AGRICULTURE AND RURAL DEVELOPMENT

LESSONS FROM PRACTICE:
Assessing Scalability

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Attempts at innovation promise to demonstrate viable approaches that can be widely expanded or replicated to increase agricultural and rural incomes and well-being. Innovations are also risky; not only may they fail, but they also consume scarce resources and the energies of communities involved. Initial tests of innovations are usually small, but they need to provide guidance to implementers and funders on whether or not to go to scale, and how. This report builds upon a literature review, desk studies of 22 World Bank Development Marketplace innovative projects, field studies of three promising innovations and surveys of selected stakeholders in the innovations. It identifies simple sets of questions and tools for designing and then quickly judging which innovations should be encouraged to scale up, and how. It concludes, in brief, that innovations should be simple, strategic and readily monitored. Scaling up needs local legitimacy and ownership, leadership, and an implementing organization with capacity to learn and grow. It needs time to prove the effectiveness of the implementation and build the conditions for scaling. It needs a champion who can put the innovation on the agenda of key stakeholders in scaling up and play a role in bridging actors and eliminating roadblocks. It needs to be moving toward financial viability, either by being cost covering, moving to private sector adoption, or accepted as a public good. There need to be incentives for scaling up. Finally the decision to scale needs to be revisited again and again during implementation.

For the Agriculture and Rural Development Department, The World Bank

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Table of Contents

Lessons from Practice: Assessing Scalability

Abbreviations

ADP	Agricultural Development Programme (State level, Nigeria)
ARD	Agriculture and Rural Development Department
DGF	Development Grant Facility
DM	Development Marketplace
FADAMA	National Project – Nigeria; funded by World Bank loan
IFC	International Finance Corporation, World Bank Group
MCSUs	Mini-Cold Storage Units (India)
PES	Payment for Environmental Services
OGADEP	Ogun State Agricultural Development Program
TTL	Task Team Leader, World Bank
UNAAB	University of Agriculture, Abeokuta Nigeria

Foreword

Scaling-up has been a topic of interest in the development community for decades. With the ongoing global economic crisis requiring that increased effectiveness in poverty reduction initiatives be carried out in an environment of increasing budget constraints, the need to replicate effective interventions and build on proven successes takes on even greater importance.

This report examines critical elements for scaling up in three pilot projects in order to assess the scalability of similar initiatives and offers strategic guidance on how to bridge the gap between testing innovation, scaling up and bringing projects to scale. This report, and its accompanying case studies, literature review and surveys, is part of a larger effort by the Agriculture and Rural Development Department (ARD) at the World Bank to build a body of evidence to assist development practitioners and other stakeholders in evaluating the potential for scaling up and increasing the effectiveness of development interventions – both large and small. The following piece builds on earlier work by the International Fund for Agricultural Development (IFAD) to further develop a framework for this process of assessing scaling up.

22 projects from the 2008 Development Marketplace competition – which all sought to demonstrate the effectiveness and potential of innovations in contributing to the enhancement of rural livelihoods – were used as a foundation to address the paradox of scaling up small scale innovations: the need for evidence of effective development before a project has been given sufficient time to produce this evidence. In order to bridge this evidence gap, development practitioners need skills and tools for rapid assessment of scalability to enable promising innovations to go the next step in the scaling up process. The guidance in the pages that follow is intended to improve these skills and augment other tools which have been created.

Key findings in this report suggest that practitioners working with innovations need to **develop a mindset to explore the factors which will help or hinder the scaling up process**. These factors include a clearly defined Theory of Change, clearly defined competencies among different agencies and actors, and champions at the project, community and/or institutional levels. Furthermore, it is important to bear in mind that **scaling up is an iterative process** and the decision to continue down this path needs to be consistently revisited throughout all stages of the project cycle. Finally, this report also concludes that it is essential to **facilitate simplicity as much as possible within the complex realities of the development context**. Simplicity should be a guiding principle in order to minimize the required number of agencies and actors involved, design an effective theory of change and lay the appropriate foundations necessary to bring about a shift in mindsets which may ultimately be required for project success.

Acknowledgements

Building knowledge for effective development practice is an iterative process that builds on the experience, evidence and wisdom of others. This is true of this report to the World Bank on lessons about scalability, drawing on learning from the 2008 cohort of Development Marketplace project winners. Particular recognition should go to Larry Cooley and Johannes Linn who have thought systematically about scaling up innovation and graciously shared their thinking with me. Professor Laurence Simon of the Heller School provided overall guidance and support. Credit should go to the following, and many others, who have been involved in the various studies and in logistics:

Literature Review – "Mapping the Roads from Development Marketplace Agriculture and Rural Development Projects to Sustainable Practice" – Prepared by Susan Holcombe, Laurence Simon, Diana Schor, Maria Creciun, Danielle Fuller, Jessica Olans Hausman, Tapiwa Mupereki, and Jong-Hyon Shin

Desk Study of 22 Projects – Prepared by Diana Schor, Maria Creciun, Danielle Fuller, Jessica Olans Hausman, Tapiwa Mupereke, Jong-Hyon Shin, and Susan Holcombe.

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Executive Summary

Over the past 60 years, the development community has seen a myriad of innovative approaches demonstrated in small-scale pilots. These innovations, even when promising success, have often remained orphans. There is a gap between innovation funding and opportunities for scaling up. The pathway to expansion, adaptation or replication has not often been obvious or easily followed. This report examines the 2008 cohort of Development Marketplace projects, looking not just for the scalability of these 22, but also for guidance on how to foster the transition to a stage of expansion or replication of innovations that can have broad impact on agricultural and rural livelihoods, environmental conservation and poverty reduction. This report and the underlying studies, are part of a larger effort by the Agriculture and Rural Development Department at the World Bank, as well as of other agencies, to examine the challenges of scaling up innovations and to develop guidelines and tools to help development practitioners pursue scaling up more effectively. The work reflected in this report focuses on the first part of the scaling up continuum, the assessment of *scalability* based on the testing of the innovation. The 22 Development Marketplace projects on which part of this work is based are small, $200,000 or less, and differ substantially in size and reach from most of the work of the World Bank. Small projects are often a cost-effective way to test innovation before investing substantial resources. Smallness creates its own constraints in developing the evidence needed to show scalability. This report focuses on recommendations and tools geared to assessing scalability of small innovation projects. Its findings and recommendations are linked to but separate from the *scaling up* knowledge work being generated by ARD, IFAD and other agencies. While the focus is on scalability, the report will also discuss scaling up; an understanding of scaling up is closely articulated with potential for scaling or scalability.

For more than a decade the World Bank has been funding Development Marketplace (DM) projects that test or demonstrate innovative approaches to solving significant development challenges. In 2008, the 22 DM projects were in the agriculture area, focusing on three sub-themes:

- Linking small farmers to input-output markets;
- Improving land access and tenure for the poor;
- Promoting the environmental services of agriculture in addressing climate change and biodiversity conservation.

The purposes of this set of knowledge products, of which this report represents the overview, are to draw lessons from their experience and to offer recommendations to the World Bank on assessing the scalability of DM (and other small innovation) projects and on making the transition from testing of innovation to the next steps in scaling up. The 22 projects of the 2008 cohort represent a special case. First, each is relatively small (total funding US $200,000 or less). Second, they are time limited---seeking to demonstrate the feasibility of one or more innovations within two years,

when the funding ends. Third, they concentrate on innovation in agriculture and rural development. Fourth, they are innovations that originated in a variety of organizations outside the World Bank. Finally, because of the small size, paucity of data and short time period, they remain preliminary demonstrations of innovations.

Methodology
This study is based on work done by a team from the Heller School for Social Policy and Management at Brandeis University. Background work includes:

- a literature review;
- a desk analysis of available documentation on the 22 Development Marketplace projects, selected in 2008 and most of which have completed or are near completion;
- field-based case studies of three projects, which on the basis of desk study, appeared to show promise of scalability; and
- Responses to surveys sent to project managers of the 22 winning projects; to the 78 finalist projects that were not funded, and to the Task Team Leaders (TTLs) of the 22 winning projects.

The literature review, "Mapping the Roads from Development Marketplace Agriculture and Rural Development Projects to Sustainable Practice" (*see Annex V*), examined key literature on scaling up innovations, looking particularly at the analytical frameworks and tools developed by Larry Cooley, Johannes Linn and Ruth Simmons. Drawing on this knowledge, the Mapping the Road report proposed an analytical framework and set of questions, which were used to guide the desk reviews of the 22 projects in the 2008 cohort, and ultimately the three case studies. Those frameworks and questions have been iteratively adapted in light of that work and are discussed below in the body of the report. A Simplicity-Complexity Index of Scalability, altered from but using the essential approach of the Cooley and Kohl Scalability Checklist, is presented in the report. This report recommends it as practical tool that can be used by a variety of practitioners from the design of an innovative project to the design, funding and implementation of the scaling up process. Recommending this as a practical tool for practitioners does not mean that more systematic evaluations, business plan assessments or management analyses would not also need to be done. DM projects are small and lack the financial and human resources for more sophisticated analyses of scalability during the early stages. A mindset that gives priority to finding potential for scaling up, along with a framework for analysis and a set of questions plus the use of the Simplicity-Complexity Index of Scalability tool are intended to streamline assessment and allow practitioners to identify innovative projects that show promise of wide impact through scaling up.

This focus on a simple tool for practitioners flows from a key paradox observed about innovation and scaling up. *We want proof of innovation impact and scalability before deciding to scale up, but decisions on scaling up need to be made before there is*

adequate information. The Simplicity-Complexity Index allows the practitioner to consider the key questions about scalability and to track progress.

Additionally three short videos have been prepared, illustrating the innovations in the three projects selected for case studies (in India, Mongolia and Nigeria), and the potential they have for impact if scaled up. They make vivid the impact on participants in the three projects, and suggest the demand for scaling up.

What do we mean by 'scaling up' and scalability, and why are they important?
Scaling up has multiple definitions, but it is generally agreed that scaling up means the expansion, adaptation, replication and sustaining of desired policy, program and practice changes. Implied in definitions of scaling up is the assumption that we scale up in order to achieve valued outcomes, such as poverty reduction, or the goals of country and World Bank strategies. In scaling up we may be interested in the magnitude and reach of the impact, the quality of the impact, the impact for whom, and over what time period. Expansion and replication are intentional and planned types of scaling up. Readers should not overlook the importance of spontaneous replication, which may occur when an innovation is broadly perceived by all stakeholders as highly beneficial and the barriers to adoption are low. Scalability, then, is the potential of a particularly innovation or change to be scaled up, or expanded, adapted or replicated.

There is no established theory on scalability and scaling up successful innovation, but there are emerging a number of analyses that propose guidelines for analyzing and planning for scaling up and there are questions that provide a framework for assessing specific variables thought important to the scaling up process.

Scaling up innovations has a current urgency. One driver of the demand for scaling is the concern about the persistence of poverty, even in societies experiencing economic growth. Innovations in agriculture, access to rural markets, access to land or linking livelihoods to the environment are failures unless they can be scaled to make a difference in the lives of many people living in poverty.

Donor demand, the engagement of the private sector and of social entrepreneurs, the role of new and large private foundations, and critiques of aid effectiveness propel the interest in scaling up. Gates Foundation, for example, is investing in scaling up technologies for preventing and treating both major diseases and neglected tropical diseases. It also funds its grantees to undertake rigorous evaluations of innovative models in order to lay the ground for scaling up.

Primary take-away lessons and specific recommendations for the Development Marketplace projects*:*
On the basis of this analysis, the report develops general observations on scaling up, which overlap with specific recommendations with respect to Development Marketplace processes and for follow-up to the 2008 cohort of DM projects. The findings, conclusions and recommendations are synthesized and summarized here

as five take-away lessons plus a summary of specific follow-up recommendations for the 2008 cohort of DM projects:

First, scaling up is an iterative process, not a two year demonstration project. Two year projects to test innovations are critical, but insufficient. Designing the test of an innovation needs also to include an assessment of its scalability and a strategy for bridging the gap between testing and scaling up (if warranted). The intention to scale should be part of the design of the original project to test the innovation. The decision to move toward scaling up needs to be based on evidence of whether the innovation delivers intended results and has potential for replication and expansion. There is a paradox in how we approach scaling of innovation. In theory we test an innovation in order to determine whether it works and has potential for scaling up, but in practice the decision to move toward scaling up must often be made on inadequate information and before all conditions are in place. Projects testing innovations, like the DM projects, are usually small and may lack the time, human skills and other resources to assess rigorously the effectiveness and efficiency of the innovation, and to judge the requirements for scaling up. The report suggests that a first decision to move toward scaling up an innovation needs to be made at a very early stage, but that this decision is an iterative decision based on evolving evidence. Practitioners need a trimmed-down set of tools that can guide iterative decision-making on scaling up. The report suggests criteria and a Simplicity-Complexity Index of Scalability (*see body of report*) to use to guide this decision-making, particularly in the early stages. If assessment of scalability is done iteratively, there are two advantages. First, the information from the assessment can be used to influence implementation of the demonstration project. Second it can be used for decision-making on whether or not to proceed toward scaling up.

Second, keep innovation simple. The report concludes that innovations with the best possibility for scaling up have clear and testable designs or theories of change; and are perceived as having local legitimacy, ownership and the capacity to produce benefits. Keeping innovative projects simple means limiting the number of agencies necessary to delivering implementation, the number of actions, and the number of decision-points necessary before an action can take place. The Simplicity-Complexity Index described in this report and included in the Annex I is a tool for practitioners that may be helpful in assessing these conditions.

Scaling up is essentially the implementation of *chang*e. In this case the innovation represents change in technologies used, processes or systems, and behaviors. It is an exercise in strategic leadership, management, learning and adaptation. The literature on implementation strategies as well as on scaling up offers a number of frameworks and checklists to guide an effort to scale-up promising innovations. Following these guidelines can be an impossibly daunting task for small organizations that launch and test innovation. Given the competing demands, time pressures and organizational incentives, simplicity becomes important. The use of simple tools to assess scalability can allow implementing organizations and funders to focus on a small number of key actions that will pull along the other implementation steps required in a scaling up process.

Third, monitor and evaluate. Monitoring how the innovation is implemented and tracking the results is part of a practitioner mindset that is oriented to the possibility of scaling up. Even if small projects testing innovations lack the resources to conduct rigorous and independent evaluations, project managers need to be aware of the theory of change embedded in the innovation, and also to be ready to track whether the innovation is being implemented as predicted and whether it is producing the expected results. Even without a rigorous evaluation, good monitoring, to the degree that it documents that the innovation can be implemented and produce results, can provide evidence for the scalability of the innovation. Project managers who foster systematic monitoring are reflecting a mindset that is important to the scalability of an innovation. It is a mindset that gives priority to establishing the evidence that leads to decisions on scaling up.

Evaluation is important, but in the case of small projects like the Development Marketplace winners, investment in rigorous, independent evaluation may follow, rather than precede, the initial assessment of scalability. An initial assessment of scalability may justify the human and financial expense of investing in rigorous evaluation. Very small projects like the DM winners, when assessed as potentially scalable, can move to a next stage on a scaling up continuum, where evaluation is a part of the next project design.

Investments in continuing, independent and dynamic assessment, evaluation and learning about innovations being scaled up are critical. As scaling up proceeds, the sophistication of evaluation and learning should increase and feed into decisions about scaling the innovation and about the implementation process, creating reciprocating learning and decision-making. Once the decision has been made on the *scalability* of small projects, continuing information to inform the scaling process is needed on the effectiveness and reach of the implementation; about the financial as well as social and political viability of the innovation; and about the process of scaling up implementation are critical.

Fourth, make sure critical levers are in place to facilitate the transition from successful demonstration of an innovation to scaling up. In particular, there needs to be clarity about which agency will take responsibility for planning and implementing the scaling up process (the driver), and whether there are interested, powerful actors (champions) who can and will advocate for the innovation, make connections and help resolve problems or reduce barriers. Short-term innovative projects, like the DM projects, need '*shoulde*r' activities, where a mediating agent, most likely but not always the original donor, plays a role in determining whether the implementing agency for scaling up is specified, and advocates for the scaling up are in place.

Fifth, embrace Development Marketplace projects as an incubator. The report suggests changes to the DM project proposal and selection process to give greater emphasis to elements that would create the evidence to justify scaling up, to identify the type of scaling and the key actors in scaling, and to create the legitimacy of and

constituency for the innovation. DM projects, like any project introducing change, are time limited. They have a beginning and an end. The challenge of tools for assessing scalability of innovations is to allow decision-makers to make the links to follow-up activities (as justified). The Development Marketplace and the Agriculture and Rural Development Department have intentionally provided significant backstopping to the 2008 DM projects; this report suggests a few ways in which the DM, the WB Department to which the innovation is linked, and the country office can collaborate to use Development Marketplace projects as true incubators of successful, innovative changes that make a much broader contribution. Essentially this collaboration is about more intentional articulation of the DM Projects as incubators with the Country Strategies

Specific follow-up actions for the 2008 cohort. These recommendations are on three tracks. First there are specific recommendations for projects that show promise of scalability and where the World Bank can take direct actions. These actions are sometimes low cost, but they may involve staff time and commitment. Second, for projects where the World Bank may not be the best agency to facilitate scaling up, it can encourage other actors, large international NGOs, bilateral and multilateral donors, development banks, the private sector, social entrepreneurs, Governments and other development funders to take advantage of the DM tested innovations. There are particular types of DM projects most suited to this continuing, outside collaboration. Third, some projects do not merit significant continuing attention because there is insufficient evidence of scalability; the projects lack scalability potential or their potential impact is limited.

I. Introduction

This report is about the scalability of successful innovative projects. It looks at how innovative technologies or approaches, tested in small projects, can be moved toward expansion, replication or incorporation into larger, national projects; or when and whether the decision should be made to adjust or abandon testing of the innovation. It identifies lessons learned and makes recommendations to the Agriculture and Rural Development Department of the World Bank on managing pilot projects that test innovations and on follow-up and dissemination.

The report brings together the findings of several prior knowledge products prepared for the Agriculture and Rural Development Department of the World Bank about the 2008 Cohort:

- "Mapping the Roads from Development Marketplace Agriculture and Rural Development Projects to Sustainable Practice" (referred to in this report as "Mapping the Roads" *see Annex V*). This was a review of the literature on scaling up and the identification of tools and questions to assess the scalability of small projects that test innovations or the transfer of innovations;
- A desk study of the 22 winning projects in the 2008 Development Marketplace competition;
- Surveys which were distributed to the project managers of the 22 winning projects; to the World Bank Team Task Leaders (TTLs) managing the DM projects; and to the 78 Finalists in the 2008 competition; and
- Three case studies of Development Marketplace projects in Nigeria, Mongolia and India (*see Annexes II, II, IV*). The case studies used the tools developed in "Mapping the Roads", particularly the criteria for scaling up, the questions to inform analysis and the scalability index. These case studies involved desk review and about four days in country interviewing the implementation team, partners, and beneficiaries and World Bank Country Office staff.

Reference to the documents above will expand and clarify points made in this report; though this report is a synthesis, it is intended to stand on its own.

All of this work is based on the experiences of the 2008 Development Marketplace (DM) projects[1], which focused on testing new ideas in the following areas:

- Linking small farmers to markets;
- Improving access to land and land tenure for communities living in poverty;
- Promoting the contribution of agriculture to environmental services that mitigate; climate change and support biodiversity conservation.

[1] See the website http://agriculture.developmentmarketplace.org/dm/home# for additional information on this cohort.

The Agriculture and Rural Development Department (ARD) of the World Bank cooperated with the Development Marketplace staff in supporting the 22 winning projects with technical advice, communications, and sharing of experience. The 2008 cohort of winners coincided with the tenth year of Development Marketplace competitions. This initiative was introduced by the World Bank to provide seed money to new ideas with potential for a big impact on social and economic development outcomes. ARD had commissioned this work on the 2008 DM projects as part of a larger effort to examine scaling up of innovations in ARD lending.

This report discusses first the methodology of each of the studies carried out by Brandeis, reviews the key definitions, and identifies the limitations of the studies. (Section II). Section III synthesizes the findings of the literature review, case studies, desk reviews and surveys; uses the synthesis to structure a set of questions relevant to assessing scalability; and proposes a Simplicity – Complexity Index of Scalability to us used as a quick tool to estimate scalability. Section IV revisits the 22 projects in the 2008 cohort, and drawing on the synthesis done for Section III, summarizes findings on the case studies and the 19 projects on which desk reviews were completed. It draws out some additional findings related to potential scaling up of these projects. Section V makes key recommendations to the World Bank on assessing scalability and bridging the gap between demonstrating innovations and beginning the process of scaling up.

II. Methodology, Definitions and Limitations

This summary report is built on the underlying literature review, case studies, desk reviews, and surveys. It also links to the work being done on scaling up at ARD and IFAD and the publications of Cooley and Kohl and Simmons. The linkage has importance beyond the value of the knowledge others have generated. If we think of scaling up as a continuum then we need ways of thinking about specific phases in the continuum of scaling up from innovation to expansion and replication to sustainable operations. The tools may be different at different stages, but they need to articulate or connect with each other.

Methodology

Literature review, desk reviews, field case studies, surveys of project managers and World Bank Task Team Leaders (TTLs), and synthesis were the primary methods of investigation and analysis. Ideally the literature review would have preceded the desk reviews and have provided a framework or guide for the desk reviews. Because of the two month timeline the literature review and desk reviews were carried out nearly simultaneously, but in ways that they informed each other. An interdisciplinary team of researchers at the Heller School for Social Policy and Management at Brandeis University began at the beginning of February 2011 to scan the literature and meet weekly to develop a framework to conduct the desk reviews. At the same time the same team was assigned to review the documentation on each of the 22 projects. In this way key variables in the literature that had importance to the scalability of innovations were compared to the

documentation available on the 22 projects. Feedback from this comparison led to refinements in the set of questions used in preparing writing up the desk reviews. The results of the literature review and the 22 project reviews were synthesized in the summary document of this first phase of work, "Mapping the Road" (*Annex V*), which went a further step and refined the set of questions to be applied in the field based case studies of three projects recommended as showing high potential for scalability. The three case studies were carried out in the months of July and August, with between 4-5 days in-country for field visits plus discussions with key stakeholders, including the implementing organization, project participants, and World Bank staff. Field visits often required substantial time for travel. Case study authors received similar, but separate, briefings on the "Mapping the Road" document, the common questions to guide the case study, and approaches to assure field personnel that the case study exercise was not an evaluation. Simultaneous to the field studies, three questionnaires were developed by a member of the Phase 1 team. The three questionnaires sought the opinions on topics related to scalability from 1) managers of the 22 winners of the 2008 competition, 2) managers of the 78 finalists, and 3) Team Task Leaders in the World Bank Country Offices responsible for the winning cohort of 22. The surveys probed topics related to scalability, including the challenges and the opportunities affecting implementation of the project; relationships between the project and the World Bank (TTL, ARD, DM); and ability to raise additional support for the innovation. This final report attempts to synthesize findings from all prior work and to develop a set of tools---key questions to ask and a Simplicity – Complexity Index of Scalability. Understanding scalability and scaling remains a work in progress. These tools need to be tested by practitioners and refined again.

Scope and limitations of this synthesis

There are limitations to the data developed through these previous exercises, but these deficiencies reflect the reality in which decision-makers actually make about scaling up. The desk reviews depended on project proposals and periodic progress reports. In the case of many of the 22 projects, progress reports were not available to the reviewers. Field visits to develop information for the case studies were too brief (4-5 days), required long road trips to project sites, and did not allow the opportunity for quantitative data collection or analysis. The surveys used an email approach that assured confidentiality of responses. Perhaps because of the timing of the survey (July- August), the response rates ranged between 32% and 59%. The small size of both the number surveyed and the responses do not allow generalizations, but responses do suggest issues that need more investigation.

Synthesis of the case studies, desk review and literature review findings are guided by recognition of two critical *paradoxes* and one feature of development interventions that hides in plain sight. The first paradox is that *we want proof of innovation impact and scalability before deciding to scale up, but decisions on scaling up need to be made before there is adequate information.* Project implementation does generate information about innovation viability and scalability, but planning for scaling up needs to be part of the project design and implementation. The

literature review in "Mapping the Road" noted a consensus (Cooley, Linn, Simmons) that planning for scaling up starts in the design of a pilot project. The Development Marketplace projects represent such pilots. Yet the organizations developing pilot tests of innovation may lack the time, resources and incentives to focus on laying the groundwork for scaling up at the same time as they focus on implementing the pilot project. There is a gap between project implementers, who focus on 'getting things done', and planners and researchers who want to fill the information gaps. Pilot tests of innovations may produce incomplete information on whether the innovations(s) were cost-effective, on how the delivery systems worked, and on opportunities for and constraints to scaling up. Even though there is inadequate information, decisions on whether to take an innovation to the next stage have to be made even before the pilot demonstrations is complete. Gaps between completion of a project testing an innovation and starting a scaling up effort can lead to a loss of momentum, of expertise (for example, as key implementers seek other employment) or disillusionment among intended beneficiaries. Decision-making on scaling up is a progressive process, not a single decision. Stakeholders need a systematic way to make decisions to go the next step, even in the absence of full information. Going the next step can start to fill in critical information gaps. For example, a new technology promises to allow farmers to store a commodity with minimal post harvest lost until they can take advantage of best market prices. The pilot has been tested in a representative area over the past months. How do the implementing organization, key stakeholders, and/or donors make decisions about going beyond the test area, and about what critical information is needed to go forward---without losing the momentum of the pilot effort.

The second *paradox* flows from the first. If planning for scaling up must begin during the testing phase (the DM project), then the search for the best agency to implement scaling up must also be taken seriously, assuming that scaling up is a possibility even before the innovation is fully tested. In practice and in the examples of the DM projects examined, this clarity did not always exist. The consequence is an inability to begin planning for scaling up as part of the DM project. Lack of certainty about the implementing agency for scaling also suggests that the DM project may lacks constituency or demand for scaling up, and a powerful champion to build the constituency.

Finally, hiding in plain sight are *features* that distinguish scaling up in development and government settings from scaling up an innovation in the private sector. Decision-making processes and incentive systems vary between private sector and government efforts to scale up. Political and social considerations, rather than market issues have more influence on public sector decisions; but the incentives for producing social goods are not always present or clear. Government and non-profit organizations serve a public function and deliver public goods.

Definitions

Before defining critical definitions of innovation, scaling up and scalability used here, it is worth re-stating why we care about scaling up. The task of expanding the

impact of innovative changes, or scaling up, is an old challenge that has new urgency. The World Bank, other major development agencies, practitioners and academics have been asking this question in earnest for the last decade and longer. The Agriculture and Rural Development Department of the World Bank is analyzing its own experience of scaling up successful innovation in its major lending experience.

While some countries have made measurable progress in increasing income and human well-being, others still experience poverty and inequality. Agricultural and rural livelihoods stagnate in these places. The need, and the opportunity, to make an impact on a large scale on human well-being are at the basis of why we care. Rajiv Shah, the Administrator of USAID, expressed compellingly why we care about scaling up when he spoke recently of proposals to reduce material and infant mortality:

> I was inspired by the ingenuity, focus and energy behind each proposal….We know that it is not sufficient to simply develop a single innovation that can save lives. We also have to find ways to deliver these innovations to scale in order to have countrywide impact…. [2]

If innovation works, it needs to be available to all who need it in order to make a dent in the multiple challenges of poverty.

Donor demand, the engagement of the private sector and of social entrepreneurs, the role of new and large private foundations, and critiques of aid effectiveness propel the interest in scaling up. Gates Foundation, for example, is investing in scaling up technologies for preventing and treating both major diseases and neglected tropical diseases. It also funds its grantees to undertake rigorous evaluations of innovative models in order to lay the ground for scaling up. Demand for scaling up innovations should challenge our thinking about how development assistance is conceived and delivered and how actors in development practice work together.

Innovation represents change. It is easy to think of innovation as technical, but we need also to look for innovations in service delivery, or in the organizations implementing the change. Behind the change lies a (sometimes implicit) theory of how the innovation will produce a desired outcome: if farmers use drip irrigation according to guidelines, their yields will increase by X%. But we need to look deeper at the implementation and how the improved irrigation was delivered to farmers so that they adopted it appropriately, and what were the organizational structures and operations that made this change possible. Innovation, thus, is not just technical; innovation is also the processes that enable the significant behavioral changes and/or the institutional and organizational changes required if the

[2] http://www.huffingtonpost.com/dr-rajiv-shah/innovations-to-save-moms-_b_933135.html. 8-23-2011

innovation is to deliver results to people. Social processes are often more complex than technical changes. We think of innovation as new, but the discussion of categories of practice in section II below suggests that innovation occurs at different levels before it becomes accepted in policy and practice. A technical innovation may not be 'new' but the interventions to achieve behavior changes or build institutions may be new.

The "Mapping the Road" document pointed to agreement in the literature that scaling up remains a difficult challenge. The Ashoka Globalizer Social Impact online discussions refers to the failure to make good use of innovative models:

> *"Breakthrough innovations too often remain local.* ***We reinvent the wheel****, and fail to bring innovations to where they matter."*

IFAD is more direct: *"effective scaling up is a key measure of successful innovation"* (in Linn 2010, 4). If there is no impact at some scale, there is no innovation (See also Roob and Bradach 2009).

Like innovation, scaling up has multiple definitions. Common but not universal, themes that run through the definitions are scale of impact, quality of impact, impact for whom, and sustained time frames (Binswanger and Aiyar, 2003. 25-6). A definition that flows out of the 2004 Shanghai Conference on Scaling Up is simple and widely used:

> *Scaling up means expanding, adapting and sustaining successful policies, programs and projects in different places and over time to reach a greater number of people.* (quoted in Hartmann and Linn 2008).

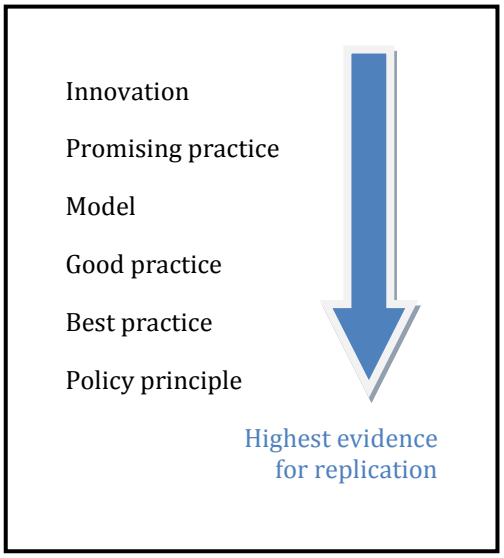
This definition has the merits of brevity and simplicity. Part of impact is implied by the requirement of reaching greater numbers of people. The "successful" descriptor implies that there is some valued end of scaling up, without specifying that end. It implies more than one pathway to scaling. It leaves open many questions, including of what is scaled, who does the scaling, how we decide which people are reached or how implementing scaling is managed. The implication is that the definition can (and must) be tailored to specific contexts. In the context of this report, the focus is on scaling up as replication or expansion. The simplest form[3] of scaling up is adoption of the innovation by government and incorporation into ongoing operations, either as expansion or replication in individual government subdivisions. Expansion and replication become more complex when the scaling up is managed by multiple organizations in multiple locations.

[3] Spontaneous replication is actually easier. It occurs when the value of a change or innovation is perceived as being so advantageous that other units or localities unilaterally adopt the innovation without any other outside incentive.

Human capacity to innovate outstrips capacity to transfer innovative approaches to broad numbers of people, and particularly to those who are traditionally marginalized. Excitement and glamour adhere to innovation. Attention withers during the long slog of implementing effective and efficient innovative practices. We reward innovation. Innovation can be exciting and bring quick rewards. The Stanford Social Innovation Review suggests,

> *"The social sector invests intensively to foster innovation, but seems to have less enthusiasm for mastering the skills of transplanting successful innovations to other needy locales."*[4]

Starting with these definitions of innovation and scaling up, and assumptions stated above, the remainder of this report synthesizes the findings from the desk study project reviews, field case studies and surveys listed above. It draws conclusions particularly about the small scale projects that set out to test innovations and it asks questions about what makes them *scalable*. It goes on to make recommendations to the Agriculture and Rural Development Department on designing pilot projects that test innovations, and on dissemination and follow-up to the work they have done with the 2008 Development Marketplace cohort of winning projects.



III. Synthesizing Findings from the Literature Review, Case Studies, Desk Reviews and Surveys

DM projects, as should be the case with any testing of an *innovation*, are small, with available resources focused on implementing the innovation(s). With budgets less than US$200,000 over a period of two years, the resources and energy for planning of scaling up and analysis of outcomes are limited. This is the paradox of scaling up decision-making. We need adequate information, but it is often not there before decisions are made. Failure to make decisions in a timely way can have negative consequences for the momentum and credibility of innovation efforts. The sections below analyze case studies, desk reviews and survey results using criteria for scaling up in the foundation literature review[5]. The aim is to demonstrate a practitioners' toolkit for iterative decision-making.

1. Understanding innovation and its scalability potential from the beginning.

This section looks at the 2008 cohort of DM projects in terms of categories of innovation; clarity and credibility; legitimacy of the implementing agency; evidence

[4] http://www.ssireview.org/articles/entry/disseminating_orphan_innovations
[5] See "Mapping the Road".

of effectiveness and efficiency; the financial model; alignment and linkages; and the complexity, coordination requirements and behavior changes necessary. Testing a new technology or approach in other contexts should, in theory, reduce risks of failure.

Type of Innovation: Innovation is a particular kind of change. It may be a new and untested technology, delivery system and/or organizational change or partnership aimed at solving a development problem or achieving valued development outcomes. Often these innovations come in packages, for example, a new technology for preserving marketable fruits and vegetables; training of youth entrepreneurs to maintain and manage the technology, and a new type of partnership between local government and a university unit. Innovations, narrowly defined, are untested, pose the risk of failure, and need evidence to demonstrate their effectiveness and efficiency. The term innovation is often used broadly to cover the types of changes listed in the box (above right)[6]. This hierarchy of changes suggests that true innovations are untested, have little evidence for their feasibility, and pose the greatest risk for failure because of the absence of experience.

This section finds that some of the 22 DM projects are testing one or more true innovations. However, a number are actually replicating promising practices or models that have been tested in other contexts and for which there is some evidence of their feasibility. Contrary to what one might expect, as this and subsequent sections will imply, DM projects using models that have been demonstrated elsewhere may actually face greater challenges to scaling up than true innovations *if* the delivery system is complex or large behavior changes are required.

Of the 22 DM projects that are testing real innovations, most are a combination of a two or three innovations: new technology, a new delivery system or way of working and a new organizational arrangements or partnerships. As an example, the India Mini-Cold Storage Unit project combines access to a new technology (small farmer-appropriate cold stores), managed by youth entrepreneurs (a new delivery system) and supported by a partnership between a technical training institution and local government. All three innovations are being tested in the DM project. Many of the 2008 DM cohort, especially those that link farmers to markets and to effective participation in the value chain and some of those addressing environmental services, include more than one innovation.

Four projects seeking to expand or protect access to land have a primary focus on a single innovation. --- a new process or delivery system. These include establishing women's communal ownership or promoting knowledge about land rights or access to riverbed land. The land access projects were not trying out technologies, though they may try some new partnerships, as between an international NGO and a law school.

[6] See Cooley and Kohl, 2006, (7-9).

A subset of the 2008 projects were not testing innovations, but implementing *models* that had been tested with success in other locations. These include, for example, the five projects seeking to introduce payment for environmental services (PES) to new areas or the introduction of Azolla Anabena plant as a bio- fertilizer to Ecuador.

Clarity and credibility. The innovations (or models) in each of the projects are means toward an expected outcome, such as increased income for rural producers. Clarity means that the project has identified the chain of actions, relying on innovation, which will produce the desired outcome. This is the *theory of change*.[7] The projects selected for case studies[8] have a clear articulation of how the innovation(s) will produce change. The Nigeria Project, "Adding Value to Waste in the Cassava Processing – Goat Keeping Systems in Nigeria" has a clearly articulated theory of change that can be tested, and which leaves no logical gaps in implementation. The outcome expected is increased income for farmers with incomes less than $2 per day plus reduced carbon emissions as a result of eliminating the burning of cassava waste. An agriculture university, working with government agricultural extension agents introduces to farmers a new technique of drying cassava waste[9], access to credit for the drying platform and market linkages to goat (and other animal) producers who need fodder. At the same time agricultural extension agents introduce the dried cassava waste and a diet regimen that will bring goats to marketable size in less time. The theory depends upon the cassava farmers and goat keepers adopting a small number of new, simple practices/behaviors. The theory of change is clear and can be measured and/or monitored. Early on in project implementation it becomes evident whether farmers are adopting the innovation, and the income benefits are rapidly apparent. This can be observed in the willingness of increasing numbers of farmers to adopt the innovation. In this case, the demand for cassava drying was strong and the project exceeded its objectives for the number of communities involved. The impact on carbon emission reduction is more difficult, but not impossible, to estimate. The theory of change becomes credible to stakeholders through the logic of the innovation and the easy perception of its benefits, as well as through public perception of the technical capacity of UNAAB and project management.

In some other cases, the theory of change in the Development Marketplace project was not always clear and it depended on implicit assumptions about what would happen. For example, projects using environmental service payments to encourage peasants to switch to new types of livelihoods relied on unexamined assumptions about sustainability of market demand for the new product (acai, 'wildlife friendly'

[7] See the Literature Review "Mapping the Roads from Development Marketplace Agriculture and Rural Development Projects to Sustainable Practice" prepared as a foundation study for this knowledge product. Also Carol Weiss for a discussion of the theory of change and Aspen Institute for tools to map the theory of change. (Weiss, 1997).

[8] See separate case studies on DM projects in Nigeria, Mongolia and India.

[9] Wet cassava waste includes toxins dangerous to animal health. Drying removes the toxin and creates a nutritious feed that can accelerate goat or other animal growth to market size.

rice). Other projects rely on complex technology without clarity as to whether the technology can be maintained in poor rural areas (milk coolers) or whether the intended beneficiaries will be able to use a complex technology (genomic identification of cocoa cultivars or locally produced biofuel motors). Also unaddressed is whether complex technologies include or exclude women and other marginalized groups. Related to the clarity of the theory of change and credibility of the innovation and of the implementing agency is the legitimacy of both.

Legitimacy of Implementing Organization. Looking at the DM Projects as packages of innovations that include the implementing organization, it is useful to ask about the 'legitimacy' of those organizations. Legitimacy has multiple meanings in relation to organizations and policies and reflects a perception that the organization and its actions are desirable and accepted within a particular context (Suchman 1995, Brinkerhoff 2005; others). Legitimacy in the case of scaling up DM projects is also an important characteristic of the organization that may take the responsibility for scaling up. Roughly half the DM projects have, as the chief implementer, an organization based outside of the country. Non-national implementing agencies include international NGOs (Helvetas, Mission Goorgoorlu, Wildlife Conservation Society, Biodiversity International, International Development Enterprises, Voluntary Service Overseas, Rural Development Institute, Pachama Coffee Cooperative[10]), universities (University of Georgia, University of Sydney), and international organizations (Organization of American States). A large minority of the 2008 cohort was implemented by national organizations, including universities (University of Agriculture, Abeokuta, Nigeria; Tiruchirappalli Regional Engineering College – Science and Technology Entrepreneurs Park TREC-STEP) and local institutes or NGOs (Escuela Superieur Politecnica, Centro Ecologico, Conservacion y Desarrollo, Manav Seva Sansthan, Grupo Ecologico Sierra Gordo I.A.P.) Two DM projects are implemented by private sector organizations[11] (Vinh Sang Ltd., Africa Biofuel and Emission Reduction (Tanzania) Ltd.).

None of the projects were implemented by a government agency, though there was cooperation with government agencies in many cases. It is not surprising that testing of innovations is initiated and driven by organizations outside government, or by organizations based outside the country. Outside organizations may lend technical knowledge, credibility and financial, organizational and human resources, which government agencies may lack. Ultimately outside organizations do not have legitimacy, in a country that is not their own, as implementers of scaling up efforts that seek to integrate an innovation into government policy and practice or take the innovation to national level. Many of the innovations tested in the DM project have potential to be integrated into government policy and practice. They need to be seen as legitimate, or acceptable and owned locally. Gaining this legitimacy is an intentional exercise.

[10] Pachama is a tax exempt organization registered in the U.S. but includes five producer groups in Ethiopia, Peru, Nicaragua, Guatemala and Mexico)

[11] The private sector innovations will be discussed separately below.

At the project design stage and at subsequent decision points, project management needs to focus on how the outside implementing responsibility is transferred to an indigenous agency, government, non-government or private.

Evidence of Effectiveness and Efficiency. It is easy to dismiss the experience of projects demonstrating innovation. As small projects they lack rigorous evidence of innovation impact and documentation of implementation. This is central to the paradox of decision-making on scaling-up small scale innovations. Realistically we need to acknowledge that resources, energy and incentives are often lacking for monitoring and evaluation. Practitioners may place higher priority on getting the innovation completed than in developing documentation that might be useful for planning scaling up. Project managers responding to the survey of 2008 Development Marketplace winners and finalists noted the pressures of implementation and noted that time was needed to allow the results to emerge. Thus, the challenges of implementation may mean that results may not be available before the project funding completes. As one project manager surveyed noted:

> *I would not have been so ambitious in terms of farmer involvement. It takes time to make changes in rural areas, and the time span of the project---two years---is a very short period.*

Indeed, annual project reports for many of the 22 projects were not available for the desk reviews. This makes assessing the effectiveness of the 22 Development Marketplace projects difficult. Field visits for the three case studies did not allow time for independent assessments of outcomes. However, all three projects for which cases studies were completed, particularly the two projects implemented through tertiary education institutions, have developed internal evidence that the innovations are effective in producing outcomes. The evidence comes from monitoring and also assessments at the end of projects, and not from carefully designed evaluations that examine impact on participants versus equivalent non-participants. The project reports do attempt to document the delivery of outputs.

Chart 1
Producing Evidence for Results

	Outputs		**Outcomes**	
	Planned	***Achieved***	***Planned***	***Achieved***
Nigeria -Number of dryers -Number of sites -Cassava farmers -goat herders -Increase in income ---cassava farmers ---goat herders	 24 12 3600 600	 33 33 6078 886	 $384 $198	 $635 -----
Mongolia Outputs: stakeholders reached or facilities established	-300 herder households reached in 3 soums -3 grading laboratories -100 traders at soum level -5 cashmere and wool manufacturers	-380 herder households in 4 soums - 1 grading laboratory -no traders formally participating -2 cashmere and wool manufacturers		Not reported, but participating herding households reported in increased earnings resulting from graded wool and other project activities.
India	-install coolers in 5 markets -benefit 2500 farmers	-mini-coolers and entrepreneurs established in 5 markets -2014 farmers registered in markets -358 farmers actively using Mini Cold Stores	- estimated 50% reduction in wasting of fruits and vegetables; estimated savings of $200,000.	- estimated savings of $200,00 from reduced waste.

The data generated by the three case study projects are not independently verifiable. They do offer initial evidence that the projects are being implemented as planned and that outputs come close to or exceed plans. They reflect a value placed on measuring the outcomes in terms of impact on intended beneficiaries. When all outputs were not achieved at the time of the case studies, the lags may help identify bottlenecks. Finally, the results cited above demonstrate that these projects are able to incorporate monitoring, evaluation and learning function along with implementation of the innovations. The Nigeria Cassava and the India Mini-Cold Storage Projects are implemented by university entities with access to research capacities and an organizational culture oriented toward learning.

Efficiency, seen as the ability to bring benefits to the largest number of intended beneficiaries at the lowest cost, can also be examined at an early stage in terms of potential. DM innovation projects necessarily reach a small number of people because of their size (<$200,000). Some DM projects attempt to identify at an early stage the number of beneficiaries, the benefits per beneficiary, the cost of delivering the benefit and the potential market for the innovation if expanded or replicated. This may be easy when the innovations are simple and the links between the innovation and the outcomes are direct.

Nigeria. Using the Nigerian cassava waste case mentioned above, the project proposal identified expected beneficiaries of that project; in addition one can estimate the potential number of poor cassava growers and goat and other animal herders in Nigeria and in comparable cassava producing countries that might benefit from this innovation. The cassava waste project is also testing the costs, the greatest of which is the drying platform, which costs $165[12]. The project proposal, and subsequent results of project monitoring, estimate expected income increases to cassava dryers, allowing an initial estimate of the potential net benefit to farmers, and a rough estimate of the potential efficiency of this approach in raising rural incomes. The other two case studies completed also suggest that it is possible to begin assessing potential efficiency from the project proposal stage.

India. The India Mini-Cold Storage Project is addressing the problem of waste of poor farmer produce in markets not just in Tamil Nadu, but in many tropical and sub-tropical areas. It is a strategy that allows poor farmers to get better returns from participation in the market. The technical innovation gives poor farmers access to their own compartments in specially designed small cold storage units. The project can track the number of small farmers using the units, the reduction in waste of vegetables and fruits and the increase in income. In this India case, project proposal estimates and initial results show that the returns in income to are substantial. However, the initial proposal identifies a key cost constraint, the high costs of the mini-cold storage unit ($16,500). From the outset the high capital investment raises questions about whether the cold store can be operated as a small business by youth entrepreneurs, or whether Government owned farmers markets in Tamil Nadu and elsewhere in India should provide mini-cold storage units as a public good, and as part of the larger Government strategy to reduce rural poverty. Or alternatively this analysis raises the question of whether the costs of the cold storage can be substantially reduced. The implementing agency, TREC-STEP, is currently investigating alternative technologies and power sources---new technical innovations with potential to reduce costs significantly.

Mongolia. The Mongolia DM project, "Value Chain Development for Textile Projects", also illustrates the value of early questions about efficiency. As a pilot, the project reaches only a small number of herders in country, but the problem of being unable to sell wool directly to factories and to upgrade the quality of wool keeps *all* herders in Mongolia from accessing markets and taking part in the value chain of the textile industry. Mongolia has a total population of about 2 million of which 43% depend on livestock, primarily goats, for livelihoods. While cashmere products represent 6.6% of GDP and 8.6% of exports, it is estimated that about half of raw cashmere wool is lost to outside textile manufacturers. As this project moves toward scaling up inside Mongolia, one can compare the costs of maintaining rural wool testing

[12] Separate from the capital cost to farmers is the financing issue. UNAAB experienced difficulties with a microfinance partner, but is already actively seeking alternatives.

laboratories that guarantee high quality wool to the increases in incomes of herders and also of the national wool textile industry.

In summary the questions we need to ask are:

- How many people (of the targeted group) does the project benefit? How many people might the project potentially benefit in the country or in similar geographic and social contexts?
- What are the expected benefits?
- What are the costs? How might the costs or revenues be managed?

Not all outcomes can be anticipated in the short-run or in the context of individual DM and therefore it is difficult to make judgments about efficiency. When expected benefits are environmental, for example, the protection of the Atlantic Forests and maintenance of wildlife corridors, can be monitored over time, but the benefits may not be perceived in the lifetime of a two year project.

Financial Model. Related to evidence that the innovation works and is at least potentially cost effective is whether there is a sound model of financial viability, or a long-term strategy for achieving sustainable financing. The nature of the financial model will vary, dependent on the degree to which the innovation represents a 'public good' or high national policy priority or the innovation has the potential to be self-funding on a sustaining basis. In either case, the innovation project design needs clarity at the outset about the source and sustainability of financial support to test the innovation and to move beyond testing to different levels of scaling up. The Nigeria cassava waste project envisions that the earnings from dried cassava waste can amortize the cost of the drying platform and lead to stream of income for cassava producers. Raising the capital for the platform requires that participants have access to microcredit, and that the microcredit is managed in a sustainable and accessible way. The project monitoring data appear to demonstrate that the dried cassava can generate enough income to cover capital investment and added income, but the financial model needs to be revisited during a scaling up process, should, for example, market conditions for dried cassava change. The Mongolia project reflects a dependence on outside funding for a substantial period. The case study indicates that outside funding, involving the Government, will be necessary for multiple years in order to establish and maintain the rural laboratories for testing cashmere fibers as well as to establish design of cashmere products to meet global market standards. The Mongolia project promises to re-establish an important national industry and major export that benefits rural people. Because the behavior and practice changes involved (see below) are large, Government and outside funders will need to stay involved. One of the risks (complications) involved in assessing the scalability of the Mongolia project lies in estimating whether the window of Government and donor support for this project will remain open long enough for a laboratory, design and marketing capacities to develop and assure that the cashmere and wool sector successfully enters the global market and is able to cover its costs. Less complicated is the case of India where the Government has apparently made the decision to

subsidize farmers' market, including part of the cold storage units, in order to bring poor farmers into the market and increase income of rural poor. Still, as the case study suggests, there may be longer terms risks in this subsidized model.

Alignment and linkage. Related to characteristics of legitimacy and ownership is the question of alignment between the innovation being tested and the policies and practices of Government and the World Bank. We can think of alignment narrowly as overlap of the project with stated government and World Bank policies, but it may be important to look at alignment in terms of the ways in which the World Bank and governments engage with the innovation and the project. In other words, if the innovation is aligned in practice, it is *linked* in practical ways to what Government, the World Bank or other major actors are doing. In organizations there is often a gap between what is said and what is actually done[13]. If there is alignment in practice, then one would expect governments and the World Bank to be highly aware of and involved in the innovation being tested, and seeing the DM project as an incubator for an approach that can be scaled. If there is not alignment in practice, despite alignment of policies, this may reflect inability to communicate the innovation or to develop 'champions' for the innovation; or it may reflect hostile environmental features, such as resistance of government to work with non-governmental entities.

The foundation study for this knowledge product, "Mapping the Road", concluded on the basis of desk reviews of that most projects generally

- Align with World Bank Goals and Strategies, including the Country Assistance Strategies;
- Serve more than one World Bank strategy or theme;
- Align with priority clients of World Bank strategies (farmers, livestock keepers, fisher people, especially women, in poor communities).

The issue is not whether the innovation project is aligned on paper with priorities. The important question is whether the DM projects are linked in practice to World Bank Country Offices, to World Bank sector lending, and to government agencies, particularly those agencies most likely to contribute to implementation or to scaling up. This question about linkage is more important than it might seem at first glance. World Bank projects may have a large influence on what gets done within the agriculture or other sectors in a country, and thus on government policy and practice. If the innovations show how to link small rural producers to markets and poor people to land, or show how agriculture can contribute to climate change mitigation or biodiversity conservation, the learning from innovations that promise success may have something to contribute to a World Bank loan implementation and thus to national policy and practice. If DM projects are to be seen as an incubator for larger aid or government programs, there needs to be real engagement among the DM project, the World Bank Country Office as well as

[13] See Chris Argyris and Donald A, Schon. 1973. Theory in Practice. New York: Jossey-Bass.

government. The evidence is mixed and incomplete on whether and how this linkage and alignment works in practice.

The Development Marketplace and ARD have made a special effort to build links with and among the 2008 cohort of winners to encourage learning and problem solving. The survey of project leadership of the 2008 winners suggests a variety of experiences with respect to linkages between the project management and World Bank staff at different levels. On the plus side, many project managers in response to more than one question noted excellent support from both the country office and Washington, DC. "Although the budget was relatively small, it was the enthusiasm of the World Bank staff as well as that of partners that allowed [us] to initiate and implement an interesting and locally highly appreciated project!" At the same time one or more respondents were concerned about lack of contact with the Country Office and with Washington, noting delays in disbursements, in responding to communications or in managing bureaucratic requirements. The surveys also indicate that some projects were never visited by the Country Office Task Team Leader (TTL), though other projects were visited three times or more by the TTL. Some Project Managers responding saw potential for a greater Country Office role, for example, in marketing the innovation to other World Bank projects. Responses of some of the project managers reflect good project linkages with Government agencies, mentioning the involvement of the project staff in assisting government develop regulations relevant to the project concept. In other cases project managers noted willingness of governments to become involved in implementation and to incorporate the approach into government programs.

Finally one or more respondents noted the importance of continuing contact between the project and Development Marketplace in order to consolidate results.

The evidence available on linkages is fragmentary, making it difficult to develop conclusions. If, as we discuss below, government is a likely candidate to implement replication or expansion of the innovation, there is a logic to building early links between the project and government in order encourage government ownership.

Complexity, Coordination, and Behavior Change. The innovation project itself and the design of any subsequent expansion or replication, are heavily influenced by the multiplicity of actors and decision-makers required for implementation and by organizational and behavior change requirements, each of which can complicate or constrain the ability to implement.

Chief among the organizational factors are the number of actors, decision-makers and decision points and the centralization or diffusion of the power to make decisions on resources necessary for implementation[14]. The more the actors and

[14] The classic study on actors and decision points is in Jeffrey L Pressman and Aaron Wildavsky, 1973, Implementation: How Great Expectations in Washington Are Dashed in Oakland; Or, Why It's Amazing that Federal Programs Work at All. See also Brinkerhoff and Crosby, 2002 on the challenges of coordination in implementing policy change

agencies involved, the greater the challenges of coordination across individuals and organizations. The more power to decide is diffused or in different locations, the greater the challenge of coordinating and sequencing inputs. For example, a technical innovation such as a renewable energy powered cooling system that emerges from a first world university and depends upon a local university, a local government, a partnership with the private sector and the involvement of dairy farmers and local dairies has multiple actors in multiple locations divided by great distance and communication difficulties. A delay in university procedures may delay transfer of the innovation. Distances across time zones and cultures may complicate communications. All the actors may be necessary and may be able to collaborate to produce a successful innovation, but the coordination needs to be managed and coordination mechanisms and agreements established. This may prolong the time required to test the innovation and to develop the patterns for scaling up. Complexity and the corresponding demands for coordination can complicate scalability.

Behavior change is a requirement of successful innovation. It can too easily be assumed that subsistence farmers, though widely seen in the literature as risk-averse, can adopt, in a short period, new practices necessary to sustain an innovation. For example, the use of an organic nitrogen (Azolla Anabena—AA) reduces the necessity to buy commercial fertilizer for rice production and contributes to organic production. AA as fertilizer has been successfully used in some parts of the world. However, its use requires additional labor and the market advantage of organic rice may not be observable. The complicating question in implementation will be whether and how farmers will invest the additional labor required to adopt AA.

Innovations also require changes in behavior of staff critical to implementation. Innovations that rely on government services in testing the implementation or in scaling up are being asked to take on new work. They may be required to develop new skills, or to work with new types of clients (indigenous, women). Investing in incentives,, motivation and training for staff addresses the challenge of changing staff practices, but the larger the change in practice, the greater the time and resource investment required for implementing the innovation or subsequent scaling up effort. The organization and management literature[15] suggests that it is the role of leadership to create the motivation, including through incentives, for change. Enabling behavior change is often overlooked in considering scalability or planning the implementation of a scaling up effort. In this context, assessing the kinds of behavior changes required by both implementers and participants and also the leadership capacity of an implementing agency, is part of assessing scalability.

Complexity may be inherent in development problems, but complexity in the design of innovation, particularly design that depends on close coordination of multiple inputs, and complexity in behavior changes required of implementers and

[15] See, for example, John Kotter. 1990. A force for change. New York: The Free Press. 3-18, 35-47.

participants, all hinder the process of scaling up. In this sense, complexity can be the enemy of scalability.

2. Checking for scalability: at project design and throughout implementation. Taking the key characteristics of the innovations and projects as assessed above, this section begins to explore what it is about clarity and credibility; legitimacy of the implementing agency; evidence of effectiveness and efficiency; the financial model; alignment and linkages; and the complexity, and requirements for coordination and behavior changes that influence scalability. At the beginning of planning a DM project that will test an innovation, and at subsequent decision points, there needs to be an assessment of scalability. Drawing on the findings above, Chart 2 below lays out a set of questions about the factors that will simplify or complicate the implementation of an innovative project, and equally of any scaling up efforts. Drawing on the implementation literature, the assumption is that complexity constrains implementation, while simplicity makes implementation of change easier. These questions, which require assessment of key factors along a simplicity-complexity continuum, need to be considered along with Chart 3 and 4, which more specifically look toward scaling up. Chart 3 and 4 employ a strengths and weaknesses and opportunities and threats analysis and is prompted by questions about drivers and spaces for scaling up. This draws on the drivers and spaces framework developed by Johannes Linn and others in their work for IFAD, but it makes some changes, described below. The questions from both charts use examples from the 2008 cohort, but particularly the three case studies, and are synthesized and simplified to create a tool for practitioners. This tool, Chart 5, is a Simplicity-Complexity Index of Scalability and is presented later in this section.

Beginning with *Chart 2*, the framework for thinking about the potential of innovative proposals to be scaled offers a set of questions about what will simplify or complicate implementation. To show how this framework can be applied, we use the Nigeria case study to illustrate the simplifying factors, and the other case studies and 19 desk assessments to illustrate complicating factors and the constraints they may place on implementation. This chart below collapses the examples of simplifying and complicating factors. For example, where the payment for environmental services projects lack a clearly articulated and credible theory of change in the payment for environmental services projects, it becomes difficult to identify with precisions the steps and sequencing required to convert forest producers to other types of livelihoods not dependent on consumption of forests. Though there is evidence that PES can halt destruction of forest cover, we know less about enabling peasants or indigenous groups to adopt new livelihoods in a short period. The complexity (the number of inter-related steps and involvement of different actors required to change behaviors), ---even if we know what they are---, hinders implementation.

This chart owes a debt to the thinking of Cooley and Kohl, Linn and others, in particular the large literature on implementation that explores factors that contribute to or complicate implementation[16].

Chart 2

Examples of Simplifying and Complicating Factors in Implementing Scaling Up

Characteristics of the Model	**Simplifying Factors** *(Nigeria cassava case examples)*	**Complicating Factors** *(Examples from all projects)*
Clarity and Credibility. Evidence; Is the model or theory of change clear and testable? Is the implementing agency respected? Trusted?	-Scientific credibility: University of Agriculture at Abeokuta, Nigeria developed the cassava drying method that removes dangerous toxins from wet cassava waste; and developed a diet for goats, using dried cassava waste. -UNAAB, in project proposal and in implementation has focused on establishing credibility and viability, particularly through a Project Monitoring and Performance Assessment Team.	-Among the complicating factors that appear in many of the 22 projects are a lack of clarity and hidden assumptions in the model or theory of change; and difficulties in being able to measure and test expected outcomes in the period of the two year projects. For example, payment for environmental services (PES) is a model that has credibility from its successes in other locations. Some DM projects are based on assumptions about poor peasant/indigenous community willingness and ability to take up alternative livelihoods (see below) or on the availability of reforestation credits and other mechanisms. These may assumptions may not be true in practice, or they may require time to materialize. Thus real testing of the innovation model is delayed.
Legitimacy. Is the innovation locally owned or embedded?	-UNAAB is a local and respected organization, which developed the innovation of drying cassava waste. -Cassava drying, as an innovation in the cassava production value chain, is easily recognized as a beneficial innovation by extension agents, and it was supported by state government .	-A large subset of the 2008 DM winners were initiated and implemented by an organization from outside the country. For example, projects involving complex, multi-step technologies, such as renewable energy powered milk coolers in Uganda or biofuel outboard motors in Senegal were managed respectively by US based University and an NGO. Given the complexity of the technology there are questions about whether the innovations can be indigenized or wholly owned by the end of the two year period. -In other cases, for example, politically sensitive land rights projects, there is the potential of conflict with more powerful vested interests or with Government. In these cases the outside organization

[16] See footnote 17.

Is the innovation relevant to the perceived needs of stakeholders? Does it meet a perceived need?	-Adding value to the cassava production chain and to goat and other livestock producers benefits small holders, many of who live near the poverty line. This addresses an identified priority of poverty and inequality reduction. -Drying and re-using cassava waste instead of burning addresses a climate change mitigation priority, but may be less broadly recognized as important.	will require time and commitment of resources to develop ownership by local government and other actors. -Conservation of forest areas and biodiversity corridors are a response to a problem recognized globally and also increasingly at national levels; they may be less recognized at lower levels of government, or among affected communities whose priority may be immediate, survival livelihoods. Demand for the project innovation, in terms of conservation effects, may be weak among the participants (forest users) who are expected to make substantial changes in their practices.
Evidence and Observability of Effectiveness and Efficiency. Does the innovation have advantages perceptible to users and other stakeholders over current practices? Is there growing and verifiable evidence of effectiveness and efficiency?	-In Nigeria participating cassava farmers and goat herders perceive income changes within a few months of adoption. -Impacts on income are visible in a short period of time and are documented by UNAAB.	-Many of the DM projects, because of a long gestation period, will be producing results that are not easily perceived by the intended beneficiaries and the implementing staff. For example, a local project manager noted in the survey that heavy investment in a sophisticated technology meant that, in the project period, results were observable only in the laboratory, and that it might have been more productive to focus funds on farmers and market opportunities.
Financial Model. What are the funding challenges? Does the sustainability of the innovation depend on ongoing financial or other support? Or does the innovation generate resources?	-In Nigeria, funding was available to support training of extension agents and to demonstrate the model in 33 sites. -For adopters, the new income from the sale of dried cassava and increased income from more rapid growth of livestock to market size appears to be sufficient to justify the capital cost of the drying platform (cassava growers) and the purchase of dried cassava (goat farmers). UNAAB is in the process of documenting this.	-All innovations require start-up funds. Many of the 2008 DM projects envision a stream of revenue that will allow beneficiaries to maintain the innovation. In many projects there is not a clearly articulated business model and/or the time required to get to a financially sustainable position is indeterminate. -Some projects are intended to be commercially viable, for example, the Pachama coffee, the chocolate projects, the microfinancing scheme for agricultural services in Cambodia, biofuels in East Africa, biofuel outboard motors in Senegal or rice panels for construction in Vietnam. In general, the proposal and the two years of implementation have not yet demonstrated a good financial model or plan. These may or may not be innovations that merit continuing investment in testing and expansion, but the lack of a credible business model means that

		they are at an early stage and need time, resources to support financial planning and monitoring and a willingness to take a risk.
Alignment and linkage with Government, World Bank priorities? Is there active engagement by the World Bank and government during the implementation of this innovation? -There are two levels of alignment. The first is the alignment of policy statements. The second is linkage at the level of program action.	-The cassava waste project aligns with both Government and World Bank priorities, strategies, and priority clients, particularly farmers, livestock growers and women in poor communities. -UNAAB, the technical university implementing the innovation, has linked with the Ogun State Agricultural Development Programme (OGADEP), which has provided the village extension workers who implement at the village level. -The World Bank Team Task Leader is actively engaged with the project: contributing to solving the problem of appropriate microfinance services for drying platforms; and building a partnership with FADAMA III, a major project supported by the World Bank that focuses on increasing farmer incomes in 36 states in Nigeria. -FADAMA III concludes in 2013. It is not clear to what degree this innovation will be integrated in FADAMA III in other states, and whether there will be a FADAMA IV. -Funding is necessary, particularly for training and travel, to launch this innovation in new locations. It is not clear whether there is a champion within Ogun State to expand the innovation throughout the state. Nor is it clear who might serve as a champion at the federal level in Nigeria to promote this innovation in other states, particularly in the absence of a FADAMA IV. -This innovation has potential value to small producers in comparable cassava producing countries; getting the innovation to travel needs a *champion* internationally. UNAAB has the potential to serve as this champion. It is, for example, hosting the meeting of the International Society for Tropical Root Crops in 2012.	-For the most part the 22 DM projects are broadly aligned with Government and World Bank stated policies and strategies. The divergence in alignment is evident in terms of how the priorities are evidenced in practices of Government and the World Bank. To what extent are Governments and the World Bank ready to incorporate the innovation into ongoing development activities? To what extent are relevant Government officers, TTLs, or World Bank offices actively engaged with the DM projects? -Surveys of project managers and TTLs of the 22 projects indicate that some DM projects were never visited by the TTL or other World Bank official, while others received three or more visits plus engaged attention. Some projects were implemented in isolation from Government. -If an easy route to scaling up is through expansion or replication by Government or through incorporation into World Bank funded activities, engagement means that both actors need to see the DM projects as incubators for novel ideas/innovations, which, if successful, can enhance ongoing work.
Complexity, coordination and behavior changes. Ease of adopting or transferring model? Number of decision-makers; departure from existing practices and behaviors of population and implementing organization; challenge to values and practices; level of technical sophistication; clarity of technology; level of complexity; requirements for infrastructure and facilities. -Do complex technologies exclude women?	-Cassava drying and marketing plus use of dried cassava waste as fodder is consistent with existing practices and values; -Cassava drying is simple technology -Introduction of innovation integrated easily into normal extension work. -Innovation appears to reach women (as cassava growers) at the village level. -In Ogun state, project does not require the addition of multiple decision points to authorize implementation. UNAAB is already working with Ogun State agricultural extension. Limited number of actors involved.	-In the Nigeria cassava project there was insufficient capacity in the partner organization to deliver effectively microcredit to finance drying platforms, and therefore initially the challenges of coordinating with a partner. -The introduction of sophisticated technologies, such as genome or organoleptic methods to identify highest quality cocoa cultivars, may have enormous value in the long run in establishing a high value market for producers, but they may require multiple new practices by stakeholders at different levels. -The introduction of laboratories to grade cashmere wool to the rural herding districts in Mongolia

Marginalized communities?		requires the training of lab technicians to work in remote areas and the development of herders' sophistication about the value of the testing and the relationship to new marketing strategies. To assure that herders early on perceived the projects as serving their interests, the implementing agency included early support, not related to the value chain, to improving quality of home produced wool clothing. -Implementing the mini-cold storage units at markets in India faces challenges a) of major behavior changes required for youth to become entrepreneurs and not just operators of the MCSU and b) of the complexity of decision-making by Government agencies responsible for farmers' markets.
Alignment and linkage with Government, World Bank priorities? Is there active engagement by the World Bank and government during the implementation of this innovation?	-There are two levels of alignment. The first is the alignment of policy statements. The second is linkage at the level of program action. -The cassava waste project aligns with both Government and World Bank priorities, strategies, and priority clients, particularly farmers, livestock growers and women in poor communities. -The Ogun State Agricultural Development Programme (OGADEP) has played a critical role by providing the village extension workers who implement at the village level. -The World Bank Team Task Leader is actively engaged with the project: contributing to solving the problem of appropriate microfinance services for drying platforms; and building a partnership with FADAMA III, a major project supported by the World Bank that focuses on increasing farmer incomes in 36 states in Nigeria. -FADAMA III concludes in 2013. It is not clear to what degree this innovation will be integrated in FADAMA III in other states, and whether there will be a FADAMA IV. -Funding is necessary, particularly for training and travel, to launch this innovation in new locations. It is not clear whether there is a champion within Ogun State to expand the innovation throughout the state. Nor is it clear who might serve as a champion at the federal level in Nigeria to promote this innovation in other states, particularly in the absence of a FADAMA IV. -This innovation has potential value to small producers in comparable cassava producing countries; getting the innovation to travel needs a *champion* internationally. UNAAB has the potential to serve as this champion. It is, for example, hosting the meeting of the International Society for Tropical Root Crops in 2012.	-For the most part the 22 DM projects are broadly aligned with Government and World Bank stated policies and strategies. The divergence in alignment is evident in terms of how the priorities are evidenced in practices of Government and the World Bank. To what extent are Governments and the World Bank ready to incorporate the innovation into ongoing development activities? To what extent are relevant Government officers, TTLs, or World Bank offices actively engaged with the DM projects? -Surveys of project managers and TTLs of the 22 projects indicate that some DM projects were never visited by the TTL or other World Bank official, while others received three or more visits plus engaged attention. Some projects were implemented in isolation from Government. -If an easy route to scaling up is through expansion or replication by Government or through incorporation into World Bank funded activities, engagement means that both actors need to see the DM projects as incubators for novel ideas/innovations, which, if successful, can enhance ongoing work.

3. ***Looking Beyond the DM Project Phase: Ongoing Scalability Criteria***
The section above on *Understanding Innovation Potential* identified the key questions to ask about the simplicity or complexity inherent in implementing an innovation, assuming that the greater complexity involved in the innovation model and its implementation, the more difficult it will be for the model to succeed and be scaled up. The simplicity-complexity inquiries proposed in the framework above (*Chart 2*) lay part of the foundation for the simplicity-complexity tool discussed below. The other part of the foundation for the simplicity-complexity tool is presented in this section, which examines internal and external factors that influence the potential for scaling up. This framework for analysis of scalability draws on old tools, stakeholder analysis and SWOT analysis, and overlaps them with the framework and questions developed by Johannes Linn and colleagues and the step process developed by Larry Cooley. It omits some of the questions and steps in these other frameworks, which are intended to assist in planning and implementing a scaling up process. The intention here is to lay the framework for a simple tool. The Simplicity-Complexity Scalability Index to be recommended later, that can be used easily by development practitioners assessing the scalability of very small trials of innovations. As noted earlier, because of the small size of these projects there may be information gaps. For example, there may be only partial information about the feasibility and impact of the innovation, or about the financial model. The questions below are intended to allow a practitioner to assess whether there is enough potential in the innovation to merit additional investment in next steps toward scaling up. Chart 3 below looks at the internal drivers or strengths and weaknesses of the innovation and potential organization for scaling up. Chart 4 focuses on the external spaces or the opportunities and threats to scaling up. These are applied, in summarized fashion to the cases of DM projects in Nigeria, Mongolia and India. Developing these categories for assessing scalability, but the categories are intended to allow articulation with the tools currently being developed for planning and implementing scaling up.

Besides providing the foundation for the Simplicity-Complexity Index, the framework in *Chart 3* and *Chart 4* serves another purpose. They provide a set of questions that can be used by (or for) an organization with the legitimacy and capacity to make or influence the decision to expand or replicate an innovation, and to take actions that set in motion the scaling up process and the authorization of the organization that will manage or drive the scaling up. With the exception of spontaneous replication, some sort of *intermediation* is needed between the demonstration or testing of the innovation(s) and the appropriate follow-up leading to scaling up. In this work we are interested in *intentional* scaling up, where an entity with some power or influence negotiates the conditions to support scaling up. At the simplest, this can be a Government, which has decided to incorporate the innovation into its standard practice using its own resources and organizational capacity; or a private sector company, which uses the innovation to expand commercially viable production. Reality is more complicated. The three case studies indicate interest of several potential mediating and implementing organizations in replication of these three DM projects, but there is a gap between

interest and the decision to act. This is compounded by the gap between the completion of the project and a decision to scale up. *The DM projects have a specific ending, beyond which there is neither funding nor mandate*. This is a gap in the design of the Development Marketplace initiative. There needs to be an agency or mechanism that plays the role of linking successful demonstrations of innovation to decisions and to organizations to play the role of driving organization and to the resources to take the next steps.

Though this study is about assessing scalability of demonstrations of innovations the analysis suggested below should be done repetitively as scaling up unfolds. Scaling up is a process, and the strengths and weaknesses of an organization, as well as the opportunities and threats in the environment need to be examined as circumstances change and new competencies are required. The organization doing the scaling up can do this analysis, or it may benefit from doing this analysis with an *intermediary organization* that accompanies the scaling up process during the critical expansion or replication.

Finally, the analysis below needs to be applied to the organization expected to implement the expansion or replication.

Chart 3 - Drivers or strengths and weaknesses. This section uses the matrix below to discuss the types of factors or forces that will drive replication or expansion of the innovations tested in the three DM projects for which cases studies were done. One of the problems in assessing the strength of drivers is the lack of clarity around which agencies will implement the scaling up. This is the second paradox identified in the introduction. In many DM projects[17] the innovations being tested need to be incorporated into Government policies and programs, with responsibility to drive the scaling up assigned to a particular agency or unit, if the innovation is to reach large numbers of beneficiaries. In Nigeria and India, the DM projects were implemented by state level tertiary educational institutions. Though they have strong ties to their respective state governments, it is not their mandate to implement policy at the state level, or to lead replication at the federal level. In Mongolia, the implementing agency for the DM project is an international NGO. Though VSO has a good working relationship with different levels of the Mongolian Government and though Government policy gives high priority to the outcomes that the value chain innovation supports, there is not yet clarity about which Government agency will move into leadership of scaling up efforts. Immediately important to assessing scalability is the presence or absence of a mediating organization, which plays the role of linking the promising innovation to the decisions that will launch the scaling up process. Champions play a critical role also in managing the spaces for scaling up. They can help create the supportive constituencies (demand) and thus expand the space for scaling up. They may also play a role in helping scaling up plans to weather threats identified in *Chart 4.* In

[17] There are a few exceptions, discussed below, where the DM project is being implemented by a private sector organization which is also a likely candidate for expanding the innovation to commercial viability.

the three projects for which case studies were done, it is not clear that a 'champion' has emerged at senior levels in government or elsewhere to help identify an implementing agency and, in the case of Mongolia particularly, to support the project through a multi-year process of building the capacity to implement.

Chart 4 – Spaces or l threats and opportunities. Organizational/institutional capacities, political demand or opposition, financial resources and opportunities along with political stability and human security can create or constrain the spaces for scaling up and thus need to be a part of the analysis of scalability. The categories used in Chart 4 below conflate the categories of spaces used by Linn, Hartmann and others in order to reduce the tasks in a quick assessment of scalability. An assessment of the organizational and institutional capacity of an agency to be charged with implementing scaling up relies on questions about leadership, systems, financial management and learning capacity, combining categories used elsewhere. Political space, including the demand from a constituency for the innovations, which can create incentives for service delivery, is also important. Financial sustainability, and stability of resource flows are important. A clearly articulated financial analysis of the potential for self-funding of an innovation may indicate space for scaling up. An innovation with a longer gestation period requiring long-term government or other funding is open to threats of changes in the priorities of the funder. Political stability can influence stability of commitment to scaling up and innovation. Insecurity threatens implementation in concrete ways. Chart 4 below uses findings from the case studies to demonstrate, in a condensed fashion, how the questions can be used.

CHART 3
Drivers of Scaling Up

Factor	Questions	Strengths	Weaknesses
Clarity about potential **driving or implementing organization(s)** for replication or expansion.	Is the organization implementing the DM project a viable candidate for leading scaling up? Are there alternative organizations able to lead and manage scaling up?	The implementing organizations in Nigeria and India (UNAAB and TREC-STEP) are credible local organizations with demonstrated capacity to test the innovations and to troubleshoot problems. VSO is an international NGO interested in and able to support scaling up until Government is able to take over, but funding is uncertain. All have strengths to support the organization implementing scaling up through technical, management and organization development advice but lack funding and mandate.	As university agencies UNAAB and TREC-STEP do not have the organizational mandate to lead broad-based scaling up. VSO is an external agency. Functions of the project need to be transferred to the Mongolian Government.
Mediating or influencing organization is ready to support the transition from test to scaling up	Once a test project shows enough evidence, through the analysis above, that the innovation(s) should and can be expanded or replicated, who makes the decision to do so? Who provides the resources for the next steps in scaling up? Is there a mediating or intermediary organization that links the project to decision-makers on and funders for scaling up?	In Nigeria, Mongolia and India there is already Government interest in adopting the innovations, but none were leading the transition process at the time of this report.	-There is an absence of firm plans and commitment on expanding to other areas. -It is not clear which organization will play the role of mediation between the demonstration DM project and a subsequent scaling up activity.
Champions	Are there influential stake-holders not involved in implementation but who can advocate for and help solve problems in the environment?	---	-Not clear which individuals or agencies in government might play this role in any of the three cases studied.
Incentives for scaling up	Do the financial and other incentives for scaling up of these innovations remain strong?	-Immediate benefits in India and Nigeria projects create incentives for beneficiary populations, as well as implementing agency. -Benefits from increases in wool quality emerge over time; in the intermediate term the Mongolia project has introduced improvements to home production that encourage participation in longer term project. -In all cases, benefits enhance government reputation for producing results.	-Changes in market demand and price for cashmere may jeopardize incentives for participation by several actors in value chain.

Chart 4
Spaces: Opportunities and Threats

Factor	Questions	Opportunities	Threats
Management capacities of potential implementing organizations (institutional space)	-Leadership capacities? -Systems? Monitoring, evaluation, learning, personnel? -Financial or business plan; appraisal of benefits versus costs? -Capacity to manage relationships with partners, donors, government, communities?	-State Governments in Nigeria and India have the capacity to implement expansion through existing state level agencies. They may need to be supported with respect to training, monitoring and evaluation, financial analysis. UNAAB and TREC-STEP have the capacity to provide technical and other support to State agencies and to other technical universities.	Government of Mongolia is the likely implementing agency of this innovation in the longer term. Capacities need to be strengthened at several levels of Government and across Sectors. For scaling up of this promising innovation to be successful, the transfer of implementing responsibility to Government needs medium term support from an intermediary organization.
Enabling policy and/or legal frameworks	-Is there a policy decision or legislation supporting or encompassing the innovation?	-Government legislation in Mongolia creates a framework for the value chain to contribute to enhancing cashmere/woll industry and exports. -Agricultural policies at Federal and State level in Nigeria provide a focus on small producers and the extension infrastructure to support expansion or replication.	
Constituencies (political incentives and policy space)	-demand for (or opposition to) the innovation among stakeholders, particularly those who can affect implementation? -culturally and socially acceptable? -broader public endorsement of the innovation?	- DM projects in Nigeria, Mongolia and India have delivered benefits perceived by beneficiaries. In some cases there are political incentives to continue support. -culturally appropriate interventions -Communications campaigns created public awareness. No obvious opponents.	---
Political and security issues	-likelihood of continuing support among administration, legislatures, public? -security risks?	-Present in all three. -Political support at state and/or national level. -Stable political environments.	---
Prospects for financial sustainability and stability in flow of resources	-financial sustainability of model? -public good? Secure stream of revenue	-Nigeria cassava waste model appears to have inherent financial viability. -India MCSUs not likely to be commercially viable in medium term, but may merit investment as a public good. In the longer term provision of cold storage for small farmers may materialize as a viable business. -Mongolia value chain dependent on soum level grading labor-atories, which require subsidies.	-MCSUs need to be seen as public good. -Laboratories need to be seen as public good, like extension services. Will need Government support for the intermediate term.

4. A Tool for Practitioners – Simplicity – Complexity Scalability Index.

Development practitioners need *simple* tools to help them make decisions about innovations and their scalability. Why *simple*, when we know that development and change are complex? Henry Mintzberg, in looking at the work of CEOs, described the work of managers as fast-paced, involving multiple incidents or activities "…characterized by brevity, variety and fragmentation".[18] Development managers and practitioners are often time poor and yet they need to make decisions about development interventions and about how to prioritize their own time and resources. Decisions to initiate and continue scaling up need to be based on evidence. Particular attention needs to be paid to evaluation of outcomes of innovations, monitoring of implementation tasks, and technical support to financial viability models. Simultaneously, practitioners need some simple tools or rules of thumb to tell them when innovations show promise of scaling up and therefore merit investment in more rigorous evaluation or financial assessment or other technical support. The Simplicity-Complexity Index of Scalability, presented below in Chart 5, is intended a simple tool for practitioners. Simplicity of use allows the tool to be used quickly and repeatedly. The simplicity factors are those that will support or drive implementation of scaling up. Complexity factors will make implementation more difficult. It is a crude assessment of the simplicity or complexity of an innovation---and therefore its potential for scalability---, based on the analytical frameworks in *Chart 2, Chart 3* and *Chart 4*. It is a tool that raises basic questions that practitioners can include in their analytical toolbox and can be used as 'rules of thumb'. It is useful for making decisions about scalability. It is not a substitute for the more detailed analysis and planning required once a decision has been made to invest in moving an innovation along the continuum of scaling up.

[18] Henry Mintzberg. 1973. **The Nature of Managerial Work.** New York: Harper and Row. pp. 28-53.

Chart 5

Simplicity and Complexity Index of Scalability - Adapted from Cooley and Kohl, 2006

This checklist is intended as a tool for practitioners (implementers, funders, partners) to assess periodically the scalability of an innovation. This is an informal, management tool intended to trigger management decisions to develop additional information or to take actions.

Innovation Model		**Simplifying factors ← Check left**	**Neutral**	**Complicating factors Check right →**	
Is the model credible?		-Has a clear, logical and complete theory of change -Supported by respected organizations -Testable -Steps are being taken to evaluate --Outcomes; --Feasibility; --Cost effectiveness?		-Theory of change incomplete, unclear -Not supported by respected organizations -Not testable -Steps not being taken to evaluate: --Outcomes; --Feasibility; --Cost effectiveness	
Is the innovation relevant?		-Does it address perceived needs of target population? -Does it deliver observable benefits?		-Need addressed is not perceived by target population? -Are benefits not readily observed?	
Alignment		-Consistent with government, WB strategies? -WB country office involved with project implementation?		-Differs from government, WB strategies? -WB country office not involved?	
Does the innovation have legitimacy?		-Initiated and implemented by credible local organizations -Consistent with existing cultural practices? -Socially, politically desirable?		-Initiated and implemented by outside orgs? -Requires large change from cultural practices? -Social, political opposition?	
Potential for impact (est.)		Large impact on large number of the target population?		Small impact on small number of the target population?	
Mediating agency		-DM or other agency engaged in supporting transition from demonstration to scaling up.		-No mediating agency managing gap between testing and scaling up.	
Driver		Agency identified as appropriate to lead scaling up?		Appropriate agency not identified for leasing scaling up?	
Champion		-Powerful advocates supporting innovation adoption?		-No support among powerful influencers?	
Constituencies		-Growing demand for innovation?		-Weak demand for innovation?	
Management capacities		-Few decision points and small number of actors involved in implementing project? -Few actions and partners who need to be coordinated. -Requisite skills to implement innovation exist?		-Multiple decision points and multiple actors involved in implementing innovation? -Many actions and partners required who need to be coordinated? -Requisite skills to implement innovation missing?	
Financial viability		-Cost of adopting innovation is low? -Relies on existing infrastructure? -Innovation self-financing or commercially viable? -If public good, commitment to public financing exists?		-Cost of adopting innovation is high? -Requires new infrastructure? -Innovation requires large, ongoing financing? -If public good, no commitment to public financing	
Total Number of checks √					

Included in *Annex I* is a form of stakeholder analysis, 'Mapping the System', developed by Arnold Howett at the Ashe Center, Harvard University. In addition to identifying stakeholders and their interests, the tool asks the analysts to think about the forms of action and pathways open to each stakeholder.

IV. Revisiting learning from the 22 Development Marketplace Projects (2008)

In looking at the Development Marketplace 2008 cohort of projects, the problem is less with the innovation, and more with the implementation of scaling up. The challenges revolve around deciding which innovations are ready for investment in scaling up. This section looks at the 22 projects in the 2008 DM cohort. All exhibit the ingenuity, focus and energy to which Rajiv Shah, USAID Administrator, referred to in the quoted statement earlier in this report. The question is whether some of these innovations can be taken to scale in order to have wide impact. Some are candidates for scaling up that might achieve the "countrywide impact" to which Shah referred. The tools discussed above may be useful in thinking about how to move toward scaling up. Some projects are not ready for the scaling up to which Shah refers. For a range of reasons, ---complexity of the intervention or theory of change; lack of local ownership; insufficient evidence of the effectiveness and efficiency of the innovation(s); lack of sufficient credibility to create a broad demand for the innovation---, several innovative projects are not ready for scaling or they require such long term nurturing from an outside agency that they are not likely to reach large numbers of people and communities living in poverty. The sections below summarize conclusions on scalability with respect to:

- Conclusions on how to assess scalability
- Three projects on which case studies were completed.
- The 19 projects on which desk studies were completed.
- Keeping focused on intended clients.

1. Assessing Scalability

If we are indeed looking for "countrywide" or even global impact we need to have some guidelines for assessing scalability and for deciding to move to planning and implementing the scaling up process. This report began by noting two paradoxes of scaling up efforts: first that decisions about scaling up need to be made even before the demonstration project has given evidence about whether the innovation is effective and efficient, but we want such information before committing more resources; and second that innovations are often tested by pioneering organizations and they may or may not be the appropriate agency to implement the scaling up. Additionally, it was noted that scaling up development innovations is a process that includes political and social elements. There is no single time to make a decision about scaling up. Rather, the agency implementing a small project testing an innovation, along with the funders supporting the project, must constantly be thinking about scaling up, particularly in terms of:

- Credibility and clarity of the innovation with key stakeholders and potential implementing agencies for scaling up.
- Legitimacy of the innovation; is it locally 'owned' or embedded?
- Perception and evidence of the innovation's benefit and efficiency.
- Simplicity of the innovation and ease of adoption, implementation.

- Financial model that promises sustainability, either as a public good owned by government or as a self-financing operation.
- Alignment, not just with Government policy and available donor funding, but more importantly alignment in practice, i.e., linkage, leading to government and other stakeholder participation; emergence of champions.

The questions in Chart 2 can assist in this analysis.

The process above, throughout the testing of an innovation in a DM or other project, can lead to clarity about who should drive and implement the scaling up process, and a decision to plan the next phase of scaling up. Ideally the assessment above should be done jointly with the organization implementing the DM or other innovative project, the agency most likely to lead scaling up, and funders. Cooperation at the stage of the DM project will help to shorten or close the gap between the ending of DM funding and the launching of an effort to scale up. It is unrealistic to think that DM projects that have successfully demonstrated innovation, will transform instantaneously, like the emergence of a butterfly, into a well-planned effort to scale up. There is an intermediate zone that needs leadership to foster the emergence of a scaling up process.

Even before it is clear which agency will take leadership in implementing a scaling up effort, a streamlined set of questions and tools, illustrated in the section above, can be used by the several stakeholders a) to assess the strength or weakness of the drivers that will make scaling up happen, and b) to identify the policy, political and other spaces that encourage, constrain or are likely to choke scaling up.

- Continuing credibility of the innovation; growing demand among key stakeholders; powerful champions for scaling up at the critical decision-making levels; partner organizations.
- Capacities of the implementing organization in terms of leadership, management, and financial management.
- Enabling policy and/or legal frameworks.
- Political stability and human security.
- Prognosis for financial sustainability and stability.

The questions discussed in the report should be part of the professional tool kit of program managers at the organizations implementing DM projects and of program managers at the World Bank concerned with scaling up innovation from DM projects and other sources. They should be used fluidly as tools to assess the scalability of innovative ideas and as a basis for deciding whether the innovation is showing evidence that it is making a significant contribution to solving the problem that the innovation is intended to solve; and therefore whether to take next steps in planning for scaling up. The questions identify the strengths and weaknesses of the innovation and of the implementing organization, and also the drivers and demand for scaling up the innovation along with the key constraints and chokepoints that may threaten scaling up.

None of the tools and questions here is intended to be exhaustive, comprehensive or final. From a practical perspective, program managers have time constraints. They need tools

that can be applied in real time. Innovation is inherently a risky process and for this reason we start small testing innovations. The risk of innovation is managed by iteratively reviewing whether to proceed or to stop supporting the innovation.

Conceptualizing scaling up as a process that needs iterative assessment and decision-making assumes that there is an agent, or agents, who have the role not only of accompanying the testing of the innovation but also of shepherding and mentoring the successfully tested innovation through multiple phases of scaling up. From the case studies, desk reviews and surveys, there is evidence that the Agriculture and Rural Development Department and the Development Marketplace have invested heavily in mentoring the 22 DM projects review. There remains a gap between completion of the DM projects and the next phases of scaling up.

2. Scaling up in Nigeria, India and Mongolia.

The three case studies suggest the nature of this gap between the *completion* of DM projects with strong promise of scalability and *follow-up* expansion and replication. Assessed against the simplifying versus complicating characteristics of scalability, all three projects rank high on most indicators. Additionally, they have the potential for "countrywide impact" and even, in some cases, international replicability. What each lacks is a clear *transition mechanism* from DM project to scaling up. The respective governments have a clear interest in the innovations and are already interested in or supporting expansion or replication, but there have not been a clear policy decisions at state or national levels in India and Nigeria to incorporate the innovations into policy. It is not clear whose role it is to shepherd this decision-making to replicate the innovations in other areas of the country, or whether and how a decision can be made to use the expertise of the two university units implementing the DM projects to support replication. Assessment of Mongolia value chain project illustrates this need for continuing expertise to support the scaling up of the innovation. The challenges start with the complexity of the laboratory grading of wool and the introduction of herders into the value chain. Added to this is limited government capacity in a sparsely populated country. Finally there are the challenges of designing cashmere products for a global market. Ongoing mentoring or intermediation is important to support the building of this capacity in a gradual fashion. The argument for long-term mentoring is that cashmere wool production provides a basic livelihood to a large portion of the largely rural population; and cashmere represents a high value export for Mongolia with potential to contribute to economic growth.

The simplicity versus complexity tool and the drivers and spaces frameworks and questions discussed above can be used for a one-time assessment of scalability, but they can be used iteratively to check whether conditions for scalability are growing. The leadership of the DM implementing organizations for these three projects seemed intuitively aware of the need to expand the credibility and the observability of the benefits of project results, or they used learning from experience to address some of the complicating factors. UNAAB, for example, systematically monitored results and measured outcomes and impacts in terms of cassava farmers reached and of income increases. TREC-STEP, recognizing that the high capital and operating costs of the Mini Cold Store Units were a barrier to commercial viability, has been exploring lower cost units and alternative

energy sources. By looking at the complexity of establishing and maintaining wool grading labs in remote areas, VSO has recognized the necessity of a slow process of expanding the innovation so that Government capacity to manage it is created.

The separate case studies detail the strengths of these projects for scaling up, and identify the challenges that need to be addressed as part of the scaling up process. Because of their potential to contribute broadly to poverty reduction and human well-being, there is urgency to bridging the gap between DM project funding and next steps.

3. ***Observations from Desk Review on Scalability of the 19 DM Projects.***
Of the 19 projects for which case studies were not completed, many have potential for scaling up. Some do not merit efforts to scale up, either because of the complexity and uncertainties of the scaling process, or because they are not likely to reach the large numbers of beneficiaries that is hoped for from DM projects.

Payment for Environmental Services. These projects, largely in Latin America[19], combine payment for environmental services with livelihood promotion activities, and depend on government involvement to put in place the legal framework, to assure consistent access to carbon trading markets and to provide critical agricultural extension and other inputs. These DM projects have been implemented by international agencies and/or respected and well-networked local research and policy institutes. They appear to have established credible relations with governments and are in a position to champion the PES approach with Governments, funders and carbon trading markets. Governments where the projects are sited largely do have policy frameworks encouraging use of PES to maintain forest corridors and to conserve biodiversity. The actual commitment and capacity of governments to implement PES approaches varies. In these projects, particularly in Latin America, scaling up may be a combination of expansion and replication through a combination of increasing government capacity to manage the payment for environmental services and to deliver the inputs to improving livelihoods. OAS and Wildlife Conservation Society are significant international agencies with the capacity to 'champion' these PES approaches; to maintain networks among the national agencies and governments, to raise funding and to serve as intermediary agencies supporting national agencies and governments through the scaling up processes. These PES projects are contributing to critical environmental and biodiversity goals by developing context specific interventions involving marginalized communities. It is not always clear from the documentation available how these programs link to World Bank strategies in country.

Land Access Projects. There may be no easy path to expanding or replicating innovative ways of enabling excluded and poor communities to access land and use it in a productive way. The four DM projects for which desk reviews were completed suggest innovations that are very context specific and which require close coordination with governments.

[19] These include Acai Production for Income Generation and Credits for Reforestation in the Amazon Reserve, both in Brazil; Agricultural Cooperatives for Biodiversity Conservation in Cambodia; Reducing Impacts of Ranching on Biodiversity in Mexico; Credits for Reforestation in the Amazon Reserve; and Payments for Ecosystem Services and Sustainable Agriculture in Paraguay.

Land availability and quality varies by location. Ownership and land tenure issues have political implications. The land access project that evidenced the greatest possibility of success and replication, (the Nepal project involving innovative use of riverbed land) relies heavily on Government cooperation and the long-term presence of the international NGO partner (Helvetas). The Land Ownership for the Rural Poor project in Chiapas, Mexico appears to be highly dependent on an outside NGO for long-term support for funding and for supporting the capacity of local organizations in implementing a complex model for creating sustainable livelihoods for traditionally marginalized farmers. There may be social justice imperatives for supporting these initiatives because of what they may achieve for the landless poor. They do not show promise of being able to expand to large areas in a short period or to be replicated readily in other areas, without the kind of long term and thoughtful support provided by the implementing agencies. The complexity of implementation may not be perceived as efficient in economic terms.

Projects with Private Sector Potential. Projects implemented by private sector organizations[20] as well as other projects which aim at creating a viable, commercial enterprise[21] differ from others in their explicit search for commercially viable innovations that will directly improve the income of identified groups of people living in poverty and, in most cases, make an environmental contribution. A few of these projects have potential for scalability through market-based partnership. The Pachama Coffee Cooperative, as the desk study indicates, has used the DM funding to create online ability for consumers to trace coffee back to the producers and the farm. They are trying to create a niche market for coffee, using an innovative means of marketing and creating brand loyalty. This is a hybrid organization, which has a range of funding sources for a start up stage and should be encouraged to seek social venture capital. The material available for the desk assessment does not allow a close analysis of the project Low Cost Housing: Waste Rice-Straw Construction Panels. The experience of the two years of DM project funding may have been sufficient to establish that this as a viable business. As such it should be of interest to social venture capitalists.

One DM project has implemented, with reported success, a model of micro-franchising agricultural extension in a context where the government has limited capacity to deliver services. This model is based on creating a corps of private sector extension agents who can offer agricultural inputs, technical advice, in-kind credit and marketing services to small farmers who can increase income by supplying vegetables to the domestic market (60% of vegetables are currently imported). The implementing organization is an international agency with a long commitment to working in Cambodia and good links to major donors. The model should be monitored for its sustainability and its capacity to upgrade the skills of the extension agents to see if it has merit for testing in other locations with similar conditions.

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[20] Pachama Coffee Cooperative of Small-scale Coffee Producers, five countries; Africa Biofuel and Emission Reduction Ltd, Tanzania/Kenya; and Vinh Sang Ltd (waste straw construction panels), Vietnam. Registered as a 501C3 organization in the US, Pachama intends to be a commercially viable enterprise.

[21] Renewable Energy-owned Milk Coolers, Uganda; Locally Produced Biofuel Outboard Motor, Senegal; and Micro-financing Scheme for Agricultural Services, Cambodia.

4. Other projects.

The desk studies look at a number of other projects that are difficult to categorize, and for which there was not enough evidence to make recommendations on scalability. For example, the project in Trinidad and Tobago, implemented by an international NGO with support from a North America university, may make a long term contribution to establishing a niche market for high value cocoa and bring benefits to 10,000 producers. Whether working knowledge of identifying flavorful cocoa cultivars can be transferred effective to producers is not known. A related project in Ecuador to link cocoa producers to high value chocolate markets may have promise for scaling up. Both need continuing support and it may be that a growing public private partnership will fill the gap between DM funding and follow-up steps.

Two projects, which support the adoption of bio-fertilizers in Ecuador and Vietnam, may have promise for scalability and sustainability. Use of the biofertilizers can reduce expenditure on artificial fertilizers, often imported and costly, while increasing yields. The Ecuador innovation, though successfully adopted in Asia, faces challenges in Ecuador because of the increased labor requirements. The Vietnam example, because of a durable, tested partnership among the University of Sydney, the Institute of Agricultural Sciences of Southern Vietnam and the Mekong Delta Development Research Institute at Can Tho University, might be expected to use the DM project as a platform in raising support for the next steps in scaling up. The ongoing experience of these projects should be monitored because of expected rise in the cost of artificial fertilizers, but also because of the environmental benefits.

5. Keeping focused on intended clients.

A priority of ARD and the World Bank is reaching households and individuals living in poverty. Many of the DM funded projects in this cohort have multiple objectives, for example, trying to increase the contribution of agriculture to climate change mitigation and biodiversity protection while assuring sustainable livelihoods to small holder farmers. The material available for desk studies do not allow examination of this question, but there may be tensions between the priority of serving poor households and environmental goals. It may, for example, be more difficult and time consuming to include indigenous people, women and other traditionally excluded people in time-bound efforts to implement payment for environmental services approach. This is an area where there may be potential for elite capture of benefits.

V. Recommendations.

The individual case studies and desk assessments include specific recommendations on scalability for the 22 projects. Results from the surveys also suggest some recommendations on managing DM projects and preparing for scaling up. The recommendations are primarily intended for ARD and the World Bank. They include recommendations for changes in how ARD manages its relationship to the DM innovations tested; summary recommendations on the three projects examined in more depth; and some broad recommendations for maximizing the impact of innovations that have been tested successfully.

1. ***Embrace Development Marketplace Projects as an Incubator*** for World Bank, ARD and government strategic priorities. ARD and the DM have already moved in this direction through the support given to the 2008 cohort of DM projects, and through its efforts to learn how to move from innovation to large-scale impact.
    - ARD and DM should give priority to involving Country Office and headquarters staff in the recruitment and vetting of DM proposals that integrate with and enhance ongoing World Bank and government strategies and programs.
    - ARD and DM should give recognition to Country Office staff (TTLs), who are responsible for DM projects. In particular they should find ways to recognize and reward Country Offices and TTLs who are able to nurture innovations that are incorporated into World Bank funded projects and government policies and programs and which deliver impact in terms of large numbers of people and poverty reduction. Rewarding the use of DM projects as incubators for larger World Bank or Government activities, or for private sector adopted or expanded innovations, does not have to be monetary. It can include celebration, at subsequent Development Marketplace events, of innovations successfully scaled up.
    - The Development Marketplace and the World Bank have other options for increasing the incentives and opportunities for scaling up promising innovations.
        - At a minimum level the DM should consider reducing the number of annual DM rewards and investing the difference in bridging the gap between DM testing of innovation and scaling up. Development Marketplace may wish to reduce the number of awards each year (from 22 to 20) in order to free up resources that can be used strategically to identify the most promising innovations among the projects being implemented and to support key actions that will bridge the gap between the completion of the DM project and possible scaling up. These key actions may include small investments in financial management or in monitoring and evaluation capacity or linking projects with champions, implementing agencies for scaling up, and funders.
        - Using its convening power, the World Bank can consider mobilizing the donor community to create a fund dedicated to bridging the gap between innovations tested and innovations launched on the road to scaling up and sustaining operation at regional, national and global levels.

2. Scaling up is an intentional process, not a two year project. Design for scaling up from the start. Invest in the transition from demonstration of the innovation to scaling up---when the innovation is promising. Identify which agency will drive scaling up, and identify the potential champions who will support the scaling up.

Along with strengthening the working links between DM projects and World Bank and government priorities, scaling up needs to be an explicit part of the project design and of assessment of project candidates.

- Revisit guidelines for project proposal submissions to include:
    - Brief description how the project may be scaled, by whom and over what time period.
    - Projections of potential clientele for the innovation.

    - If an international agency is implementing the DM project, there should be an explicit discussion of how the innovation is taken over and sustained by local institutions.
    - Plans for monitoring whether intended clients are reached and measurable indicators of outcomes are met.
    - A simplicity – complexity assessment of the model and its implementation. See the Simplicity – Complexity Index of Scalability in the section above.
- ARD and DM should intensify its support to building capacity needed for scaling up, starting with the DM project, for example, strategic support to building monitoring and evaluation skills and systems, finding outside expertise to assist with documenting the outcomes of the project innovations or lending technical expertise to designing financial models. There may be some low cost and innovative ways do this; for example, partnerships with universities in-country or regionally, drawing on faculty and graduate students to work on monitoring and evaluation over the life of the project.

3. Identify early the potential for scaling up

- ARD and DM, working with the implementing organization, using tools emerging from this work, should identify potential for scaling up among the DM projects and move to identify the organization best suited for expanding or replicating the innovation(s). Simultaneously it should find local champions and build broad support among relevant stakeholders to scaling promising innovations. This is already happening among the most promising of the DM projects.
- As projects with scalability and impact potential emerge, ARD may wish to actively seek interim funding, for example, from the Development Grant Facility (DGF), so that scaling up activities can begin as the DM funding finishes, thus eliminating a gap and the momentum of innovation implementation. Other funders, IFAD, regional development banks, governments, bilateral donors, social investors or the private sector may be interested in tested innovations. There are multiple ways to communicate and encourage follow-up investment.
- Identifying potential for scaling up also means weeding out those projects which are not working or which show little promise of scalability.
- ARD should focus scaling up efforts on projects that can be *scaled easily* and *produce benefits* for large numbers of priority clients or which have significant impact on government policy and practice.
- Not all projects with scalability potential are appropriate for direct ARD involvement in facilitating the scaling up process.
    - As the findings above suggest, PES projects may require substantial time and effort to assure access to carbon markets or other mechanisms and also to introduce and sustain new forms of livelihood production for the smallholders and others being asked to provide the environmental services. In these cases ARD can use its convening power to draw together stakeholders in country and across countries to foster follow-up and bridging the gap between the DM project and sustainable scaling up.

- Some projects are clearly intended for scaling up by private sector organizations. As such DM projects are identified as being scalable, ARD can use its convening power to interest social venture capitalists or the International Finance Corporation to take up intermediary support until the financial models are viable on their own.

4. Immediate actions to support promising innovations in Nigeria, Mongolia and India. The individual case studies have detailed discussion and recommendations on immediate and longer terms support to scaling up. Key recommendations are:

Mongolia

- The Mongolia "Value Chain Development for Textile Products" is an innovation that seeks to make a fundamental change in the way cashmere and other wool is marketed, affecting actors at all levels of the value chain. The innovation has potential to serve all the herding population of the country and to assure a high value export trade in cashmere products.
- Making this fundamental shift and building a value chain that benefits stakeholders from herders to cashmere product factories is complex. The project should continue in a gradual, level by level expansion that is accompanied by growing capacity at different levels of government to manage the project.
    - VSO, the DM implementing agency should be encouraged to fund expansion of the existing project to cover all or Uvurkhangai Aimag (province).
    - Government should begin gradual replication of the approach in other aimags as part of the implementation of the new Auction Law.
    - ARD and DM should seek funding (DFG, Asian Development Bank, bilateral donors or social venture capitalists) to support replication in all aimags, and to support VSO or other organization to assist in building capacity of government in other aimags, the national level, and in the cashmere factories.

India

- The Government of Tamilnadu is already beginning to replicate the "Waste to Wealth by Incubating Mini Cold Storage Technology" project in other areas of the state. TREC-STEP, the World Bank and the Government of Tamilnadu should meet and discuss ways to expand the project to all 160 farmers' markets in the state and whether funding to support expansion can be found at the level of the Tamilnadu and/or the national Governments.
- While the original model for this project assumes that the MCSUs will become sustainable businesses run by youth entrepreneurs, this is not likely to happen in the near future. The current high capital and operating costs of the MCSUs and the complexity of grooming youth to become small entrepreneurs makes this difficult. The Government of Tamilnadu should be encouraged to support the MCSUs as a public good for the next decade. At the same time, TREC-STEP

should be encouraged to continue work on reducing the costs of the MCSUs, and to mentor and monitor the evolution of youth from managers of the MCSUs to small business people.

- Government may have the capacity to champion and fund scaling up of the MCSUs. The World Bank should explore ways (meetings, communications strategies) to build interest in the MCSUs and their suitability as an innovation appropriate to farmers' markets across the country that can be incorporated into national government agriculture and poverty reduction strategies.

Nigeria

- The Nigeria "Adding Value to Waste in the Cassava Processing – Goat Keeping Systems" project has high potential for expansion in Ogun State and replication in the 24 central and southern states where cassava is grown; and for replication in other cassava growing areas where goat and other animal herding is practiced.
- With respect to Nigeria, the World Bank should work through Government to replicate the approach in the other states, ideally through the World Bank funded project, FADAMA.
    - If FADAMA IV funding does not materialize and/or the innovation cannot be replicated through FADAMA III, ARD should seek other funding, from the DGF for example, to launch the approach with leadership from the federal level and working through state governments and the ADPs.
    - UNAAB can serve as a resource in transferring the innovation to other states; in training; and in trouble shooting.
    - UNAAB can work with Government and the World Bank to re-introduce a revised microcredit mechanism that can allow poorest households to access the project.
    - UNAAB should be encouraged to strengthen mechanisms whereby dried cassava is marketed to goat and livestock farmers, establishing quality standards and branding. Improved marketing approaches can be shared with other states.
- ARD and DM, working with UNAAB, can share the simple but effective innovations in this project by communicating the approach to governments and growers in other cassava growing countries and at meetings of cassava researchers and producers.

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Annex I

1. Tools for DM Case Studies

Note on Tools and Their Uses in Theory and Practice. The tools below (and others) are useful in providing us with questions and help to identify all the critical issues influencing the question of scalability. No one tool is useful in all circumstances---we need a range of tools. This is a guide to tools of use in conducting cases studies of scalability potential.

Mapping a theory of change. The usefulness of mapping our theory of change is that it forces us to make explicit the steps/actions and assumption required to produce the change sought.

- Carol Weiss – See: "How Can Theory-Based Evaluation Make Greater Headway?" Evaluation Review. August 1997. 21:501-524. Here and elsewhere Weiss shows how to make explicit all the actions necessary to go from the decision to implement to the achievement of the change.
- Aspen Institute model – a free copy is available at http://www.dochas.ie/Shared/Files/4/TOC_fac_guide.pdf
- Backward Mapping – See: Richard Elmore. "Backward Mapping: Implementation Research and Policy Decisions". Political Science Quarterly. Vol. 94, No, 4. (Winter, 1979-1980), 601-616. Elmore starts with the change required and asks what action is necessary to produce the change; Then the backward mapping process works backward, asking what is required to produce each step or action.

Stakeholder analysis. There are multiple ways to identify and then diagram or map stakeholders, seeking to emphasize different characteristics, such as power, interests, competencies, pathways for action

- Arnold Howett – Mapping the system (See sample below
- Examples from Derick W. Brinkerhoff and Benjamin L. Crosby, Managing Policy Reform, Hartford: Kumarian Press 2002, pp. 141-152 and 163-178; or "Using a Power-versus-interest Grid". in Barbara C. Crosby and John M. Bryson. Leadership for the Common Good. San Francisco: John Wiley. 121-124.

Scaling Model Decision Framework – The text above suggests the complexity of decision-making as to whether expansion, replicability or collaboration, or some combination of these choices, represents the best approach to scaling up in a particular case. The Cooley and Kohl decision model can help structure thinking about the variables that influence this choice. See below.

Scalability Checklist – This checklist (see Simplicity – Complexity Index of Scalability in the text above.) a good rapid assessment tool that raises many questions about scalability; some of which should be investigated in depth in a qualitative way.

SWOT Analysis. This is an old and well-known tool with many adaptations. It is a useful way to frame the analysis of the drivers and spaces of a particular scaling approach.

Mapping the System
(Arnold Howett, Ashe Institute, Harvard University)

Actors	What are their interests?	Why do they matter?	In which 'action pathways' will they participate?

Annex II: Mongolia Case Study

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Case Study on Potential for Scaling Up: "Value Chain Development for Textile Projects" in Mongolia

This report assesses the scalability of Development Marketplace Project 6251, "Value Chain Development of Textile Products" sponsored by the Voluntary Service Overseas's (VSO's) program in Mongolia. The Project seeks to reverse the decline in the quality of raw Mongolian cashmere, yak wool, and sheep wool; to strengthen linkages within the entire cashmere and wool value chain; and to increase the international competitiveness of firms that produce high quality final goods. The principal goal is to retain more of the value chain benefits within Mongolia, especially for herder households.

The study concludes that this is an innovative, well-designed project that holds significant merit and potential for being scaled up due to project characteristics, favorable political conditions, and the wide recognition that it effectively addresses concerns that are critical for the long-term, equitable, and sustainable development of Mongolia. The timeline of its current funding cycle is too short to realize and measure the Project's impacts and to enable Government to take over implementation.

Two recommendations emerge from the assessment: (1) VSO should continue and expand the Project within the Uvurkhangai aimag (province); and (2) the Government should replicate features of the VSO Project in other aimags as part of the implementation of the new national Auction Law, drawing on the lessons of the VSO experience in Uvurkhangai.

For the Agriculture and Rural Development Department, The World Bank

October 2011

Table of Contents

Abbreviations and Acronyms

ARD	Agriculture and Rural Development Department, World Bank
COMECON	Council for Mutual Economic Assistance
DM	Development Marketplace
GDP	Gross Domestic Product
HDI	Human Development Index
MOFALI	Ministry of Food, Agriculture and Light Industry
MPP	Mongolian People's Party
MPRP	Mongolian People's Revolutionary Party
RIAH	Research Institute for Animal Husbandry
NGO	Non-governmental organization
PRSP	Poverty Reduction Strategy Paper
RIAH	Research Institute for Animal Husbandry
UNDP	United Nations Development Programme
USAID	United States Agency for International Development
USSR	Union of Soviet Socialist Republics
VSO	Voluntary Service Overseas

Executive Summary

Case Study:

Value Chain Development for Textile Products

In Mongolia

Prepared by Barry Shelley

The Heller School for Social Policy and Management, Brandeis University

October 2011

World Bank Development Marketplace Project Number 6251

Implementing Organization: VSO Mongolia

Supported by the World Bank Development Marketplace and the Agriculture and Rural Development Department.

Introduction

This report assesses the scalability of Development Marketplace Project 6251, "Value Chain Development of Textile Products"--hereafter called the Project--sponsored by the Voluntary Service Overseas (VSO's) program in Mongolia. The Project strives to reverse the decline in the quality of raw Mongolian cashmere, yak wool, and sheep wool; to strengthen linkages within the entire cashmere and wool value chain, from herders to manufacturers; and to increase the international competitiveness of firms that produce high quality final goods. The goal is to retain more of the value chain benefits within Mongolia, especially for herder households.

Mongolia and its cashmere - wool sector

Since 1990, Mongolia has been engaged in a challenging transition from a U.S.S.R.-backed, centrally planned, socialist economy to a more independent market economy. With the collapse of the Soviet Union, Mongolia lost both critical financial aid as well as many of its trading partners. The state-owned enterprises discovered they were ill-prepared to compete in more open international markets. In addition, domestic value chains of production were thrown into disarray once the new government began dismantling the command and control institutions that previously had managed production. While market-supporting institutions have developed significantly during the past decade, many market linkages remain relatively weak, and industrial enterprises struggle to increase their competitiveness. These deficiencies are particularly evident in the cashmere/wool value chain.

Cashmere and wool are major products in the Mongolian economy and society. Officially, cashmere products alone accounted for 6.6 percent of Mongolia's GDP and 8.6 percent of all exports in 2002 (World Bank 2003, 1 and 5). However, it is estimated that about 50 percent of Mongolia's output of raw cashmere is unrecorded as it is smuggled to China (U.S. Agency for International Development (USAID) 2005, 1).

The cashmere – wool sector is particularly pertinent to poverty reduction and sustainable development in Mongolia. Since most of the rural poor engage in herding, the health of the cashmere – wool sector has a robust positive impact on the well-being of rural households. Also, despite being the least densely populated country in the world, the effects of overgrazing are becoming apparent in many areas..

Recognizing the critical economic and cultural role played by the cashmere – wool sector, the current government, led by the Mongolian People's Party (MPP), successfully passed on June 2 of this year a signature piece of legislation entitled the *Auction Law on Livestock Raw Material.* The Auction Law exhibits a high degree of synchronicity with the VSO Project in its goals and design. The key provisions of the Auction are the following:

- Livestock raw materials, including raw cashmere, yak wool, and sheep wool, can be exported only if,
    - they meet certain stated standards of quality and preparation (for which training programs will be conducted),
    - their quality is graded and certified,
    - they are sold at officially sanctioned auctions,
    - they are brought to auction for sale by herder cooperatives (i.e individual herders cannot sell to the auction), and
    - the buyers are licensed as traders.
- Grading laboratories will be established in each and every aimag.
- Customs officials will check for certificates released at the auction.
- Three percent of annual GDP will be committed to fund the implementation of the law.

In this way, the Government hopes to improve fiber quality, facilitate value chain linkages, and increase the supply of quality raw fibers that go to national manufacturers. The law will take effect January 1, 2012.

Critical criteria for scalability

Innovation and the theory of change

The most innovative element of the Project is the creation of a fiber grading laboratory in the aimag capital and the accessibility of its services to herders for an affordable fee. The Project's focus on the entire cashmere and wool product value chain is also a key aspect of its inventiveness and potential effectiveness.

The problems

During the past twenty years, the Mongolian cashmere and wool industry has faced varied and complex challenges at all levels of its value chain. Problems that are particularly relevant for the Project are as follows:

- Weak linkages within the value chain.
- A deficient rural infrastructure, especially the roads.
- The necessity of most herder to sell their raw material at the farm gate.
- The lack of incentives for herders to improve fiber quality since they sell primarily in bulk without sorting by quality prior to sale.
- The recent decline in the quality of raw fibers.
- The advantage of the Chinese textile manufacturing sector over its Mongolian counterpart in economies of scale, technology, and thus, productivity, leaving Mongolian factories unable to compete for the supply of high quality fiber and operating far below full capacity..
- The recent increase in herd sizes, especially of goats, that has led to the near saturation of the ecological carrying capacity of much of the productive areas of the grasslands.

The theory of change to address the problems

The theory of change embedded in the Project can be summarized as follows:

1. Locating a credible fiber grading laboratory in the aimag center serves as a catalyst for quality improvement, value chain integration, and reductions in transaction costs.
2. Training and technical assistance improve herders' knowledge about fiber quality, market preferences, and quality-differentiated pricing, thus increasing incentives to improve and certify the quality of their raw products. The laboratory provides an affordable means by which they can test and certify fiber quality and respond proactively to the newly realized incentives.
3. The decentralized laboratory and grading system and the incentives generated for higher grade fiber contribute to an increased supply of high grade cashmere and wool to the manufacturing sector.
4. Strengthening vertical connections in the value chain lowers transaction costs, raises the percentage of raw material sold to national factories, and allows the retention of greater value added by Mongolian agents at all levels of the process.
5. Soum level training in the preliminary quality-based sorting of fibers leads to the relocation of a portion of the value added to rural households and to savings on transportation costs.
6. Training and equipment for home production of woolen and cashmere goods supplement herders' incomes and increase the participation of women.
7. Supporting the role of herder associations as the primary channel through which herders participate in the Project, government, and commercial planning and negotiation lowers the cost of transactions with all three entities and helps to empower herders in such transactions.
8. Providing information on market prices and extension services through cell phone texts and FM radio broadcasts further empowers herders in market transactions, strengthens value chain linkages, and encourages capacity building that could increase productivity and improve fiber quality.
9. Traders who are able to effectively adjust to the new grade-oriented regime benefit from more stable prices and a more secure process.

10. Resources and training in fashion design and international marketing will help manufacturers increase their international sales.

The intended benefits

All combined, the theory suggests, these interventions will generate the following changes:

- Herders will benefit with increased incomes and more secure, stable livelihoods.
- Soum populations more generally will benefit from the increased consumption by herders and the added employment opportunities coming from sorting operations.
- Some traders will benefit from increased income and a more stable market system.
- Manufacturers will benefit from reduced transportation costs, a greater supply of high quality fiber, lower transactions costs, better design and increased international sales.
- Mongolians more generally will benefit from the retention of more value added from the cashmere and wool industry and thus from the multiplier effect throughout the national economy.

Actual benefits and effectiveness

It is too early to formally verify concrete, measureable results. However, it is clear that much has been accomplished in the past two years. The Project has persuaded stakeholders from all targeted groups to participate, procured their long-term commitment to the process, and nurtured promising working relationships between the various stakeholders. It has provided initial training for herders, established a fiber grading laboratory in the central city of the Uvurkhangai aimag, arranged for radio broadcasts, and facilitated designer training and export market connections for manufacturers.

Most of the progress to date, however, has been in implementing the Project structure and getting it to the point of *beginning* to function as originally envisioned. Now it will require another period of time for the Project to significantly impact the livelihoods of value chain sectors and to verify what actual benefits have been realized.

Primary challenges that remain

While there has been significant progress in implementing the Project design, a number of remaining challenges must be addressed if the desired change is to be realized.

- Training and technical assistance in fiber quality assessment, sorting, and breeding must be expanded and deepened for the Project to have the impact it seeks.
- It remains to be seen (a) if the perceived return for quality improvements will be sufficient to induce large numbers of herders to implement the quality enhancing measures recommended, and (b) if significant numbers of herders will possess the basic educational skills needed to effectively carry out such measures to improve quality over time.
- As the shift from selling by bulk weight to selling by quality sorted batches takes place, lower quality producers will likely find themselves at a distinct disadvantage. Some type of transitional support program for initially disadvantaged herders may be necessary while they survive the several year process of improving their quality.

- The fiber quality laboratory technicians in Arvaikheer need more experience, capacity-building, and expert supervision if the laboratory is to meet acceptable standards and firmly establish its credibility.
- The long-term financial sustainability of the laboratory has been another area of concern. The aimag government,is willing to subsidize its budget for the short-term. A question remains as to whether the laboratory can become self-sustaining in the relatively near future.
- At the manufacturing level, improving and updating the design of wool and cashmere clothing lines to increase their competitiveness in the international market has been more problematic than expected. So far, the Project only has been able to channel design services to two companies.
- Most small manufacturing enterprises may be unprepared to ramp up their designing and marketing for export.
- Even some large firms may not be well-positioned in this regard.. The short-term design assistance provided so far has been inadequate to support this transition for the long-run.
- Finally, continued work is needed on developing trust, accountability, and credibility between all stakeholders. Such relationships require time to mature.

Key Project stakeholders

Key stakeholders in the Project are the following:

- Herders
- Traders
- Manufacturers
- National government
- Aimag, soum, and bag governments
- Voluntary Service Overseas (VSO)
- Other partners whose missions converge with that of the Project.

The project offers potential benefits to all of these stakeholders. The continued participation of each depends on the realization of expected benefits.

Alignment

There is an exceptionally high degree of alignment of the Project's innovation and strategic vision with those of the Mongolian government, the Agriculture and Regional Development (ARD) Department of the World Bank, and the World Bank country program. Indications of the convergence of these visions can be found in Mongolia's Poverty Reduction Strategy Paper (PRSP) and the corresponding interim progress report (Mongolia 2003; Mongolia 2005, 44-50); The World Bank's most recent agriculture action plan (2009)—a document spearheaded by ARD; and World Bank country documents for Mongolia, including recent country strategy assistance papers and its Sustainable Livelihoods Project (World Bank n.d.-d; World Bank 2004, 20-23; World Bank 2007, 25-28; World Bank 2008, 8-9).

Assessment of scalability of the innovation

There is a clear interest among stakeholders in continuing and scaling up the Project or incorporating its features into a compatible expanded program such as the Auction Law. Moreover, there is little evidence of any formidable opposition to either the Project or its scaling up. There are clear spaces for scaling up the innovation. VSO is well positioned to expand the Project within Uvurkhangai. The Auction Law provides a framework and significant funding to replicate Project strategies throughout the country under government direction. I conclude that there is very high potential and strong justification for scaling up this innovation in some form. Discontinuing the Project just as it is "getting its legs" or limiting its reach to current levels would constitute a major lost opportunity.

Recommendations

I recommend two concurrent types of scaling up:

1. That VSO continue and **expand** the Project within the Uvurkhangai aimag..
2. That, drawing on the Uvurkhangai experience, the government **replicate** features of the VSO Project in other aimags as part of the implementation of the Auction Law,.

The Project would continue at least another two to three years with sufficient funding not only to consolidate the structure it has organized, but also to expand its spatial reach to other parts of Uvurkhangai. VSO has stated its interest in and commitment to managing the Project for another two or three years if funding were available. VSO has already demonstrated in the first two years of the project the competent leadership and organizational capacity necessary to continue the Project effectively within the parameters of one aimag. However, by VSO's own self-assessment, promoting the organization to lead a large scaling up effort throughout other regions of the country would not be advisable.

Regarding Recommendation 2, government priorities, the framework of and budget for the Auction Law provide the opportunity to extensively scale up the Project throughout the entire country in a multiple-phase process.

Case Study

Value Chain Development for Textile Products

In Mongolia

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Introduction

During the past year a team from the Heller School for Social Policy and Management at Brandeis University has been conducting a study for the Agriculture and Rural Development Department (ARD) of the World Bank on how innovative DM/ARD projects might generate impact on a wider scale than they do within their initial spatial reach. In the study's first phase, an extensive review of scaling up literature serves as the basis for developing criteria for assessing the scalability of a project and guidelines for launching a scaling up process (See Holcombe et al. 2011). The second phase focused on case studies of three DM project which were identified in a preliminary review as exhibiting high scalability potential—one each in Mongolia, India, and Nigeria. Each of these case studies assesses the scalability of the targeted project using the criteria developed in the first phase of the Heller School study and then recommends if and how scaling up of the Project should be supported.

This paper reports the findings of one of those case studies—DM Project 6251, "Value Chain Development of Textile Products"--hereafter called the Project---implemented by the Voluntary Service Overseas (VSO) program in Mongolia. The Project addresses the decline in the quality of raw Mongolian cashmere, yak wool, and sheep wool by creating a decentralized grading laboratory and carrying out extensive training programs on grading, sorting, and quality-based breeding in one rural province. It addresses the weak market structures in this post-Soviet-era transitional economy by facilitating stronger linkages within the entire cashmere and wool value chain, from herders to manufacturers. It also strives to increase the competitiveness of firms that produce high quality final goods and

improve the design and international marketing for such products. All together these provisions seek to increase the supply of quality fiber to national manufacturers and retain more of the value chain benefits within Mongolia, especially for herder households. More Project details will be discussed in subsequent sections.

The case study research included a desk review of documents from the Project, World Bank, and other entities, and an intensive field visit to Mongolia July 4-9. During those six days I conducted interviews with diverse Project stakeholders, including herders; traders; manufacturers; national, provincial (aimag), county (soum), and district (bag)[22] government officials; university researchers and professors; agricultural extension specialists; a fashion designer; VSO staff; representatives of collegial non-governmental organizations (NGOs); and the liaison to the Project from the World Bank country office. Appendix 1 provides specifics of each interview. The fieldwork time was evenly divided between the capital city of Ulaanbaatar and the rural aimag of Uvurkhangai, both in the aimag capital, Arvaikheer, as well as in the more remote soum of Nariinteel—almost 600 kilometers from Ulaanbaatar.

On the basis of this investigation I conclude that this is an innovative, well-designed project that is very likely to fulfill its initial, well-conceived objectives. Furthermore, it holds significant merit and potential for being scaled up due to project characteristics, favorable political conditions, and the wide recognition that it effectively addresses concerns that are critical for the long-term, equitable, and sustainable development of Mongolia (World Bank n.d.-c). Certainly formidable challenges remain with the original Project and new challenges would arise with any scaling up. However, the challenges are not unyielding, and the attributes of the Project are well worth its continued and expanded support. At the same time, I suggest that the timeline of its current funding cycle is too short, closing essentially at the point where the Project staff and other stakeholders have successfully built the framework, created the networks, and facilitated initial capacity-building. After only two years the Project is now well-positioned to generate the concrete socio-economic impacts sought. However, there understandably has not been sufficient time to realize and measure those impacts and solidify the innovative structure so that it can become sustainable. Phasing out the Project at this time would be analogous to planting a garden and then not watering, weeding, or fertilizing it: The potential benefits could be lost.

The assessment also points out that with additional funding VSO would be willing and very able to continue the Project in its current size and even extend its spatial reach to some degree within the Uvurkhangai aimag where it currently operates. However, in both my and VSO leaders' judgment, organizational limits and uncertainty about VSO's long-term future, limit their capacity to play a major management role in any efforts to scale up the Project to other regions of the country. But VSO could draw on its experience with the Project to play a crucial advising role in extensive scaling up ventures. Fortunately, policy

[22] Mongolia is divided into 21 *aimags* that are comparable to provinces. Each aimag is divided into county-like *soums*, and each soum is further divided into *bags.*

and budgetary priorities recently established by the national government create extraordinary synchronicity with the Project vision and very favorable conditions for scaling up the Project innovations through integration into the soon-to-be-implemented so-called Auction Law.

Given the above assessments, I make the following recommendations regarding the Project's continuation and scaling up: (1) that VSO continue and **expand** the Project within the Uvurkhangai aimag; and (2) the government **replicate** features of the VSO Project in other aimags as part of the implementation of the Auction Law, drawing on the lessons of the VSO experience in Uvurkhangai.[23]

This paper explains the findings summarized above as follows: First, a brief overview introduces Mongolia and its cashmere - wool industry, as relevant for this case study. I then proceed to assess the Project in terms of critical criteria for scalability. This constitutes most of the report as the discussion explores the Project's key innovation and its theory of change; the interests and influences of key stakeholders; the alignment of the Project's design and VSO's organizational characteristics with the strategies and priorities of Mongolian government entities and World Bank programs; and the scalability of the innovation. The recommendations follow. The paper concludes with a discussion of the challenges that are likely to arise in the scaling up process.

Mongolia and its cashmere - wool sector

Since 1990, Mongolia has been engaged in a challenging transition from a centrally planned, socialist economy to a more independent market economy**.** The Government and economy were heavily influenced by and dependent on the Soviet Union for most of the period between 1921 and 1990. During the 1980's Mongolia traded almost exclusively with the Union of Soviet Socialist Republics (U.S.S.R.) and the Soviet bloc countries with only 1 percent of imports and 4 percent of exports exchanged with non Soviet bloc countries, including China. As a member of the Council for Mutual Economic Assistance (COMECON), Mongolia's international trade was directed by Soviet central planning. Thus, Mongolia exported primarily raw materials in which it had comparative advantage—mainly minerals and livestock products—and imported most capital and consumer goods. Domestic industries either processed raw materials for export or produced, with little competitive pressure, and a small supply of finished goods for local demand. The trade

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[23] I am well aware that my conclusions and recommendations are based primarily on a relatively brief field study, and believe that credible research demands acknowledgment of such limitations. At the same time, I believe I was able to probe sufficiently deep during the investigation to fulfill the purpose of this case study. That outcome was due in no small part to the cooperation of the VSO staff, who were unresisting and responsive to my requests for specific interviews and candid and forthcoming in answering my sometimes challenging questions.

deficit from 1981 to 1990 averaged 30 percent of GDP. However, this deficit was not a cause for serious concern since it was financed by transfers and grants from the U.S.S.R. (U.S. Department of State 2011; World Bank 2003, 1-2).

With the collapse of the U.S.S.R., reform movements helped instigate the withdrawal of Soviet troops and democratic elections in 1990, and a new constitution that went into effect in 1992. Almost overnight Mongolia lost both its critical financial aid from the Soviet Union and many of its trading partners. As in other former Soviet bloc countries, the state-owned enterprises discovered they were ill-prepared to compete in more open international markets, and by 1993 exports had fallen to half of what they had been in 1989. Imports had fallen by 80 percent (World Bank 2003, 2). The economy plunged into a deep recession with GDP falling by 20 percent during the same period. In addition, domestic value chains of production were thrown into disarray once the new Government began dismantling the command and control institutions that previously had managed production. The market institutions meant to replace the central planning apparatus have been slow to develop.

The economy began to stabilize by 1993--albeit at lower levels of production, incomes, and trade--largely due to the agricultural and herding sectors. These were the only sectors to demonstrate modest growth during the first years of transition as many rural residents left unpromising jobs in towns and took up herding for cash and subsistence. The country has experienced varying rates of economic growth since 1994. Growth rates averaged 3.5 percent through the rest of the nineties (World Bank 2003, 2) though it took the entire decade to regain the 1990 Gross National Income (GNI) per capita levels (United Nations Development Programme 2011, 14). Since 2000 rates have been as high as ten percent (2007) as a mining boom began, and as low as one or two percent during several years when extreme weather caused massive livestock losses. The winter of 2009-2010 was particularly catastrophic. Twenty-two percent of the nation's total livestock perished. The economy rebounded in 2010 to grow at a seven percent rate.

After Mongolia's lost decade of the 1990's, income levels and living standards have risen notably during the past decade. GNI per capita increased from 1110 USD in 2001 to 1850 in 2010. Based on this figure, the World Bank classifies Mongolia as a "lower middle income" country (World Bank n.d.). Poverty rates have also improved. According to World Bank data (n.d.), the percentage of the national population that lives below the national poverty line declined from 61.1 in 2002 to 35.2 in 2008. Both rural and urban poverty declined during the same period, though the rural-urban poverty gap still exists. Rural poverty rates dropped from 69.7 to 46.6 and urban rates fell from 54.1 to 26.9. Human development, as measured by the Human Development Index (HDI), has advanced as well. Mongolia's HDI has risen to 0.622 from 0.538 a decade ago and from 0.520 two decades ago, giving the country the rank of 100 out of 169 nations world-wide and a classification as a "medium human development" nation. Life expectancy is now 68 years and mean years of schooling stands at 8.3. Mongolia boasts a 97% literacy rate (United Nations Development Programme (UNDP) 2011, 14-15).

These indicators of economic and human development demonstrate the progress that has been made since 1990 in restructuring the economy. The market structures and the legal and political institutions required for markets to function efficiently and fairly are much stronger than previously. However, these institutions are still maturing, many market linkages remain relatively weak and spotty, and industrial enterprises struggle to increase their competitiveness. These deficiencies are particularly evident in the cashmere/wool value chain.

Cashmere and wool are major products in the Mongolian economy and society. Mongolia produces 25 percent of total cashmere output in the world, second only to China which accounts for 60 percent. Cashmere products alone accounted for 6.6 percent of Mongolia's GDP and 8.6 percent of all exports in 2002, ranking third behind copper and gold in exports (World Bank 2003, 1 and 5). However, it is estimated that about 50 percent of Mongolia's output of raw cashmere is smuggled to China (U.S. Agency for International Development (USAID) 2005, 1). These sales are not included in official export statistics. The illegal transactions occur despite the fact that Mongolian manufacturers are operating at around 50 percent of their capacities and seek larger supplies of quality raw fiber. In fact, only sixteen percent of the total value of official cashmere exports are finished goods. The rest are raw (thirteen percent) or semi-processed fiber (71 percent), which reap much less value added for Mongolia (World Bank 2003, 36). One estimate suggests that if all of the country's raw fiber, including that currently smuggled to China, were used to manufacture finished products in national factories, official cashmere exports would quadruple and employment in the textile processing industry would more than double (USAID 2005, 1).

Reasons for the high levels of exports that are illegal and/or low-value-added are numerous and complex. There are two reasons that are particularly relevant for this case study. First, Mongolian textile factories are competitively disadvantaged compared to Chinese enterprises and thus can not initially offer herders and traders prices that are as high as those paid by Chinese manufacturers. Only after the combing and shearing season is over are Mongolian and Chinese offers similar. But many herders cannot or will not wait. Second, the value chain between herders and manufacturers remains underdeveloped. Because of distances, few and costly transport alternatives, and the lack of vertical linkages and alliances with national factories, most herders have little choice other than selling their fiber to traders at the farm gate. The majority of traders are more tied into Chinese value chains than into those in Mongolia.[24]

The cashmere – wool sector is particularly pertinent to poverty reduction and sustainable development in Mongolia. While there has been some urbanization in recent decades, the percentage of the population living in rural areas has remained constant over the past twenty years and has declined only slightly from 47 percent in 1981 to 43 percent in 2010.

[24] For detailed and somewhat divergent analyses of the Mongolian cashmere industry see two articles listed in the list of references: World Bank 2003 and U.S. Agency for International Development 2005.

Almost all rural households—40 percent of the total national population--depend on livestock products for at least a portion of their income (World Bank n.d.). Semi-nomadic lifestyles still predominate on the steppe grasslands, though increasing numbers of rural residents are settling into agricultural communities.(U.S. Department of State 2011). While rural poverty has declined in recent years, it still plagues almost half of those living in rural areas, as stated above. Since most of the rural poor engage in herding, the health of the cashmere – wool sector has a robust impact on the well-being of rural households.

Livelihood practices in the sector also have significant environmental impact, and the environmental health of the steppe will have a large long-run impact on herder livelihoods. Despite being the least densely populated country in the world—less than three million people in a land slightly larger than Alaska--the effects of overgrazing are becoming apparent in many areas. In addition, water shortages are of critical concern in several aimags. Other ecological concerns include air pollution from the burning of soft coal as a primary energy source, and soil erosion and water pollution from mining.

Politically, Mongolia is a young, but relatively stable democracy. It has a mixed presidential-parliamentary system with a popularly elected president and a prime minister appointed by the legislature. Recognizing the critical economic and cultural role played by the cashmere – wool sector, successive governments since 1990 have tried different strategies to strengthen the value chain and retain more of the textile fiber raw material inside its borders and to restore grassloand ecological health. Policies such as an export ban in the mid-1990's and the export tax that replaced it apparently exacerbated the smuggling problem. The tax also, in effect, transferred income from the herders to the manufacturers by helping the latter buy raw materials from the former at a price under world prices (World Bank 2003, iii).

The current administration has adopted an "agriculture for development" stance and has stated its commitment to prioritize livestock-related sectors and the restoration of grazing lands. The government is led by the recently renamed Mongolian People's Party (MPP), which evolved from the Soviet era communist Mongolian People's Revolutionary Party (MPRP). The MPP has re-made itself with a social democratic orientation and has continued to be a key actor in national politics after the changes two decades ago.

On June 2 of 2011 the MPP successfully passed a signature piece of legislation entitled the *Auction Law on Livestock Raw Material.* The Auction Law, as it is commonly known, exhibits a high degree of synchronicity with the VSO Project in its goals and design. In fact, the VSO Project leader, Erdenebileg Batmunkh, served on a advisory committee that contributed to the law's formulation. The key provisions of the Auction are the following:

- Livestock raw materials, including raw cashmere, yak wool, and sheep wool, can be exported only if,
    - they meet certain stated standards of quality and preparation (for which training programs will be conducted),
    - their quality is graded and certified,
    - they are sold at officially sanctioned auctions,

    - they are brought to auction for sale by herder cooperatives (i.e individual herders cannot sell to the auction), and
    - the buyers are licensed as traders.
- Grading laboratories will be established in each and every aimag.
- Customs officials will check for certificates released at the auction.
- Three percent of annual GDP will be committed to fund the implementation of the law.

In this way, the government hopes to improve fiber quality, facilitate value chain linkages, and increase the supply of quality raw fibers that go to national manufacturers. The law will take effect January 1, 2012.[25]

Critical criteria for scalability

Innovation and the theory of change

The most innovative element of the Project is the creation of a fiber grading laboratory in the aimag capital and the accessibility of its services to herders for an affordable fee. Previously, the only grading laboratories were located in the capital city of Ulaanbaatar and they primarily served the textile manufacturing sector. Thus, there was a significant asymmetry of grading information in the past, with the producers of raw materials disadvantaged in regards to both price negotiations as well as knowledge necessary to improve the quality of their animals' natural fibers. The Project's focus on the entire cashmere and wool product value chain is also a key aspect of its inventiveness and potential effectiveness. The Project addresses not only the quality of the raw material, but also the timeliness and appeal of product design, the quality of final consumer products, and the effectiveness of national and international marketing. Furthermore, it strives to better develop the linkages between all these links in the value chain. This Project's theory of change rests on the claim that improving the average grade of fiber and formally certifying that increased quality can serve as a pivotal catalyst to increased benefits for all sectors in the value chain--including herders, traders, manufacturers, and exporters—and is critical to retaining within Mongolia more of the value added along the chain. This section reviews the primary obstacles confronting key actors in the value chain, explains how the Project proposes to address these obstacles and bring about change, and assesses the Project's effectiveness in realizing the change theorized.

The problems

The Mongolian cashmere and wool industry faces varied and complex challenges at all levels of its value chain. Primary problems that are particularly relevant for the Project are as follows:

1. Under the Soviet influenced centrally planned economy, the cashmere and wool value chain within Mongolia, though inefficient, was stable and controlled. Most herds were

[25] Badarchingiin Myakhdadag, Parliamentary Standing Committee on Natural Environment, Food, and Agriculture, interview by author, Ulaanbaatar, July 4, 2011.

state-owned. Much of the unprocessed and semi-processed fiber was exported to Soviet Bloc countries by the state trading company, Mongol Impex. Some was retained for a small domestic market. Manufacturing of final goods was controlled by two state-owned enterprises. While incentives for innovation and increased productivity were weak, the system was relatively secure and predictable for participants in the chain. With the demise of the Soviet-backed government in 1990 the centrally planned economy suddenly gave way to a market economy, before markets were sufficiently developed to fill the void. After 70 years under one economic system, the links in most value chains have had to be reconnected within an almost entirely new social and economic fabric. (World Bank 2003)

This transition still continues throughout the economy, including the cashmere and wool sector. Weak market and legal institutions have made it difficult to consolidate the national value chain, to form vertical alliances between value chain agents and to take advantage of economies of scale. Furthermore, herders often lack regular access to basic information such as market prices, advice on production techniques, and long-term outlooks. It has been during these past twenty years of transition that much of the raw material has been diverted—much of it illegally--to China, whose manufacturing sector has advanced much faster technologically and become much more competitive internationally than has Mongolia's.

2. Physical infrastructure is also a constraint. The only major market exchanges in the country are in the capital city of Ulaanbaatar—separated from most production centers by 600 – 1000 kilometers of poorly paved roads, unpaved roads, and unplanned tracks across the steppe. Transportation services are spotty and very costly.

3. Given the weak market, legal, communication, and physical infrastructures, most herders are forced to sell their raw material at the farm gate or in small provincial markets to intermediary traders. According to a World Bank study (2003, iii), an estimated 80 percent of all raw cashmere in 2003 was traded at the farm gate. In the cashmere market it was estimated that farm gate and provincial market prices were discounted 10-45 percent over those in the major markets in the capital city.

4. Furthermore, most herders currently sell their fibers primarily in bulk by weight. There is no sorting by quality prior to sale to traders and often not before sale to the manufacturers. It is the factories that usually do the sorting and grading. The quality content and proportions are not accurately known until near the end of the value chain. The intermediary traders who purchase the raw material from the herders reduce their risks by offering a price that is based on the assumption of lower average quality than is likely the actual case. They make only minimal differentiation between herders and the quality of their respective products in pricing. For the herders then, a kilogram of lower quality wool or cashmere garners roughly the same price as a kilogram of higher quality fiber. Thus, they have little incentive to improve the quality significantly, especially since higher quality goats have lower yields in terms of bulk and weight. (USAID, 2005, ii). Moreover, many herders have limited knowledge about the characteristics that would determine quality for the manufacturers and about how to improve those characteristics in their own livestock.

5. In fact, the quality of raw fibers, most notably that of cashmere, has been declining in recent years. Historically, Mongolian fiber has been recognized for its very high quality, with credible claims that its cashmere and yak wool are the best in the world, surpassing the respective Chinese fiber in fineness (micron), length, structure. This advantage is usually attributed in significant part to Mongolia's climate, and the livestock's natural grazing of Mongolia's steppe grasslands. Chinese manufacturers even promote their products as using Mongolian fiber. Mongolians claim that Chinese factories mix the higher quality Mongolian fiber with lower quality Chinese fiber.

However, during the past two decades, as many herders made quantity a higher priority, the coarseness of Mongolian cashmere has been increasing, thus beginning a decline in the demand for the raw product in the manufacture of high end products. The World Bank study cited earlier (World Bank 2003) identifies this deterioration of quality as the single most important factor impeding the development of the industry" (p.iii).

6. Since the Chinese textile manufacturing sector holds advantages over its Mongolian counterpart in economies of scale, technology, and thus, productivity, they generally are able to offer a higher price per kilo than the Mongolian factories, especially at the beginning of the season when the fiber is collected by shearing or brushing. Therefore, Mongolian textiles miss out on part of the potential supply of raw material even though it is produced within the same national borders. For some time now, most cashmere and wool factories in Mongolia operate at far below full capacity.

7. Finally, it is important to recognize that an increase in herd sizes—especially of goats--in recent years and the unregulated use of land and water resources have led to the near saturation of the ecological carrying capacity of much of the productive areas of the grasslands. Such degradation threatens the sustainability of both the steppe environment as well as herders' livelihoods. So far, the degradation from yaks, which are concentrated in higher altitude regions than goats and sheep, has been comparatively less problematic. The Project does not include strategies that directly address these environmental concerns. However, its prioritizing of fiber quality improvements and increased supply of raw materials to national factories by reducing the flow to China could complement efforts to reduce environmental damage while still advancing an industry that plays a critical role in the Mongolian economy and culture.

The theory of change to address the problems

The Project's vision of change targets primarily the problems of raw material quality and the development and consolidation of the value chain within Mongolia. These are viewed as critical to retaining more of the value added within the country, improving the transaction efficiencies along the chain and increasing Mongolia's share of international market. All of these developments should enhance the incomes and well-being of industry participants at all levels, and contribute to the Mongolian economy as a whole. The theory of change embedded in the Project can be summarized as follows:

1. Locating a credible fiber grading laboratory in the aimag center will serves as a catalyst for quality improvement, value chain integration, and reductions in transaction costs. The reasons for such become apparent in the points that immediately follow.

2. Training and technical assistance improve herders' knowledge about fiber quality, market preferences, and quality-differentiated pricing, thus increasing incentives to improve and certify the quality of their raw products. Part of this training includes visits to the regional laboratory by at least some herder association representatives. The laboratory provides an affordable means by which they can test and certify their quality and respond proactively to the newly realized incentives. If their product quality is already of high grade, they stand to immediately receive a higher price per kilogram than they have in the past. If not, technical assistance opens up opportunities to intentionally improve quality—and thus to increase future income--through breeding and livestock management.

3. The decentralized laboratory and grading system and the incentives generated for higher grade fiber contribute to an increased supply of high grade cashmere and wool to the manufacturing sector. Many manufacturers, especially those well-positioned for the international market, recognize that Mongolia's comparative advantage in the highly competitive international clothing markets is the quality of its raw cashmere and yak wool. The Project seeks to arrest and reverse the recent decline in fiber quality.

4. Strengthening vertical connections in the value chain lowers transaction costs, raises the percentage of raw material sold to <u>national</u> factories, and allows the retention of greater value added by Mongolian agents at all levels of the process. The competition demands that Mongolian textile manufacturers streamline and increase their procurement of high grade fiber. This can be accomplished by facilitating direct sales between herder associations and manufacturers. These sales are supported by the two-way flow of information on fiber quality and by local-level sorting, both of which depend on laboratory services.

5. Soum level training in the preliminary quality-based sorting of fibers leads to the relocation of a portion of the value added to rural households and to savings on transportation costs. Soum governments establish cooperative sorting operations that provide employment for local residents whose livelihoods are not based on livestock. Since low grade fiber would be extracted and excluded from the shipments to the factories in Ulaanbaatar, there are significant savings on transportation—a very expensive link in the value chain due to poor or non-existent roads, long distances, and high gasoline prices. Laboratory testing of fiber samples is needed to monitor sorting operations.

6. Training and equipment for home production of woolen and cashmere goods supplement herders' incomes and increase the participation of women. The lower grade fiber is retained locally and used to fabricate products for self-consumption or for soum and aimag markets.

7. Supporting the role of herder associations as the primary channel through which herders participate in the Project, government, and commercial planning and negotiation lowers the cost of transactions with all three entities and helps to empower herders in such transactions. Primary input into the Project from herders comes via association representatives. In addition, the Project is beginning to collaborate with the Mongolian National Cooperative Association, an umbrella organization that promotes and supports cooperatives as they develop in the post-Soviet era.

8. Providing information on market prices and extension services through cell phone texts and FM radio broadcasts further empowers herders in market transactions, strengthens value chain linkages, and encourages capacity building that could increase productivity and improve fiber quality.

9. Traders who are able to effectively adjust to the new grade-oriented regime benefit from more stable prices and a more secure process.[26] Even with more vertical alliances between herders and manufacturers, not all cashmere and wool would be purchased directly from the herders by the factories. A role for intermediary traders remains.

10. Resources and training in fashion design and international marketing will help manufacturers increase their international sales. Higher grade fiber will not in itself make cashmere and wool products more successful in export markets even at competitive prices. Success also depends on clothing designs that appeal to international retailers, and on experienced and aggressive marketing. The Mongolian manufacturers have been comparatively weak in both of these areas. The Project has provided the services of a designer from the U.S. to strengthen the abilities of Mongolian designers to stay abreast of international styles and demands and to design cashmere and woolen clothing lines accordingly. They have also helped to facilitate the participation of several companies in international cashmere and woolen product exhibitions. In one such event in Beijing, European buyers showed particular interest in Mongolian yak wool products. Some of the larger manufacturers have begun discussing the possibility of creating a cooperative Mongolian brand of cashmere that they collectively would promote throughout the world.

The intended benefits

All combined, the theory suggests, these interventions will generate the following changes:

- Herders will benefit with increased incomes and more secure, stable livelihoods.
- Soum populations more generally will benefit from the increased consumption by herders and the added employment opportunities coming from sorting operations.
- Some traders will benefit from increased income and a more stable market system.

[26] However, traders in general are likely to be the sector most negatively impacted by project strategies. More about the perspective of traders is discussed below in the section on stakeholder.

- Manufacturers will benefit from reduced transportation costs, a greater supply of high quality fiber, lower transactions costs, better design and increased international sales.
- Mongolians more generally will benefit from the retention of more value added from the cashmere and wool industry and thus from the multiplier effect throughout the national economy.

In the initial Project design, the contemplated spatial reach of these benefits included the following participating entities:

- 300 herder households, including approximately 1000 persons, in 3 soums of the Uvurkhangai aimag.
- 100 traders at the soum level.
- 3 grading laboratories.
- 5 cashmere and wool manufacturers in the capital city of Ulaanbaatar (Voluntary Service Overseas 2008, 2-3).

Actual benefits and effectiveness

Given that only two years have passed since the Project's inception, it is too early to formally verify concrete, measureable results. This is a complex project that involves the participation of diverse stakeholders, and that attempts to establish market value chains that were centrally planned prior to the fall of Soviet influence and the entry into a transitional market economy.

Much has been accomplished in the past two years. The Project has persuaded stakeholders from all targeted groups to participate and has procured their long-term commitment to the process. The actual spatial reach to date has encompassed

- 280 herder households in 4 soums of the Uvurkhangai aimag.
- 1 grading laboratory.
- 2 cashmere and wool manufacturers in the capital city of Ulaanbaatar.
- (No traders formally participate in the Project.)[27]

Herders have received training in grading and marketing. The Project has provided herder associations with human powered spinning, weaving and other equipment, and trains herder families—mostly the women—in their use. These households are now beginning to produce goods such as woolen shoes and slippers, hats, and children's coats. A fiber grading laboratory has been established in the central city of the Uvurkhangai aimag, and is now operating with trained laboratory technicians. Radio broadcasts have begun**,** but their reach and impact are still uncertain. Manufacturers have benefitted from designer

[27] B. Erdenebileg, Secure Livelihoods Programme Manager, VSO Mongolia, personal communication with author, October 10, 2011.

assistance, and have begun to improve their connections with export markets through coordinated representation at international trade exhibitions.

Furthermore, it has nurtured promising working relationships between the various stakeholders, especially between the herders, the manufacturing sector, and government agencies at the soum, aimag, and national levels. Representatives of herder associations and of manufacturers have met, and some direct sales between them were arranged in an ad hoc fashion in recent months. Now that the sampling and testing process has been established and results have been reported to the processing companies, the Project hopes to expand and systematize direct sales agreements. The aimag government has taken responsibility for the operation of the laboratory. More details of this progress in available in the Project's progress reports to Development Marketplace (VSO 2009-2011). To the degree possible, given time and logistical constraints in the field, this consultant confirmed the progress reported.

The progress so far has been impressive. Most of the progress to date, however, has been in implementing the Project structure and getting it to the point of *beginning* to function as originally envisioned. Now it will require another period of time for the Project to overcome some remaining challenges and to significantly impact the livelihoods of value chain sectors. It will require still more time to formally verify what actual benefits have been realized. Funding conditionalities require a project evaluation in October 2011. It is unlikely that this evaluation process at this time will demonstrate significant positive social and economic impacts, not because of the Project's poor management or strategic ineffectiveness, but because the Project so far has had inadequate time to effect and demonstrate such impacts.

Primary challenges that remain

While there has been significant progress in implementing the Project design, a number of remaining challenges must be addressed if the desired change is to be realized.

The theory of change hinges, in part, on the recognition by herders of the benefits and possibilities of enhancing and certifying the quality of their livestock fibers. Spawning this awareness and building the capacity of herders to act on this new awareness has not been easy. While partial success is evident in the discourse and concrete participation of some herders, training and technical assistance in fiber quality assessment, sorting, and breeding must be expanded and deepened for the Project to have the impact it seeks. Logistical impediments to such efforts include the distances, poor roads, and unreliable communication networks between Ulaanbaatar and Arvaikheer, between Arvaikheer and the involved soums, and even between the herders in the same association—who often live as far as 25 kms. from their nearest neighbor on the steppe. The limited time and availability of the relatively few persons who can provide quality training and the scarcity of financial resources to support such activities are also important factors.

Even if herders actively participate in capacity-building opportunities, it remains to be seen (a) if the perceived return for quality improvements will be sufficient to induce large numbers of herders to implement the quality enhancing measures recommended, and (b) if

significant numbers of herders will possess the basic educational skills needed to effectively carry out such measures to improve quality over time.

Those herders already producing relatively high quality fiber, such as the cashmere producers with whom I met, will likely realize immediate benefits from the Project's emphasis on quality and from the parallel emphasis in the new national Auction Law. Longer-term benefits will come as they invest part of their increased income into measures to improve quality further. However, an aspect of the Project shrouded in uncertainty is the behavior of and impact on herders whose baseline quality is comparatively low. As the shift from selling by bulk weight to selling by quality sorted batches takes place, lower quality producers will likely find themselves at a distinct disadvantage. The Auction Law will prohibit them from continuing to sell in bulk to Chinese traders, since all exported fibers must be sorted by quality. If the quality of their fiber is evaluated they stand to lose on the price offered. If they wish to sell in bulk in the domestic market they will face lower demand for their product, and falling bulk prices as buyers recognize that eventually only herders with lower quality fiber will choose to sell in bulk without sorting. This suggests the prospect of a more distinctly segmented market. Lower quality producers are unlikely to increase their incomes as the transitions begin and may very likely experience a decline, perhaps risking an unstoppable spiral downward as they become less and less able to invest on their own in quality improvement and less able to compete with other herders.

I was told repeatedly in Mongolia that there is sufficient unused manufacturing capacity and potential export market demand to absorb all of the high quality fiber that herders can produce. Thus, there is no desire to force less efficient herders out of the sector to make it leaner. This is the intent of neither the Project nor the new laws. Thus, if the goals are to improve quality while maintaining level or increasing supply, some type of transitional support program for initially disadvantaged herders may be necessary while they survive the several year process of improving their quality. I am not convinced that the possibility of such a scenario has been adequately anticipated and addressed in the project design or in the Auction Law.

Another on-going challenge for the Project is the training of the fiber quality laboratory technicians in Arvaikheer. Analysis of the fibers is a meticulous process that requires scientific understanding, a consistent and systematic regimen, very precise measurements, and the knowledgeable use of laboratory technologies. There are only a few persons in Mongolia who have this particular set of knowledge and skills and there was no one in Arvaikheer with such experience. Furthermore, in the surrounding area there was a relatively small pool of candidates with the educational backgrounds needed to learn these skills. Given these circumstances, and the fact that qualified instructors are separated by six hours of driving, it is not surprising that the training of the two technicians hired has required significant time and resources and that progress in their reaching acceptable competence levels has been slow. While clear progress has been made and the laboratory is now functioning and serving the aimag region, more experience, capacity-building, and expert supervision is needed to meet acceptable international standards. In order for the Project to be viable along the entire value chain, the laboratory must establish its credibility with the manufacturers so that grading and sorting done locally will be trusted

by those companies. Currently the manufacturers' laboratories in Ulaanbaatar double check the grading performed by the laboratory in Arvaikheer. Project staff report that the majority of results correspond within acceptable parameters, but there still are an unacceptable number of mistakes detected by the larger, established laboratories. The recruiting, training, and on-going supervision will pose a major challenge to establishment of grading laboratories in all 21 aimags, as contemplated in the Auction Law.

The long-term financial sustainability of the laboratory has been another area of concern. A major hurdle in this regard was passed when the Uvurkhangai aimag government agreed to assume responsibility for the on-going management of the laboratory. The government has already invested 26,000 USD into the facility and its equipment, and is willing to subsidize its budget for the short-term. A question remains as to whether the laboratory can become self-sustaining in the relatively near future. Will herders be persuaded that the market benefits of grading and certifying will be worth paying the full costs?

At the manufacturing level, improving and updating the design of wool and cashmere clothing lines to increase their competitiveness in the international market has been more problematic than expected. The Project has provided the services of a Mongolian designer and an international fashion design consultant. In both cases, the original intent was to make these services available to multiple companies. However, the Project eventually assigned most of the service time of the two resource persons to two companies—the Mongolian designer to Mongol Textiles and the North American consultant to Sor Cashmere. Evidently this change was due primarily to conflict of interests and coordination issues.

As explained above, the Mongolian textile industry is composed of about a dozen relatively large firms and 100 or so small businesses. Many of the small businesses engage primarily or exclusively in the basic processing of the fibers into yarn. The international fashion consultant suggests that the small firms who do produce final goods are especially unprepared to ramp up their designing and marketing for export.[28] Others in the industry and the World Bank study (2003) agree. Many such firms have no well-trained designer on staff, and the designers that are present usually have little or no experience in connecting with the high-paced world of international fashion. Furthermore, the companies often lack internet skills and resources to keep up with such trends. For example, in the consultant's judgment, Sor Cashmere has solid experience, produces goods of sound technical quality, and is successful in selling to the domestic market and contracting Russian outsourcing work. However, it is not clear if the small company wants and/or is able to invest in stepping up designs and marketing for export sales. With personnel already performing multiple roles it would be difficult to designate sufficient resources to stay abreast of fashion trends, do the advanced planning and design work needed to launch products on

[28] Marilyn Teorey, VSO fashion design consultant, interview by author, Ulaanbaatar, July 8, 2011.

international buyers' schedules, and link to new markets outside of Mongolia—all fundamental requirements, according to the consultant, for successful exporting.

Even the large firms face these same problems, though perhaps with more resources and less daunting constraints. Twelve of these large companies are collaborating on an effort to capitalize on the reputation of Mongolian cashmere by establishing a shared Mongolian brand of cashmere. Combined with the positive responses of some international buyers at the 2010 Beijing trade convention, there is reason for optimism for these companies. However, the short-term design assistance has been inadequate to properly support this transition for the long-run. The Project currently has no provisions for continuing such assistance. It is not clear how this assistance should be directed and how it would be supported financially. One possibility that should be investigated is to involve local fashion design schools in this discussion and the work ahead, should the Project be extended. The international consultant expressed a positive impression of the technical and artistic skills of locally trained designers she had observed.

Finally, continued work is needed on developing trust, accountability, and credibility between all stakeholders. This is not so much to suggest that there exists a problem in these relationships than to recognize the time required for such ties to develop and the continuing need for them to mature. On-going support and facilitation is needed for this to happen.

Key Project stakeholders

The key stakeholders are as follows:

- Herders of goats, sheep, and yak, and their herder associations.
- Traders of cashmere and wool from sheep and yak, who purchase the fibers directly from the herders and sell them to either manufacturers or other traders in the chain.
- Private firms that buy raw fiber and manufacture cashmere and wool products.
- The National Government and its agencies, particularly the Ministry of Food, Agriculture and Light Industry and the Research Institute for Animal Husbandry.
- Aimag, soum, and bag governments.
- VSO.
- Other formal partners, including the Textile Institute, the Chamber of Commerce, and several collegial NGOs.

In the previous section some of the interests of these stakeholders have already been discussed and, for the most part, will not be repeated here. This section will further develop the profile of each of these groups of actors.

Herders

Forty-three percent of Mongolian households depend on livestock herding, the majority on goat herding, for at least part of their incomes (World Bank 2003, i). In the Uvurkhangai

aigmag where the Project operates, that portion rises to around 70 percent.[29] The incomes of about 47 percent of rural herder households fall below the poverty line. (Government of Mongolia 2009, Table 22).

The primary interests in the Project of the herders and their associations are the opportunities offered to improve their economic well-being: (1) to build their natural assets by increasing and certifying the grade of the raw fibers they produce; (2) to increase their income by drawing on the enhanced flow of benefits from their natural assets, i.e. by receiving higher prices for the fibers; (3) to further increase their incomes by providing sorting services, thereby capturing a greater share of the value added in the value chain; (4) to diversify their livelihoods further by fabricating home-made textiles using lower grade fibers for their own consumption and for local markets; and (5) to retain a greater share of the value chain income by negotiating directly with manufacturers, thereby receiving a share of the income that traditionally has gone to intermediary traders. The herders interviewed were quite candid, even with project staff present, that they will sell to the highest bidder, whether that is to Mongolian or Chinese buyers, under the most advantageous market regime—graded or ungraded. Their initial decision to participate in the Project was grounded in their assessment of the potential benefits offered. Their continuing participation understandably rests on the realization of concrete benefits.

Project participation is riskier and less promising in the short-term for those herders whose fiber quality may be lower than average or who lack the financial or human capital to invest in a quality enhancing breeding program. As mentioned previously, the long-term participation of these herders may depend on some type of risk reducing transitional support during the years needed to raise their fiber quality. If the program were to be expanded, as would essentially happen de facto via the new Auction Law, there would become fewer options to sell in bulk.

Politically, herders have collective influence, especially at the local and regional level, since they compose the vast majority of the population at those levels. Historically, they also tend to be distrustful of the aimag and national governments, especially the latter, and can be suspicious of international NGOs. Indeed, in the case here, establishing working relationships with herders has required a significant investment of time and resources on the part of VSO staff. Fortunately, this investment appears to be reaping positive results.

Traders

The reluctance of most traders to participate in the Project suggests their suspicion that the Project's benefits for their role in the value chain are more uncertain and likely less widespread. During my field visit, requests in the Arvaikheer market to traders for informal interviews were, without exception, met by a complete unwillingness to engage, as indicated by rolling up vehicle windows, shaking one's head in silence, and walking

[29] Dulamdorj Togtokhsuren, Governor of Uvurkhangai aimag, interview by author, Arvaikeer, Uvurkhangai, July 6, 2011.

away.[30] Their concerns are understandable and reasonable. Direct negotiations between textile companies and herders will probably lower traders' volume of buying and selling, and the shift to quality differentiated pricing may reduce the range of prices they can effectively offer to herders. The new Auction Law further squeezes the traders by requiring all raw fiber being exported to be graded and sorted, and requiring all traders to meet certain criteria in order to be licensed as brokers.

Project managers acknowledge the precarious situation of many traders and the likelihood that the many small, part-time, and informal operations will not be able to qualify as brokers or compete in the new system. In their mind, this would be a justified and necessary trade-off. The numbers of people affected would be relatively small in the context of the entire value chain, and the benefits in the form of higher prices for herders would outweigh the costs. However, they also argue that those who do remain in the system will benefit from more stable prices and a more secure and regularized process.

Manufacturers

As previously mentioned, about one dozen large firms and approximately 100 small businesses compose the cashmere and wool textile manufacturing sector. Many of these manufacturers are engaged in processing and semi-processing of the raw fiber. A smaller number produce final goods. Manufacturing capacity expanded rapidly during the 1991-1996 cashmere boom. However, the downturn in 1997 left significant excess capacity that remains today (World Bank 2003, i-ii). During the past two decades the textile manufacturing sector has not been able to make significant new in-roads into world markets. This has been true even for cashmere, despite the fact that Mongolia is the second largest producer—after China—of the raw fiber in the world.

Those companies involved in the Project are motivated primarily by the prospects of increasing both their production and their share of international markets for fine cashmere and wool goods. Yak wool seems especially promising in this regard. Many in the industry believe it has an untapped potential market abroad due to its fine quality, relative cost, and environmental advantages over cashmere. Three significant challenges to increasing exports of final goods are (1) the recent decline in the quality of Mongolian cashmere and wool fibers, and (2) the undersupply of raw material available to national manufacturers at feasible prices. Such problems originate down the value chain, and textile manufacturers realize that they can do little to resolve these issues on their own. The Project provides a channel of communication and coordination between the companies and the herders that offers the prospect of further developing value chain linkages in ways that would be mutually beneficial. Direct contracting with herders is particularly attractive. Manufacturers have attempted to enter into such arrangements in the past, but without success. They hope the Project will facilitate viable connections that will allow such contracts.

[30] I was able to interview in another location a trader who had cooperated in the past with the Project.

Like the herders, the manufacturers will remain committed to the Project to the degree that the Project helps to facilitate the benefits promised. They will be looking to see if fiber quality improves, the aimag laboratory and the soum-level sorting operations demonstrate their credibility, and transaction costs decrease.

Many of the smaller companies are very small and may be satisfied to maintain a stable decent living staying small, using less advanced technology, and selling to the domestic market. Most will be less likely, in the short term, to participate in the international marketing aspect of the Project. However, they could still benefit significantly from the strengthening of value chain linkages. The participation of and rewards for smaller firms remains a question.

National Government

The current National Government, led by the Mongolian People's Party, declares rural development to be a top priority and promotes the cashmere and wool industry as a key driver of both rural and national development. The recent passage of the Auction Law and the budgetary outlay of 3 percent of GDP to support and implement its provisions give significant policy and resource backing to this strategic vision. It is understandable why the National Government would enthusiastically support the Project, as interviews with Government representatives indicate that it does. The Project effectively serves as a de facto pilot project for key elements of the Auction Law, and the Ministry of Food, Agriculture and Light Industry (MOFALI) officials are encouraged by the prospect that the Project can provide critical feedback for the implementation of the new legislation. The Research Institute for Animal Husbandry (RIAH), overseen by MOFALI, has collaborated extensively with the Project in leading the training of herders and laboratory technicians in sampling, sorting, and grading. Personnel from both MOFALI and RIAH serve on the Project's advisory board. It also makes sense politically that the government would endorse and support the Project. Almost half of the Mongolian population comes from herder households.

Aimag, soum, and bag governments

For the associated governments at these levels, innovative strategies for the development of the cashmere and wool industries and the rural areas more generally are an even higher priority than they are for the national government. Seventy percent or more of their constituencies—with the portion rising as one moves to the smaller scale political units—earns at least part of their household income via herding. The Project not only offers a promising strategy for increasing incomes, it also offers the possibility of retaining more value added at the aimag and soum levels and of building assets for the long term. Thus, given local funding constraints, the Project makes a welcomed contribution to the respective policy agendas.

The leaders at all three levels have been directly involved from early on: For example, the aimag contributed 26,000 USD worth of in-kind support to the establishment of the laboratory, and has volunteered to take financial and operational responsibility for the laboratory from this point onward. The soum governors played a key role in selecting herders to participate in the Project, and continue to provide logistical assistance. Some

are taking initial steps towards establishing local sorting operations. The bag governors help to facilitate engagement with the herders' association.

Voluntary Service Overseas (VSO)

VSO is an international NGO based in London that works in over 40 disadvantaged nations world-wide with the goal of eradicating poverty. In most contexts, the VSO model of assistance combines full-time salaried national program staff with the placement of international, professionally skilled volunteers in assignments with national partners. In Mongolia these volunteers include educators who work with the Ministry of Education and teacher training colleges; health professionals who develop and help facilitate nursing training with rural health agencies; and business advisers and management specialists who work in various facets of secure livelihoods development. Long-term volunteers stay from one to two years. Few speak the Mongolian language fluently. The country office in Ulaanbaatar is staffed almost entirely by full-time, salaried nationals. Mongolian program managers and project directors facilitate partner relationships and volunteer assignments, and supervise volunteer work.

This model has its advantages and disadvantages. While the volunteers provide inexpensive injections of short-term expertise, their time in-country and their language skills limit their long-term impact unless assignments are well-conceived, well-focused, and well-supervised. The hope is that the national staff provides the contextual knowledge, continuity, and oversight needed to generate this long-term impact. So far, VSO has carried out the "Value Chain Development of Textile Products" project primarily with national staff and VSO partners. The international fashion design consultant has been the only volunteer extensively involved. Given the substantial foundation-building organizing work required, this was likely a wise approach in the beginning. It also demonstrates the competence of the VSO national staff. With the framework now in place there may be places where other particular types of volunteer expertise could make a significant contribution to the Project.

VSO staff have envisioned, designed, resourced, and implemented the Project. They are heavily invested in and committed to it, and to the other stakeholders involved. They want to see indicators of positive impact because of their organizational values and mission. The commitment and focus of the VSO team is genuine. Understandably, motivations also likely include strengthening VSO's reputation and funding appeal, and enhancing the personal satisfaction and long-term professional prospects of individual staff members.

Other partners

Not surprising, other organizations that have partnered with the Project have done so because their missions converge with that of the Project. The Textile Institute promotes its namesake industry. The Chamber of Commerce seeks to stimulate development and economic growth nation-wide. Several NGOs, both national and international, participate on the Project advisory board and collaborate where appropriate out of shared goals and interests related to similar work in other regions of the country.

Alignment

There is an exceptionally high degree of alignment of the Project's innovation and strategic vision with those of the Mongolian Government, the Agriculture and Regional Development (ARD) Department of the World Bank, and the World Bank country program. The convergence of Government and Project visions should be clear from the previous discussion of the Government as a stakeholder. It is also indicated by Mongolia's Poverty Reduction Strategy Paper (PRSP) and the corresponding interim progress report in which rural development and the environment are discussed as priority concerns to be addressed (Mongolia 2003; Mongolia 2005, 44-50). There has been significant cross-fertilization of the major Government policy instrument—the Auction Law—and the Project. The VSO Project Director, B. Erdenebileg, was integrally involved in the formulation of the Auction Law, while MOFALI officials have played important roles on the Project advisory board from early on.

Similarly, the Project's focus and approach complement well the World Bank's emphasis in recent years on agriculture for development and the reduction of rural poverty. The Project directly addresses two of the Bank's five commitments to "What we will help our clients do," outlined in its most recent agriculture action plan (2009)—a document spearheaded by ARD: (1) raise agricultural productivity growth, and (2) link farmers to markets and strengthen value chains (pp. xiv-xv). This is precisely what the Project strives to accomplish. World Bank country documents for Mongolia are also in accord with Project strategies. While the rapidly growing mineral industry is a primary focus of attention in recent country strategy assistance papers, efforts to improve rural livelihoods and the rural environment remain priorities as well (World Bank n.d.-d; World Bank 2004, 20-23; World Bank 2007, 25-28; World Bank 2008, 8-9). Particularly relevant here is the World Bank's Sustainable Livelihoods Project, a three-phase, twelve-year effort (2002-2014) to "reduce rural vulnerability and increase the sustainability of poor households in rural Mongolia." Key issues identified by this project include "market linkages and role of the private sector," "access to livestock services and input," and "pasture management"—all critical elements of the Project and the Auction Law. Furthermore, the second phase now underway prioritizes the scaling up of the previously piloted Index-Based Livestock Insurance Project. Such risk reduction strategies well-complement and support the changes in herder production methods needed to improve cashmere and wool quality (World Bank n.d.-d).

Assessment of scalability of the innovation

Interviews reveal that there is a clear interest among stakeholders in continuing and scaling up the Project or incorporating its features into a compatible expanded program such as the Auction Law. Already participating herders desire further training and technical assistance, and opportunities for direct sales at higher prices. Other herders hope for new opportunities to participate. Manufacturers seek expanded supply of high-grade cashmere and wool, and thus would welcome a larger arena of raw material sources. The policy priorities of the bag, soum, and aimag governments include an expansion of the Project's spatial reach to more of their constituents. The National Government is essentially already beginning to scale up key features of the Project by taking the initial steps to

implement the Auction Law in selected aimags, eventually throughout the entire country. VSO expresses its interest in seeing the project through to further consolidation and more solid grounding, both in its current size and with a broader reach if resources were available. Thus, there are advocates for the Project and for its scalability at all levels of participation. Moreover, there is little evidence of any formidable opposition to either the Project or its scaling up. The exception may be the traders, but it is unlikely they have the collective power to generate game-changing resistance.

There are clear spaces for scaling up the innovation. VSO has already established strong ties in the Uvurkhangai aimag and has the backing of the aimag government for expanding the Project to more herders and more soums. VSO is well positioned to expand the Project within Uvurkhangai. On the other hand, the Auction Law provides a framework and significant funding to replicate Project strategies throughout the country under government direction. In both cases, existing quality private-public collaboration would help facilitate the scaling up process.

The Scalability Checklist developed by Cooley and Kohl gives the Project a mixed review in terms of its scalability (Appendix 2).[31] Criteria that favor its scalability include the following:

- Supported and espoused by respected individuals and institutions.
- Has a clear emotional appeal.
- Addresses a persistent problem.
- Addresses a need that is sharply felt by the target population(s).
- Addresses a need that is sharply felt by potential adopting organization(s).
- Current solutions are considered inadequate.
- Able to be tested by users on a limited scale.

There were also indicators of factors that might complicate any effort to scale up the Project:

- Many decision makers are involved in adoption of the model.
- Large departure from current practices and behaviors for target population.
- Significant emphasis on values and/or processes.
- High complexity; integrated package with many components.
- Requires new infrastructure and facilities.

[31] I completed this assessment tool while in Mongolia and reviewed my responses with Project staff before finalizing them.

The evaluation of several other criteria led to neutral results. A few qualifications arise when considering the complicating factors above. While the central innovation—the decentralization of the laboratory— represents a "large departure from current practices and behaviors for target population," experience so far suggests that the reasons for such a departure can be persuasive. Furthermore, no aspect of the innovation conflicts with cultural values or other significant interests, which would likely generate greater resistance to the Project and its scaling up. Finally, no required "new infrastructure and facilities" (e.g. a laboratory) would have to be built if the parameters of scaling up were the Uvurkhangain aimag. However, the establishment of a laboratory in each aimag, as per the Auction Law, could pose a significant challenge in some provinces.

In my judgment, the conditions that favor scalability outweigh those that do not. I conclude that there is very high potential and strong justification for scaling up this innovation in some form. The potential benefits for agricultural and rural development, poverty reduction, and improved well-being are significant. Discontinuing the Project just as it is "getting its legs" or limiting its reach to current levels would constitute a major lost opportunity.

Recommendations

I recommend two concurrent types of scaling up:

3. That VSO continue and **expand** the Project within the Uvurkhangai aimag..
4. That, drawing on the Uvurkhangai experience, the government **replicate** features of the VSO Project in other aimags as part of the implementation of the Auction Law,.

As a first priority, the VSO project should continue for at least another two years at its current scale. After two years of organizing work, the Project has succeeded in laying the groundwork for applying the theory of change. If that groundwork is not supported for a while longer with staff time and resources, there is a danger that the fragile fabric of value chain ties and alliances will unravel. The Project needs to continue long enough to generate genuine impacts and to measure such impacts. Otherwise the lessons learned will be minimized and project participants will be left in limbo, provoking another cycle of distrust and suspicion towards NGOs and Government agencies. The original time frame simply was not adequate.

Preferably, the Project would continue another three years with sufficient funding to not only consolidate the structure it has organized, but expand its spatial reach to other parts of Uvurkhangai. Public-private collaboration could be developed even further so the Project's renewed mandate would include assisting in implementing the initial stages of the Auction Law within the aimag.

VSO has stated its interest in and commitment to managing the Project for another two or three years if funding were available. VSO has already demonstrated in the first two years of the project the competent leadership and organizational capacity necessary to continue

the Project effectively within the parameters of one aimag. However, by VSO's own self-assessment, promoting the organization to lead a large scaling up effort throughout other regions of the country would not be advisable. There are several reasons for this. First, VSO is a relatively small NGO, has limited human and financial resources, and has experience in only a few geographical regions of Mongolia. Secondly, the program in Mongolia is currently in a major transition due to decisions made in their international headquarters in London. In three years the program probably will no longer function as it is now—i.e. as a United Kingdom based international NGO with international volunteers serving in key professional positions. It appears that the office will either fold altogether or the program will evolve into a Mongolian NGO.

This raises the one concern I have about VSO's ability to lead Recommendation 1—the possibility of key staff turnover, both in the next few months and again in two or three years. At the present time, Project staff members are all too aware that because Development Marketplace funding is closing and future funding remains uncertain, their own personal future employment security is also in doubt. Few, of any, will be in a secure enough financial position to risk foregoing new employment opportunities. I urge ARD and the World Bank country office to make decisions soon about facilitating additional funding for the Project and to immediately communicate any positive commitments made to VSO. Otherwise, I fear that key Project leaders will seek employment elsewhere, and/or that VSO will not be financially able to prolong their employment while funding prospects remain unclear. It would be difficult, though not impossible, for VSO to effectively continue and perhaps expand the Project at this time with a significant turnover in core staff, especially the Project director. A similar problem could arise further down the road if VSO decides to reduce their program in Mongolia significantly. Project staff facing a definite VSO country program end-date may be enticed to leave the Project early if particularly promising opportunities were to arise before completely fulfilling the dates of their Project contracts. I am less concerned about this possibility than the former, but it would require attention in any longer-term Project planning. For example, it could be worthwhile to structure staff incentives so as to discourage early exit from the Project.

Regarding Recommendation 2, Government priorities, the framework of the Auction Law, and the commitment to significant, sustained funding for its implementation, provide the opportunity to extensively scale up the Project throughout the entire country in a multiple-phase process. A challenge for VSO would be to develop its capacity to learn from the Project experience and transfer that learning to government agencies implementing its features elsewhere. It is unusual to have such a space almost ready made for national level replication. Stakeholders should take full advantage of this fortuitous convergence of interests and commitments.

To emphasize what is already implicit, the scaling up recommendations made above are exclusively for Mongolia. The Project's central innovation and its design are very specific to a rather unique combination of industry, history, geography, and current political context. There would be little prospect for or value in attempting to scale up the Project beyond the borders of Mongolia. However, lessons from the Project may be useful elsewhere. For example, the experience in strengthening value chain linkages and alliances will likely be

applicable to many poor-country contexts with undeveloped agricultural markets, especially in other former Soviet bloc transitional economies. Also, though few other poor livestock-based communities offer products with the demand and development potential of Mongolian cashmere and yak wool, the strategies in this project to improve the quality of these products might provide insights in other herder societies, particularly where nomadic lifestyles persist.

Challenges for scaling up the Project

Despite the assessment that the Project merits scaling up, that the conditions for expansion and replication are quite favorable, and thus, that the potential for success is high, I also expect the scaling up process to face formidable challenges. Some of those challenges are those faced by the initial and still on-going efforts to solidify the foundation of the Project in its current size, as previously discussed in the section, "Primary challenges that remain." Many of those concerns likely will be replicated as the Project design moves into new communities and new regions. Other challenges will arise from the scaling up process itself, including the required shifts in leadership and management to government entities. Possible questions and concerns that Project actors need to anticipate in relationship to the latter include the following:

1. While I believe that sufficient political will exists within the various levels of government, the question remains as to whether the government is up to the job of implementing and managing nationwide a project for which success depends on building connections between diverse and historically antagonistic groups. Will unequal power dynamics and political influence skew the Project priorities and impede good management? Will corruption siphon off critical resources and provoke distrust and a waning of committed participation? Are there enough competent and willing organizers and managers to make this work?

2. Similarly, do National Government agencies have or can they recruit adequate numbers of appropriately trained professionals to carry out the massive campaign of capacity-building that will be required at all levels of the value chain? According to a representative of the Research Institute of Animal Husbandry, the training done so far for the Project taxed the time and resource capacity of the RIAH staff.[32] The process was complicated by the distances and poor roads. She suggested that MOFALI would have the capacity to assemble a sufficiently large and competent team, but that it would require significantly more human resources than currently exist in the responsible agencies. Fortunately, those needs have been anticipated and addressed in recent livestock policies that identify human resource shortages and future needs and direct special attention and resources to corresponding professional programs in the national agricultural university. The human capital supply to the Auction Law will depend on the effectiveness of these new policies and on whether incentives to enter these fields will be sufficiently enticing. Furthermore, these human resource constraints will require a carefully planned multiple-phase implementation process.

[32] Baatar Narantuya, Research Institute of Animal Husbandry, internview by author, Ulaanbaatar, July 8, 2011.

3. At the aimag and soum level the quest for human resources becomes even more challenging. The difficulty of recruiting and training the laboratory technicians in the Uvurkhangai aimag forewarns of the human capital obstacles that likely will confront the implementation of the Auction Law elsewhere. This is of serious concern for the long-term independence and credibility of the laboratories, on which the success of the Project pivots. It is also a critical question for other dimensions of the program that require particular levels of education and specialized skills and experience. In fact, several persons with whom I spoke speculate that some, maybe most, aimags have even lower human capital than does Uvurkhangai, which happens to be closer to Ulaanbaatar than many aimags. It will be difficult and problematic to implement and manage Project elements integrated into the Auction Law primarily from the capital city.

4. Despite the budgetary commitment of three percent of the national Gross Domestic Product (GDP) to the Auction Law, the question of long-term financial sustainability needs to be raised as a matter of good routine practice. While the current Government proclaims the Auction Law as a long-term transformational priority, without short-term parameters, the longevity of the budget is uncertain. Will the program proceed with a sense of resource security, or will a shadow of doubt follow it? Also, what possibilities are there of a shift in Auction Law priorities should upcoming elections lead to a significant change of Government?

5. One financial issue of particular concern to many is the affordability to herders of laboratory fees and livestock ear tagging. The real cost of grading just one sample of raw cashmere is 17 USD, while each of the soon-to-be-required, high quality ear tags cost 8 USD.[33] RIAH sees little possibility of significantly reducing those costs. Currently, the aimag government covers most of the costs of the laboratory in Uvurkhangai, but it is uncertain how long such subsidies can continue. When these unit costs are multiplied by the number of samples needed and the size of a herd for the tags the result is a significant outlay of cash. The amount is prohibitive for many herders and at least a considerable disincentive for most others to invest in improving fiber quality. At the same time, cumulatively for all herders the cost would represent a huge dedication of resources by the Government. At least in the initial transition, a pricing scheme that effectively balances the individual and Government financial constraints will be needed.

6. Another concern directly related to herders is the restriction in the Auction Law that only herder cooperatives can bring raw material to auction. Some herders are already organized into cooperatives or into associations, like those in Uvurkhangai that currently participate in the Project. Associations can be transformed into cooperatives by meeting certain legal requirements of structure, transparency and democracy. According to the

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[33] Less expensive ear tags are available, but the extreme colds of the Mongolian steppe require the more durable and costly type.

Executive Director of the Mongolian Cooperator's Association, this may not be easy in many cases even when associations are relatively well-resourced and stable. She cautions that many associations, or existing cooperatives for that matter, depend on the leadership of one or two traditional leaders and thus do not evolve into the more broadly and actively participatory organizations needed to help them benefit from the Auction Law. More difficult still will be the establishment of cooperatives among currently unorganized herders. Many herders, she states, especially the more nomadic households in the central part of Mongolia, tend to resist such organization, especially when it is perceived as imposed by the Government. Furthermore, it is not yet clear how the Government intends to facilitate the organization of cooperatives. While she welcomes the recognition of cooperatives in the Auction Law, she cautions that the organizing task will be monumental. Moreover, she fears that the process could in the end create too many cooperatives in name only and thereby undermine both the power balance sought as well as the long-term prospects of the cooperative movement in Mongolia.[34]

7. The environmental challenges of the Project must be addressed. Over-grazing has already led to environmental degradation of the steppe. Such deterioration threatens herder livelihoods. Goats are particularly damaging while yaks are less so. The undersupply of raw fiber to national factories is due in large part to the high portion exported to China and the decline in the percentage of fiber that meets acceptable quality standards. Thus, it may be that the supply to manufacturers can be increased only by retaining more of the fiber within the country and by improving quality. However, it would seem likely that incentives to increase national supply would also push upward the total number of livestock head, thus further exceeding the carrying capacity of the land. The Project strategy must be accompanied by and coordinated with measures both to arrest and reverse current degradation as well as to prevent overgrazing in the future. Government policy does not ignore these concerns and now gives more attention to grasslands management. The key will be the synchronization of the environmental efforts with the push to increase high quality supply.

8. Finally, questions about the long-term prospects of the nomadic herder lifestyle in Mongolia must also be raised. Though they lie beyond the identified scope of the Project, issues such as urban migration, especially of rural youth; property rights; and lagging improvement of living standards in remote areas will affect the Project's long-term viability and impact. The development of rural infrastructure will be critical to both addressing these issues as well as facilitating the Auction Law and the Project. While I believe that cashmere and wool production can be a significant driver of economic development in

[34] Oyunchimeg Togoodorj, Executive Director of the Mongolian National Cooperator's Association, interview by author, Ulaanbaatar, July 8, 2011.

Mongolia and that rural residents can play an important role as stewards of the natural environment and the ecosystem services it generates, those benefits will be lost if the rural regions do not maintain their populations. In our globalized, high-tech world, rural Mongolians will demand that rural living conditions be more commensurate with those in the urban areas. If such inequities are not addressed, the Project will lose the foundation upon which it depends for long-run success.

Conclusion

In their review of the literature on scalability, Holcombe et al. (2011) emphasize that scaling up requires time, perhaps "as much as 10, 15 or even more years" (p.19). Patient money is needed to assure that some degree of funding security permits this necessary long-term commitment (32). These lessons are especially relevant for the DM Project 6251, "Value Chain Development of Textile Products."

The Project merits scaling up. It addresses critical needs through innovative ways that contribute to the overall development of Mongolia. It also robustly fulfills most of the scalability criteria outlined in Holcombe, indicating that it likely could be effectively scaled up. In order for that to happen, however, the Project first would need further time and funding just to consolidate the framework that has been implemented so far. Two years was simply too little time for such a complex apparatus to be up and running well and ready to be evaluated by measurable impacts. The project needs time to mature. Without an extension of support, impacts are likely to come slower or be stifled. Furthermore, the lessons learned will be reduced and the development of value chain linkages may stall without on-going facilitation. More unrushed time and long-term funding commitments would be needed to carry the innovations of the Project to a larger scale through the nation's Auction Law. Scaling this innovation up to 21 rural aimags will be a tremendous challenge, requiring a phased process that could take ten years or more. It would be even more challenging if the current program fades and is unable to serve as a demonstration resource for it replication under the Auction Law. Indeed, patient support for both the expansion and replication is critical.

Appendix 1: Persons Interviewed During Field Visit, July 4-9, 2011

Monday, July 4, Ulaanbaatar

- Mongolia Country Office, The World Bank
  - ERDENE-OCHIR Bardarch, Rural Development and Environment Officer, and liaison to the VSO Project
- Mongol Textile, manufacturer of luxury yak wool and cashmere products
  - R. ENKHBOLD, Executive Director
- Parliamentary Standing Committee on Nature, Environment, Food, and Agriculture
  - Dr. Badarchingiin MYAKHDADAG, Consultant
- Voluntary Service Overseas (VSO)
  - Dr. Indermohan Narula, Country Director
  - B. ERDENEBILEG, Secure Livelihoods Programme Manager and Project Director

Tuesday, July 5, Ulaanbaatar

- Ministry of Food, Agriculture, and Light Industry
  - Dr. D. BARDARCH, Director, Department for Coordination of Light Industrial Policy Implementation
  - B. BATTSETSEG, Senior Officer, Department for Coordination of Light Industrial Policy Implementation
  - REGZEDMAA Sandag, Senior Officer for Policy of Light Industry and SME
  - BINDERIYA Batsukh, Officer of the External Cooperation Division
- Mongolian Textile Institute
  - Ms. ENKHTUYA, Director

Wednesday, July 6, Uvurkhangai Aimag

- Uvurkhangai Aimag government, Arvaikheer
  - Dulamdorj, TOGTOKHSUREN, Governor of Aimag
  - Ch. CHINBAT, Director, Food and Agriculture Agency for Small and Medium Enterprise
- Nariinteel Soum Government
  - O. TUMENJARGAL, Governor of Soum
- Herders' Association, Nariinteel Soum
  - Approximately ten male association leaders
  - Women leaders involved in household production of wool and cashmere products

Thursday, July 7, Arvaikheer, Uvurkhangai Aimag

- Laboratory for grading wool and cashmere fiber
    - Mrs. B.MUNKHSOYOL, Technician
    - Mrs. BATTSETSEG, Technician
- Wool and Cashmere Trader
    - Mr.Enkhbayar.

Friday, July 8, Ulaanbaatar

- International fashion design consultant
    - Marilyn Teorey, , VSO volunteer placed with Sor Cashmere manufacture
- Research Institute of Animal Husbandry
    - Dr. Baatar NARANTUYA, Head of laboratory of cashmere quality
- Mongol Yak Society
    - Ms. KHISHIGJARGAL, Executive Director
- Mongolian Agricultural Universty
    - Ms. GANBAT, Head of Livestock Products

Saturday, July 9, Ulaanbaatar

- Mongolian National Cooperative Association
    - OYUNCHIMEG Togoodorj, Executive Director
- Mongolia Country Office, The World Bank
    - ERDENE-OCHIR Bardarch, Rural Development and Environment Officer, and liaison to the VSO Project
- Voluntary Service Overseas (VSO)
    - Dr. Indermohan Narula, Country Director
    - B. ERDENEBILEG, Secure Livelihoods Programme Manager and Project Director
    - Additional Project Staff

Appendix 2: Scalability Checklist for the Project (next page)

This assessment instrument was completed in consultation with the VSO Project team during our wrap-up meeting in Ulaanbaatar on July 8, 2011.

Scalability Checklist -Reproduced from Cooley and Kohl 2006

This tool provides a rapid assessment of the complexity or simplicity of the innovation, and thus a rough indicator of scalability.

Table 3. Scalability Checklist

Characteristics of the Model	A Simplifying Factor	B Neutral	C Complicating Factor
Is the model credible?	☐ Based on sound evidence	☒	☐ Little or no solid evidence
	☐ Evaluated by independent sources	☒	☐ Not evaluated by independent sources
	☒ Supported and espoused by respected individuals and institutions	☐	☐ Not supported or espoused by respected individuals and institutions
How observable are the model's results?	☐ Very visible to casual observation; easily communicated to public	☒	☐ Not very visible; not easily communicated to public
	☐ Clearly associated with the intervention	☒	☐ Not clearly associated with the intervention
	☒ Has a clear emotional appeal	☐	☐ Has little or no clear emotional appeal
How relevant is the model?	☒ Addresses a persistent problem	☐	☐ Addresses a temporary problem
	☒ Addresses a need that is sharply felt by the target population	☐	☐ Addresses a need not sharply felt by the target population
	☒ Addresses a need that is sharply felt by potential adopting organization(s)	☐	☐ Addresses a need that is not sharply felt by potential adopting organization(s)
Does the model have relative advantage over existing practices?	☒ Current solutions are considered inadequate	☐	☐ Current solutions are considered adequate
	☐ Superior cost-effectiveness clearly established	☒	☐ Little or no objective evidence of superiority to current solutions
How easy is the model to transfer and adopt?	☐ Few decision makers are involved in adoption of model	☐	☒ Many decision makers are involved in adoption of model
	☐ Small departure from current practices and behaviors for target population	☐	☒ Large departure from current practices and behaviors for target population
	☐ Small departure from current practices and culture of potential adopting organizations	☒	☐ Large departure from current practices and culture of potential adopting organizations
	☐ Little emphasis on values and/or process	☒	☐ Significant emphasis on values and/or process
	☐ *Model* has low technical sophistication	☒	☐ *Model* has high technical sophistication
	☐ Includes a clear and easily replicated *technology*	☒	☐ Does not include a clear and easily replicated technology
	☐ Low complexity; simple with few components	☐	☒ High complexity; integrated package with many components
	☐ Able to use current infrastructure and facilities	☐	☒ Requires new infrastructure and facilities
How testable is the model?	☒ Able to be tested by users on a limited scale	☐	☐ Unable to be tested without complete adoption
Is funding likely to be available and/or will resources be saved?	☐ Much less expensive than current practice	☒	☐ Much more expensive than current practice
	☐ Fully funded by revenues or a dedicated funding source	☒	☐ No dedicated funding source; zero or low cost recovery
Total Number of Checks	___	___	___

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Annex III: India Case Study

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The Heller School for Social Policy & Management, Brandeis University

Case Study on Potential for Scaling Up: "Waste to Wealth by Incubating Mini Cold Storage Technology Ventures" in India

This report assesses the scalability of Development Marketplace Project 4893, "Waste to Wealth by Incubating Mini Cold Storage Technology Ventures in India." The Project seeks to reduce substantial post-harvest waste of vegetables in India by giving small farmers access to cold storage units suited to the needs of small producers. Two years of implementation demonstrates a small farmer demand for using the Mini Cold Storage Units (MCSUs), reduction in waste and increased income for small farmers. Rural and semi-urban youth have been trained in MCSU maintenance and management. The Government of Tamil Nadu is replicating the MCSUs in other farmers' markets in the state and has agreed to subsidize electricity costs. The implementing agency, Tiruchirappalli Regional Engineering College – Science and Technology Entrepreneurs Park (TREC-STEP), has developed a financial model predicting sustainability of MCSUs as viable businesses operated by youth entrepreneurs. The project ends before the Pubic Private Partnership model with youth entrepreneurship model is proven, and before steps have been taken for replication in other states in India. The report makes recommendations for intermediary actions to assure that the demonstration project fulfills its potential for reducing vegetable waste in markets, for benefiting small farmers, and for fostering viable enterprises run by youth.

For the Agriculture and Rural Development Department, The World Bank

October 2011

Abbreviations

ARD	Agriculture Rural Development (The World Bank)
BHEL	Bharat Heavy Electrical Limited
DM	Development Marketplace (The World Bank)
EU	European Union
ICRISAT	International Crops Research Institute for the Semi Arid Tropics
IDRC	International Development Research Center - Canada
MCSU	Mini-Cold Storage Unit
MDG	Millennium Development Goals
MRC	Mother Resource Centre
PPP	Public Private Partnership
TN	Tamil Nadu – Southern State in India
TREC-STEP	Tiruchirappalli Regional Engineering College – Science and Technology Entrepreneurs Park
UNDP	United Nations Development Programme
UNIDO	United Nations Industrial Development Corporation

Executive Summary

Case Study:

Waste to Wealth by Incubating Mini Cold Storage Technology Ventures in India

Prepared by Anuradha Desai

The Heller School for Social Policy and Management, Brandeis University

October 2011

World Bank Development Marketplace Project Number 4893

Implementing Organization: Tiruchirappalli Regional Engineering College – Science and Technology Entrepreneurs Park (TREC-STEP) Tamil Nadu

Supported by the World Bank Development Marketplace and the Agriculture and Rural Development Department.

Introduction

"The Waste to Wealth by Incubating Mini Cold Storage Technology Ventures" project funded by the Development Marketplace has demonstrated the potential to substantially reduce post-harvest vegetable waste and to increase farmer incomes by 9 to 31% by enabling small farmer access to Mini Cold Storage Units (MCSUs) especially designed to meet the needs of small famers. The project has tested but not yet proved a Public Private Partnership (PPP) model of a delivery system, which relies on youth entrepreneurs to manage the MCSUs. The youth entrepreneurs have been trained, and they are managing and maintaining the MCSUs in the five demonstration markets. What have not yet been demonstrated are the viability of the business plan and the ability of the youth to move from a management to an entrepreneur role. The ending of Development Marketplace funding closes out the capacity of TREC-STEP, the implementing agency, to support the transition of this demonstration to the scaling up stage. The potential of this innovation to benefit small farmers and to contribute to local and national food security is at risk. The lack of transition planning and funding may make an orphan of a promising innovation.

The challenges of rural poverty and malnutrition persist in an India that is becoming a global economic power. India has the potential for increasing agricultural and food production. Sixty percent of India's population depends on agriculture for livelihoods, and the majority of people living in poverty are in rural areas. While the growth of national GDP has increased to 9% in recent years, growth of the rural sector has been slower (4.7%) in

the same period. [35]Agricultural productivity is low, and post harvest loss is high. TREC-STEP, the implementing agency, notes that a high percentage of land in India is cultivatable and that India annually produces 63.5 tons of fruit and 125.9 tons of vegetables, of which about 40% is lost due to the insufficiency of cold storage facilities. Existing cold stores, they estimate, meet only 11% of the need and serve only single commodities (e.g. potatoes) and large commercial farmers. Small farmers, who represent the population living in poverty, lack access to cold stores and thus lose a substantial portion of the value of production to rotting. Overall, post-harvest waste of fruits and vegetables in India is estimated at 40% of the total value.[36]

The theory of change represented by the innovations in this project has two tracks. First, by making appropriate cold storage available to small farmers at state-run farmers' markets, the project expects to see a decrease in post-harvest waste, resulting in increased sales and incomes for the small farmers. The internal TREC-STEP evaluation suggests initial increases in income of 9 to 31%. Increased income was verified by visits to small farmers participating in two of the markets. Increased income, the theory of change suggests, can be applied to a small fee for the cold storage as well as to investment into improved production and/or family well-being. This part of the theory has not yet been demonstrated, except through anecdotal evidence of the willingness of farmers to pay for the cold storage.

The second track of this project envisions the emergence of a viable business model for operation of the MCSUs, run by youth entrepreneurs who have been trained by the project in MCSU maintenance, repair and management. The project has demonstrated that the trained youth can manage the MCSUs, working with the managers of the farmers' markets. The project has not yet had time to demonstrate the viability of the business model for a self-standing MCSU enterprise.

The assessment of scalability indicates that the project matches well against many criteria for scalability. The innovations are clear and credible. The implementing agency, TREC-STEP, which designed the MCSUs, is a highly respected agency with a successful track record in incubating other (mostly private sector) innovations in India. There is demand for the cold storage. Despite some initial fears on the part of farmers that the cold stores would damage produce, usage of the cold stores is up to 70% of capacity. Interviews indicate that providing access to appropriate cold storage for small farmers has been well-received by most stakeholders. The Government of Tamil Nadu is supportive, underwriting costs of energy and adopting a similar technology in other farmers' markets. There has been interest in the MCSUs from other states in India, and from outside the country. The results (decreasing wastage and increasing small farmer income) also align well with Government of India priorities around reducing rural poverty, increasing agricultural productivity and access of small farmers to increased income through markets.

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[35] World Bank, Country Strategy 2009-2012

[36] TREC-STEP, Evaluation Report, Mini Cold Storage Unit Project for Small Farmers, October 2011

Challenges to scaling up this innovation lie primarily in lack of clarity around 1) which agency will drive expansion of the innovation in Tamil Nadu and replication in the rest of India and 2) who will serve as a champion for the innovations to make sure that they get priority attention. The Development Marketplace funding ends without a clear designation of which agency in Tamil Nadu will take the lead in expanding MCSUs and which agency in the national government might take the lead in implementing MCSUs at farmers' markets. TREC-STEP is highly qualified to accompany and advise on the expansion and replication, but they are not funded to play this role on a large state or national level.

The ending of the two year project also leaves unanswered other questions critical to understanding the potential for scaling up. TREC-STEP has developed a business model that predicts that the MCSU can become a viable commercial enterprise, covering its capital and operating costs within a year or two. This business model depends on some critical untested assumptions and it has not yet been demonstrated. Demonstrating that the business model does work (or not) is critical to the sustainability of the MCSU innovation and the Public Private Partnership model of implementation. Development Marketplace funding ends before this question is answered.

As with many innovations, it is difficult to measure the results within the limits of the two-year project implementation period. The income, family well-being and poverty reduction effects take a longer period to materialize.

This assessment concludes that the MCSU innovation has high promise for scaling up because of the contribution it makes to reducing post-harvest wastage and increasing incomes of small farmers. The PPP model of youth entrepreneurs also addresses the issue of youth employment opportunities that is worth monitoring to see if it works and can be replicated. The assessment recommends;

- That the World Bank and/or Governments in India use their convening power to pull together key stakeholders in this innovation to develop strategic recommendations for expanding or replicating the innovation. Recommendations from such a convening should identify and authorize key actors to *drive* the scaling up. The conveners may act as continuing champions of the approach.
- That the World Bank and the Government of India seek ways to incorporate the MCSU approach in ongoing projects as appropriate.
- That the World Bank and TREC-STEP together consider ways to conduct a local, independent evaluation of the income effects of the MCSUs over time and of the viability of the PPP business plan.

DM Project NR. 4893, "Waste to Wealth by Incubating

Mini Cold Storage Technology Ventures"

Tiruchirappalli Regional Engineering College – Science and Technology Entrepreneurs Park (TREC- STEP), India

Development Market Place Sub-Category:

Linking small-scale farmers to input-output markets

Anuradha Desai

October 2011

Introduction

1. Rationale for the Project and the purpose for the case study:

With a potential to be one of the world's major food suppliers, India currently has an annual transaction of 230 million metric tons of perishable products. Yet it loses 40% value of perishable products due to insufficient cold storage facilities. The post-harvest vegetable waste in farmers' and vegetable markets across India amounts to an estimated annual loss of nearly $6 billion. In a country with high rates of poverty, where 224.6 million people are undernourished,[37] and with a growing population there is an urgent need to increase the food supply and reduce such sizeable post-harvest wastage. The constant warm weather causes produce to rot rapidly both at the farm and at the market level. On average, vegetables lose 25% to 40% of their value daily, with at least 10% of the loss in value occurring in farmers' markets alone.[38] Large agri-business use cold storage units to reduce waste, but such units are neither appropriate in design nor accessible to small scale farmers. The technological innovation of Mini Cold Storage Unit (MCSU) in this Project, with controlled humidity and efficient space usage, offers a solution suited to small farmers, allowing them to access refrigeration and increase the shelf life of their produce. The Project promised and delivered on helping small farmers keep their vegetables fresh for two to three days and bring down the wastage by 50%. Since March of 2011 the Project has installed coolers in five farmers' markets across the State of Tamil Nadu, already

[37] TREC-STEP, Evaluation Report, October 2011.

[38] Project Assessment: Waste to Wealth by Incubating Mini Cold Storage Technology: Schor, March, 2011

generating savings that are estimated to reach $200,000 annually from reduction in post-harvest wastage in these five markets alone.

The Project also aimed to create a strong public private partnership (PPP) among the government, the private sector and civil society to create a sustainable and self-financing market-focused model that could be scaled up in the region, in the country and around the world to deliver real value to small farmers.

The case study was undertaken to understand the potential for scaling up this Project, with product and process innovations and its ability to link small farmers to input-output markets. The promise of reducing the vegetable wastage and increasing the financial benefit to small farmers was one of the key factors that led to the case study. An additional rationale for the case study was to assess the Public Private Partnership model that is part of the project innovation. As designed by TREC-STEP, the Development Marketplace Project proposed to train rural youth in management and maintenance of the MSCUs, with the expectation that they would become small entrepreneurs and sustain the cold stores on a commercial basis.

The site visit in August assessed the potential for scaling up (expanding) this project in Tamil Nadu and for replication in other states in India or elsewhere globally. In doing so it looked at whether the innovations in the project were working as planned, whether the MCSUs have prospects for sustainability and whether the conditions for scaling up exist.

2. Country context

In the past two decades India has gone through substantial shifts in macroeconomic policies and has experienced good rates of economic growth. India has emerged as the fourth largest economy globally[39], in terms of its purchasing power. GDP growth rates, averaging 8 to 9% per year, have brought significant economic and social benefits to some of the population, yet 37% of the population falls below poverty line. Disparities between rich and poor are rising. About 70% of India's 1.2 billion people live in the rural areas, about 42% of whom are below the poverty line. The rural population relies on agriculture-oriented activities. Despite achieving self-sufficiency in food-grains, India has seen a slow-down in agricultural growth rate in the 1990s and 2000s, posing a serious concern about food security. The country needs to raise agriculture productivity (through new technologies, diversification to higher value crops, and developing value chains to reduce marketing costs), increase rural employment and ensure food security for the burgeoning population. India is considered a global agricultural powerhouse leading in the production of milk, pulses and spices and is the second largest producer of the fruits and vegetables in the world. Despite being the second largest producer of fruits and vegetables in the world, India has a higher than average post harvest loss estimated at 35-40%.[40] The problems of

[39] WB India Country Results Profile

[40] Government of India, Planning Commission. January 2007. "Report of the Working Group on Horticulture, Plantation Crops and Organic Farming for the XI Five year Plan (2007-2012). See pp. 224-247.

post-harvest waste arise from multiple reasons, but specifically exposure to heat and humidity, the impact of which can be addressed by appropriate cold storage. Large cold storage facilities in the country primarily service large agri-business and are out of reach and inappropriate for the small farmers, the weakest link in the value chain.

State of Tamil Nadu background: Tamil Nadu is the eleventh largest state in India with nearly 62 million people. As in the rest of the country, 70% people live in the rural areas and rely on agriculture-oriented activities. Vegetable cultivation in the state accounts for 234,000 metric tons every year.[41] The State Government has established 160 farmers' markets across the State in more than 100 towns and cities. The farmers' markets offer direct market access to consumers without a middleman, free space, free transportation and controlled prices, benefitting both farmers and consumers. In these 160 markets, about 12,000 to 15,000 farmers sell vegetables to approximately 400,000 to 500,000 consumers everyday, selling $260 million worth of vegetables annually. The lack of refrigeration facilities in most vegetable markets cause a huge wastage, losses estimated at $25million to $50 million annually.[42]The State Government is deeply concerned about these losses. After the initial design of the MCSU was presented, the government enthusiastically accepted the idea of the Mini Cold Storage Unit and had installed less efficient and simpler cold storage units in 22 markets even before the Project began. Now, seeing the positive impact of the Project, the Government has shown interest in expanding its reach beyond the five markets of the current Project, using the better designed MCSUs. It is unclear if there will be a change in the agriculture policy after the recent shift from the Karunanidhi government to the new government of Jayalalitha.

3. Government of India and the World Bank priorities in India

The Project, assessed for scalability in this report, is aligned with the Government of India and World Bank development priorities, especially in the areas of improved farmer access to agricultural/vegetable markets, increased skills and employability for the rural youth, reduced food wastage, increased food security and income for small farmers, and a sustainable economic model through public-private partnerships.

While the country has seen the unprecedented growth in the last decade and met many of the Millennium Development Goals, India is also facing serious challenges, especially in its high poverty rate in the rural areas (42%) and slower agriculture growth of 3.5% per annum, below the target of 4% in the 11th plan.[43] In its 11th Five Year Plan, the Government of India has made a commitment to reinvest resources into a set of ambitious programs to deliver services to the poor by focusing on elementary education, basic health care, agriculture productivity, rural employment and other infrastructure services.

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[41] TREC-STEP, India (2008), DM#4893, Full Proposal Package

[42] TREC-STEP, India (2008), DM#4893, Full Proposal Package

[43] WB – India: Issues and Priorities for Agriculture

The World Bank program in India is closely aligned with the objectives outlined in the country's Eleventh Plan. The Country Strategy for India for FY 2009-2012 concentrates on 1) Maintaining rapid and inclusive growth by investing in infrastructure, skill building for rural and informal workforce, agricultural growth, sustainable development practices and increasing the effectiveness of service delivery, 2) Investing in the low-income states, such as, Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Orissa, Rajasthan and Uttar Pradesh, by helping them become attractive investment destinations and raise the standard of living through better public service delivery, 3) Supporting Agriculture and Rural Development with a focus on agriculture and livestock, watershed management and rural livelihood development, and 4) Increasing the effectiveness of service delivery by supporting programs that provide education, health, skills and safety nets.

Critical Criteria for Scalability
Innovation and the theory of change - promise and problems

1. Key elements of the innovation

The innovations in this Project are at the product and the process level. The product is an innovative form of mini cold storage unit geared towards the needs of small farmers. The service delivery method is a form of *public-private partnership*, where the State Government and a nonprofit at the regional technical college collaborate to support the emergence of youth entrepreneurs who can sustainably operate the cold storage units and deliver services to small farmers.

Innovation in Product: Cold Storage Units (CSU) currently exist throughout the country for large agro-industrial needs. Even though subsidized by Government, these facilities are both too costly and physically inaccessible for the vast majority of small farmers. The presently existing 5,316 cold storage facilities across the state serve only 13% of the agro-industry.[44]TREC-STEP estimates the value loss due to lack of cold storage for small farmers to be around 20 to 40% of produce value, translating to $300,000 to $400,000 annually for the five markets in this Project alone. While the Government has made some attempts to create smaller storage units for farmers, these efforts were limited to air conditioned rooms (10' x 10' in a larger room of 24'X24'), which were rarely used because of inadequate and faulty technology and which did little to reduce spoilage losses. The innovation in this Project is a Mini Cold Storage Unit (MCSU) with an innovative design that offers differentiated temperature and humidity controls for different varieties of vegetables and fruits. The new product, MCSU, designed by TREC-STEP, is specifically geared toward the needs of small farmers and vegetable vendors. The MCSU is divided into two main chambers that allow for customized temperature zones needed to maintain freshness for different types of vegetables. When only one chamber is in use, the other one can be turned off, resulting in energy savings. Plastic crates are available for each farmer, with traceability and identification options. Each farmer can use flexible partitions to suit his/her daily needs. After the installation of first two units last year, more design modification in terms of larger size of the unit and eco-friendly construction materials are incorporated for all the units. The MCSUs are managed by rural youth, who have been trained in MCSU

[44] TREC-STEP Power Point presentation to the Case Study team, Aug 16, 2011

management and maintenance by TRECT-STEP. The youth also guard against theft and pilferage, a serious concern for the farmers. For additional security, farmers use locks to secure their section of the cooler. The MCSUs fill a gap in the marketplace for small farmers who cannot afford the use of an individually owned refrigerator and lack access to large scale cooling units. The new design of MCSU prevents loss in value in the supply chain at its weakest link, the small farmers, who can least afford the loss in the value of their produce.[45]

Innovation in Process: The public sector, in this case the State Government of Tamil Nadu, and the nonprofit implementing agency, TREC-STEP, partnered to enable small youth entrepreneurs to deliver cooling services to small farmers. TREC-STEP created the Mother Resource Centre (MRC) to provide MCSU design, installation, and service support; to recruit and train unemployed rural and semi-urban youth in technical and business skills; and to monitor the overall business performance. Rural youth entrepreneurs, trained by TREC-STEP, are responsible for daily operations, supervising the security and daily record-keeping of vegetable arrival, sales and storage, and repairing the units as needed. They work in partnership with the managers of the five farmers' markets on a range of issues. Since the State Government owns a large number (160) of farmers markets, including the five targeted by this project, the managers are government employees. In addition to offering the space and services to the small farmers, the Government of Tamil Nadu also covers the monthly cost of the electricity - $250 per market, a large portion of the operating cost- needed to operate the MCSUs.

The Theory of Change: This Project offers a critical intervention at the market level that has the dual purpose of improving farmers' income and engagement in the market and addressing the broader national issue of food security, by reducing the estimated food wastage of 25-40% daily ($6 billion dollars annually across the country). The theory is that a key technological innovation and novel service delivery method will have sufficient net benefits to engage farmers, government and trained rural entrepreneurs to run the venture and make it into a viable, self-sustaining business. Critical to the theory are assumptions:

- that the MCSU will substantially reduce vegetable wastage by 50% or more;
- that farmers will use the cold stores in increasing numbers;
- that farmers will see an increase in income as a result of reduction in daily vegetable waste;
- that farmers will, over time, be willing to pay (up to one rupee per kilogram stored) for the use of the MCSU;
- that fees generated from farmers will over time to be able to cover costs of operation and the capital cost of the units themselves;
- that the youth trained will be able to manage operationally and financially the MCSU as a sustainable enterprise; and
- that the State Government will continue to subsidize electricity costs and will continue to offer farmers free access to the market.

[45] TREC-STEP, India (2008) DM #4893, Full Proposal Package

Intended, perceived and actual benefits: The TREC-STEP proposal for this Project, testing the above theory of change, had the intended objectives of:

1. Reducing the wastage of vegetables in the farmers markets by 50% or more, thus restoring the lost value in price, rotting and breakage;
2. Training rural youth in technical skills and entrepreneurial business practice will reduce the rural unemployment as they get employed by the cold storage venture and within the community with their newly acquired technical skills;
3. The Public-Private Partnership (PPP) approach in creating the mini cold storage units for the market place will create a sustainable, scalable and efficient business model to install MCSUs in the vegetable markets across India, saving large scale wastage and making this a profitable venture.

The Project planned to install five MCSUs[46] in five markets and to demonstrate the PPP model. TREC-STEP expected to see increase in earnings from the five MCSUs, increased income for 1000 farmers, and interest in replication of the approach.

By March 2011, this project was fully operational in all five markets – Karur, Kumbakonam, Palayamkottai, Nanganallur and Salem in Tamil Nadu. After two years in design development, stakeholders' active engagement and installation of MCSUs, this pilot project is showing promising benefits to participating farmers, youth workers, managers and consumers. An internal TREC-STEP evaluation confirms that the MCSUs have been established at the five markets. To date 2,014 farmers are registered in the markets and 358 farmers are actively using the MCSU in the Project areas. TREC-Step evaluators indicate that vegetable wastage has been reduced by 100%, and that "the value of the vegetables that can be recovered per year from the wastage is 95% of the DM investment in the Mini Cold Storage Units (95% of $200,000)."[47] The evaluation findings analyzed data from 2009 and 2011 to show changes following the introduction of the MCSUs. TREC-STEP also indicates that since the installation of MCSUs there is:

- Increase overall in vegetables arriving at markets;
- Increase overall in vegetables being stored once the MCSUs are installed;
- Increase in small farmer income ranging from 9% to 31% due to vegetables not being lost to wastage as a result of cold storage use;
- Reductions in costs of transport due to ability to store vegetables at market from one day to the next.

The evaluation study found that 56% of the users of the MCSUs are women farmers. At the time of the evaluation the MCSUs at 5 markets were being used to 70% of capacity leaving room for expansion. The Government of Tamil Nadu has replicated parts of the program and installed less efficient MCSUs (even before the design of TREC-STEP was finalized) in

[46] The MCSUs, as installed, include two chambers, that allow different temperature and humidity settings.

[47] TREC-STEP Evaluation Report: Mini Cold Storage Unit Project for Small Farmers, October 2011

22 other farmers' markets in the state. Now the state government and its various units, NGOs and farmers associations are interested in adopting the more efficient and well thought-out MCSU design and approach.

As part of this case study, a site visit to two farmers' markets at Kumbakonam and Palaykottai confirmed that farmers are using the cold storage units and they feel that the storage has definitely helped them financially. They have been able to reduce the wastage, increase the selling capacity and have made financial gains to be able to reinvest in the fertilization of their land, better seeds, and better land use and water conservation techniques. Interviews with farmers and visit to a small farm in Palaymkottai indicated that farmers are getting better services and higher prices, compared to the wholesale market as the government sets fixed daily retail prices of the vegetables at the farmers' market. They also talked about the reduction in the strain of lugging vegetables back and forth from the village each day, and about feeling happier because of the well-organized market, the absence of middlemen and steady stream of customers due to the fixed price and the outreach by the government.

The conversations with the managers of the two farmers' markets visited by the Case Study team suggest that the Government of Tamil Nadu is keen on supporting the small farmers (possibly for political reasons), likes the innovation and is interested in replicating this model in all 160 government-managed farmers' markets in the state. The managers enthusiastically reported that the addition of the cold storage unit has helped to recruit more farmers to sign up for the farmers' markets. Farmers are excited about increased sales of their vegetables due to the cold storage. The thorough practice of recruitment (each farmer receives an ID card after due diligence), controlled prices, and support in terms of better production tools and techniques are allowing government mangers to do their job well while supporting the small farmers to improve their livelihoods.

At the farmers' markets in Kumbakonam and Palaymkottai, the two rural youth entrepreneurs (out of 36 that were trained by TREC-STEP) are managing the cold storage units from the opening of the farmers' markets in the early morning to closing in the afternoon on a daily basis. Having gone through three months of intensive training in Refrigeration and Air Conditioning Systems and Business Management Training at TREC-STEP's Mother Resource Centre (MRC), the rural youth expressed their excitement about being employed and their increased capacity to have additional contract work to repair AC and refrigeration in their community when they complete their duties at the market in early afternoon. Youth entrepreneur/manager responsibilities for the MCSUs include preventive maintenance; weighing, collection and distribution of vegetables for storage each day; categorizing vegetables by storage temperature/humidity requirements; and record keeping.

Customers reported that they received better prices compared to the open vegetable market and they didn't need to engage in the haggling on prices. They also shared their satisfaction about getting better quality produce and supporting local farmers.

Other accomplishments of the project are:

- Active discussion with the Indian Ministry of Renewable Energy and private corporations, such as, Bharat Heavy Electricals (BHEL)and RFLEX ENERGY on power cost savings by bringing solar panels and solar trees in the design of the MCSU. The discussion with refrigeration and food industry in using bio-waste from the market itself is also underway.
- Managers and field level officers in the Agriculture Marketing and Agri-Business Department of Government of Tamil Nadu have been engaged in the discussions about monitoring and effective implementation of MSCUs.
- Extensive outreach by TREC-STEP to media, agriculture institutions, and farmers associations is underway across the country to promote the idea of MSCUs and the business model. [48]

Effectiveness of the innovation: The provision of cold storage is an important element in helping farmers derive more benefit in the supply chain, but it is evident from the site visits and interviews with the farmers, managers and consumers, that government plays a substantial role in helping farmers to increase production and income. This includes a free access to a stall in the common space, free transportation to the market, regulated price of the vegetables, and guidance in better crop production methods leading to increased yields and daily management of the market. The addition of a well-designed MCSU has proved to be an effective innovation, which is profitable for the farmers and has benefitted consumers as well. The benefits of the MCSU and of the farmers' markets are readily perceived by farmers. For example, Ballama, a female farmer whose farm the Case Study team visited, was enthusiastic, like other farmers, about the cold storage facility, "*We have been coming to this farmer's market in Palaymkottai for the past decade. Earlier I used to lose nearly Rs. 200 to 300 worth of greens everyday* (a loss of nearly 10 to 15% in the daily revenue, just at the market –not counting the post-harvest loss at the farm and in transportation). *Now there is no wastage, thanks to the cold storage facility. Additionally we have increased the sale of vegetables and our income.*"

Cost effectiveness and commercial viability of the Project: TREC-STEP believes that the MCSU can be a self-sustaining, stand-alone profitable micro venture that can be replicated in other regions of India. Not only the Tamil Nadu Government and other state governments have shown interest in replicating this idea, TREC-STEP has also received inquiries from other countries about the venture. TREC-STEP has developed a business model (see below), which it believes demonstrates the financial viability of the MCSUs as a commercial enterprise operated by youth entrepreneurs.

The business model for the MCSUs, updated in the October 2011 Evaluation Report[49], assumes that reduced vegetable loss due to MCSU storage will lead to increased farmer income that can be used to cover a small fee (up to 1 Rupee for kilogram of vegetables

[48] TREC-Step Power Point presentation, August 16, 2011

[49] TREC-STEP Evaluation Report for Mini Cold Storage Units Project, October, 2011

stored) for using the cold storage. The Table presenting the TREC-STEP business model is in the Annex to this paper. If users pay RS.1/ kg for a minimum of 2,500 kg stored per MCSU per day, then the MCSU would generate RS. 900,000 per year. After deducting annual operating expenses of RS.240,000 (for energy, manpower, maintenance costs and room rental for MCSU), the balance of RS.660,000 each year can cover the capital costs of RS.700,000 of the MCSU. This analysis assumes that the youth entrepreneur (or farmers' association) could finance the MCSU through a subsidized loan at 12.5% interest. With interest of RS.87,500 on a loan of RS.700,000, this analysis suggests that the capital costs could be repaid in as little as 14 months.

This is an attractive business model that needs to be assessed independently and against some of the implicit assumptions:

- These cold storage facilities at the 5 farmers' markets in Tamil Nadu operate along with other interventions for small farmers that the Government is supporting/subsidizing. As noted above, these include free access to a stall, fixed prices, free transportation, and advice to farmers to increase productivity. Similar policies may not exist in all states, but may be a critical influence on farmer participation;
- Increased farmer earnings over the year show a sustained and substantial increase because of reduction in vegetable waste as a result of effective storage. The demand for vegetables is sustained along with the increasing supply of vegetables.
- Farmers using the MCSUs without charge will be ready to pay a fee up to RS.1 per kg for vegetables stored.
- The youth trained as managers/maintainers of the MCSUs will be able to act as entrepreneurs and, for example, set aside funds for maintenance, depreciation and replacement.

Business metrics may not be the best way to measure the viability of the MCSUs. As described in the project proposal, the Project seeks to reach small farmers and to reduce poverty. The MCSU delivers a public good that has the potential to reduce the post harvest wastage and increase food security. This departure from the business venture model and reliance on government subsidies may be justified because of its creation of public goods and its contribution to Government poverty reduction goals. Since the beginning of the Project two years ago, the gains for the farmers and consumers are noteworthy. It is still an open question as to whether this Project can be a self sustaining micro enterprise without government or development agency support for an intermediary period. If the MCSU is accepted as a social enterprise, there needs to be an intentional effort on the part of a key stakeholder, probably the State Government of Tamil Nadu with support from TREC-STEP, to foster the emergence of the MCSUs as viable businesses with the gradual introduction of user fees for the MCSU as the economy of small farmers evolves and they increase earnings from marketing excess vegetable production. In the short run, subsidization of cold storage may be a public good that helps change the production and marketing patterns of small farmers and increases food supply. The MCSUs will be able to move toward being viable businesses only if fees for use are gradually introduced and if the youth managers take ownership and become true entrepreneurs. Improvements in the technology of the MCSUs and in off-grid energy sources may drive down costs. In the long run, if the MCSUs

demonstrate their commercial viability, there may be increasing spontaneous replication of MCSU enterprises and adoption of MCSUs by farmers' cooperatives or associations.

The short site visits to two markets and to small farms clarified some basic assumptions in the project, but further evaluation and analysis of the benefits to farmers, women, consumers, government and entrepreneurs are needed in order to understand how this innovation can be transformed into a viable, self-sustaining enterprise and whether, how and for how long it needs to be supported by government subsidy as part of Government policies to address rural poverty and modernize smallholder agriculture.

Key challenges identified in the project:

- Farmers' markets are not booked fully. In one case, a new market had opened nearby causing the outflow of the farmers and the consumers. If the cold storage units are attractive in increasing the sales, one would assume a greater interest on farmers' part to sign up for the farmers' markets. It is possible that if a farmer goes regularly to the market, he/she has to retain a laborer for tilling the land, which is a high cost. Increased sales from the produce may be negated by the cost of retaining a laborer or loss of hiring replacement labor on the farm while they are at market. It would be helpful to undertake the analysis of the opportunity cost to the farmers.
- The MCSUs are not currently being used to their full capacity (70% of capacity at the time of the report). Only about 35 to 40% of the registered farmers are using the cold storage units right now. TREC-STEP estimates that it is a matter of a few months before full usage is attained and that proper communication with and among farmers to demonstrate the benefits will help to see the full capacity of the units.
- The power costs to run the MCSU are high. While power costs are presently being met for the five markets in this project, it is not clear whether government commitment to subsidy will continue. The use of solar panels and solar trees have been considered as ways to reduced energy costs (and have real merits), but the start-up costs of these innovations are high and need investors for these ideas. BHEL and REFLEX Energy are looking into this innovation but no further information is available at this time.
- The idea of MCSU as an independent, self-sustaining profitable venture, attractive to a business entrepreneur, needs further research, especially in light of small-scale farmers' limited financial and organizational capacity and even willingness to pay the user fee for the installation of MCSU. Thus an independent assessment of the business model is important to substantiate potential earnings.
- Consumers are often interested in lower prices and greater selection of vegetables and fruits. Farmers' markets generally have lower and regulated prices than the regular vegetable market but the variety of vegetables is limited since the outside vendors are not allowed and farmers are only able to bring locally grown seasonal produce. At Palayamkottai, a new experiment of allowing a few farmers from a farther distance, but with the different vegetable variety, showed that customers tended to favor buying from those farmers because of the variety.
- The rural youth entrepreneurs are trained in refrigeration and air-conditioning systems as well as in basic business principles. While they appear to be fulfilling the role of managers of MSCUs, it is not clear that they have become 'entrepreneurs,' capable of scaling up the model and managing the entire project as an independent business.

- The Government that started the farmers' markets and supported this idea of the cold storage unit no longer holds political power in Tamil Nadu. While the agriculture issues and farmers' interests are well represented before any government, there are questions about the full commitment on the part of the newly elected government.

2. Key stakeholders

Interests, functions and pathways of action, influence

1. Farmers: with small land holdings, mostly from local communities, 56% women, 46% men on average[50]
   a. Interests:
      i. Reduction of wastage of produce through refrigeration
      ii. Access to better designed mini cold storage unit, helping to refrigerate the vegetables for more days
      iii. Better prices leading to increased income and better livelihood
      iv. Access to market- free space, free transportation and free use of refrigeration are big plusses
   b. Pathways of action:
      i. Willingness to use the system
      ii. Readiness to pay a small user fee for the MCSU (this will require organizing of small farmers. Not clear who will handle that)
      iii. Getting long-term financing through farmer's coops to install MCSUs
   c. Influence:
      i. Since 70% of the Indian population survives through the agriculture sector, farmers (small and large) have some political clout to get the ongoing government support at no cost for the use of the market and for the cold storage units
2. Consumers:
   a. Interests:
      i. Low price, high quality, fresh produce
      ii. Variety of vegetables and fruits
      iii. Support of the farmers' market model, eliminating the middleman
      iv. Oversight of the managers for qualtiy and controlled prices
   b. Pathways of action:
      i. Knowledge and support of MCSU (often they are not even aware of the presence of the cold storage unit)
      ii. Readiness to support the farmers' markets despite the lack of variety
   c. Influence:
      i. Can demand better prices and higher quality of vegetables
3. Market Managers: Government officials of the farmers' markets
   a. Interests:
      i. Support of farmers allows government to be seen in positive light

[50] TREC-STEP Power Point presented to the Case Study Team, Aug 16, 2011

ii. Ability to provide mentorship to farmers for getting better yield and managing the market flows

b. Pathways of action:
   i. Knowledge, support and marketing of MCSU
   ii. Detailed data collection on consumption pattern and goods movement
   iii. Ongoing mentoring to farmers

c. Influence:
   i. Can act as a bridge between the farmer's needs and government policies
   ii. Can mediate between the consumer needs and farmers' practices

4. Rural youth entrepreneurs: managers of the MCSU
   a. Interests:
      i. Being gainfully employed
      ii. Acquiring new skills in business management and refrigeration systems
   b. Pathways of action:
      i. Train others to become managers of MCSU
      ii. Create their own enterprise using the new skills
      iii. Manage and sustain the MCSU model with the new business model
   c. Influence:
      i. Provide support to manage MCSUs when the replication takes place
      ii. Assist in taking care of the community's refrigeration needs
5. Tamil Nadu Government
   a. Interests:
      i. Supporting small farmers
      ii. Creating food security by reducing the food wastage
      iii. Building the political good will and voter base
      iv. Becoming a leader and innovator in social initiative that can be replicated nation-wide and even globally
   b. Pathways of action:
      i. Committing fully to the idea and replicating in the 160 farmers markets in the state of TN
      ii. Supporting MCSU as social enterprise
      iii. Helping to underwrite the power costs
      iv. Able to help other states when the scaling up begins
   c. Influence:
      i. Can guide national policies in reduction of vegetable loss and food security through MSCU example
      ii. Can assist farmers and the rural populations in improving their livelihoods
6. TREC-STEP – Implementing agency
   a. Interests:
      i. Generating social value
      ii. Supporting farmers and reducing the food wastage through improved technology and innovative public private partnership
      iii. Incubating a social initiative that can be replicated nation-wide and globally
   b. Pathways of action:
      i. Coordinating with other stakeholders, especially the government agencies and entrepreneurs to take the idea to scale

ii. Developing the technology for solar panels and solar tree, working with BHEL and REFLEX Energy, to reduce the power costs
iii. Training rural youth in managing the MCSU

c. Influence:
i. Outreach to government and development agencies
ii. Being a catalyst between public and private sector
iii. Promotion of technological advancement and the strength of the idea

3. Alignment

TREC-STEP and the Government of Tamil Nadu worked well together from early on as the idea of using the cold storage units for the small farmers' market took shape. After the positive response in the first pilot, the Government is enthusiastic about scaling the MCSUs in 160 government funded farmers' markets in the state. It is still not clear what the priorities and strategies of the new government are in relation to its agriculture policy in general and its decision for the farmers' markets in particular. As a result, TREC-STEP also wants to align with business entrepreneurs, Government of India, Department of Scientific and Industrial Research and United Nations Development Program to help champion the policy of instituting MCSU at all the farmers markets across the country.

4. Assessment of scalability of the innovation

KEY FACTORS: The project innovation can add value to national efforts to address rural poverty, increase food security, transform agriculture and reduce malnutrition. It has potential for scaling up through expansion in Tamil Nadu and replication in other states, provided some of the outstanding questions get answered in relation to the explicit goal of incubating viable business venture[51] versus creating a different track by making the project a social enterprise, relying on government subsidies and development agency support in the beginning and then adding user fees and other financial mechanisms. It is also worth exploring whether this model can be replicated in other states where the World Bank has made a commitment in the rural livelihoods programs.

Demand: The MCSU has proven its viability in the five farmers' markets where the project has been launched. Out of 2,014 registered farmers, 358 farmers, who are using the cold storage facility in these five locations, are showing that, due to refrigeration, they have gained a daily value (combined earnings) of $522, a 95% return on investment/farmer by Development Marketplace.[52]This is a significant income increase for farmers living at or below the poverty line.

[51] TREC-STEP, India 2008, Full proposal

[52] TREC-STEP Power Point presented to the Case Study Team, August 16, 2011

The government employees - managers of farmers' markets - are fully on board with this idea and are keen to see the installation of mini cold storage units grow to other places. Managers are also very interested in providing mentoring support to other farmers' markets in the state and elsewhere when and if the project goes to scale. The State Government has been enthusiastic about this idea of mini cold storage. Even before the final design of MCSU was rolled out, it adopted the model in 22 farmers' markets around the state, installing and operating cheaper and less efficient variety of MCSUs. After seeing the gains in the five farmers' markets, there is a greater appreciation for the efficient and technologically more advanced design offered by TREC-STEP.

The rural youth entrepreneurs are getting trained in new skills and are being employed by TREC-STEP to manage the MCSUs. By scaling the Project to 160 farmers markets in the state and many more nationally, there is a great opportunity to build the rural youth employment program, a stated goal of the Government of India and the Agriculture and Rural Development division of the World Bank.

Driver: While TREC-STEP has been a driver of this Project in Tamil Nadu, it is not clear who will drive this project for expansion in other markets in Tamil Nadu or for replication elsewhere in the country. If this program is to be seen as supporting the Government's poverty alleviation, employment generation and food security programs, then there has to be a designated position(s) in the Department of Agriculture and Cooperation with sufficient resources within the Central Government that drives this process across the country. The implementing agency(ies) for scaling up, like TREC-STEP, will need both drivers and champions and sufficient financial resources to scale up the project.

Champions: Farmers, government officials, rural youth entrepreneurs, along with TREC-STEP staff, are the greatest supporters of this innovation within the State of Tamil Nadu. To assure the replication of this Project across India, a powerful advocate at the national level, able to influence decisions and facilitate action, is needed. It is not clear who at the national level will champion this innovation and foster its adoption and implementation by appropriate agencies. If the World Bank sees the merit in scaling up the Project and will consider supporting it with resources in the earlier phase, the chances that the Central Government will play a leading role in encouraging scaling up the Project in multiple states are higher.

Uniqueness of the innovation: The coolers are more efficient and technologically more advanced, offering customized humidification services and temperature ingredients to yield real benefits. The innovation works because ultimately it prevents food wastage and increases the profit margin for small farmers.[53] The innovation is simple but effective. There is a sizable cost to produce and run MCSU. Presently TREC-STEP is in conversation with BHEL, REFLEX Energy, Tamil Nadu Agriculture University and ICRISAT in Hyderabad to develop solar powered and bio-mass powered cold storage units to reduce the power costs. If the technological innovation, combined with process innovation of using public-private partnership to enable sustainable management of the MCSU, is applied with a shift

[53] Project Assessment for DM 4893: Schor, March 2011

in the approach (social enterprise with government/development agencies support) this innovation could yield greater benefits for the farmers and the society in general.

Opposition: While there is no or relatively little opposition to this Project in Tamil Nadu, the political shift in the state government draws into question the public private partnership idea. The agriculture lobby in the country has substantial support, so if there is a right champion of this Project, the replication of MCSUs nation-wide may not meet with much opposition. TREC–STEP has done extensive outreach to the national and regional government agencies, farmers' associations and agri-businesses.[54] Early indications show favorable support for the Project.

Incentives for scaling up: The project design, reports and assessment on the ground suggest that there are clear incentives for all the actors: the farmers want to reduce the food wastage and increase income; the State Government desires to increase the public good and satisfy the electorate demands as well as to become a leader and innovator of the idea at the national level; the rural youth wishes to be gainfully employed; and the Central Government wants to increase the food security and rural employment.

Spaces for scaling up: As mentioned earlier, the Government of Tamil Nadu runs 160 farmers' markets across the State and has been an enthusiastic supporter of the mini cold storage units. Farmers' market managers as well as various agriculture-oriented departments in the State Government have shown great interest in scaling up this model. As the Project got underway, the State Government indicated its interest in providing MCSUs for additional markets in Tamil Nadu. However, it is not clear at this time if the State Government has allocated sufficient resources to support a second phase and expansion of the MCSUs to all markets in the State.

There is scope for increasing the links of poor farmers to market enhancement. Poverty remains a major problem even as India experiences GDP growth rates of 8 to 9%. More than 300 million people live below the official poverty line, and the number is even higher if measured in as PPP $1.25[55] per day in 2005. Poverty is worse in rural areas where 70% of India's population lives and sustains itself on income from agriculture. Poverty is particularly concentrated in the seven 'lagging' states (Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Orissa, Rajasthan and Uttar Pradesh), and among scheduled castes, tribals, women and the disabled, many of whom are small farmers. As many as 40% of India's villages is not connected to roads. This initiative aims at providing a solution to small farmers' access to markets and ability to increase income. Its demonstration in Tamil Nadu is attracting attention and it has a real potential to attract support from other state governments, Central Government and development agencies.

[54] TREC-STEP made a Power Point presentation to the Case Study team on Aug 16, 2011

[55] Purchasing Power Parity, the World Bank

The innovation is clearly beneficial to the farmers and consumers, prevents post-harvest vegetable wastage and reduces rural poverty, generating greater public returns above and beyond those that accrue to the small farmer beneficiaries. Reduced postharvest vegetable waste, increased small farmer earnings and increased rural youth employment can help both the Government of India and the World Bank achieve stated goals of increasing food security and supporting increased agricultural productivity.[56]It is in the space of this complementarity that the argument can be made for interim funding to allow this innovation to transition from a demonstration project to a sustainable way of assuring small farmer access to cold storage at markets.

Over the course of the Project, TREC-STEP has invested in design improvements to the mini cold storage units that reduce the environmental impact. The use of the eco-friendly construction materials, such as pre-fabricated PUF panels instead of brick and mortar and thermocole panels, is the first step in that direction. PUF panels save up to 35% compared to thermocole insulation panels and they also offer a greater life span of 15 years, compared to three years of thermocole panels. TREC-STEP has engaged BHEL and REFLEX Energy in the private sector and the Ministry of Renewable Energy and ICRISAT in the public sector to develop the solar power pack, solar trees and bio-gas technology to reduce the dependence on electrical power.

5. Type of scaling

Relevance, Viability and Credibility: The mini cold storage unit approach has clear relevance to local and national problems of high post-harvest wastage of vegetables and to the problem of small farmer access to appropriate cold storage solutions. Cold storage for vegetables does exist in India but access to it has been limited to larger scale, commercial farmers. At the micro level, small farmer access to household type refrigerators for storage of vegetables is also limited because of cost and also lack of electric supply at the village level. TREC-STEP has developed a unit which is suitable for use by multiple small farmers and allows differentiation of humidity and temperature for different types of vegetables. TREC-STEP has a strong national and international reputation for incubating technical innovations and fostering their adoption into enterprises with the potential to become large, and it carries substantial credibility with key stakeholders in its support for scaling up of this model.

Financial viability: This innovation depends on a Public Private Partnership (PPP) for managing the mini cold stores and envisions the emergence of a small enterprise to be managed in a commercially viable way by a youth entrepreneur. Two years of project implementation have not yet demonstrated that the MCSU enterprises are commercially viable, though TREC-STEP has developed business model that needs to be independently assessed. Nor has it yet been demonstrated that the youth managers are becoming entrepreneurs and able to manage a small business. To date, the World Bank Development Marketplace Project funded the MCSUs and paid the training costs and salary of the youth

[56] World Bank Country Strategy for the Republic of India, 2009-2012

entrepreneurs; the Government has subsidized the power costs of the MCSUs, provided free access to market stalls, transportation and access to the cold storage. It may be that such subsidies are important and that the incubation period for this model extends beyond the two years of the project.

6. Implementing Organization

An impressive organization with 24 years of experience in incubating technological innovations, TREC-STEP has been the primary instigator and implementer of the MCSU pilot project in Tamil Nadu. In its history of close to a quarter century, TREC-STEP has promoted more than 185 high growth start-up SMEs, supported 4000 SME and micro ventures and it annually trains 4,000 to 5,000 youth in technology and business skills. Over the years it has won innumerable awards in entrepreneurship incubation locally, nationally and internationally.[57]

TREC-STEP's rich experience in the Refrigeration and Air-Conditioning domain, its training expertise offered to the unemployed youth in technology, and successful implementation of PPP models were the primary triggers to jump start this pilot project that turns Waste to Wealth by Incubating Mini Cold Storage Unit Technology.

Strengths:

- The organization has credibility with various stakeholders – government, development agencies, civil society, private sectors and end-users, such as farmers and rural youth - for delivering sound and sustainable projects with efficiency. It has been recognized for excellence in promoting innovation and technology entrepreneurship in India.
- TREC-STEP has a strategic focus on promoting new entrepreneurial start up ventures with a mandate to train youth in technology and business skills and trains 4,000 youth in technology trades every year.
- It has a wide network and influence in the State of Tamil Nadu as well as at the Central Government level (The Central level Home Minister Mr. P. Chidambaram has shown keen interest and recently visited TREC-STEP's project of New Emerging Technology Skills Nodal Center at Karaikudi)[58]. This high level connection is of significance if the pilot project is to scale up in other states.
- The values and goals of TREC-STEP, especially of finding innovative solutions to increase food security, link small-scale farmers to market, and to work with rural youth are closely aligned with what Development Marketplace and the Government of India seek to achieve in terms of scaling up workable ideas.
- In addition to the World Bank, TREC-STEP has worked with International agencies like UNDP, UNIDO, EU, InfoDev, British Council Division, IDRC and others. TREC-STEP's Vocational Training for Employment Generation Project was heralded as the best example of a good project by the European Delegation and others. TREC-STEP is

[57] TREC-STEP proposal to the World Bank, 2008, Full proposal package

[58] TREC-STEP Power Point presentation, August 16, 2011

at the nexus of resource network for technological advancement for national and international organizations.

- TREC-STEP has successfully disseminated the Project DVD, Project leaflet and Project brochure to more than 38 organizations ranging from governmental, semi-governmental, agri-business, banks and farmers associations as mentioned in the Power Point[59] and garnering interest in the mini cold storage unit.
- The pilot project in the five famers markets has received attention and interest, not only nationally but internationally, including from Pakistan, Indonesia and Farmers' Associations in Africa.
- At its helm, Mr. R.M.P. Jawahar has served as the executive director of TREC-STEP for over 22 years. He has been entrepreneurial in terms of ideas and strategic in his approach to grow and sustain the organization that functions as an independent NGO and no longer has to rely on the Engineering College in Tiruchirappalli for financial resources. Serving as a member of board or advisory council for more than 12 professional bodies, Mr. Jawahar is able to facilitate effective exchange between his and other organizations' learning about technology, incubation and scaling up. Mr. Jawahar seems to motivate and engage staff to think big ideas and successfully deliver them. He has developed a large network in various sectors, allowing the organization to yield positive results from these connections.
- TREC-STEP has a dynamic management team of professionals with management experience in building and managing collaborations, partnerships and projects and deep commitment to technology and social issues.

Weaknesses: While TREC-STEP has a proven track record of successful implementation of projects in the private sector, it may be less suited for incubating enterprises that are aimed at small, poor farmers. The technological incubation projects that the organization started to date have been taken over by entrepreneurs nation-wide to scale them up as commercial ventures. However, as the discussion above indicates, in order to scale up the MCSU Project, governments are going to have to play a major role. The primary market for the MCSUs appears to be in the farmers' markets across the country. Secondarily there may be opportunities for NGOs and cooperatives to invest in MCSUs. In the longer term, small entrepreneurs may take up the MCSU as a profitable enterprise, but they will have to be convinced of the financial viability of the MCSU. To move forward, there will need to be actors at the state and national level who are prepared to incorporate the technical innovation into their small farmer/poverty reduction work and to locate entrepreneurs to take the lead in outlaying the capital costs for the MCSUs and manage and monitor the project successfully. Identifying these actors, who will drive and implement expansion and replication, requires champions who will advocate for this approach.

- TREC-STEP has at least 10 large incubation projects in the hopper. Its core competency is in technological innovations and in the area of offering vocational guidance – both of these areas they have excelled at. The focus on the agriculture issues and small farmers' problems is more recent. Despite their initiation and

[59] TREC-STEP Power Point presentation, August 16, 2011

successful implementation of this pilot project, it is unclear if TREC-STEP alone is able to take this Project to scale, nationally or internationally. They can offer the consultation for the technology and may be able to come up with distribution systems, but it would be worthwhile to explore further how they can scale up if they are the sole implementing agency nation-wide.

- Without the financial commitment from a development agency and/or from the government, TREC-STEP will not be able to focus on the scaling up process or develop management and distribution system. [60]
- TREC-STEP has provided a business plan that promises that the MCSU can be a viable commercial enterprise within a year of operation. The model has not been tested, and it is based on some assumptions (see above) that may not materialize. Since the business venture model is at the core of the design of this Project, not having a full understanding of who the entrepreneurs will be and how the business model will work is a concern.

Recommendations: Based on the assessment above, we recommend the following options to make the structural change in the design of the Project.

1. The pilot Project at the five farmers' market in Tamil Nadu has clearly shown benefits. The technological innovation of MCSU has evolved significantly and is helping to reduce the wastage of vegetables and increase the income of farmers. Rural youth trainees have acquired marketable skills and are gainfully employed. There is excitement and enthusiasm at the State Government, farmer and the implementing agency levels. The outreach to expand the idea elsewhere has already begun. However, the lack of financial sustainability of the PPP model as envisaged in the current project design has yet to be demonstrated. With the termination of the current project funding, the innovation requires bridge funding to enable the project to move from demonstration to a mainstream activity driven by state and national governments or taken up by other actors. As is described in the Brandeis Report on "Mapping the Road,"[61] an innovative effort cannot succeed and will not go to scale if the full support from various stakeholders is not given to the idea of scaling up.

   Since the Tamil Nadu Government already runs additional 160 farmers' markets across the state, it is worthwhile to convene TREC-STEP, the agriculture department of the State Government and the DM-ARD unit of the World Bank to discuss possible ways to sustain and scale the Project, including how to move toward the realization of the business plan. They can share the evolving knowledge from the pilot Project, take the salient features that have worked, analyze the economies of scale and develop a three to five year plan to expand the MCSU Project to all 160 farmers'

[60] Mr.R.M.P. Jawahar, the Executive Director of TREC-STEP in the phone interview with Diana Schor, as quoted in the Project Assessment, No.4893, March, 2011

[61] Mapping the Roads from Development Marketplace Agriculture and Rural Development Projects to Sustainable Practice, Brandeis Report, March 2011

markets in the State of Tamil Nadu. In addition to reducing the wastage of vegetables and increasing the income of small farmers in the entire state, this scale-up operation will offer valuable lessons and will help establish a process to achieve viability of the PPP model before taking it to scale nationally and internationally. At this stage, the State Government and to some extent the World Bank could assume an enabling role, support the business development of MCSU, adjust the business venture model and absorb initial risks. Over time, as the model gets better established and the farmers and their associations as well as other entrepreneurs start to see the value of the cold storage unit, increasing user fees from farmers and other financial mechanisms can assist in reducing the subsidies and decreasing the reliance on the government or a development agency. As the business model is demonstrated, one would expect to see more spontaneous adoption of the approach.

2. Demonstration of this model in other regions will immediately benefit poor farmers through the reduction of post-harvest waste, but will also accelerate the diffusion of the model as the commercial viability of the entrepreneurship model is established. The current World Bank Country Strategy for India (CAS) has identified seven low income states, namely Bihar, Chattisgarh, Jharkhand, Madhya Pradesh, Orissa, Rajasthan and Uttar Pradesh, to invest greater resources to reduce poverty and achieve MDG goals. We recommend that the World Bank convene appropriate stakeholders in the state governments of these states to communicate the potential of the Tamil Nadu pilot project and to encourage them to develop pilot projects in their own states. The World Bank Country Office should be encouraged by the DM and ARD to consider incorporation of the MCSU into World Bank projects like The India National Agricultural Innovation Project or a range of other projects, many at the state level, aimed at rural livelihoods and poverty reduction.

3. Aside from the centrality of financial sustainability of the business model, the Project has a high potential for product scaling up. The energy efficiency, customized humidification services, temperature control and other features are well thought out in the design of MCSU and offer tangible benefits by reducing the food wastage and increasing the profit margin for small farmers. Presently TREC-STEP is exploring the solar options to support the cooler with the hope that the unit can operate off the grid. If this is successful, the cooler innovation can be introduced at the farm or village level, further minimizing the spoilage exposure and prolonging the vegetables' shelf life.[62] Even if the MCSUs are installed only in the farmers' markets and not in the wholesale vegetable markets across the country, there will be a sizable reduction in postharvest vegetable waste across the country.

[62] Project Assessment: Waste to Wealth by Incubating Mini Cold Storage Technology: Schor, March 2011

List of Persons Met

TREC-STEP staff

- **Mr. R.M.P. Jawahar –** Executive Director, TREC-STEP
- **Ms. Gita Chengappa –** Manager, TREC-STEP
- **Ms. Bindu Balkrishnan –** Deputy Manager, TREC-STEP
- **Mr. Antony Raju –** Coordinator, TREC-STEP

Farmers Markets

- **Mr. R. Babyraj** -Administrative Officer at Kumbakonam market, from Tamil Nadu government
- **Mr. S. Pannerselvam** - Assistant Administrative Officer at Kumbakonam market, from Tamil Nadu government
- **Mr. G. Rajeev** - Youth entrepreneur, trained by TREC-STEP, and manager of MCSU at Kumbakonam market
- **Ms. Mallika and her husband Bisva** – Fruit farmers at Kumbakonam market
- **Ms. Lacchmi** – Vegetable farmer at Kumbakonam market
- **Mr. Natarajan** – Coconut, bananas and greens farmer at Kumbakonam market
- **Ms. Dhanlaxmi** – Farmer from the Horticultural Self help Group for Women at Kumbakonam market
- **Mr. M. Balasubramanian** – Administrative officer at Palayamkottai market, from Tamil Nadu government
- **Mr. S. Babu -** Assistant Agricultural Officer at Palayamkottai market, from Tamil Nadu government
- **Mr. S. Muthu Krishnan** - Youth entrepreneur, trained by TREC-STEP, and manager of MCSU at Palayamkottai market
- **Mr. Dhituga Durai** – Manager of MCSU at Palayamkottai market
- **Ms. Peramal Amma** – 80 years old farmer at Palayamkottai market
- **Ms. Ballama** – Farmer at Palayamkottai market, visited her farm as well
- **Mr**. **Devdas** – Organic farmer at Palayamkottai market
- **Mr**. **Subhash Palekar** – Consumer, also met three other buyers and interviewed them

The World Bank

- **Mr. Samik Sunder Das** – Senior Rural Development Specialist, The World Bank, India – phone conversation

Annex

Break-Even Analysis						
Capital Cost Requirement			In Rs.		in $	
Capital Requirement for setting cold storage units of 2.5 to 3.5 MT storage capacity in a rented building			700,000		15,556	
Monthly Recurring cost requirement						
Power Cost based on usage			8000		178	
Manpower cost for operation			4000		89	
Maintenance Cost			3000		67	
Room rent that houses the cold storages			5000		111	
Total			**20,000**		**444**	
Revenue generated through collection of usage charge for the usage of cold storage						
Usage charge collection / kg			Rs. 1/kg	75 paisa/ kg	50 paisa/kg	25 paisa / kg
For minimum Storage of	2500	kgs				
Income / day			2500	1875	1250	625
Income / month			75000	56250	37500	18750
Income / year			**900,000**	**675,000**	**450,000**	**225,000**

Expenses / month	20000	20000	20000	20000
Expenses / year	**240,000**	**240,000**	**240,000**	**240000**

Income that could be generated after meeting all Recurring Expenses	660000	435000	210000	-15000

Repayment for Capital Expenditure	55000	36250	17500	-1250

(Here it is assumed that the Capital for cold storage units can be mobilized from banks with 12.5% subsidized loan)

Break-Even Month	**14th mth**	**21st mth**	**41st mth**

From: TREC-STEP, Evaluation Report for Mini Cold Storage Project for Small Farmers. October 2011.

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Annex IV: Nigeria Case Study

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Case Study on Potential for Scaling Up: Adding Value to Waste in the Cassava Processing-Goat Keeping Systems in Nigeria

This World Bank Development Marketplace funded project, which relies on linked but simple innovations, has significant potential to be expanded in Ogun State and replicated in other cassava producing states in Nigeria. The two year Development Marketplace project has demonstrated the capacity of these simple innovations to raise substantially the incomes of goat keepers and cassava growers, many of whom are women. There is unmet demand for expansion in Ogun State. The University of Agriculture in Abeokuta has created a model that can be adjusted to institutions and contexts in other states. Scaling up in this fashion can help Nigeria meet its poverty reduction and improved livelihood goals at the same time as it reduces the impact of burning cassava waste on the environment.

For the Agriculture and Rural Development Department, The World Bank

September 2011

EXECUTIVE SUMMARY

Case Study:

Adding Value to Waste in the Cassava Processing-Goat Keeping Systems in Nigeria

September 2011

Prepared by: Danielle Fuller, The Heller School for Social Policy and Management, Brandeis University

World Bank Development Marketplace Project Number 4345

Implementing Organization: University of Agriculture, Abeokuta, Nigeria (UNAAB)

Support from the World Bank Agriculture and Rural Development Department

This project, which relies on linked but simple innovations, has significant potential to be expanded in Ogun State and replicated in other cassava producing states in Nigeria. The two year Development Marketplace project has demonstrated the capacity of these simple innovations to raise substantially the incomes of goat keepers and cassava growers, many of whom are women. There is unmet demand for expansion in Ogun State. The University of Agriculture in Abeokuta has created a model that can be adjusted to institutions and contexts in other states. Scaling up in this fashion can help Nigeria meet its poverty reduction and improved livelihood goals at the same time as it reduces the impact of burning cassava waste on the environment.

Nigeria is the largest producer of cassava in the world with an annual production of over 40 million metric tons (MT). Up until now, the cassava waste, comprised of the peel and chaff, has been discarded and either burned, releasing toxic fumes, or left to rot.

The Nigeria project, *Adding Value to Waste in the Cassava Processing-Goat Keeping Systems in Nigeria*, is comprised of five innovations: a simple *technology* (a drying platform for the cassava peels to be used instead of burning the waste), a new *product* (clean dried cassava peels that can be sold as goat feed), an *educational component* (a diet prescribed to goat farmers, designed by animal scientists that utilizes cassava peels and maximizes the growth rate and health of the goats), *access to credit* (facilitating micro-credit loans to build the drying platforms), and a new *market mechanism* (linking cassava processors and goat keepers).

The innovation provides a measureable economic benefit to both cassava processors and goat farmers with average annual incomes less than $2 a day. Original estimates suggest an annual increase of $384 USD and $198 USD respectively and early evidence indicates gains closer to $635 USD a year (DM TEAM, October 1, 2010). Further, recycling the cassava waste into a marketable product provides an environmental benefit by preventing the burning of cassava waste and the subsequent release of harmful toxins into the air.

The project aligns with the goals of the Federal Government of Nigeria, the World Bank, and the Millennium Development Goals. It benefits from strong leadership and offers economic and environmental benefits but lacks a champion to advocate for the innovation and help bring it to scale. The World Bank Country Office will play an important role in garnering the support of the Federal Government of Nigeria to assist in bringing the innovation to scale.

Based on the success of the pilot phase, we recommend that the innovation be brought to scale and offer three recommendations for the scaling process: 1.) Re-introduce a micro-credit component to ensure that the poorest of the poor have access to credit and can therefore, take advantage of the innovation; 2.) increase the benefits of the project by strengthening the market mechanism; and 3.) partner with FADAMA III and adopt the community-centered model.

Case Study:

Adding Value to Waste in the Cassava Processing-Goat Keeping Systems in Nigeria

Introduction

Nigeria is the largest producer of cassava in the world with an annual production of over 40 million metric tons (MT). More than 90% is processed and consumed locally. Up until now, the cassava waste, comprised of the peel and chaff, has been discarded and either burned, releasing toxic fumes, or left to rot.

The use of cassava as livestock feed is limited in Nigeria and Africa in general, in contrast to other regions of the world where cassava is grown. In Africa, where 87 million tons of cassava is processed annually, only 6% is used as livestock feed. In comparison, 32% of the cassava produced in Latin America is used for livestock feed and in Asia, the number is over 40% (International Fund for Agricultural Development (IFAD) and Food and Agriculture Organization of the United Nations, 2000).

The Nigeria project, *Adding Value to Waste in the Cassava Processing-Goat Keeping Systems in Nigeria*, capitalizes on the large cassava industry in Nigeria and the opportunity to convert the waste into a marketable product for goat feed. After receiving Development Marketplace (DM) funding for two-years from the Agriculture and Rural Development department of the World Bank, the project was selected for a case study based on an initial assessment of the 22 DM/ARD projects to ascertain if the project is able to be brought to scale and to provide a basis for the next stage of the scaling up process. The initial review found the project to be a strong candidate for scaling based on a number of criteria identified in the literature review.

The project provides evidence of indigenous organizational and leadership capacity to scale up a simple innovation to reach an increasing number of rural communities within Nigeria and potentially beyond. The University of Agriculture in Abeokuta, the current implementing agency, has the technical and organizational capacity and the commitment to scale up in Ogun State and could play a role in fostering replication in other states in Nigeria.

The innovation provides a measureable economic benefit to both cassava processors and goat farmers with average annual incomes less than $2 a day. Original estimates suggested an annual increase of $384 USD and $198 USD respectively ("Development Marketplace Proposal #4345," 2008, p. 2) and early evidence indicates gains closer to $635 USD a year (DM TEAM, October 1, 2010). Further, recycling the cassava waste into a marketable product provides an environmental benefit by preventing the burning of cassava waste and the subsequent release of harmful toxins into the air.

Early evidence of the innovations' benefits has led to a growing demand for participation. Already in its first two years, the project exceeded the initial target of reaching 3,600 cassava processors and 600 goat keepers, expanding its reach to 21 additional locations and directly benefiting 6,078 processors and 886 goat keepers. The expansion was a direct result of pressure from agricultural extension officers and the communities they represent ("Personal interview with Dr. Kolawole Adebayo, Project Team Leader," March 4 and August 7, 2011). Project team leaders estimate that there is potential to reach 200,000 of the 350,000 farmers in the state of Ogun in addition to thousands more in the remaining states ("Development Marketplace Proposal #4345," 2008, p. 2).

The country context for expansion within Nigeria offers organizational capacity, government interest in enhancing the cassava industry, available resources, and a relatively well-educated population. Given the use of cassava as a plant that thrives under drought conditions, this innovation may have a broader application across West Africa and elsewhere, allowing Nigeria the opportunity to play a role in dissemination and replication.

Country Assessment

Located in West Africa between Benin and Cameroon and bordering the Gulf of Guinea, Nigeria is Africa's most populous country, with a population of over 155 million people in an area that is slightly larger than twice the size of California. The country is a federal republic comprised of 36 states and the Federal Capital Territory, Abuja.

Nigeria is a lower middle-income country with an economy dominated by oil. With over 36 billion barrels of oil, Nigeria has the tenth largest reserve of oil in the world ("Country Profile: Nigeria," July 2008), accounting for 85% of government revenue (The World Bank, 2009). However, corruption has prevented the oil wealth from improving the lives of average Nigerians. According to a World Bank estimate, 80 percent of energy revenues benefit only one percent of the population ("Country Profile: Nigeria," July 2008). International organizations have pressured recent administrations to diversify the economy in order to prevent dependence on oil and to create a more robust economy.

Nigeria is among the countries with the highest levels of inequality in the world. Despite the abundant oil revenue, much of the country still lives in poverty. Gross Domestic Product (GDP) per capita, adjusted for purchasing power parity in the U.S. is $2,289. The multidimensional poverty index (MPI) provides a more accurate picture of poverty than just income by looking at 10 health, education and standard of living indicators. Nigeria has an MPI of .368, calculated by multiplying the incidence of poverty by the average intensity across the poor. Another way to understand the level of poverty in Nigeria is to look at the *percentage* of people that are poor: 64% of the population are defined as "very poor," using both the MPI criteria and the World Bank definition of those living on $1.25 a day or less; 84% of the population are considered "poor," living on less than $2 a day (Alkire & Maria Emma Santos, 2010).

The disparity within the country is also represented in educational attainment. While the country boasts a number of excellent Universities and many well-educated professionals, the mean education of adults is comprised of only five years of schooling. Poor health care and an HIV/AIDS prevalence of 3.9 percent contribute to an average life expectancy of only 48 years. Unemployment is of growing concern, with a rate over 23% in rural areas and more than 12% in urban areas.

Table 1: Nigeria Economic and Human Development Indicators	
GDP per capita, PPP (2008 PPP USD)	$2,289.0
Education (Mean years of schooling, of adults)	5.0
Life expectancy at birth (years)	48.4
Rural Unemployment*	23.2%
Urban Unemployment*	12.4%
Poverty (Multidimensional poverty index, k greater than or equal to 3)[63]	0.368
Percentage of MPI Poor*	64%
Percentage of Income Poor ($1.25 a day)*	64%
Percentage of Income Poor ($2.00 a day)*	84%
Percentage of Poor (National Poverty Line)*	34%
Human Development Index Rank (out of 165 countries)[64]	142

Data Source: (UNDP, 2010)

*Data Sources: ((International Monetary Fund, 2007)

**Data Source: (Alkire & Maria Emma Santos, 2010)

Agriculture

Sixty percent of Nigerians work in agriculture and over 86 percent of the land in Nigeria is used for agricultural purposes. The country produces a number of agricultural products

[63] Composite measure of the percentage of deprivations that the average person would experience if the deprivations of poor households were shared equally across the population.

[64] A composite index out of 169 countries measuring average achievement in three basic dimensions of human development—a long and healthy life, knowledge and a decent standard of living.

including cocoa, peanuts, cotton, palm oil, corn, rice, sorghum, millet, cassava, yams, rubber and timber. Cattle, sheep, goats, pigs, and fish are also raised for sale (CIA, 2011). In addition to agriculture, the country is rich with natural resources including petroleum, tin, iron ore, coal, limestone, lead, zinc and significant natural gas reserves, comprising the largest reserve in Africa and the seventh largest in the world ("Country Profile: Nigeria," July 2008).

The climate varies throughout the country: equatorial in the south, tropical in the center and arid in the north. For this reason, the 24 central and southern states are the regions where cassava is grown. While the central region boasts lush rainforest, the country as a whole suffers from a number of environmental issues including soil degradation, rapid deforestation, desertification, oil pollution, and loss of arable land (CIA, 2011). Rapid urbanization and industrialization have created a widespread waste management problem from the open burning and dumping of waste and improperly constructed landfills which have resulted in air, water and soil pollution ("Country Profile: Nigeria," July 2008). Deforestation, a result of logging, burning and overgrazing by livestock has led to a loss of almost half of the forests since 1990. The project being assessed addresses the issue of waste management, open burning, and deforestation due to livestock grazing.

Government Development Priorities

A former British colony, Nigeria gained its independence in 1960. Between 1960 and 1999, Nigeria experienced a number of military regimes and a brutal civil war. With the election of President Yar Adua in 1999 after almost 16 years of military rule, the country transitioned to a civilian government.

In 2000, Nigeria signed an agreement with the International Monetary Fund (IMF) that allowed debt restructuring, contingent on economic reforms. Between 2003 and 2007, Nigeria implemented the National Economic Empowerment Development Strategy (NEEDS), an economic reform program designed to raise the country's standard of living. NEEDS was designed to address basic deficiencies, including lack of freshwater for household use and irrigation, unreliable power supplies, failing infrastructure, and corruption and also set the budget based on conservative estimates of oil revenue, providing stability against the fluctuations in oil prices. ("Country Profile: Nigeria," July 2008). The economy responded with strong growth between 2003 and 2007.

The Poverty Reduction Strategy Paper (PRSP) for Nigeria, prepared in consultation with the staffs of the World Bank and the IMF, evaluated NEEDS and SEEDS (the state level economic empowerment and development strategy) and found the overall performance of NEEDS to be remarkable. Advances in the agriculture sector during this time include:

- An average annual agriculture growth rate of 7.0% from 2004 – 2006 (target goal was 6%).

- A 36% increase in the production of cassava, from 36 metric tons in 2005 to 49 metric tons in 2006 (International Monetary Fund, 2007).

While NEEDS surpassed many expectations, it did not achieve the poverty reduction, employment generation and power supply goals (International Monetary Fund, 2007).

In 2008 Nigeria began to implement market-oriented reforms such as modernizing the banking system, curbing inflation and addressing disputes over the distribution of oil earnings (CIA, 2011). Former President Umaru Musa Yar'adua, after taking office in 2007, implemented a policy known as Vision 2020, designed to transform Nigeria into one of the world's top-20 economies by 2020. Vision 2020 is focused on power and energy infrastructure, food security and agriculture, wealth creation and employment, mass transportation, land reform, security, and education ("Country Profile: Nigeria," July 2008). The current President, Goodluck Jonathan, has pledged to continue economic reform with a focus on infrastructure improvements that include privatization of the state-run electricity generation and distribution facilities and strengthening public-private partnerships for roads.

A longer-term economic development program is the UN National Millennium Development Goals (MDG's) for Nigeria. Implemented in 2000 and planned through 2015, the objective is to reduce poverty, increase access to education, achieve gender equality, improve health, protect the environment and promote international development cooperation. The MDGs are part of a global agenda but also align with Nigeria's own development vision, as outlined in the 1999 constitution ("Nigeria Millennium Development Goals Report," 2010).

Boosted by the country's debt relief in 2005, which added one billion dollars to the annual budget, the government of Nigeria is using the infusion of funds to invest in pro-poor programs needed to achieve the MDGs. The Vision 2020 policy serves as the framework for the investments needed to meet the development goals. The latest MDG report for Nigeria, published in 2010 by the Government of Nigeria, indicates progress towards achieving the stated goals. Between 2005 and 2009, primary health care services have been extended to over 20 million people, safe water has been provided to over 8 million people, insecticide-treated nets have been distributed to 5 million mothers and children to protect them against malaria and there has been a 98% reduction in the incidence of polio ("Nigeria Millennium Development Goals Report," 2010).

While there have been gains, the World Bank's Country Partnership Strategy (CPS) report indicates that the country is off-track for meeting most of the MDGs (The World Bank, 2009). A number of problems persist that limit economic growth and development, including: inadequate human development, inefficient agricultural systems, weak infrastructure, poor growth in manufacturing, an insufficient policy and regulatory environment, and mismanagement of resources ("Nigeria Millennium Development Goals Report," 2010).

Like many countries, Nigeria's financial sector was negatively impacted by the recent global financial crises with a decline in oil revenue amounting to roughly one-third of the 2008 peak, reduced access to credit and weaker flows of private capital (The World Bank, 2009). The crisis confirmed the need to diversify the economy and strengthen fiscal management in order to achieve the desired development goals.

Critical Criteria for Scalability

Innovation

The strength of the innovation for this project is its simplicity and therefore, its ability to be easily replicated and adopted. The project is comprised of five innovations: a simple *technology* (a drying platform for the cassava peels to be used instead of burning the waste), a new *product* (clean dried cassava peels that can be sold as goat feed), an *educational component* (a diet prescribed to goat farmers, designed by animal scientists that utilizes cassava peels and maximizes the growth rate and health of the goats), *access to credit* (facilitating micro-credit loans to build the drying platforms), and a new *market mechanism* (linking cassava processors and goat keepers).

The drying platform is comprised of a raised cement platform covered with a durable black plastic tarp. The tarp is used to absorb the heat from the sun, which increases the drying time and can also be used as a quick cover to protect the cassava peels from the rain, a benefit greatly appreciated by the driers during the rainy season. The dimensions of the platform, while sometimes varied, are set to minimize the drying time. The raised design keeps the peels clean and protects them from being mingled with dirt and eaten by small animals.

The end product is clean dried cassava peels, often sold in large waterproof grain sacks at the local market or to nearby neighbors as livestock feed. The cassava peels from this project differentiate themselves from other cassava peels in that they are completely dried (wet cassava peels contain cyanide that is poisonous to animals and therefore not useful as feed) and free of dirt, unlike the peels that were previously dried on the ground. Goat farmers repeatedly mentioned their preference for the clean cassava peels from the drying platforms as a superior product to feed their animals.

Animal scientists from the University of Agriculture, Abeokuta designed a specific diet for the goats, comprised of dried cassava peels (30%) and grasses, legumes and roughages (70%) that maintains the health of the animals (reducing the cost of antibiotics and risk of death) and minimizes the time needed for the goats to reach their full growth (at which point they can be sold). In most cases the growth time is cut in half and the input cost of feed is drastically reduced, increasing the profit margin of the farmers by roughly $198 USD a year.

Providing access to credit is an important element of the project because it allows poor workers (either cassava processors or the women who peel the cassava) to purchase the materials needed to build the income-generating drying platform. The cost to build a platform is roughly $165 USD, an amount far beyond the resources of most rural farmers. (Note, that the original proposal estimated the cost to be much higher at $1,210 but many of the villagers build the platform themselves and use local materials (e.g., sand, water) which they are able to obtain free of cost.) While micro-credit is available in many parts of Nigeria, the standard interest rate is 22% and the loans require collateral. This project is able to partner with an NGO (SLIDEN AFRICA), who provides micro-credit loans at a one-time fee of 10% and without the burdensome restrictions of traditional loans. Unfortunately, the project has suffered from a high default rate of 68%. According to the most recent report, a total of 651,800 N ($4,207 USD) was borrowed from 27 individuals, 21 of which defaulted. The credit program was subsequently put on hold. If the project is brought to scale, the micro-credit component will need to be re-designed and management may need to be handled by a different partner with more experience in micro-credit. The ability to provide loans to cassava driers is essential to ensure that the income-generating innovation benefits the most vulnerable, who, without access to credit, do not have the financial resources to set up a drying platform.

The fifth component of the project is the market mechanism linking the cassava driers with goat farmers. This is arguably the weakest component of the project and will need to be strengthened if the project is brought to scale. In theory the extension workers (state employees working directly with local farmers) connect cassava driers (sellers) with goat farmers (buyers). From conversations with both driers and buyers in several villages, the buying and selling process is informal and based largely on relationships and word of mouth. During the two-year pilot project phase, the demand was high enough that a stronger market mechanism was not required. However, if the project is brought to scale, more can be done to educate the driers on how to market their product and build relationships with both local and national markets, especially reaching markets in the north where cassava is not grown but where dried cassava peels could be sold for animal feed.

Theory of Change

The project produces social change by increasing the income of poor rural farmers, which improves their ability to cover basic necessities such as food, health care and school supplies, thus improving their quality of life and reducing the burden of poverty. The project introduces poor rural farmers to an income-generating product (drying platform), which can provide additional revenue, between $384 and $635 USD a year, minus the cost of building the platform ($165 USD). The majority of cassava driers are women who use the additional income to cover basic needs for their families. Since the project targets vulnerable populations living at the margins of poverty, the additional income is able to improve the living conditions of thousands of families. Likewise, the goat farmers also benefit by raising healthier goats in half the time, providing additional annual income that is often used to expand their business, buying additional goats and improving the pen where the goats are kept.

Benefits and Effectiveness of innovation

The Project Monitoring and Performance Assessment Team (PMPAT) visits the communities where the project is implemented to continuously assess the activities and objectives of the project and measure the performance against set goals.

The project aimed to reach 3,600 cassava processors and 600 goat-keepers, increasing their incomes by at least 15% from the sale of dried cassava waste and fast-growing goats in the two years of implementation (2008-2010). To accomplish this goal, the DM team originally planned to construct 24 drying platforms in 12 sites ("Development Marketplace Proposal #4345," 2008, pp. 1-2).

The project exceeded the original goal, expanding its reach to a greater number of communities. After the first 18 months (the final two-year report is expected in October 2011), the project was expanded to an additional 21 locations, resulting in a total of 33 drying platforms; 12 donated as demonstration platforms and 21 fully or partly funded with micro-credit loans facilitated by SLIDEN AFRICA for local cassava processors and goat farmers. The expansion to new locations was a result of pressure from agricultural extension officers and the communities they represent.

The project exceeded the goal of increasing the incomes of the beneficiaries by 15% ($198/ year for goat farmers and $384/year for cassava processors). A sample of 40 direct beneficiaries found a monthly increase in income of over 39%, resulting in an average revenue gain of $635 USD (DM TEAM, October 1, 2010, p. 18).[65] It should be noted that there was a wide variance in the revenue reported from the project; the higher incomes were in areas where other livestock keepers (especially cattle herders) compete for the cassava wastes and therefore the price of the dried cassava peels is higher. It is not clear that this is a representative sample and better data may be provided in the final report.

The general reach of the project was expanded from the original aim of reaching 3,600 cassava processors and 600 goat keepers to 6,078 cassava processors and 886 goat keepers. These numbers can be somewhat misleading in that they represent the number of people who *heard* about the project from the Agricultural Extension Officers. However, a much smaller number directly benefitted from the project. The last progress report, representing the first 18 months of the project, indicates that 278 cassava processors and 215 goat keepers directly benefitted from the 33 drying platforms (DM TEAM, October 1, 2010, p. 18).

Another essential element of the project is the market mechanism between cassava processors (sellers) and goat farmers (buyers). While no specific targets were set in the project objectives, the 18-month report indicated that 85% of cassava processors have direct linkages with livestock keepers and less than 14% have linkages with marketers (DM TEAM, October 1, 2010, p. 18). Interviews with cassava processors and the DM Team

[65] Income figures are based on a sample population and collected by members of the DM Team. An independent assessment of a larger representative sample is needed to verify the average income benefit.

during the August 2011 field visit revealed that this objective to create a market mechanism could be strengthened.

The environmental impact of burning cassava waste is one of the concerns addressed by the project. The goal was to eliminate the emission of carbon-monoxide and other toxins from 24 of the processing centers (100% of the originally planned drying platforms). By expanding the number of drying platforms used, the project was able to eliminate the harmful emission in 28 of the centers (DM TEAM, October 1, 2010, p. 18).

While the final results are yet to be tabulated, early evidence shows promise of commercial viability. Goat herders have demonstrated strong demand for the product as evidenced by sufficient demand during the pilot phase, even with limited marketing efforts and further by extension officers, who have expressed that the demand for the dried cassava peels is high among the thousands of farmers that they work with. The simplicity of the drying platform innovation and its relatively low cost is a clear economic gain for those able to obtain micro-credit loans. With an average cost of materials of $165 USD, depreciated over the anticipated 10-year life of the platform, the yearly cost to the owner of the drying platform is roughly $16.50 plus the possible replacement of the black tarp every few years. The innovation proves to be cost-effective with an average increase in annual income somewhere between $384 (original estimate) and $635 USD (preliminary findings).

Key Stakeholders

Cassava Processors and Goat Keepers – Beneficiaries

Cassava processors are entrepreneurs ranging from small scale, subsistence processors to medium and large-scale industrial processors who process cassava into different product forms including gari, starch, fufu, chips and ethanol. The main target of this project is small-scale female processors who benefit from increased incomes and the introduction of new livelihood opportunities.

Goat keepers are farmers who either rear goats as their sole economic activity or in combination with other animals and /or crops. The goat keepers seen during the case study site visit, have small pens housing 8-10 goats.

University of Agriculture, Abeokuta (UNAAB) – Implementing Agency

The existing project was started in Ogun State by the University of Agriculture in Abeokuta (UNAAB). Dr. Kolawole Adebayo, a Senior Lecturer at the University and an expert on cassava and rural development, recognized the opportunity to create a market mechanism to transform cassava waste into a product that can be sold to goat farmers, providing additional income to both the cassava processors and goat keepers. UNAAB has served as the implementing agency, monitoring the World Bank Development Marketplace funding and providing researchers, including Dr. Adebayo, to coordinate the partners and monitor and evaluate the project.

Established in 1988, the University of Agriculture, Abeokuta is one of three universities of agriculture established by the Federal government of Nigeria. Located on a 24,000-acre campus, the University runs livestock farms for teaching and research as well as permanent crop plantations and serves 6,000 undergraduate and 1,500 postgraduate students with 51 professors and 274 academic staff ("Development Marketplace Proposal #4345," 2008). In 2003, the University was recognized as the best university in Nigeria in the area of students/faculty staff ratio and research activities ("Historical Background of 'Nimbe Adedipe Library, UNAAB,"). Further, the University offers expertise in the cassava industry and working with national and international agencies. Between 1999 and 2006, UNAAB worked to commercialize local cassava products and has worked with a number of companies including NESTLE Food Plc, the International Institute of Tropical Agriculture and the International Foundation for Science.

Ogun State Agricultural Development Programme (OGADEP) – Government Partner

Ogun State Agricultural Development Programme (OGADEP) is the agency responsible for providing agricultural services in Ogun State. Established in 1986 as one of the first Agricultural Development Programs (ADPs) in Nigeria, it was initially supported through a tripartite funding arrangement including the World Bank, the Federal Republic of Nigeria and Ogun State government. The World Bank ceased its funding in 1995 and OGADEP has since been run as an agency of the Government of Ogun State. The agency works to facilitate increased food production, productivity, and income and to improve the standard of living of small-scale farmers in the state. OGADEP employs 120 Village Extension Agents (VEAs) that live and work in the communities and are in direct contact with the farmers, as well as 20 Block Extension Officers (BEO), 20 women Block Extension Agents (BEAs) and 4 Zonal Extension Officers (ZEO) that provide agricultural extension services to all areas of Ogun State. The agency also has a team of Subject-Matter Specialists (SMSs) and Research Assistants who work with research institutes and universities to adopt available technologies to local conditions.

In this project, OGADEP provides the village extension workers to identify local beneficiaries of the project, recommend potential beneficiaries for micro-credit loans, train consumers on the recommended drying techniques and feeding regime and monitor implementation of the drying platforms. Prior to implementation of the DM08 project, the extension officers were conducting training programs on the processing and utilization of unfermented cassava flour and were therefore well situated to introduce the drying platform technology. The role of OGADEP is essential to the success of the project, having an existing human infrastructure that can reach all the villages in the State. ADPs like OGADEP are in every state in Nigeria and can be utilized if the project is brought to scale.

UNAAB Micro-Finance Bank – Micro-Credit Partner

UNAAB Micro-Finance Bank Limited is the banking entity that serves the University community and the entire farming community around the University campus. The Bank is actively involved in loan services and small credit facilities for the farming population near the University. For this project, the bank acts as the main credit institution that guarantees

credit facilities for beneficiaries of the project and works closely with the NGO, SLIDEN AFRICA, who disburses the loans, monitors its use and ensures repayment.

SLIDEN AFRICA – NGO, Micro-Credit Partner

SLIDEN AFRICA is a non-governmental organization (NGO) based in Nigeria with offices in Kenya and Ghana. Established in 2000, SLIDEN AFRICA is comprised of a network of partners—professionals in the Agriculture, Development Studies and related fields. Their work is focused on empowerment of poor people in rural Africa through poverty alleviation, livelihoods development, skill enhancement and gender parity in development, research and information networking. Their current role in the project is to facilitate credit services to beneficiaries, though the program is currently on hold due to high default rates. This is their first experience managing a micro-finance program and it is not evident that they have the appropriate expertise to maintain this role. While the high default rate is not uncharacteristic for Nigeria, it is mostly due in part to the design of the program, which lacks an educational component (arguably necessary when lending to a population that has no experience borrowing money) and a community/ group approach that has been proven to create greater accountability and higher repayment rates.

World Bank – Funding Partner

The Agriculture and Rural Development Department of the World Bank provided the initial funding for this project through the 2008 Development Marketplace Competitive Grant process. Funding for the two-year pilot phase totaled $170,038 and was matched with $68,880 in non-DM funds ($21,180 from UNAAB and $47,700 from OGADEP for personnel costs). The World Bank Country Office, based in Abuja has provided exceptional leadership of the project under the supervision of Dr. Adubi, who also oversees FADAMA III and is interested in seeing the project be brought to scale.

FADAMA III – World Bank Community Development Partner

The most recent partner, FADAMA III, was introduced to the project by Dr. Adubi, the World Bank Country Team Leader, who oversees both the DM2008 project and FADAMA III. With a $450 million budget: $250 million from the World Bank and $200 million from the Federal, State and local government, FADAMA III builds upon the success of FADAMA I & II to increase the incomes of land and water resource users in a sustainable manner. The objective is to increase incomes in order to help reduce rural poverty, increase food security and contribute to the achievement of the Millennium Development Goals (MDGs). FADAMA III has the benefit of working in all 36 states and the federal capital territory and is already working in the communities where the DM cassava project currently operates and could help introduce the project to additional communities in the rest of Nigeria.

In addition to its presence in the rural agriculture community, FADAMA III offers a number of benefits to the DM project, including a group/community approach to development. Rather than targeting individual farmers or rural community members, FADAMA only works with groups within a community, usually comprised of women. The group dimension brings encouragement, accountability and greater sustainability. The difference is notable. After visiting numerous villages were the DM08 cassava project had been

targeted to individuals, a visit to a village where a FADAMA III/DM08 project was implemented in a group setting, was notable for the vibrancy and enthusiasm of the women. Together, they were setting goals and working to benefit their community. If brought to scale in partnership with FADAMA, the cassava project will be able to take advantage of the group model and capitalize on the energy and accountability that comes with group ownership. Further, Dr. Adubi expressed interest in including a micro-credit component to FADAMA's work that could be used for the cassava project and which would most likely include an educational/training component on money management and business skills and would be offered in a group context, providing incentives for repayment in the form of social pressure and group accountability.

Core Project Team (CPT)

A Core Project Team, composed of an agricultural extension expert/team leader, an agricultural economist, an agricultural engineer and an animal production expert from the University of Agriculture, Abeokuta along with the Director of Extension Services and the Assistant Chief Planning Officer from OGADEP, worked together to implement the cassava drying technology in Ogun State. In addition to the CPT, 12 Village Extension Agents, supervised by four Zonal Extension Officers provided field level extension visits. A staff comprised of local NGOs provided independent assistance for the Project Monitoring and Performance Assessment Team (PMPAT), who monitored all project activities and provided feedback on how to improve the project and achieve better results.

Alignment with Government and World Bank Strategies

The Government of Nigeria has demonstrated commitment to growing and expanding the cassava industry. In 2002, the Federal Government presented the Presidential Initiative on Cassava with the goal to achieve self-sufficiency in food production and to provide foreign exchange income for the country. The Initiative included mandates for the use of cassava products (namely cassava flour and ethanol) in certain industries. As a result, it reduced reliance on imports and boosted local industries involved in the processing of cassava products. The increased demand for cassava resulted in widespread job creation and benefited farmers throughout the country, providing employment opportunities for those previously unemployed. While the initiative helped to expand the cassava industry, it was later modified under the late President Yar'Adua and the changes went into effect in 2008. The revised initiative relaxed the previous cassava mandates, which in turn, reduced the demand for cassava products. As a result there has been some decline in the cassava industry ("Nigeria: The Presidential Initiative On Cassava," 2010). Despite the weakened mandate, the government remains supportive of the industry and the DM08 project can provide employment opportunities for those who may have been affected by the change.

The World Bank's strategy in Nigeria is a complement to the Government of Nigeria's and focuses on improving governance, maintaining non-oil growth and promoting human development. The Country Assistance Strategy (CAS) and the Country Partnership Strategy-CPS II (a detailed strategy representative of the major donor agencies including the Department for International Development (DFID), the United States Agency for

International Development (USAID), and the African Development Bank (AfDB)) outlines the Bank's full strategy along with the Bank's Agriculture Action Plan for 2010-2012 which endeavors to link small farmers to markets and promote the contribution of agriculture to environmental services that mitigate climate change. The Action Plan's strategies include raising agricultural productivity, linking farmers to markets and strengthening value chains, reducing risk and vulnerability (by increasing incomes), and enhancing environmental services.

The cassava project aligns with the goals of maintaining non-oil growth and promoting human development. The cassava industry represents a large non-oil industry that can be expanded and made more efficient to provide economic growth. Further, to the extent that it has already expanded, the cassava waste project mitigates the environmental damage caused by the sector's growth and also creates employment opportunities for the rural poor. The income generated by the program helps achieve the human development objectives by allowing farmers to earn additional income to cover basic necessities such as food, healthcare costs and school fees.

Assessment of Scalability of the Innovation

Given the success of the two-year pilot phase of the DM08 project and its alignment with the Nigerian Government and World Bank's strategies, the next step is to assess how the project could be brought to scale. In preparing a plan for scaling, we draw on the Management Systems International (Cooley & Kohl, 2006) three step, ten task framework for scaling.

Step 1: Develop a Scaling Up Plan

Task 1—Develop a Vision: the Project's vision will ultimately need to be decided in collaboration with the partner organizations. Based on communication with the World Bank and existing partners, a draft vision is: *to improve the lives of poor rural farmers by creating an income generating opportunity that provides economic growth for the country of Nigeria and mitigates harm to the environment.* If the goal is to expand the project not only beyond Ogun State, but also outside of Nigeria, the final vision should reflect the projected reach of the project.

Task 2—Assess Scalability:

Forces or Drivers:

In assessing the potential of a project to be brought to scale we look at the factors that influence the drivers of change—the credibility of the innovation, leadership capacities and commitment, champions, constituencies and incentives.

The credibility of the innovation is evident from the success of the pilot project and is reflected in the demand for the drying platforms and dried cassava peels. The project aligns with *traditional practices and cultural norms* by focusing on cassava processors and goat herders in a country where over 86% of the land is used for agricultural purposes. The

cassava industry is widespread throughout the southern and central states and small-scale goat farms have a presence throughout the country. The drying platform takes advantage of an existing industry and provides a product (cassava peels) that is already being used, but provides an improved product (clean peels that are dried off of the ground) and packaged as a product that goat feeders can purchase.

There has been widespread support for the project from agricultural extension agents working at the community level, leadership from OGADEP demonstrating state support, the University of Abeokuta, providing research and coordination as well as connection with other Universities and research institutions throughout Nigeria, and existing beneficiaries who are demonstrating the advantages of the drying platforms and feeding regimens to their neighbors. However, it is not clear that there is a main *champion* who is advocating for scaling up the project and who will mobilize support across the states. As evidenced in the literature, a champion of the project plays an important role in garnering the necessary political support and bringing together the partners needed to scale the project. In the absence of a clear champion, the project will need to rely on the funder and implementing agency to fill this role until a champion can be identified.

There are a number of benefits for scaling up the innovation—reducing environmental pollution from burning cassava waste in all regions where cassava is produced; increasing income opportunities for poor rural farmers which can then be used to improve access to healthcare, education and ensuring adequate food and shelter; and improving the health of livestock throughout the country. However, it is not clear that there are true *incentives* for the federal or state government to scale up the project. The benefits may be enough to motivate the government and partner agencies to expand the project but the project does not have the kind of incentives that would help ensure the cooperation of the needed partner agencies.

Once a plan to scale up is reached, mechanisms will need to be in place to hold the implementing organization *accountable* for scaling up according to the plan. Determining the appropriate mechanisms will in part depend on who the implementing organization is, but regardless, funding will most likely be in the form of a grant to the implementing organization with a clear grant agreement that outlines the roles and responsibilities of the partners. There will also be checks and balances with a partnership model. Before the project is implemented in new states, there will need to be a clear written plan that all partners agree to, outlining roles and responsibilities.

Spaces for Scaling Up the Innovation:

The innovation fits within the federal government's general plan for growth of the cassava industry, caring for the environment and human development. While the federal government was not directly involved in the pilot project phase, it may need to take a larger role in bringing the project to scale. It potentially offers both the ability to provide funding and the capability of bringing the necessary partners (including the Ministry of Agriculture/ ADPs) together throughout the country.

At the State level, the Agricultural Development Programs (ADPs), with their network of extension workers operating in rural communities, have the *capacity* to provide the personnel needed to bring the innovation to scale. OGADEP, the ADP for Ogun State expressed confidence that ADPs throughout the country would be amenable to adopting the innovation because of the project's fit with the ADP's mandate. However, funding may be needed to cover the costs of fuel and incidentals for the Extension Officers to meet with community members and spread information about the innovation.

Scaling of the innovation will require relatively modest *funding*, primarily for personnel costs of the implementing organization to coordinate all partners and for the materials and labor to construct the demonstration platforms. Once the innovation has spread, farmers will be able to see the benefit of the drying platform and the innovation can spread by word of mouth. It is likely that the state government can provide indirect financial support in terms of personnel (e.g., extension officers). At the federal level, the government has the capacity to support the project financially but they will need to be included in the discussion to assess their willingness to support the project.

Task 3—Fill Information Gaps: If the project goes to scale, appropriate partners will need to be selected in each new state. The University of Agriculture in Abeokuta can provide recommendations on Universities and Research Institutes. There is an alliance of NGOs in Abuja that provides information on the NGOs working in each state and what their specialties are. The World Bank Country Office can also lend its expertise in selecting the most appropriate NGOs to work with. FADAMA III may implement a micro-finance component to its program and they may be able to manage the micro-credit component of the project or work in partnership with an NGO who can manage the loans.

Task 4—Prepare A Scaling Up Plan: Once a decision is reached to scale the project, a more detailed plan will need to be created for *how* the project will be scaled, the *degree* to which it will be scaled (what communities and States will be targeted for inclusion), what *partners* will be included (it may require different partners in different states), what level of *funding* is needed, over how many years (*timeframe*); *who* will fund the scaling up and whether there will be matching requirements.

Step 2: Establish the Preconditions for an Effective Scaling up Process

Task 5—Legitimize change ("getting the issue on the agenda"): The cassava drying project benefits from the government's expressed support for expanding the cassava industry, creating jobs and taking care of the environment; however, without a champion, significant work remains to get the issue on the agenda of all levels of government and to bring in the necessary partners in each new state.

Task 6—Build Constituency ("building bridges"): The two-year pilot phase of the project succeeded in building constituency among the current partners. If the project expands to new states, it will require additional partners. DM08 partners play a critical role in identifying their counterparts in other states (e.g., agricultural development programs, research institutes, NGOs) to bring on as new partners to replicate the project in other states.

Task 7—Realign and Mobilize Resources: DM08 funding has been expended. If the project is brought to scale, it will require funding commiserate with the size of the expansion. The World Bank will need to determine if it is able to provide funding to scale the innovation or if it can find other funders to support the project expansion. The hope is that the World Bank will not abandon the project after the two-year development marketplace funding but that it will work with the federal government and other funders, to take advantage of the success of the project and maximize its impact. If the World Bank does not provide or facilitate funding, the project partners will need to identify a champion who can seek out other sources of funding to help bring the project to scale.

Step 3: Implementing the Scaling up Process

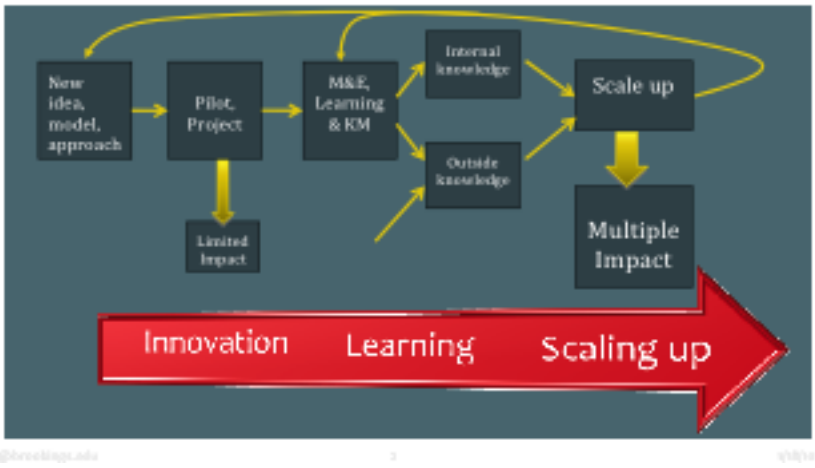
Task 8—Modify and Strengthen Organizations: This task will depend on what partners are selected in each state the project expands to. Of the initial partners, the coordination of the micro-finance component will need to be modified (a new NGO or FADAMA III may be selected to take over) or strengthened (a new lending model implemented to ensure higher repayment rates).

Task 9—Coordination Action: During the pilot phase, the University of Agriculture in Abeokuta successfully coordinated the work of the partners. An increased level of coordination will be required to bring the project to scale; it is possible that UNAAB may continue this role, or a large NGO could take over. Alternatively, the federal government could potentially take a lead coordinating role. Whatever agency coordinates the scaling process will need to have the clout and respect to manage any potential tensions between partners. While relations between the partners during the pilot phase were generally very positive, there was some indication of tension between the state level Agriculture Development Programs (ADPs) and FADAMA III. Interviews with World Bank Country Office and UNAAB representatives mentioned existing tension between FADAMA III, who provides the funding for community development projects and who has the mandate to implement programs independently, and the ADPs who want to control the projects. The tension appears manageable but nevertheless, the coordinating partner plays an important role in mitigating and clarifying the roles of all partners.

Task 10—Track Performance and Maintain Momentum: During the pilot phase, UNAAB established a monitoring and evaluation team that went into the communities where the drying platforms are installed and met with the agricultural extension agents and the beneficiaries of the project (cassava processors/ driers and goat herders) to monitor the performance (e.g., feeding regime, health and growth of goats, marketing and sales of dried cassava peels, increase in income). The evaluation and monitoring team was comprised of members from UNAAB (the University), OGADEP (the State ADP), and SLIDEN AFRICA (Micro-credit NGO). A similar monitoring and evaluation team will need to be established in each state that the project is implemented in, in order to track performance and maintain momentum by listening to the local communities and beneficiaries and spreading information on the value of the innovation and increase adoption of the technology.

Type of Scaling

Building on the success in Ogun State, the project can be scaled by *replicating* the DM08 project in additional states. IFAD (the International Fund for Agriculture and Development) provides a conceptual model for scaling up that can be applied to the case study at hand (Linn & Hartmann, 2010). Their model focuses on the organizational and institutional aspects of scaling—the drivers of scaling up and the financial, political and organizational components required for scaling—and emphasizes the importance of monitoring and evaluation.



Source: (Linn & Hartmann, 2010)

The current case study began with the *idea* to prevent the burning of cassava peels by drying them and turning them into a marketable product that could be used as nutritious feed for goats. The idea was then tested during a *pilot project phase* in Ogun State with the help of DM08 Marketplace Development funding. A team regularly *monitored and evaluated* the project, collecting data and interviewing the beneficiaries. From this *learning* exercise, we discovered important lessons that inform *if* the project should be scaled and how it should be modified if it is brought to scale. Lessons learned include:

- Goat farmers were willing to pay for dried cassava peels.
- When providing micro-credit, the distance between where the farmers live and work and where they need to complete the loan paperwork discourages poor, uneducated farmers from securing loans and taking advantage of the innovation. In more remote communities, the only people with drying platforms are those that did not require loans and who were therefore, not the most vulnerable in the community.
- Dried cassava peels are desired as livestock feed for animals besides goats (e.g., pigs, cattle).
- The price of cassava peels varies depending on the demand and therefore the income generating benefit varies widely depending on the location.

- Introducing the innovation to community groups instead of individuals is perhaps a more desirable model for the number of people that it benefits and the support that the women provide each other.

The pilot phase provides the benefit of learning what worked, what didn't and how the innovation can be improved if it is brought to scale. Based on the success in Ogun State, the project can be replicated in additional states to maximize the benefit of the innovation.

Implementing Organization – Strengths and Weaknesses Analysis

The implementing organization will be specific to each state and selected in the next phase of planning. FADAMA III has the organizational capacity and national presence to implement the project but is limited by its funding time frame, which is set to expire in December 2013. UNAAB was the implementing organization during the pilot phase and will continue to play a role in the project expansion but may not have the geographical reach to serve as the implementing organization outside of Ogun State. From the pilot phase it is evident that the University is a great asset to the project and offers the expertise, vision and capacity to implement the project.

As a research University specializing in agriculture and development, UNAAB offers the *expertise* of numerous researchers including Dr. Adebayo, the project team leader who originated the initial project innovation. Dr. Adebayo is a Senior Lecturer at UNAAB and has worked for 21 years as an extension officer, rural development expert and lecturer. His area of expertise is in the uptake and dissemination of agricultural innovations in smallholder farming systems, management and sustainable funding of agricultural development as well as rural livelihoods and management of the environment.

Housed within the University of Agriculture, the College of Agricultural Management and Rural Development (COLAMRUD) operates with the objective "to assist in the attainment of self-sufficiency in the production of basic food; contribute to the marked increase in the production of agricultural raw materials to support the growth of industries; to enhance the production and processing of export produce; to enhance the rural employment opportunities and to evolve effective ways of protecting agricultural land resources from ecological degradation ("College of Agricultural Management and Rural Development (COLAMRUD)," 2011). The objectives of COLAMRUD and UNAAB with the DM08 project helped to ensure the integrity of the project implementation in Ogun State. This alignment of vision is an important component in the selection of an implementing organization in other states.

As the recipient of numerous research grants, a University has the experience and *capacity to manage the funds* if the project is brought to scale. With the need to maintain its reputation in the field, the University has the incentive to provide appropriate oversight over the project. Because the administration of grant funding is separate from the implementation of the project, it offers additional oversight to ensure that the integrity of the project is maintained and that the funds are used for their intended purpose.

As one of the top University's in the country, UNAAB maintains relationship with the other Universities and research institutions within Nigeria specializing in agriculture. This *relationship network* can be leveraged to help bring together the appropriate partners in each state where the project is implemented. Prof. Segun Apantaku, Dean of COLAMRUD confirmed the commitment of the University to do whatever they can to help bring the project to scale.

UNAAB and similar Universities provide the additional benefit of being a neutral partner, free of the competitive relationship of FADAMA and OGADEP, and with the respect and proven ability to work with multiple partners.

The University benefits from the leadership of Dr. Adebayo, the project team leader. While his leadership has been valuable to the project it is important that the implementing organization not be dependent on a single individual. UNAAB was able to utilize a team of researchers from the University to avoid this potential pitfall and in the future could consider utilizing students in the training and dissemination of the innovation.

Partner Organizations

Partner organizations will need to be selected for every state in Nigeria that the project is implemented in, and while the roles and responsibilities will remain fairly uniform, the actual organizations will differ from state to state. The pilot phase provided a successful model that can be replicated in additional states.

State Agricultural Development Programs

An essential partner to the project is the Agricultural Development Program (ADP) operated within every state in Nigeria. The ADPs provide a network of Agricultural Extension Officers who are able to disseminate the innovation to the local communities. The Core Program Team trains the extension officers who then demonstrate the benefits of the drying platform to the farmers in the rural communities where they work. The extension offers not only introduce the innovation to potential beneficiaries, they are also able to help with the market mechanism by connecting buyers (goat farmers) with sellers (cassava processors). Because they have a close relationship with the villagers, they are able to recommend potential beneficiaries for micro-credit loans. Without the presence of the extension officers the innovation would be far more costly and difficult to implement. The partnership with OGADEP in Ogun State has worked well and Mr. Niyi Phillip, the Project Manager for OGADEP conveyed confidence that ADPs in other states would be willing to partner with the project.

The ADPs receive their funding from the state and would most likely be able to offer the use of their extension officers but they may not have room in their budget for incidentals (e.g. fuel) that the extension officers would need to disseminate the innovation. A more detailed discussion is needed with each ADP as part of the planning phase for scaling.

Coordination between the implementing organization (UNAAB), the Core Program Team, FADAMA III and the ADP would be relatively straightforward. The Core Program Team trains the extension officers, the extension officers disseminate the innovation in coordination with FADAMA III and the monitoring and evaluation group ensures that the innovation is being implemented appropriately. Because FADAMA III and the ADPs are already working together in a similar capacity, it should be a natural synergy but in situations where there is conflict over roles, the project team leader will be a neutral party that can mitigate and coordinate all partners.

FADAMA III

The development objective of the World Bank-funded FADAMA III Project is to sustainably increase the incomes of rural communities. By increasing incomes, the project will help reduce rural poverty, increase food security and contribute to the achievement of a key millennium development goal. The project aims to directly deliver resources to the beneficiary rural communities, efficiently and effectively, and empower them to collectively decide on how resources are allocated and managed for their livelihood activities (World Bank, 2008).

FADAMA III has the benefit of already working throughout Nigeria in the communities that would benefit most from the drying platform innovation. In some areas they are working directly with cassava processors, in which case a drying platform can be easily added to provide additional income to the women who use it. As previously discussed, FADAMA III uses a group/community approach to development which allows a greater number of people to benefit and offers the encouragement and support that comes from working together. The group approach is also beneficial when offering micro-credit. Dr. Adubi, the World Bank Team Leader of FADAMA III and the DM08 project indicated that FADAMA III is currently studying the use of micro-finance in South-East Asia and considering implementing a micro-credit component to the work of FADAMA. If implemented, the loan program could potentially include the cassava drying project. FADAMA III is interested in using the group model to provide accountability for the borrowers and to include educational trainings on how to manage money, repay loans, and build a business. An NGO may still be involved to manage the micro-credit accounts and payments. FADAMA III provides a presence in the rural communities, an expertise in agriculture and development, a group model and potentially, access to micro-credit for the users.

The main drawback to FADAMA III is that its funding and mandate expire at the end of 2013. Already in its third phase, it is possible that funding will be renewed for a FADAMA IV but this was not discussed and the likelihood of this is not known. With less than a year and half left of operation, FADAMA III can propel the scaling process but cannot be counted on for the full timeframe needed to bring the project to scale.

University or Research Institution

There are three Universities of Agriculture in Nigeria and several other research institutions that could serve as partners in the different regions where the project may be scaled. The benefit of maintaining a regional University or research institution in the scaling phase is to help maintain the integrity of the program with their expertise in animal science, agriculture and development. While the innovation itself is relatively simple, we learned from the pilot phase that driers will often try to modify the drying platform (e.g., dimensions and materials used), which can reduce its effectiveness. Further, maintaining the appropriate feed regimen for the goats is important to maintain optimal results. Aspects of the innovation may need to be adjusted to adapt to regional differences. Having a partner with the technical expertise to help with trainings, compliance and modifications is important to maintaining the integrity of the project. The specific Universities and research institutions in each state will need to be identified during the planning phase. Both the Dean of COLAMRUD and the Project Team Leader at UNAAB expressed their willingness to help identify and recruit the necessary research partners.

NGO (Management of Micro-finance)

The current partner NGO, SLIDEN AFRICA works throughout Nigeria but their presence outside of Ogun State (location of the pilot phase) is minimal. While Dr. Adebayo, the Project Team Leader is comfortable with maintaining their role as a partner based on their experience and knowledge of the project, there are NGOs with greater expertise that could be brought in. Depending on the geographical reach of the NGOs, it might be necessary to partner with different NGOs in each State where the project is replicated. Compared to other countries in Africa, Nigeria is not considered a friendly environment for NGOs; as a result, it lacks a large presence of international NGOs but does maintain a network of local NGOs that can be used. During the planning phase, the World Bank Country Office, in connection with the alliance of NGOs in Abuja, should be able to offer advise on which NGOs to consider for partnership.

Depending on the other partners in each State, the main role of the NGO will most likely be to manage the micro-credit component of the project. If FADAMA assumes this role, they may still want to work with an NGO to manage the loans and repayment. The team should wait to select an NGO partner until it is clear what the needs are that the partner will be addressing.

Intermediary Organizations

It is not evident that an intermediary organization will need to be brought in for the scaling up process. With the existing model, UNAAB will be able to coordinate bringing in the appropriate partners in each State that the innovation is introduced in. Given the number of partners involved and their individual expertise, the partners collectively contain the skills needed to bring the innovation to scale. It is possible that the implementing organization could benefit from the expertise of a consulting firm to help with marketing

the innovation and preparing the communication, but this is not essential to the success of the project.

There remains an important role for the World Bank, both as a funder and as a partner with FADAMA III. The project has the support of the government and a network of partners available to bring the project to scale. By leveraging the presence of ADPs and FADAMA III in the rural communities, the cost to introduce the DM08 innovation is modest. However, no outside funding for the scaling process has been identified to date. Funding from the Federal Government of Nigeria, the World Bank or an organization introduced by the Bank, would help make the scaling possible.

Next Steps

The next phase of the project will be to decide if the innovation should be brought to scale and to secure funding. This will include involving the Federal Government of Nigeria and assessing the possibility of its role in helping to facilitate and finance the replication of the project throughout Nigeria. The World Bank Country Office can play an important role in bringing in the Federal Government in the next phase and securing the key partners needed to replicate the project. One possibility is to organize a conference that brings the partners together and introduce the innovation to the Federal Government. Once funding has been identified, the planning can proceed.

Conclusion and Recommendations:

Nigeria is a country with the organizational capacity and resources needed to bring the DM08 innovation to scale. As the leading producer of cassava in the world, Nigeria has enormous potential to replicate the cassava-drying project throughout the country and take advantage of the increased economic and environmental benefits. With the infusion of the necessary funding, the benefits experienced in the DM08 pilot phase can be more fully realized in the other States within Nigeria and beyond.

It should be noted that while the project meets most of the criteria necessary to scale up throughout Nigeria, it lacks a champion and true incentives. A champion plays an important role in advocating for the innovation and bringing together the necessary players; without a champion, the project will require the cooperation of all partners to go to scale. Further, the innovation boasts a number of benefits—from economic growth, to mitigating environmental degradation—but lacks explicit incentives to ensure replication.

Nevertheless, the project has enormous potential to be scaled. From the two-year development marketplace funding, the project has demonstrated evidence of indigenous organizational and leadership capacity; demand for the drying platform and clean, dried cassava peels as a marketable product that goat farmers are willing to purchase. The project proved to be financially viable with lower building costs and higher revenue gain than expected. The partners have expressed their commitment to expand the project and bring on other partners if the necessary funding is secured. If scaled, the project will be able to benefit additional rural communities throughout Nigeria, raising the incomes of

poor farmers, helping them to meet their family's basic needs (e.g., food, housing, education and health) and improving the health of all Nigerians by reducing the release of environmental toxins from the burning of cassava peels.

We recommend that the innovation be brought to scale and offer three recommendations for the scaling process:

1.) ***Re-introduce a micro-credit component*** to ensure that the poorest of the poor have access to credit and can therefore, take advantage of the innovation. The original micro-credit program run by SLIDEN AFRICA had a default rate of 68%; a rate that proved unsustainable to maintain and the program was subsequently put on hold. Without access to credit, the innovation will primarily benefit those with the economic means to build a drying platform. According to the World Bank Country Office, the default rate is not unusual for Nigeria but both the implementing agency and the World Bank Office agreed that a lower default rate is possible. Modeling successful micro-credit programs in South-East Asia, FADAMA III is considering providing micro-credit and utilizing its group model to provide greater accountability and financial education to complement the loans. Including an educational component to the loan program is important to ensure that this new population of borrowers have the skills needed to grow their business and repay the loans. Whether through FADAMA III, a new NGO or SLIDEN AFRICA, the micro-credit component should be reintroduced and revised to ensure a lower default rate while still providing loans to the poorest of the poor.

2.) Increase the benefits of the project by ***strengthening the market mechanism***. The original project created a new market by introducing a product (dried cassava peels) that could be sold for profit. While there was sufficient demand for the project at the pilot level; scaling up the project will necessitate selling a greater quantity of dried cassava peels and would benefit from a plan to market the cassava peels to goat farmers and other livestock owners (the best results are seen in goats but cassava peels can be used as feed for pigs and cattle as well). When the cassava driers are trained on the benefits of the drying platform they could also receive training on how to market their product to a larger consumer base. Currently most cassava processors sell the peels informally to neighbors or at the local market. Uniform branding and packaging of the product may also help build name recognition and a reputation for the product that would increase demand.

3.) ***Partner with FADAMA III and adopt the community-centered model***. FADAMA III is the most recent partner, brought on after the original pilot phase ended. The World Bank, as a funder of FADAMA III can provide further support to the DM08 project by utilizing the network of FADAMA III projects throughout Nigeria and the group model it uses with its development projects. Further if FADAMA III employs a micro-credit program, this could potentially be used to provide loans for the cassava processors. Keeping in mind that FADAMA III is only funded through December 2013, its relationship with the project should serve primarily as an entry point to new communities throughout Nigeria and adoption of a group-focused model.

The DM2008 project, *Adding Value to Waste in the Cassava Processing—Goat Keeping Systems in Nigeria* (4345) offers a simple innovation that reduces environmental degradation and provides additional income to a rural poor population. The pilot phase demonstrated demand for the drying platform, which was successfully implemented in a total of 33 villages—21 more than originally planned, providing an average increase in income of $635 USD a year. Goat farmers proved their willingness to purchase clean dried cassava peels, which they fed to their goats and saw a return on their investment in the form of healthier goats, who reached their full growth in half the time. The success was due in large part to a partnership that leveraged the network of agricultural extension agents and benefited from the training and technical expertise of the economists and scientists at UNAAB, access to credit to build the drying platforms and later, the FADAMA III community model and their experience increasing incomes in rural communities. The project aligns with the goal of the Federal Government of Nigeria to expand the cassava industry; the World Bank, to care for the environment and provide non-oil growth and the Millennium Development Goal to halve poverty by 2015. With the infusion of modest funding, the innovation can be brought to scale and benefit thousands of rural farmers in Nigeria and beyond.

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Annex V: Mapping the Roads

The Heller School for Social Policy and Management

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Mapping the Roads from Development Marketplace Agriculture and Rural Development Projects to Sustainable Practice

Applying Scaling Up Theory to DM/ARD projects with Scalability Potential

Prepared by a Team from
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Table of Contents

Executive Summary

For more than a decade the World Bank has been funding Development Marketplace (DM) projects that test or demonstrate innovative approaches to solving significant development challenges. In 2008, the 22 DM projects were in the agriculture area, focusing on three sub-themes:

- Linking small farmers to input-output markets;
- Improving land access and tenure for the poor;
- Promoting the environmental services of agriculture in addressing climate change and biodiversity conservation.

The Agriculture and Rural Development Department (ARD) of the World Bank has closely followed these 22 funded projects with careful monitoring and the creation of a community of learning among the staff of these projects. Recognizing the emerging potential of these projects, ARD and DM are seeking ways to use the learning from the projects to design a series of tools and recommendations which can be used to help determine the suitability of a project to be scaled up.

This current study flows from concerns by ARD and DM that the innovative potential of the projects be used more effectively. The study examines current literature on scaling up, develops criteria for identifying projects with potential for scaling up and offers guidelines for scaling up, and makes recommendations on the selection of three projects for inclusion in a case study.

The considerable literature on scaling up indicates that development practice has had a strong focus on support to innovation but less attention has been paid to scaling up innovative ideas that have begun to demonstrate promise. Scaling up is a complex, often context-specific, process for which there are no precise guidelines. Moreover, pilots or demonstrations of innovation are often not designed with an eye towards creating a foundation for scaling up. Instead, the focus is on implementing the innovative idea – not on building evidence that the innovation works to deliver intended benefits nor creating necessary plans and organizational capacity for scaling up. Moving from an innovative idea in a small project to a large scale intervention is an iterative process which involves clarity about:

- The innovation itself and the theory of change that explains how the innovation works to produce the intended outcome;
- The key actors and stakeholders in the innovation;
- Alignment of the innovative project and its managing organization with the strategies and goals of the government and of World Bank projects.
- Potential for scalability, including the factors or drivers of scaling and the conditions in the environment that encourage scaling up;
- The type of scaling up recommended;
- The strengths and weakness of the scaling up organization (and its key partners);

- The need for support (or accompaniment) from an intermediary organization during the scaling up process; and
- Planning for scaling up, including plans for careful evaluation of the implementation process and of the impacts of the innovation.

The report recommends that the World Bank conduct case studies on three of the 22 projects:

- Using Cassava Waste to Rear Goats (Nigeria 4345);
- Value Chain Development for Textile Products (Mongolia 6251); and
- Waste to Wealth by Incubating Mini-Cold Storage Technology Ventures (India 4893).

Other projects also ranked high on an assessment of their potential for scalability. These three were recommended because of the diversity they represent in terms of geography, types of adopting organizations and partnerships, implementing mechanisms, and the quality of governance. Moreover, each of these three projects had impacts across the three subthemes, particularly linkages with markets and the contributions of agriculture to environmental services.

Many of the projects have potential for scaling up within the country where they have been tried or through replication in other countries. Some projects may also have potential for scaling through private equity investments. This report recommends that the World Bank use its influence as a thought-leader in development practice and its convening power to support scaling up of many ARD-Development Marketplace projects.

Mapping the Roads from Development Marketplace Agriculture for Development Projects to Sustainable Practice
The Heller School for Social Policy and Management
Brandeis University

Introduction

There is an urgent need to finding ways to expand the impact of innovative technologies, ideas and approaches that promote development in poor areas and contribute to an improvement in the quality of human life. Scaling up or diffusing innovations, as a way to address this need, has been a topic of inquiry for many decades. The last decade has seen an intensification of attention to scaling up innovations to make an impact on development goals. This considerable research and analysis indicate that we lack a single theory or formula for scaling up development innovation. Nonetheless, their findings do provide us with some conceptual frameworks and tools for assessing the scalability of innovations, for identifying the approaches, drivers, and spaces for scaling-up as well as practical guidance on leading, planning and managing the changes required for successful scaling. Clear lessons of the literature suggest that context matters; that ongoing and evolving monitoring, evaluation and learning are critical; and that successful scaling up requires both time and the right kind of sustained support to assure the emergence of local capacity to manage and sustain innovation.

This study, prepared for the Agriculture and Rural Development Department (ARD) of the World Bank, is not a traditional review of the literature on scaling up. It does rely on the rich literature of the past decade[66] – including definitions, conceptual models, frameworks, criteria, steps, tasks and case studies – to build a framework for assessing the experience of the 2008 ARD/Development Marketplace projects and for recommending which of the projects show promise for scaling up. If one thinks of scaling up as being a multi-stage project, this study focuses on an early stage of decision-making about what innovations can and should be scaled up. This stage is a precursor to the stages of planning scaling, and of implementing the scaling up plan.

This current report, while it must stand on its own merits, acknowledges a deep debt to the systematic analyses of the past decade aimed at enabling development practice to multiply successful innovations and models that contribute to human well-being and dignity. Drawing on this knowledge to create an intellectual foundation, we seek here to create and identify criteria, guidelines and tools that will start promising ARD Development Marketplace projects on the path to sustainable and expanding impacts, recognizing that there is more than one road to sustainable, scaled up impact.

[66] There are several excellent, systematic attempts to look at scaling up. The work of Cooley and Kohl, Linn and Hartmann, Simmons and colleagues, Binswanger and Aiyar, IFAD, the World Bank, WHO and GTZ, among others are cited in the references.

The 2008 crop of ARD Development Marketplace projects are implementing innovations that may not have been fully tested yet. Still, there is preliminary evidence that the innovation(s) may provide effective and that efficient contributions to development goals and the legitimacy, organizational capacity, leadership, partnerships, financial viability and ability to learn and change exist at a level that justify moving toward one possible form of scaling up.

Selecting potential candidates for scaling up has some similarities to the decision processes of a venture capitalist. There is the need to assemble the evidence to justify the selection, but in the case of a new agriculture and rural development innovation, some of this evidence may not yet exist. There is also the need to make judgments on those criteria that are not easily measured (for example, the nature of the leadership). Finally there is risk. There is risk of selecting a project which is not suited for scaling because of variables that could not be identified at the time of selection. Equally, an innovation with real potential may not be selected, again because of incomplete information. Thus the road toward sustainable scaling is not a single straight path; it may be incremental, there may be detours, and there may even be a need to close the road down or start on a new road.

Thus the outputs of this current work include criteria for selecting innovative ARD/Development Marketplace projects to begin a path toward scaling up. The criteria will be applied to the 22 ARD Development Marketplace Projects approved in 2008, all of which are worthy candidates for scaling up. The criteria will be used to recommend three projects, for which case studies will be developed, keeping in mind that those not selected may have high, but not fully apparent, potential for scaling. For these projects the path to scaling may be more complex; or the expected impacts appear to be more limited in scope than those projects recommended. Additionally, this study will recommend a framework, or set of common guidelines for conducting the three case studies. Case studies should provide the basis for the next stage of the scaling up process. They should a) establish the form of scaling, b) identify likely organizations to lead the scaling, c) provide an information base for initial planning and d) identify the institutional, intermediary and financial support required. The case studies should provide a systematic information base and a framework for next stages. Questions that follow from this relate to how promising innovative work matches with ongoing Bank activities, as well as to the role of the Bank as a convener, a thought leader in new approaches and a broker with other donor partners who may seek a long-term partnership with the scaling up of an important innovation.

The organization of this report starts with acknowledgement of the reasons that give this topic urgency. Second, it moves to definitions of innovation and of scaling up. In doing this, three dominant conceptual models of the scaling process are compared and the overlaps and differing languages used are drawn out. Third, it identifies and explains a checklist of factors which drive and constrain scaling up efforts. Fourth, it identifies and explains criteria for a preliminary desk review of the 22 projects used in recommending three projects for in depth case studies and recommends projects to be included in these case studies. Fifth, it shows how those criteria can be expanded in a guideline for producing individual case studies that are contextually unique but which provide evidence for comparison on a broader scale. It will suggest that these case studies should be a useful

foundation for deciding whether and how to scale up, as well as how to plan the scaling. Sixth, the report returns to the conceptual models in the second step and makes recommendations on a small number of options open to the Bank for the implementation of scaling. Finally, the report identifies tools that may be useful in the assessing scalability, and in the subsequent planning and implementation of scaled up projects.

I. Why focus on scaling up?

The Ashoka Globalizer Social Impact online discussions refer to the failure to make good use of innovative models:

> *"Breakthrough innovations too often remain local.* ***We reinvent the wheel****, and fail to bring innovations to where they matter."*

IFAD is more direct: *"effective scaling up is a key measure of successful innovation"* (in Linn 2010, 4). If there is no impact at some scale, there is no innovation (See also Roob and Bradach 2009).

Human capacity to innovate outstrips the capacity to transfer innovative approaches to broad numbers of people, and particularly to those who are traditionally marginalized. Excitement and glamour adhere to innovation. Attention withers during the long slog of implementing effective and efficient innovative practices. We reward innovation. Innovation can be exciting and bring quick rewards. The Stanford Social Innovation Review suggests,

> *"The social sector invests intensively to foster innovation, but seems to have less enthusiasm for mastering the skills of transplanting successful innovations to other needy locales."*[67]

The task of expanding the impact of innovative changes - or scaling up - is an old challenge that has new urgency. The difficulties of meeting the Millennium Development Goals; the increasing concerns about persistent poverty, the bottom billion, and growing inequalities intensify the priority given to expanding solutions which promise to deliver benefits. Donor demand, the engagement of the private sector and social entrepreneurs, the role of new and large private foundations, and critiques of aid effectiveness add to this growing interest in scaling up. The Bill and Melinda Gates Foundation, for example, is investing in scaling up technologies for preventing and treating both major diseases and neglected tropical diseases. It also funds its grantees to undertake rigorous evaluations of innovative models in order to lay the ground for scaling up. The Paris Declaration on Aid Effectiveness (OECD 2005) frames its commitment to aid effectiveness in terms of a broad definition of scaling up and accountability for results. Demand for scaling up innovations challenges our thinking about how development assistance is conceived and delivered and how actors in development practice work together. The demand side for scaling up innovative answers

[67] http://www.ssireview.org/articles/entry/disseminating_orphan_innovations

offers the opportunity for new thinking as well as the challenge to clarify what is meant by "innovation."

II. Definitions and Concepts

Defining Innovation

One might be forgiven for thinking that there are as many definitions of innovation as there are innovations. The objective here is to identify core elements of innovation in sustainable agricultural and rural development that can be applied to criteria for scaling up. Innovation implies "new"; the literature agrees that it can be new technology, new processes, new systems and structures, new networks or new behaviors. Frequently, it is a combination of these types. However, not all innovation is new. Innovation can be an old idea or technology applied or successfully disseminated through new processes, systems and structures.

We often think of innovation as a technological change. Innovation can be seen as a specific technique - a new method of irrigation in dry areas, for example. More often, it is a combination of new technology with processes, systems or practices - such as a set of incentives (credit; risk reducing measures) to persuade farmers to adopt the innovative method of irrigation for dry areas. Innovation is often also a **process** that may result from, and contribute to, adoption of the new technology, system, or behavior. We may see innovation as something like a new irrigation technology that has been tested and demonstrated to be able to increase yields under particular soil and climate conditions. However, such new technology does not in fact become an innovation until it is adopted and incorporated into general practice. Change does not exist until innovation becomes practice. Technology needs to be combined with processes that allow adoption. **Capacities**, **structures** and **systems** that support the implementation are also necessary components of this process.

As noted, many innovative technologies are not new—they are resurrections of old knowledge. What is new is the process of adoption, which becomes part of the basis for scaling up. There are many possibilities, or **theories of change**, for this process of adopting innovation. Using some of the tools for analyzing the (often implicit) theory of change inherent in a project's innovation forces one to make explicit the actions required to turn innovative ideas into practice, as well as the assumptions underlying those actions and their effects.

Innovative change can be seen on more than one level. It can be the introduction of an innovative model to solve a particular problem or it can seek to expand the capacity to solve problems. An example from a case study in Laos illustrates this. A project in Laos identified a number of simple changes in small farmer agricultural operations that could increase productivity or minimize labor inputs (Millar and Connell 2010). These included feeding forage to fish and planting forage near working crop fields so that farmers could carry forage home each night for livestock and fish. Each of these innovations could have been communicated to farmers as a single improvement, but in this case the changes were

developed through a community based process (here the method was Farmer Field Schools), which focused on developing a capacity to solve problems on an ongoing basis.[68] The innovative model was more than a single productive change - it was used as an opportunity to transform farmers' approaches to solving problems. We will examine this later as well look at theories of change as a criterion for scalability.

Innovation can be seen as a first level on a hierarchy of best practices for scaling up. In a 2003 study The World Bank/ARD identified five categories of "best practice," with "innovation" representing the initial level and lacking significant evidence. This categorization has been used by others (Cooley and Kohl 2006) as a useful guide to specifying the nature of the innovation to be scaled up. The significance of the categorization is that we need to look for the level of evidence that exists for the new practice and determine whether it has been tested across different contexts. In theory, a scaling up process would begin with the lowest level in the hierarchy—that of innovation (see table below). In the reality of the Development Marketplace, the innovation - most likely the technology part of the innovation - may have already been tested in one setting but the Development Marketplace may be testing the technology in a new setting with different, innovative approaches to implementation.

The implication for case studies of Development Marketplace projects is that we need to be clear about the level of innovative practice, how much evidence exists about a project's effectiveness and efficiency and at what level evidence needs to be developed as scaling efforts go forward. In practice, one would expect the Development Marketplace projects to fall at the lower level of the hierarchy below. Cooley and Kohl offer a different taxonomy of projects that may be considered for scaling. They list pilot, demonstration, capacity building, policy (advocacy), and service delivery projects. In their work they focus on "pilot" projects, which may be testing an untried innovation or applying a demonstrated model to a new site or different problem. They refer to the common donor practice of calling many small projects "pilots" despite the absence of an innovation. Cooley and Kohl suggest using the term "model" instead.

The significance for this study and the subsequent case studies is that defining the level of best practice is important for determining if scaling up is both possible and advantageous. The more testing required of the practice to be scaled, the more attention required for evidence on the effectiveness and efficiency of the model, and more need to design criteria or milestones for deciding whether to continue with scaling up efforts.

[68] See Chris Argyris and the concepts of single loop learning (solving one problem) and double loop learning (learning how to solve problems).

Proposed state-of-practice classification system

State of Practice (Science-Based Practices+)	*Level of Evidence*	*General Applicability*
Policy principle, principle* Policy+	Proven in multiple settings, replication studies, evidence quantitative, scientific	Consistently replicable, widely applicable "truism" essential for success
Best practice* Protocols, codes of practice+	Evidence of impact from multiple settings, meta-analyses, expert review	Demonstrated replicability, limited risk
Good practice, better practice* Exemplary+	Clear evidence from some settings, several evaluations	Promise of replicability, medium risk
Models+ Lessons learned*	Positive evidence in a few cases Program evaluations, conference workshops	Limited number of settings and experiences
Promising practices, state of the art*	Unproven in multiple settings, anecdotal evidence, testimonials articles, reports	High risk
Innovation	Minimal objective evidence, inferences from parallel experiences and contexts	New idea, no previous experience; highest risk

World Bank, 2003

Innovation – What are we scaling up? Going forward, we assume that innovation is, as Simmons describes it, not one change, but a package of changes. In looking at the ARD Development Marketplace projects, we can see that what is being scaled up is not a single innovation, but rather several components that may include a technical innovation as well as innovations in process and organization structure, systems and capacity.

Innovations, Goals and Values. Innovations do not exist independently of individual and organizational goals and values. The urge to innovate rises from a demand for change and the need to solve a problem when no current practice seems to work. The literature addresses this in several ways. Critically important is keeping the focus on the target clients and the intended benefits. A World Bank study on scaling up good practices in rural development (2003) noted the dangers of benefit capture, or losing sight of poor and marginalized populations.

Many agencies ground their definition of scaling up in the pursuit of goals in normative rationales: human rights, human dignity, equity, empowerment, focus on the poor and vulnerable (WHO 2009; Simmons 2007; Mangham 2010). The Development Marketplace, and ARD, in the 2008 cohort of DM projects, sought to support and demonstrate innovative solutions to challenges in agriculture and rural development. While there is concern surrounding the effectiveness of innovations and their potential efficiency, the Development Marketplace projects also aim to serve the goals and priority of clients, discussed below.

Linking Innovation to World Bank Goals, Strategies and Strengths

This framing document on innovation and scaling up impact is conducted in the context of the priorities of the Agriculture and Rural Development Department of the Bank, and of the World Bank Group Agriculture Action Plan 2010-2012. The challenge is connecting viable innovation and scaling up opportunities to World Bank goals, strategies and strengths in the agriculture and rural development area. The Action Plan identifies broad areas of cooperation with client governments and more specific strategies to guide its work. This is a period when the World Bank Group seeks "*to support client countries efforts to improve agriculture's contribution to food security, raising the incomes of the poor, facilitating economic transformation, and providing environmental services" (*World Bank 2009 1). Agriculture's importance is driven by the Bank's recognition of the contribution of agriculture to GDP growth and to reducing poverty. Though the globe is urbanizing, the preponderance of poor people live in rural areas and engage in farming. Urbanization is expected to continue, particularly in poor countries; at the same time the transformation of the rural agriculture sector provides the basis for industrial growth in urban areas and may also work to control the pace of urbanization.

The Action Plan specifies five key strategies for helping client governments:

- Raising agricultural productivity
- Linking farmers to markets and strengthening value chains
- Reducing risk and vulnerability
- Facilitating agricultural entry and exit, and non-farm income
- Enhancing environmental services and sustainability

The Action Plan recognizes that these strategies are overlapping and re-enforcing and that their application will vary by region and country. It calls for increasing lending within these strategic areas and for scaling up good practice examples. Within these strategies, the Agriculture and Rural Development Department of the World Bank identified three themes for the funding of Development Marketplace innovative projects:

- Linking small farmers to markets;
- Improving access to land and land tenure for communities living in poverty;
- Promoting the contribution of agriculture to environmental services that mitigate; climate change and support biodiversity conservation.

Underpinning the strategies in the Action Plan are World Bank social priorities that give particular attention to reducing hunger and poverty and to the inclusion of women in productivity. Recent food and financial crises have added to the already large number of chronically malnourished people. Increasing food demand, rising populations in some areas and the impacts of climate change all exacerbate the challenges of providing adequate food and improving livelihoods in pursuit of the Millennium Development Goals. Thus the Action Plan calls for targeting the "ultimate client"— rural farmers working in the crop, livestock, fishery and other agricultural sectors.[69] Additionally the plan calls for a

[69] The 2008 World Development Report on Agriculture opens with the poignant word picture of an African woman subsistence farmer weeding sorghum, and then paints the opportunity of enabling this woman, and

focus on those regions with the largest number of rural poor (Sub-Saharan Africa, South Asia and East Asia and the Pacific).

World Bank and ARD Strategic goals suggest that Development Marketplace Projects considered for inclusion in case studies on scalability should show evidence of:

- Alignment with World Bank Goals and Strategies
- Serving more than one strategy or theme
- Alignment with priority clients
- Alignment with Bank comparative advantages in a scaling up process.

***Comparative advantages that the World Bank brings to innovation and scaling up in the agriculture and rural development area*:**

- Credibility with donor and academic communities with respect to development thinking; research, evaluation.
- Large project, program and policy lending.
- Influence with governments; other actors.
- Convening power;
- Funding.

Scaling up

Like innovation, scaling up has multiple definitions. Common, but not universal, themes that run through the definitions are scale of impact, quality of impact, and sustained time frames (Binswanger). A definition that flows out of the 2004 Shanghai Conference on Scaling Up is simple but potentially adaptable:

> *Scaling up means expanding, adapting and sustaining successful policies, programs and projects in different places and over time to reach a greater number of people.* (quoted in Hartmann and Linn 2008).

This definition has the merits of brevity and simplicity. Impact is implied by the requirement of reaching greater numbers of people and the "successful" descriptor implies that there is some valued end of scaling up, without specifying that end. This definition also implies more than one pathway to scaling and leaves open many questions, including what is scaled, who does the scaling, how we decide which people are reached or how implementing scaling is managed. The implication is that the definition can be tailored to specific contexts.

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other poor farmers like her, to escape poverty through access to agricultural innovation, access to markets, and ability to add value to primary produce.

Comparing conceptual models of scaling up

There is an abundance of principles, criteria, guidelines, steps, tasks and conceptual models developed in the literature. The conceptual models are useful in illustrating the flow of actions deemed necessary to scale up an innovation, though the two dimensional representations have difficulty illustrating the non-linear, multi-dimensional and iterative nature that most say is characteristic of scaling up. Three conceptual models (Hartmann and Linn, Cooley and Kohl and Simmons, Fajans and Ghiron *see Annex I)*) do allow for an analysis of common elements that need to be considered when developing criteria for assessing scalability. Full understanding of the three models requires examining the full studies.

- All start with the innovation, or what is to be scaled up. There is a common requirement that **clarity about what the innovation is and evidence that it provides benefit** exist. There is general agreement that it is not a singular innovation, but a package of innovations (usually a combination of a technology, and process, structure, systems and networks innovations). The innovation requires a means of delivery and capability for scaling.
- All ask for clarity on the **actors and stakeholders** (individual and institutional) in the innovation and the scaling up process. This includes identifying who tested the innovation, who is going to scale it up, who will support the scaling and who might stand in the way of scaling.
    - In analyzing individual actors, the three models in the annex raise questions about **drivers** of the scaling up, champions, leadership, networks and partners.
    - In looking at institutional actors, they note the importance of **organization and management capacity**; this includes a wide range of competencies. The level of importance of a specific capacity may be context specific. Capacity for monitoring and evaluation, or ability to develop evidence demonstrating results, is a priority.
    - For all actors, an underlying question is the degree to which these actors are embedded in the national and/or local context. Is there present or potential local **ownership**?
- All acknowledge the context specific ways in which *the external environment (or spaces)* can help or hinder the scaling up process. Positive policies, political, economic and social conditions nationally provide spaces for scaling; when negative these spaces decrease the space or opportunity. Partnerships, networks, donor relationships, bureaucracy, and public demand for change are examples of environmental factors.
- All indicate that **intermediary organizations or resource teams**, along with appropriate time and pacing, are necessary to support the adopting or user organization.

The three models, and the rationale behind them, do have differences. One important difference to note is that the Cooley and Kohl three-step and ten-task framework offers a template for planning and implementation; Linn and Hartman (2010) have recently taken a

different tack in their work with IFAD and have provided an operations analysis of IFAD work as a basis for recommendations to IFAD on how to strengthen IFAD's organizational capacity for promoting scaling up.

Types of scaling up

Reproduced from Cooley and Kohl. 2009. p. 11

Expansion	Growth Re-structuring or decentralization Franchising Spin-off
Replication	Policy adoption Grafting Diffusion and Spillover Mass Media
Collaboration	Formal partnerships, joint ventures and strategic alliances Networks and coalitions

Cooley and Kohl (2006) explain that expansion means "increasing the scope of operations of the organization." The way in which it expands has implications for the capacity of the organization. Replication is increasing the use of the innovation, but this is not done by the originating organization. Replication through the adoption of government policy appears to be a simple form. However, if the innovation requires behavior changes and participation by the community, governments may lack capacities for such complex implementation. The other forms of replications have significant implications for the management of the originating organization. Collaboration falls between the first two models and requires coordination and other forms of partnerships with one or more organization or network.

There are other ways of thinking about forms and dimensions of scaling up, including geographic, functional, political and organizational. Value chains are another way of visualizing scaling up. Instead of focusing on one level, scaling up enables backward and forward linkages - as in the case of linking the farmer to technology or process innovations as well as to markets and consumers (Hartmann and Linn 2008). The Cooley and Kohl format becomes particularly useful when linking methods to critical consideration factors in choosing a type of scaling. Their Table, "*Choosing a Scaling-up Method*" is reproduced in *Annex 2*. The implications for selecting ARD Development Marketplace projects for case studies and for planning and implementing scaling up strategies are significant. Initial reviews may show that a project has potential for investment in a particular type of scaling up. Information developed in the case studies should be used to revisit the original assessment.

The various types of scaling up imply working with traditional development actors - such as governments, donors, and NGOs - and also suggest the possibility of working with or through networks and coalitions, partnerships, joint ventures, social enterprises and the private sector. There are both advantages and challenges to collaboration. **Public-private partnerships** (PPPs) have generated a large literature and interest from some major donors. Perceived advantages of government partnering with the private sector include access to technical expertise and skills, sharing of systems, capabilities and networks and risk sharing. PPPs work best when there are shared interests and equitable power relations. The challenge is to assure that public interests are balanced with private sector objectives (Brinkerhoff and Brinkerhoff 2011). **Business models** for reducing poverty are also expanding and are perceived to deliver efficiency while simultaneously reducing dependency on aid. Goldsmith (2011) suggests that there are many such business models but they tend to be characterized by a focus on the poor and excluded, intention to improve the productivity of poor people, financing that includes commercial debt and private equity, and leadership with a social mission. Goldsmith refers to Mohammed Yunus' concept of "**social business**", where the company operates on a non-profit basis, reinvesting earnings in the company; or where the

business is owned and operated by poor people who receive the earnings. Social enterprises include microfinance, access to equitable supply chains, or production of housing or food using appropriate technologies (innovation). There are increasing numbers of organizations supporting social enterprises and social venture capital investments and partnerships (Acumen Fund, Grassroots Business Fund, Tandem Fund). Some, like Aavishkaar, have emerged in developing countries.

III. Coping with complexity and multidimensionality in scaling up efforts

The task of assessing the potential for scaling up of the 22 ARD is a complex and multidimensional enterprise. The pieces are moving and have sequential relationships at the same time as they may happen simultaneously. In finding ways to articulate the moving parts, we need to be aware of some of the challenges, dilemmas and paradoxes. While the final part of this paper proposes criteria for selecting projects for case study and offers guidelines for conducting comparable case studies, this section reviews challenging factors, critical requirements, dilemmas and paradoxes that need to inform use of the criteria and the guidelines.

Blueprints or adaptations. One debate in scaling up efforts concerns universalist and contextualist approaches to scaling up. There is little support for the idea that we have a universal blueprint for scaling up innovations, though universal solutions have the appeal of simplicity and efficiency. Context does matter, and although criteria and guidelines exist (see below), these need to be flexible enough to incorporate knowledge and learning from specific contexts.

Simplicity, guidelines and the reality of the implementation context. The organization and management literature suggests that leaders/managers operate in a context far different from that of policy analysts. In a study of CEOs, Mintzberg noted that these managers made a significant decision every nine minutes (1979). The implications for managers and drivers of scaling up processes suggest a need for simple, internalized guidelines that can be drawn upon to make decisions. The time constraints of management action require the ability to make rapid decisions. Lacking a clear strategy or set of guidelines, managers risk losing focus on priority tasks for scaling up.

Leadership matters. Scaling up is a change management process. At different stages in the process, leadership will need to play critical roles. Kotter (1990), among others writing about leadership and change in the private sector, notes the importance of a leader's role in clarify and maintaining focus on the mission and the expected results; of motivating staff to implement the strategy; and of keeping alignment between organization staff, structures and systems on the one hand, and organization goals and values on the other. The implication for a scaling up effort is that leadership can play different, critical roles, but that these roles may change according to the current situation of the organization. Leadership is not static, it needs to learn and adapt. Organizations in a scaling up process will grow through different organizational stages and requirements as they expand, replicate or

collaborate. As a result, they need leadership with the capacity to align and realign staff, structures and systems to adapt to changing goals and values.

Learning and changing. If scaling up an innovation is a change process, the organizations implementing or supporting a scaling effort need to be open to change and able to learn about change. Fostering learning is a leadership task and foes beyond leadership of the scaling up organization. Simmons and her colleagues note this:

> *…scaling up is viewed as a learning process that involves building local capacities for innovation, and undertaking the needed adaptation of tested innovations to local settings. This idea was succinctly articulated in the IIRR seminar report, which states that going to scale implies more than replication. It also refers to the dissemination or expansion of "options, knowledge, processes and technologies such that people build capacities to make better decisions and/or influence decision-making authorities" (2007 ix).*

For ARD projects with potential for scaling, this implies the capacity to develop an organizational culture that encourages learning and the willingness to discuss failures and challenges and a need for organizations that are flexible enough to change bureaucratic processes and systems (Linn 2010). For example, in Ghana the ability of Government health bureaucrats to learn and accept the innovation in integrating the formal health sector functions into community institutions (CHPS) counted significantly in the success of a scaling effort there (WHO 2009).

Evidence and evaluation*.* Most models for scaling up suggest that all pilots of innovations should begin by explicitly planning for scaling up if the innovation proves successful. In practice, this rarely happens. This reality has implications for the next step of deciding whether a project has the potential to go to scale, and also for the support that intermediary organizations or resource teams should give to the originating and adopting organizations. Knowing whether an innovation is producing results, and whether it does so efficiently, is critical to any decision to go to scale. Originating and adopting organizations often lack the skills and funding to conduct rigorous evaluations that will provide the necessary evidence. Moreover, their energies may be so focused on implementation that there is little attention or resources left for evaluation. There are many appropriate tools for evaluation in scaling up situations (cf. Duflo 2004). This is a place where support from resource teams, intermediary organizations and donors is important.

Paradoxes and Pressures*.* Donor focus on results may create unintended paradoxes and tensions. Alnoor Ebrahim's work uncovers the unintended but perverse relationship between donor focus on measureable results and the time and space that allows implementers to learn from mistakes and improve their practice. Implementers of aid projects may tailor their monitoring efforts to the requirements of donors because they want to build reputation and position themselves to get the next grant. This focus on demonstrating the results in the donor's document may have perverse consequences. By focusing on the input, output and outcome

measures required by donors, staff may lose the opportunity to learn from mistakes and examine processes of implementation (Ebrahim 2007). This implies that donors need to support not only capacities for evaluating outputs and outcomes, but also the capacity to reflect on processes of implementation. Pressures to achieve scaling up goals and reach more people, without pausing to reflect on problems in implementation, may contribute to reducing the quality of the innovation. Furthermore, ambitious targets and limited funding also reduce quality. (Mangham 2010)

Aligning goals and values with practice (avoiding the usual road of good intentions). The literature widely suggests that scaling up, and indeed all development efforts, are inspired by a normative rationale (Simons et all 2007). These values may be explicit or implicit. For this exercise, it means examining whether there is clarity about the goals and values of the innovation and scaling up project, and whether the project is actually meeting these goals for the intended beneficiaries. Users of the scaling up definition above should first define "successful" in terms of the end results and beneficiaries of the scaling up initiative.[70] What are the benefits? Who benefits? We need an analysis of whether the benefits are aligned with the goals of client governments and communities, and of the supporting organization; in this immediate case, the World Bank. Though scaling up efforts are inspired by a normative rationale (Simmons 2007), there are often gaps between what was intended and what actually happens. Mangham and colleagues note that "without measures specifically directed at poor and vulnerable populations, scaling up may result in widening inequalities in health outcomes." (89) Where exclusion is deeply rooted in culture, perceptions and practice, special measures may be necessary to assure access for women or the very poor. This was true of one of the scaling up successes supported by IFAD, Ford Foundation and others. Over 90% of Grameen Bank clients today are women. When Grameen first initiated lending activities, women could not easily come outside their homes to attend centre meetings or access small loans. The Bank had to first invest in building trust within the community and with women. Then Grameen had to set requirements for its staff that 50% of new clients would be female. Actions had to be intentional.

Scaling up as transformative change for clients. Scaling up is more than adoption of a new technology. Millar says it is a process of enabling farmers to identify their problems, try options and make informed decisions (224). Binswanger and colleagues (2009) note,

> "*Bringing about local and community driven development is not a project; it entails a deep transformation of political and administrative structures that aims to empower communities and local governments with powers and with resources and the authority to use these flexibly and sustainably, thus enabling them to take control of their own development.*" (4)

[70] See also Cooley and Kohl, Task 1 Creating a Vision.

For the assessment of the 22 projects this means looking at empowerment, decentralization of authority and responsibility to the local level, accountability and building capacity. In deciding whether an innovation is ready for scaling, it means examining the implications for organizational culture, organizational processes and leadership of the adopting organizations or the key driver of scaling.

Risk. Innovation and scaling up are subject to several types of risks. Most studies note the importance of external conditions or actors, beyond the control of the scaling up organization. These factors may benefit or impinge on successful scaling. In deciding whether a project is ready for scaling, an effort needs to be made to identify conditions or negative stakeholders who have the power to help or thwart the scaling up process. Linn and Hartman's concept of "spaces" provides some useful questions for identifying environmental factors. Stakeholder analyses are a well-known tool for identifying actors, their relative power, the pathways in which they have influence and their interests.

A very different sort of risk in making decisions on which project to scale up are the dangers of type 1 and type 2 failures.[71] Linn and Hartman note that type 2 errors—*"where scaling up takes place, but it done in a wrong way"* is *"found most frequently in the large scale development banks"* because of insufficient testing, learning and phasing." (2010 11)

In the case of the ARD Development Marketplace projects, type 1 errors may also be a concern. Projects that have real potential for scaling may not be identifiable at the moment that decisions are made on selecting projects for a full case study. Lack of time, changes in implementation plans and lack of capacity to develop the evidence on the innovation may be an issue. This does not mean that many of the 22 ARD projects will, at some point, merit investment in scaling up.

Time. Scaling requires time, as much as 10-15 years or more. Everett M Rodgers, who developed a model of diffusion of innovations, notes an early study of the diffusion of hybrid corn in the United States (Iowa). The authors of this study analyzed responses from 259 respondents about adoption. The hybrid seed was released in 1928. But by 1933 only 10% of farmers had adopted the corn. There was 40% adoption by 1936. It took until 1941 before there was complete adoption. Rodgers' model derives from an analysis of why individual farmers adopt innovation, suggesting the complexity of individual choices and actions (Rodgers 2004).

Scaling up innovation can be risky, time-consuming and tedious. Hartmann and Linn (2008) note examples of scaling up that required 20 years to evolve, undergoing changing partnerships and funding (cf. SERVOL in Trinidad and Tobago 48). The pathway to success is rarely straight. It may be marked by setbacks, diversions and

[71] Type 1 error being "too little scaling up" and type 2 error being "wrong scaling up"

frustration among the stakeholders and partners in the effort. The road to successful scaling of innovation may resemble what Charles Lindblom called incrementalism, or "*the science of muddling through*" (1959). The implication for scaling up is that change may come in small bites - containing both setbacks and successes – which allow for setbacks to become opportunities to adapt. Organizations adopting and scaling an innovation may also require the long-term support of an intermediary organization and the patience[72] of the donor (Cooley and Kohl).

Intermediary organization to accompany the scaling process*.* As noted earlier, Cooley and Kohl make a strong case for an intermediary organization to support the work of the adopting organization that is doing the scaling. Simmons and colleagues identify the role of a resource team to support the user organization(s) in the scaling up strategy. To use Cooley's terms, the adopting organization, as it begins to go to scale, requires an ever-growing set of competencies. Among these are:[73]

- Evaluation and research capacities in order to develop evidence for the effectiveness and efficiency of the innovation.
- Documentation
- Strategic planning
- Advocacy and marketing
- Knowledge of political and institutional landscape
- Convening power
- Boundary spanning and policy entrepreneurship
- Knowledge and technology transfer
- Capability building and systems strengthening
- Process consulting
- Organizational change

Cooley (2011) suggests that the intermediary organization is separate from the adopting organization and recognizes that it is important to build the capacity of organizations in developing countries that can play the intermediary or support roles.

Simmons and colleagues talk about a resource team as having been involved in the "*development and testing of the innovation.*" It may be a network of individuals or even a team situated in the same organization doing the adopting. In addition to the training, management and technical skills suggested by Cooley, Simmons and colleagues note the importance of leaders on the resource team who *"command authority and have credibility with the user organization"* (8-9). Relationships between the resource team and the user organization are dynamic, challenging and

[72] Social venture investments have been referred to as "patient capital."

[73] This list of skills and the role that the intermediary organization can play come from a power point presented by Larry Cooley at the Development Management Network in October 2010 and from a personal conversation on February 24, 2011.

two way. Simmons and colleagues indicate that resource teams may play a role in tempering user organization goals that are too ambitious for the existing political environment or for the capacity of systems (10). The original four donors to Grameen Bank played a role, during the first decades, in persuading the growing Bank to adopt increasing sophisticated financial accounting systems to accommodate the changing needs of the scaling organization. Relationships were sometimes testy between the Bank and some of the donors, but they remained productive, in part because some of the donors had presence in Dhaka and they were in frequent personal contact with Bank staff.[74] Another way of looking at the relationship between the intermediary organization/resource team and the adopting/user organization is through the concept of accompaniment. Used by some European NGOs, the term implies the independence of the adopting organization in an environment where there is enough trust for the intermediary organization to provide honest and challenging advice along with multiple types of support.

IV. Criteria for Assessing Scalability—Development Marketplace Projects

The chart that follows sets out generic criteria for evaluating which ARD Development Marketplace projects were selected for a case study as the first step in a scaling up process. The focus on specific questions is drawn from suggestions of Johannes Linn.

Criteria for Scaling: Development Marketplace Projects with Scalability Potential

	Factors	Questions	Tools/Sources*
Innovation	• Type • Clarity • Theory of change • Evidence of effectiveness, efficiency • Legitimacy	• What is to be scaled? • What is/are the innovation(s)? technology, process, institutional/structure/ systems, behaviors? • Is there a clear theory of change? • Is it simple or complex? Complex includes many steps, multiple actors and organizations, multiple levels. • Is there evidence that it works? • Is there credibility with	• Innovation type • Objectives analysis • Theory of change analysis (Weiss, Aspen Institute, Backward mapping tools) • Transaction analysis • Monitoring, evaluation studies • Telephone interviews • Stakeholder analyses • Scalability checklist

[74] This example comes from the principal author's interviews done in Dhaka in 1990-91 with some of the resident donor staff and Grameen Bank staff.

		key stakeholders? • Who benefits from the innovation? • Is there evidence of local ownership?	
Alignment with Government, ARD, and World Bank goals and strategies	• Linkages to target strategies and population groups • Attention to gender, poverty, inequality, regional and other priorities	• Will the innovation, if scaled, contribute to achieving relevant government and World Bank goals? • Does the innovation, if scaled, contribute to government and World Bank strategies? • Does the innovation reach priority populations?	• Relevant Government and World Bank documents: PRSPs, CAS, other.
Drivers	• Credibility of innovation • Leadership and management capacities and commitment • Champions • Constituencies • Incentives	• Is there a demand for the innovation? Among which stakeholders? • Which individual is likely to lead/drive the scaling up process? To maintain focus on scaling up objectives? • Does the organization have the capacities to manage the scaling up? To adapt systems and structures to changing requirements? • Does evaluation capacity need strengthening? • To whom is the organization accountable?	Strengths and weaknesses analysis
Spaces or environmental factors	• External factors that enable or discourage scaling up	• Is there an enabling policy framework? • Are there important political supporters or opponents? • Are there political or security constraints? • Are there prospects of	• Opportunities and threats analysis

		financial sustainability? What is needed? • Who are the partners? Do they have the requisite capacities? If private sector partners or implementers, do their interests align with the intentions of the innovation? Do government partners or implementers have the requisite capacity? • Is the innovation culturally and socially acceptable?	
Type of scaling	• Type of scaling • Scaling organization • Supporting organization • Partnerships	• Expansion, replication or collaboration? • Which organization(s) will take responsibility for the scaling? Is it a government, NGO or private sector organization? Is it local or foreign? • Is there an intermediary organization? Can this capacity to provide support to the scaling up organization be created locally? • Who are the partner organizations? What competencies do they bring?	• Cooley and Kohl definitions and decision model

**This has been a desk review, thus primary sources for assessment of the 22 ARD projects are the project proposals and any project reports made available to us by the World Bank. In many cases there is limited information beyond the project proposal. In a few cases, largely projects considered as having good potential for scaling, telephone interviews were held with project directors*.

The criteria have been used to assess the 22 ARD Development Marketplace projects. In many cases key information was not available. Additionally, the criteria are not accompanied by precise quantitative measures making comparison among projects difficult. Criteria of geographic distribution and diversity in development

level of the country/beneficiary population and type of organization implementing the scaling up are used in the recommendation that follows.

Recommendations for Case Study Inclusion and Justification.

This team recommends that field based cases studies be undertaken for the Nigeria cassava project (4345); Mongolia value chain project (6251); and the India Mini-Cold Storage Technology Ventures (4893).[75] Selecting these three projects does not mean that the remaining 22 are not appropriate for scaling up. Many of the projects give evidence that the innovation(s) add income and well-being to the lives of the target populations. Many have delivery systems which are in the process of demonstrating how best to disseminate and institutionalize innovation. The strengths and weaknesses of the 22 projects, and the potential for scalability according to criteria above, are reviewed in the project assessments provided to ARD/World Bank in a separate document. There are necessarily flaws in these project assessments, as none of the 22 projects were designed with the intent to develop information that would lay the basis for scaling up. In addition, this assessment is constrained by the fact that our team relied mostly on a review of secondary documentation and a lack of access to the most recent project information. The limited time frame constrained our ability to conduct interviews with the project managers as a partial way of filling in information gaps.

The three recommended projects rank higher, but not always significantly so, from other strong projects not selected (see below) in terms of the drivers of scaling up, the spaces for scaling, and the capacities to lead and manage the scaling up. Factors which contributed to the selection of the three include geographic and economic diversity, differences in the quality and strength of governance, variety in the approaches to delivering the innovation to beneficiaries and in the types of adopting and partnership organizations. Our choice was also based on a broad interpretation of the demonstrated and potential impacts of the innovation if scaled up.

The Nigeria project, *Adding Value to Waste in the Cassava Processing – Goat Keeping Systems in Nigeria* (4345), shows evidence of the indigenous organizational and leadership capacity to scale up a simple innovation to increasing numbers of rural communities. There is direct, measureable economic benefit from the processing and sale of cassava waste that had previously been discarded, and from efficiencies in the production and marketing of goats. There is the environmental benefit in that cassava waste, which used to be burned, is now being recycled. The benefits are observable. Word of mouth communication has led to a growing demand for participation.

Nigeria represents a country context with a relatively well-educated population, organizational capacity and available resources. The current agency implementing

[75] Note: the Cambodia project was ultimately replaced by the project 4893, "Waste to Wealth by Incubating Mini Cold Storage Technology Ventures" in India

the project, the University of Agriculture at Abeokuta, has the technical and organization capacity and the commitment to scale up in Ogun State. It could also play a role in fostering replication in other states in Nigeria with similar conditions of cassava and goat production. Given the recent focus on cassava as a plant that thrives under drought conditions, this innovation may be of broader applicability across West Africa and elsewhere and Nigeria could play a role in dissemination and replication.

The Mongolia Project, *Value Chain Development for Textile Products: Linking Farmers to Markets* (6251), represents a small population, low density country with a traditional reliance on pastoral production. While Mongolia has a high literacy rate (97% in 2004, UNDP/HDR), the social services have been declining and capacities of local government have been reduced since the 1990s. The innovation is not narrowly technical, but the process of implementation involves building capacity at the local level to grade raw materials (wool) and improving the value of the product sold by the producers. It enables the Mongolian producers to engage successfully in an international market and it reduces their reliance on external intermediaries who reduce the income flow to producers. The initial experience of this project suggests that herders have the capacity to use skills to grade and process wool and that adoption will increase herder income from raw wool rated high quality by 10%. This can produce incentives to breed stock with high quality wool, and thus perhaps to decrease herd size and the impact on pastures. The Government has provided a positive policy framework with recent legislation requiring that grading be done in country before exports.

One of the challenges of this innovation is transferring the project leadership from the current implementing organization, VSO, to local counterparts. The current implementing organization, VSO, appears committed to long-term support and is amenable to the development of local capacity to carry on the management of scaling up and sustaining the impacts. While Mongolia is a small country with a limited population, some of the experience gained here may be transferrable to pastoral populations elsewhere in Asia and in Africa. The project also has the capacity to demonstrate how the value chain from the producer to the purchaser can benefit the Mongolian producers; and how the capacity of Mongolian pastoral communities can be improved through new skills that enhance processing along the value chain and facilitate engagement with the global market.

The India project, *Incubating Mini-Cold Storage Technology Ventures* (4893), *is clearly scalable,* with one reservation, noted below. The Project aims to reduce the postharvest vegetable waste in farmers markets in the state of Tamilnadu, Southern India. The postharvest vegetable waste is caused by warm weather that causes produce to spoil and rot very fast. Vegetables lose an average of 25% to 40% in their value on a daily basis, with at least 10% of the loss in value occurring in farmers markets. The Project responds to this problem by designing Mini Cold Store Units (coolers) that allow small farmers to refrigerate and increase the shelf life of their produce. Through the use of these coolers, the Project expects to reduce the

postharvest vegetable waste in farmers' markets by 50%. To date, the Project has installed five coolers in five farmers markets in Tamilnadu, benefiting 2,000 small vegetable farmers and generating savings of USD 0.2 million.

The Project is run as a public-private partnership, with each cooler operation being managed by rural youth entrepreneurs collaborating with the managers of the five (publicly owned) farmers markets and various other public officials. Youth entrepreneurs received training in technical, operational and business skills. The Project's cooler innovation has the potential to be replicated in other farmers markets in India. Operating mini cold storage units that respond to the needs of small farmers who sell their produce in farmers' markets can reduce significantly the postharvest vegetable waste in India, which is estimated at USD 6 billion annually

Given the government's proactive approach to the mini coolers business ventures, it seems likely that, in the presence of appropriate funding, upwards of 100 farmers markets in Tamilnadu could readily adopt the new technology. The PPP model has the potential to be expanded and replicated at the local level. Intermediary organizations also working at local level appear to play a useful enabling role, providing assistance in the early stages of business experimentation and building capacity. TREC-STEP has the necessary capacity and size to help expand and replicate the Project at provincial and state level. Suitable partners could be found at national level as well. It is likely that the cooler innovation could be introduced in other countries that face a similar postharvest vegetable waste problem.

In moving toward scaling up, the financial model of the project needs to be examined carefully. While there is evidence that the cold stores deliver benefits to participating farmers, it is not clear that the model is self-sustaining and may be dependent on government subsidy. The PPP model used to deliver services to farmers has not proven to be financially sustainable and therefore not scalable in its current format without continuing subsidy.

The Cambodia project, *Micro-franchising Scheme for Agricultural Extension Services* (4676), was a strong candidate for a case study. It was not included because the conditions for a case study did not coincide with the timing of this work. The Cambodia project is being implementing in a country with limited government capacity and generally weak governance. It aims to meet a gap in demand for agricultural technology extension available to subsistence farmers in a country where government capacity to deliver is quite weak. This innovation is led by an international NGO (International Development Enterprises - IDE) which has been operating in Cambodia since 1994. IDE partners with Angkor Mikroheranhvatho (Kampuchea) Co., Ltd., a local microfinance operation. A secondary partner that provides expertise is Australian Business Volunteers. The latter may have capacity to offer intermediary support over the long term.

In the absence of a strong government capacity to provide extension services to small holder producers, IDE has been testing the capacity of Private Extension

Agents (PEAs) who will provide a self-sustaining and self replicating source of agricultural extension that can improve the productivity and market access of small farmers. Additionally the PEAs can provide a link to microfinance services. IDE has had two years of experience with the PEAs and expects that the Development Marketplace funding provides the opportunity to take the extension service innovation to a new level. Though there are information gaps, there is sufficient evidence about the capacity of IDE to take the innovation to the next steps of scaling up. This model suggests a simple, self replicating way of providing sustainable private extension service in the absence of strong government capacity[76]. Looking forward work should be done to examine whether this self replicating, private, extension service is reaching marginalized farmers (women, minorities), and whether it has an impact on poverty reduction.

Though the Nigeria, Mongolia and India projects have been recommended for case studies, the World Bank should be conscious of the possibility of *type 2* errors: the case studies may find that the innovations in these projects do not in fact promise significant impact through scaling up, that the adopting organization designated for managing the scaling up lacks the capacity to move it forward, or that the 'space' for scaling up does not exist.

At the same time there is likelihood that our recommendations reflect a *type 1* error in that they do not recommend for a case study DM projects that in fact have considerable potential for scaling up. However, some projects, such as the Indian project *Waste to Wealth by Incubating Mini-Cold Storage Technology Ventures in PPP Model* (4893), are already being scaled up. This project has strong Government support. Government sees the availability of cold storage units as a public good that substantially reduces food losses resulting from high temperatures. Even though the financial viability of the cold storage units or the sustainability of the youth entrepreneurs has not been fully demonstrated, the State Government in Tamil Nadu appears ready to support scaling up as a public good. In another way, the *Agricultural Cooperatives for Biodiversity Conservation* in Cambodia (6275) shows promise of scalability of the innovation model and the organization and management capacity to support expansion and ultimately the development of local NGO capacity to carry on the project. In this case the key implementing organization has been an international NGO, which may have the capacity, on its own, to seek continuing funding support to allow scaling up to occur, and to foster the development of local management capacity.

Other Development Marketplace projects show promise of commercial viability in the intermediate term and may be attractive for adoption by social investors. The

[76] A relevant comparison may be the *Savings for Change* project in West Africa, funded by the Gates Foundation and executed through local organizations to which Oxfam American serves as an intermediary organization. Like the PEAs, the savings groups in West Africa become largely self-sustaining once they have been mobilized and trained.

Linking Small-Scale Coffee Farmers to Better Markets via Traceable Coffee (5739) seeks to exploit high- end coffee markets and return profits to producers by linking end consumers with the individual coffee producers. The non-profit managing this innovation includes participation of producer organizations on the board of directors and relies on management that has skills and experience in fairly traded agricultural products. Development Marketplace funding appears to have been critical in allowing this project to flourish. For the next phase, this project may now be ready for an equity investment from a social investor. In the same way the *Using the Organoleptic Analysis of Fine Chocolate to Improve Market Access of Small-Scale Cocoa Growers in Ecuador* project (6676) may also be attractive to social investors interested in a high end, niche chocolate project. This project has strong local management and has had a good response from farmers trained in the analysis, grading and processing of fine dark chocolate and opens access to a high end market for chocolate where supply is limited.

For some Development Marketplace projects more information is required. The Nepal project (6252), *Riverbed Farming for Landless Households* in Nepal is aimed at a high risk group---the landless and poor. There appears to be riverbed land available for leasing to a large number of the landless. While there appears to be good support from local governments for scaling up, there is not sufficient information on implementation to date to recommend scaling up now. Likewise, innovations in Senegal, *Locally Produced Biofuel Outboard Motor* (4573) and Uganda, *Renewable Energy-Powered Milk Cooler for Smallholder Dairy Farmers* (5681) are testing technical innovations with potential to benefit significantly populations living in poverty. They are also testing interesting public-private partnerships and promotion of entrepreneurship. However, there is insufficient information to show that the more complex technical innovations in these cases can and will be adopted by small producers. A potentially valuable biofertilizer innovation for rice production in Vietnam (*Sustaining Nitrogen-Efficient Rice Production* 5227) has been tested and has strong support from the University of Sidney and local partners. Reports suggest that farmers have been slow to take up the use of Biogro, and that the planned production facilities have not yet been launched. In this case more experience is required to test the delivery system to farmers.

In considering our recommendation for three case studies, ARD and the Development Marketplace should keep in mind that ultimately the case evidence may argue that they are not ready for investment in scaling up. At the same time, the ARD and DM should continue to track the remaining projects and explore a range of opportunities to move toward scaling them up.

V. From Criteria to Guidelines for Project Case Studies

The following guidelines have several functions. First, they provide a common framework and outline for each of the three case studies proposed by ARD. Second,

they try to capture the key, common criteria for successful scaling up that are found in the literature. Finally, they seek to produce case studies that are comparable.

Guidelines have limitations. Because scaling up is an iterative, multi-dimensional process, the sections of the guidelines may overlap and the case study authors will have to cope with potential repetition. Guidelines, however, are not straightjackets and they may be adapted to fit the needs of the particular project context, keeping in mind that a major goal of the case studies is to produce the information that would allow planning of the scaling up process. The questions below are intended as guides and may be amended or augmented as appropriate.

Case Study Guidelines
Selected Development Marketplace Projects
With High Promise of Scalability

Introduction

1. Purpose of case study.
2. Country assessment
    - Common table on economic, agricultural and rural development and human development indicators.
    - Political, governance, security, environmental and other factors.
3. Government development priorities; World Bank Vision and Strategy for the Country
    - Refer to CAS, PRSP and other relevant country documents.
    - Link to ARD priority target groups, strategies and modalities (see literature review).
4. Summary of overall assessment

Critical Criteria for Scalability

1. **Innovation** clarity, simplicity, perceived benefit; and potential dimensions of benefit:
    - What are the key elements of the innovation?
    - What is the theory of change (conceptual model)?
    - What are the intended benefits? The perceived and actual benefits to date? Is it producing expected results? What are the potential benefits? Discuss in terms of numbers of people reached, geographic impact, and the magnitude of the benefit(s).
    - What is known about the effectiveness of the innovation? Of its efficiency? (cost effectiveness; business plan; commercial viability);

2. **Key Stakeholders**
   - Identify key stakeholders in the innovation to be scaled; include users/beneficiaries, innovating organizations funders, partners and potential partners and others involved in the scaling up.
   - Discuss the interests, functions and pathways of action; relative influence or power of key stakeholders.
   - Identify any stakeholders whose interests may not be served by the innovation.

3. **Alignment** of the innovation and of the organization implementing the scaling up with government strategies and with the World Bank country program and with ARD and World Bank mission strategies and recommended modalities.

4. **Assessment of scalability of the innovation**. The capacities of the organization leading the scaling up, and of partner and other organizations are covered in Section 6 below.
   - Use Scalability checklist[77] and discuss key factors favoring or working against successful scaling up.
   - **Forces or drivers** of the innovative change
     - Legitimacy of the innovation; is there a demand for this innovation? What level of demand? From where does the demand come? (users, communities, government, private sector other).
     - Does the innovation differ significantly from traditional practices or cultural norms?
     - Are there supporters or champions for this kind of change at the community level? At the regional and national level? In the private sector? Elsewhere?
     - Is there opposition to the innovation and its scaling?
     - What are the incentives to scaling up this innovation?
     - What mechanisms exist to hold the implementing organization accountable for scaling up according to a plan?
   - **Spaces** for scaling up the innovation
     - Is there a policy and legal framework in the country that encourages or supports this scaling up?
     - Is there a political environment that provides a secure space for scaling? Is there political support in government for the scaling up?
     - Is there government capacity to provide necessary support to scaling up?
     - Does the potential for the required flow of financial resources to support the scaling up and institutionalization of the innovation?

[77] A model of the MSI – Cooley and Kohl Scalability Checklist (2006) is in the annexes. A more recent version is under development at MSI and may be available for the case studies.

If the innovation is a public good, is there government and/or donor support and is that support assured over the necessary period of operation? If it is a private good and the private sector is involved in implementing the scaling up, is there a sound business plan that assures the long-term financial viability of the innovation? Is there assurance of 'incubator' funding to get the innovation scaled and established?

- If the innovation is to be scaled up through a private sector organization or public private partnership, what accountability or support mechanisms are in place to assure that the innovation reaches targeted beneficiaries?
- Do the partner organizations involved in the scaling up have the necessary overlap in interests with the implementing organization? Are they likely to continue the partnership? Will they serve the targeted beneficiaries? Are there adequate coordination and decision-making mechanisms in place?
- Will this innovation contribute to agricultural and rural development goals? To poverty reduction? To improved human well-being?
- Are there potential environmental gains resulting from this innovation? Are there possible environmental costs?

5. **Type of scaling.** Use the matrices in annexes to recommend and justify a particular type of scaling for this innovative project, including identification of the implementing organization that will lead the scaling up process, any intermediary organization recommended, and key partners, networks and relationships.

6. **Implementing Organizations.** The implementing organization needs a range of capacities, which adapt and change as the scale of the innovation and the organization grow. This implies an active leadership able to plan organization development strategically and to re-structure and re-tool as necessary. Organizations leading the scaling up may not have all the critical capacities at any one time. The purpose of this section is to identify where the strengths and weakness. Section 8 below will address the potentials for supporting the implementing organization.

- **Strengths and Weaknesses analysis.** Particular attention should be given to the capacity to learn and adapt. Consider:

  - Alignment between organization mission and values and the objectives and tasks of scaling up.
  - Leadership capacities and potentials. Think of leadership in terms of ability to motivate and align personnel, structures and systems to the changing tasks of scaling up and to the intended benefits of the innovation.

    - Bridging capacities; communication skills; ability to manage partnerships and collaboration.
    - Personnel management; competencies relevant to tasks; capacity to train or re-orient staff to new tasks, attitudes; systems and methods to recognize and reward or to control alignment of tasks to intended strategy and goals.
    - Financial management; systems.
    - Financial resources.
        - Donor dependent; donor commitment to the scaling process (time, money).
        - Government resources.
        - Cost-covering.
        - Other.
    - *Capacity to learn*; culture of learning; monitoring and evaluation systems and structures.
    - Access to support to fill organization and management competency gaps.
- **Opportunities and Threats** analysis. Scanning the external environment, are there events or market, political, geographic environmental or other factors that may help or hinder scaling up?

7. **Partner organizations**
- Identify organizations that play a key partnership role in implementing the scaling up.
- What strengths do they bring to scaling up? What liabilities?
- What is the nature of coordination required between the implementing organization and the partner organizations? Among the partner organizations? Is the coordination simple (sharing information)? Or complex (joint decision-making on actions)?

8. **Role of intermediary organizations** to support the scaling up process. The intermediary organization should be thought of as an autonomous agency that can link the implementing organization to organization development consulting, management training, and skills building required as the demands on the capacities of the implementing organization change over time. The quality of the relationship is critical. The authority to decide must remain with the implementing organization, but there must be a level of trust and a frequency of interaction so that the intermediary organization can provide independent guidance.
- In light of the weakness (current and potential) of the implementing organization, what support does the intermediary organization need to scale up and institutionalize the innovation?
- Are there any organizations on the ground that can provide intermediary organization support?
- What organization support needs to be brought in from outside?
- Is there a continuing role for the World Bank?

9. **Next steps**: planning and implementation.

- Is there enough information available about the innovation, the implementing environment and the implementing organization to begin planning a scaling up process?
- Who should participate in the planning?

VI. Conclusions and recommendations

A salient finding from the literature is that innovative ideas are plentiful and rewarded, but identifying innovations that can be scaled and providing the support required to produce large scale impacts is complex and unglamorous. Early in this paper it was noted that the development profession, despite its professed interest in results and scaling up, favors the quick demonstration of innovations and neglects the follow-up or scaling stage. ARD and the Development Marketplace have funded hundreds of promising innovations over the past decade and more. Increasingly, both ARD and Development Marketplace have closely followed the Development Marketplace projects with monitoring visits and the creation of a community of learning among the projects. They look forward to tracking the projects after the funding is completed.

Going forward, what should be done to re-balance the priorities of development practice, from innovation to scaling up to achieve broad scale impact? And what roles should and can ARD and the Development Marketplace play in fostering and rewarding scaling up?

Key Lessons: Re-balancing the priorities of development funders and practitioners.

1. Scaling up to achieve widespread impact requires an increasing leadership, management and learning capacity. The need for growing capacities is particularly relevant for government and non-profit organizations that are expanding or replicating an innovation. To be sustainable, these capacities need to be grown in indigenous organizations. An outside organization may introduce an innovative approach, but for the innovation to be sustainable at scale it needs to be locally owned and rooted. Enabling this local capacity requires:

   a. Time. Most innovations start small and expand in increments. Only later in the process, when the adopting/implementing organization has developed confidence and capacity, may scaling up accelerate.
   b. 'Patient' money. Financial support is important, but the amounts needed in the early stages can and should be small, corresponding to the pace of scaling up. Too much money may be destructive. This suggests a role for smaller donors or social venture capitalists in the initial stages of scaling up; but they should be donors who have the patience to follow an organization over a period of five to ten years, and through setbacks as well as gains. Traditionally development practitioners focused on getting

results efficiently. This created an incentive for outside agencies to take responsibility for implementation and disincentives for the slower and less certain work of building capacity (see Fukuyama 2000). While producing results in the short run, outsider implementation retards the evolution of local organizational capacity.

c. Accompaniment by one or more intermediary organizations that can support, but not take over, the scaling up. When there is trust and when the intermediary organization can give access in a timely way to resources that meet the needs of the evolving organization doing the scaling up, there is less likelihood that the scaling process will break down when new challenges are faced.
d. Monitoring and evaluation that supports learning and decision-making. The organization implementing innovation needs to be able to learn from experience and adapt strategies, structures, and systems to meet changing situation. Equally, intermediary organizations and donors need information to adjust support, and even to withdraw support if the initial promise of scalability is not being met.

2. Public private partnerships can ease the implementation burden on government and non-profit organizations and can contribute to financial and other sustainability and to linking producers to markets and to improved supply chains. Public Private Partnerships need to be monitored to track the alignment between public goals of innovations and market viability requirements.
3. Specific innovations need not be regarded as permanent solutions, but as a step on the way to better ways of doing things. The Private Extension Agents (PEAs) in Cambodia are an example of how to provide a self-financing service in the absence of government capacity. This may be a solution that can be scaled up to meet the needs today of agricultural producers in Cambodia (and other sites). The PEAs may be replaced in the future by another approach when the situation changes.

Roles of ARD and the Development Marketplace.

The World Bank has a comparative advantage among development agencies and practitioners in terms of its thought leadership, its convening power and its brokering power. To refocus development actors' attention away from innovation toward the more difficult task of scaling up, World Bank units have the capacity to put forward new models of development impact through patient attention to scaling up. This role as a thought leader will need to be supported by documentation and research, initially through case studies, on scaling up; and also by development of evidence on whether or not the innovations are having the impact on intended development goals, and on how the scaling up works to deliver impact. In accumulating evidence, the World Bank can work with other agencies, like IFAD, to develop an influential body of knowledge.

The Bank's convening power can be used to bring development actors together to share evolving knowledge of what is required to achieve scalability, and to encourage adoption of lessons such as ones identified above.

Finally, the World Bank can play a brokering role with respect to Development Marketplace projects that show promise of scaling. The Bank itself may not be structured to fund and support small projects. It may choose to recommend some projects to the IFC. Or it may use its convening capacity and credibility to share successful Development Marketplace projects with foundations, social entrepreneurs, emerging donors, and others, and to provide advice on how other institutions might support effective scaling up.

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Annex A
Examples of Conceptual Models for Scaling Innovations

Cooley and Kohl (2006, 2010, 2011)

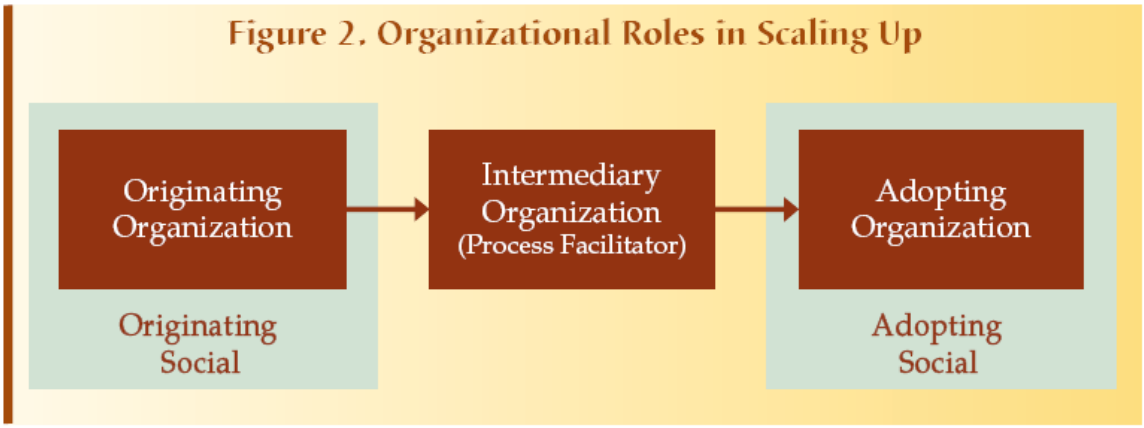
This model sees scaling up as a process that begins with good planning. It is grounded in the public administration and development management literature. Ideally planning starts with initial testing of the innovation. In this model, **most of the work is done prior to any action to scale up**. It is a three step, ten task framework. The framework below draws on fuller versions of the model that Cooley and Kohl have used in different publications. Each of the tasks below is accompanied by a series of question that guide the implementation of the steps. Questions are provided for Step 1.

Step 1 Developing a Scaling Up Plan
- Task 1: Developing a Vision: What is being scaled up? How is the scaling up to occur? Who is doing the scaling up*? Where is the scaling up to occur?
- Task 2: Assessing Scalability
- Task 3: Filling Information Gaps
- Task 4: Preparing A Scaling Up Plan

Step 2 Establishing the Preconditions for an Effective Scaling Up Process
- Task 5: Legitimizing change ("getting the issue on the agenda")
- Task 6: Constituency Building ("building bridges")
- Task 7: Realigning and Mobilizing Resources

Step 3 Implementing the Scaling up Process
- Task 8: Modifying and Strengthening Organizations
- Task 9: Coordinating Action
- Task 10: Tracking Performance and Maintaining Momentum

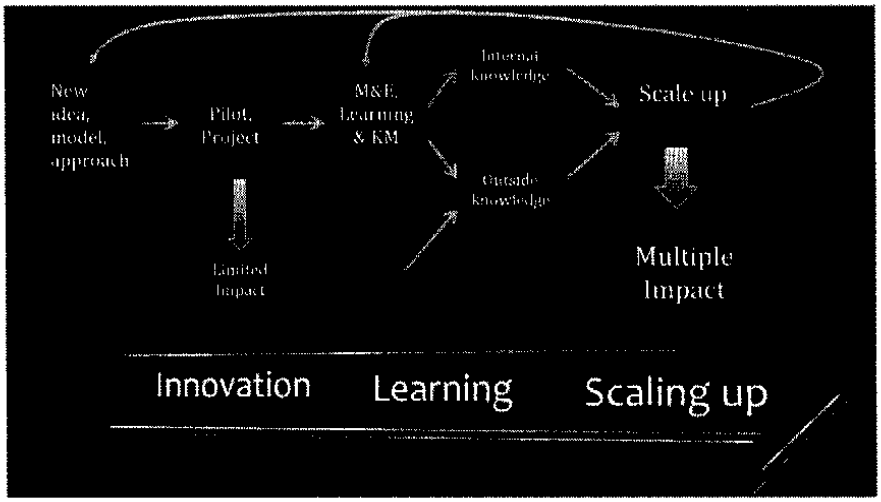
*The Cooley and Kohl Model stresses the importance of an ***Intermediary Organization*** to support the adopting organization which is doing the scaling up:



Linn and Hartmann (IFAD 2010 10)

This conceptual model was developed on the basis of extensive literature review and analysis of IFAD work on innovation and scaling. The model emphasizes the importance of learning in an " iterative and interactive cycle" of scaling up.

Figure 1: Innovation, learning and scaling up linkages



The work that Linn and Hartman have done gives emphasis to organizational and institutional aspects of scaling; focuses on the drivers of scaling up and the financial, political, organizational and other spaces, which permit the scaling up; and stresses the importance of monitoring and evaluation for learning and adaptation. Like Cooley and Kohl (above,) Linn and Hartman note that scaling up needs supportive policies and programs along with *"organizations with institutional and human capacity"* (2008 37-8). They also suggest that *"the donor community needs a change of mindset and practices by applying the basic lessons summarized above. This means first and foremost defining a clear vision, applying strong leadership and instilling the institutional values in the aid organization to assure the scaling up goal is systematically reflected in the institutional mission and practice."(*41)

Ruth Simmons, Peter Fajans and Laura Ghiron 2007

While this model focuses on scaling up innovation in reproductive health programs, the conceptual thinking draws from many non-health disciplines and has relevance to the agricultural area, particularly with respect to innovations that require significant changes in the behaviors and practices of the client population (such as rural producers) as well as of other actors, such as extension agents, government staff and partner organizations. Like other conceptual models, this model does not assume that the organization scaling up (user) is necessarily the organization that originally introduced and tested the innovation. Like Cooley and Kohl, and in a different way, Linn and Hartmann, this model emphasizes the role of a resource team (or intermediary organization), which was *"involved in the development and testing of the innovation and/or [is] seeking to promote its wider use".(*12)

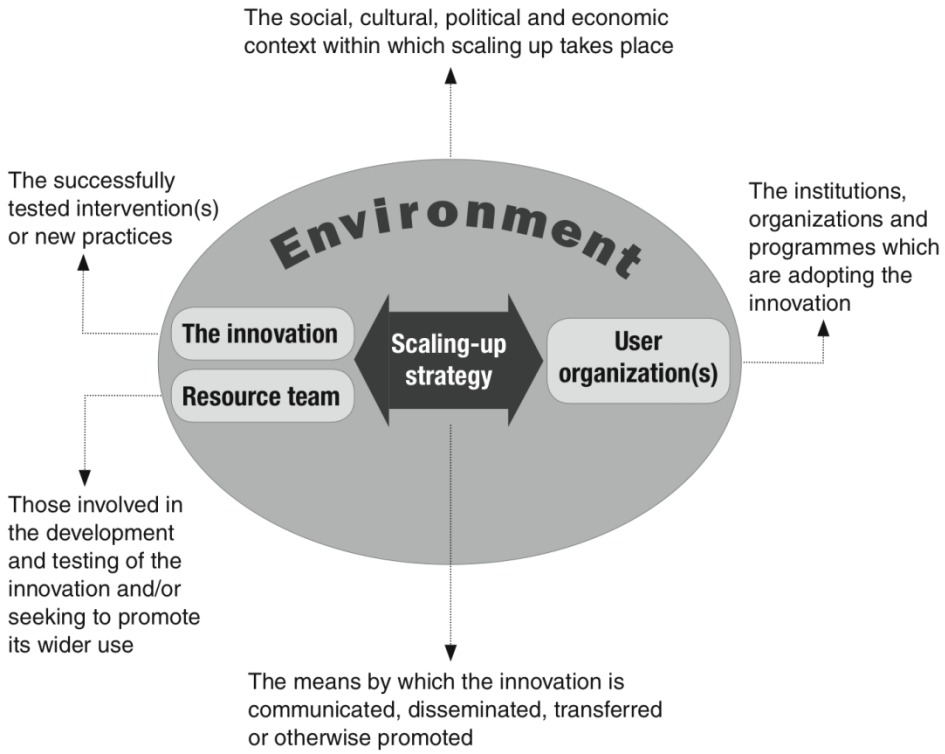


Figure 1.1 The elements of scaling up

Simmons and colleagues go on to identify strategies for scaling up, and specifically choices on the type of scaling up, dissemination strategies, organizational choices, costs and resources, and monitoring and evaluation.(18) Like Cooley and Kohl, Linn and Hartmann, Simmons and colleagues suggest that the environment or "space" influences the scaling up strategy. For Simmons and colleagues, politics and policies, bureaucracy, the sector, the socioeconomic and cultural context and people's needs and rights are influential.

Annex B - Tools for DM Case Studies

Note on Tools and Their Uses in Theory and Practice. The tools below (and others) are useful in providing us with questions and help to identify all the critical issues influencing the question of scaling up. No one tool is useful in all circumstances--- we need a range of tools. This is a guide to tools of use in conducting cases studies of scalability potential.

Mapping a theory of change. The usefulness of mapping our theory of change is that it forces us to make explicit the steps/actions and assumption required to produce the change sought.

- Carol Weiss – See: "How Can Theory-Based Evaluation Make Greater Headway?" Evaluation Review. August 1997. 21:501-524. Here and elsewhere Weiss shows how to make explicit all the actions necessary to go from the decision to implement to the achievement of the change.
- Aspen Institute model – a free copy is available at http://www.dochas.ie/Shared/Files/4/TOC_fac_guide.pdf
- Backward Mapping – See: Richard Elmore. "Backward Mapping: Implementation Research and Policy Decisions". Political Science Quarterly. Vol. 94, No, 4. (Winter, 1979-1980), 601-616. Elmore starts with the change required and asks what action is necessary to produce the change; Then the backward mapping process works backward, asking what is required to produce each step or action.

Stakeholder analysis. There are multiple ways to identify and then diagram or map stakeholders, seeking to emphasize different characteristics, such as power, interests, competencies, pathways for action

- Arnold Howett – Mapping the system (See sample below
- Examples from Derick W. Brinkerhoff and Benjamin L. Crosby, Managing Policy Reform, Hartford: Kumarian Press 2002, pp. 141-152 and 163-178; or "Using a Power-versus-interest Grid". in Barbara C. Crosby and John M. Bryson. Leadership for the Common Good. San Francisco: John Wiley. 121-124.

Scaling Model Decision Framework – The text above suggests the complexity of decision-making as to whether expansion, replicability or collaboration, or some combination of these choices, represents the best approach to scaling up in a particular case. The Cooley and Kohl decision model can help structure thinking about the variables that influence this choice. See below.

Scalability Checklist – This checklist (see below) a good rapid assessment tool that raises many questions about scalability; some of which should be investigated in depth in a qualitative way.

SWOT Analysis. This is an old and well-known tool. It is a useful way to frame the analysis of the drivers and spaces of a particular scaling approach.

Mapping the System (Howett)

Actors	What are their interests?	Why do they matter?	In which 'action pathways' will they participate?

Which Form of Scaling?
A Decision Guide – Reproduced from Cooley and Kohl 2006

This should be used in conjunction with "Types and Methods of Scaling " Tool illustrated in the text of the paper.

Table 2. Choosing a Scaling-up Method

Factors to Consider	Method Preferred
Type of Model	
Technology Intensive	Any
Process Intensive	Expansion or Collaboration
Comprehensiveness of Model	
Specific Practice	Any
Complete Model	Expansion
Capacity of Originating Organization	
Strong	Expansion or Collaboration
Weak	Replication
Source of Financing	
Internal	Any
External	Replication or Collaboration
Availability of Formal Evaluation and Documentation of the Model	
Yes	Any
No	Expansion
Observability of Results	
High	Any
Low	Expansion
Ease of Transfer to Other Organizations	
High	Replication or Collaboration
Low	Expansion
Quality of Governance	
High	Replication
Low	Expansion or Collaboration
Presence of NGO Networks	
Strong	Replication
Weak	Expansion or Collaboration
Social Homogeneity	
High	Any
Low	Replication

Scalability Checklist -Reproduced from Cooley and Kohl 2006

This tool provides a rapid assessment of the complexity or simplicity of the innovation, and thus a rough indicator of scalability.

Table 3. Scalability Checklist

Characteristics of the Model	A Simplifying Factor	B Neutral	C Complicating Factor
Is the model credible?	☐ Based on sound evidence	☐	☐ Little or no solid evidence
	☐ Evaluated by independent sources	☐	☐ Not evaluated by independent sources
	☐ Supported and espoused by respected individuals and institutions	☐	☐ Not supported or espoused by respected individuals and institutions
How observable are the model's results?	☐ Very visible to casual observation; easily communicated to public	☐	☐ Not very visible; not easily communicated to public
	☐ Clearly associated with the intervention	☐	☐ Not clearly associated with the intervention
	☐ Has a clear emotional appeal	☐	☐ Has little or no clear emotional appeal
How relevant is the model?	☐ Addresses a persistent problem	☐	☐ Addresses a temporary problem
	☐ Addresses a need that is sharply felt by the target population	☐	☐ Addresses a need not sharply felt by the target population
	☐ Addresses a need that is sharply felt by potential adopting organization(s)	☐	☐ Addresses a need that is not sharply felt by potential adopting organization(s)
Does the model have relative advantage over existing practices?	☐ Current solutions are considered inadequate	☐	☐ Current solutions are considered adequate
	☐ Superior cost-effectiveness clearly established	☐	☐ Little or no objective evidence of superiority to current solutions
How easy is the model to transfer and adopt?	☐ Few decision makers are involved in adoption of model	☐	☐ Many decision makers are involved in adoption of model
	☐ Small departure from current practices and behaviors for target population	☐	☐ Large departure from current practices and behaviors for target population
	☐ Small departure from current practices and culture of potential adopting organizations	☐	☐ Large departure from current practices and culture of potential adopting organizations
	☐ Little emphasis on values and/or process	☐	☐ Significant emphasis on values and/or process
	☐ *Model* has low technical sophistication	☐	☐ *Model* has high technical sophistication
	☐ Includes a clear and easily replicated *technology*	☐	☐ Does not include a clear and easily replicated technology
	☐ Low complexity; simple with few components	☐	☐ High complexity; integrated package with many components
	☐ Able to use current infrastructure and facilities	☐	☐ Requires new infrastructure and facilities
How testable is the model?	☐ Able to be tested by users on a limited scale	☐	☐ Unable to be tested without complete adoption
Is funding likely to be available and/or will resources be saved?	☐ Much less expensive than current practice	☐	☐ Much more expensive than current practice
	☐ Fully funded by revenues or a dedicated funding source	☐	☐ No dedicated funding source; zero or low cost recovery
Total Number of Checks	___	___	___

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