System (PGS) Safe Vegetable label.

Much of the existing literature on private labels focus on the producer and/or supply chain transformations rather than consumer demands and perceptions of labels or consumer purchasing behaviors for variations in labels. Labeling literacy, or variations in willingness to pay dependent on the format of information disclosure are not studied in detail, and few studies address developing markets. Furthermore, it is critical to understand perceptions, attitudes, and product choice under existing food safety labeling options available to consumers in Vietnam.
This baseline evaluation aims at understanding consumer demands for information disclosure with respect to food safety. It considers existing consumer knowledge and perceptions of food safety and works towards planning a market trial that can experiment with various price points and formats of information disclosure to effectively increase consumption of fruits and vegetables.

Key informational outcomes:

1. What are consumer characteristics and purchasing behaviors for safe vegetables in traditional markets?
2. What are the constraints or potential barriers for purchasing safe vegetables in traditional markets?
3. What are likely important determinants of effective food safety communication and labeling campaigns?

Background

Food safety is an emerging public health concern worldwide, especially in developing and rapidly urbanizing middle-income countries. For Vietnam, food safety is both a public, economic, and health concern, posing a threat to market access, trade and tourism, as well as health and well-being. Based on national and regional data and an independent study by the World Bank (2017), biological hazards are the most important cause of foodborne disease in Vietnam. The use of animal and human waste in cultivation is highly prevalent increasing the risks of biological hazards. In addition, there are high risks associated with the habits of consuming raw meats or vegetables and the illegal use of inputs such as pesticides, antimicrobials, and growth promoters increase the risks of residues in food. According to a study by the World Bank (2017), "373 outbreaks of foodborne diseases were reported in 2014 and 2015 involving over 10,000 cases and resulting in 66 deaths" (p.16). However, evidence from similar countries suggest that foodborne disease (FBD) is greatly under-estimated as only a small proportion of foodborne disease is ever recorded as outbreaks. The lack of or poor-quality data with respect to food borne diseases prevents or limits the ability to evaluate the overall economic burden of FBD which presents further limitations on policy interventions. A study by the World Bank (2019) used DALYs (disability-adjusted life years)[1] as a measure to determine the total productivity loss associated with food borne diseases in LMICs and estimates a total of $95.2 billion USD. By region, LMICs in Asia account for US$63.1 billion (World Bank 2019. P. 40)

Increased reports of food safety incidents, pesticide applications and residues, and food safety advisories in the media have raised consumer awareness and concerns (Pham V Hoi, 2016; Marcus Mergenthaler, 2009; Wertheim-Heck et. Al, 2014). Consumers responded by changing their purchasing habits, demanding safer vegetables, more transparency and clear labeling. A number of consumer groups are currently working with government agencies on monitoring and improving food safety protocols. Policies have been restructured, food safety laws revised, private standards established, and supply chains have been transformed for almost a decade now to address food safety concerns and mitigate outbreaks. Amongst the various food safety policies and supply chain transformations, retail modernization and private food safety labels are some of the most controversial.

[1] DALYs include years of life lost and years lost to illness, disability, or death. The valuation of health costs using a human capital approach starts with estimated DALYs.

The diffusion of supermarkets is often seen as a core strategy and preferred model by policymakers in developing countries to achieve food safety by implementing private food safety standards and management systems (Reardon, 2005). An argument can be drawn from various policy documents and media statements that the Vietnamese government presents retail modernization as both an instrument to transform the country's food safety crisis and a means for the country to realize its aspirations of becoming a modern society. Legislation in Vietnam (Law on Food Safety, No.55/QH12/2010) aims to operate as an umbrella of guidelines to manage regular food safety incidents (Wertheim-Heck et al., 2015). Under the LoFS policy umbrella is Decision 146/2006/QD-UB, an incentive mechanism for the construction of retail outlets. This retail policy is accompanied by Decision 99/2008/QD-BNN "which requires all vegetables entering modern retail outlets to possess a certificate issued by official government authorities verifying that the produce has been produced in accordance with national regulations on safe vegetable production" (Wertheim-Heck et al. 2015). This food retail policy stands on two pillars: (1) reduction of traditional markets (2) expansion of modern retail outlets. According to the Ministry of International Trade, pillar one will reduce the role of traditional markets by restricting the construction of new markets, upgrading and renovating existing markets, and/or transforming traditional markets into supermarkets. In 2015, approximately 2% of the total vegetable consumption in Hanoi was secured by retail markets resulting in 98% of vegetables being consumed through traditional markets further emphasis the significance these outlets have in the local food system (Wertheim-Heck et al., 2014b). This raises concern over the existing food modernization policies as they might further threaten the livelihoods and incomes of smallholder producers and traders currently focusing on traditional markets. They might not be able to produce at a scale needed to supply these newly envisioned retail outlets.

Private food safety labels are also of growing controversy in Vietnam as the consumers seem to distrust some of the existing labels. Purchasing behaviors and lobbying by consumer advocacy groups for increased transparency indicate potential challenges faced by any newly introduced labels. These challenges are mostly a result of information asymmetries. Producers and certifying bodies of fruits and vegetables in Vietnam are better informed than consumers about the safety and might not always have an incentive to truthfully disclose the quality of their products. Asymmetric information can exist in almost any market and in cases such as food safety, mandatory disclosure of information can be justified by net societal gains from information provision (Coffee, 1984). Government policies, standards, (and private labels already exist. However, there are increasing reports of consumer distrust in the existing standards and labels. Before introducing additional standards that may limit or exclude the participation of smallholder producers and traditional markets, it is worth further examining consumer purchasing behavior, perceptions, and demands related to food safety.

The existing regulatory environment

Food environments are generally defined as the availability, affordability, convenience, and desirability of various foods (Herforth, 2015). The traditional markets of Vietnam are deeply rooted in the culture for reasons including the food environment and social interactions that they provide (Geertman, 2011). Like the city of Hanoi, traditional markets are the most commonly accessed provision outlets for fresh vegetables and is especially true in rural provinces.

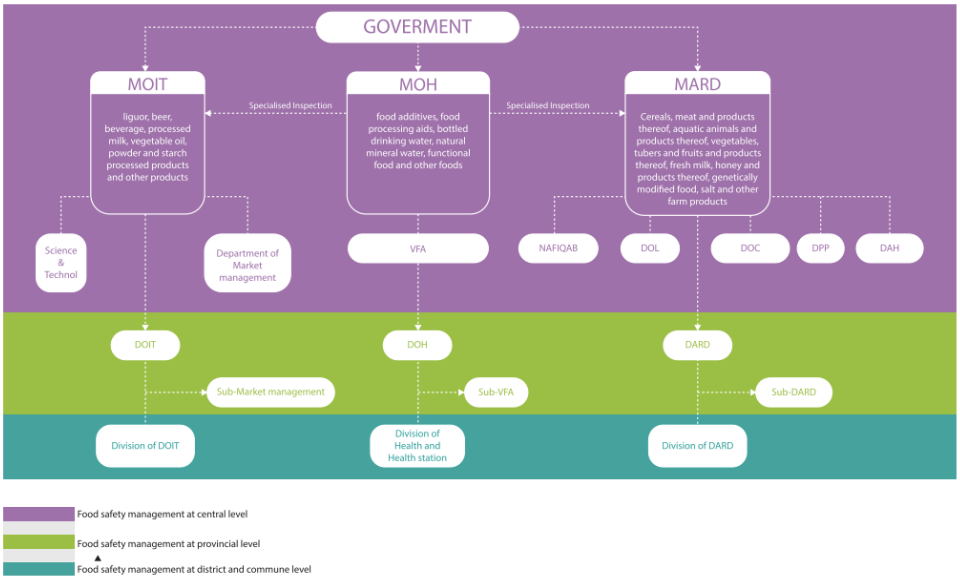


Figure 3: Structure of food safety management (source: World Bank Report, 2017)

The Law on Food Safety (LoFS) is the overarching guideline to managing and mitigating food safety incidents and is defined as *"any circumstances arising due to food poisoning, a food borne-disease or other circumstances arising in relation to food that cause harm to human health and lives*." Responsibilities for management and enforcement of the law are divided amongst three national ministries: Ministry of Agriculture and Rural Development (MARD), Ministry of Health (MOH), and Ministry of Industry and Trade (MOIT). Figure 3 is a diagram demonstrating the food safety governance and structure from the level of central government to the commune level. As seen in in figure 3, MOH has overarching responsibility for food safety in Vietnam which involves coordination of unified and effective management activities. MARD is responsible for food safety as it pertains to agriculture, agroforestry, and aquatic products. It is important to recognize that although MOH has overarching responsibility of food safety, each ministry has the authority to direct the management of their food safety activities independent of one another. This has led to a fractured management system and various independent initiatives, standards, and enforcement. The fragmented management system presents significant challenges and inefficiencies as the production and distribution of vegetables is complex with multiple actors as seen in figure 4. The fragmentation in governance and distribution presents challenges in credibility, enforcement, and verification of existing food safety standards and labels both at a national and local level.

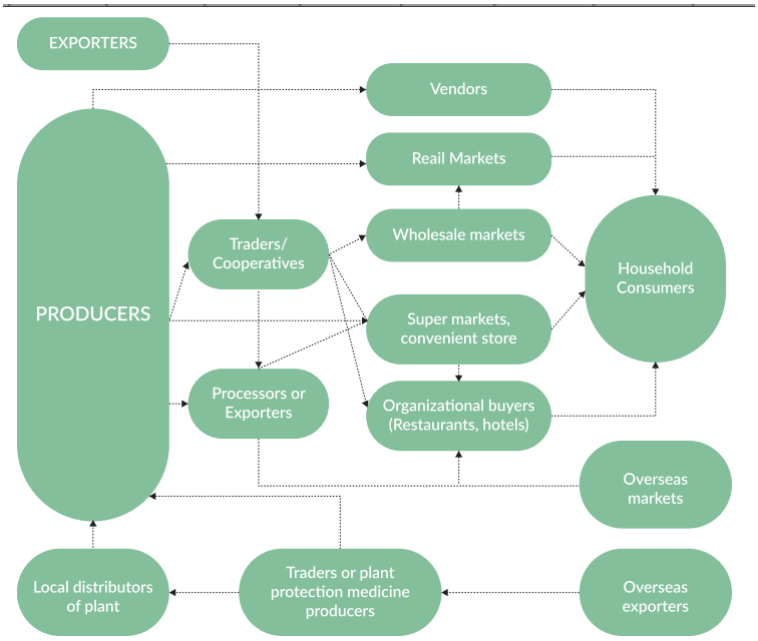


Figure 4: Vegetable production and distribution (World Bank, 2017)

Review of Literature

Much work has been done examining agricultural production standards and labeling as it relates to global trade, marginalization and/or exclusion of smallholder farmers, and the consolidation of value chain actors (Chiputa, B., et al., 2015; Clark,P. et al., 2016; Handschuch, C. et al., 2013; Reardon et al.,2005). The existing literature provides a comprehensive examination of private labels and/or standards and their effect on value chains, actors, and particularly the costs and benefits brought to smallholder farmers. However, the literature demonstrates a lack of consideration for consumer demand constraints (access, affordability, acceptability), especially in the context of the retail environment in LMIC's. Through an exploration of existing literature, I hope to determine key concepts of consumer preferences (i.e. label information, quality attributes, purchasing preferences, etc.), perceptions of food safety, consumer behavior related to information disclosure, and market failures as a result of asymmetric information.

Asymmetric Information and Information Disclosure

As consumers, many of us make purchasing decisions multiple times a day. The time and effort we put into searching for information before making a purchasing decision will vary based on our level of personal experience and/or brand awareness for any given product, as well as the ease of obtaining additional information. How we obtain information and how it influences our decision making can come from advertisements, experience, friends & family, online search, etc. but the level of influence those information sources have on our decisions will vary depending on our perceived value of the good we are purchasing. For example, a consumer may buy a certain brand of gum simply because they've heard an advertising jingle so often that it becomes the top-of the mind brand (O'Guinn, Thomas et al, 2015). However, some information about *quality* can be harder to obtain. Food safety could be characterized a credence attribute and is not observable to the consumer. It is not uncommon for sellers to have more information than the

buyer, however the degree to which that level of asymmetric information and misaligned incentives are exploited can create market failures. Akerlof (1970) explains:

> "There are many markets in which buyers use some market statistic to judge the quality of prospective purchases. In this case there is incentive for sellers to market poor quality merchandise, since the returns for good quality accrue mainly to the entire group whose statistic is affected rather than to the individual seller. As a result, there tends to be a reduction in the average quality of goods and also in the size of the market. It should also be perceived that in these markets social and private returns differ, and therefore, in some cases, governmental intervention may increase the welfare of all parties." (Akerlof, 1970, p.488)

What Akerlof describes in the automobile market resembles a possible outcome for fruit and vegetable markets in Vietnam. Akerlof also points to warranties and standards as potential remedies for market failures. A handful of standards and labels have been introduced by the private sector and endorsed by the government as a means to provide consumers with safer purchasing options. These labels can serve as a signal to consumers and allow producers to differentiate their products at a premium price. However, existing labels seem to not have been effective in making consumers feel confident in their purchasing decisions, confident in the credibility of the label, and most importantly, confident in the safety of the product. There have been increasing reports of false labeling, labels lacking verification, and false and/or little information about the practices and processes required to obtain labels. Ultimately these shortcomings have tarnished consumer trust and reduced the value of food safety standards and labels as a whole.

Loewenstein (2014) presents mandatory disclosure of information (targeted transparency) as an alternative to hard forms of regulation (standards, taxes, etc.) because it allows for flexibility and preserves free market principles. He argues:

> "Regulatory mandates are blunt swords; they tend to neglect heterogeneity and may have serious unintended adverse effects. For example, energy-efficiency requirements for appliances may produce goods that work less well or that have characteristics that consumers do not want" (Loewenstein 2014. P.392)

This can be seen in Vietnam as consumers continue to prefer and pursue traditional markets for various reasons despite blunt sword regulations to shut them down in an effort to promote supermarkets. Lowenstein's example of information provision requirements for automobile manufactures seems very relevant to food safety labels because it ensures a certain level of information disclosure but still allows for consumers to have a choice:

> "If automobile manufacturers are required to measure and publicize the safety characteristics of cars, potential car purchasers can trade safety concerns against other attributes, such as price and styling. Disclosure does not interfere with, and should even promote, the autonomy (and quality) of individual decision making. If properly designed, it should also increase efficiency, helping to avoid cases of market failures resulting from incomplete and asymmetric information coupled with misaligned incentives" (Loewenstein 2014. P.392).

Loewenstein goes on to emphasize two critical elements for mandatory disclosure to be effective, (1) mandatory disclosure can be justified by an efficiency argument when the societal gains from information provision outweigh the societal costs (2) distinguish which information is verifiable (and misinformation can be punished) and those in which information is unverifiable. The costs associated with providing such levels of information and to be verifiable raises doubts for its implementation, however in the case of Vietnam it is necessary to consider the societal gains from information provision compared to the societal costs (food safety outbreaks, public health costs, negative nutritional outcomes, etc.) to determine if an information provision mandate can be justified.

Lastly, Loewenstein's' work reiterates important findings by Ripken (2006) stating that "In order for a disclosure system to be effective, not only must the information that is supplied be disclosed completely, clearly, and accurately, but it must also be read and comprehended by the consumer. Here is where disclosure today fails in its purpose" (p.405). Key elements of targeted transparency might not be satisfied under current market conditions and food safety labels in Vietnam. While there is arguably a plausible justification for a mandatory disclosure mandate in the market for fruits and vegetables in Vietnam, a comprehensive cost-benefit analysis is beyond the scope of this research. Instead, I collected data on consumer purchasing behavior and determinants that might influence a PGS market trial.

Standards and labels

Food standards can be imposed by various actors (private or public) and can be related to various quality and/or production attributes including but not limited to: (1) product quality and safety attributes; (2) production processes affecting quality and safety attributes in the final product; (3) environmental and labor considerations as part of the production process (Reardon, 2006). Public standards for domestic food markets are often insufficient and inadequately implemented in developing countries. Most developing countries try to follow public standards imposed by importing governments for export markets (such as USDA and FDA standards to export from a developing country to the US market) (Reardon 2006). In addition to the standards, governments monitor imports and exports for plant and animal products. Yet, governments in developing countries have little to no capacity to monitor and enforce standards in domestic markets.

Private standards are traditionally imposed by large-scale agro-food companies, retailers, large multinational processors, etc. They have an incentive to implement standards where they are missing, or supplement inadequate public standards to manage reputational risk and improve their own value chains. The private standards typically address credence attributes as mentioned above. They are often times in response to (or as a preemptive measure of expected) regulatory developments. They are ultimately based on consumer concerns and allow firms to position and differentiate themselves in markets for high-value or value-added agricultural goods. Large agro-food companies and supermarkets view standards as a catalyst to more coordinated and vertically integrated supply chains in part because they specify and harmonize the product and delivery attributes, thereby enhancing and efficiency and lowering transaction costs. In reflection of and in support of the diffusion of private food safety and quality standards is the development of quality metasystems such as good manufacturing practice (GMP) and good agricultural practices (GAP) (Reardon 2006). Such metasystems are viewed as 'codes of conducts' for the agricultural

industry and are embedded in voluntary public standards at the national level and/or proprietary private standards.

Much of the work that has been done to examine the role and impacts of standards in developing countries has been for the purpose of export markets and address both, public and private standards. Reardon (2006) points out that there is a disconnect between the literature and the true market landscape in developing countries stating "The share of exports in output of small/medium farmers in developing regions, is about 3% of their output, and only 5% of their marketing (of grain, fruits, vegetables, meat, fish, cotton, coffee/cocoa, sugar and palm oil). Domestic urban markets- and who sets the terms for farmers' access to them- are a far more important subject with respect to rural develop and poverty alleviation" (p.81). I found that the literature demonstrates significant examination into the development and effects of both private and public standards, however they are examined independent of one another and in the case of developing countries they are often only examined for the purpose of export markets. There is a gap in the literature which fails to examine how private and public standards can be imposed and enforced in conjunction with one another in LMICs to achieve certain product quality and/or safety attributes such as food safety.

Food safety standards in Vietnam

In the last two decades there has been an emergence of various food safety models which primarily consist of voluntary standards including but not limited to: RAT, VietGAP, Basic GAP, Community-based certifications (PGS), and Safe Agricultural Zones. RAT stands for "*Rau An Toan",* which refers to the work *"safe vegetables"* in Vietnamese. There are differences in how the ministries and provinces deploy and enforce standards. They may either support existing national standards (i.e. RAT) independently at the local province level or develop inter-provincial agreements to improve food safety during transport between provinces as seen in Ho Chi Minh (World Bank, 2017). The deployment of government endorsed food safety standards and vertically integrated value chains with private standards vary across cities largely due to differences in the supply chain management. For example, the available data suggests that vegetables sold at retail markets in Ho Chi Minh come primarily from wholesale markets (85%) while only 33% is channeled through wholesale markets in Hanoi (World Bank 2017). For the city of Hanoi, that leaves an estimated 500,000 tons of vegetables consumed each year believed to be sourced from (i) direct supplies from producers/vendors to local markets or retail markets and (ii) imports from China (World Bank, 2017). Very little is known about how food safety is addressed for a significant volume of produce that flows directly from producers to traditional markets.

The RAT standard is one of the oldest food safety standards in Vietnam dating back to 1998 and was the first 'safe vegetable' production program to be rolled out by the Ministry of Agriculture and Rural Development. The program has focused on educating farmers on safe vegetable production which includes pesticide application and management training for farmers (Huong et al., 2013a). RAT is a standard, but it does not include a label and while it is one of the oldest modules, it has had weak implementation due to limited government capacity. Both VietGAP and BasicGAP were designed to replicate the internationally recognized GlobalGAP standard but with modifications to suit the local production environment and food safety challenges. Both

VietGAP and BasicGAP were established and issued by the Ministry of Agriculture and Rural Development and continue to be recognized by the government. In 2015 the Department of Agriculture and Rural Development mapped the production of safe vegetables per district, districts which are the primary source of vegetables into Hanoi. The maps in figure 5 presents a snapshot the production areas and amount of hectares that are currently RAT and VietGAP certified.

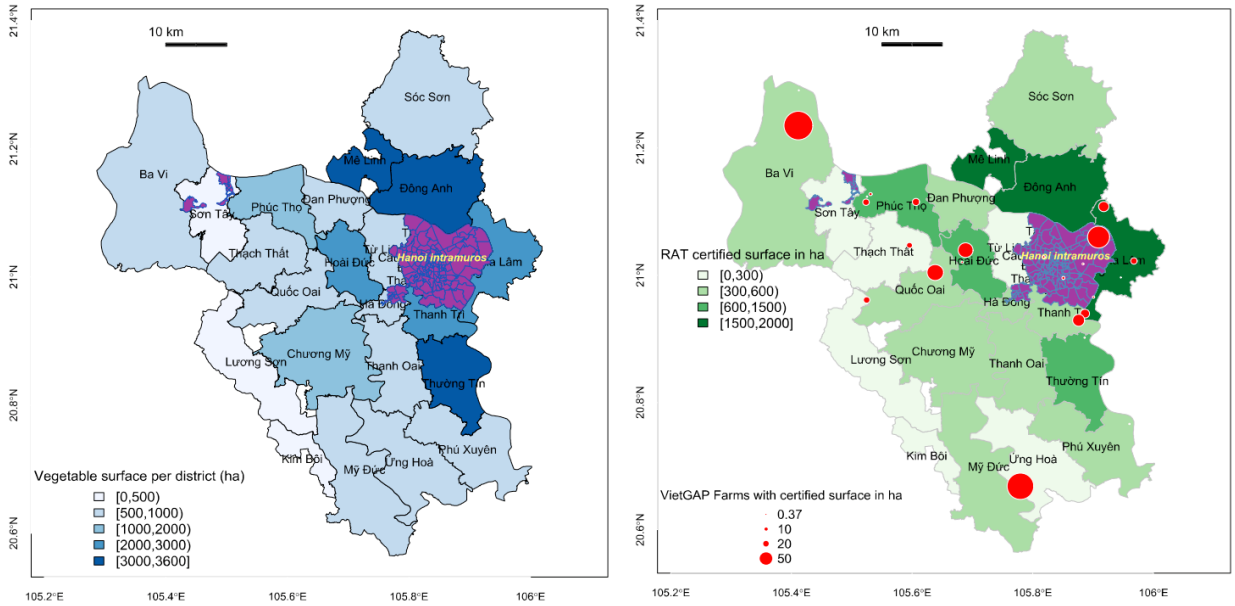


Figure 5*:* **(Left)** Hanoi's total production surface of vegetable per district, period 2011-2013. Source: DARD of Hanoi (2015). **(Right)** Hanoi's total production surface of RAT per district period 2011-2013, with location of VietGAP farms in red. Source: DARD of Hanoi (2015).(Pham, 2017)

The PGS Safe Vegetable label is achieved by smallholder producers who use Participatory Guarantee Systems (PGS) to monitor and certify the Basic GAP (food safety) standard. It is a community-based model which has proved effective in many developing countries, especially for small-scale production systems. PGS is based on a 3-tiered approach: (1) internal control & support within each farmer group (composed of 5-10 households) (2) cross-checking amongst farmer groups to verify compliance with the food safety standard (3) random inspections by the local coordination board (multi-stakeholder entity supervising the PGS composed of representatives of farmers, authorities, consumers, etc.). Key differences between BasicGAP and VietGAP include price of annual certification, price of implementation, access to technologies and resources that are required to achieve compliance, and other financial and scalability differences. The PGS model has been widely used in Vietnam for organic production and has aspirations to apply the model in conjunction with BasicGAP standards to serve as a more affordable production standard for smallholder producers and consumers alike without jeopardizing food safety. Figure 6 offers a high-level comparison between the most commonly known standards but does not go into detail of any individual section or specifications of the standards.

There are both mandatory and voluntary national standards in Vietnam but there are differences in how the ministries and provinces are managing food safety. They either develop independent voluntary standards at the local province level or develop inter-provincial agreements to improve food safety during transport between provinces as seen in Ho Chi Minh (World Bank, 2017). The presence of food safety standards or vertically integrated value chains with private codes of conduct differ significantly between Hanoi and Ho Chi Minh City largely due to differences in the supply chain management. For example, the available data suggests that vegetables sold at retail markets in Ho Chi Minh City are almost all from wholesale markets (85%) while only 33% is channeled through whole sale markets in Hanoi (World Bank 2017). For the city of Hanoi, that leaves an estimated 500,000 tons of vegetables consumed each year believed to be sourced from (i) direct supplies from producers/vendors to local markets or retail markets and (ii) imports from China (World Bank, 2017). Very little is known about how food safety is addressed for a significant volume of produce that flows directly from producers to traditional markets.

Item	Short Description	Certified By	Year of Implementeaiton	Background
VietGAP	Standard/Label	Local government	2008	Introducted to Vietnam by the Sygenta foundation. Today is the most known safety signal Vietnamese foods and can be leveraged to create VC linkages. Most used by supermarkets, canteens, and safe vegetable shops. Farmer response is that the annual certificaiton fee is too high and not suitable for small-scale farmers.
RAT	Standard	Local government	1998	Introduced by Ministry of Agriculture and Rural Development
PGS	Standard/Label	Inspecition committee made up of elected members.	2008	Introduced to Vietnam by the Agriculture Development Denmark Asia and VredesEilanden Country Office for safe organic vegetable production.
Safe Agricultural Zones	Standard/Label	Local government		Branding of specific production zones. Intended to assure production of safe food products in terms of uncontaminated locations, primary processing, and trading. Difficult to differentiate in the market place and consumer trust has not been attained.
BasicGAP	Standard	Local government	2014	Introdued in partnership with JICA. Improving crop productivity and quality but with simpler and more accessible requirements for farmers to deliver food farming practices and safe food. BasicGAP has been applied by farmers to produce safe vegetables for domestic markets but there is still doubt on its ability to be scaled up while still assuring food safety.
Organic	Standard/Label	Local government	2004	Introduced to Vietnam by ADDA, a denmark NGO

Figure 6: Summary of existing standards and labels

Consumer concerns in Vietnam

There has been a documented increase in consumer concerns about safety of fruits and vegetables as a result of increased reports of food safety incidents, increased pesticide applications and residues, and food safety advisories in the media (Pham V Hoi, 2016; Marcus Mergenthaler, 2009; Wertheim-Heck et. Al, 2014). In response, consumers are re-considering where they shop, purchasing more packaged/ processed foods, demanding safer vegetables, and creating consumer groups to work with government on monitoring and improving food safety protocols. The literature suggests that food safety is the primary concern for consumers when shopping for vegetables followed by convenience (Wertheim-Heck et.al 2015, Marcus Mergenthaler, Wertheim-Heck et al., 2014). Research in Vietnam and neighboring countries demonstrates a willingness to pay premiums for safe vegetables, however these statements have not been reflected in purchases partially due to lack of trust in existing labels (Kelly et al.2014; Liu et al. 2014). Consumers are demanding more transparency in how the standards are deployed and enforced from the farm to final selling outlet.

The primary food safety concerns relate to potential health risks as a result of agrochemicals usage. A study conducted by Wertheim (2015) found that 81% of consumers whom participated in a household survey are most concerned about longer-term health effects. However, their experiences and references to previous foodborne illnesses are short-term and limited in scope as they list stomachaches, vomiting, and diarrhea. Wertheim (2015) also found that the respondents who have experienced foodborne illnesses in the past feel less confident in their personal ability to select safe vegetables by relying on their own skills and knowledge. Research from China documents similar findings and also states that consumer confidence in their ability to make safe purchasing decisions varied depending on where consumers obtained their food safety information and what information sources were perceived to be most used, trusted, and credible in general (Rongduo, L. et al.,2014).

Labeling research in the U.S.

Consumer studies in South East Asia all highlight the effects asymmetric information can have on consumer trust and demand for agricultural products that are deemed higher risks. It also resulted in urgent calls for food safety policies. In the U.S., while safety standards are well established, and outbreaks are rare, similar developments with regards to nutritional labeling policies and its effects on consumers' food choices provide some interesting insights. Difficulties, consumers face when making informed purchasing decisions with regards to nutrition are of significant importance as the country suffers from obesity and its negative health effects. Consumers internalize the cost of information search and it might be prohibitively costly for most consumers to acquire exact nutritional (or safety) information. However, firms can choose to signal the quality or specific product characteristics that eliminate asymmetric information and potentially charge a premium (Kiesel, 2011). Kiesel (2011) aregues that the effectiveness of food labeling depends on government information requirements, firms' incentives for information provision, and the role of third-party entities that standardize and certify the accuracy of the information. She also argues that the choice to consume goods and information at the level of utility maximization is subject to budget and time constraints. It should be noted that there are significant differences in how effective labeling can be in the U.S. compared to Vietnam

Implications for labels in the Vietnamese market

Consumer and labeling research in the U.S. has several elements that can be applied to the food safety and labeling regulations in Vietnam. After having identified the most commonly sold food safety labels, and in reviewing the existing literature, I am able to conclude that the increase in available labels has not increased consumer trust and confidence with regards to purchasing safe vegetables. This might be primarily due to the lack of effective regulatory and communication mechanisms for introduced labels (Nguyen H.D. My et al. 2016). Kiesel's study reinforces earlier studies (e.g. Caswell & Padberg1992 and Verbeke 2005) which argue that the effectiveness of nutritional labels lies in providing the appropriate nutritional label to specific consumer segments which includes their ability to address informational needs. The effectiveness of nutritional labels to inform healthier eating habits depends on if the information can be easily processed and used by the specific consumer segments. The same can be said about food safety labels and public health in Vietnam. The ability for standards and labels to address food safety challenges must be examined both at the production and demand level. The criteria of food safety standards should first and foremost be scientifically informed to address true food safety risks, then credence attributes. Secondly, labels and any additional consumer facing communication around the standards, should be communicated clearly and accurately to be understood and used by consumers. Together these ensure food safety standards reach their full value potential by bringing benefits to all actors (i.e. environment, workers, farmers, and consumers). Rikolto has a strong understanding of agricultural production practices in Vietnam, therefore understanding how and where standards can help minimize food safety risks. However, more information is needed with respect to consumer perceptions of existing labels and demands for future labels. My data collection described in the following sections hopes to provide more insights in this regard.

Methods for Additional Data Collection

Both a consumer survey and semi-structured interviews were developed based on the explorative phase with stakeholders during phase one of the research, and the review of the existing literature. In preparation for a food safety and PGS communication campaign, these four focus areas were ranked as most important for a consumer study: (1) consumer behavior and preferences related to food safety in vegetable purchases and consumption (2) labeling preferences and consumer choice (3) knowledge about existing food safety standards in Vietnam (4) food safety perceptions and concerns. There was limited literature on these areas that were specific to either consumers of traditional markets or PGS.

The goal of this additional research is to better understand who our target market segment is within traditional markets and how to better engage and communicate with them in presenting food safety and PGS information. To do so, I felt it best to approach food safety communication and perceptions from both the consumer and policy side. 250 consumer surveys were deployed in two separate traditional markets with the intent of building a communication baseline which will inform future campaign benchmarks. The objective of the interviews was to consult relevant policymakers in Vietnam on the past and future food safety policies and the potential role of food safety standards and labels in achieving national food safety goals. Rikolto has been

implementing PGS in Vietnam for over 10 years and has built strong and diverse relationships with numerous stakeholders. Rikolto will leverage their relationships and learnings in an effort to effectively bring PGS safe vegetables to traditional markets.

Target markets and survey design

In consultation with Rikolto, I decided to collect additional consumer data two separate traditional markets in Hanoi. Several factors supported that decision: (1) Rikolto and CIAT Asia headquarters are based in Hanoi (2) both organizations have well established stakeholder relationships and ongoing research in the city and surrounding provinces (3) the three ministries responsible for overseeing food safety are conveniently located in Hanoi (4) Hanoi has received significant government focus and resources to fully realize retail modernization. It is estimated by the General Statistics Office (GSO) that between 50-80% of the cities vegetables and leafy greens are sourced within a 30 km radius with the ratio increasing during winter months making the potential for transparency value chain coordination somewhat more manageable.

My designed survey was delivered at two traditional markets, Nghia Tan and Dong Xa. These are two of several markets that are being considered for the market trial. The biggest differences are the physical location and structure of the markets. Don Xa can be seen as having a more permanent infrastructure, easily accessible off a main road and easier for motorbikes to navigate in. The Nghia Tan market is much more compact, consists of several small vendors in comparison to Don Xa, is conveniently located in a highly populated neighborhood with schools, a main avenue, and the people's committee office nearby.

Survey design and delivery

The survey includes a total of 25 questions which were translated by a research assistant and enumerators from the Vietnam National University of Agriculture. The survey went through multiple reviews and iterations by food safety and GAP experts at UC Davis, by the EATS research team, Rikolto, and was tested in the market on 3 separate occasions before finalized and delivered. It includes questions related to purchasing behaviors, food safety knowledge, trusted and most used sources for food safety information, preferences and knowledge of existing labels, willingness to pay, and label information preferences. The answers were coded according to a Likert-scale. The survey was delivered to a sample size of 250 consumers in and around two traditional markets by two enumerators. The enumerators have had previous surveying experience and were trained by Rikolto staff. The survey was uploaded to a survey software called KoBo Toolbox and responses were collected using a tablet and uploaded on a daily basis. Enumerators were sure to track the time and place of surveys to ensure that they were doing an adequate job at collecting a representative sample of market shoppers. The survey took a total of five days.

Semi-structured interviews

A total of five semi-structured interviews were recorded with stakeholders from the Ministry of Agriculture and Rural Development (Deputy Head Plan Protection and Deputy Head National Ag Extension Center), Nghia Tan market management, Fruit and Vegetable Research Institute, and the Vietnam Academy of Agricultural Sciences. The interviews were structured around five

key themes with questions modified for specific stakeholders: (1) food safety governance; (2) supermarket growth outlook and changes to traditional markets; (3) food safety certifications and monitoring ;(4) participation of smallholder farmers in market changes; (5) food safety communication. The interview design was influenced by both feedback and takeaways from the workshop [a] in phase one and learnings from the literature review. Interviews were primarily done in Vietnamese by a research assistant, however interview language varied depending on comfort level and preference of interviewee. Each interview was recorded and later transcribed by the research assistant. The semi-structure interview was a secondary form of data collection and could have benefitted significantly by adhering more strictly to a specific research method. Ground Theory was used to an extent, although minor, for delivering and transcribing the interviews.

Discussion of Findings

A total of 250 consumer surveys were collected between the Ngia Tan and Don Xa markets over the course of five days. Much of the survey responses pertaining to purchasing behaviors and food safety perceptions were consistent with existing literature, however the survey proved valuable in providing new and distinct information that can support a marketing and communication campaign specific to consumers of traditional markets as well. A total of five semi-structured interviews with food policy stakeholders were also conducted over the course of three-weeks. Interviewees were diverse in their experience and where they fall within the value chain which was important in evaluating the current state of food safety and policies in Vietnam. Despite their differences in the value chain and experience, there were common threads across all actors that speaks to the future of food safety in Vietnam which will be discussed in the following sections.

Survey results

Sample Characteristics (%, n=250)

Gender			
Male	9.6		
Female	90.4		
Age (Years)		**Willingness to pay**	
20-30	10.4	0%	5
30-40	22	5-10%	7
40-50	16	10-20%	14
50-60	19.2	20-30%	25
60-70	26.8	30-40%	11
70 <	5.6	40-50%	38
Education		**Income (self-reported)**	
> Secondary	2	Low	15.7
High school graduate	15	Medium	73.5
Some college	25	High	10.8
College graduate	54		
Masters <	4		

Figure 7: Demographics of survey respondents

[a] A stakeholder workshop in phase I identified food safety as a common thread between the eight domains with references to labeling, consumer distrust, and food safety education.

The introductory survey questions were designed to give insight into very basic but important consumer purchasing and dietary behaviors. Vegetables followed by meat products were the most often consumed foods on a weekly basis. However, they were also ranked as the top two food items that consumers were most concerned with in terms of safety. Despite a rising concern that closure of traditional outlets will limit low-income families access to safe foods, we found that the majority of shoppers at both markets were middle-income and that affordability was ranked as a low level of influence on consumers purchasing decisions. The majority of respondents stated they would be willing to pay up to 50% more for safe vegetables. However, survey responses revealed that consumer's willingness to pay is highly dependent on the consumers level of trust in the label and what information they are provided regarding the safety of the product.

Additionally, responses indicated that consumers of traditional markets utilize various food provision outlets and outlets varied depending on the product. For example, several respondents commented that they make daily vegetable purchases at traditional markets because of perceived freshness. However, respondents who consumed meat and/or fish four or more times a week (37%) said they were more likely to buy from supermarkets for similar reasons as well as cleanliness of markets and perceived safety. Overall, traditional markets were the primary point of purchase for vegetables. Main explanations for this food outlet choice included proximity, followed by cleanliness of the marketplace, and consumers' level of trust in the vendor (Figures 8 and 9). Consumer's perceived safety of traditional markets were ranked as having low to very-low safety, yet traditional markets remained most preferred point of purchase with five or more visits per week for vegetables. The existing regulations push for the expansion of supermarkets at the cost of shutting down existing traditional markets in an effort to achieve food safety. Our survey findings support the existing concerns and literature that a decrease in traditional markets may actually worsen food security and decrease purchases of vegetables. Many consumers currently using traditional markets might not be able to access supermarkets for reasons such as location and cost. We have seen both in the literature and survey results that consumers make daily vegetable purchases both for social reasons such as vendor trust and daily social interactions, but their purchases are also space constrained. Wertheim-Heck (2014), found that most shoppers interviewed rarely 'travel' outside their local community and their lives are commonly organized around the house. Everything outside their action radius is considered inconvenient, which is explained by limited transportation. The placement of supermarkets in Hanoi has been cited by respondents in my survey as inconvenient for similar reasons including limited transportation to markets and inconveniently location in proximity to home or children's' school.

Affordability was ranked as a low level of influence on consumers purchasing decisions, and that most respondents stated they would be willing to pay up to 50% more for safe vegetables. However, survey responses revealed that consumer's willingness to pay is highly dependent on the consumers level of trust in the label and what information they are provided regarding the safety of the product.

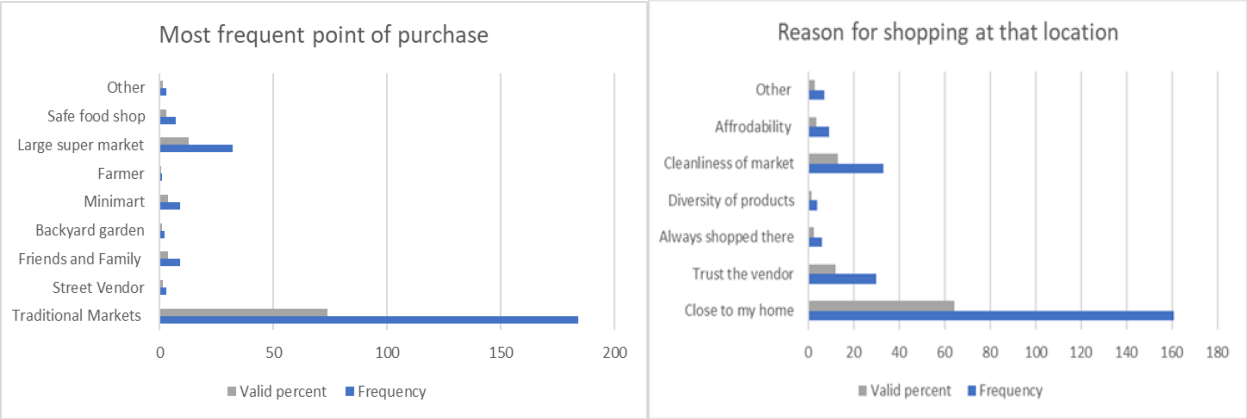
Limitations of findings

It should be noted that there are limitations to the findings and their overall representativeness of the population due to site selection. As stated earlier, the sites were selected based on the preferences of Rikolto and CIAT. The results give insights into consumer preferences for those particular markets, but we are limited in our ability to use the data to make population inferences as they were not randomly selected therefore may not be a representative sample. To correct for this, I would suggest that any future consumer research should not be market-specific but collect random samples from various neighborhoods to reflect variation in demographics and income. For example, our findings indicate that the majority of respondents were high school or college graduates and middle-income. There was no pre-survey review of the average income or demographics of the neighborhoods surrounding the markets (i.e. Vietnam Household Standard of Living Survey) to influence the site selection and limits us in determining if the findings and responses are representative of the city of Hanoi.

Additionally, it's important to note respondents' willingness to pay and how to interpret and apply that information to the market trial design. Our findings demonstrate that a majority of respondents were willing to pay up to 50% more for safe vegetables. However, the survey was only able to collect stated-preferences which can over-state the true willingness to pay, or can serve as an upper bound of what the price point is. Therefore, we cannot confidently say that consumers future purchasing behaviors (revealed preferences) are captured here. In preparation of the market trial, I would suggest doing the following as additional analysis to assess any potential correlations between:

- Income levels and willingness to pay
- Education levels and willingness to pay
- Willingness to pay and preferred labeling information
- Education levels and preferred labeling information

A market-level experiment could allow for variation in labeling content, labeling design, and price points to determine if respondents stated-preferences are reflected in their purchasing behaviors (revealed preferences) and provide further insights.



Figures 8 and 9: *Percentage and frequency of respondents point of purchase and reasons for shopping at location*

Stakeholder analysis

We asked stakeholders semi-structured interview questions regarding current trends, challenges, and the future of food safety in Vietnam. We found a shared acknowledgement of four key themes: (1) Prominent role of traditional markets; (2) labels as a mechanism to restructure value chains and gain consumer trust; (3) role and potential growth of cooperatives; (4) need for consumer study to promote food safety communication. The most quoted challenges amongst the interviewees were the issues of fragmented regulatory structure and fragmented supply chains. The interview findings were consistent with existing literature and stakeholder feedback that we received in phase one. The interviews confirmed that regulatory design and enforcement is managed independently by all three ministries (MOH, MOIT, MARD) meaning you are trying to manage fragmented supply chains with fragmented resources. This set the tone for much of the interviews and was consistently brought up as major challenge in almost all of the key themes mentioned above.

A prominent shared perspective amongst the interviewees was the formal recognition of traditional markets remaining a primary function of food security in Vietnam. Whether or not all stakeholders agreed that it should remain that way or is a realistic solution differs, but all were in agreement that despite supermarket promotion and growth consumers will "*keep buying at traditional markets because culturally buying vegetables every day is a habit they will keep*" (RUDEC). Acknowledgement of the disconnect between current regulations promoting supermarkets and the culturally embedded consumer habits favoring traditional markets was also strongly evident in interviews. However, the solutions to close the gap varied amongst interviewees, especially when discussing the role food safety labels have played, and will continue to play, in closing that gap. Ultimately there was acknowledgement that traditional markets cannot be overlooked and instead must be considered and/or incorporated into more flexible food safety policies to ensure food security.

Food safety labels and the potential role and growth of cooperatives were discussed in parallel as solutions to achieving: (A) vertically integrated supply chains which would bring about transparency and efficiency (B) inclusion of smallholder farmers; (C) preservation of traditional markets. It's important to note that in all interviews, stakeholders discussed food safety labels, cooperatives, traditional markets, and smallholder farmers as an ecosystem. Very rarely did the stakeholders talk about one without considering and discussing its linkages and interdependency on others in the system. Policymakers and stakeholders put significant emphasis on the value and role that cooperatives will serve in the near future of the Vietnamese food system. Cooperatives are being considered as the solution to ensure the preservation of traditional markets, a way of creating new markets for smallholder farmers, and the most efficient way to have variation (and credibility) in food safety labels (i.e. private labels imposed by supermarkets or international buyers, as well as government approved labels for traditional markets).

Finally, the need for (4) improved communication and understanding of consumer preferences was the fourth major theme that emerged in the interviews, especially when discussing the future of food safety labels in Vietnam. Mr. The Anh of the Vietnam Academy of Sciences spent a significant portion of the interview emphasizing a lack of understanding for food safety communication (i.e. where consumers obtain food safety information, credibility of sources, and how consumers are using that information in their daily purchasing habits). Mr. The Anh

mentioned that CIRAD (Center for International Agricultural Development) was also in the midst of delivering a consumer survey for the purpose of supporting future food safety communication at the local government level.

Policymakers and stakeholders called attention to the issue of how labels are certified, specifically who should be responsible for monitoring and enforcement of labels (i.e. third-party certifying bodies, government agencies, etc.). The issue of how growers obtain certification and consumer perceptions and understanding of labels was an important point of discussion in most of the interviews and will be discussed in the communication analysis section. In summary, policymakers recognize the need for more flexible food policies to preserve the role of traditional markets and the need for regulatory restructuring. However, there was consensus that as long as there is a fragmented regulatory framework, there will continue to be inefficiencies and roadblocks to achieving shorter value chains which enable cooperatives, traditional markets, and ultimately food safety to be obtainable.

Communication analysis

As part of our communication analysis we were interested in gaining a baseline understanding of how consumers interact with food safety information and how it influences their purchasing decisions. Consumers can obtain information from advertisements, public announcements, their own experiences or those of friends & family, online searches etc. The level of influence information sources has on consumer purchasing decisions will vary depending on the perceived value of the good purchased, the contribution this information makes to decreasing uncertainty, as well as the quality of the information. Our survey results suggest a challenging environment when communicating food safety information to consumers. For example, half of the respondents actively seek out food safety information and 43% of respondents feel that they are knowledgeable about food safety, however government information sources are the least utilized or trusted for information compared to television and internet. Below, I describe the results of the survey in more detail. As an additional part of the research phase, I organized the findings into a marketing plan included in the appendix.[2]

Aspects that need to be considered when analyzing how consumers obtain and process information effectively include the information is disclosed completely, clearly, accurately, can be read and understood by consumers, and whether the information is verifiable.
In a first look at the data, I summarize how many times each respondent consumed vegetables and what type of information regarding food safety they use.

Consumer preferences for vegetables and food safety information

Items	**n=250**	**Valid %**
1. Frequency of consuming vegetables I		

[2] The literature review and semi-structured interviews from this project were used to conduct a situation analysis and inform the objectives for a communication and marketing campaign; the strategy, execution, and evaluation of the marketing plan was dependent on the survey results. A competitor analysis gave me insight into the most popular existing food safety labels which were then used in our survey to evaluate consumer preference and trust towards them. I was then able to ask follow-up questions about other influences on purchasing decisions such as information sources, trust in sources, labeling information, etc.

Five or more times per week	98
2. Actively seek out food safety information (Y)	
3. Level of food safety knowledge	
knowledgeable	43
4. Level of trust in VietGAP	2.4
5. Level of trust in PGS Organic	1.6
6. Most preferred food safety certificate (to buy)	
None	44
PGS	23
Items 3, 4, & 5 were measured on a 6-point Likert scale. Item 3 started with "no knowledge" and ended with "very strong knowledge". Items 4 & 5 started with "Never heard of" and ended with "Very High Trust"	

Figure 10: Consumer preferences for vegetables and food safety information

Vegetables were the highest consumed food item amongst meat, dairy products, fruit, and fish with 98% of respondents consuming vegetables more 4-5 times a week. VietGAP was ranked as the most trusted label amongst respondents while PGS ranked third, however PGS's management and certification structure was ranked as most trusted for a certifying body. There was very little recognition and understanding of the PGS label by consumers which supports the need to build a communication plan for PGS prior to the market trial. In figure 11, I further summarize the sources of information. Most respondents used, and trusted food safety information seen on TV networks followed by the internet and their family/friends. The fact that TV networks and the internet are the most trusted sources raises national concerns over validity of information that consumers are receiving as a number of the information received from these sources might be promotional versus scientific. However, it suggests that TV commercials, blog posts, and social media platforms such as Facebook are accessible communication channels for food safety and PGS information that Rikolto can leverage in conjunction with local government or international agencies to ensure validity of information.

Consumer attitude towards information sources and certifying bodies	
Items (n=250)	**Valid %**
1. Actively seek out FS information (Yes)	50
2. Most used information source	
Internet	27
TV	61
3. Preferred information on labels	
Farm location	4.2
Cooperative location	4
Harvest date	4.4

Expiration date	4.4
Preservation instructions	4.4
4. Consumer trust in information sources	
TV	3.8
friends & family	4
Food vendors	2.3
5.Trust in certifying body	4.2
PGS (Group composed of other farmers, consumers, authorities, buyers, & NGOs)	3.4
Government agencies	1.6
Market managers	2.3
Supermarkets	
Items 4 & 5 were measured on a 6-point Likert scale starting with the first option of "no trust" and ended with "very high trust" as final option. Item 3 was measured on a 6-point Likert scale starting with option one "not important" to " very important" as final option.	

Figure 11: Consumer attitude towards information sources and certifying bodies

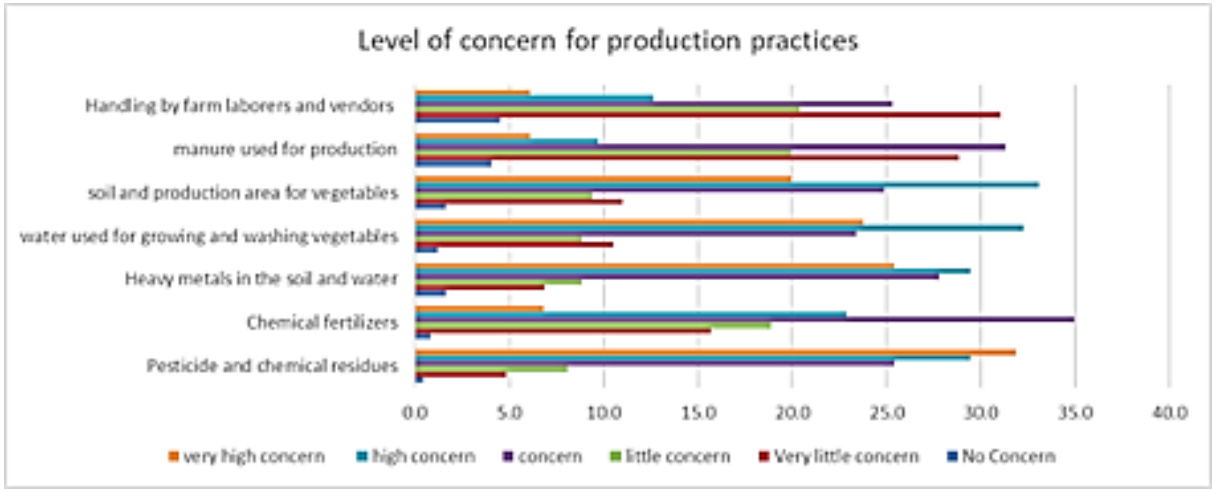


Figure 12: Production practices and consumer concerns

Consumer concerns with agricultural production practices are highlighted in figure 12. As noted earlier, PGS can be used by farmers to achieve either BasicGAP certification or Organic certification, both of which cover every element that respondents seem most concerned about. The least developed or managed elements of existing standards are handling by farm laborers and vendors. In contrast to Vietnam, non-synthetic fertilizer applications, food handling, and water quality issues are strictly managed and regulated in U.S. produce safety rules for leafy greens as they are considered a high food safety risk. Rikolto is tasked with the responsibility to recognize and address consumer concerns while still making scientifically informed decisions to strengthen the food safety components of their PGS programs. Consumers may not be concerned

with food handling or manure but there is significant research and recent food safety outbreaks in the U.S. to support that these production practices pose serious threats to food safety and human health.

Respondents' concerns with agricultural practices, expectations for food safety standards, and the information that is shared with them will be a challenge to address both from a practical and an effective communication point of view. However, consumer preferences for labeling information suggests that PGS as a system is well suited to deliver on both customer demands and the capacity of smallholder farmers with information such a harvest date, location, etc. I feel confident that Rikolto's framework and the use of PGS has the flexibility to respond to and manage food safety challenges at the level of cooperatives and traditional markets. PGS has four management components: farmers, farmer groups, intergroups and a local coordination board (LCB). Farmer groups are made up 5-10 farmers and they carry-out the cross-inspection of other groups compliance and group leaders facilitate internal inspection to ensure that members comply with the standard (Rikolto, 2018). The intergroups and local coordination board brings together multiple farmer groups or cooperatives and develops the cross-inspection plans, manages and approves the certification applications, sanctions groups that do not comply with the rules, helps connect farmers and farmer groups to markets and interacts with mass media. Together, the intergroups and LCB are the key players to monitor and enforce, as well as to promote and manage PGS at the local level.

Rikolto's use of PGS as a monitoring and enforcement system, their partnerships with cooperatives, farmer groups, local government agencies, and the public, are all collaborations that can increase transparency and strengthen smallholder supply chains. Specifically, it has the unique strength to minimize risks of contamination throughout the supply chain which is a differentiator compared to other standards. The BasicGAP requirements are strong in addressing production related food safety risks, but with some minor modifications, the PGS framework and management system can allow for oversight and transparency of the exchange points and actors throughout the restructured and more direct value chains into traditional markets which is of significance importance in reducing contamination risks and addressing consumer concerns.

Rikolto can further manage communication about the PGS standard and inform consumers more about how the standards are achieved, but as long as consumers have a weak understanding of food safety and are challenged with navigating asymmetric information and misinformation, Rikolto and other standards run the risk of having low consumer trust and buy-in. Rikolta could therefore also take the lead in general consumer education on food handling and safety to minimize health risks.

Proposed marketing and communication strategy

The suggested targeted market segment for the campaign are consumers who shop at traditional markets, specifically the Nghia Tan market as it is centrally located between Rikolto and CIAT. While there is opportunity to further specify an age group or gender, we felt it best to keep it broad to all consumers of traditional markets since 50% of respondents stated that they actively pursue food safety information and utilize very similar communication platforms.

The objectives are to: (1) increase consumer awareness of PGS Safe Vegetables; (2) increase consumer understanding of PGS.

In order to measure and evaluate the effectiveness of the campaign, I suggest the following key benchmarks to measure against:

1. Increased consumer awareness of PGS from 23% to 50%
2. Increased consumer understanding of PGS from 15% to 30%

The campaign should run for 6 months and be evaluated on a quarterly basis. The primary communication platforms should include: TV, Facebook, and additional government outreach. These platforms had the highest ranking for food safety information sources by respondents. A post-campaign survey should be conducted to measure the effectiveness of the integrated brand promotion campaign before commencing the one-year market trial. Our consumer and competitor analysis demonstrated low recognition, understanding and trust of the PGS label which ultimately will influence purchasing intent. In order to accomplish the campaign objectives, it is important to leverage our results and inform the design and placement of our advertisements and informational posts. I suggest a multi-media advertising campaign to build brand awareness. This approach incorporates our gained understanding that consumers have diverse go-to sources for information and Rikolto has the infrastructure and relationships to do utilize these. Below, I summarize key aspects of my proposed marketing plan organized by three main objectives.[2.]

1. Increased consumer awareness of PGS
    - Deploy TV commercials that concentrate on communicating the *what* and the *where.* I envision a commercial that is the preliminary snapshot of what the PGS label is and that they can purchased at Nghia Tan market. The commercial is the introduction of the brand to the consumer and is then supported by complementary media outlets, internet and information banners at markets.
2. Increased consumer understanding of PGS
    - Deploy informational videos that can be hosted (and shared) on the Rikolto Facebook page and Rikolto website. I envision being able to monitor questions, comments, and track Facebook 'likes' and shares.
    - Deploy informational materials online and in markets. Existing research suggests that printed content allows a reader to dwell and process the information at a personalized and comfortable rate (Thomas et al., 2015).
3. Increased consumer trust in PGS
    - PGS banners with key information points about PGS will be conveniently located in the market and at local government offices (i.e. MARD or Peoples Committee)
        - Detailed print materials will be placed on the bulletin board outside of the market managers office alongside required government documentation. We know that market managers already work closely with local government on various market protocols. Information disclosure is effective when information is verifiable and

[2] Complete marketing plan can be found in the appendix

enforced, therefore it is important that consumers see that food safety communication and labeling is recognized, monitored, and enforced at the market management level.

A post-campaign survey will be conducted to measure the effectiveness of the integrated brand promotion campaign and its ability to increase consumer awareness and understanding of PGS safe vegetable label before commencing the one-year market trial. The survey should recollect the same information from the baseline survey such as: recognition of PGS, trust in PGS, understanding of PGS, etc. such that changes as compared to the benchmark can be measured. Furthermore, Rikolto should work with the local and national government to officially recognize PGS certificates. While government officials were not significantly favored as trustworthy sources of information, government recognition will help validate quality assurance, provide opportunity for scalability such as technical or financial assistance for smallholder farmers. Finally, there must be increased coordination between food safety standards and national or local governments to detect false labeling and misinformation.

Closing Remarks

This project evolved from a conceptual study of the food system in Vietnam to a specific and targeted project that investigates food safety as one of, if not the, most important development challenges for Vietnam. The economic and social burdens of food borne diseases are unequally distributed, with Asia and Sub-Saharan Africa having the highest incidences and impacts. Food safety performance and compliance costs affect the agri-food trade in LMIC's, but the costs of performance and compliance is much smaller than the impacts on public health and market development (World Bank 2018).

Food safety communication and consumer education is only one of many corrective actions needed to be able to mediate the current information market failures. Rikolto has and can play an important role in engagement, education, and communication with consumers and value chain actors. Rikolto should to work with local government and academia to incorporate the science of behavioral change by redesigning training programs and information campaigns. The demand for food safety standards and labels still exists, however the level of consumer trust and willingness to pay for labels will depend on the level and validity of information disclosure. Without government support and restructuring, Rikolto and PGS can only provide short term solutions. The 2017 and 2018 World Bank reports both emphasize the need to correct the fragmented institutional responsibilities for food safety in-country, and this was echoed in stakeholder interviews in both Phase I&II. It's recommended by the World Bank (2018) that "LMICs invest both in "hardware" (laboratories, markets places) and "software" (management systems, human capital, awareness raising for behavioral change) as part of their unified food safety strategy. LMICs need to calibrate public expenditures for food safety to the economic costs of unsafe foods and benefits of investing in its prevention and management" (p. XXI). In doing so, Vietnam could evaluate if the societal gains from mandatory and targeted information provision outweigh the societal costs and thus necessitate a public intervention.

I strongly suggest that Rikolto proceeds with their proposed market trial in collaboration with CIAT, but I recommend that they deploy a marketing and communication campaign prior to the trail. The ultimate goal is to ensure consumer access to safe food that is affordable, accessible, and acceptable. But as long as consumers do not understand or trust food safety information and labels, they remain vulnerable and at risk.

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Appendix

Survey

Rikolto Vietnam is interested in assessing concerns, perceptions, and demands for safe vegetables amongst consumers in Hanoi, Vietnam. The end goals of this project are to improve safe vegetable certification programs and increase access to safe vegetables in traditional markets.

As a consumer, we would appreciate your participation in this survey to help us achieve these goals. Please answer each of these questions honestly and to the best of your ability. You should know that your responses will be treated confidentially. Please feel free to ask any questions or express any concerns you may have along the way. The responses you provide will be anonymized, and will not be shared with anyone outside the project. Thank you for your assistance, your responses are important to us and to the success of our project.

Section One

1.1 Purchasing preferences: Where do you purchase the majority of your foods?

Purchasing locations	Select one
Locations	
1. Traditional market	
2. Street vendor	
3. Friends & family	
4. Backyard garden	
5. Minimart	
6. Farmer	
7. Large supermarket	
8. Safe food shop	
9. Other (Specify)	

1.2. What is your main reason for shopping at that specific location?

Purchasing preferences	Select one
Locations	
1. Close to my home/work/children's school/etc.	
2. I trust the vendors	
3. I have always shopped here	

4. Diversity of products	
5. Cleanliness of market	
6. Affordability	
7. Other (specify)	

1.3 What influences your vegetable purchases?

Purchasing influence	Level of influence Low……High					
	No influence	Very little influence	Little influence	Influence	High Influence	Very high Influence
1. Affordability						
2. Appearance and freshness						
3. Food Safety label						
4. Origin of product						
5. Mass media information on food safety						
6. Other (Specify)						

1.4 How many times in the past week did you eat the following items?

Food items	Consumption patterns					
	Never	One time	Two times	Three times	Four times	Five or more times
Food items						
1. Meats						
2. Vegetables						
3. Fruit						
4. Fish						
5. Milk and dairy products						

Section Two

(A) Sources of Information

2.1 Do you actively seek out food safety information?

Yes____ No_____

2.2 Where do you obtain the majority of your food safety information? (i.e food safety on farm, in your home, etc) Please select one

Sources of information	
	Select one

Information sources	
1. Newspapers and magazines	
2. Internet	
3. TV	
4. Radio	
5. Government	
6. Medical doctors	
7. Consumers association	
8. Food Vendors	
9. Friends and family	
10. Other (specify)	

(B) Trust in sources

2.3 What is your level of trust in the following information sources?

Sources of Information		Trust in sources of information Low……High					
	Not applicable	No trust	Very low trust	Low trust	Trust	High trust	Very high trust
Sources of food safety information							
1. Newspapers & magazines							
2. Internet							
3. TV							
4. Radio							
5. Friends and family							
6. Government							
7. Medical doctors							
8. Consumers association							
9. Food vendors							
10. Other (Specify)							

(C) Media and access to information

2.4 In your opinion, where should safe vegetable certifiers improve communication on food safety information? Which specific websites, channels, locations do you recommend

Section Three

(A) General Food Safety Issues

3.1. What are your concerns with the following production practices

Risk Source	Level of concern Low……High					
	No Concern	Very little concern	Little concern	Concern	High concern	Very high concern

General Food Safety Issues						
1. Pesticide and chemical residues on food						
2. Chemical fertilizers						
3. Heavy metals in soil and water						
4. Water used for growing and washing vegetables						
5. Soil and production area for vegetables						
6. Manure used for production						
7. Handling by farm laborers and vendors						
8. Other (specify)						

3.2 In your opinion, how safe is the food you eat?

	Level of safety				
Not Safe at all	Very Low safety	Low safety	Safe	High safety	Very high safety

3.3 How many times do you think that you've gotten sick in the last year from unsafe foods?

Food borne illness					
Never	One time	Two times	Three times	Four times	Five or more times

3.4 How safe do you think the food is at various food selling outlets?

Food items	Food Safety					
	Not safe at all	Very low safety	Low safety	Safe	High safe	Very high safety
Food outlets						
1. Traditional market						
2. Street vendor						
3. Minimart						
4. Large supermarket						
5. Safe food shop						
6. Farmer						
7. Backyard Garden						

3.5 What is your level of food safety concern, if any, for the following food items?

Food items	Level of concern Not concerned at all……..Very concerned					
	No concern	Very low concern	Low concern	Concern	High concerned	Very high concern
Food items						

9. Meats						
2. Vegetables						
3. Fruit						
4. Fish						
5. Milk and Dairy products						

3.6 How much more are you willing to pay for safe vegetables?

Willingness to pay	Select one
1. 5-10%	
2. 10-20%	
3. 20-30%	
4. 30-40%	
5. 40-50%	

(B) Production conditions and practices

3.7 Which farmer practices lead to **un**safe food?

	Select all that apply
Production conditions	
1. Heavy metals in the soil and/or water	
2. Contaminated water used for irrigation and washing (Bacteria, parasites, viruses)	
3. Lack of proper handwashing by farmers and handlers	
4. Pesticide residues in water used for washing vegetables	
5. Nitrates in water used for washing vegetables	
6. Use of non-permitted fertilizers from list in Vietnam	
7. Use of non- permitted pesticides from list in Vietnam	

©Food safety knowledge

3.8 How would you rank your level of food safety knowledge?

Level of food safety knowledge					
No Knowledge	Very low knowledge	Low Knowledge	Knowledgeable	Strong knowledge	Very strong knowledge

Section Four:

(A) Food Safety labels

4.1. Which, if any, food safety labels have you heard of?

Food Safety programs and labels	Frequency of hearing about label		
	Never heard	Heard a few times	Heard many times
Food Safety certifications/labels			
1. USDA Organic			
2. VietGAP			
3. PGS Safe Vegetables			
4. PGS Organic			
5. Food Safety and Hygiene Certificate			

4.2 Which, if any, certifications do you prefer to buy?

Mark all that apply	
Food Safety Certifications	
USDA Organic	
1. VietGAP	
1. PGS Safe vegetables	
2. PGS Organic	
3. Food Safety and Hygiene Certificate	
4. None	
5. Other (Specify)	

4.3. Have you seen the Participatory Guarantee System (PGS) label in markets you shop at?

Yes_____ No_____

4.4 If yes, can you please explain what you know

4.5 Which, if any, certifications do you trust?

Food Safety programs and labels		Level of trust No trust at all ……Very trustworthy					
	Never heard of	No trust	Very little trust	Little trust	Trust	High trust	Very high trust
Food Safety certifications/labels							
1. USDA Organic							
2. VietGAP							
3. PGS Sage vegetables							
4. PGS Organic							
5. Food Safety and Hygiene Certificate							

(B) Verification

4.6 Which, if any, do you trust to verify food safety certification compliance?

Food safety verification	Level of trust No trust at all ……Very trustworthy					
	No trust	Very little trust	Little trust	Trust	High trust	Very high trust
Food Safety verifications						
1. Farmer cooperatives						
2. Government agencies						
3. Peoples Committee (Farmers union/women's union/etc)						
4. Group composed of other farmers, consumers, authorities, buyers, & NGO's						
5. Third-party certification bodies						
6. Supermarkets						
7. Market managers						
8. Other (specify)						

4.7 Which, if any, do you perceive as a potential risk to certification credibility?

Food safety verification	Level of concern No concern ……..Very concerned					
	No concern	Very little concern	Little concern	Concern	High Concern	Very high concern
Food Safety verifications						
1. Lack of knowledge or capacity of cooperative						
2. Lack of knowledge or capacity of inspection staff						
3. Corruption of certifying bodies						
4. Irregular inspections						
5. Other (Specify)						

4.8 What information, if any, do you prefer on safe vegetable labels?

Labeling information	Labeling preferences Not important……..Very important					
	Not important	Very little importance	Little importance	Important	High importance	Very high importance
1. Farm location						
2. Cooperative number and location						
3. Certifying organization						
4. Harvest Date						
5. Expiration date						
6. Preservation instructions						
7. Other (Specify)						

Section Five: Demographics

Date (mm/dd/yyyy)	
Country	Vietnam
District	
Age of respondent	
Education level	
Gender of respondent	
Income level	

Workshop Material

BREAKOUT SESSSION ONE
9:00-10:00

Domains

1. Food production	2. Food processing and distribution	3. Food loss and inorganic waste	4. Food access and consumption
5. Food and water safety	6. Nutrition	7. Sociopolitical context	8. Environmental health

Facilitator- The objective of this breakout session is to allow participants to collaboratively discuss what this domain means in the context of Vietnam and the necessary indicators to effectively measure and monitor the domain's activities and interventions.

First, participants will briefly define what the domain means and what it includes, to help the group more efficiently define indicators. For example: Food production, should it include or begin at the stage of seed development or should it begin at the production on the farm?

Next, the group will identify 10 priority indicators for the domain. An indicator is something that can be quantified and, coupled with other indicators, serve as a composite measure for the domain. For example: number of Freshwater withdrawals or amount of Diesel fuels used.

As the facilitator, you will monitor the time allocated to each session to make sure your group can complete the session, ask for clarification on any points, and document the results of the session below.

Breakout Instruction
For this breakout discussion, we ask that participants work within their domain to collaboratively define:

- *The Domain* (10 Minutes): What does this domain mean in the context of Vietnam? What does it encompass? This will help you identify priority indicators next.
- *The Priority Indicators* (40 Minutes): What are the 10 priority indicators to effectively monitor activities and interventions within the domain?

Session Feedback (10 Minutes)

1. How did your group define the domain? Please provide a short description and any takeaways of the process that you wish to share.

2. What were the 10 priority indicators that your group identified? After listing the 10 indicators please share which parameters were considered (if any) when identifying indicators and why.

1.	
2.	
3.	
4.	
5.	
6.	
7.	

8.	
9.	
10.	

3. Parameters considered and general feedback or takeaways

BREAKOUT SESSION TWO

10:15-11:40

Domains

1. Food production	2. Food processing and distribution	3. Food loss and inorganic waste	4. Food access and consumption
5. Food and water safety	6. Nutrition	7. Sociopolitical context	8. Environmental health

Facilitator

The objective for this breakout session is to allow participants the opportunity to review the domain indicators the EATS team has identified. While reviewing the list of indicators, use the parameters shared below to facilitate the identification of 10 priority indicators from the EATS list of indicators.

We have included a list of identified data sources for your domain and ask that group participants identify all known missing data sources. As the facilitator, please collect these data sources.

Breakout Instruction

A. Have participants work within their domain to collaboratively identify the 10 priority indicators from the list of EATS indicators while considering the following parameters (45 Minutes):

1. Feasibility of data collection for the indicator
2. Representativeness of the indicators for the domain

3. Representativeness of the indicators for decision-making priorities in Vietnam. Consider known activities and/or priorities of each indicator and whether or not having the accurate and accessible data for these indicators is important for the success of the activity or intervention.

Next to each indicator check the boxes for each parameter the indicator fulfills. If the group believes there are important indicators or parameters not included in the EATS list, please include and specify.

Indicator	Feasibility of data collection	Representation of the domain	Representative of the decision-making priorities in Vietnam	Other parameter considered
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

B. Please review the list of existing data sources for your group's domain and identify any known missing data sources. These are data sources that would support the 10 priority indicators. (25 Minutes).

Name of Data	Data source host	Publicly available Y/N	How to access

Food System Innovation

PGS SAFE VEGETABLES IN NGHIA TAN MARKET

Alejandra Sanchez

ADVERTISING PLAN

Executive Summary

The following advertising plan was developed to support a one-year market trial that will be conducted in 2019 by the International Center for Tropical Agriculture (CIAT) and the Vietnamese NGO, Rikolto. The market trial will be testing various food safety label designs, content, price points, and promotions. The advertising plan was informed by preliminary research to determine baseline consumer demands, understanding, and perceptions of food safety labels. The preliminary research was primarily focused on consumers who shop at and/or live near the Nghia Tan traditional market in Hanoi, Vietnam. The following plan was designed with the intent to create brand awareness and understanding prior to the market trial so that the study can more specifically concentrate on labeling preferences and pricing mechanisms. The market trial research is part of a national development effort to guarantee affordable, accessible, and acceptable safe foods for consumers that shop at traditional markets.

Respondents of the baseline consumer survey range in age from mid-20's to late 70's and most respondents are low to middle-income. The campaign *could* have been designed to target a very specific demographics (i.e. emerging young consumers as they make up 40% of the population, low to middle-income consumers, etc). However, the campaign is designed to target *existing shoppers* of traditional markets because they are the most at risk of losing access to affordable and accessible food. They are also at risk with limited access to safe foods as a result of current food modernization polices that aim to reduce the number of traditional markets in Vietnam while supporting the expansion of supermarkets.

rikolto
VECO

CIAT
Centro Internacional de Agricultura Tropical
Desde 1967 Ciencia para cultivar el cambio

Overview

The following campaign proposal is informed by preliminary consumer research, literature reviews, as well industry and market analysis. The campaign is designed to target consumers of traditional markets through multi-media platforms: TV, Facebook, and joint government informational promotion. The following pages will walk you through a situation analysis, campaign objectives, measurements and methods, campaign strategy, evaluation and more.

Situation Analysis

Cultural Context: Vegetables play a significant role in the daily Vietnamese diet, daily consumption in Hanoi alone is estimated at 290 g per capita, one of the highest vegetable consumption rates in the world (Wertheim-Heck et al., 2014b). Recurring incidents with regular breaches in food hygiene, high levels of pesticide residues, and over application of pesticides in food products have resulted in a growing concern for food safety by consumers and policymakers alike. Like many regions of Southeast Asia, the public policies in Vietnam place significant emphasis on the expansion of supermarkets, and the reduction of traditional markets, as a core strategy to ensure food safety quality. Private food safety management systems that are seen throughout western modes of food provisions, such as supermarkets, are considered instrumental for realizing food safety improvements (Reardon, 2005). The modernization polices aim to transform how foods are distributed and consumed in the country. However, cultural consumer habits and traditions have proven to be persistent, making the modern retail markets a niche phenomenon, with supermarkets in Hanoi contributing just 2% of total vegetable consumption (Wertheim-Heck et al., 2014b). The food policies that exclusively promote supermarket and retail modernization often lead to counterproductive development outcomes such as the marginalization of small-holder farmers who are unable to meet supermarket standards and volumes, and the disruption of long-standing relationships between traders and consumers which play an important role in coping with food safety risks.

***Historical Context*:** Rikolto is an international NGO with a 20+ year presence in Vietnam. Their mission in Vietnam is to promote sustainable and safe food policies while tackling safe vegetable production, consumption, and marketing that benefits smallholder farmers. Rikolto has a history in Vietnam of facilitating product quality assurance and compliance with both sustainability and food safety standards. Their Participatory Guarantee Systems (PGS) enable farmer organizations to set up self and multi-stakeholder monitoring processes and to achieve low-cost certifications with either a food safety standard (BasicGAP) or an organic standard (PGS Vietnam). They have proven successful in supporting farmer organizations to develop fair business partnerships with private actors to guarantee direct and transparent sourcing. Their rich history of partnerships is diverse in terms of their presence in various growing regions and stakeholder representativeness such as governments, research institutions, consumers, banks, and farmer organizations.

***Industry Analysis**:* Three major industry trends that are affecting change in the Vietnamese food system are: 1) food safety concerns, 2) food modernization policies affecting consumption and distribution patterns, and 3) international trade. Food safety concerns are especially high for produce and aquaculture which have high biological and chemical hazards, veterinary drug residues, and heavy metals. Vietnam's import and export sectors have been growing rapidly since major economic reforms were launched in 1986, this trend is inclusive of agricultural products as agricultural and aquatic goods made up 17.6% of the value of total exports in 2014 (World Bank, 2017). In addition to international and economic impacts, Vietnam has a significant share of their population under the age of 25 (40%) and is seeing an increase in urbanization,

both of which may influence a change in diets and domestic markets. As stated earlier, the existing food modernization policies are aimed at expanding the role of supermarkets and reducing the number of traditional markets. In conjunction with the rise in retail outlets there has been a rise in private food safety labels (VietGAP, USDA Organic, etc.) being sold at supermarkets. Both retail outlets, and the private labels that accompany them, are unobtainable to a significant portion of the population in Vietnam for reasons including: affordability, accessibility, and acceptability (Wertheim-Heck et al., 2015).

***Market Analysis*:** An increase in food safety outbreaks and consumer awareness has created a demand for accessible, affordable, and trust-worthy safe vegetables. There is asymmetric information in the current market for fruits and vegetables in Vietnam leaving consumers with little knowledge and/or lack of trust of safe vegetable labels. The primary buyers of fruits and vegetables under a food safety label certification are typically consumers who are: middle- and higher-income classes, more highly educated, shopping at supermarkets, living with young children or elderly, health and safety conscious.

Competitor Analysis: There are a handful of safe vegetable labels being sold at various food provision outlets including: Supermarkets, minimarts, and safe vegetable shops. Labeling competition comes from the following food safety labels as they have received the highest shares of consumer recognition, consumer trust, or consumer purchasing preference: USDA Organic, VietGAP, PGS Safe Vegetables, PGS Organic, and Food Safety and Hygiene Certificate. A study by Wertheim-Heck et al. in 2014 found that safe vegetables only constitute 3.2% of all vegetables sold in Hanoi. The low percentage of safe vegetables can in part be explained by the barriers to entry for small-holders as previously stated which include: small land holdings, limited access to financial services, expensive and complex certification requirements to supply urban supermarkets, etc. The government has supported VietGAP, a third-party certification based on Global GAP (Good Agricultural Practices), as the main standard for safe vegetable production certification. Despite being comprehensive, the certificate's prohibitively expensive fees (900-1,700 USD for a 2-year license) have prevented farmers from obtaining it. In 2015, only 16,970 ha of land had VietGAP certifications out of > 835,000 ha (~2 %) for vegetable production (MARD, 2015). High implementation costs, limited availability and accessibility, high purchasing costs, and reports of false labeling are all weaknesses of the existing safe vegetable labels, and hence an opportunity for the PGS Safe Vegetable label to be sold at traditional markets.

Consumer preferences for vegetables and food safety information

Items	n=250	Valid %
1. Frequency of consuming vegetables I		
Five or more times per week		98
2. Actively seek out food safety information (Y)		
3. Level of food safety knowledge		
knowledgeable		43
4. Level of trust in VietGAP		2.4
5. Level of trust in PGS Organic		1.6
6. Most preferred food safety certificate (to buy)		
None		44
PGS		23

Items 3, 4, & 5 were measured on a 6-point Likert scale. Item 3 started with "no knowledge" and ended with "very strong knowledge". Items 4 & 5 started with "Never heard of" and ended with "Very High Trust"

Objectives

***Marketing objectives*:** Baseline consumer data was collected via in-person surveys at the Nghia Tan market in Hanoi to determine labeling preferences (i.e. harvest date, farm location, etc.), stated willingness to pay, food safety knowledge, and food safety information sources. Survey results will be used to inform the advertising campaign prior to the market trial. The market trial intends to evaluate the potential for PGS safe vegetables to be sold at traditional markets through various pricing schemes in and around Hanoi and is a separate research project being conducted by CIAT (International Center for Tropical Agriculture) and Rikolto. The advertising campaign will be designed and managed as a communications effort to build brand awareness and understanding before testing pricing mechanisms and promotions. The target market segment will be consumers who shop at the Nghia Tan market and the objectives are to: 1) increase consumer awareness of the PGS Safe Vegetable label and 2) increase consumer understanding of the PGS Safe Vegetable label. As displayed in the figures above, initial survey research shows that the PGS Safe Vegetable label is not widely recognized or understood by consumers who shop at or near traditional markets.

Measurement for success: In order to measure and evaluate the effectiveness of the campaign, we will use the following key benchmarks to measure against:

1. Increased consumer awareness of PGS from 23% to 50%
2. Increased consumer understanding of PGS from 15% to 25%

The campaign will run for a total of six months through the three primary outlets: TV, Facebook, and government outreach. These outlets had the highest ranking for food safety information sources by consumers. Following the six-month campaign, we will

again randomly survey 125 consumers in the Nghia Tan district to determine if benchmarks were achieved.

Strategy

Our thorough consumer and competitor analysis demonstrated low recognition, understanding, and trust in the PGS Safe Vegetable label, all which influence purchasing intent. In order to accomplish our campaign objectives, it is important that we leverage the acquired consumer insight into the most commonly used and trusted information sources for food safety as we design and place our advertisements. Our strategy is to employ a multi- media advertising campaign to build brand awareness and understanding.

Execution

Our survey results showed that 50% of consumer respondents take the time to seek out food safety information. Similarly, most respondents stated their most used sources for food safety information in order from highest to lowest: TV, Internet, and Government.

Consumer attitude towards information sources and certifying bodies

Items (n=250)	**Valid %**
1. Actively seek out FS information (Yes)	50
2. Most used information source	
Internet	27
TV	61
3. Preferred information on labels	
Farm location	4.2
Cooperative location	4
Harvest date	4.4
Expiration date	4.4
Preservation instructions	4.4
4. Consumer trust in information sources	
TV	3.8
friends & family	4
Food vendors	2.3
5.Trust in certifying body	4.2
PGS (Group composed of other farmers, consumers, authorities, buyers, & NGOs)	3.4
Government agencies	1.6
Market managers	2.3
Supermarkets	

Items 4 & 5 were measured on a 6-point Likert scale starting with the first option of "no trust" and ended with "very high trust" as final option. Item 3 was measured on a 6-point Likert scale starting with option one "not important" to " very important" as final option.

It also known from the Vietnamese household living survey, that 90% of the urban population own a television. The consumer responses correspond well with the existing resources and framework that Rikolto operates within, further supporting the campaign's integrated brand promotion proposal to deploy advertisements via TV, internet, and joint brand awareness with local government officials.

***Copy Strategy and Media Plan*:**

3.Increased consumer awareness of PGS

- Deploy TV commercials that concentrate on communicating the *what* and the *where.* We envision a commercial that is the preliminary snapshot of what the PGS label is and that they can purchased at Nghia Tan market. The commercial is the introduction of the brand to the consumer and is then supported by complementary media outlets, internet and information banners at markets.
- We will work closely with Rikolto to ensure that the commercial is consistent with the brand image that Rikolto wants to build and maintain.

4. Increased consumer understanding of PGS
    - Deploy informational videos that can be hosted (and shared) on the Rikolto Facebook page and Rikolto website. We will be able to monitor questions, comments, and track Facebook 'likes' and shares.
    - Deploy informational print materials online and in the markets, "Printed pages allow a reader to dwell on the copy and process the information at a personalized, comfortable, rate" (Thomas Clayton et al., 2015).
5. Increased consumer trust in PGS
    - PGS banners with key information points about PGS will be conveniently located in and around the market.
    - Detailed print materials will be made available on the bulletin board alongside official local government documentation that is required to be displayed at the market (located outside market manager's office).

Evaluation:

A post-campaign survey will be conducted to measure the effectiveness of the integrated brand promotion campaign and its ability to increase consumer awareness and understanding of PGS safe vegetable label before commencing the one-year market trial. The campaign will run a total of six months and the survey collection will be done over the course of two weeks and will be measured against the benchmarks stated in *objectives* section of the proposal.