DETERMINANTS OF SUCCESSFUL SCALING UP: IN THE CASE OF AGRICULTURAL COMMERCIALIZATION CLUSTER IN ETHIOPIA

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Statement of certification

This is to certify that Tsilat Yewondwossen has carried out this thesis work title "**Determinants of Successful Scaling Up: In the Case of Agricultural Commercialization Cluster in Ethiopia"**

The work is original in nature and is suitable for submission for the award of the Master of Art Degree in Project Management.

Signature: _____

Date: June, 2021

Name of the Advisor: **Mengistu B.(PHD)**

DECLARATION

I the under signed, hereby declare that the thesis entitled "**Determinants of Successful Scaling Up: In the Case of Agricultural Commercialization Cluster in Ethiopia"** is my original work and has not been submitted to any other college, institution or university other than Addis Ababa University for the award of the Degree of Master in Project Management at Addis Ababa and that all sources of material used for the study have been appropriately acknowledged.

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Abstract

The purpose of this study was to examine determinants of successful scaling up and adopted a descriptive research and explanatory research design. All staffs of the Agricultural Transformation Agency who are involved in Agricultural Commercialization Cluster program were targeted as the population of this study. This study used a purposive sampling technique to select sample projects of the target population. The sample size of this study was therefore 166 employees working on the Agricultural Commercialization Cluster program. The study used primary data that was collected through questionnaires. Correlation analysis was conducted to see the strength of association between determinants of scaling up and successful scaling up. Multiple regression analysis was also conducted to analyze the effect of determinants of scaling up on Successful scaling up. The study showed that all the independent variables have a significant effect on Scaling up in the study area. Finally, the research found that spaces or enabling environment for scaling up is the higher significant factor that affects successful scaling up of the Agricultural Commercialization Cluster program followed by, drivers and pathways of scaling up. Hence, the Agricultural Transformation Agency shall work on identification of the environmental factors (spaces) influencing scaling up and understand how they affect the process.

Keywords: Agricultural Commercialization, Agricultural Transformation Agency, Drivers, Spaces Or Enabling Environment, Pathways

Contents

List of acronyms

ATA- Agriculture Transformation Agency

SPSS- Statistical package for special sciences

NGos- Non-governmental organizations

GTP- Growth and transformation plan

ACC- Agricultural commercialization Cluster

ADLI- the Agricultural Development Led Industrialization

IRR - International Institute of Rural Reconstruction

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CHAPTER ONE

1. Introduction

This research intended to explore the strength of association and relationship between determinants of scaling up and successful scaling up. Accordingly, the degree of influence and relationship between variables was examined and the results are briefly explained in chapter of this study

In this section of the study: background of the study, statement of the problem, objectives of the study, research questions, significance of the study, limitation and scopes of the study are presented in a way that they are clear and easily comprehensible.

1.1 Background of the study

As Linn, 2012, explained, unstable food prices and famine have brought agriculture and nutrition to become the priority of the international development agenda though it was ignored for many years. Recently aid organizations and governments have started to move from project to program support and how to replicate and scale up successful models gained importance.

According to Johannes F. Linn,(2012), the global community has set itself the challenge of meeting the Millennium Development Goals (MDGs) by 2015 as a way to combat world poverty and hunger due to the fact that development interventions: projects, programs and policies are limited in scale, short-lived, and therefore have little lasting impact. Therefore pushing forward successful projects, programs, or policies and expanding, adapting, and sustaining them in different ways over time for greater development impact is critical for improved agricultural productivity, rural incomes and nutrition.

According to the 2020 FOCUS BRIEF on the World's Poor and Hungry People which were held in October 2007 , emphasis on scaling up has emerged from concern over how to deploy and absorb the substantially increased levels of official development assistance that were promised by the wealthy countries.

Hence, this research paper is designed to add its contribution towards successful scaling up mainly focused on determinant factors for the interventions to be adapted, expanded and replicated.

A s far as literature is concerned there are number of successful scaling ups implemented in the world which their success factor story has been replicated, adapted and expanded in to other countries. For example, The Green Revolution which dramatically raised the productivity of farmers in many parts of the world; the microcredit schemes of Grameen Bank and (Bangladesh Rural Advancement Committee) in Bangladesh; the multidonor River Blindness Eradication Program in Western Africa; Johannes F. Linn,(2012).

Ethiopia is a country with an agrarian economy characterized by high population growth, huge dependence on erratic rainfall, low agricultural productivity, structural bottlenecks and land-locked-ness as described at the Plan for Accelerated Sustainable Development to End Poverty (PASDEP) (MoFED, 2002; 2005). The agriculture sector is characterized by low productivity partly due to low investment level in the sector (particularly in smallholder farms) backward farming technologies, low farm level capacity, land degradation and recurrent drought (EEA/EEPRI, 2005), though in the last few years the performance of the sector has notably improved. Like in other African countries, Ethiopia's potential with respect to commercial agriculture is largely untapped and the current status of agriculture is a source of major concern as the sector is dominated by poor smallholders, often solely engaged in subsistence agriculture, while the agribusiness sector is in its infancy (Bonaglia et al., 200). Subsistence agriculture is not a viable activity to ensure sustainable household food security and welfare in the long run (Pingali, 1997). Therefore, Ethiopia needs to achieve accelerated agricultural development along a sustainable commercialization path to alleviate poverty and ensure overall national development. However, the transformation process, besides designing different strategies, requires the government and development agencies of ensuring that commercial farming and smallholders are well integrated into the market system and benefiting from or contributing to the process of commercialization.

The Agricultural Commercialization Clusters (ACC) program was introduced during the first Growth and Transformation Plan period (GTP I) with the aim of integrating prioritized

interventions from the Transformation Agenda that are geographically targeting and focusing on specific/limited number of high-value commodities (ATA, 2015). The ACC initiative was designed by looking at the best practices from countries that have used the geographically focused approach to transform agricultural transformation and rural industrialization.

Among these, the Agricultural Development Led Industrialization (ADLI) strategy has been the central pillar of Ethiopia's development approach since 1993, driving the Sustainable Development and Poverty Reduction Program (SDPRP) from 2000/01 – 2004/05, and the Plan for Accelerated and Sustained Development to End Poverty (PASDEP) from 2005/06 – 2009/10.

Understanding of the marketing behavior, market channels used and the determinants of market participation of each party is required at all levels of the exchange system to aid in designing and implementing appropriate technological, policy and institutional strategies to ensure that all are well with the process of commercialization. In spite of the policy decision of the government of Ethiopia (GoE) to commercialize subsistence agriculture and also promote commercial farming, there is a dearth of information on the commercialization process and marketing behavior of participating parties in Ethiopia.

Therefore, this study has focused primarily on the role of agricultural commercialization in general and identifying determinants of successful scaling – up commercialization in particular by reviewing different research done on the past.

1.2 Statement of the problem

Linn, 2012 has mentioned many examples of successful scaling up: such as, The Green Revolution, the microcredit schemes of Grameen Bank and (Bangladesh Rural Advancement Committee) ,the multidonor River Blindness Eradication Program in Western Africa; and the conditional cash transfer program in Mexico - a success story that has been replicated in many other developing countries. More typically, however, development interventions are limited in scale and short-lived. Incoming political leaders tend to promote their own new initiatives rather than build on the success of their predecessors. Bureaucracies are plagued by a lack of continuity in leadership, a focus on the new and different, and a lack of effective evaluation of what works and what doesn't.

External assistance reinforces these tendencies. The number of governmental aid agencies and NGOs continues to expand, the number of projects supported by donors becomes ever larger, their average size ever smaller, and donors compete for the attention of recipient organizations with newer initiatives.

According to International Food Policy Research Institute briefing made on recently**,** introducing the concept Systematic scaling up requires a perspective that sees beyond the traditional project approach. It explores from the outset and throughout the project cycle the potential scaling-up pathways that can ensure that a successful project is not a one-time event but the stepping stone toward a wider and sustainable impact. Scaling up expands, replicates, adapts, and sustains successful policies, programs, or projects to reach a greater number of people. A new idea, model, or approach is typically tested and examined in a pilot project of limited impact; with monitoring and evaluation (M&E), the knowledge acquired from the pilot experience can be used to scale up the model to create larger impacts. The process generally is not linear but an iterative and interactive cycle as the experience from scaling up converted into new ideas and learning. Not every innovation can or should be scaled up, but the experimental nature of the innovation process needs to be recognized as important in its own right. The risk of pilots not succeeding must be accepted as an integral part of the innovation and learning process. They pay their own dividends in lessons learned.

The Agricultural Transformation Agency report showed that the Government of Ethiopia (GoE) has designed and implemented a number of development strategies over the last few decades, with the goals of accelerating growth, reducing poverty, enhancing sustainability and inclusiveness, and eliminating the country's dependence on overseas development aid. As the part of strategy, the ACC program was designed to assist the implementation process by incorporating recommendations from research to identify and solve the systemic bottlenecks. It involves the largest public extension service system in the world that provides seed, fertilizer, mechanization, and market service to farmers in the agriculture sector (Bomba, 2013).

The Agricultural Commercialization Cluster (ACC) program attempts to address these issues by focusing on high value crops and horticultural commodities produced in Ethiopia that can

contribute to the growth in agricultural productivity and commercialized to not only create sustainable food systems locally through import substitution but also create market surplus for the export market (Source: Agricultural Commercialization Clusters appraisal document)

Despite the importance given to the scale up of agriculture and it's increasing importance leading to a number of initiatives to grow agricultural productivity, Ethiopia is not currently realizing its full agricultural potential, as the sector is dominated by subsistence-oriented, low input and output farming. Ethiopia's agricultural produce is also limited in product diversity. As it has been revealed by professionals on the area, one of the major problems faced in the design of many development programs is the successful scalability of pilot interventions on a national scale.

Further by making discussions with ATA specifically with ACC high level managers, the researcher has come up with the following gaps :First, Several technologies and innovations have been developed and given to farmers, yet the spread and impact of the technologies/innovations is not felt on the ground , Second access to funding is becoming problematic as citizens demand accountability of moneys spent on research , third Poor understanding on how new technologies and innovations are faring on the market and being adopted and lastly, Understanding of the factors that determine diffusion of technologies/innovations is critical in understanding factors hindering uptake and therefore scaling up of new technologies and innovations.

Yet in spite of the numerous works done on Scaling up, there seems to be little focus on the determinants of successful scaling up. While literature on scaling up of agricultural innovation abounds, most of it does not focused on the factors that influence the task of scaling up which this the main objective of this particular study.

Hence, there is the need to study the factors affecting successful scaling-up of agricultural commercialization in Ethiopia by taking ACC program as a case study.

1.3 Research questions

Understanding of the factors that determine successful scaling up is critical in understanding factors hindering uptake and therefore scaling up of new technologies and innovations. Hence, the study has raised the following general research question:

- ***What are the key factors affecting the successful scaling-up of agricultural commercialization in ACC program***?

In addition to the general research question, the study has raised the following specific research questions:

> Scaling up is a dynamic process requiring a force—or driver—to propel it forward. First, there has to be an idea, an innovation that meets a need or creates a demand among people. Second, there has to be a leader or champion. All successful programs that have expanded from small beginnings have benefited from charismatic leaders who are endowed with a vision, are persistent in their efforts, are often well connected to major stakeholders and constituencies, and have the ability to command respect and guide people. ***Therefore,(1).***

- ***To what extent drivers of scaling up process influence the successful scaling up in Agricultural Commercialization Cluster (ACC) program*****?**

Ideas, champions, and external catalysts are not enough, however. For interventions to be scaled up, they need space in which to grow. Sometimes, such space already exists, but more often than not it has to be created. A number of interrelated spatial dimensions must be available if interventions are to be replicated and scaled up successfully. ***Hence,(2)***

- ***How does spaces of scaling up or enabling environments in which the imitative can grow influence successful scaling up in ACC program?***

According to Linn (2012), a scaling-up pathway is a serious of steps to certify that a successful pilot is taken from its experimental stage through subsequent steps of scale for greater impact. This sequence has three components: identifying the type of scaling up desired; dissemination and advocacy of the innovation; and attention to organizational processes. It is important to define from a project's start the scale to which an intervention should or could ultimately be taken, given the needs of the target population and the nature of the intervention, and to consider realistically the time horizon over which the scaling process needs to extend. Along the scaling-up pathway the program should deliver intermediate results. This is necessary to allow for the testing and, where needed, adaptation of the approach. ***Therefore, (3)***

- ***How does pathways for scaling up influence successful scaling up in the ACC program***?
- (4) Which factors highly affect the successful scaling up in ACC program?

1.4 Research objectives

1.4.1. General objective

The main objective of this research was to identify factors affecting successful scaling-up in agricultural commercialization cluster (ACC) program?

1.4.2. Specific objectives

- To determine the effect of Drivers of scaling up on successful scaling up in ACC program?
- To know the influence of spaces of scaling up or enabling environments in which the imitative can grow on successful scaling up in ACC program.
- To examine the influence of Pathways of scaling up process on successful scaling up in ACC program.
- To determine among which factors do highly affect successful scaling up in ACC program.

1.5. Hypothesis Development

The process of scaling up can be understood through pathways (process, actors and their roles), spaces (the enabling environment) and drivers (champions and demand). A good understanding of the factors that will affect the scaling-up process is essential in order to design and implement successful scaling-up projects. The critical factors include a well-defined theory of change, clearly defined competencies among the implementing partners, champions at the project, community; and a suitable policy and regulatory framework. Based on the literature, innovation initiatives with the best possibility for scaling up have: clear and testable design for theory of change; local legitimacy; alignment (with policies, priorities and practices); effective partnerships; capacity to benefit; and simple designs. Complexity (of both the innovation and the scaling-up process in terms of number of actors and decision points) constrain implementation, while simplicity makes implementation easier. Clear lessons from the literature suggest that context matters; evaluation and learning are critical; and successful scaling up requires both time and the right kind of sustained support to assure the emergence of local capacity to manage and sustain an innovation. Innovations that are backed by locally generated evidence of programmatic effectiveness and feasibility increase the likelihood of being successfully scaled up. Scaling up must be concerned with sustainable policy and programme development, including organizational capacity and

availability of financial resources. In many projects, there is not a clearly articulated business model, or the time required to establish a financially sustainable position is unclear. The initiatives should move towards financial viability by being cost covering or sharing, through private sector adoption or by proving themselves as a public good.

Hence, based on the proposed research model discussed in chapter two, the study has formulated and tested following research hypotheses in the context of successful scaling up.

- H1: There is a positive and significant relationship between drivers of scaling up process and the successful scaling up of agricultural commercialization in ACC program.
- H2: Spaces of scaling up have a positive and significant effect on the successful scaling up of Agricultural commercialization in ACC program.
- H3: There is a positive and significant relationship between pathways for scaling up and the successful scaling up of agricultural commercialization in ACC program.

1.6 Significance of the study

Commercialization of agriculture is a recent practice and initiation in Ethiopia with low or no scalability. As pointed out above, this study aimed at exploring scaling up factors that determine the successful up scaling in ACC, including the kind of association each factor has on successful scale up. Findings from this study will provide useful inputs for researchers, governments, the private sector, donors, and other stakeholders to improve scaling up processes for innovations so as to maximize their socio-economic impacts on the wider population

The result of this study is believed to add knowledge to the existing literature and can also be used as a reference for researchers who need to conduct a research on the topic in the future. Furthermore, this study will contribute to the limited knowledge available on the successful scalability of pilot programs in the local context.

1.7 Scope /Delimitation of the study

Conceptually, this particular study was limited to examine factors affecting the successful scaling-up of the ACC program only. The study has focused on the key determining factors that led to the successful scale up of the Agriculture Commercialization Cluster program from pilot stage to it's current size and area of implementation.

With regards to geography, the research is confined to study within the four clusters namely: Oromia, Amhara, Tigray and SNNP regions of Ethiopia.

When we come to the methodological scope, relatively large sample size which is more representative was determined and factors affecting the successful scaling-up of agricultural commercialization in ACC program was analyzed using statistics such as, correlation and regression analysis. And the study has been conducted and concluded within 2021.

1.8 Potential limitations of the study

The project is still under implementation in the scale up stage and is consistently changing and adapting to meet the needs of the program stakeholders. In addition, the main beneficiaries of the interventions of the ACC are smallholder farmers spread across the four regions of Amhara, Oromia, SNNP and Tigray making it difficult to collect firsthand data on the ground. As such, this study was focusing on the larger picture of the ATA and the intervention design and implementation from the federal level.

1.9 Organization of the study

The rest chapters of this study has been categorized under four major parts

Chapter two is all about literature review, related literatures about scaling up and it's determinants have been thoroughly reviewed, and the conceptual framework was developed.

Major methodology parts such as research design, research approach, population and sample size of the study, sampling techniques and method of data analysis are clearly presented in chapter three.

The fourth Chapter of this study encompasses data presentation, analysis, and interpretation. In this section of the study, both correlation and regression analysis has been carried out and accordingly, the result of the research finding has been interpreted and presented.

All the research findings; conclusions and recommendations and areas for further research are presented in last chapter of the study, chapter five.

1.10 Definition of key terms/operational Definitions

Agriculture: the science, art and practice of cultivating plants and livestock

Cluster: an approach that is aimed at forming a consolidated cultivable holding dedicated to specific food grains, vegetables, fruits and other horticulture crops

Cooperative: an autonomous association of persons united voluntarily to meet their common economic, social, and cultural needs and aspirations through a jointly-owned enterprise

Pilot: an initial small-scale implementation that is used to prove the viability of a project idea.

Scale up: the term used to refer to the increase in the size of a project. A sequence of steps which is taken to certify that a successful pilot is taken from its pilot stage through subsequent steps to scale is referred to as Scaling up

Smallholder farmer: as per the definition of the Central Statistics Agency (CSA), smallholder farmers are farmers that have less than 25.2 hectors of farmland

CHAPTER TWO: LITERATURE REVIEW

Introduction

The purpose of this chapter is to review the literature in the area of Scaling up and mainly focused on factors affecting successful scaling up. This review of literature establishes the theoretical frame works for the study and highlights different frame works used in different studies.

2.1Theoretical Literature review

2.1.1 Innovations related to Agriculture

Karl, 2013 defined Innovation as the process of applying new or existing knowledge in new ways and contexts to do something better. It is a process that transforms ideas into outputs by replacing older established products, processes, and services with new ones (Karl 2013). This transformation may be in products, processes, or services and can be incremental or radical and at various levels of the value chain. According to the Oslo manual for measuring innovation (OECD, 2005), innovation has been classified into four namely, product innovation, process innovation, marketing innovation and organizational innovation.

Product innovation refers to a good or service that is new or significantly improved. This includes significant improvements in technical specifications, components and materials, software in the product, user friendliness, or other functional characteristics. Whereas process innovation refers to a new or significantly improved production or delivery method. It comprises significant changes in techniques, equipment, and/or software. Marketing innovation implies method involving significant changes in 5Ps namely: ***product promotion or pricing, product design or packaging, product placement***. On the other hand, Organizational innovation refers to a new organizational method in workplace organization, business practices, and or external relations.

Innovation consists of three basic elements: (i) technology innovation, including new varieties or breeds and soil or water management practices; (ii) organizational innovation, in terms of organizing and delivering knowledge in new ways; and (iii) institutional innovation, in terms of rules, cultures, values, norms, behavior, policies and laws (Karl, 2013).

2.1.2 What is Scaling- Up?

The term "scaling up" has multiple definitions depending on the area of focus and discipline of interest. From the literature there are two definitions that are relevant for our purposes. According to Hartmann and Linn (2008), "Scaling up means expanding, adapting and sustaining successful policies, programs, and projects in different places over time to reach a greater number of people

A WHO/ExpandNet report (2012) defines scaling up as "deliberate efforts to increase the impact of innovations, successfully tested in pilot or experimental projects so as to benefit more people and to foster policy and programme development on a lasting basis." Both of these definitions have a number of elements in common: greater reach, successful interventions, adaptation and sustainability. However, the WHO definition states that the intent is to increase the impact of innovation and stresses the importance of fostering policy and program development.

Based on these definitions, the distinctive features of scaling up are:

• A "successfully tested" intervention is supported by locally generated evidence of programmatic effectiveness and feasibility obtained through pilot testing or experimental projects. In this sense, scaling-up does not mean simply broadening the use of existing or new practices from small to large scale without local research, evaluation or adaptation. "Successful" means the innovation is realistic to carry out, relevant and worthwhile, and that the intervention has real benefits for potential users.

According to Binswanger and Aiyar,(2003), There have been several contexts and definitions to which scaling-up has developed . Some of the definitions are scale of impact, quality of impact, and impact for whom, and sustained time frames.

The popular view of scaling up persists that it applies to only tangible objects (Fatunbi et al., 2015). Others feel that scaling up is not only about projects but for programmes and policies (World Bank, 2005) and therefore pre-defined scaling up as "the efficiency increase of socioeconomic impact from a small to a large scale of coverage". After decades of neglect, unstable food prices, and famine, the World Bank understood the importance to frame it in the perspective where governments, non-governmental and development partners should focus on how successful interventions could be up scaled to get the best and leverage on the gains in agriculture, rural development, and nutrition (World Bank, 2012).

In Agriculture, production may involve the scaling of agricultural innovations such as disease resistant and drought-tolerant maize varieties, zero-tillage techniques, permaculture cultivation practices based on perennial crops, and automated milking systems (Wigboldus, 2016).

According to the International Institute of Rural Reconstruction (IRR, 2000) scaling up implies bringing more quality benefits more quickly, more equitably, to more people over a wider geographical area.

From the agricultural innovation system concept or model (IAR4D) introduced by FARA, which aims to have a "good impact" (Fatunbi et al., 2015), scaling-up is defined as "efforts to intensify the influence of successfully tested innovations in pilot stages aiming at benefiting the wider population, group, individuals and improve policy and program development for the long run" (Simmons, Fajans and Ghiron, 2007). In this particular study, this definition of scaling up was adopted although the definition of IRR (2000) is more widely used. The adopted definition for this particular research is echoed by Uvin (1995), who viewed scaling up as a successful transitional process from a pilot project to a large-scale, multi-dimensional operation.

Due to the complexity of the scaling up concept (Franzel et al., 2010), there is currently very little knowledge about its precise meaning (Uvin, 1995). Scaling up has been considered in much broader terms, that is, as a process of adaptation, innovation, feedback, and expanded human capability (Krishna et al., 1998). Also, depending upon the object of scaling up, the concept could mean transition, institutionalization, transformation, integration, incorporation, evolution, and development (Wigboldus and Leeuwis, 2013). It should however be noted that 'scaling up' is often said to have come from a research and development model that forecasts research being done to identify possible improvements to agricultural practice, testing and refining such interventions in pilot locations and then widely disseminating the refined interventions (Linn, 2012).

According to (Linn, 2012) systematic scaling up requires a perspective that sees beyond the traditional project approach. It explores from the outset and throughout the project cycle the potential scaling-up pathways that can ensure that a successful project is not a one-time event but the stepping stone toward a wider and sustainable impact. Scaling up expands, replicates, adapts, and sustains successful policies, programs, or projects to reach a greater number of people.. A new

idea, model, or approach is typically tested or examined in a pilot stage of limited impact; with monitoring and evaluation (M&E), the knowledge acquired from the pilot experience can be used to scale up the model to create larger impacts. The process generally is not linear but an iterative and interactive cycle as the experience from scaling up convetrted into new ideas and learning. Not every innovation can or should be scaled up, but the experimental nature of the innovation process needs to be recognized as important in its own right. The risk of pilots not succeeding must be accepted as an integral part of the innovation and learning process. They pay their own dividends in lessons learned.

Scaling up is typically a long-term, non-linear process that combines generalized and context-specific approaches, focusing on the order of activities, integrating local and 'external' knowledge and mainstreaming new processes and principles (World Bank, 2003). Armed with the knowledge of the research gap, development agencies have sought to identify certain factors that prevent the increase in productivity and "hindering the realization of meaningful transformations of people's lives despite decades of government and donor expenditures on poverty alleviation" (Wabungu, 2011).

Theories for scaling up centering on projects include but are not limited to that of UNDP (2013), which sees scaling up as processes that can take many forms. Scaling up can range from the national level, covering the whole population and then be upgraded to a policy reform having come about through a successful pilot, thereby reaching the wider geographic area and covering a greater number of rural and urban poor (Fatunbi et al., 2015).

2.1.3 Determinant factors Affecting Successful Scaling UP

1. Pathways for scaling up

According to Greve & Seidel, 2015 Pathways are organized activities by which a social program reaches more people is called a pathway. In studies of the diffusion of production technologies, the initial path selected can greatly determine the eventual scale up outcome (Greve & Seidel, 2015). The organization or a set of organizations that controls the program makes decisions about which pathway to use to achieve scale (Dees, Anderson & Wei-Skillern, 2004).

Pathways vary on a number of factors, and most especially in the degree of central control that a lead organizational partner has over the scale up process (Gabriel, 2014; Management Systems International, 2012; Sezgi & Mair, 2010). In this study the influences pathway towards successful scaling up has been determined

According to Linn (2012), a scaling-up pathway is a serious of steps to certify that a successful pilot is taken from its experimental stage through subsequent steps of scale for greater impact. This sequence has three components: identifying the type of scaling up desired; dissemination and advocacy of the innovation; and attention to organizational processes.

It is important to define from a project's start the scale to which an intervention should or could ultimately be taken, given the needs of the target population and the nature of the intervention, and to consider realistically the time horizon over which the scaling process needs to extend. Along the scaling-up pathway the program should deliver intermediate results. This is necessary to allow for the testing and, where needed, adaptation of the approach. It also helps with ensuring the buy-in of the community, the government, and other stakeholders. M&E and rigorous impact evaluations are key ingredients of a successful scaling-up strategy. During the implementation of the pilot, the intervention's impacts need to be assessed and the stakeholders need to learn what the potential drivers, spaces, or constraints for an eventual scaling-up process can be. During the scaling-up process the assumptions about drivers and spaces must be tested and the impacts evaluated, with a randomized approach wherever possible (Linn, 2012).

2. Drivers of Scaling Up

Scaling up is a dynamic process requiring a force or driver to push it forward. The following drivers have been identified in most literatures:

- **Ideas and Models:** this is to mean that there has to be an idea or model or an innovation that meets a need or creates a demand among people and works at a small scale or has been promoted successfully elsewhere for further scaled up.
- **Vision and leadership:** there has to be a leader or champion. All successful programs that have expanded from small beginnings have benefited from charismatic leaders who are

endowed with a vision, are persistent in their efforts, are often well connected to major stakeholders and constituencies, and have the ability to command respect and guide people. A vision is needed to identify that the scaling up of an idea or a model is essential, desirable, and practicable. Visionary leaders or champions play a significant role in driving the scaling up process.

- **External catalysts:** external catalysts can serve as drivers of change and scaling up. They might include crises such as political, natural disasters or economic meltdowns, or they can be agendas introduced by outside actors.
- **Incentives and accountability:** it is clear that incentives and accountability for results are required to drive actors and institutions. This may include among others rewards or competitions, and political pressure or community demand, peer reviews, and independent evaluations.

3. Spaces or enabling environment for Scaling up

Successful scaling up requires effective spaces or enabling environments in which an initiative can grow: Space has to be created for an initiative to grow and reach the desired scale in a sustainable manner. The most important spaces are fiscal/financial, institutional/organizational, political, partnership, and cultural.

- **Fiscal/ financial space**: It must be ensured that the scaling up model is financially sustainable. It is a must to mobilize financial resources to support the scaled-up intervention, or costs related to the intervention shall be pushed down first to match the available financial resources.
- **Policy space**: In order to realize and support successful scaling up, the policy and legal framework has to be adapted.
- **Market space**: When scaling up agricultural production, potential market constraints need to be considered and addressed in order to help avoid negative price and wage effects.
- **Institutional capacity space**: Institutional, organizational, and staff capacity must be created.
- **Political space**: Because Political dynamics often change as programs grow, Scaling up requires political commitment.

- **Natural resource/environmental space**: The impact of the intervention (any new idea or model) on natural resources and the environment in general must be taken into account while scaling up. In other words harmful effects shall be mitigated, and beneficial impacts must be promoted.
- **Cultural space**: Before we are going to the scaling up process, possible cultural bottle necks or support mechanisms need to be identified so that programs can be suitably adapted to permit scaling up in culturally diverse environments. Programs often need to be adjusted as they are being extended or replicated to accommodate other values or social-interaction patterns, especially in multicultural communities and countries, or when successful interventions are transferred to another one.
- **Partnership space**: Partners need to be selected and informed to join in the effort of scaling up process. It is essential to determine whether external and internal partners will continue to support the program, or whether new partners will be required. In most successful scaling-up operations, partners were a key factor in helping to maintain the momentum and focus. They can support the drivers and provide financial support in the scaling-up process.
- **Learning space**: For successful scaling up, knowledge about the scaling up must be transferred respective group via various methods. Monitoring, evaluation, and feedback loops are important for learning and adaptation.

2.1.4 Scaling up agriculture, rural development, and nutrition

Linn explores the experience of scaling up successful interventions in agriculture, rural development, and nutrition under five broad headings:

1. The role of rural community engagement
2. The importance of value chains
3. The intricacies of scaling up nutrition interventions
4. The lessons learned from institutional approaches
5. The experience of international aid donors

They have provided vivid pictures of scaling up. There are no blueprints for when and how to take interventions to scale, but the examples and experiences described offer important insights on how to address the key global issues of agricultural productivity, food insecurity, and rural poverty.

2.1.5. Scaling up and scalability

Scaling up is can be explained as "continuous efforts made to enhance the influence of successfully tested or proven innovations aimed to benefit more people and to enhance policy and program development on a lasting basis (Nations Development Programme; 2013). Based on the definition the researcher can infer that scaling up mean a process for significantly increasing the number of sustained implementations of a successful program, thereby serving more people with comparable benefits.

On the other hand Scalability, can be defined as the: ability of a agriculture related intervention which is successful proven on a small scale to be expanded, adapted or replicated practically to other contexts, while retaining effectiveness (Milat AJ, et.al. 2012). From the definition one can generalize that Scalability does not only refer to expansion, but also reduction. For example, an agricultural intervention that has practically implemented or tested and found to be effective on a large scale could be applied on a smaller scale.

Types of scaling up

According to WHO/ExpandNet, 2012 Scaling up can be either spontaneous or a deliberate effort to promote innovation at a faster rate. The deliberate efforts are based on the realization that successful scaling up rarely happens spontaneously. There are three types of deliberately guided scaling up namely: Expansion or replications, policy/political/legal/institutional scaling up and Functional/ diversification scaling up. The study has tried to examine each of the three types of scaling ups in the following way

- **Replications or Expansion:** can be named as horizontal scaling up. Horizontal scaling up refers to the expansion of coverage of a project, program, or policy across more people and greater space. Expanding programs to cover more people across wider geographic areas inevitably requires working with higher level (provincial, national, regional, and even global) institutions and political forces. Moreover, Cooley and Kohl (2006), have explained expansion as improving the scope of operation of an organization. Meaning the way it expands affects the capacity of the organization. On the other hand, replication is increasing the use of the innovation, but it is done by the originating organization.

- **Policy/political/legal/institutional scaling up:** can be as named vertical scaling up. Vertical scaling up refers to creating the organizational and political framework needed to permit going to a larger scale.
- **Functional/ diversification scaling up**: Also called functional scaling up involves testing and adding interventions to existing packages. Functional scaling up means going beyond one function to include others. Functional scaling up is more of an optional dimension, but it can be a serious threat to the long-term success of development interventions.

Though a number of agricultural initiative projects are often developed and support packages are designed to enhance the sector in Ethiopia, it is less likely to see when such initiatives are expanded and replicated in local context. A successful pilot project at local level might stimulate a replication of the project in other local settings. However, sustainable expansion and replication within regional and/or even national boundaries, policy and legislative changes at higher levels are often required. That means that scaling up processes often cross different political and administrative levels (Nations Development Programme; 2013) – that political and organizational scaling up is important.

2.2 Models

Scaling up projects is strongly related to the dissemination and implementation of innovations that might have been successfully tested of new solutions to particular problems.

Scaling up begins by clarifying exactly what is to be scaled up which is referred as Model This model is normally embedded, at least initially, in a project and can include technical, proces s, and organizational components. . A pilot project can take a model that has worked successful in one context or for one problem and apply it to a new context or problem(Source:a managemen t Framework for Practitioners Second Edition, 2012).

There are four useful conceptual models in the literature that offer a greater insight into the scaling-up process. Although they focus on different aspect of the processes, in combination they provide useful guidelines for practical application (World Bank, 2011).

The first conceptual model, proposed by Cooley and Kohl (2006), is grounded in the public administration and development management literature. This three-step, ten-task framework deals

with planning and implementing a scaling-up intervention. The authors make a strong case for an intermediary organization to support the work of the organization that is implementing the scaling up.

The second conceptual model was proposed by Linn et al. (2010), based on IFAD's work emphasizing the importance of learning in an "iterative and interactive cycle" of scaling. This model gives emphasis to organizational and institutional aspect of scaling. It focuses on the drivers of scaling up and the financial, political, organizational and other spaces that permit it. The model also stresses the importance of monitoring and evaluation for learning and adaptation. This model recognizes that scaling up depends on supportive policies and programs, along with organizations with institutional and human capacity.

The third model, reported in WHO/ ExpandNet (2012), was developed to address scaling up in the reproductive health sector. This has relevance to agriculture, particularly those projects that require significant changes in behavior. This model does not assume that the organization doing the scaling up is the same one that originally tested the innovation. It also identifies strategies for scaling up that involve the type of scaling, dissemination strategies, organizational choices, costs and resources, and monitoring and evaluation.

2.2.1 ExpandNet model

ExpandNet is an informal global network of individuals from international organizations, non-governmental organizations, academic and research institutions, governmental ministries and specific projects who seek to advance the science and practice of scaling up. According to the model scaling up is a deliberate effort to increase the influence of innovations successfully tested or proven in experimental projects aiming at benefiting more people and to enhance policy and program development on lasting basis.

Deliberate efforts: Scaling up typically requires systematic guided efforts to achieve success.

Innovations: The package of interventions being scaled up. If the package is new in the local context, it is an innovation, even if implemented elsewhere.

Successfully tested: the intervention package requires local evidence of feasibility, acceptability and effectiveness to ensure appropriate fit to the context**.**

Benefit more people: Reaching new populations and/or geographic areas with interventions is a primary rationale for scale up.

Foster policy and program development: Embedding the innovation in the policies, organizational structures and operational guidelines is critical for sustainability**.**

On lasting basis: Expansion of new interventions without ensuring continued implementation wastes valuable resources.

According to the ExpandNet model, a scaling-up strategy is placed: Within an environment (e.g. agricultural needs and social, cultural, political and economic contexts); and between a resource team promoting an innovation and a potential user organization, being addressed or even expected to adapt and implement the innovation.

2.2.2 Conceptual model

The conceptual model by (Greenhalgh et al. 2004) is based on a systematic review of innovation studies and structures the relevant critical factors in a more detailed manner.

Idea ⟶ Plan ⟶ Action

2.3. Proposed theoretical / Conceptual framework of the Study

The study mainly concerned on factors affecting the successful scaling-up of agricultural commercialization in ACC program and it deals with theoretical framework and overview of related concepts. For each context, various factors have been identified from the literature but only those that are considered relevant for study are included in the framework.

The relationship between determinants of scaling up and successful scaling up are shown on the below conceptual frame work of the study.

The proposed framework is presented in Figure 1. In any scaling-up process, five mutually reinforcing key elements interact with one another to produce the desired outcomes: the

innovation, the beneficiaries, the enabling environment (spaces), the promoters (drivers) and the service providers. Monitoring evaluation and the associated learning should be an integral part of this process. In addition, critical decisions have to be made about the type of scaling up, dissemination and advocacy, the organization of the scaling-up process, cost and resource mobilization and M&E (ExpandNet 2012). Careful attention should be paid to all these elements in the design and implementation of scaling-up project. It has been demonstrated that adherence to manageable theories of change, implementation of well-understood drivers, and creation of necessary spaces can provide a roadmap that is adaptable to conditions of a project's scope, scale or location (IFPRI, 2012). The key elements of this framework are discussed in the following sections

Determinants of successful scaling up

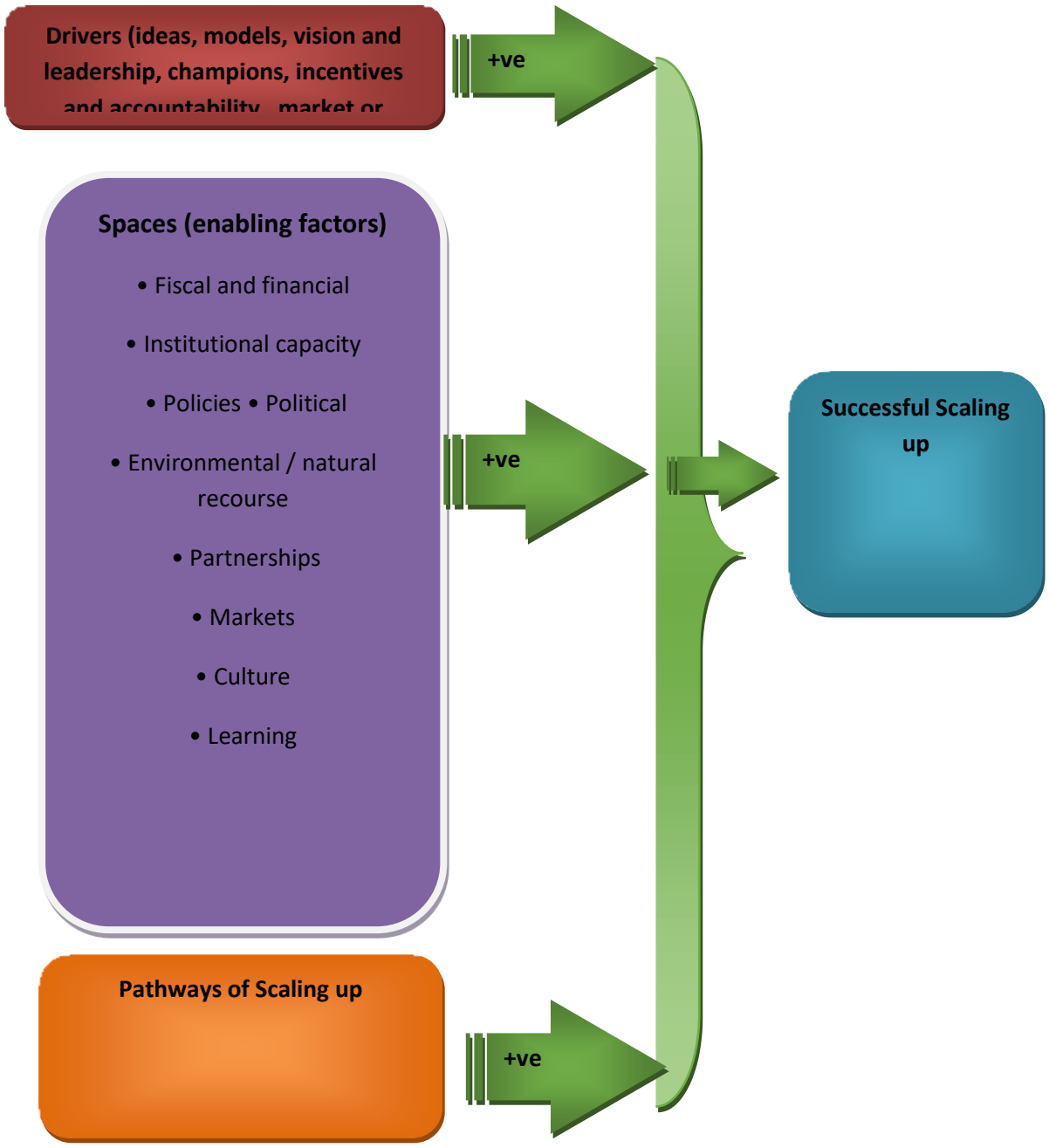


Figure 1: Proposed Conceptual Frame Work

The figure above is to study the relationship between dependent and independent variables for the conceptual framework. The figure shows the conceptual framework is the essential basis of this research project. The **ExpandNet** and conceptual model along with three building blocks for designing scaling-up namely: drivers, spaces and pathways are implemented in this research to form the research framework.

2.3.1 Drivers

Scaling up is a dynamic process requiring a force—or driver—to propel it forward. First, there has to be an idea, an innovation that meets a need or creates a demand among people. Second, there has to be a leader or champion. All successful programs that have expanded from small beginnings have benefited from charismatic leaders who are endowed with a vision, are persistent in their efforts, are often well connected to major stakeholders and constituencies, and have the ability to command respect and guide people.

2.3.2 Space to Grow

Ideas, champions, and external catalysts are not enough, however. For interventions to be scaled up, they need space in which to grow. Sometimes, such space already exists, but more often than not it has to be created. A number of interrelated spatial dimensions must be available if interventions are to be replicated and scaled up successfully. These are:

Fiscal Space: In most cases, increased capital costs can only be covered by determining what other expenditures can be reduced or what additional revenues can be raised.

Political Space: Scaling up requires political commitment. Political dynamics often change as programs grow. Small programs tend to be watched benevolently and with appreciation by those in power. But as the programs expand, as they build constituencies around them and replace other activities, they can be perceived as threatening and evoke negative reactions. Creating political space is a long-term process that must be started early on in the scaling-up journey. It requires advocacy and the legitimization of the programs.

Economic Space: Scaling up requires that sufficient demand must exist for the services offered by the larger program, or that this demand can be readily created.

Capacity Space: Institutions that are unwilling or unable to operate the larger program are perhaps the single biggest constraint to scaling up.

Cultural Space: It is particularly important for participatory programs and for programs that deliver culturally sensitive services.

Partnership Space: It is also essential to determine whether external and internal partners will continue to support the program, or whether new partners will be required. In most successful scaling-up operations, partners were a key factor in helping to maintain the momentum and focus.

Space for Learning: Scaling up is not a linear process; it extends over many years and navigates much uncharted territory**.**

Chapter Three: Research Design and Methodology

3. Introduction

This section of the study deals with the research design and methodology of the study. Research design and approach of the study, target population, sample and sampling techniques, data collection instruments, methods of data analysis are presented in organized manner.

3.1. Research Design and Approach

3.1.1 Research Design

According to Kothari, (2004), the research design is nothing but the theoretical framework in which the research is undertaken. This study employed explanatory and descriptive research design. In order to investigate the objective of the study and test the hypothesis explanatory research design is the best suited for this study. This particular study tried to obtain information that describes existing phenomena by asking sampled respondents about their perceptions on determinants of scaling up. Hence, it adopted a descriptive research design.

3.1.2. Research Approach

In this particular study main parts constituting this research such as research objectives, research design, sample, and the questionnaire used were predetermined first and the data used in questionnaires were quantitative and analyzed using statistics such as, correlation and regression analysis. Hence, this particular study used deductive quantitative research approach. Why it is deductive because various validity of assumptions were made.

3.2. Population of the study

The study has been undertaken to examine factors affecting the successful scaling-up of agricultural commercialization in ACC program by the staffs of the ACC project. The Agriculture Commercialization Cluster (ACC) program has 14 projects. Due to the time and money constraint, for this research the population is individuals who are working in the ACC program. Hence the population for this study is 286 staff members of ACC office.

3.3. Sampling techniques and Sample Size

3.3.1. Sampling Techniques

According to Toye, (2002) sample was defined as "a proportion of a population". Further it was explained as a smaller version of the entire population that the research is about. The sample was chosen from the employees of Agricultural Transformation Agency (ATA) under ACC project.

In order to achieve the objective of the study, the researcher used purposive sampling method sampling technique and selected ACC office. And the researcher used convenient sampling technique to distribute questionnaire for the respondent.

3.3.2 Sampling Size

Sample size was calculated and determined by using Yamane's (1967) sampling formula with a 95 percent confidence level and 0.05 level of precision. Accordingly, at 95% confidence level, the formula is clearly presented in the following manner:

$$n = \frac{N}{1+Ne^2} \qquad \ldots\ldots 1$$

Where;

- n stands for sample size
- N is the population which the sample is drawn
- **e** stands for sampling error

Hence, The sample size of this study is given below

$$n = \frac{286}{1 + 286(0.05)^2} = 166 \approx 166 \ldots\ldots 2$$

The sample size of this study was therefore 166 employees or specialists of the Agricultural Commercialization Cluster program.

3.4. Data sources and collection Methods

The two major sources, primary and secondary source of data were used in this study as applicable. . Primary data was collected from staffs of ACC using a structured questionnaire with a five point Likert Scale. Questionnaires were developed and distribute to employees' to gather information regarding successful scaling up dimensions namely ***pathway for scaling up, drivers of scaling up process and spaces of scaling up***.

The questionnaires were comprised of two parts. Part one was prepared just to gather information about the respondents' such as, gender, education, and the length of time the employee has been working on the project. On the other hand, in part two of the questionnaires, respondents were asked their degree of their agreement and disagreement on determinant factors of successful scaling up in Agricultural Commercialization Cluster program.

Besides, questionnaires in part two were evaluated through a five point Lickert scale. For each question of the questionnaire a number indicating 1, 2, 3, 4 and 5 were assigned and measured as Strongly Disagree, Disagree, neutral, agree and strongly respectively.

3.5. Data analysis

Having collected the primary data through questionnaires, the researcher made analysis using regression and correlation models. Correlation analysis was a conducted to measure the strength of the association between factors for scaling up dimensions and successful scaling up. Whereas regression analysis was made to determine by what extent factors of scaling up (the three core dimensions) explained or influenced successful scaling up.

Tools like tables and percentage were also used. The data analysis was done by using SPSS software version 22. For the sake of reducing possibility of getting wrong answers and to ensure the soundness of this study, the following measures were taken.

1. Data was carefully collected from trustworthy sources, from respondents who have worked on the program
2. The questionnaire was based on literature review
3. The latest SPSS software version was employed to analyze the statistical data and maximum was made during data coding.

3.6 Validity and Reliability

3.6.1 Validity

To check the validity of questioners and to make sure that questioners are valid in terms of content, the researcher has performed the following activities:

1. Before questionnaires were distributed to respondents, a pilot test was conducted, and pilot questioners were distributed to individuals who had previously undertaken a research and expertise in the area.
2. Questioners were submitted to the advisor for further comment

Based on their valuable comments, modification was done questionnaires.

3.6.2 Reliability

In this particular research the Cronbach's alpha was used to check the internal consistency the variables used in this study, and the results of reliability test are presented in chapter four under reliability section. In addition, consultations have been made with ACC specialists and experts to check the degree to which the instruments of measurement are appropriate for the data to be analyzed.

3.7 Research Ethics

Throughout the study all code of conducts of research are appropriately implemented. Any relevant concept in this research was properly quoted. All research participants are protected, there information which were collected via questionnaires from sample respondents, are kept confidential and are only used for the intended purpose of this study.

CHAPTER FOUR

Data Presentation, Analysis and Interpretation

Introduction

This section of the study is all about data presentation, analysis and interpretation. The primary data collected from respondents has been analyzed through a statistical tool, SPSS version 22 software. This chapter consists of four major sections, which are reliability test, correlation analysis, normality test, regression analysis, hypothesis testing and discussion of results

4.1 Reliability Test

The questionnaire survey was conducted within a week time by using Google forms. A total of 166 questionnaires were distributed to sample respondents and only 148 were collected, the remaining 18 of them were left uncollected due to the fact that respondents were not able to fill and submit on the given time frame. Hence, for this particular study 148 questioners were effectively used for analysis that indicates 89% response rate which is acceptable to undertake a study.

In this study Cronbanch's Alpha is used to measure the internal consistency of the items used. George and Mallery (2003), provides the following rules of thumb: >0.9-Excellent, >0.8-Good, >0.7-Acceptable, >0.6-Quesstionable, >0.5-Poor, <0.5-Unacceptable (as cited by Gleam and Rosemary, 2003). The results are shown in the below Table (4.1).

Table 4.1 reliability statistics result for the independent and dependent variables based on Cronbach's Alpha Value

Variable	Cronbach's Alpha	N of Items	Remark: Based on Cronbach's Alpha Value
Drivers of scaling up	.786	6	Acceptable
Spaces of scaling up	.816	10	Good
Pathways of scaling up	.718	6	Acceptable
Successful scaling up	.806	6	Good

Source: Questionnaire survey, (2021)

The above table, 4.1 showed the internal consistency of the data used for this study based on Cronbach's alpha value. The alpha values for the three variables showed that the items that formed them had reasonable internal consistency – being from 0.718 and 0.816(From acceptable to good).

As showed above, the Cronbach's alpha value for all variables is more than .70. Therefore, all variables are considered variable. The independent variable, Spaces of scaling up scored the highest alpha value of 0.816 with 10 items. This implies that Spaces of scaling up is the most reliable variable followed by, Drivers of scaling up and pathways of scaling up having alpha value of 0.786 with 6 items, and 0.7718 with a total of 6 items respectively. Besides, the dependent variable, successful scaling up has alpha value of 0.806 with 6 items.

For testing the reliability of the entered variables, it is rational to say that the test is dependable with independent variables achieved and fulfilled the level of internal consistency as it was measured by Cronbach's Alpha value.

4.2 Validity

To check the validity of questioners and to make sure that questioners are valid in terms of content, the researcher has performed the following activities:

3. Before questionnaires were distributed to respondents, a pilot test was conducted, and pilot questioners were distributed to 7 (Seven) individuals who had previously undertaken a research and expertise in the area.
4. Questioners were submitted to the advisor for further comment

Based on their valuable comments, modification was done questionnaires.

4.3 Correlation Analysis

The next step after checking the goodness of data and validity of data is making correlation analysis. In this section of the study, the association between the independent and the dependent variables has been determined and hypotheses testing were made accordingly.

According to Hair (2003), the Pearson correlation coefficient measures the degree of linear association between two variables and its value varies between –1.00 and +1.00, with 0 representing absolutely no association between two variables, and –1.00 or +1.00 representing a perfect link between the two variables in question, and the higher the correlation coefficient, the stronger the level of association is. Further Sekaaran (2003) pointed out that the Pearson correlation coefficient is appropriate for interval- and ratio-scaled variables, and any bivariate correlation can be obtained.

Accordingly, this study used Pearson correlation coefficient to know the degree of association between determinants scaling up and successful scaling up

To properly evaluate the outcome of Pearson correlation coefficients of each variables the below rules of thumb are used in this study.

Table 4.2 Rules of thumb about the strength of correlation coefficients of variables

Range of Coefficient	Description of Strength
±.81 to ±1.00	Very strong
±.61 to ±.80	Strong
±.41 to ±.60	Moderate
±.21 to ±.40	Weak
±.00 to ±.20	None

Source: Hair (2003)

Table 4.3 Pearson correlations for the determinants of scaling up and successful scaling up

Correlations					
		Drivers	**spaces**	**pathways**	**Scaling up**
Drivers	Pearson Correlation	1	.528**	.290**	.627**
	Sig. (2-tailed)		.000	.000	.000
	N	148	148	148	148
Spaces	Pearson Correlation	.528**	1	.424**	.756**
	Sig. (2-tailed)	.000		.000	.000
	N	148	148	148	148
Pathways	Pearson Correlation	.290**	.424**	1	.568**
	Sig. (2-tailed)	.000	.000		.000
	N	148	148	148	148
Scaling up	Pearson Correlation	.627**	.756**	.568**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	148	148	148	148
**. Correlation is significant at the 0.01 level (2-tailed).					

Source: Questionnaire survey, (2021)

The correlations table, 4.3 showed that Drivers of scaling up, spaces for scaling up and pathways of scaling up are correlated at .627, .756, and .568 respectively (which are statistically significant at the .000 level). These results revealed that each of these three variables namely; Drivers of scaling up, spaces for scaling up and pathways of scaling up are moderately and strongly related to successful scaled up i.e. changes either in any of these variables (Drivers of scaling up, spaces for scaling up and pathways of scaling up) is associated with changes in successful scaling up).

As clearly shown on the above correlation matrix table, all variables are significantly connected to one another variables. There are the three variables within the range of 0.568 - 0.756 which have strong and moderate relationship. Since, all variables correlation coefficients are less than 0.9, multicollinearity does not exist in these data.

Thus, to test the developed hypothesis, this study used the Pearson correlations coefficients matrix as shown in the above table and the results are presented as follows:

4.3.1 Correlation between Drivers of scaling up and successful scaled up

Pearson correlation analysis was checked for Drivers of scaling up and successful scaling up. According to the correlations coefficient result shown in the above table, Drivers of scaling up and scaling up are evaluated and their value, .627, is significant at the 0.01 level (2-tailed). As per the rules of thumb on the strength of the associations between the two variables, the coefficient value, .627 falls within the strong strength intensity level. Therefore drivers of scaling up and successful scaling up are correlated with strong and positive relationship **(r = 0.627**).**

4.3.2 Correlation between spaces for scaling up/enabling environment and successful scaling up

Pearson correlation test was also made to examine the degree of relationship between the spaces for scaling up and successful scaling up. The results of the association between these variables are already shown in table 4.3. According to the result, there is a significant correlation between spaces for scaling up and successful scaling up at significant value of 0.000 lower than 0.05.

Hence, spaces for scaling up dimension and successful scaling up are related with strong relationship **(r = 0.756**).**

4.3.3 Correlation between pathways of scaling up dimension and successful scaling up

In order to see the correlation between pathways of scaling up and successful scaling up, Pearson correlation test was checked, and the results found were presented in table 4.3. There is a positive and significant correlation between pathways of scaling up and successful scaling up with a significant value of 0.000 lower than 0.05. In other words pathways of scaling up and successful scaling up are related with a moderate relationship**(r = 0.568**).**

4.4 Normality test

The Durbin Watson Test that is also called as serial correlation in residuals that measure the autocorrelation from the regression analysis. According to Field (2009), test statistic consider

normal in values that ranges between 1.5 and 2.5. In this study, the Durbin Watson statistic value is 1.709. Hence, it is consider relatively normal.

4.5 Regression Analysis

Regression analysis uses knowledge about the level and type of association between the independent and the dependent variables to make predictions. Statements about the ability determinant variable to cause changes in the dependent variable must be based on conceptual logic or information other than just statistical techniques.

Assumptions of Simple regression model

(1) The variables of interest are measured on interval or ratio scales (except in the case of dummy variables);

(2) These variables come from a bivariate normal population and

(3) The error terms associated with making predictions are normally and independently distributed.

Based on these assumptions into consideration the linear regression model is developed and briefly discussed in the next sub section.

4.5.1 Regression analysis between the determinant factors of successful scaling up

The bivariate regression analysis conducted by using SPSS produced four important tables namely: descriptive statistics, model summary, ANOVA and coefficients. The first table presents the descriptive statistics:

Table 4.4. Regression analysis for descriptive statistics

Descriptive Statistics			
	Mean	Std. Deviation	N
Successful Scaling up	4.7106	.35654	148
Drivers of scaling up	4.4977	.38095	148
Spaces for scaling up	4.4757	.38041	148
Pathways of scaling up	4.4831	.38819	148

Source: Questionnaire survey, (2021)

The Descriptive Statistics table showed that the mean score of variables used in this study is very close to the center. Similarly standard deviation of the independent variables (drivers of scaling up, spaces for scaling up and pathways of scaling up) was measured and has scored a minimal deviation among them and the same measures were taken for the dependent variable successful scaling up.

4.5.2 Multiple Linear Regression

Multiple linear regressions were conducted to identify the relationship and to determine the most dominant independent variable that influenced successful scaling up. This regression analysis was done to know and understand to what extent each independent variable (drivers of scaling up, spaces for scaling up and pathways of scaling) explains the dependent variable that is successful scaling up. In order to show the impact that each determinants dimensions of scaling up has on successful scaling up, the study checked the Standardized Coefficients. The results of the regression analysis are depicted in the following tables.

Table 4.5 Linear multiple regression analysis: model Summary

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.841[a]	.707	.700	.19514	1.709
a. Predictors: (Constant), pathways, Drivers, spaces					
b. Dependent Variable: scaling up					

Source: Questionnaire survey, (2021)

The multiple linear regression model summary and overall fit statistics are shown in the above Table, 4.5. The model summary revealed that the adjusted R^2 of the model is .700 with the R^2 = .707. it implies that the linear regression model with the independent variables explains 70.7% of the variance of the dependent variable and rest, 29.3% is explained by other variables.

Table 4.6 Linear multiple regression analysis: ANOVA

ANOVA[a]						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	13.203	3	4.401	115.577	.000[b]
	Residual	5.483	144	.038		
	Total	18.687	147			
a. Dependent Variable: scaling up						
b. Predictors: (Constant), pathways, Drivers, spaces						

Source: Questionnaire survey, (2021)

The above ANOVA table shows the significance of the multiple linear regressions of variables used in this study. According to the test there is no linear relationship between the entered variables. Meaning $R^2=0$. As per the result, the F-test of the Model is highly significant, and it showed that there is a linear relationship between the variables in this model.

Table 4.7 Linear multiple regression analysis: Coefficients

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.309	.243		1.273	.205		
	Drivers	.272	.050	.290	5.442	.000	.716	1.396
	spaces	.455	.053	.485	8.603	.000	.641	1.559
	pathways	.255	.046	.278	5.559	.000	.814	1.228
a. Dependent Variable: scaling up								

Source: Questionnaire survey, (2021)

The above table 4.7 shows the multiple linear regression coefficients of variables and estimates including the intercept and the significance levels. The fore, the regression equation would be:

SS = .309+ .455 (S) + .272 (D) + .255 (P) + .243(std. error)

Where: SS= Successful scaling up
S = Spaces for scaling up
D=Drivers of scaling up
P = Pathways of scaling up

From the above multiple regressions one can conclude that, for every increase in Spaces for scaling up/ enabling environment, the successful scaling up will also increase by 0.455. Likewise, for every increase in any of the other variables: Drivers of scaling up and pathways for scaling up; the successful scaling up will increases by .272 and .255 respectively.

As a result of all determinant variables are coded in the analysis the Beta weights was taken to compare the relative importance of each independent variable in standardized terms. Therefore, Spaces for scaling up has a higher impact than the other independent variables, followed by drivers of scaling up and pathways of scaling up.

4.6 Hypothesis Testing

The coefficient of correlation matrix table indicates the strength and dimension of association between determinants of scaling up and successful scaling up. A positive relationship was exit between the independent and dependent variables

To accept or reject a hypothesis, this study checked the Standardized Coefficient β value along with the significant value. This study showed that the formulated hypotheses are supported by the research finding. This has done by taking the coefficient of correlation table, which signal strength and dimension, along with the coefficient of regression analysis β value. Thus:

H_1, – Drivers of scaling up positively and significantly affects successful scaling up is supported with the research finding because β=.272; p < .000.

Similar to this particular study there are researches that concluded Drivers of scaling up has a significant impact on the success of scaling up.

$H_{2,}$ – Spaces for scaling up positively and significantly affects the success of scaling up is supported because β = .455 and p < .000.

The finding is consistent with the literature; for projects and initiatives to scale up, they need room to grow. According to Hartmann & Linn (2008), this space often needs to be created and they discuss seven spaces namely; Fiscal, poetical, policy, organizational, cultural, partnership and learning

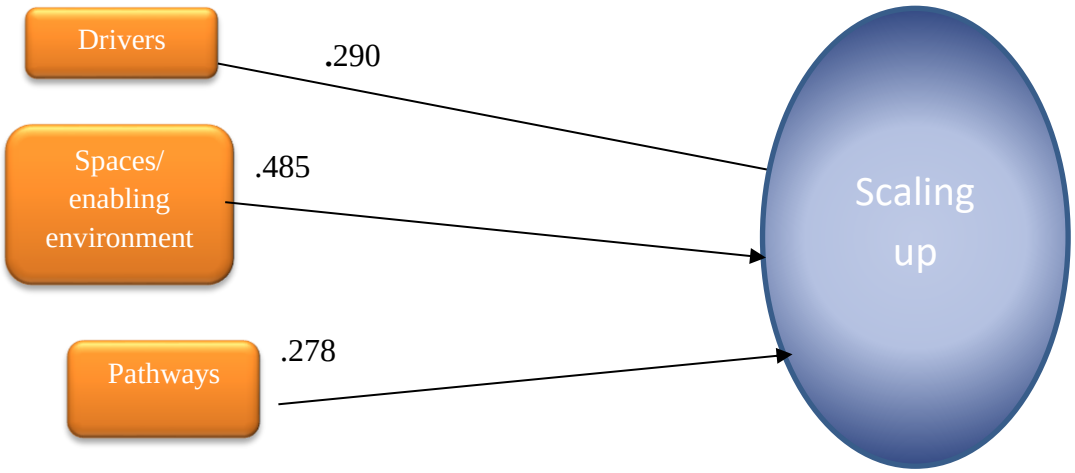
$H_{3,}$ – pathways of scaling up positively and significantly affect successful scaling up is supported as the β = .255 and p < .000.

The finding was in line with literature; (Greve & seidel, 2015) (2006), in their studies of the diffusions of production technologies, the initial path selected can greatly determine the eventual scale up outcome.

4.7 Hypotheses Results

Determinants of scaling up and successful scaling up

Figure 1 findings on the constructs



4.8 Discussion

The findings showed that the developed variables significantly influence the success of scaling up. All three independent variables namely: Drivers, spaces and pathways of scaling up have strong influences on successful scaling up.

Most research findings, as indicated in the review of related literature section; chapter 2; this particular study also confirms the association between the determinant factors for successful scaling up and successful scaling up. Hence, research finding is consistent with those studies. Thus, the effect of determinants of scaling up on successful scaling up used in this research is modeled as:

SS = .309+ .455 (S) + .272 (D) + .255 (P) + .243(std. error)

In this particular research successful scaling up has been greatly impacted by spaces or enabling environments with the highest value of .455, followed by drivers and pathways with coefficients of .272 and .255 respectively.

From these it can been clearly seen that spaces for scaling up or enabling environment is the most significant factor among the independent variables of successful scaling up used in this research, followed by drivers of scaling up and pathways of scaling up.

This suggested that enabling environment or spaces such as the availability of financial resources, appropriate policy and legal framework and political backing to support the scale-up of interventions highly affect the successful scaling up.

Further the findings of this research showed that the availability of an idea or a model used as benchmark, visionary leaders who often drive the process and recognize that the scaling up is necessary, desirable and feasible, pressure from outside actors highly affects the realization of successful scaling up.

Data analysis of this study showed that there is positive relationship among the independent variables: drivers, spaces/ enabling environment & pathways and the dependent variable, Successful scaling up.

CHAPTER FIVE

Summary, Conclusion and Recommendation

This is the last section of the study which includes basic subsections like the research summary, conclusion, recommendation and further research directions.

5.1 Summary the major findings

The objective of this study was to examine the determinant factors affecting the realization of successful scaling up in Agricultural Commercialization Cluster (ACC) in Ethiopia. The study adopted descriptive and explanatory research design. Also the study used quantitative research approach and was conducted from March 2021 to June 2021. The sample size was taken from the population of Agricultural Commercialization Cluster. From this a total of 166 staffs of ACC were sampled and the study were conducted in the city of Addis Ababa and other regions where ACC project placed. Having identified the constructs that are Drivers, spaces/ enabling environment and Pathways, the researcher had developed and tested the following hypotheses:

- H1: There is a positive and significant relationship between pathways for scaling up and the successful scaling up in ACC program.
- H2: There is a positive and significant relationship between drivers of scaling up process and the successful scaling up in ACC program.
- H3: Spaces of scaling up have a positive and significant effect on the successful scaling up in ACC program

As it has been mention clearly in the analysis section of this study, all developed hypotheses were supported by the research findings. The extent of constructs or dimensions impact on successful scaling up in ACC has already presented detail in the previous chapter. In this section of the study, the findings of the respondents are presented in summarized and informative manner.

The respondents were asked to answer the influence of the three independent variables on Successful scaling up. The researcher have tested the questionnaires before she goes to the analysis

by using the reliability test and the result showed that, the coefficient alpha for this study's instrument was found to be more than 81% . Since all the dimensions are greater than 70%, it is acceptable for further analysis.

The assessments made on the dimensions was made by analyzing the independent variables i.e. Drivers, spaces / enabling environments and dependent variable i.e. Successful scaling up by using correlation and regression analysis.

Accordingly, the following correlation and regression analysis results were found. As it is tabulated in the analysis part of this study and the correlation analysis results stated below, all the constructs have strong and moderate relationship magnitude with successful scaling up.

Results of correlation analysis

- **Drivers of scaling up and successful scaling up**

  Drivers of scaling up and successful scaling up are related with a strong relationship (**r = 0.627**).**

- **Spaces for scaling up and successful scaling up**

  The construct spaces or enabling environment and successful scaling up have a strong relationship (**r = 0.756**).**

- **Pathways of scaling up and Successful scaling up**

  The independent variable, pathways has a moderate relationship with dependent variable, successful scaling up (**r = 0.568**).**

In addition to checking the degree of association between variables, the three constructs were also examined their extent of explanation to successful scaling up jointly using multiple regression analysis, but before the researcher has made the regression analysis, the independent variables were tested Multicollinearity. As per the VIF results all variables correlation coefficients is less than 0.9. Hence, Multicollinearity does not exist in these data.

In this research the determinant factors affecting the realization of successful scaling up in ACC are thoroughly analyzed. The relationship strength and dimensions between the factors of successful scaling up were identified. These factors, which are considered as a major component

in most literatures, were: drivers, spaces/ enabling environments and pathways. Spaces or enabling environment has been found central to successful scaling up.

This variable, spaces/ enabling environment for scaling up found in this study as the strongest association determinant factors on successful scaling up. Thus, spaces/ enabling environment demission has been identified as a major constituent to predict successful scaling up; that is; scaling up can be explained in terms of spaces dimension as per this research finding, followed by drivers, and pathways.

Then after as the multiple regressions analysis shows below and depicted in the tables of the previous chapter all independent variables explain the dependent variable with different extent.

The Multiple regression analysis result showed that:

- ✓ All the three constructs jointly explain 70.7 % scaling up
- ✓ Successful scaling up were explained by spaces for scaling up ,drivers of scaling up, and pathways of scaling up , individually with .455,.272 and .255 respectively

5.2 Conclusions

This study examined the determinant factors affecting successful scaling up, in the case of Agricultural commercialization cluster by using drivers, spaces and pathways as a determinant of scaling up. Based on the empirical research findings in this study, it can be concluded that successful scaling up is affected by the above mentioned determinants

Therefore, as per this research finding it can be conclude that:

- ✓ All the independent variables used in this study have positive and significant association with successful scaling up. Spaces or enabling environment is the most influential factor on successful scaling up.
- ✓ Drivers of scaling up are the next most important factor which can predict successful scaling up, followed by pathways of scaling up.

5.3 Recommendations

After detailed analysis of the sampled questioner survey, which was considered relatively large sample size, reliability test, normality test major regression and correlation analysis were done. All the developed hypotheses have been tested and all are found supported with the research findings. In addition Existence of multicollinearity and multiple linear regressions were conducted and found none. The assumptions made to use statistics have also been tested, and those assumptions were evaluated and found valid to proceed.

All the determinant factors used in this research are determined to have positive and strong association with successful scaling up. Although the data is collected only from one project, ACC, the finding of this empirical study can be generalized to other projects in the Ethiopian as well. This is because the form of operation or project life cycle in all projects is the same and relatively large sample data is considered for this study; also data was collected from all part of Ethiopia where ACC program is undergoing.

Hence, the researcher would like to forward the following recommendation to different stakeholders.

- The study has revealed that spaces or enabling environment is the highest significant variable that determines successful scaling up. Scaling up is about the "how" and not just the "what." It is not just the technology. Scaling up is about the processes, the players, the incentives, the policies.
    - Hence, the agricultural transformation agency (ATA) shall highly work on identification of the environmental factors (spaces) influencing scaling up and understand how they affect the process, Make use of opportunities to improve the supports for scaling up and Continue to assess changes in the environment as the process of scaling up evolves so that the projects can easily Scalable to the other projects

- The Ethiopian Government generally and ATA specifically, should focus on creating good leadership that can drive the scaling up process, scaling up objectives and need to develop organizational capacity to manage the scaling up

- Should have a clear communication path to follow during the scaling up process; that is the organization should ensure the proper dissemination and advocacy of the innovation during scaling up and Information are communicated to the ultimate beneficiaries and other stakeholders.

- From literature, it can be inferred that scaling up must be an integral part of the project from the onset and strategies must be put in place to enable successful scaling up of an innovation. Some of the strategies were: enabling policy environment; intrinsic property or inherent nature of the innovation itself such as being simple and able to reduce costs, partnerships and networking including farmer-to-farmer dissemination of information; collective action; and involvement of extension providers. Funding must be adequate. Furthermore, partnerships between governmental and non-governmental organizations that provide support to projects by fostering capacity-building and training of farmers and stakeholders must be encouraged. Finally, according to Gundel (2001), from the perspective of researchers, scaling up has been neglected or given very little attention during the research design phase; it has often been considered a post-project activity and therefore recommended to for inclusion in the pre project design

5.4 Future Research Directions

The study of this research took a sample only from one cluster that is Agricultural Commercialization Cluster (ACC) in Ethiopia. Therefore, other researchers should incorporate the wider range of geographical coverage and sample from the other projects of ATA in order to collect several of perspectives. Besides that, it is recommended future research to build results that is feasible to challenge the currently adopted practices. New research is encouraged to use more others analytical tools such as qualitative to be carry out in exhaustive finding.

Moreover, because of time and finance constraint, the study has limited to ACC which is focused on enhancing agricultural commercialization. However, there are other projects under ATA.

Therefore, other researchers are recommended to include and conduct a research on those programs.

Furthermore this research is limited itself only on the three variables namely: drivers, spaces and pathways. Nevertheless, there might be other factors. Hence, other researchers are recommended to include other factors which are not covered in this study.

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APPENDIX

Appendix 1

Research Instrument

Appendix 1

Research Instrument

ADDIS ABABA UNIVERSITY SCHOOL OF COMMERCE

PROJECT MANAGEMENT POST GRADUATE PROGRAM

Questionnaire

Dear respondent, I would like to thank you for taking your precious time to fill the questionnaire. The objective of this research is to study **Determinants of Successful Scaling Up in the Case of Agricultural Commercialization Cluster (ACC).** This survey is designed as part of my work for the requirement of Masters of Art in Project Management at Addis Ababa University School of commerce. All the information will be kept confidential and used **strictly** for academic purposes only.

Tsilat Yewondwossen

Instruction:

Please, mark using (☑) in the appropriate box for your choice. Please, also make sure that your choice is clear and visible.

Part I. General Information

1. Education level?

☐ Diploma	☐ Doctoral
☐ Degree	☐ Professor
☐ Masters	☐ Other

2. What is your gender?

☐ Male

☐ Female

3. How long have you been working in the project or total work experience? _____ (Years)

Part II: FACTORS AFECTING THE SUCESFUL SCALING UP

Please provide your degree of agreement or disagreement on each statement below by simply putting a tick mark ((☑)

Key:

1 is representing SD: Strongly Disagree

2 is representing D: Disagree,

3 is representing N: Neutral,

4 is representing A: Agree, and similarly

5 is representing SA: Strongly Agree,

1.	**Drivers of Scaling up** : The drivers push the scaling-up process forward relentlessly	SD	D	N	A	SA
1.1	There has been an idea or model used as a bench mark and that works on a small scale or has been promoted successfully elsewhere					
1.2	ACC have visionary leaders who often drive the process and recognise that the scaling up is necessary, desirable and feasible					
1.3	Political and economic crises or pressure from outside actors (donors, NGOs) have driven the scaling-up process forward					
1.4	Incentives and accountability for results were needed to drive actors and organizations					
1.5	Empowered rural communities have promoted scaling up and hold public agencies accountable as they can be a very strong political voice					
1.6	Profit was a very powerful driver in delivering private goods and services.					
2.	**Spaces for scaling up or enabling environment:** *Successful scaling up requires effective spaces, or enabling environments, in which the initiative can grow*	**SD**	**D**	**N**	**A**	**SA**
2.1	Financial resources were mobilized to support the scaled-up interventions					
2.2	The appropriate policy and legal framework was adopted to support scaling up					

2.3	Potential market constraints were addressed in order to avoid negative prices and wage effects while scaling up agricultural production					
2.4	Organizational partner and staff capacity was successfully created to facilitate scaling up					
2.5	The rules of engagement (i.e. guidelines for decision-making, accountability and responsibility, conflict resolution and the role of the leader) were clear and well understood by all stakeholders					
2.6	There has been political support for scaled-up intervention					
2.7	The project has created social space for women, youth and other vulnerable groups in the community to contribute to the scaling-up process and benefit from the intervention.					
2.8	Possible cultural obstacles or support mechanisms were identified and intervention adapted to permit scaling.					
2.9	Knowledge about what works has been utilized through knowledge-sharing and training					
2.10	Partners are mobilized to join in the efforts of scaling up					
3.	**Pathways for scaling up: a scaling-up pathway is a sequence of steps**	**SD**	**D**	**N**	**A**	**SA**
3.1	Information on the project (e.g. impact) was communicated to the ultimate beneficiaries and other stakeholders					
3.2	A successful pilot or practice has been taken from its experimental stage through subsequent stages of scale					

3.3	The type of scaling up desired were properly identified at its initial stage					
3.4	Dissemination and advocacy of the innovation has been put in place during scaling up					
3.5	Project data (i.e targets, analysis…) was presented clearly, concisely and in a timely manner					
3.6	Approaches such as training, technical assistance, policy dialogue, and peer exchanges (including exchange visits) were used in the scale up.					

Part III- Successful scaling up related questions

Please, also indicate your agreement or disagreement level for the next statements, using the same method of selection as the previous section.

A WHO/ExpandNet report (2012) defines scaling up as "deliberate efforts to increase the impact of innovations, successfully tested in pilot or experimental projects so as to benefit more people and to foster policy and programme development on a lasting basis.

4	Scaling up Dimension	SD	D	N	A	SA
4.1	The number of people or firms that receive benefits from an intervention has increased.					
4.2	The project has brought demonstrable benefits that can be measured at different levels (individual farm, target group, national).					
4.3	The intervention has exhibited certain predictors of sustainability					
4.4	The intervention helps to expand opportunities for the most vulnerable groups in society					
4.5	The program had been successfully diffused into a community and integrated into the long run functions of the host agency or organization					
4.6	The intervention has been adapted or customized for different population or sub-group					

Thank you again for your participation in this research!!

Appendix II

SPSS Data output

1. Reliability Analysis

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	148	100.0
	Excluded[a]	0	.0
	Total	148	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.816	4

```
RELIABILITY
  /VARIABLES=Drivesrs1 Drivesrs2 Drivesrs3 Drivesrs4 Drivesrs5 Drivesrs6
  /SCALE('Drivers of scaling up') ALL
  /MODEL=ALPHA.
```

Scale: Drivers of scaling up

Reliability Statistics

Cronbach's Alpha	N of Items
.786	6

```
RELIABILITY
  /VARIABLES=Spacesof1 Spacesof2 Spacesof3 Spacesof4 Spacesof5 Spacesof6
Spacesof7 Spacesof8 Spacesof9 Spacesof10
  /SCALE('spaces of scaling up') ALL
  /MODEL=ALPHA.
```

Scale: spaces of scaling up

Reliability Statistics

Cronbach's Alpha	N of Items
.816	10

```
RELIABILITY
  /VARIABLES=Pathways1 Pathways2 Pathways3 Pathways4 Pathways5 Pathways6
  /SCALE('Pathways of scaling up') ALL
  /MODEL=ALPHA
```

Scale: Pathways of scaling up

Reliability Statistics

Cronbach's Alpha	N of Items
.718	6

```
RELIABILITY
  /VARIABLES=scalingup1 scalingup2 scalingup3 scalingup4 scalingup5
scalingup6
  /SCALE('Successful scaling up') ALL
  /MODEL=ALPHA.
```

Scale: Successful scaling up

Reliability Statistics

Cronbach's Alpha	N of Items
.806	6

```
CORRELATIONS
  /VARIABLES=Drivers spaces pathways scaling up
  /PRINT=TWOTAIL NOSIG
  /MISSING=PAIRWISE.
```

2. Correlations Analysis

Correlations

		Drivers	spaces	pathways	scaling up
Drivers	Pearson Correlation	1	.528**	.290**	.627**
	Sig. (2-tailed)		.000	.000	.000
	N	148	148	148	148
spaces	Pearson Correlation	.528**	1	.424**	.756**
	Sig. (2-tailed)	.000		.000	.000
	N	148	148	148	148
pathways	Pearson Correlation	.290**	.424**	1	.568**
	Sig. (2-tailed)	.000	.000		.000
	N	148	148	148	148
scalingup	Pearson Correlation	.627**	.756**	.568**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	148	148	148	148

**. Correlation is significant at the 0.01 level (2-tailed).

```
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS CI(95) R ANOVA COLLIN TOL
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT scaling up
  /METHOD=ENTER Drivers spaces pathways
  /RESIDUALS DURBIN.
```

3. Regression Analysis

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.841[a]	.707	.700	.19514	1.709

a. Predictors: (Constant), pathways, Drivers, spaces

b. Dependent Variable: scaling up

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	13.203	3	4.401	115.577	.000[b]
	Residual	5.483	144	.038		
	Total	18.687	147			

a. Dependent Variable: scalingup

b. Predictors: (Constant), pathways, Drivers, spaces

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.309	.243		1.273	.205		
	Drivers	.272	.050	.290	5.442	.000	.716	1.396
	spaces	.455	.053	.485	8.603	.000	.641	1.559
	pathways	.255	.046	.278	5.559	.000	.814	1.228

a. Dependent Variable: scaling up

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions			
				(Constant)	Drivers	spaces	pathways
1	1	3.988	1.000	.00	.00	.00	.00
	2	.005	27.523	.00	.35	.04	.67
	3	.004	33.748	.55	.05	.67	.03
	4	.003	36.606	.45	.60	.29	.31

a. Dependent Variable: scaling up

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	3.6598	5.1294	4.7106	.29970	148
Residual	-.65978	.52327	.00000	.19314	148
Std. Predicted Value	-3.506	1.397	.000	1.000	148
Std. Residual	-3.381	2.681	.000	.990	148

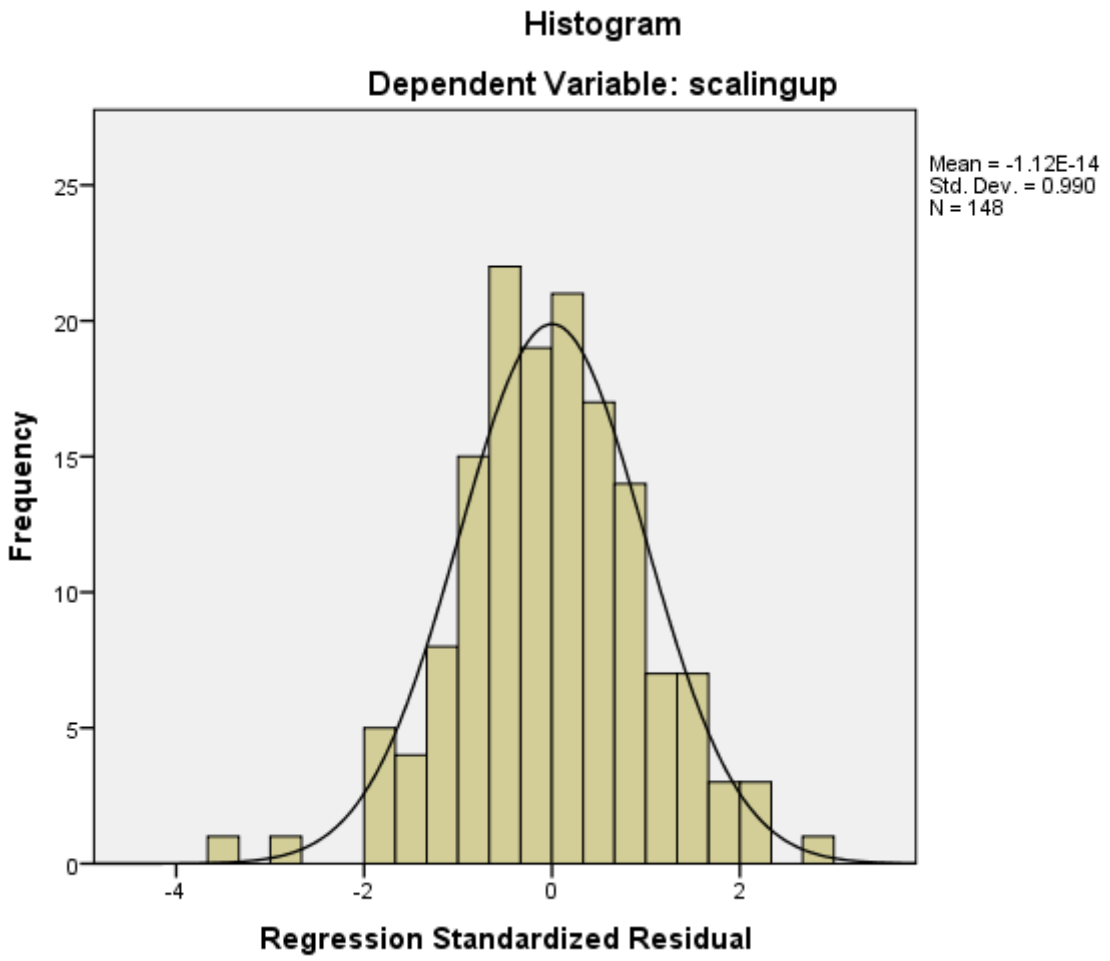
a. Dependent Variable: scaling up

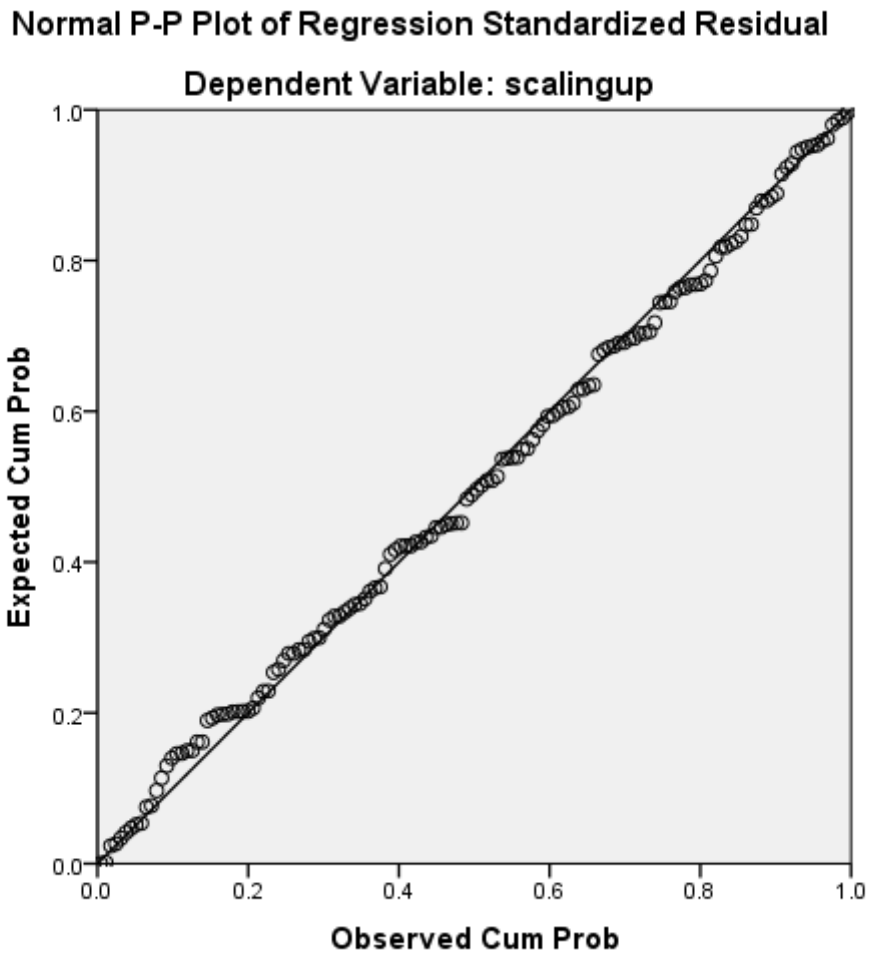
Descriptive Statistics

	Mean	Std. Deviation	N
Scaling up	4.7106	.35654	148
Drivers	4.4977	.38095	148
spaces	4.4757	.38041	148
pathways	4.4831	.38819	148

4. Normality Test

Charts




Normal P-P Plot of Regression Standardized Residual
Dependent Variable: scalingup
Expected Cum Prob
Observed Cum Prob
0.0
0.2
0.4
0.6
0.8
1.0