

Proposal for a costed extension of the Innovative Research on Inclusive and Efficient Value Chains and/or Governance of Natural Resources

(support by the Belgian government to the CGIAR Research Program on Policies, Institutions and Markets (PIM))

1. General information

1.1. Title: Innovating for resilient food supply chains in Africa

1.2. Summary of the project

In addition to being efficient and inclusive, food supply chains also need to be resilient. A variety of shocks, such as those emanating from trade wars, migration, climate change and adverse natural and weather events all have the potential to severely disrupt food systems, jeopardizing the livelihoods and food security of large shares of the population in Africa. The recent COVID-19 pandemic provides an opportunity to gain insight into resilient commodity value chains. We propose an extension of the existing project on *Innovating for Effective and Inclusive Value Chains in Africa*, which provides a unique base on which to build for immediate and focused analysis on COVID-19 impacts to draw lessons and identify policy for impact.

1.3. Organization submitting the proposal

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1.4. Contact person within the organization submitting the proposal

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1.5. List of key partners involved in the project

- a. Prof. Miet Maertens, Division of Bio-economics (DBE); Department of Earth and Environmental Sciences, KU Leuven; Celestijnenlaan 200 E, B-3001 Heverlee, Belgium; e-mail: miet.maertens@kuleuven.be; <https://ees.kuleuven.be/bioecon/index.html>
- b. Dr. Bart Minten, International Food Policy Research Institute, Development Strategy and Governance Division, PO Box 5689, Addis Ababa, Ethiopia; e-mail: b.minten@cgiar.org; <http://essp.ifpri.info/>

1.6. Location(s) of the project

IFPRI, Kampala, Uganda and KU Leuven, Leuven, Belgium; research activities in Senegal, Uganda, and Ethiopia.

1.7. Linkages with larger projects/programs

This extension will build on data and findings from the CGIAR/PIM project supported by the Belgian government on *Innovating for Effective and Inclusive Value Chains in Africa*, which in turn builds on extensive previous collaborations between IFPRI and KU Leuven and ongoing research programs such as the *Value Chains and Sustainable Development project* at the Division of Bio-economics at KU Leuven and the *Global Value Chains and Development Research Program* at LICOS Centre for Institutions and Economic Performance as well as country projects (e.g. NWO funded seed systems project in Uganda, USAID/PIM funded Small and Medium Enterprise project in Uganda, value chain activities by IFPRI's Senegal country program, and theme 3 “Improving Markets, Value Chains, and Trade” of the Ethiopia Strategy Support Program).

2. Detailed description of the project

2.1. Rationale

As COVID-19 is spreading rapidly, governments across the globe are implementing policies to “flatten the curve”. While data is scarce and numbers likely an underestimate, it seems that up to now, Africa has been spared in terms of infections and fatalities. However, more than developed economies, countries with largely informal economies are affected by the social distancing measures, the shutdown of (non-essential) businesses, curfews and restrictions on movement.

Food supply chains, a complex web of interactions involving farmers, workers, agricultural input suppliers, processing plants, shipping, retailers and service providers, are the backbone of agricultural-based economies. In poor countries, supply chains are generally much more informal, relying more on inter-personal cash-in-hand transactions. They are dominated by labor intensive small and medium scale enterprises that tend to be found in clusters such as dense sets of food processing small and medium enterprises (SMEs), scores of meal vendors at truck stops, and dense masses of wholesalers and retailers in public wholesale markets and wet markets. As such, while the health effects are muted, the pandemic may turn into a food security and nutrition crisis similar to (or even worse than) the 2008-12 food price crisis, with its ensuing social unrest.

The impact of COVID-19 seems to be more in the medium to long run. While most countries seem successful in halting and even reducing the spread of the virus, experts warn that the virus will be with us for a considerable time, and that business as usual may still be months if not years away. COVID-19 also affects input supply chains, which means that effects on production will play out in the longer run. In East Africa, COVID-19 comes on top of a range of other shocks, including trade conflicts within the East African Community and desert locust infestations, making resilience even more salient.

Partly funded by the Belgian development cooperation through CGIAR/PIM, we recently collected primary data on a variety of value chains in Uganda, Senegal and Ethiopia. This data has already resulted in a series of studies that have greatly improved our understanding of the structure of these value chains, the innovations that drive value chain upgrading, and its inclusiveness in terms of certain groups (eg. small farmers, youth, women). These studies, and the data sets in particular, provide an excellent base on which to build for immediate and focused analysis on COVID-19 impacts to draw lessons and identify policy for more resilient supply chains.

We propose to implement a series of follow-up surveys to get detailed data on how food supply chains adapt to the evolving situation. Our approach allows to create generally valid insights and adds to the understanding of resiliency in agricultural value chains in Africa. Based on these insights, we aim at influencing and enriching the policy debate for improved governmental and corporate decision-making towards more resilient, efficient and inclusive value chains in Africa.

2.2. Objective and research questions

We focus on four different dimensions of value chains – geography of (input and output) markets, inclusiveness aspects related to gender and scale, organizational structure, and frequency of interactions. In previous research, we found that these four dimensions characterize different value chains. These dimensions are likely to be impacted by shocks such as the COVID-19 pandemic and important in terms of resilience more generally.

2.2.1. How do input and output markets in food supply chains affect COVID-19 impact on the value chain?

Food supply chains differ substantially on where inputs are sourced and where commodities end up being consumed. Some food supply chains are relatively short and localized, such as for example staple food supply chains that connect producers directly to consumers in the immediate neighborhood. Others are more complex and use inputs that need to be imported and supply high-value commodities to markets across the globe. Clearly, the impact of COVID-19 and associated measures will be very different depending on the type of value chain.

The baseline data that was collected as part of the *Innovating for Effective and Inclusive Value Chains in Africa* project allows us to look at various aspects of this. In fresh fruit and vegetables supply chains in Senegal, we can study how sorting and packing lines adapt in the light of social distancing requirements. Informal transaction in the dairy sector in both Ethiopia and Uganda reduced significantly due to fear of consumers that consumption of raw foods carries a potential risk of contamination through droplets coming from food handlers. At the same time, we see that some of the reductions in raw milk consumption is compensated by an increase in demand for processed milk such as powder milk and UHT, often sold in supermarkets or gas stations (see <https://www.ifpri.org/blog/covid-19-shifting-consumption-and-disrupting-dairy-value-chains-ethiopia>).

Supply chains for agricultural inputs often extend outside of the country. Thus, some disruption in product availability might be expected, and – depending on the timing and magnitude of any disruptions to these supply chains – there will be important implications for rural livelihoods and food supplies. In Uganda, we collected extensive information on small and medium scale input providers that are integrated in maize value chains, which can again be used as a baseline.

2.2.2. Are value chains that differ in terms of inclusiveness (gender/scale) differentially affected?

Past disease outbreaks, such as Ebola, Zika or SARS, have shown that women's needs were insufficiently addressed, and gender was not strongly considered in the response to the outbreak. While there is no immediate indication that physical health consequences are worse for women

(contrary to, for example, Zika that is particularly risky during pregnancy), socially constructed gender dimensions may matter. For instance, women are likely to bear the brunt of the nationwide school closures. Women are also generally the primary health care providers within the household, putting themselves more at risk.

Gender will thus affect labor supply. Some subsectors, such as fresh fruits and vegetables in Senegal and Ethiopia, provide relatively more employment to women. Furthermore, we also often find gender participation patterns along the value chain. For instance, while women may be less represented among farmers of a commodity, they may be relatively more important at the packaging and processing stage. In maize value chains in Uganda, we see that relatively more women are involved as input dealers. As COVID-19 is likely to affect different parts of the chain differently, this will translate in differential gender effects.

Similarly, impact and capacity to adapt may differ substantially between food supply chains that work with a few large producers, as opposed to those that rely on many small producers. An interesting comparative analysis here can be made between the Ethiopian dairy sub-sector where farmers have on average only a few cows, and the sub-sector in Uganda where farmers have on average about 30 animals. While in Ethiopia, it may be easier for farmers to find markets locally, in Uganda, restricted movement and curfews may result in substantial losses as local markets may not be able to absorb excess supply.

2.2.3. Does the organizational structure of food supply chains matter for how the chain responds to COVID-19?

Our research shows that the organizational structure of food supply chains ranges from situations where processors buy directly from individual farmers to complete vertical integration. As a result of stringent standards and quality requirements, fresh food and vegetable value chains in Senegal are characterized by a high degree of vertical integration (with production happening on leased land, handling and packing in their own units, transport to the harbor and export organized by a single company). In cases where quality is important but large-scale production is not feasible, producer organizations and cooperatives may be important actors in the supply chain. This is for instance the case in dairy supply chains in Uganda. For supply chains where quality is of secondary concern or can be observed more easily, such as in maize supply chains in Uganda and teff in Ethiopia, processors buy from farmers, often through assembly traders.

The impact of COVID-19 will also be mediated by the organizational structure of the food supply chains. A clear decision structure in vertically integrated chains such as fresh fruits and vegetables in Senegal may make it easier to respond to logistical challenges. Resilience to shocks may be higher due to solidarity between members in supply chains where cooperatives play an important role such as dairy in Uganda. The one-off cash-on-delivery nature of relationships in teff supply chains in Ethiopia may make it easier for farmers to redirect supply to local markets and for buyers to cut their losses if supply chains are disrupted

2.2.4. Are value chains characterized by more frequent interactions different in terms of impact of and response to COVID-19?

Food value chains not only differ in terms of market geography (local versus global), additional value created, or organizational structure (vertically integrated versus working with independent

suppliers). In the context of a pandemic like COVID-19, the frequency and nature of interactions is also an important consideration.

Dairy value chains differ from most other food supply chains in that transactions are made on a recurring (daily or even twice daily) basis. Therefore, more than in other commodity value chains, direct impacts will not only be felt post-farm midstream (e.g., wholesale, logistics, and processing) and downstream (food-service enterprises and retail), but also directly on the farm. At the same time, actors in value chains with frequent interactions may innovate faster as there are more opportunities for learning. In this part of the research, we will compare data on how dairy supply chains adapt to data from maize value chains in Uganda.

2.3. Tools, methods, and data

Depending on the particular case and situation in the country, the method of collection (in-person or ICT-based phone interviews, online forms or apps that collect information), the frequency of data collection and the amount of data will vary. For instance, for complex value chains, more actors may be interviewed, but only once times a year. For other supply chains, some data (such as prices and quantities) may be requested at a much higher frequency.

The data will also allow of producing a set of comparative studies, both between countries (to capture -inter alia- differences in policy response) and between supply chains (as different commodities and chains will be affected differently). We build on data we collected for fresh fruit and vegetable value chains in Senegal and Ethiopia, dairy and maize value chains in Uganda and teff value chains in Ethiopia. The mix of commodities, differences in the institutional organization of the chains and heterogeneous policy response of the various countries provides for interesting variation that can be used in identifying impacts of, and responses to the crisis.

2.4. Locations

We will continue to work in two Belgian partner countries in which PIM also has a significant presence: Senegal, and Uganda. These activities will be complemented by additional funding (from PIM and USAID) that will be used towards comparative analysis in Ethiopia. Selection of the countries and commodity groups was motivated by: 1/ experience and long-term collaborations of the researchers in these countries; 2/ potential to build on existing large-scale datasets; 3/ innovations that are likely occurring in these value chains; 4/ likely sizable gender and nutrition (i.e. dairy and horticulture) impacts of transforming value chains; and 5/ population size and composition of the country.

Specific elements that affected the choice of these commodity groups and countries are:

- *Senegal*. Dr. Swinnen and Prof. Maertens have significant experience and published extensively on horticultural export value chains in Senegal. They collected large-scale datasets over several survey rounds which can be used to study gender and rural development impacts of growing horticultural value chains in Senegal. The previous work by the PIs will serve as a comparison point with domestic value chains (as well as with export crops from other countries).

- *Uganda.* Dr. Van Campenhout has significant experience in Uganda. He resided for five years in Uganda as head of IFPRI’s activities. He published on smallholder market participation, innovations, and maize market integration. As part of the *Innovating for Effective and Inclusive Value Chains in Africa*, two stack surveys were done (one on dairy and one on maize value chains). These studies are an excellent starting point to assess the impact of COVID-19.
- *Ethiopia.* Dr. Bart Minten was heading the Ethiopia Strategy Support Program (ESSP) of IFPRI in Ethiopia during the *Innovating for Effective and Inclusive Value Chains in Africa*. While he is moving to Myanmar, he will still be involved in ongoing research in Ethiopia.

3. Output and impact

The key research output consists of rigorous evidence on the functioning of food supply chains under stress, and how these chains adapt to deal with the challenges. This knowledge will be translated into policy recommendations and strategies. While it will help governments and development partners on how to best mitigate the fall-out of the pandemic on income, employment, and political risks, the project is likely to produce relevant recommendations to increase resilience in food systems more generally. Below are more detailed examples of outputs we envision and strategies we will use to ensure impact. More details can be found in the logical framework at the end of this document. We also included a detailed workplan.

Survey bulletins will be published with updates on the latest trends of key indicators and rapid analysis of those trends, while policy notes will also use the analyses to set out policy recommendations. We will also regularly publish findings to wider audiences using blog posts in [IFPRI’s COVID-19 blog series](#). Policy implications will be presented to governments in the respective countries, either in meetings or in virtual events.

Findings of more in-depth data analysis and comparative research will be published in a series of discussion papers that will inform policymakers on coping policies and medium- to long- term policy efforts to implement as the pandemic subsides.

Furthermore, with assistance of IFPRI’s Director General’s office, we will organize a series of policy dialogues in the countries where this project is implemented. Translating research results to policy action requires a dedicated focus on a strategic network of individuals and institutions engaged in local, national and international policy-making and active in shaping policies that support efficient and inclusive value chains in Africa. The specific activities that will contribute to this result are in-person country and regional level policy dialogue events to be held in each of the project’s focal countries. This series of evidence-based policy dialogue events will support critical consultative processes with key stakeholders that offer an opportunity to share information and lessons learned, identify information gaps, and improve capacity to identify appropriate and country-specific policy actions to help improve the food system in Africa through more efficient, inclusive and resilient value chains. This consultative process also supports South-South learning among key stakeholders within the project countries.

4. Project partners

Two key partners will implement the project (IFPRI and the KU Leuven). The partners involved have extensive experience in collaboration, and have also been collaborating closely in the *Innovating for Effective and Inclusive Value Chains in Africa* project.

At the KU Leuven, two divisions are involved:

- KU Leuven – Division of Bio-economics (DBE), Faculty of Bio-science Engineering.
 - (a) Miet Maertens is a professor of agricultural and resource economics. She will supervise the work in Senegal and the work on export crops. Prof. Maertens has published extensively on agricultural value chains in developing countries and has looked at impact of changes in value chains on different dimensions of development, including gender and food security. She has co-authored with Jo Swinnen one of the most quoted papers in this area (“*Trade, Standards, and Poverty: Evidence from Senegal*”, published in *World Development* in 2009).
 - (b) Anna Fabry, Hendrik Feyaerts and Kaat Vanhoyweghen are PhD students who are working on horticultural supply chains in Senegal.
- KU Leuven - LICOS Centre for Institutions and Economic Performance, Faculty of Economics and Business.¹ Dr Van Campenhout is an associate researcher at this institute and is based here.
 - (a) Caroline Mieke and Anusha De are PhD students at LICOS that are working on maize (seed) supply chains and dairy supply chains in Uganda.

Within IFPRI, the project will be led by the:

Development Strategy and Governance Division (DSGD).

(a) Dr. Bjorn Van Campenhout has done significant work on agricultural markets and value chains and is a research fellow with IFPRI. For five years he led IFPRI’s country-based work in Uganda. He recently moved to Belgium and is currently based at LICOS, Leuven, where he pursues his activities with IFPRI – Uganda.

(b) Dr. Bart Minten, will lead all proposed activities in Ethiopia. He is a senior research fellow at IFPRI and was program leader of the Ethiopian Strategy Support Program (ESSP), a large research and capacity building program in Ethiopia. He was also the representative of IFPRI’s country programs in IFPRI’s Extended Management Team. He spent 25 years living in developing countries in Africa and Asia, mainly doing research on agricultural value chains. Dr. Minten has a longstanding collaboration with the KU Leuven. He published several joint and highly cited papers with Johan Swinnen and Miet Maertens and participated in Ph.D. committees at KU Leuven of students supervised by Profs. Swinnen and Maertens. While Dr Minten recently moved to Myanmar, he will continue to be involved in this project and works through his vast network in Ethiopia.

(c) Johan Swinnen is the Director General of IFPRI. Dr. Swinnen is a global authority on the analysis of agricultural value chains with extensive experience on this in Europe, Asia

¹In 2003 LICOS was chosen as a Centre of Excellence by the European Commission and in 2005, LICOS was selected as one of the twelve Centers of Excellence by the KU Leuven. This was reinforced by two new Centre of Excellence grants.

and Africa. He has widely published on this topic. His book on “*Global Supply Chains, Standards and the Poor*” is a seminal work in this area. He is a Fellow of the European and American Agricultural Economics Associations and a past president of the International Association of Agricultural Economists.

At the country and Africa-wide level, we closely collaborate with:

- Ethiopia: the Ethiopian Strategy Support Program, a collaborative program of IFPRI with the Ethiopian Development Research Institute (EDRI).
- Uganda: IFPRI has a large country office in Uganda with strong links to local research organizations and CGIAR centers. In Uganda, we will also work with people from the Economic Policy Research Center (EPRC) at Makerere University, who have worked on dairy value chains in the past.
- Senegal: IFPRI’s Senegal Country Program.
- IFPRI’s Africa office.

5. Project budget

We estimate that we would need 300,000 euros to execute this additional research. From this, 120,000 euros will go to KU Leuven which is split between the Division of Bio-economics (75,000) and LICOS (45,000). This will be used for the salary of PhD students that will work on the project, and for executing surveys in Senegal.

Within IFPRI, the budget includes 6 months of labour time for senior researchers. The IFPRI portion also includes funds for fieldwork in Uganda. Funding for fieldwork in Ethiopia will be obtained from other sources.

	Year 2021	euro
labour/fringe	81,266	73139
subcontractor	133,333	120000
local collaborator	20,000	18000
survey	42,838	38554
travel	3,983	3585
publications/outreach	5,976	5378
service center	13,253	11928
total direct	300,649	270584
indirect cost	32,684	29416
total	333,333	300000

6. Planned activities

	Assigned supervisor	2018	2019	2020	2021	Deliverable type	Gender focus	Age focus	Capacity building
I. RESEARCH ACTIVITIES									
A. Country studies									
Senegal (horticultural value chain)									
<i>Domestic horticultural value chains</i>									
Survey implementation and data collection	MM/GVB					Dataset	x	x	x
Follow up data collection	MM					panel data	x	x	x
Analysis of innovations (RQ1)	MM/GVB					DP/PB/JA			x
Analysis of inclusion and efficiency (RQ2, RQ3)	MM/GVB					DP/PB/JA	x	x	x
Analysis resilience (RQ5)	MM					DP/PB/JA	x	x	x
Uganda (maize - dairy - coffee)									
<i>Maize</i>									
Survey implementation and data collection	BVC/BM					Dataset	x	x	x
Follow up data collection	BVC					panel data	x	x	x
Analysis innovations (RQ1)	BVC/BM					DP/PB/JA			x
Analysis inclusiveness and efficiency (RQ2, RQ3)	BVC/BM					DP/PB/JA	x	x	x
Analysis resilience (RQ5)	BVC					DP/PB/JA	x	x	x
<i>Dairy</i>									
Survey implementation and data collection	BVC					Dataset	x	x	x
Follow up data collection	BVC					panel data	x	x	x
Analysis innovations (RQ1)	BVC					DP/PB/JA			x
Analysis inclusiveness and efficiency (RQ2, RQ3)	BVC					DP/PB/JA	x	x	x
Analysis resilience (RQ5)	BVC					DP/PB/JA	x	x	x
Ethiopia (teff - dairy - coffee)									
<i>Teff</i>									
Survey implementation and data collection	BM					Dataset	x	x	x
Follow up data collection	BM					panel data	x	x	x
Analysis innovations (RQ1)	BM					DP/PB/JA			x
Analysis inclusiveness and efficiency (RQ2, RQ3)	BM					DP/PB/JA	x	x	x
Analysis resilience (RQ5)	BM					DP/PB/JA	x	x	x
<i>Fresh Fruit and Vegetables</i>									
Follow up data collection	BM					panel data	x	x	x
Analysis resilience (RQ5)	BM					DP/PB/JA	x	x	x
B. Global/Africa									
Conceptual models value chains	JS					DP/JA			x
Cross-country commodity analysis (RQ4)									
a. Dairy	BVC/BM					DP/PB/JA	x	x	x
b. Maize	BVC/JVC					DP/PB/JA	x	x	x
c. Coffee	MM/BM					DP/PB/JA	x	x	x
Cross-country/cross-commodity comparison (RQ4)	JS/MM/BM/BVC					DP/PB/JA	x	x	x
Identification of good value chains practices (RQ4)	JS/MM/BM/BVC					PB	x	x	x
Edited book on innovations in value chains in Africa	JS/MM/BM/BVC					Book	x	x	x
II. CAPACITY BUILDING									
1. Hands-on experience									
Ph.D. students KULeuven	JS/MM/BM/BVC					Ph.D. degree	x	x	x
Local collaborators	JS/MM/BM/BVC						x	x	x
2. Trainings									
Value chain, policy and price analysis (4 countries)	BVC					Training material	x	x	x
III. OUTREACH EVENTS									
Seminars and participation in relevant events	JS/MM/BM/BVC								
Special session IAAE	JS/MM/BM/BVC								
Session other conference (AAEA, EAAE, AAAE)	JS/MM/BM/BVC								
Final workshop (4 countries)	JS/MM/BM/BVC								
Final workshop Belgium	JS/MM/BM/BVC								
Policy dialogues	MM/BVC								
IV. MONITORING AND EVALUATION									
Progress reports	JS/MM/BM/BVC								
JS=Johan Swinnen; BM=Bart Minten; MM=Miet Maertens; BVC=Bjorn Van Campenhout									
DP=Discussion Paper; PB=Policy Brief; JA=Journal Article									

7. Logframe

	Project Summary	Indicators	Means of verification	Assumptions
Impact	Resilient Food Supply Chains (FSC) in Sub-Saharan Africa	<ul style="list-style-type: none"> - sufficient nutritious food available to all at affordable prices - access to food - livelihoods preserved - transient poverty reduced 	<ul style="list-style-type: none"> - Nationally representative datasets such as DHS data and National Household Budget Surveys (UNHS, UNPS, PAPA) 	
Outcomes	<ul style="list-style-type: none"> - sound policies are in place to create an enabling environment for resilient food supply chains - FSC actors in the middle of the chain (processors and traders) are better equipped to respond to shocks - donors are provided with guidance on value chain intervention options to increase resilience - rigorous evidence on resilience in FSC in the form of global public good is available 	<ul style="list-style-type: none"> - number of policies targeting FSC actors - extent to which COVID-19 related precautionary measures consider FSC operations (eg curfew exemptions for transporters) - bankruptcy among processors, traders and service providers - number of new value chain interventions initiated by development partner that have resiliency component - 3 peer reviewed publications in international science journals 	<ul style="list-style-type: none"> - in country official documents (official strategy and policy documents) - professional associations (agro-input dealers association, dairy cooperatives,...) - activity reports from donors - science journals 	<ul style="list-style-type: none"> - supporting capital and services are available such that FSC middle can execute recommendations - donors do not significantly scale back funding
Outputs	rigorous evidence on the functioning of food supply chains under stress disseminated to development partners in appropriate forms	<ul style="list-style-type: none"> - 3 open access panel data sets documented and published - 6 Survey bulletins published - 3 working papers published - 3 policy notes/briefs published - 9 workshops and trainings organized - 3 policy dialogues organized - 3 blogs published 	<ul style="list-style-type: none"> - data repositories such as dataverse - various dissemination services (eg ifpri Kampala newsletter) - Ifpri website - various blogging platforms such as Agrilinks, IFPRI's COVID-19 blog series,... 	<ul style="list-style-type: none"> - limited political risk: COVID-19 measures such as curfew are not based on political considerations - development partners base strategies and policies on scientific evidence
Activities	<ul style="list-style-type: none"> - several follow-up interviews in Senegal and Ethiopia - analysis of collected and secondary data - review policy documents - organize policy dialogues - organize workshops for FSC actors 	<ul style="list-style-type: none"> - data sets collected - questionnaires - field reports - code written for analysis - number of policy makers and other development partners reached - number of workshops and trainings organized 	<ul style="list-style-type: none"> - data repositories such as dataverse - version control platforms such as github - project documentation (including attendance sheets for trainings, mail communication with policy makers and donors,...) 	<ul style="list-style-type: none"> - clearance received for doing surveys - good response rate for telephone surveys - possibility to engage with policy makers (possibility to travel of meet online) - funding for labor time to collect and analyze data