STDF Standards and Trade Development Facility

Spillover Effects of Export-Oriented SPS Technical Assistance on the Domestic Food Safety Situation

Final Report

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Leslie D. Bourquin, Ph.D.
Deepa Thiagarajan, Ph.D.

MICHIGAN STATE UNIVERSITY

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LIST OF ACRONYMS

ACP	Africa, Caribbean and Pacific
FAO	Food and Agricultural Organization of the United Nations
GAP	Good Agricultural Practice
MACBETH	Market Access through Competency Based Education and Training in Horticulture
MRL	Maximum Residue Limit
MSU	Michigan State University
NGO	Non-Governmental Organization
PPG	Project Preparation Grant
SPS	Sanitary and Phytosanitary
STDF	Standards and Trade Development Facility
TA	Technical Assistance
UN	United Nations
WBG	World Bank Group

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EXECUTIVE SUMMARY

1. This report summarizes work completed under a Project Preparation Grant (PPG), entitled *"Spillover Effects of Export-Oriented SPS Technical Assistance on the Domestic Food Safety Situation"* (STDF/PPG/535), which was led and implemented by Michigan State University and funded by the Standards and Trade Development Facility (STDF).

2. The objectives of this PPG were to identify and evaluate existing evidence for spillover effects, propose a conceptual framework that describes potential positive and negative spillover effects, and disseminate the findings of this work in a project summary document.

3. The ultimate goal of this work was to draw key lessons to improve the framework, design, delivery and impact of future trade-related technical assistance programs. A secondary goal was to develop hypotheses that could be tested by research conducted to further characterize potential spillover effects of trade-related technical assistance programs on the domestic food safety situation.

4. Desk research was conducted by MSU researchers to prepare an initial scan of potential evidence for spillover effects. This desk research was comprised by 1) formal search of peer-reviewed articles and reports of technical assistance projects conducted with funding from STDF and other donors, and 2) an internet survey of SPS technical assistance practitioners and other stakeholders to identify additional formal publications, articles, grey literature and anecdotal evidence that might support the existence of these spillover effects. During the course of the desk research, the MSU team also consulted with experts from the World Bank Group and FAO to collect additional inputs on the project terms of reference, approach, and deliverables. Based on a review of the literature, survey contributions and consultations with project stakeholders, the MSU team developed a draft conceptual framework that described potential positive (and negative) spillover effects that might result from SPS technical assistance programs.

5. A technical working group was convened to evaluate and refine the conceptual framework and provide guidance on future activities under the PPG. The working group was convened for a two-day workshop on November 1-2, 2017 in Geneva. The primary outcomes of the Geneva workshop were 1) a refined definition for spillover effects as they relate to this project, 2) the development of an overall conceptual framework for spillover effects, 3) revised lists of potential positive and negative spillover effects, and 4) a list of hypothetical conditions that would be expected to increase the likelihood of spillover effects.

6. The revised definition for spillover effects agreed by the working group is: "Side effects (both positive or negative) of trade-related SPS capacity building programs on the domestic food safety situation." The working group identified a total of 18 potential positive spillover effects and five potential negative spillover effects. These effects were categorized and conditions were identified that would be expected to impact their likelihood.

7. Following the working group meeting, the MSU team then initiated a second phase of research to validate the list of potential spillover effects agreed by the working group. This validation exercise consisted of 1) a review of published research and reports from trade-related SPS technical assistance projects in several economies, and 2) a series of interviews with key informants to gather feedback on the spillovers framework and identify evidence for spillover effects based on their experiences. The outcomes of this research were reviewed by the working group prior to finalization in this report.

8. The desk review of published reports identified evidence for most of the positive spillover effects, but little information supporting the occurrence of negative spillovers. Most of the evidence for spillover effects was anecdotal in nature. The consensus from key informant interviews was that the conceptual framework for spillover effects was well conceived, but the existing evidence base supporting the existence of spillovers is limited at this time, primarily because trade-focused capacity building projects have not been designed to identify, measure or report on possible spillovers on the domestic situation. Future such projects would benefit from more systematic and targeted attention to clearly identify, track and report on spillover effects, wherever possible. In addition, based on the analysis and findings of this study, more should be done to understand how projects to improve food safety capacity for trade can

generate and leverage benefits for the domestic food safety situation. This would require a slightly different approach to the design, implementation, and monitoring and evaluation of such projects, as well as more attention to consider synergies to and the appropriate role of other (i.e. non-trade focused) stakeholders.

9. Based on the outcomes of this study, we have the following recommendations.

i. Monitoring and evaluation of trade-related SPS technical assistance projects in the future should strongly consider the inclusion of indices to assess potential spillover effects on the domestic food safety situation. Systematic assessment of spillover effects resulting from these projects would provide valuable information on the potential for investments in trade-related SPS capacity to beneficially impact food safety domestically.

ii. At the outset, when food safety capacity building projects to promote trade are being designed and developed, more systematic thought should be given to more explicitly and clearly identify and tease out linkages and synergies between trade-related capacity building and domestic food safety. For instance, might there be opportunities to link or "twin" capacity building activities targeted at trade-related value chains with other supply chains that primarily serve the domestic market? Might there be opportunities to increase dissemination of food safety training materials developed to other stakeholders not involved in trade?

iii. It would be beneficial for published articles and project reports from trade-related SPS technical assistance projects to be made available in the STDF online Library, available on the STDF website (www.standardsfacility.org/library). Donors and development partners are strongly encouraged to make more and better use of the online Library to share their relevant project documents, reports, evaluations, etc. related to SPS capacity building.

iv. Donor agencies should strongly consider funding research and analysis to evaluate the occurrence of individual spillover effects as well as the broader conceptual framework for spillovers, including conditions hypothesized to support positive spillovers. This study identifies and describes a conceptual framework for categorizing spillover effects and hypothesized conditions that would be conducive for positive spillover effects, based on desk research and consultations. Additional research to fully validate this framework and test these hypotheses, on the ground in selected developing countries or regions would be beneficial. Such research to validate and test this framework could be designed and carried out as a stand-alone project, or could be incorporated into selected already planned trade-related food safety capacity building projects.

10. We also have the following recommendations for recipient countries:

i. Trade related capacity building efforts are more likely to generate positive domestic spillover effects when the efforts are focused on value chains/products that are consumed domestically. Investments in products that are primarily exported are less likely to positively impact domestic food safety.

ii. Avoid servicing exports at the expense of domestic food safety. Investments in regulatory capacity and infrastructure supporting export markets should be planned in a manner in which they can support domestic food safety efforts.

iii. Engagement of all relevant actors – government, private sector, civil society organizations, research institutions, consumers, etc. – in value chains will increase the likelihood of positive spillovers on domestic food safety. Effective planning and implementation of capacity building can comprehensively improve food safety for products that are exported, as well as those which are domestically consumed.

11. The conceptual framework for assessment of potential spillover effects generated by this project should be a valuable framework enabling practitioners to prospectively design methods to formally assess domestic spillover effects associated with future trade-related SPS capacity development projects.

1 INTRODUCTION

1. Capacity building programs aimed at improving market access of agri-food products from developing countries are sometimes assumed to have spillover effects (positive or negative) on the domestic setting. For instance, stakeholders involved in projects aimed at meeting Maximum Residue Limits (MRLs) for given products through Good Agriculture Practices (GAP) and better use of pesticides may point to a reduction of environmental pollution (soil and water) and fewer cases of pesticide-poisoning among farmers and operators as a result of improved use and management of pesticides. Similarly, projects that improve pre- and post-harvest practices to reduce mycotoxin contamination in exported products, such as nuts, have been linked to a potential reduction of morbidity (liver cancer, stunting, acute toxicity, etc.) and mortality among the local population due to consumption of safer nuts. Furthermore, projects that strengthen the capacity of SPS competent authorities to facilitate exports may assume that this will improve their ability to carry out controls on imported or domestically produced foodstuffs.

2. On the other hand, some have argued that improving SPS capacity in export-oriented value chains has resulted in a segmentation of the market, with safer and higher quality products exported and lower quality products sold on the local market. This so-called "two-tier" system is sometimes linked to the increased attention of regulatory authorities to control the quality and safety of export-oriented products, to the detriment of locally consumed products. In this context, it is sometimes suggested that export-oriented SPS technical assistance is likely to lead to or exacerbate the existence of a two-tier SPS system in developing countries.

3. Although the existence of such spillover effects has often been claimed as an outcome of technical assistance and capacity building projects, to date there has been little formal evidence to confirm their occurrence. This Project Preparation Grant (PPG), funded by the STDF and developed with the support of some STDF founding partners (FAO, WBG and WHO), aimed to identify, evaluate and analyse the evidence for such spillover effects. Implementation of the PPG, entitled *"Spillover Effects of Export-Oriented SPS Technical Assistance on the Domestic Food Safety Situation"* (STDF/PPG/535), was led by Michigan State University and carried out in collaboration with interested STDF partners and other STDF members.

4. The original objectives of this PPG were to evaluate existing evidence for spillover effects, propose a conceptual framework that describes potential positive and negative spillover effects, and formulate a project proposal that aims to carry out research to identify the spillover effects of export-oriented technical assistance on the food safety situation. Ultimately, the remit of this PPG was adjusted – following discussions at the technical working meeting and in consultation with the STDF Secretariat – to focus on development of the conceptual framework, evaluating evidence for spillover effects based on desk research and key informant interviews, and disseminating the findings of this work in a summary document. There was agreement that the ultimate goal of this research study would be to draw key lessons to improve the framework, design, delivery and impact of future trade-related technical assistance projects and programs so that they can have greater benefits for domestic food safety.

5. For the purposes of this project work and report, we have utilized a broad interpretation of the term "SPS technical assistance." This reflects the following categorization of STDF projects used in a recent external meta-evaluation of STDF project evaluations (Andersson, 2018) commissioned by the STDF:

i. ***technical assistance*** activities, such as workshops, trainings, studies and development of assessment tools;

ii. more elaborate ***institution building*** aiming at reforming and/or strengthening administrations and engaging the private sector; and

iii. ***sector development*** that commonly apply a value-chain approach to support individual sectors, involving a wide range of local stakeholders.

6. The authors of this report, together with the working group commissioned to complete this PPG (see the Acknowledgements), adopted a definition of "SPS technical assistance" that includes all three of these categories.

7. Spillover effects were provisionally defined in the original concept note (STDF, 2012) and terms of reference for the PPG (STDF, 2017), but this provisional definition was modified by the working group convened for this PPG as: ***"Side effects (both positive or negative) of trade-related SPS capacity building programs on the domestic food safety situation."***

8. This report summarizes the work undertaken by MSU and the members of a technical working group convened for the purposes of this PPG to define and frame potential spillover effects, evaluate existing evidence for the occurrence of these effects, and propose recommendations for the manner in which this framework can be used in the future.

9. The project work stream included the following elements:

i. Initial desk research was conducted to review the existing literature on spillover effects and develop a draft conceptual framework for discussion.

ii. The initial desk research was supplemented with information on potential spillover effects collected using a web-based survey.

iii. A technical working group was convened in Geneva on the sidelines of the SPS meetings on 1-2 November 2017 to discuss and further elaborate the conceptual framework, and make recommendations for evaluating this framework.

iv. Following the technical meeting, the MSU researchers conducted further desk research to identify potential spillover effects in documents from recent projects completed on trade-related SPS capacity development.

v. MSU researchers further evaluated the conceptual framework for spillover effects by conducting interviews with key informants who were responsible for implementing several trade-related SPS capacity development projects globally.

vi. The background research, methodological approach and findings were described, reviewed, and published in this summary report.

10. The original concept note (STDF, 2012) and terms of reference (STDF, 2017) for this project preparation grant are available at: www.standardsfacility.org/.The members of the working group as well as others who contributed to this PPG are identified in the Acknowledgements section of this report.

11. This summary report presents the methodology employed to develop and evaluate a conceptual framework that describes and characterizes potential spillover effects resulting from trade-related SPS capacity building projects, and summarizes the results of this work. The overall conceptual framework for spillover effects is presented, and the lists and categorization of potential spillover effects as defined by the working group are presented and discussed. Subsequent desk research and key informant interviews were conducted to validate the conceptual framework; the results of this research are presented in the validation sections. Details of potential spillover effects identified during this desk research are summarized in Annex 2. The summary report ends with recommendations for donor organizations and recipient country governments, and overall conclusions from this work.

2 METHODOLOGY

12. Desk research was conducted by MSU researchers to prepare an initial scan of potential evidence for spillover effects of trade-related SPS technical assistance on the domestic food safety condition. This desk research was comprised by 1) formal search of peer-reviewed articles and reports of technical assistance projects, and 2) an internet-based survey of SPS technical assistance practitioners and other stakeholders to identify additional formal publications, articles, grey literature and anecdotal evidence that might support the existence of these spillover effects. Grey literature is defined by Schöpfel (2011) as "manifold document types produced on all levels of government, academics, business and industry in print and electronic formats that are protected by intellectual property rights, of sufficient quality to be collected and preserved by library holdings or institutional repositories, but not controlled by commercial publishers i.e., where publishing is not the primary activity of the producing body."

13. The internet survey instrument (attached as **Annex 1**) was developed in consultation with the STDF Secretariat and was disseminated by email announcement on August 15, 2017. The initial mailing list included approximately 100 individuals engaged in SPS technical assistance with UN organizations, government agencies, NGOs, development organizations, academia, and members of the STDF working group. The survey was also announced in a September 4, 2017 email message from the STDF to its mailing list (which includes several thousand individuals). The initial survey close date was announced as September 8, but this was extended to September 15 owing to the summer holiday season. Ultimately, responses were collected until early October, when the survey was closed to further entries.

14. The survey was administered using the MSU Qualtrix online survey tool. A total of 141 survey responses were logged, but many responses were incomplete and did not include usable data. An option also was provided for survey participants to respond to the MSU principal investigators directly by email to provide input and attach relevant literature for consideration. Ultimately, seventeen completed formal responses were received to the survey. Some of contributions received did not specifically address potential spillover effects, but the responses were included in background information provided to the technical working group to provide a full record of the contributions that were received.

15. During the course of the desk research, the MSU team also held conference calls with the World Bank (Steve Jaffee) and FAO (Mary Kenny). Representatives from the STDF Secretariat also participated in these calls, which were designed to collect additional inputs on the project's terms of reference, approach, and deliverables. Based on a review of the literature, survey contributions and consultations with project stakeholders, the MSU team developed a draft conceptual framework that described potential positive (and negative) spillover effects that might result from SPS technical assistance programs.

16. Based on the preliminary desk research and survey responses, MSU prepared a background document on spillover effects to serve as a starting point for discussions by a technical working group convened to evaluate and refine the conceptual framework and provide guidance on future activities under the PPG. The composition of the working group was determined in consultation with the STDF Secretariat, and included representatives from UN agencies, government regulatory agencies, academia and international development organizations having experience in trade-related SPS capacity development programs. The membership of the working group is listed in the Acknowledgements section.

17. The working group was convened for a two-day workshop on November 1-2, 2017 in Geneva. The specific objectives of the workshop on 1-2 November were to review the information and evidence collected by MSU as part of the preparatory desk research and analysis, and discuss the draft conceptual framework on spillover effects, and provide suggestions and recommendations to further improve it.

18. Following the working group meeting, MSU prepared a summary report including the conceptual framework agreed by the workshop participants. This summary report was finalized after review and by working group members and the STDF Secretariat. As agreed during the Geneva workshop, the MSU team then initiated a second phase of desk research to identify references to positive or negative spillover effects in published articles and available reports from trade-related SPS projects. The working group recommended numerous projects across a number of geographies and value chains for this

assessment. In practice, a large proportion of the reports reviewed for this exercise were from STDF-funded projects, which were readily available on the STDF website and relevant to the assessment. While some STDF partners and others involved in the working group provided relevant documents for this review, ultimately the amount of documentation provided to the MSU team was less than expected. This assessment was completed and reviewed by the working group.

19. As a final step to further evaluate the proposed conceptual framework for spillover effects, the MSU team conducted several interviews of key informants in June 2018. The key informants were recommended by the working group as persons who had been implementers of technical assistance projects that were considered appropriate for retrospective assessment of potential spillover effects. The persons who participated in these key informant interviews are listed in the Acknowledgements section. Prior to the interviews, these informants were provided with the spillovers framework for review. They were then asked for their feedback on the proposed spillovers framework, and if they were aware of any additional examples of potential positive (or negative) spillover effects that had not already been captured from the prior review of published articles and project reports. These key informant interviews were further supplemented with information gathered from written communications with working group members and other individuals with experience implementing food safety technical assistance projects for STDF.

20. All research protocols involving human subjects (surveys, interviews) were reviewed and approved by the Michigan State University Human Research Protection Program (MSU's designated institutional review board).

3 LIMITATIONS

21. Several factors limited our ability to evaluate the conceptual framework for spillover effects in this study. First, and perhaps most importantly, is that SPS technical assistance projects typically are not designed to assess potential spillovers. In fact, as was noted by participants in the technical working group and by several key informants contributing to this study, development projects historically have not been designed with robust monitoring and evaluation frameworks that enable thorough assessment of intended effects. Therefore, it should not be surprising that evidence for potential spillover effects is largely anecdotal in nature. As noted earlier in this report, STDF in particular has recently emphasized strong monitoring and evaluation frameworks for their funded projects.

22. A second challenge encountered in this study was limited access to published articles, reports or summaries of trade-related SPS technical assistance projects that could be evaluated for mentions of potential spillover effects. While many reports could be obtained from various repositories, we are aware of a significant number of technical assistance projects of interest to this PPG wherein the relevant project reports could not be accessed. It should be noted that STDF projects, in particular, are exceedingly well documented on the STDF web site. The approach of STDF to openly share all relevant documents related to their funded projects should serve as a model for other donor agencies.

23. The challenge of attribution of potential spillover effects was noted by several working group members and key informants interviewed for this project. One respondent summarized the problem as follows: *"Estimating spillovers in capacity building of just about any sort is highly problematic due to the many variables at play, probably the most prominent being the issue of attribution. Variables can evolve due to domestic shifts (including of people) / investments unrelated to the project, or a consequence of multiple projects in the same area by different donors (who interact minimally from my observation). Unless the issue of impact assessment and a focus on spillovers is built in to projects ex-ante, I contend it would be extremely difficult to determine attributions - including spillover between export and import food control systems."*

24. Clearly, the issue of attribution of spillovers to particular investments would be exceedingly difficult to address in any post-hoc assessment of such effects. Recognition of this key limitation supports the decision taken by the working group to focus the aims of this study on developing a conceptual framework that describes spillover effects and hypothesizing conditions that may be conducive to development of positive spillovers. Thus, rather than conducting an exhaustive review of all available project reports in an effort to validate all aspects of this framework, we have identified specific examples

from technical assistance projects that support the likelihood that many of the hypothesized spillovers are observable.

4 CONCEPTUAL FRAMEWORK AND CATEGORIZATION OF SPILLOVER EFFECTS

4.1 Spillover Effects Defined

25. During the November 2017 technical workshop, considerable discussion was dedicated to refining the working definition of spillover effects in the context of this project. The final revised definition of spillover effects was as follows.

> **Spillover effects:** ***"Side effects (both positive or negative) of trade-related SPS capacity building programs on the domestic food safety situation."***

26. This revised definition includes some notable changes from the original working definition of spillover effects in the PPG terms of reference, which was: "*unintended or side benefits of trade-related SPS capacity building programs on the domestic food safety situation."*

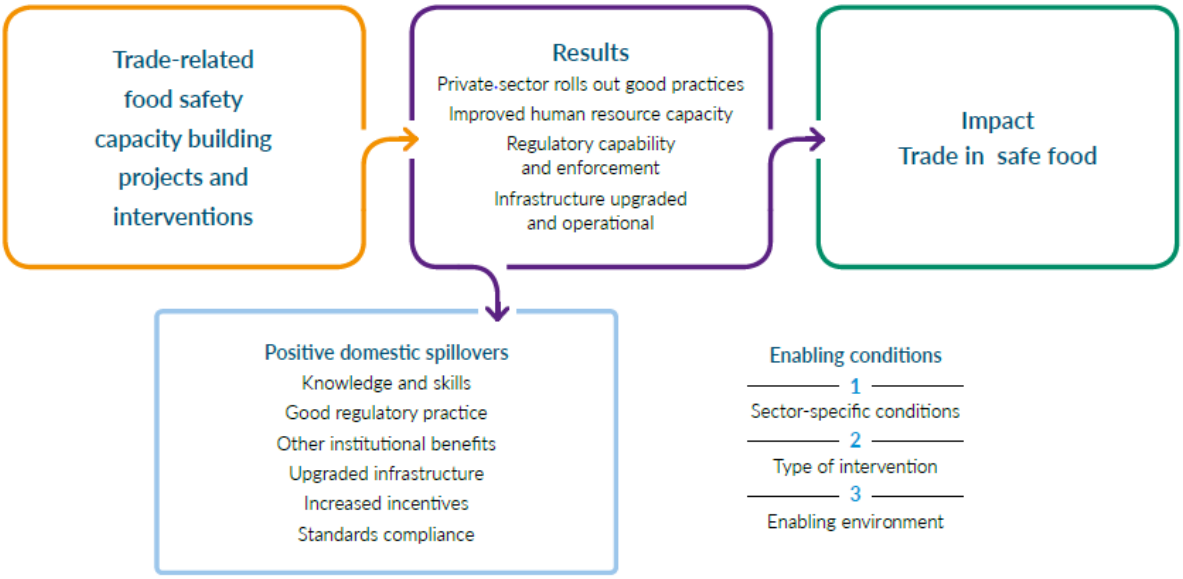
27. The term "benefits" was replaced by "effects" to reflect the fact that spillover effects can either be positive or negative in their outcomes. The term "unintended" was considered by the working group members to be redundant as it is implied by the term "side effects". Therefore, "unintended" was eliminated from the final definition. Finally, the term "SPS" was maintained in the definition, but the group was in agreement that, for the purposes of this project, the focus should be on **export-oriented** food safety related capacity building programs that have spillover effects (positive or negative) on domestic food safety resulting from SPS (i.e. food safety) capacity building for trade. This focus was intended to ensure that the research was manageable.

4.2 Overall Conceptual Framework for Spillover Effects

28. The participants at the Geneva workshop on 1-2 Nov. 2017 had an extensive discussion on the types of spillover effects (both positive and negative) that might occur, the categorization of the different types of potential spillover effects, and conditions that might be permissive for such spillover effects to occur. This information was all organized into a single framework as depicted in **Figure 1**.

29. The boxes in the upper half of Figure 1 depict the common activities associated with SPS capacity development programs and their intended outcomes (results) and impact – i.e. expanded trade in safe food products. The boxes in the lower half depict different categories of possible spillover effects as well as conditions we hypothesize would increase (or decrease) the likelihood of spillover effects to occur. These categories of spillovers and conditions for spillovers will be described in more detail in the following narrative.

Figure 1. Overall conceptual framework for spillover effects.



4.3 List and Categorization of Potential Spillover Effects

30. Using the spillover effects of capacity building efforts identified in the background document as a starting point, the technical working group had an extended discussion on potential positive and negative spillovers. Additional potential spillover effects of such efforts were added in both the positive and negative categories, and some were reworded or deleted. The final list agreed by the working group consisted of 18 potentially positive and 5 potentially negative spillover effects.

31. After developing the consensus list of spillovers, the group discussed an approach to categorization of spillover effects. This was an extended discussion that resulted in grouping the spillover effects into seven general categories. These categories are listed and briefly described in **Table 1**.

32. Each of the spillover effects was then discussed and categorized using this system. Several potential spillover effects were considered to fit into more than one of the spillover categories. The outcome of this discussion on potential spillover effects and their categorization is summarized in **Table 2** (positive spillovers) and **Table 3** (negative spillovers).

Table 1. Description of spillover effect categories.

ID	Spillover Category	Description
A	Private Sector Practice Improved (Formal Sector)	Spillover effects resulting in improved food safety capacity and performance by private sector enterprises (e.g., food safety certifications of formal enterprises that also supply domestic formal markets).
B	Product Safety Improved	Effects resulting in safer food products being available in the local market (e.g., increased availability of products containing reduced concentrations of mycotoxins or other food safety hazards in domestic markets).
C	Public Sector Capacity (Better Regulatory Practice)	Spillover effects resulting in improved capacity of government authorities to enforce food safety requirements for foods in the domestic market.
D	Environmental Pollution and Pesticide Use Reduced	Effects on domestic food safety resulting from more responsible use of pesticides or other chemical food safety hazards.
E	Consumer Awareness Raised	Projects that improve consumer awareness regarding the importance of food safety can drive increased demand for safe products in local markets.
F	Small-Scale Producers and Livelihoods Supported (Informal Sector)	Spillover effects that impact small-scale producers primarily participating in the domestic market (e.g. increasing domestic food safety standards might exclude smallholders from the market).
G	Embedded Food Safety Capacity Enhanced	General effects resulting from changes in food safety knowledge, advocacy, capacity, food safety culture, reputation, or other factors (e.g. increased capacity of local universities or research organizations to support domestic food safety efforts).

Table 2. Potential positive spillover effects and their categorization.

	Positive Spillover Effects	Spillover Category						
		A. Private Sector Practice	B. Product Safety	C. Public Sector Capacity	D. Environmental Pollution and Pesticide Use	E. Consumer Awareness	F. Small-Scale Producers and Livelihoods	G. Embedded Food Safety Capacity
1.	Investments in trade-related SPS measures for exported products improves capacity of businesses to provide safe foods for the domestic market as well. This depends on the extent to which the exported products also are sold in domestic markets.	■						
2.	Adoption of good practices by farmers and SMEs for exported products extends to different products sold in local markets.	■					■	
3.	Increasing market share of formal enterprises in food production and trade will result in increased food safety. Formal enterprises are more likely to follow good practices.		■					
4.	Investments in regulatory capacity for supporting exports also results in strengthened domestic food safety policies and improved regulatory compliance for the local market (i.e. safer foods locally).			■				
5.	Investments in food production and processing standards may generally improve environmental conditions, occupational health, and food safety in recipient economies.				■			
6.	Technical assistance projects aimed at meeting maximum residue limits (MRLs) for pesticide residues in fruit and vegetable products through the use of Good Agricultural Practices (GAPs) and better pesticide use may reduce environmental pollution and reduce cases of pesticide poisoning among farm workers.	■			■			
7.	Projects focused on restricting use of banned pesticides for produce intended for the export market can lead to reductions in illegal pesticide residues on foods in the local market. (e.g., the Kenya Pest Control Products Board issued a legal notice suspending all foliar use of pest control products containing dimethoate or its metabolites in 2014 (www.standardmedia.co.ke/business/article/2000140333/state-bans-pesticide-to-protect-exports-to-eu). This could also be a negative spillover depending on the circumstances.)		■		■			
8.	Projects aiming to improve pre- and post-harvest practices to reduce chemical contamination in products intended for export may reduce morbidity in the local population through the increased availability of safer products. (e.g., reduced incidences of liver cancer, stunting, acute toxicity related to aflatoxin contamination; reduced morbidity in farm workers related to reduced exposures to pesticides, etc.)	■	■					

	Positive Spillover Effects	Spillover Category						
		A. Private Sector Practice	B. Product Safety	C. Public Sector Capacity	D. Environmental Pollution and Pesticide Use	E. Consumer Awareness	F. Small-Scale Producers and Livelihoods	G. Embedded Food Safety Capacity
9.	System-wide SPS capacity building projects (e.g., to improve SPS legislation or strengthening competent authority capacity) may improve domestic food safety controls.			■				
10.	Investment in infrastructure (e.g., processing and packing facilities, laboratory capacity) to support trade can simultaneously facilitate the provision of safer food/water locally. (e.g., STDF-funded project implemented by FAO in the Solomon Islands; www.fao.org/asiapacific/news/detail-events/en/c/1042995/)	■	■	■				
11.	Increasing consumer awareness of food safety as a result of technical assistance projects can create demand for safer food, driving improved domestic policies and regulatory capabilities, and improved food safety management by local producers and processors.			■		■	■	
12.	Demonstration of effective food safety management in one or more value chains in a country can have positive spillovers for other value chains (e.g., Success of the New Zealand dairy sector was posited as a success that has had positive spillovers for other food and agriculture sectors in the country. Maintaining New Zealand's reputation for safe food is a stated priority of the New Zealand Ministry of Primary Industries. www.mpi.govt.nz/exporting/overview/growing-exports/).	■	■	■			■	
13.	SPS technical assistance investments can have positive impacts on capability of domestic universities, research organizations, industry associations and other groups supporting other food and agriculture sectors.							■
14.	Improved awareness and SPS capacity can lead to self-policing of food safety requirements by the food and agriculture industries.	■	■					
15.	SPS technical assistance projects can facilitate cooperation among different government agencies and other key stakeholders to address food safety concerns in recipient countries. These can include public-private partnerships or partnerships among public sector agencies (e.g. U.S. Food and Drug Administration noted formation of inter-agency teams to address food defense issues.)	■		■				
16.	Building the food safety capacity of individuals within the export sector can have a wider impact nationally as these people are mobile and may transfer the benefits and skills to other organizations and sectors. (It was noted this also could lead to a potential negative spillover							■

	Positive Spillover Effects	Spillover Category						
		A. Private Sector Practice	B. Product Safety	C. Public Sector Capacity	D. Environmental Pollution and Pesticide Use	E. Consumer Awareness	F. Small-Scale Producers and Livelihoods	G. Embedded Food Safety Capacity
	if highly trained individuals depart for other opportunities – e.g. "brain drain".)							
17.	Expansion of agriculture and food sector exports creates jobs and investments related to production, processing and servicing of these exports.							
18.	Demonstrated national capacity to export safe food in one category has positive impact on reputation, improving domestic and export market opportunities in other export categories (from the point of view of importing countries).							

Table 3. Potential negative spillover effects and their categorization.

	Negative Spillover Effects	Spillover Category						
		A. Private Sector Practice	B. Product Safety	C. Public Sector Capacity	D. Environmental Pollution and Pesticide Use	E. Consumer Awareness	F. Small-Scale Producers and Livelihoods	G. Embedded Food Safety Capacity
1.	Trade-related SPS investments could result in a multi-tiered food safety system in developing countries, wherein the highest quality products are exported and less safe products are sold in domestic markets. (Note: The working group considered the possibility of this negative spillover to be more likely in less developed economies. The working group also noted that SPS investments in this context are assumed to be those principally focused on food safety.)	■	■	■				
2.	Increased focus of competent authorities on servicing SPS requirements for exports can divert needed attention away from appropriate regulation for domestic markets.	■	■	■				
3.	Inappropriate food safety reform processes and lack of coordination among donors can create distortions in the public sector and local markets (e.g., wrong policies, misallocation of resources, etc.)	■	■	■			■	■
4.	Higher food safety standards may increase local food prices and lower access to food and lead to exclusion of smallholders from the market due to their limited financial resources and technical capacity. (e.g., Traditional abattoirs in countries that have developing food safety standards.)		■				■	
5.	Identification of food safety failures in exported products can have reputational risks for other exports, and also decrease consumer trust in domestically produced foods.	■	■			■		■

4.4 Conditions for Spillover Effects

33. Prior to the Geneva working group meeting, the MSU team also proposed a list of conditions that might be permissive for development of spillover effects. The proposed framework was informed heavily by prior conversations with Steve Jaffee at the World Bank. The participants in the Geneva workshop discussed and expanded upon this element of the conceptual spillovers framework. The MSU team had also proposed, and the working group participants agreed, that these conditions for spillovers could be broadly grouped in three categories. These categories are:

1. Sector-Specific Considerations
2. Nature of the SPS-Food Safety Technical Assistance for Trade Related Compliance
3. Institutional Support / Enabling Environment

34. The revised set of hypothesized conditions for spillover effects is presented for each of the above categories in **Tables 4, 5 and 6**. It should be noted that these conditions have not been confirmed by any published reports or systematic reviews of observed spillovers. Rather, these conditions were hypothesized based on experience of food and agriculture sector development practitioners.

35. With respect to sector-specific considerations (e.g., product-specific, **Table 4**), we hypothesize that positive spillover effects are more likely to occur when the sector is well established with integrated operations, when the product has a large domestic market, and when domestic producer- and processor-focused institutions (e.g., associations) are strong. Conversely, products that are produced principally for export to other countries are expected to generate few spillovers on the domestic food safety situation. This is particularly true if the sector is geographically distinct or segregated from domestic production systems (e.g., as is often the case with plantation crops).

Table 4. Hypothetical Conditions for Spillover Effects: Sector-Specific Considerations

Conditions	Positive Spillovers	Neutral or Negative Spillovers
Products – primarily exported or domestically consumed?	More positive spillovers are anticipated when the product has a large domestic market.	Products that are primarily exported would have limited benefit on the domestic food safety condition.
Size and maturity of industry sector	Established sectors would be expected to have potential for domestic spillovers.	Niche sectors, particularly those having limited domestic markets, would have minimal spillovers.
Nature of lead firms – export focused or significant sales to domestic markets	Domestically engaged firms would be expected to be more likely to generate spillovers.	Export only firms would have no impact on domestic situation.
Nature of lead firms – vertically integrated companies	Vertically integrated companies would be expected to generate significant spillovers depending upon the extent to which they are engaged in domestic markets.	
Geography		Sectors that are spatially segregated from the rest of the domestic market (e.g. plantations) would have limited spillovers.
Organized retail sector	Positive spillovers would be expected to the extent that retailers source locally.	
Strength / capacity of local institutions	Strong local professional institutions of producers, processors and other actors along the food chain would be more likely to generate positive spillovers. (Note: This is distinct from government institutions and academic institutions. This condition is referring to cooperatives, industry associations, and other producer focused institutions.)	

36. When considering the nature of technical assistance activities (**Table 5**), we hypothesize that large scale, long term, frequent, and coordinated technical assistance activities are likely to generate positive spillover effects. Investments in physical infrastructure such as laboratory instrumentation and facilities, or cold storage and packing facilities, are likely to generate positive spillovers only to the extent this infrastructure is utilized to support the safety of products that are consumed in the domestic market. We also believe that technical assistance activities having extensive engagement of local expertise are more likely to generate positive spillovers compared to those which rely heavily on outside experts. Conversely, we hypothesize that technical assistance activities that are short term in nature are unlikely to generate positive spillover effects. Similarly, activities conducted in response to a crisis in a particular sector are not expected to generate spillover effects on in the broader domestic market, even if these activities are effective in mitigating the crisis.

Table 5. Hypothetical Conditions for Spillover Effects: Nature of Technical Assistance

Conditions	Positive Spillovers	Neutral or Negative Spillovers
Duration and frequency of engagement in TA activities	Longer term and more frequent TA activities should have greater spillovers. Multiple projects implemented by organizations in a coordinated manner would maximize potential spillovers.	Short-term or "one off" TA activities would have minimal impact. Multiple projects also could lead to negative spillovers if there is poor coordination, the multiple projects generate confusion, or there is misallocation of resources.
Breadth of TA engagement	TA engaging different value chain actors (primary producers, processors, farmer organizations, industry organizations, exporters, regulatory agencies, scientific organizations) in a coordinated manner would be likely to generate positive spillovers.	Narrow TA focus only on part of value chain (neutral with respect to potential spillovers)
Investments in infrastructure (Working group recommended breaking out infrastructure investments for regulatory vs other types of infrastructure.)	Targeted infrastructure improvements made in conjunction with TA activities should be more likely to generate positive spillovers. Investments in regulatory infrastructure (e.g. laboratories) are likely to generate spillovers on domestic food safety to the extent that these facilities are used to ensure safety of domestic food products. Industry infrastructure investments (e.g. cold chain,	

Conditions	Positive Spillovers	Neutral or Negative Spillovers
	packing facilities) are likely to generate spillovers on domestic food safety to the extent that these are used for products consumed domestically.	
Engagement of local expertise	TA projects that engage local experts, domestic academia and industry associations have greater potential for domestic spillovers.	If only local expertise is engaged, the "big picture" might be missed and situational assessments could lack impartiality, potentially resulting in missed opportunities to integrate international best practices.
Timing of TA activities – i.e. proactively planned events versus reactive actions during a crisis	Planned, coordinated TA activities (proactive) are more likely to generate domestic spillovers.	TA activities in crisis mode (reactive) may address immediate problems for affected sectors, but may not always produce positive domestic spillovers.
Scale of technical assistance / project interventions	Larger scale investments reaching larger numbers of beneficiaries would, intuitively, be expected to have larger positive spillovers compared to projects having relatively few beneficiaries.	
Focus of technical assistance activities (i.e. building capacity of regulators, producers, processors, etc.)	TA activities focused on the regulatory system have potential for positive spillovers to the extent these activities improve food safety controls for products consumed domestically. TA activities focused on food producers or processors have potential for positive spillovers to the extent these activities improve the safety of products consumed domestically.	
The focus of the TA is demand driven by local stakeholders	Demand driven, locally "owned" TA has high potential for positive spillovers on domestic food safety.	Inappropriate, donor-driven reforms could result in negative spillovers; lack of local ownership.

37. Institutional support and other factors enabling collaboration and integration in technical assistance activities also were considered to be important conditions that would be permissive for positive spillover effects (**Table 6**). For example, having strong regulatory and legal structures, and adequate resources for the domestic competent authority, would be essential for positive spillover effects on domestically-consumed foods. Broad collaboration among different value chain actors, including meaningful engagement of associations and producer organizations, also would foster an environment in which positive spillovers would be expected domestically. Finally, we hypothesize that integration of domestic scientific institutions (colleges, universities and research centers) into technical assistance efforts could foster positive long-term spillover effects by integration of technical content into educational curricula and by fostering locally relevant solutions.

Table 6. Hypothetical Conditions for Spillover Effects: Institutional Support / Enabling Environment Factors

Conditions	Positive Spillovers	Neutral or Negative Spillovers
Support and capacity of national competent authorities	Competent authority is adequately resourced such that TA has positive spillovers on domestic regulatory functions.	If the competent authority lacks sufficient resources or staffing, the likelihood of positive domestic spillovers is reduced. If the competent authority is focused on servicing export activities at the expense of domestic functions, negative spillover effects could result in the domestic food safety situation.
Legal / regulatory environment	Economies having stronger, more developed legal / regulatory structures would potentially result in greater domestic spillovers. This is anticipated as a consequence of improved capacity for regulatory agencies to enforce domestic food safety standards, conduct public health surveillance, and monitor potential hazards in foods consumed domestically. Participation by domestic competent authorities in multilateral activities (e.g. Codex) will increase the likelihood of domestic spillovers.	If domestic regulatory reforms are implemented primarily to satisfy external market requirements without proper consideration of local conditions, the reforms may be difficult to implement locally and may have potential for negative consequences on domestic producers and processors.
Engagement of associations and producer organizations	Engagement of domestic food industry institutions will improve likelihood of positive spillovers.	

Conditions	Positive Spillovers	Neutral or Negative Spillovers
Engagement of "champions" in the public and private sectors	Engagement of visionary leaders from the public and private sectors is expected to increase the likelihood of positive spillovers.	
Collaboration / dialog across organizations, including consumers	Meaningful collaboration and dialog across all organizations in the food chain, including consumers, will increase the likelihood of positive domestic spillovers.	
Engagement of scientific organizations (e.g. academia, research centers, etc.)	Projects that meaningfully integrate domestic scientific organizations would be expected to generate positive spillovers (application of locally relevant solutions, integration of TA into educational curricula, etc.)	

5 VALIDATING THE FINDINGS

5.1 Literature Review

38. The formal literature review and internet survey to "crowd source" information did not identify any published studies that have specifically assessed potential spillover effects of trade-related SPS technical assistance on domestic food safety. This is, perhaps, not surprising given that SPS technical assistance projects generally are not designed in a manner that would enable assessment of spillover effects. In fact, some survey respondents noted that technical assistance projects historically have suffered from a lack of evaluation planning. Recognizing this issue, STDF in particular has for several years required projects to incorporate robust evaluation methodologies including logical frameworks and measurable indicators.

39. Based on recommendations by the technical working group during the Geneva meeting, the MSU team conducted an extensive review of published literature and project reports from trade-related SPS technical assistance projects completed during the previous ten years. The focus of this literature review was on specific geographies and sectors of the food industry that were prioritized by the working group. Project documents were evaluated for evidence of potential spillover effects that corresponded to the list of potential spillovers identified by the working group. This assessment included both positive and negative spillover effects. The result of this analysis is presented in tables in **Annex 2** of this report.

40. Based on this literature review, mentions of potential effects corresponding to 17 of the 18 positive spillover effects in the matrix were identified. The only spillover effect not identified from the reviewed documents was spillover 9 (system-wide SPS capacity building projects may improve domestic food safety controls). Although this spillover was not explicitly referenced in the reviewed documents, we consider it likely that this positive spillover effect is likely to be observed in economies wherein extensive technical assistance activities have focused on SPS regulatory capacity and enabling environment.

41. There is a considerable body of literature on the effects of investments on food and agriculture sector profitability, trade, markets, standards, and other outcomes. However, little has been published on the impacts of these investments on the domestic health situation in countries receiving technical assistance. In this context, Jaffee et al. (2018) argue that this lack of information causes many countries to under-invest in food safety, and present an economic case for increased public investment and other policy attention on food safety in developing countries.

42. Assessing potential impacts of SPS technical assistance on local health conditions as an indicator of food safety is particularly challenging because few countries have sufficiently effective health surveillance systems to identify trends in health status indicators. In fact, even in countries with extensive health surveillance and foodborne illness reporting systems, identifying long term improvements in overall health indicators (e.g. incidence of foodborne illness in the population) is extremely challenging. For these reasons, future research on identifying spillover effects of SPS technical assistance likely will need to focus on indicators other than human health outcomes.

43. A number of the potential positive spillovers identified generally assume that improved food safety practices by more technically astute formal enterprises engaged in export activities would also improve the safety of domestically-available foods. This is potentially true for commodities that are consumed domestically as well as exported (e.g. fruit and vegetable products), but would not be expected to contribute to domestic food safety for products that are not generally consumed locally (e.g. aquaculture products primarily targeted for export markets).

Box 1. Spillover Effects: COLEACP PIP.

The PIP program was a European cooperation program managed by COLEACP from 2001-2015. It was funded by the European Union and was implemented at the request of the ACP Group of the States (African, Caribbean and Pacific). The action of the PIP program was focused on the sanitary compliance of horticultural products exported to the European Union. Trade in fruit and vegetables is an important factor for economic growth in many countries; PIP helped ACP exports achieve their full potential by allowing producers and exporters to meet EU market requirements. While export horticulture was the main area of intervention of the program, regional and local markets are also involved, so that ACP consumers also benefit from the positive outcomes of the PIP.

There is considerable evidence for potential domestic spillover effects resulting from implementation of the PIP program (COLEACP, 2010). It was noted that produce grown under GAPs (e.g. French beans in Kenya, pineapples in Cote d'Ivoire) that was of insufficient size or grade that would be suitable for export markets was commonly sold in domestic markets. The government of Kenya banned domestic use of dimethoate pesticides in 2014 to help safeguard exports of its produce to the European Union, potentially increasing the safety of produce available in domestic markets. The PIP program helped train personnel on appropriate food safety and GAP procedures, and it is highly likely that the safety of fruits and vegetables sold in local markets also were improved through the work of these trained individuals. Collectively, these are examples of the following positive spillovers:

- Investments in trade-related SPS measures for exported products improves capacity of businesses to provide safe foods for the domestic market as well. This depends on the extent to which the exported products also are sold in domestic markets (see table 2 – positive spillover 1)

- Projects focused on restricting use of banned pesticides for produce intended for the export market can lead to reductions in illegal pesticide residues on foods in the local market (see table 2 – positive spillover 7).

- Building the food safety capacity of individuals within the export sector can have a wider impact nationally as these people are mobile and may transfer the benefits and skills to other organizations and sectors (see table 2 – positive spillover 16).

44. There is considerable evidence supporting the notion that larger-scale, more formal enterprises are more likely to implement appropriate food safety practices compared to smaller-scale, level developed enterprises. However, there are limited data demonstrating that these improved practices necessarily translate to safer food. While it is to be expected that improved food safety practices result in safer food, few studies have formally studied this question. In a recent project in Malawi, Bourquin and Thiagarajan (2016) observed that food processing companies who were engaged by the World Food Program and NGOs to manufacture emergency food aid (such as fortified maize meal, maize: soy blend and high energy biscuits) were required to make significant investments in facility upgrades, improved equipment and implementation of formal food safety management systems. These improvements would be expected to have positive spillover effects on the safety of foods sold by these companies in the domestic markets.

45. Few studies have compared the safety of food in the formal and informal markets, and those that do often have found that food sold in the formal sector is no safer than that sold in the informal sector (Grace; 2015). For example, Roesel and Grace (2015) commented that, in the case of milk in Assam, Kenya and Tanzania and meat in Vietnam and Kenya, the food sold in the formal sector was no better (and sometimes worse) in meeting standards than food sold in the informal sector.

46. Improvements in infrastructure such as upgrading processing and packing facilities, installation of improved marketing and distribution facilities, or modernizing national laboratories are common approaches to support trade-oriented SPS measures. It is intuitive that these investments should have positive spillover effects on foods consumed in domestic markets, but this is not necessarily a good assumption. Grace (2015) provides examples wherein infrastructure investments in a number of countries were not successful in upgrading food safety standards for the local markets. Similarly, Thiagarajan and Bourquin (2008) observed that packing facilities constructed in Maharashtra to support

Box 2. Spillover Effects: MACBETH Project.

The MACBETH project (Market Access through Competency Based Education and Training in Horticulture) was an STDF-funded Project Grant (STDF/PG/326) implemented by Michigan State University with partners in Thailand and Vietnam during 2011-2013. The goal of MACBETH was to improve market access of fruits and vegetables from Thailand and Vietnam to high-value domestic and export markets. The project focused on the development and delivery of competency-based education and training on food safety and GAPs requirements for horticulture products to: 1) improve the capacity of small-scale, less technologically developed producers and processors to meet national and international standards, and 2) enhance the ability of government agencies, universities and private sector partners to support capacity building and market access initiatives for these suppliers.

An ex post evaluation of the MACBETH project conducted by STDF found evidence for several potential spillover effects on the domestic food safety situation that extended beyond the original project design (Graffham, 2015). Producers and processors participating in the project were able to consistently meet local high-value market demands not only for the commodities targeted by the project, but also for other products they produced. Several participating companies also noted that they made investments in infrastructure to support sales to export markets, and that this improved infrastructure also was supporting their sales to local markets. Finally, the in-country project implementing partners – Kasetsart University in Thailand and Can Tho University in Vietnam – gained from the project by incorporating the training content into their web sites, curricula, and by forging ongoing partnerships to address food sector and food safety issues. These are examples of the following spillovers:

- Adoption of good practices by farmers and SMEs for exported products extends to different products sold in local markets (see table 2 – positive spillover 2).
- Investment in infrastructure (e.g., processing and packing facilities, laboratory capacity) to support trade can simultaneously facilitate the provision of safer food/water locally (see table 2 – positive spillover 10).
- SPS technical assistance investments can have positive impacts on capability of domestic universities, research organizations, industry associations and other groups supporting other food and agriculture sectors (see table 2 – positive spillover 13).

mango export were not routinely used by growers and exporters, in part due to user fees that growers were not willing to pay.

47. Reviews of project reports for evidence of potential negative spillover effects indicated these negative effects were rarely identified. Perhaps this is not surprising if we assume that report authors are generally reluctant to call attention to potential negative outcomes. Based on this review, we conclude that objective evidence confirming the existence of negative spillover effects is largely lacking.

48. Concerns that trade-related SPS investments could result in a two-tier SPS system in developing countries is a potential negative spillover effect that was noted by a number of respondents to the initial internet survey. We are not aware of any research that has conclusively demonstrated this concern, but acknowledge the potential in some circumstances. For example, one strategy commonly used by exporting countries is pre-shipment testing for pesticide residues and other chemical residues. Products that are not deemed suitable for export based on these tests are typically diverted back into the local markets. Although this clearly is happening in some cases, the extent to which this occurs is not clear, nor is it well documented that the rejected products are actually less safe than comparable products available in local markets.

49. Jouanjean et al. (2015) used data on US import refusals to demonstrate that reputational spillovers are important factors in the enforcement of food safety measures. They found that the odds of a country experiencing at least one import refusal increased by over 100% if there was a refusal of the same

product from a neighbouring country in the previous year. Further, the odds of a refusal increased by 62% if there was a refusal of a related product from the same country in the preceding year. The findings of Jouanjean et al. (2015) don't necessarily constitute a negative spillover effect associated with trade-related SPS technical assistance, but rather demonstrate the negative impact of increased scrutiny of imports based on previous failures to effectively manage SPS issues. Nevertheless, we note that this research may represent evidence for the existence of negative spillover 5 (identification of food safety failures in exported products can have reputational risks for other exports, and also decrease consumer trust in domestically produced foods).

5.2 Key Informant Interviews

50. Key informant interviews were conducted to gather additional information on the draft spillovers framework and to identify any additional examples of potential positive or negative spillover effects. Participants in these interviews were identified based on their experience in conducting trade-related SPS technical assistance activities in a variety of economies. Fourteen individuals were invited to participate in these interviews, and information was collected by phone interview or email communication from seven individuals.

51. Some consistent themes were noted from these interviews:

- In general, all respondents agreed that the spillovers framework was well conceived and should be useful for future projects that wish to assess potential spillover effects.
- All respondents noted that the assessment of spillover effects is an extremely challenging topic. This is principally due to the very limited amount of available evidence that supports or refutes the existence of these effects.
- Several of the respondents identified potential positive spillover effects, and a few instances of potential negative effects were noted. However, only anecdotal evidence was available to support the existence of such effects.

52. In instances where potential spillovers were noted, the available evidence was included in the summary table that is appended to this report as **Annex 2**.

53. All respondents commented on the general lack of availability of objective evidence for spillovers. This lack of evidence is undoubtedly due to several factors, but the absence of a robust monitoring and evaluation framework in most technical assistance projects was commonly noted as a key factor limiting the available evidence. As one respondent noted: *"By and large most technical assistance projects I have worked on do not have robust - indeed even basic - monitoring and evaluation frameworks that measure the impact of the projects themselves (let alone spillover effects), either in the short term or long term."*

54. Multiple respondents noted that investments in capacity of national competent authorities to ensure food safety are vitally important and have a high likelihood of generating positive spillover effects on the domestic food safety situation. For example, technical assistance projects aimed at improving regulatory capacity to support exports would potentially generate benefits with respect to the safety of food products in the domestic market. The likelihood of these positive spillovers occurring would depend on several factors, such as having adequate legal and regulatory structures at the domestic level and adequate resources (financial and human resources) to support domestic food safety efforts. Nevertheless, investments in the capacity of national competent authorities are generally believed to lead to benefits that extend beyond technical assistance efforts to support trade. As one respondent succinctly noted: *"In my humble opinion, a pre-requisite for obtaining a positive spillover effect is an efficient and unbiased food safety control system."*

55. Conversely, some respondents expressed caution regarding export-focused technical assistance activities if the beneficiary agency is too focused on exports at the expense of domestic food safety. One respondent described the potential for a negative spillover effect as follows: *"This is really a no brainer for developing country food control agencies: a key driver of economic development is trade*

(where there is product to trade), investing in export-oriented food control is critical to that, and donors and private sector are eager to be involved also. The downside of this, especially for Least Developed Countries, is that a large proportion of official Competent Authority resources are devoted to servicing exports. Foreign exchange earned embeds this government investment focus in export control. However, this focus can detract significantly from domestic food control investment."

56. Several respondents noted that trade-related SPS technical assistance projects often have positive spillovers domestically with respect to building capability of small-scale producers and processors who lack sufficient scale to engage in export markets. Inclusion of SMEs in training programs and providing other forms of technical support to these small enterprises is one manner in which trade-focused technical assistance projects can increase the likelihood of positive spillovers on the safety of products available in domestic markets. One respondent noted that technical assistance aimed at improving food safety compliance with respect to pesticide usage for exported horticulture products also resulted in efficient uptake of these improved food safety practices by farmers selling other horticulture products in the domestic market.

57. Multiple respondents also noted the importance of SPS-related technical assistance activities to improve public understanding of food safety issues, which can drive increased demand for safe food products locally. Engagement of industry associations who actively support domestic food safety efforts was also noted as a key factor that fosters the adoption of food safety practices for products sold in domestic markets. Meaningful engagement of government and industry in public-private partnerships to address food safety issues is considered a key condition that can increase the likelihood of positive spillovers on domestic food safety.

58. With respect to the spillover effects described in the framework, some respondents indicated that some categories could be merged to reduce the list of potential spillovers. Another respondent recommended the addition of another potential spillover effect – "Domestic food control systems obtaining coherence with and adoption of Codex food standards and making certain domestic food control systems are aligned with international standards." At this time, the spillover framework and list of potential spillover effects has not been modified based on feedback obtained during key informant interviews.

5.3 Feedback During STDF Working Group Meeting

59. Results of this PPG were presented at the meeting of the STDF Working Group in Geneva on October 30, 2018 in the form of a draft final report and a summary presentation. Discussion and feedback on the report generally focused on two themes.

60. First, it was noted by some representatives to the STDF Working Group that the term "spillover effect" was somewhat ambiguous and did not translate clearly in some languages. Another potential term to describe these effects (co-benefits) was discussed during the working group. However, it was noted that the term "co-benefits" might not be an adequate alternative given the expectation that some "spillover effects" may, in fact, be negative rather than beneficial. Further exploration and definition of the terminology for "spillover effects" would be useful.

61. Second, the potential for developing a formal checklist to be used *ex ante* as a tool for evaluating projects with respect to their potential for spillover effects was discussed. The MSU team agreed to explore this possibility in coordination with a small group of members from the original working group for this PPG. Given the fact that most of the potential spillover effects identified in this study are hypothetical, we recommend that additional research be conducted to identify concrete evidence for spillover effects and factors that impact the likelihood of their occurrence. It is our opinion that a formal checklist could be devised as a predictive tool for potential spillover effects only after the research base is more thoroughly developed.

6 CONCLUSIONS AND RECOMMENDATIONS

62. Work carried out under this PPG highlights the general unavailability of objective, hard evidence for spillover effects of export-oriented food safety capacity building projects. This lack of evidence is likely due to several factors, including the absence of a robust monitoring and evaluation framework in many projects. In addition, while there is a considerable body of literature on the effects of investments in the food and agriculture sector on profitability, trade, markets, standards and other outcomes, little has been published on the impacts of these investments on the domestic health situation. This lack of information is assumed to cause many countries to under-invest in food safety (Jaffee, 2018).

63. While quantifiable evidence was found to be extremely limited, the work carried out under this PPG identified ample anecdotal evidence of positive spillover effects of export-focused technical assistance projects on the domestic situation. However, no qualitative or anecdotal evidence was found focused on potential negative spillovers.

64. Assessing potential impacts of SPS technical assistance on local health conditions as an indicator of food safety is particularly challenging because few countries have sufficiently effective health surveillance systems to identify trends in health status indicators. In fact, even in countries with extensive health surveillance and foodborne illness reporting systems, identifying long term improvements in overall health indicators (e.g. incidence of foodborne illness in the population) is extremely challenging. For these reasons, future research on identifying spillover effects of SPS technical assistance will need to focus on indicators other than human health outcomes.

65. Work under this PPG identified certain conditions, which if existing, are likely to increase the likelihood of spillover effects occurring. These conditions were grouped in three categories: 1) sector-specific considerations, 2) the nature of the technical assistance, and 3) institutional support and enabling environment factors.

66. For instance, positive spillover effects are believed to be more likely to occur when technical assistance projects target: i) sectors or supply chains that are well established with integrated operations; ii) products having a large domestic market; and iii) market sectors for which domestic producer- and processor-focused private sector / industry associations are strong. Conversely, technical assistance targeting products that are produced principally for export to other countries are expected to generate few spillovers on the domestic food safety situation. This is particularly true if the sector is geographically distinct or segregated from domestic production systems.

67. Further work could be carried out, based on these conditions, to formally assess the occurrence of domestic spillover effects from trade-related SPS capacity development projects. Such research would help build an evidence base for recommended practices that increase the likelihood of positive domestic spillover effects associated with trade-related SPS capacity development projects.

68. The research and analysis carried out under this study has pointed to the potential utility of the conceptual framework developed as a means to assess potential positive and negative spillover effects of trade-related food safety capacity building projects. Additional work and research in the field to further test and validate this framework would be useful.

69. Based on the outcomes of this study, we have the following recommendations for development partners, international/regional organizations and donor agencies involved in developing, implementing and/or funding projects on trade-related food safety capacity development.

i. Monitoring and evaluation of trade-related SPS technical assistance projects in the future should strongly consider the inclusion of indices to assess potential spillover effects on the domestic food safety situation. Systematic assessment of spillover effects resulting from these projects would provide valuable information on the potential for investments in trade-related SPS capacity to beneficially impact food safety domestically.

ii. At the outset, when food safety capacity building projects to promote trade are being designed and developed, more systematic thought should be given to more explicitly and clearly identify

and tease out linkages and synergies between trade-related capacity building and domestic food safety. For instance, might there be opportunities to link or "twin" capacity building activities targeted at trade-related value chains with other supply chains that primarily serve the domestic market? Might there be opportunities to increase dissemination of food safety training materials developed to other stakeholders not involved in trade?

iii. It would be beneficial for published articles and project reports from trade-related SPS technical assistance projects to be made available in the STDF online Library, available on the STDF website (www.standardsfacility.org/library). Donors and development partners are strongly encouraged to make more and better use of the online Library to share their relevant project documents, reports, evaluations, etc. related to SPS capacity building.

iv. Donor agencies should strongly consider funding research and analysis to evaluate the occurrence of individual spillover effects as well as the broader conceptual framework for spillovers, including conditions hypothesized to support positive spillovers. This study identifies and describes a conceptual framework for categorizing spillover effects and hypothesized conditions that would be conducive for positive spillover effects, based on desk research and consultations. Additional research to fully validate this framework and test these hypotheses, on the ground in selected developing countries or regions would be beneficial. Such research to validate and test this framework could be designed and carried out as a stand-alone project, or could be incorporated into selected already planned trade-related food safety capacity building projects.

70. We also have the following recommendations for recipient countries:

i. Trade related capacity building efforts are more likely to generate positive domestic spillover effects when the efforts are focused on value chains/products that are consumed domestically. Investments in products that are primarily exported are less likely to positively impact domestic food safety.

ii. Avoid servicing exports at the expense of domestic food safety. Investments in regulatory capacity and infrastructure supporting export markets should be planned in a manner in which they can support domestic food safety efforts.

iii. Engagement of all relevant actors – government, private sector, civil society organizations, research institutions, consumers, etc. – in value chains will increase the likelihood of positive spillovers on domestic food safety. Effective planning and implementation of capacity building can comprehensively improve food safety for products that are exported, as well as those which are domestically consumed.

7 REFERENCES

Andersson, J. 2018. Results and lessons from STDF Projects: A Meta-Evaluation. http://www.standardsfacility.org/STDF-meta-evaluation Retrieved October 8, 2018.

Bourquin, L. D. and D. Thiagarajan. 2016. Supporting Malawian Food Manufacturers to Effectively Comply with Global Food Safety Regulations. Malawi Integrating Nutrition in Value Chains (INVC) Project report. September, 2016.

Codex Alimentarius Commission. 2017. Report of the 23rd Session of the Codex Committee on Food Import and Export Inspection and Certification Systems.
Mexico City, Mexico 1 -5 May 2017. REP17/FICS Appendix 2.

COLEACP. 2010. Aid for sustainable development. Exports are good for the local community. https://www.youtube.com/watch?v=0gfA3LOXUdU Accessed October 22, 2018.

Grace. 2015. Food safety in developing countries: an overview. A learning resource for DFID Livelihoods Advisors. ILRI.

Graffham, A. 2015. Ex Post Evaluation of STDF Project "A Southeast Asian Partnership to Build Capacity for Fresh and Processed Fruit and Vegetable Products" in Thailand and Vietnam (STDF/PG/326) http://www.standardsfacility.org/sites/default/files/STDF_PG_326_External_Evaluation.pdf Accessed October 22, 2018.

Jaffee, S., S. Henson, L. Unnevehr, D. Grace and E. Cassou. 2018. Accelerating Food Safety Improvements in Low and Middle-Income Countries: A Development Imperative. Agriculture and Rural Development.

Jouanjean, M.-A., J.-C. Maur, and B. Shepherd. 2015. Reputation matters: Spillover effects for developing countries in the enforcement of US food safety measures. Food Policy 55:81-91.

Roesel, K. and Grace, D. 2015. Food safety and informal markets: animal products in sub-Saharan Africa. Routlege, available at https://cgspace.cgiar.org/handle/10568/42438.

Schöpfel, J. 2011. Towards a Prague Definition of Grey Literature. http://www.opengrey.eu/item/display/10068/700015 Retrieved October 3, 2018.

STDF. 2012. Concept Note. STDF study on spill over effects of export-oriented SPS technical assistance on the domestic food safety situation. STDF/Coord/396/Background Note Sep- 2012. Available at: http://www.standardsfacility.org/sites/default/files/PPG_535_STDF_Concept_Note_2012.pdf

STDF. 2017. Terms of Reference. STDF/PPG/535: Spillover Effects of Export-Oriented SPS Technical Assistance on the Domestic Food Safety Situation. Available at: http://www.standardsfacility.org/sites/default/files/PPG_535_Terms_of_Reference.pdf

Thiagarajan, D. and L. D. Bourquin. 2008. Improving farmer incomes via enhanced and sustainable market linkages. Final report of the Partnerships for Food Industry Development – Fruits and Vegetables: India Mango Market Development Project.

Annex 1 – Spillovers Survey Instrument

1) Introduction:

Michigan State University (MSU) is implementing a study for the Standards and Trade Development Facility (STDF) to develop a framework for assessing potential spillover effects of export-oriented SPS capacity building on the domestic food safety situation. The ultimate goal is to draw key lessons to improve the framework, design and delivery of future trade-related SPS programs. More information is available at: http://www.standardsfacility.org/PPG-535

To support development of this framework, we are soliciting information resources (published research, project reports, other evidence) that could be useful to support (or refute) the potential for these spillover effects. The information obtained will inform the development of a conceptual framework to assess potential for spillover effects of SPS capacity building investments.

The target audience for this survey includes individuals working in food and agriculture sector development, SPS standards, trade capacity development, and related disciplines. We would appreciate your completing this survey by **Friday, September 8, 2017**.

[Note: Survey was left open for responses until October 11, 2017.]

2)
Examples of potential spillover effects could include, but are not limited to:

- Improved safety of food products in domestic markets due to spillover of capacity development initially aimed at export-oriented activities.
- Improved food safety awareness and behaviours of food producers, processors, and other actors in the food chain as a consequence of participation in export-oriented SPS capacity building activities.
- Improved capacity of competent authorities to regulate domestic food producers and processors.
- One hypothetical example of a potential negative spillover effect would be that export-oriented capacity building might result in market segmentation wherein high-quality products are exported and only lower-quality products are sold in local markets.

3)
Do you have any information, examples or experiences of potential spillover effects (positive or negative) of trade-related SPS capacity building projects or programs?

We encourage the submission of publications, reports or other evidence even if the assessment of spillover effects was not a primary aim of the study/intervention. It is important to note that we are seeking information on a variety of potential spillover effects, including potential negative effects.

If you have information of this nature to contribute, please provide details by responding to the subsequent questions:

4)
What is the nature of the evidence?

- Publication
- Report
- Anecdotal Evidence
- Other Evidence

5)
Please provide information about the evidence you are contributing. If available, please provide a citation or web link to the relevant information in the box below. Electronic files may be emailed directly to Professor Leslie D. Bourquin at [bourqui1@msu.edu].

For anecdotal evidence or other evidence, please add a description in the box below.

If you wish to provide multiple items, you can combine them in the box below or complete this survey multiple times.

6)
Please provide your name, organization and email address so we can keep you informed about the results of this survey.

Name:
Organization:
Email Address:

7)
On behalf of Michigan State University and the STDF, thank you very much for your contribution to this project. If you have any additional questions, please feel free to contact the following persons.

Leslie D. Bourquin, Ph.D.
Department of Food Science and Human Nutrition
Michigan State University
East Lansing, MI 48824-1224 USA
Email: bourqui1@msu.edu
Phone: +1-517-353-3329

Deepa Thiagarajan, Ph.D.
Department of Food Science and Human Nutrition
Michigan State University
East Lansing, MI 48824-1224 USA
Email: thiagara@msu.edu
Phone: +1-517-353-3341

Annex 2 – Findings of the Literature Review

71. The following table details references to potential spillover effects identified by reviewing published literature and project reports from trade-related SPS technical assistance projects completed during the past ten years. The literature review was targeted to specific geographies and sectors of the food industry. These were identified by the participants in the November 2017 Geneva workshop on spillover effects.

72. The primary data sources for this exercise were completed project reports. Reports of technical assistance activities conducted under STDF-funded projects are particularly prevalent in this analysis, principally because STDF projects are generally focused on technical assistance activities that are potentially conducive to assessing potential spillover effects, and also because reports of STDF projects are readily available on the STDF web site. In some cases, information provided by working group members or other key informants were used to populate the table.

73. Mentions of potential spillover effects are organized according to the spillovers matrix developed during the November 2017 Working Group meeting.

74. A bibliography of reports and other information sources is summarized at the end of this report. In addition to the data sources noted in the bibliography, the authors also reviewed reports of 56 additional projects that did not identify potential spillover effects.

Table A1. Evidence of potential positive spillover effects identified by literature review and key informants.

Country	**Evidence** (Statements from reports or key informants)	**Reference**
1. Investments in trade-related SPS measures for exported products improves capacity of businesses to provide safe foods for the domestic market as well. This depends on the extent to which the exported products also are sold in domestic markets.		
Malawi	*In a recent project in Malawi, Bourquin and Thiagarajan (2016) observed that food processing companies who were engaged by the World Food Program and NGOs to manufacture emergency food aid (such as fortified maize meal, maize: soy blend and high energy biscuits) were required to make significant investments in facility upgrades, improved equipment and implementation of formal food safety management systems.*	Bourquin, L. D. and D. Thiagarajan. 2016. Supporting Malawian Food Manufacturers to Effectively Comply with Global Food Safety Regulations. Malawi Integrating Nutrition in Value Chains (INVC) Project report. September 2016
Myanmar	*Out of 11 beneficiaries' companies who participated in the project to implement HACCP and Hygiene practices, 6 are small (less than 20 employee) sesame and peanut edible oil miller located in Mandalay, Sagaing and Magway regions. None of these companies are exporting its products as of now. They attended the full set of training delivered by the ITC expert on food safety and 5 of them still collaborating with our local Trainers/Counsellor to implement HACCP. Since having joined the project, their main interest is to promote the quality and safety of their oils in the local market.*	STDF/PG/486. Improving compliance with SPS measures to boost oilseed exports. Personal communication with Dr. Marta Drago.
Nicaragua	*Implementation of knowledge gained during the project contributed significantly to increased quality in the crops covered, as the skills in crop planning, varietal selection, soil management, fertilization, integrated pest management, hygienic and harvesting/packing practices and safer working conditions developed by the farmers* *helped them to produce closer to market specifications, as certified by the farms which have obtained or are in the process of obtaining certification to the national GAP programme verified by IPSA.*	(STDF/PG/155 Nicaragua Evaluation, Pg. 18)
Solomon Islands	*Investment in infrastructure (e.g., processing and packing facilities, laboratory capacity) to support trade can simultaneously facilitate the provision of safer food/water locally. (e.g., FAO project in Solomon Islands;*	www.fao.org/asiapacific/news/detail-events/en/c/1042995/
Thailand	*Other remarks noted that through MACBETH project training the farmers learned best practices on chili pepper production and GAP, such as the use of safe chemical substances and establishing cooperation among farmers for setting up a packing house and collecting the fresh produce, and for pre-market management such as sorting, culling, sizing, etc., to supply produce to larger national and regional markets.*	(STDF/PG/326 SEA MSU Final Report, Pg. 15)
2. Adoption of good practices by farmers and SMEs for exported products extends to different products sold in local markets.		
Senegal	*Senegal has integrated in its agricultural development programme (PRACAS) the promotion of fruit and vegetable export chains, also with a view to having an impact on the control of the safety of products sold on the domestic market. The increase in the supply of*	Babacar Samb, Personal Communication www.ipar.sn/IMG/pdf/pracas_version_finale_officiele.pdf

Country	**Evidence** (Statements from reports or key informants)	**Reference**
	export products such as melon (11,642 T in 2016), watermelon (7,870 T in 2016) and green beans (11,676 T in 2016) in the local market during the counter-season illustrates the positive impact of the development of these export crops.	
Thailand	*Participants in capacity building programs were strategically linked to potential high-value market opportunities within the project countries*. *The OARD2 representative also indicated that, as a result of MACBETH program, GlobalGAP was being implemented in farms that produce a variety of crops such as mango, chilli peppers and other organic vegetables and supply to Green market and Q-restaurant (the restaurant which serves food only from GAP-certified farmers).*	(STDF/PG/326 SEA MSU Final Report, Pg. 2) (STDF/PG/326 SEA MSU Final Report, Pg. 15)
Vietnam	*Participants in capacity building programs were strategically linked to potential high-value market opportunities within the project countries*.	(STDF/PG/326 SEA MSU Final Report, Pg. 2)
3. Increasing market share of formal enterprises in food production and trade will result in increased food safety. Formal enterprises are more likely to follow good practices.		
Costa Rica	*Trade is therefore boosted, resulting in economic growth with benefits for those directly involved and for the associated sectors. More demand for animal feed, chemicals, veterinary drugs, packing houses and the associated cooling and freezing technologies result in more jobs, in addition to increased tax returns for the country that may be funneled to areas of interest.*	(STDF/PG/116 Costa Rica Evaluation Report, Pg. 9)
Mali	*The Enhanced Integrated Framework Programme operates to improve mango quality in regions through phytosanitary treatment of mango orchards; popularization of good agricultural practices; raising awareness, information and capacity building of the different professional actors (producers, traders and exporters) in various fields; guidance and support to the GLOBAL GAP certification for a dozen exporters; internal auditor and quality manager training; support to commercial promotion through involvement in national and international trade events (Fruit Logistica, Fancy, SIFEL in Morocco) and fund-raising assistance. The Enhanced Integrated Framework Programme has been contributing to improve the sector's stakeholders' incomes, especially those of producers, and to create additional value by supporting processing plants.*	(EIF Mali Mango Trade Facilitation Project, Pg. 1-2)
4. Investments in regulatory capacity for supporting exports also results in strengthened domestic food safety policies and improved regulatory compliance for the local market (i.e. safer foods locally).		
Nicaragua	*Food safety for consumers. As a result of the increased assurances and compliance with SPS requirements, resulting from the application of good agricultural practices in the field and in harvest and processing, consumers have better guarantees of the safety of the products being offered. The reinforcement of measures to reduce aflatoxins in peanuts in the wake of the EU FVO inspection in 2012 was easier to implement thanks to the prior knowledge obtained by the farmers through participation in MOTSSA.*	(STDF/PG/155 Nicaragua Evaluation, Pg. 18)

Country	**Evidence** (Statements from reports or key informants)	**Reference**
Thailand	*Extension experts from KURDI in partnership with the MACBETH program have developed the course contents and materials on basic/intermediate levels of GAP training which emphasize food safety principles and are easily understood and implemented by farmers. The contents were designed to address specific challenges to producers in Thailand. The course content provided best practices for chemical usage and using organic substances instead of chemical agents. Furthermore, they used core knowledge in basic/intermediate GAP and food safety as a minimum requirement for Thai standards.*	(STDF/PG/326 SEA MSU Final Report, Pg. 16)
Ukraine	*In 2015 a new Food Safety Law based on EU requirements was adopted. This was one of prerequisites to intensify export of food of animal origin to EU markets. The Law adopted new high standards for food safety in general without any distinction between domestic or export markets.*	Kateryna Onul, World Bank Group, Personal Communication.
5. Investments in food production and processing standards may generally improve environmental conditions, occupational health, and food safety in recipient economies.		
Nicaragua	*Change in Awareness and Attitude. The greatest impact of the project has been the farmer's approach to reducing risks and dangers of producing chemically contaminated foods, as they became aware of how this affects their health, environmental impact and trade value. Producers exposed to the project have wholeheartedly embraced better agronomic, health and safety, pesticide handling and hygiene practices. This has resulted in better clean and waste water management, more environmentally friendly pesticide container disposal, reduced pesticide use, keeping of application records, and a healthier living attitude all round.*	(STDF/PG/155 Nicaragua Evaluation, Pg. 18)
6. Technical assistance projects aimed at meeting maximum residue limits (MRLs) for pesticide residues in fruit and vegetable products through the use of Good Agricultural Practices (GAPs) and better pesticide use may reduce environmental pollution and reduce cases of pesticide poisoning among farm workers.		
Bolivia, Colombia, Costa Rica, Guatemala, Panama	*Finally, this project initiated dialog between government researchers, the pesticide industry, and grower/exporter stakeholders to identify and prioritize crop protection needs. With this expanded communication and skills developed among stakeholders in the region, the goal is to systematically work towards replacing "high risk" pesticides with lower-risk alternatives, providing increased safety to consumers, field workers, and the environment, while enabling governments to respond quickly to new outbreaks of pests and diseases.*	(STDF/PG/436 Latin America Pesticide Residue Data Generation Project, Pg. 14)
Kenya	*Okello and Swinton (2010) looked at the imposition of developed-country pesticide standards in export production of vegetables in Kenya. Farmers who were monitored for compliance and provided with pesticide safety training tended to have fewer pesticide-related health problems and used safer chemicals. This is an important example of spillover benefits for domestic safety from higher standards in exports, and stands in contrast to the lack of spillovers for domestic seafood in Brazil found by Donovan et al. (2001).*	(Unnevehr, L. and Ronchi, L. 2014. Pg. 6)

Country	**Evidence** (Statements from reports or key informants)	**Reference**
Various Economies	*Compliance with private food safety standards has been found to lead to higher export sales and prices, revenues, and incomes in 10 studies of high-value horticultural exports in 14 different countries. Other benefits identified in many cases include adoption of improved technology with spillover benefits for staple crops (Minten et al. 2009), higher or more stable labor income (Maertens and Swinnen 2009; Minten et al 2009), and improved health through reduced on-farm exposure to pesticides (Kersting and Wollni 2012; Asfaw et al. 2009; Okello and Swinton 2009).*	(Unnevehr, L. and Ronchi, L. 2014. View Point Pg. 2, 3)
7. Projects focused on restricting use of banned pesticides for produce intended for the export market can lead to reductions in illegal pesticide residues on foods in the local market.		
ASEAN Countries	*Increased environmental and consumer safety through upgraded crop protection tools. While second and third generation pesticides are being phased out by developed countries due to human and environmental risks, farmers in developing countries often continue to use these chemicals because of the lack of international MRLs based on newer, safer (less toxic) pesticides for their specialty crops. Due to this situation, farmers are limited in their crop protection tools (continued use of more toxic chemicals) resulting in economic loss (restricted market access), lower crop productivity (increased rate of pest resistance), and negative impacts on environmental, worker, and consumer safety. This project helped to resolve these issues, with additional benefits for agricultural productivity, environmental safety and consumer safety.*	STDF/PG/337 Results Page: Strengthening capacity in ASEAN to meet pesticide export requirements. STDF/PG/337 Strengthening capacity in ASEAN to meet pesticide export requirements. Results Story
Cameroon, Côte d'Ivoire, Ghana, Nigeria, Togo	*These trainings and workshops have imparted awareness of food safety issues to operators, at least to the extents that all operators along the value chain are aware of these issues and are taking steps to addressing them. It is estimated that this has led to a significant reduction in higher pesticide residues.*	STDF/PG/298 "COCOA SPS AFRICA PROJECT" Project Completion Report, Pg. 22
Kenya	*The Kenya Government last week indefinitely suspended the use of the pesticide dimethoate by farmers growing fresh produce for export to the European Union (EU). The Pest Control Products Board (PCPB) last week issued a legal notice suspending all foliar use of pest control products containing dimethoate or its metabolites. The suspension of the pesticide comes a few months after the Government threatened to gazette new regulations barring the use of the chemical, with a view to protecting fresh produce from being banned by the EU.*	*Standards Media 2014 article 'State bans pesticide to protect exports to European Union'*
Ukraine	*Based on the Association Agreement with the EU, Ukraine is obliged to approximate its SPS legislation including norms on pesticides. Thus, EU high norms will become obligatory not only for EU exporters, but for all producers without any distinction.*	Kateryna Onul, World Bank Group, Personal Communication.
Vietnam	*Production of safe vegetables in compliance with VietGAP helped farmers to reduce pesticides as well as labor costs to make products with 20-30% higher economic efficiency than conventional products.*	(STDF/PG/259 FAO-FAVRI Final Report, Pg. 60)

Country	**Evidence** (Statements from reports or key informants)	**Reference**
8. Projects aiming to improve pre- and post-harvest practices to reduce chemical contamination in products intended for export may reduce morbidity in the local population through the increased availability of safer products.		
Myanmar	*Myanmar farmers: throughout the set of trainings on GAP delivered by the International expert in agriculture and the continuous follow up done by the National Consultant and Trainers from regional DoA over 1.5 year timeframe as of now, the farmers acquired important knowledge on GAP, pest management, harvest and post-harvest techniques, plant and soil nutrition etc. to be applied also to other crops in their farms which will be consumed among their family members and neighbours. We hope that their increased awareness on food safety hazards due to product contamination from improper farming practices will encourage them to improve their practices to provide safer foods for their families. However, the local market still doesn't have a mechanism to recognize higher prices to GAP oilseeds crops, therefore most of the farmers are trying GAP to access the export markets.*	STDF/PG/486. Improving compliance with SPS measures to boost oilseed exports. Personal communication with Dr. Marta Drago.
Thailand	*Ultra Farm Co., Ltd., a supplier to Siam Makro Co., Ltd., underlined the benefits and impacts they received by partnering with the MACBETH program. Benefits include improving farmer production of Chinese kale in Suphan Buri province by reducing unnecessary chemical usage and adopting GAP in their production systems. They now supply directly to a chemical free area in Pa Cheng Center and Talad Thai, the largest wholesale market in Thailand.*	(STDF/PG/326 SEA MSU Final Report, Pg. 15)
9. System-wide SPS capacity building projects (e.g., to improve SPS legislation or strengthening competent authority capacity) may improve domestic food safety controls.		
10. Investment in infrastructure (e.g., processing and packing facilities, laboratory capacity) to support trade can simultaneously facilitate the provision of safer food/water locally.		
Nicaragua	*Ongoing benefits. The infrastructure set up by the project at the demonstration plots in the form of toilets, storage sheds, wellhead protection, chemical mixing stations and fencing still remains and continue to be used by the producers as a model of how to work following good agricultural practices on their and neighbouring community farms. Small groups of students continue to be trained at the facilities set up at the universities.*	(STDF/PG/155 Nicaragua Evaluation, Pg. 19)
Solomon Islands	*PHAMA provided a range of support to build the capacity of the competent authority (CA) for Health. PHAMA supported benchmark audits of Health against EU requirements. PHAMA also provided support for the National Public Health Lab to improve its testing capacity, and provided food safety training for the fish processing industry.*	(PHAMA Impact Report, Pg. 12)
Solomon Islands	Access to accredited food laboratories with capacity to test food composition, contaminants in food and microbiological safety of food is an area of increased concern in the Pacific. FAO is assisting the National Public Health Laboratory in the Solomon Islands gain international ISO 17025 accreditation for	www.fao.org/asiapacific/news/detail-events/en/c/1042995/

Country	**Evidence** (Statements from reports or key informants)	**Reference**
	microbiological testing of food and water for pathogens causing foodborne illness.	
Thailand	*The organic farming community at Wang Nam Khiao praised the MACBETH project's face-to-face training activities and are now committed to installing a new pack house and cooling room to produce a high quality fresh produce and serve larger high value markets such as department stores, as a result of increasing fresh produces values and earning more income.* *Through partnership with Siam Makro Co., Ltd and via MACBETH project participation, the company decided to set up a cooling chamber for fresh produce storage to reduce product loss and extend shelf life. In addition, the company plans to build capacity to direct-market their products to buyers.* *In Thailand the manager of the Wang Nam Khiao Vegetable Cooperative reported that her customer base has increased by ~10%, and her sales have risen from 140 tonnes to 170 tonnes per annum (18% increase). She attributed the increased sales to a better out-turn percentage with lower levels of rejections. Post-harvest wastage is down to ~5% by volume (formerly ~20%) due to implementation of better harvesting and post-harvest practices following the MACBETH training. The value of product has also increased due to improved access to high-value markets. Some of the profit has been re-invested in the business to provide a second temperature controlled truck. She was able to provide such a precise picture due to the improved record keeping system introduced as a result of the MACBETH training programme.*	(STDF/PG/326 SEA MSU Final Report, Pg. 15)
11. Increasing consumer awareness of food safety as a result of technical assistance projects can create demand for safer food, driving improved domestic policies and regulatory capabilities, and improved food safety management by local producers and processors.		
Malaysia	*Food safety has been discussed in a number of meetings and committees in Malaysia as well as international/regional e.g., ASEAN Cocoa Club and it is a concern and will be monitored continuously. She commended the initiatives of the collaborative partners to undertake this project to make sure the food safety issues are well informed by those involved in producing the raw cocoa ingredients. Consumers nowadays are more health conscious and any source of contamination must be accurately and properly identified.*	(STDF/PG/381 Report of the End Project Meeting, Pg. 2)
Myanmar	*For domestic food safety, the local oil sector is increasing competitiveness among both imported and manufactured oil. The consumer demanding good quality oil because of the increase awareness on drawback of both oil. The millers and importers explore and raise the drawback of the other side and promote to the consumer awareness. So both side are trying to improve their competitiveness. While all oil millers are encouraged to apply FDA GMP approval, palm oil importers are also encouraged to import only high quality palm olein and encouraged not to distribute in bulk into local market for more responsible traceability.*	STDF/PG/486. Improving compliance with SPS measures to boost oilseed exports. Personal communication with Dr. Marta Drago.
12. Demonstration of effective food safety management in one or more value chains in a country can have positive spillovers for other value chains.		

Country	**Evidence** (Statements from reports or key informants)	**Reference**
Costa Rica	*Implementation of a mandatory and nationwide system for group traceability and mobilization control, that makes possible to trace the origin of a group of cattle from any auction or slaughterhouse in the country to the farm of origin. The current system requires that all cattle movements must be associated with the necessary information to prove ownership, source and responsibility for the animals and establishing penalties for breaching these provisions. The system allows for improvements, as required, and is the basis for the implementation of traceability systems to other species (dairy, fish, swine, sea food,) and products (fruits).*	(STDF/PG/116 Costa Rica Evaluation Report, Pg. 9)
New Zealand	Success of the New Zealand dairy sector was posited as a success that has had positive spillovers for other food and agriculture sectors in the country. Maintaining New Zealand's reputation for safe food is a stated priority of the New Zealand Ministry of Primary Industries.	www.mpi.govt.nz/exporting/overview/growing-exports/
Nicaragua	*Increased knowledge. Farmers and their families, agricultural technicians, government officers, university professors and accreditation personnel have all benefitted from the project having provided them with training and advice, implementation manuals, materials, video, publication, leaflets, and infrastructure for continuing the task of spreading the word about the importance of Good Agricultural Practices to other stakeholders not involved in the project – 3 years after its end the legacy of the project is still evident and alive.*	(STDF/PG/155 Nicaragua Evaluation Pg 18)
Thailand	*Field visits by the evaluator in Thailand and Vietnam showed that in the 2 years since the end of the project, most of the beneficiaries visited had used the MACBETH training to implement FSM/GAP standards and gain greater access to higher value markets. For example, an organic vegetable cooperative in Thailand had increased access to high value supermarket retailers by 10%, sales volumes had increased 18% and wastage had fallen from 20% to just 5%.* *Siam Makro Public Co., Ltd, a leading produce company (including Chinese kale, chili peppers, long bean, cabbage, mango, pineapple, banana and longan) adopted the knowledge obtained from the MACBETH project to their company and their suppliers. With the collaboration of food safety networks through the MACBETH project and dedicated Siam Makro staff, at present all of their produce suppliers now have received GlobalGAP certification and the fresh produce from these suppliers are deemed safe. The company has a strong commitment to develop food safety and food quality standard by supporting and educating suppliers throughout their supply chain.* *The representative from Koerner Agro Export Center Co., Ltd., spoke highly of their involvement with the MACBETH program via the GAP train-the-trainer programs. As a lead trainer, this knowledge has been transferred to contract farms and other producers, and as a result high quality and safe products have been produced, meeting specifications for export. These agricultural products are asparagus, leafy vegetables, lemongrass, okra, and baby corn. In the near future,*	(STDF/PG/326 External Evaluation 2016. Pg. 12) (STDF/PG/326 SEA MSU Final Report, Pg. 14) (STDF/PG326/ SEA MSU Final Report, Pg. 15)

Country	**Evidence** (Statements from reports or key informants)	**Reference**
	the company plans to have certified GAP and GMP for all fresh and processed products, respectively.	
Vietnam	*ANTESCO company thanked the MACBETH project for upgrading knowledge of food safety requirements for agricultural and food producers and processors. Company staff used knowledge packages of food manufacturing and primary production from the MACBETH project eLearning platform to train other internal staff and external stakeholders in An Giang province – up to approximately 700 farmers.*	(STDF/PG/326 SEA MSU Final Report, Pg. 14)
13. SPS technical assistance investments can have positive impacts on capability of domestic universities, research organizations, industry associations and other groups supporting other food and agriculture sectors.		
Bangladesh and India	*By following the TTT approach, the in-country training partners have the capacity to train a much larger group of participants and reach small producers in rural areas. The multiplier effect is measured by the total number of people trained as a result of the collaborative effort. As of December 2017, close to 20 thousand Bangladeshi individuals have been trained to help ensure the safety of Bangladesh fish and aquaculture products. As of December 2017, close to eight thousand Indian individuals have been trained to help ensure the safety of Indian spices and botanicals being produced.*	Clare Narrod, JIFSAN, Lessons Learned from JIFSAN's Collaborative Training Initiative Experience Promoting Country-Driven Food Safety Capacity Building in Bangladesh and India; Pg. 2
Brazil	*An unintended impact of the project might lie at the level of the scientific community, with several scientific papers and documents published illustrating the results of the project, confirming results of previous scientific research and enlightening the discussions on critical control points for aflatoxin prevention.*	(STDF/PG/114 Brazil Evaluation Report, Pg. 20)
Pacific Islands	*Donor collaboration: Some of the MAWGs and IWGs have become the go-to point for donors looking to provide targeted industry support into the future. Examples include:* *• Vanuatu beef – NZ MFAT, ACIAR and FAO have all used* *the Livestock IWG as the primary point of engagement when designing technical assistance investments.* *• PHAMA has established a strategic partnership with* *the Solomon Islands Rural Development Program on cocoa which is progressing the idea of direct funding with a number of the IWGs.* *• Solomon Island fisheries – PHAMA has worked extensively with FFA to address EU market access issues; FAO/WTO's upcoming activity to improve the National Public Health Laboratory capacity is led by the Seafood IWG.*	(PHAMA Impact Report Pg. 41)
Sri Lanka	*Partnership approach. Since 2012, a strong public-private partnership has brought together the Sri Lankan government, UNIDO, and The Spice Council - the apex body representing the cinnamon industry which has helped to mobilize additional assistance. The partnership focused on boosting the productive capacities and competitiveness of the value chain and on increasing exports to high-end markets. National vocational qualifications, at cinnamon field and factory level, were*	STDF/PG/343 Enhancing capacity in the cinnamon value chain; Results Story.

Country	**Evidence** (Statements from reports or key informants)	**Reference**
	rolled out by the Cinnamon Training Academy using a competency-based framework with a focus on food safety and hygiene practices.	
Thailand and Vietnam	*Furthermore, the project facilitated institutional strengthening and provided opportunities for the in-country partners to seek further collaborations to sustain project activities and long terms goals beyond the project period.*	(STDF/PG/326 SEA MSU Final Report, Pg. 10)
Vietnam	*Due to training and guidance, closely technical instruction with the desire to learn of farmers, crops in the demonstrations had growth and development with high yield, meeting quality assurance requirements, providing quality and safe products for consumers.*	(FAVRI STDF PG 259 FAO FAVRI Final Report, Pg. 60)
14. Improved awareness and SPS capacity can lead to self-policing of food safety requirements by the food and agriculture industries.		
Costa Rica	*Food quality and safety for consumers. As a result of the increased assurances resulting from traceability and sanitary surveillance consumers have better guarantees of the safety of the products being offered. Traceability may also contribute significantly to increased quality, as the origin of the livestock, breed, animal practices and feeding practices are now known and adequate selections can be made.*	(STDF/PG/116 Costa Rica Evaluation Report, Pg. 16)
Thailand and Vietnam	*The project also fostered cooperation among stakeholders in various sectors of the food industry (producers, processors, suppliers, retailers, exporters, etc.), institutional partners, and government units in the application of the materials to bolster capacity of value chain actors to meet applicable standards.*	(STDF/PG/326 SEA MSU Final Report, Pg. 2)
15. SPS technical assistance projects can facilitate cooperation among different government agencies and other key stakeholders to address food safety concerns in recipient countries. These can include public-private partnerships or partnerships among public sector agencies.		
Thailand	*In Thailand, SIAM-MAKRO have used the MACBETH outputs to develop their own GMP training programme. The Ministry of Agriculture has incorporated MACBETH modules relating to GAP at local level in areas targeted by the MACBETH project.*	(STDF/PG/326 External Evaluation 2016, Pg. 18)
Vietnam	*In Vietnam, SOFRI has integrated the GMP and GAP outputs into their own training programmes working with government and private sector partners.*	(STDF/PG/326 External Evaluation 2016, Pg. 18)
Thailand and Vietnam	*Both CTU and KU partners had sustained interactions with respective government officials and participated in various agriculture-related fairs and trade shows to showcase project activities and pursue market linkages.*	(STDF/PG/326 SEA MSU Final Report, Pg. 7)
16. Building the food safety capacity of individuals within the export sector can have a wider impact nationally as these people are mobile and may transfer the benefits and skills to other organizations and sectors.		
APEC Economies	*Key respondents also cite important changes to regulators' approach in developing member economies. For example, two key respondents cited the importance of knowledge gained through PTIN (the regular forums as well as specific trainings) in contributing to an improved draft of the Vietnamese Food Safety law which was passed in 2014 and is the first of its kind in Vietnam. Respondents felt that information and assistance gained through PTIN had a direct bearing on*	(U.S.-APEC Technical Assistance to Advance Regional Integration (US-ATAARI) Independent Review of APEC FSCF Food Safety Capacity Development Initiative. Pg. 15)

Country	**Evidence** (Statements from reports or key informants)	**Reference**
	some provisions of the law and the implementing regulations now being drafted. Key Laotian respondents also cited the influence of PTIN in the way that government now engages private sector producers in contrast to the past. And key respondents from the Philippines state that the Philippines government is in the process of replicating the MRL approach being piloted by PTIN in wine to mangos, one of the Philippines' major exports. However, some key respondents feel that PTIN should do more to work towards concrete agreements on policy changes as part of the work.	
Fiji	*By helping exporters to become HACCP certified, PHAMA has helped open up new higher priced markets which benefits the 37,000 households farming taro. For example, the main exporter of taro in Fiji, one of the six companies PHAMA has supported, was able to secure new contracts with a higher paying supermarket client due to HACCP accreditation. This exporter reports paying farmers more for taro - meaning increased farmgate prices, and improved livelihoods for more than 13,000 taro farmers supplying that company. Additionally, at least 110 new formal jobs were created by the new contract, most of them for women in processing plants.*	(PHAMA Impact Report Pg. 22)
Thailand and Vietnam	*Trained experts were actively involved as lead trainers coordinating the in-country training sessions. These lead trainers continue to serve as nodal contacts at both institutions and are involved in the implementation of ongoing in-country trainings tailored to the specific needs of producers, processors, food safety managers, front-line officers from government departments including agriculture and food inspectors, technicians in food safety and animal and plant health, etc.* *The project's overall achievements such as changing farmer behaviour in producing safer sweet potato and onion produce and bringing about a sense of community and spreading the message to neighbouring provinces and the unified approach of academia, government, industry and farmers towards a common goal within a limited time frame were appreciated and lauded by all participants.*	(STDF/PG/326 SEA MSU Final Report, Pg. 10) (STDF/PG/326 SEA MSU Final Report, Pg. 10)
17. Expansion of agriculture and food sector exports creates jobs and investments related to production, processing and servicing of these exports.		
Kenya	*Throughout 2016, the farmers groups and technical advisers of each exporting company received training on compliance with GlobalGAP audit requirements. This included activities such as the development of individual quality management systems and the implementation of internal audits. In each farmers group, harvesting and hygiene supervisors were selected and trained on specific aspects, such as recordkeeping and post-harvest handling, as well as Hazard Analysis Critical Control Point (HACCP). These follow-up activities have led to job creation: farmers are now taking on more responsibilities along the avocado value chain.*	ITC Kenya Avocado Export Development Project, pg. 1 http://www.intracen.org/news/Kenyan-avocado-farmers-receive-GlobalGAP-certification/
Solomon Islands	*PHAMA provided a range of support to build the capacity of the CA for Health. PHAMA supported benchmark audits of CA Health against EU requirements. PHAMA*	(PHAMA Impact Report Pg. 12)

Country	**Evidence** (Statements from reports or key informants)	**Reference**
	also provided support for the National Public Health Lab to improve its testing capacity, and provided food safety training for the fish processing industry. The Solomon Islands Government responded by significantly increasing the CA Health's recurrent budget and addressing staffing issues.	
18. Demonstrated national capacity to export safe food in one category has positive impact on reputation, improving domestic and export market opportunities in other export categories.		
Nicaragua	*GAP Certified Farms. The current Nicaragua legal framework requires farmers to produce their crops according to GAP, which has been achieved partially by the project. However very few of the farmers had actually achieved GAP certification. For those that have, this is mostly thanks to MOTSSA and CRS project that followed on in some areas, with 125 farms now certified whereas before the project there were only 2 or 3 big farms certified. Several farmers became certified at the insistence of national clients (supermarkets, such as Walmart) or international customers who require compliance with GAP as part of their due diligence.*	(STDF/PG/155 Nicaragua Evaluation, Pg. 19)
Solomon Islands	*Furthermore, new, high-priced markets are currently being developed into the EU and the USA, building on improved food safety processes and training supported under PHAMA.*	(PHAMA Impact Report Pg. 12)
Thailand	*Overall it was clear that the MACBETH project had made a real impact on beneficiaries' access to markets and income levels. Data from SIAM-MAKRO in Thailand, who buy from 442 suppliers of fruits and vegetables in North Eastern Thailand, was suggestive of a much reduced level of SPS risks as a result of widespread adoption of FSM standards. All of the sites visited by the evaluator showed plenty of evidence of good practice in operations on farm and in packing and processing facilities.*	(STDF/PG/326 External Evaluation 2016, Pg. 16)
Vietnam	*The major impact in Vietnam has been increased knowledge for the farmers and local government extension officers of the importance of food safety management in production and processing of fruits and vegetables. Prior to the MACBETH project there was limited awareness among the project beneficiaries of this key issue. This is an important outcome as Vietnam seeks to develop exports of fruits and vegetables to high value markets.*	(STDF/PG/326 External Evaluation 2016, Pg. 16)

Literature Review Bibliography

Agra CEAS Consulting. 2008. Country-based Plans for SPS Development. Peruvian Field Study Cost Benefit Analysis (STDF/PG/020). Available at: http://standardsfacility.org/sites/default/files/STDF_PG_20_Peru_Cost_benefit_analysis_2008.pdf

Asfaw, S., Mithöfer, D., & Waibel, H. 2009. EU Food Safety Standards, Pesticide Use and Farm-level Productivity: The Case of High-value Crops in Kenya. Journal of Agricultural Economics, 60(3), 645–667. Available at: https://www.researchgate.net/publication/46537325_EU_Food_Safety_Standards_Pesticide_Use_and_Farm-Level_Productivity_The_Case_of_High-value_Crops_in_Kenya

Australian Aid. 2017. The Pacific Horticultural and Agricultural Market Access Program (PHAMA) Impact Report 2017. Available at: http://phama.com.au/wp-content/uploads/2017/10/PHAMA_Impact_Report_e-copy-final.pdf

Betancur, M. 2010. Ex-post Evaluation of Project STDF 114 – "Sustainable and effective aflatoxin management system in Brazil nut production". Available at: http://www.standardsfacility.org/sites/default/files/STDF_PG_114_Evaluation_report_2010.pdf

Bourquin, L. D. and D. Thiagarajan. 2016. Supporting Malawian Food Manufacturers to Effectively Comply with Global Food Safety Regulations. Malawi Integrating Nutrition in Value Chains (INVC) Project report. September, 2016

CABI. 2016. STDF PG 381. "CocoaSafe": Capacity Building and Knowledge Sharing in SPS in Cocoa in Southeast Asia & Pacific End of Project Meeting Report. Available at: http://www.standardsfacility.org/sites/default/files/PG_381_Report_of_the_End_Project_Meeting.pdf

Clay, D.C., Bourquin, L.D. & Thiagarajan, D.G. 2013. STDF PG 326. A Southeast Asian Partnership to Build Trade Capacity for Fresh and Processed Fruit and Vegetable Products [Co-branded as: "Market Access through Competency Based Education and Training in Horticulture (MACBETH)"] Final Report. Available at: http://www.standardsfacility.org/sites/default/files/STDF_PG_326_FinalReport_Feb-14.pdf

Drago, M. 2018. Personal communication regarding ongoing project STDF PG 486. STDF-ITC "Improving compliance with SPS measures to boost oilseed exports". http://www.standardsfacility.org/PG-486

EIF Mali. 2015. Supporting the Development of Small Enterprises and their Markets through Trade in Mali. Available at: http://www.enhancedif.org/en/system/files/uploads/brochurecadreintegrcmali-eng.pdf?file=1&type=node&id=4028

FAO. 2017. FAO with local authorities and partners tackling food safety across the Pacific. Available at: http://www.fao.org/asiapacific/news/detail-events/en/c/1042995/

FAVRI. 2012. Final Report – Strengthening Vietnamese SPS capacities for Trade – Improving safety and quality of fresh vegetables through the value chain approach" (STDF PG 259). Available at: http://www.standardsfacility.org/sites/default/files/STDF_PG_259_FinalReport_Jul-12.pdf

FIRCA. 2014. Final Report – SPS Capacity Building in Africa to Mitigate the Harmful effects of Pesticide Residues in Cocoa and to Maintain Market Access (STDF/PG/298). Available at: http://www.standardsfacility.org/sites/default/files/STDF%20-%20Project%20Completetion%20Report%20-FINAL%20clean.pdf

Graffham, A. 2015. Ex Post Evaluation of STDF Project "A Southeast Asian Partnership to Build Capacity for Fresh and Processed Fruit and Vegetable Products" in Thailand and Vietnam (STDF/PG/326). Available at: http://www.standardsfacility.org/sites/default/files/STDF_PG_326_External_Evaluation.pdf

Hays, H. 2016. Ex-post evaluation of Project STDF/PG/155 "Market-Oriented Training Service on Standards Application (MOTSSA) in Nicaragua". Available at: http://www.standardsfacility.org/sites/default/files/STDF_PG_155_Evaluation.pdf

Henson, S. 2009. Ex-Post Evaluation of STDF Project 20: Country-Based Plans for SPS Development in Uganda (Honey and Fish) and Peru (Asparagus and Fish). Available at: http://www.standardsfacility.org/sites/default/files/STDF_PG_20_EvaluationReport_2009.pdf

IICA. 2017. Final Report Latin America Pesticide Residue Data Generation Project (STDF/PG/436). Available at: http://www.standardsfacility.org/sites/default/files/STDF_PG_436_Final_report.pdf

Infagro. 2016. "Kateryna Onul, Adviser on Food Law, project "Reforming the investment climate in Ukraine", funded by the Swiss Government (SECO), the World Bank Group: On the legislation in the food industry in Ukraine, including dairy, and ensuring its implementation." Available at: http://infagro.com.ua/eng/kateryna-onul-adviser-on-food-law-project-reforming-the-investment-climate-in-ukraine-funded-by-the-swiss-government-seco-the-world-bank-group-on-the-legislation-in-the-food-industry-in-ukr/

ITC. 2017. Enhancing competitiveness of the Kenyan avocado sector - Netherlands Trust Fund Phase III (KEN/47/112A) http://www.intracen.org/news/Kenyan-avocado-farmers-receive-GlobalGAP-certification/ and http://www.intracen.org/itc/projects/ntf-3/KENYA-AVOCADO/

Kersting, S., & Wollni, M. 2012. New institutional arrangements and standard adoption: Evidence from small-scale fruit and vegetable farmers in Thailand. Food Policy, 37(4), 452–462. https://ac.els-cdn.com/S0306919212000486/1-s2.0-S0306919212000486-main.pdf?_tid=3a109dba-169e-11e8-a52f-00000aacb361&acdnat=1519173127_dca254568d67876e62b511d962fe9aa9

Maertens, M., & Swinnen, J. F. M. 2009. Trade, Standards, and Poverty: Evidence from Senegal. World Development, 37(1), 161–178. https://projects.iq.harvard.edu/files/gov2001/files/maertens_and_swinnen_2009.pdf

Ministère de l'Agriculture et de l'Equipement Rural. 2014. Programme d'Accélération de la Cadence de l'Agriculture Sénégalaise (PRACAS). http://www.ipar.sn/IMG/pdf/pracas_version_finale_officiele.pdf

Minten, B., Randrianarison, L., & Swinnen, J. F. M. 2009. Global Retail Chains and Poor Farmers: Evidence from Madagascar. World Development, 37(11), 1728–1741. http://cadmus.eui.eu/bitstream/handle/1814/31334/RSCAS_2014_30.pdf

Narrod, C. 2018. Lessons Learned from JIFSAN's Collaborative Training Initiative Experience Promoting Country-Driven Food Safety Capacity Building in Bangladesh and India (Personal Communication).

Nathan Associates Inc. 2016. US-APEC Technical Assistance to Advance Regional Integration (US-ATAARI) Independent Review of APEC FSCF Food Safety Capacity Development Initiative. Available at: http://fscfptin.apec.org/docs/2016/Independent_Review_of_APEC_Food_Safety_Capacity_Building_Initiative.pdf

Nguyen T.T.Q. 2012. Final internal evaluation report. Strengthening Vietnamese SPS Capacities for Trade - Improving safety and quality of fresh vegetables through the value chain approach (STDF/PG/259). Available at: http://www.standardsfacility.org/sites/default/files/STDF_PG_259_InternalEvaluationReport_Nov-12.pdf

Okello, J. J., & Swinton, S. M. 2007. Compliance with International Food Safety Standards in Kenya's Green Bean Industry: Comparison of a Small- and a Large-scale Farm Producing for Export. Applied Economic Perspectives and Policy 29(2), 269–285. https://doi.org/10.1111/j.1467-9353.2006.00342.x

Okello, J. J., & Swinton, S. M. (2010). From Circle of Poison to Circle of Virtue: Pesticides, Export Standards and Kenya's Green Bean Farmers. Journal of Agricultural Economics, 61(2), 209–224. https://doi.org/10.1111/j.1477-9552.2009.00211.x

Piñeiro, M. 2013. Ex-post Evaluation of Project STDF/PG/116 "Development and Implementation of a Movement Control System for Cattle in Costa Rica". Available at: http://www.standardsfacility.org/sites/default/files/STDF_PG_116_Evaluation_Report_2013_0.pdf

Standard Media. 2014. State bans pesticide to protect exports to European Union Nov 2014 https://www.standardmedia.co.ke/business/article/2000140333/state-bans-pesticide-to-protect-exports-to-eu

The Dairy News. 2017. Ukrainian dairy products open new markets: experts predict a rise in exports. Available at: http://www.dairynews.ru/news/ukrainian-dairy-products-open-new-markets-experts-.html

The World Bank. From Wine to Cables: Moldova's Shifting Export Basket. Available at: http://www.worldbank.org/en/news/feature/2016/05/27/from-wine-to-cables-moldovas-shifting-export-basket

UNIDO. 2016. Final Report – Enhance the Compliance, Productive Capacities and Competitiveness of the Cinnamon Value Chain in Sri Lanka (STDF PG 343). Available at: http://www.standardsfacility.org/sites/default/files/STDF_Final_project_report_Final.pdf

Unnevehr, L. and Ronchi, L. 2014. Food safety and developing markets: Research findings and research gaps. Washington DC: International Food Policy Research Institute. Available at: https://pdfs.semanticscholar.org/7ea1/5791f8f515fee2b585f101f7eca39d56b32f.pdf

Unnevehr, L., and L. Ronchi. 2014. Food Safety Compliance: Economic and Market Impacts in Developing Countries. Viewpoint Policy Journal Note Number 341. Washington DC: World Bank Group. Available at: http://www.standardsfacility.org/sites/default/files/VIEWPOINT_Food_Safety_FINAL_PUBLISHED.pdf

USDA FAS. 2017. GAIN Ukraine Dairy and Products Annual Report. Available at: https://gain.fas.usda.gov/Recent%20GAIN%20Publications/Dairy%20and%20Products%20Annual_Kiev_Ukraine_10-13-2017.pdf