COMMUNITY ENGAGEMENT ON SCIENTIFIC RESEARCH: THE PROCESS OF COMMUNICATING AGRICULTURAL RESEARCH RESULTS TO FARMERS BY THE RWANDA AGRICULTURE BOARD

BY

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A Thesis Submitted to the School of Information Sciences, Department of Communication Studies in Partial Fulfilment of the Requirements for the Degree of Doctor of Philosophy (PhD) in Communication Studies

Moi University

July 2019

DECLARATION

Declaration by the Candidate:

This thesis is my original work and has not been presented for a degree in any other University. No part of this thesis may be reproduced without the prior written permission of the author and/or Moi University.

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DEDICATION

This work is exceptionally dedicated to Ms Solange KAMUGWERA, my heavenly wife, and to Ishimwe Douce Angélique MUSABYIMANA, Ikuzwe Ange Divine MUSABYIMANA, Iriho Délice Angelle MUSABYIMANA, and Isingizwe Dan Archange MUSABYIMANA, our lovely angels. You have a special place in my heart and I will always strive to make up to you through my unfailing love.

It is also dedicated to Ms Emilienne KABAZIGA, my unequalled mother, Faustin MUNYANZIZA, my late father, and all my brothers and sisters. You have paved the way to my success and I will never forget you.

ACKNOWLEDGEMENTS

I am indebted to many people. Although only a few are mentioned, the contribution of all is acknowledged.

Foremost, I would like to express my heartfelt gratitude to Dr Abraham Kiprop MULWO and Professor Eunice KAMAARA, my lecturers and supervisors, whose insights and comments have guided me in this work. I am very grateful to them to have been available whenever I needed their help.

I am also indebted to all professors and lecturers at Moi University, School of Information Sciences, Department of Communication Studies, and other professors and lecturers from different departments who contributed to my knowledge.

I extend my gratitude to officers, researchers and extensionists at Rwanda Agriculture Bard (RAB) as well as farmers in the Rwanda, Southern Agricultural Zone who accepted to give me their time as I was trying to get a picture of how agricultural research results are communicated to farmers in Rwanda.

I am deeply beholden to my family for their special and continuous assistance, their encouragement, as well as their moral and material support.

Last but not least, I thank the Almighty Creator for He has always been my dependable Father. May His name be glorified!

ABSTRACT

Studies have revealed that in spite of investments in agricultural research and innovations in Rwanda, farmers have not been aligning themselves with agricultural research findings. Many farmers still practise traditional farming and remain vulnerable to weather and related conditions. Among the issues that might cause this phenomenon is ineffective communication of agricultural research findings to farmers. Since the most important institution dealing with agricultural research in Rwanda is the Rwanda Agriculture Board (RAB), the aim of this study was to find out how RAB communicates agricultural research findings to farmers. The study subscribed to the relativist ontology and interpretive epistemology. The qualitative approach was used with data generated using interviews and focus group discussions. Study participants included RAB researchers, as well as farmers that worked with RAB in the Southern Zone. Participants in the study produced lengthy and multi-thematic narratives on how research results were communicated to farmers at RAB, which were analysed and arranged according to emerging themes and sub-themes in accordance with the research objectives. While Transmission and Transactional Models of Communication were used to describe the communication of agricultural research results to farmers, Diffusion of Innovation Theory, Participatory Communication Approach, Freire's Theory of Conscientization, and Active Audience/Reception Theory helped to understand that communication. The study revealed that research results at RAB were communicated to farmers using two approaches: direct and indirect. In direct approaches, researchers engaged farmers directly without any mediation. This was mainly used when RAB researchers went to farmers' fields to validate the results of their research. Indirect approaches consisted in extensionists taking research results and related messages to farmers through face-to-face meetings as well as the use of mass media. While RAB staff blamed farmers for being held back by their traditional beliefs and poor farming practices, farmers also blamed RAB staff of overloading them with instructions that in some cases were not realistic, ignoring their voices and rejecting everything they had been practising. Findings suggest that while new farming practices had been adopted by farmers especially in the demonstration farms, the majority of them continued their traditional farming practices in farms not accessed by the RAB staff. They blamed RAB of imposing new farming practices without considering their traditional knowledge systems. The study argues that the top-down, often authoritarian method of engagement with farmers led to a lack of sustainability in the implementation of ideas emerging from agricultural research organizations, hence undermining research efforts. In line with theories used in the study, the study recommends that a dialogic process of engagement be adopted in order to empower farmers with knowledge, the need to adopt new agricultural practices and how these would enhance their productivity.

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ABBREVIATIONS/ ACRONYMS

AU	: African Union
C4D	: Communication for Development
CAADP	: Comprehensive Africa Agriculture Development Programme
CE	: Community Engagement
CFSC	: Communication for Social Change
CICA	: Centre for Agricultural Information Communication
CIP	: Crop Intensification Programme
DevComm	: Development Communication
DRUSSA	: Development Research Uptake in Sub-Saharan Africa
EDPRS	: Economic Development and Poverty Reduction Strategy
FAO	: Food and Agriculture Organisation of the United Nations
FFS	: Farmer Field Schools
FGD	: Focus Group Discussions
GAFSP	: Global Agriculture and Food Security Programme
GDP	: Gross Domestic Product
HIV	: Human Immunodeficiency Virus
IAR4D	: Integrated Agricultural Research for Development
ICT	: Information and Communication Technology
INATEK	: Institute of Agriculture, Technology and Education of Kibungo
IPAR	: Institute of Policy Analysis and Research
ISAR	: Institut des Sciences Agronomiques du Rwanda (French acronym meaning the Rwandan Institute of Agricultural Sciences)
IT	: Information Technology
IWM	: Integrated Watershed Management approach
KHI	: Kigali Health Institute (now part of College of Medicine and Health Sciences (CMHS), University of Rwanda)
LIM	: Land husbandry, Irrigation and Mechanisation
LIP	: Livestock Intensification Programme
LWH	: Land Husbandry, Water Harvesting and Hillside Irrigation
MDG	: Millennium Development Goal
MINAGRI	: Ministry of Agriculture and Animal Resources
MONAGRI	: 'Moniteurs Agricoles'- Agricultural Monitors

NEPAD	: New Partnership for Africa's Development
NGOs	: Non-Governmental Organisations
NSP	: National Seed Policy
NWICO	: New World Information and Communication Order
OECD	: Organisation for Economic Co-operation and Development
OGC	: Oslo Governance Centre
PSTA	: "Plan Stratégique pour la Transformation Agricole"- Strategic Plan for Agricultural Transformation
R & D	: Research and Development
RAB	: Rwanda Agricultural Board
RADA	: Rwanda Agricultural Development Authority
RARDA	: Rwanda Animal Resources Development Authority
T&V	: Training and Visit
UKAID	: United Kingdom Agency for International Development
UNDP	: United Nations Development Programme
UNESCO	: United Nations Educational Scientific and Cultural Organization
UNICEF	: United Nations Children's Fund
WB	: The World Bank

OPERATIONAL DEFINITION OF TERMS AND CONCEPTS

This section explains important terms and concepts that are used in this thesis. It guides the reader on the intended meanings and perspectives.

Community Engagement

According to Social Pinpoint (2018) in order to understand community engagement, there are closely related terms that need to be defined. Those are Community Engagement, Public Engagement, Public Participation, and Civic Engagement. For Social Pinpoint researchers, *"engagement"* is just another English word that needs to be understood basing on the context in which it is used. However, they say that the under-used meaning of any variant of "engagement" is where it means people 'doing' rather than just talking. Engagement sounds more inclusive and it indicates being part of a long-term process. Whereas the word participation creates a bit more distance, you participate in something but you have no influence on the process itself.

"Civic engagement" can be defined as working to make a difference in the civic life of one's communities and developing the combination of knowledge, skills, values and motivation to make that difference. It means promoting the quality of life in a community, through both political and non-political processes.

Concerning "*community engagement",* Social Pinpoint (2018) says that there is no widely accepted definition of community engagement and the meaning can vary in different contexts. Community engagement is a broad term that covers the interactions between groups of people with a common interest or identity and other stakeholders. Community engagement allows community members to actively contribute to Council decisions and actions by creating an inclusive environment in which community feedback is embraced, considered and acted upon. It serves as a response

to increasing community concern about low levels of trust and confidence in government and addresses the escalating expectation that all levels of government be responsive to the community, accountable for levels of service and spending. Community engagement is also about engaging with the community to provide access to a greater range of solutions – The collective wisdom of the community can help Council to achieve the vision and aspirations of the community. It is not simply about sharing information, or listening to opinions via a survey or focus group, it is about partnership with communities to engage them in joint decision making. Inevitably this leads to empowerment which is not something that can be given to a community but something that can emerge when conditions are conducive to its emergence.

With regard to "Public Engagement", Social Pinpoint (2018) says that it involves the process that brings people together to address issues of common importance, to solve shared problems, and to bring about positive social change. Effective public engagement invites average citizens to get involved in deliberation, dialogue and action on public issues that they care about. It helps leaders and decision makers better understand the perspectives, opinions, and concerns of citizens and stakeholders.

In the context of this study, it is about engaging farmers and allowing them to actively contribute to decisions and actions about their lives, problems and challenges by creating an inclusive environment in which their feedback is embraced, considered and acted upon.

Communication

In this study, communication is used to mean what Griffin (2012, p.6) defines as "the relational process of creating and interpreting messages that elicit a response". This

conception goes beyond the traditional way of looking at communication with "transmission", "transfer", "dissemination" associations. It takes the communication to be much more than transmitting transferring or disseminating a message. It considers the relational process of creating the message as the most important element of communication. The "relational, co-creation of message" is the one that informs the study since it considers agricultural researchers/extensionists and farmers to be equally important.

Conscientization

According to Freire (1970) conscientization is the liberating process of consciousness- mobilization that enables critical thinking about how we live and how the world we live in is ordered. This dynamic process is political because it is meant to transform the person into an ethically conscious citizen. It uncovers the effects of oppression and exclusion, and increases awareness of unjust circumstances, events, and relations that have been ignored and normalized or considered part of daily life. Persons who undergo a conscientization process arrive at a different understanding of the world, of themselves, and of their roles and possibilities. Conscientization includes the processes of problematization, de- ideologization, and de- alienation, from which a non-fractioned consciousness regarding social situations is constructed and reconstructed, allowing a new understanding of the lifeworld, and of the circumstances configuring this lifeworld. In this study conscientization (theory) was adopted as a theory that could help Rwanda Agriculture Board (RAB) to engage farmers to deeply understand their own problems and actively participate in solving them. More on conscientization is found in Chapter 3 - Conceptual Framework, Theory of Conscientization.

Development

According to Bellù (2011, p.2), in general terms, "development" means an "event constituting a new stage in a changing situation" or the process of change per se. As he puts it, if not qualified, "development" is implicitly intended as something positive or desirable but when referring to a society or to a socio-economic system; "development" usually means improvement, either in the general situation of the system, or in some of its constituent elements (Bellù, 2011, p.2).

This term 'development' is used in the study mostly referring to positive and desired change in the agricultural sector in Rwanda as a result of agricultural research. It is also used to refer to the positive and desired change in the lives of farmers and farmers' happiness and well-being.

Development Communication

Development communication (also referred to as "communication for development," "development support communication," and more recently, "communication for social change") has been defined differently by different authors. For Servaes (2008, p.14) development communication means the study of social change brought about by the application of communication research, theory, and technologies to bring about development. It is a widely participatory process of social change in a society, intended to bring about both social and material advancement, including greater equality, freedom, and other valued qualities for the majority of people through their gaining greater control over their environment.

This study is rooted in the field of development communication and uses development communication perspectives to determine how effective the communication of agricultural research results at RAB is.

Participatory Communication

Participatory communication is an approach based on dialogue, which allows the sharing of information, perceptions and opinions among the various stakeholders and thereby facilitates their empowerment. It is not just the exchange of information and experiences: it is also the exploration and generation of new knowledge aimed at addressing situations that need to be improved. Participatory communication tends to be associated with community-driven development, but it could be used at any level of decision making (local, national, international) regardless of the diversity of groups involved (Tufte and Mefalopulos, 2009). In this study, participatory communication refers to fostering dialogue and sharing of information, perceptions and opinions among stakeholders in the communication of agricultural research results to farmers by Rwanda Agriculture Board. More on participatory communication is found in Chapter 3 - Conceptual Framework, Participatory Communication Approach.

Research Communication

Research communication is defined as the process of interpreting or translating complex research findings into a language, format and context that non-experts can understand. This goes way beyond the mere dissemination of research results and involves a network of participants and beneficiaries, researchers themselves, journalists, editors and their media, intermediaries who provide links between stakeholders form an interdependent network linking their differing roles in the communication process. Donors, policy makers, generally governments, user organisations and the ultimate, individual beneficiaries are all potential users of research whose information needs have to be addressed in very different ways and within very differing contexts (Carter & Paulus, 2014).

Agricultural Communication

According to Satyanarayana (2007, p.7), agricultural communication is defined as "a planned transfer of farm technologies from the research system to the farmers' system through extension system and media with a view to make desirable changes in respect of higher productivity, profitability and prosperity and also get feedback from the clients". This definition seems to equate agricultural communication with agricultural extension which focuses on agricultural research results transfer or dissemination to farmers.

For the sake of this study the term "agricultural communication" has been used to mean research generation, dissemination and utilisation.

Agricultural Extension

Agricultural extension has traditionally been defined as the delivery of information and technologies to farmers, which leads to the technology transfer model of extension, seen by many as the main purpose of agricultural extension (Anandajayasekeram, Puskur, Sindu, and Hoekstra, 2008, p.83). This is based on the idea that 'modern' knowledge and information is transferred through extension agents to recipient farmers. It limits itself to the dissemination of agricultural information.

CHAPTER ONE

GENERAL INTRODUCTION

1.1 Overview of the General Introduction

The study "Community Engagement on Scientific Research: The Process of Communicating Agricultural Research Results to Farmers by the Rwanda Agriculture Board" is rooted in the field of Development Communication, and precisely, Participatory Development Communication. Participatory Communication Approach was used to understand how agricultural research results are communicated to farmers by the Rwanda Agriculture Board (RAB). The introduction of this study presents the background to the research, the problem of the study, its purpose and objectives, justification and significance of the study, assumptions, scope and limitations of the study. It also gives the organisation of the report.

1.2 Background of the Study

1.2.1 Research and development

Kirkland, Mouton and Coates (2010, p.3) show that research is very important in countries' development and that governments give a lot of value to research initiatives. However, they indicate that despite the importance of research to economic and social development and the significant resources that are provided from many institutions and agencies for development research, a significant proportion of available research findings are not taken up by the users for whom they are intended. These researchers found out that developing countries face inhibitors and practical barriers to effective communication of research findings to end users. They argue that much as researchers are expected to be a key intermediary resource to provide solutions to improve the quality of life of poor people in Africa, there has been little

institutional support for them in the area of research communication (Kirkland et al., 2010, p.3).

In Rwanda, for example, the Government has put a lot of emphasis on research and research results' generation. It has taken research as the indispensable drive to development. Rwandan research policy as presented in Ministerial Instructions N° 003/2010 of 09/12/2010 for Research Regulations; Organic Law no 20/2005 of 20/10/2005, Law no 23/2006 of 28/04/2006, Policy on Science, Technology and Innovation of October 2006, Higher Education Policy of July 2008, Presidential Order n° 51/01 of 13/07/2010, Vision 2020 and Economic Development and Poverty Reduction Strategy (EDPRS) shows that the Rwandan Government highly values research.

Research policies in Rwanda insist on quality research standards in higher learning and research institutions. With regard to research results communication, research policies in Rwanda emphasise on keeping a record of the research and publications. They suggest that research activity and publication data must be included in institutional annual reports. Policies recommend that academic and research staff must publish books and/or articles in recognized or accredited academic journals (Butera, Shyaka & Habimana, 2012, p.61).

According to the Development Research Uptake in Sub-Saharan Africa (DRUSSA) (2013), there are many terms used to describe the processes by which knowledge generated through research finds its way to those who need it. These include "research communication", "research dissemination" and "research utilisation" (or "research into use"). For DRUSSA (2013), research "communication" and "dissemination" suggest a more limited conceptualisation of "pushing research out" from the

university or research institute in which it was produced, and "utilisation" suggests the activities of the "end user" as they incorporate new knowledge into their practical or policy-oriented work. DRUSSA (2013) uses "research uptake" to encompass all of these dimensions, research dissemination and research utilisation. However, viewed from the Freirean perspective, communication intervenes in all the dimensions of uptake and even goes beyond to consider how the research/information comes to existence and where it comes from (Fritze, 2013).

The Cape Peninsula University of Technology (2012) suggests that there is a need not to simply communicate research findings to users, but also to effectively scope and understand the needs of these users in the initial stages of project design, and in some cases to involve them in research as it progresses. In its Discussion Paper dated 2012, the Cape Peninsula University of Technology presents the ability of universities to respond to the research needs of their stakeholders in the design and undertaking of work therefore as part of a comprehensive research uptake approach (Cape Peninsula University of Technology, 2012).

When one looks at research in Rwanda and its connection with Rwandans' well-being, agricultural research becomes paramount since the agricultural sector in Rwanda employs more than 90% of the Rwandan population. Research in agricultural sector in Rwanda is mainly carried out and coordinated by the Rwanda Agricultural Board (RAB). That is why the proposed study looked at how agricultural research results are communicated to farmers at Rwanda Agricultural Board (RAB).

1.2.2 Description of the Rwanda Agriculture Board

Rwanda Agriculture Board (RAB) is an autonomous body established by Law N°38/2010 of 25/11/2010. This law specifies that RAB has the general mission of

championing the agriculture sector development into a knowledge based, technology driven and market-oriented industry, using modern methods in crop, animal, fisheries, forestry and soil and water management in food, fibre and fuel wood production and processing. RAB, which is under the Ministry of Agriculture, was formed from three agriculture agencies, namely the Rwanda Agriculture Research Institute (French acronym: ISAR – Institut des Sciences Agronomiques du Rwanda), which was primarily dealing with agricultural research on one side, and the Rwanda Animal Resources Development Authority (RARDA) together with the Rwanda Agricultural Development Authority (RADA), which were serving as extension agencies. This was meant to remove the historical legacy that created a huge gap between research and extension. It was also meant to strengthen the linkage with policy, and establish efficiency in service delivery through institutional integration in the agricultural sector for improved livelihoods of the Rwandan people (Rwanda Agricultural Board, 2012).

The expectation of creating RAB premised on physical proximity under one administrative structure, using a common standard operating procedure, which removes institutional boundaries by improving communication, mutual understanding and consensus building between extension, research and policy. This research-extension-policy nexus was considered critical in intensifying the focus and increasing the relevance of research and extension to pertinent issues required for acceptable levels of agricultural sector growth and contribution of the sector to the overall socioeconomic development process in Rwanda. Although its head office was put in Kigali, the Capital of Rwanda, Rwanda Agriculture Board was meant to execute its activities in four agricultural zones of the country: Northern Zone, Southern Zone, Western Zone, and Eastern Zone. It therefore has 4 branches

corresponding to those agricultural zones, which are structured in almost the same way.

The communication between RAB and farmers in different zones is somewhat similar and, in this study, it was assumed that studying the communication process in one zone can provide a clear picture of how other zones function in terms of communication. However, it was realised that, in terms of research, each zone focuses on crops or animals that are predominant and important in the zone. Each Agricultural Zone has researchers in different crop and animal dependent programmes together with extensionists making it a unit capable of conducting agricultural research and disseminating/communicating research results. The following figure shows the organisational structure of Rwanda Agriculture Board, Southern Zone, which was the focus of this study.

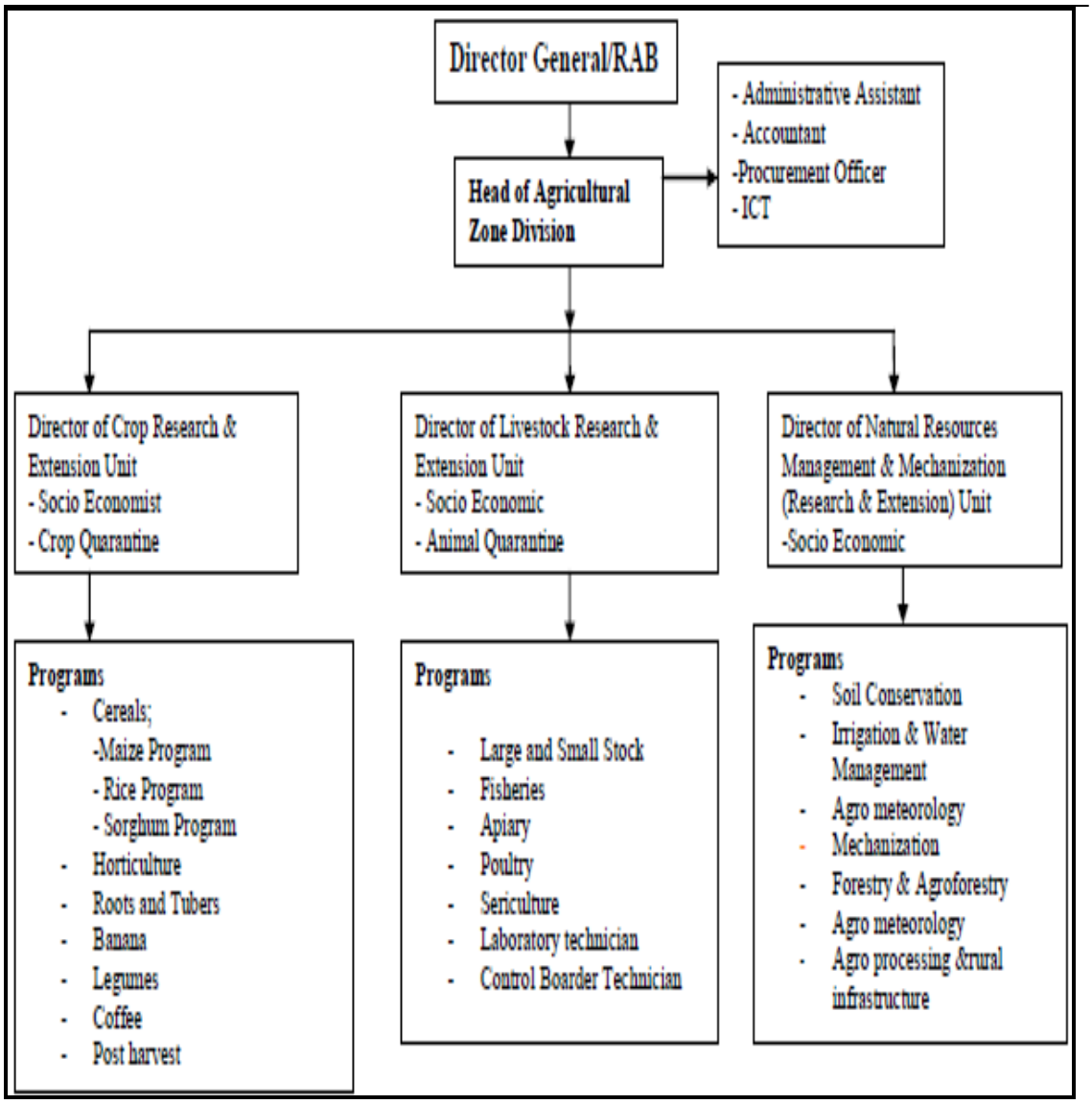

Figure 1: Organisational Chart of RAB Southern Agricultural Zone
Source: *Government of Rwanda, Official Gazette N° 46 bis of 14/11/2011*

Much as the Rwanda Agriculture Board (RAB) was created in 2010, the study revealed that the acronym RAB is mainly used by people working at Rwanda Agriculture Board as well as other educated people. Most of the neighbouring people, predominantly farmers, do not refer to the institution as RAB. They still refer to it as ISAR. This refers to the French "Institut des Sciences Agronomiques du Rwanda (ISAR)", which translates as the Rwanda Agricultural Research Institute. ISAR was created during the colonial period, and had been dealing with agricultural research

only. It was therefore grouped with other institutions that were dealing with extension to form the Rwanda Agriculture Board (RAB).

1.3 Statement of the Problem

Agriculture-led growth is the main strategy for development in Rwanda with farmers accounting for more than 90% of the Rwandan population (Bizimana, Usengumukiza, Kalisa & Rwirahira, 2012, p.32). The national government budget on agriculture was 8 billion Rwanda francs in 2000; 67 billion in 2010/2011, and 100 billion (10.2% of the total national budget) in 2012 (Bizimana, et al., 2012, p. 32). The Ministry of Agriculture uses part of its budget on grants, loans or/and subsidies to support agricultural research in higher learning institutions in Rwanda. In addition to the national budget, the agricultural sector gets extra funding for research from development partners (RDB, 2012, p. 10). This investment in agricultural research has paid dividends. There have been a lot of research results in crop protection, genetic resource conservation, biotechnology, post-harvest handling and management, and livestock production (RAB, 2013).

However, in spite of increasing expenditure on agricultural research and production of agricultural research results, studies have shown that the performance of the agricultural sector remained low. While analysing the agricultural situation in Rwanda, the Institute of Policy Analysis and Research (IPAR) (2009, pp.2-3) realised the following: there is little use of modern technology, and a low use of fertilisers. There is little use of improved seeds and pesticides due to a combination of a shortage of supply, poor distribution networks, a lack of knowledge and skills, and a lack of incentives. There is little irrigated land and a weak meteorological capacity, making the sector vulnerable to weather-related shocks. The quality of products is poor; nearly a third of milk produced is wasted due to lack of proper milking, milk handling

and transport mechanisms; 90 per cent of agricultural production is food crops, leaving cash crops to less than 10%, and 66 per cent of the agricultural produce is consumed by producers. This was also confirmed by RDB (2012, p.11-12) in Rwanda Agricultural Sector Skills Survey 2012.

Literature shows that research findings and innovations have been made available by research institutions (the Institute of Policy Analysis and Research, 2009; RAB, 2013; Gahakwa *et al.*, 2014). However, these findings and innovations do not sufficiently reflect in farmers' practices. One of the factors that can cause this phenomenon is ineffective communication of those research findings to farmers and lack of engagement of farmers. As scholars have revealed, access to appropriate information and knowledge is known to be one of the biggest determinants of agricultural production (Masuki, *et al.*, 2010).

Against the above background, I wanted to find out whether lack of agricultural information, poor practices and low performance of farmers might be linked to the way farmers are engaged with research findings and innovations and how these research findings and innovations are communicated to them.

I therefore chose to explore this issue focusing on Rwanda Agriculture Board (RAB) since it is the most important institution doing research in agricultural sector, meeting ordinary farmers and coordinating agricultural research in other institutions in Rwanda. I studied ways in which agricultural research results are communicated to farmers at RAB focusing on the farmers' perspective.

1.4 Aim of the Study

The aim of this study was to explore how Rwanda Agriculture Board (RAB) communicates agricultural research findings to farmers in order to determine how it

makes these research findings reach and get used by farmers and therefore contribute to the performance of the agricultural sector.

1.5 Research Questions

The study undertook to find answers to following questions:

1. How does Rwanda Agriculture Board communicate agricultural research results to farmers?
2. How do farmers working with Rwanda Agriculture Board (RAB) make sense of RAB communication initiatives relating to research findings?
3. What can Rwanda Agriculture Board do to improve the communication of research findings to farmers?

1.6 Scope of the Study

The study is about research communication but focuses on the communication of agricultural research results by Rwanda Agriculture Board (RAB). With regard to RAB zones in Rwanda, I chose to work with the Southern zone since it is the widest zone with long history in agriculture research and extension. The study is situated at organisational communication level. However, it focuses on external organisational communication by Rwanda Agriculture Board. It studied the communication of agricultural research results between RAB and farmers in the Southern Agricultural Zone of Rwanda.

1.7 Justification of the Study

The missions of most research institutions in Rwanda rotate around “Service to the People” and/or “Socioeconomic Development of Rwandans”. In this perspective, Rwanda Agriculture Board as a research institution that does research in agriculture should use its research to soundly impact on farmers’ development as a way of

realising its mission. It should make the needy farmers access, own and use agricultural research results for their development. This study is therefore geared towards finding out how Rwanda Agriculture Board communicates research findings to farmers in order to determine how it makes agricultural research findings reach farmers and therefore contribute to the performance of the agricultural sector.

1.8 Significance of the Study

This study is expected to contribute to the existing body of knowledge on the need to promote research communication for improved agricultural productivity in order to make sustainable development in farmers a reality. It was meant to remind research institutions in Rwanda that though people need information and research results in their developmental activities, generating information is one thing and making it useful is another. More than 90% of Rwandans being farmers, the focus on agricultural sector in research becomes paramount in advancing development in Rwanda. It is also important to always check whether findings in agricultural research really reach intended beneficiaries.

1.9 Limitations of the Study

Agricultural research in Rwanda is done by the Ministry of Agriculture, Rwanda Agriculture Board, Higher Learning Institutions dealing with agriculture, as well as Non-Governmental Organisations operating in the agricultural sector. The focus of this study being Rwanda Agriculture Board, the results of this study might not be generalizable to all institutions dealing with agricultural research in Rwanda. They might only apply to Rwanda Agriculture Board (RAB), which was the focus of the study. However, this study provides insights to all agricultural researchers not only in Rwanda but also in other situations similar to Rwanda.

1.10 Methodology

The study falls into the interpretive paradigm and borrows from the qualitative approach. The communication of agricultural research results by Rwanda Agriculture Board could only be apprehended by making its stakeholders talk about it. Data collection/generation tools therefore included in-depth interviews and focus group discussions, and their analysis and interpretation followed the qualitative trend. Participants in the study included purposively selected RAB researchers, extensionists, communication officer and librarian as well as purposively selected farmers. These participants produced lengthy narratives about the communication of agriculture research results at RAB which were analysed into relevant themes and sub-themes in line with the research objectives, research questions and conceptual framework. More on the methodology is found in the chapter on methodology.

1.11 Organisation of the Thesis

The thesis comprises 7 chapters. Chapter 1 introduces the study. It discusses the research problem and its background. It gives research objectives, research questions, justification of the study, significance of the study, scope of the study, limitations of the study and methodology. Chapter 2 presents the literature review. It presents what researchers focused on in the area of agricultural research communication in general and in Rwanda in particular, and talks about the gaps that need to be bridged in that area. Chapter 3 talks about the conceptual framework that was used to understand, describe and appreciate the phenomenon of communication of agricultural research results to farmers by Rwanda Agriculture Board. Chapter 4 talks about methodology. It presents the research paradigm, population of the study and sampling, data collection/generation methods and techniques as well as data analysis. Chapter 5 presents the findings for the study. Chapter 6 is about the discussion of findings and

presents key lessons that were drawn from the research. Chapter 7 is about general conclusions and recommendations.

1.12 Summary

This chapter gives a background to the study and clearly explains what the research is about. It highlights the importance of taking research findings to their intended users. It shows that the problem of the study is the incommensurateness of investments in agricultural research and abundance of research results, on the one hand, and agricultural productivity and farmers' practices and well-being, on the other hand. The chapter also provides the scope of the study, its importance and significance as well as its limitations. Within the interpretive paradigm, the chapter also briefly introduces the approach, population and sample as well as data collection methods. It also presents the organisation of the thesis.

CHAPTER TWO

LITERATURE REVIEW

2.1 Overview

This chapter situates the study in the field of communication studies in general and development communication in particular, with a special focus on participatory communication. It presents a review of existing literature about agricultural research and agricultural research communication, agricultural policies in Rwanda, and agricultural research communication in Rwanda. The relationship between agriculture and development, the status of agricultural research communication, and challenges in agricultural research communication are also discussed in the chapter.

2.2 Situating the Study in the Field of Communication Studies

This study falls in the field of Development Communication and, therefore, enters Communication Studies as the broad area of the research/thesis. Communication studies (also referred to as communication sciences) is an academic discipline that deals with processes of human communication, commonly defined as the sharing of symbols to create meaning. It examines how messages are interpreted through the political, cultural, economic, semiotic, hermeneutic, and social dimensions of their contexts. Communication studies integrates aspects of both social sciences and the humanities (Calhoun, 2011). According to the New Charter University (2017) there are three types of communication: verbal, involving listening to a person to understand the meaning of a message; written, in which a message is read; and nonverbal communication involving observing a person and inferring meaning.

2.2.1 Development communication as a field of communication studies

The Swiss Agency for Development and Cooperation (2016) distinguishes two broad communication areas: institutional communication - a useful tool to publicise what we

do and report on our actions, and communication for development - a tool for social and political transformation that promotes participation and social change using the methods and instruments of interpersonal communication, community media and modern information technologies. Communication for Development emerged closely interconnected with the growing "development industry." At the beginning it was named "development support communication," then "program support communication," "communication for development," or "development communication," and it has been seen as a strategic tool to persuade people to change and enhance development processes (Tufte & Mefalopulos, 2009).

It is worth noting that multinational and multilateral donors tend to introduce their own variations in denominations but, while in essence, talking about the same reality. The Food and Agriculture Organisation (FAO) talks of Communication for Development (ComDev); the United Nations Children's Fund (UNICEF) talks about Communication for Development (C4D); the United Nations Development Programme (UNDP) talks of Communication for Empowerment; the World Bank talks of Development Communication (DevComm), while the Organisation for Economic Co-operation and Development (OECD) talks of Communication for Results (Wilkins, Straubhaar & Kumaar, 2014).

Wilkins et al. (2014) argue that the contemporary focus for the new field of communication has been "social change". Although they acknowledge "change" as the common denominator in this field, they feel that choosing between "development" and "social change" would be unproductive. They then suggest maintaining the two and talk about "Communication for Development and Social Change" while referring to this contested field. Development communication can be categorized into different fields of study such as education, agriculture and health among others. For the sake

of this study, however, all the terms above that have been used to refer to this communication field that aims at enabling people to have a say, participate and develop a sense of ownership, are used interchangeably, and more often, "Development Communication" is used.

As Waisbord (2001, p.1) put it, development communication has its origins in post-war international aid programmes to countries in Latin America, Asia and Africa that were struggling with poverty, illiteracy, poor health and a lack of economic, political and social infrastructures. Development communication commonly refers to the application of communication strategies and principles in the developing world. It is derived from theories of development and social change that identified the main problems of the post-war world in terms of a lack of development or progress equivalent to western countries (Waisbord, 2001, p. 1).

The Development Communication Division of the World Bank (DevComm) considers development communication as an interdisciplinary field based on empirical research that helps to build consensus while it facilitates the sharing of knowledge to achieve positive change in development initiatives (Mefalopulos, 2008, p.8). This looks at Development Communication as, not only effective dissemination of information but also using empirical research and two-way communication among stakeholders. Development Communication is also looked at as a key management tool that helps assess socio-political risks and opportunities.

There is also a definition for Development Communication that emerged at the First World Congress of Communication for Development held in Rome in October 2006. Here participants in the Congress agreed to conceive Development Communication as a social process based on a dialogue, using a broad range of tools and methods. They

also agreed that Development Communication is also about seeking change at different levels, including listening, building trust, sharing knowledge and skills, building policies, debating, and learning for sustained and meaningful change. It was agreed in the Congress that Development Communication is not public relations or corporate communication.

2.2.2 Main theoretical models that characterised development communication

Scholars identify 3 main theoretical models that characterised development communication and matched people's understanding of the concept "Development". Different scholars referred to these models as development paradigms. According to Korten (2013), a paradigm is a fancy word for the worldview, model, or story of how things work that underlies the theory and methodology of a particular field of thought. In the case of development, the relevant field of thought is standard economics and its theory of how a country moves from "underdeveloped" to "developed" nation status, whereby it is believed that societies advance by learning from and emulating the behaviour of their financially most successful individuals, corporations, and nations. Scholars have called this the Old Development Paradigm and the opposite thoughts, the New Development Paradigm.

The Old Development Paradigms

The Old Development Paradigms are basically *the Dominant Paradigm: Modernisation and the Opposing Paradigm: Dependency*. In the Old Development Paradigms, money is the measure of value and the purpose of the economy and business is to grow aggregate consumption and financial returns, flows, and assets. People and nature are commodified and valued for their contribution to generating financial returns—people are looked at as investors, consumers, and workers; whereas nature is viewed as a pool of free resources and a convenient waste dump.

The monetization and commodification of relationships, competition for individual financial advantage, and abandonment of attachments to place are celebrated as contributions to increased economic efficiency and accelerated development progress as defined by growth in Growth Domestic Product (GDP). Freed from constraints of national borders and the meddling of government regulators, proponents of the Old Paradigm believe the invisible hand of the unfettered market will magically turn a natural human tendency towards individualistic competition and excess into limitless prosperity for all. They advocate eliminating national borders and leaving management of the global economy to those global corporations that emerge as winners in the global competition for economic dominance. By their success, these corporations demonstrate their distinctive ability to maintain a relentless focus on the financial bottom line and their superior wealth creation capacity.

According to Old Paradigm logic, economic growth will generate the financial assets necessary to correct for related social and environmental harms. In the meantime, if the economy of one place is depressed, its natural resources are exhausted, its taxes are too high, or its air, ground, and water are dangerously contaminated, just move to another place.

i) The Dominant Paradigm: Modernization

This old paradigm, rooted in the concept of development as modernization, dates back to soon after World War II and has been called the dominant paradigm because of its pervasive impact on most aspects of development. In this paradigm, communication was associated with the dissemination of information and messages aimed at modernizing “backward” countries and their people. Because of the overestimated belief that they were extremely powerful in persuading audiences to change attitudes and behaviours, mass media were at the centre of communication initiatives that

relied heavily on the traditional vertical one-way model: Sender-Message-Channel-Receiver (SMCR). This has been the model of reference for the diffusion perspective, which has often been adopted to induce behaviour changes through media-centric approaches and campaigns.

ii) The Opposing Paradigm: Dependency

In the 1960s, strong opposition to the modernization paradigm led to the emergence of an alternative theoretical model rooted in a political-economic perspective: the dependency theory. The proponents of this school of thought criticized some of the core assumptions of the modernization paradigm mostly because it implicitly put the responsibility, and the blame, for the causes of underdevelopment exclusively upon the recipients, neglecting external social, historical, and economic factors. They also accused the dominant paradigm of being Western-centric, refusing or neglecting any alternative route to development.

With regard to communication in the dependency paradigm, the basic conception remained rooted in the linear, one-way model, even though dependency theorists emphasized the importance of the link between communication and culture. They were instrumental in putting forward the agenda for a new world information and communication order (NWICO), which was at the centre of a long and heated debate that took place mostly in the United Nations Educational, Scientific, and Cultural Organization (UNESCO) in the 1980s. One of the main issues in this paradigm was the demand for a more balanced and equitable exchange of communication, information, and cultural programmes among rich and poor countries. Although the dependency theory had gained a significant impact in the 1970s, it started to lose relevance gradually in the 1980s with the failure of the alternative economic models proposed by its proponents.

The New Development Paradigm

Although many scholars chose to also refer to this paradigm as participation, highlighting participation as the salient element that differentiates this paradigm from the old paradigms (Mefalopulos, 2008; Imoh, 2013; Sylvester, 2016), scholars such as Korten (2013); the Royal Government of Bhutan (2013), and Alliance for Sustainability and Prosperity (2013) observed that, in addition to participation, the main focus for the new development paradigm is happiness and well-being. It is worth mentioning that this study was mainly informed by the New Development Paradigm philosophy.

In the worldview of the emerging New Development Paradigm, life is the measure of value. The purpose of the economy and business is to maintain and enhance the health, vitality, resilience, and creative potential of people and nature—including strengthening relationships of caring, cooperation, and sense of attachment to nature and communities of place. Economic performance is evaluated against indicators of the health and well-being of people, nature, and living communities. Policy options are assessed accordingly. Financial systems are valued only for their contribution to maintaining and balancing accounts in market transactions in support of the economy's true purpose of maintaining and enhancing living system health and well-being.

By New Paradigm reckoning, the proper and healthy function of markets depends on the helping hand of democratically accountable governments to assure compliance with mutually agreed rules of public conduct essential to community integrity and mutual prosperity and to maintain essential common physical, cultural, and institutional infrastructure. New paradigm economists look at nature as an essential

source of wisdom, inspiration and learning as we strive to bring human societies into symbiotic, mutually creative balance with the living systems of Sacred Earth.

The resilience and generative capacity of Earth's biosphere are products of life's capacity to self-organize locally everywhere to maximize the sustainable, self-reliant local capture, sharing, and utilization of the energy, water, nutrients, and information on which life depends. Managed borders are essential to maintain the integrity of these processes. The institutions of the global human economy, therefore, properly support bounded self-organizing, self-reliant bioregional economies that work in balanced partnership with nature's natural processes to meet the needs of their own people, while exchanging their surplus and freely sharing beneficial knowledge, culture, and technology with members of other bioregions.

This new paradigm was called by some scholars, participatory development. When the promises of the modernization paradigm failed to materialize, and its methods came increasingly under fire, and the dependency theorists failed to provide a successful alternative model, a different approach focusing on people's participation began to emerge. This new model is less oriented to the political-economic dimension and more rooted in the cultural realities of development. The development focus has then shifted from "economic growth" to include other social dimensions needed to ensure meaningful results in the long run—as indicated by the consensus built in the definition of the Millennium Development Goals. Sustainability and people's participation became key elements of this new vision, that is, participation got increasingly recognized as a necessary part of sustainable development strategies.

There have been varying definitions of participation depending on the perspective applied. According to Tufte and Mefalopulos (2009), some stakeholders define

participation as the mobilization of people to eliminate unjust hierarchies of knowledge, power, and economic distribution. Others define it as the reach and inclusion of inputs by relevant groups in the design and implementation of a development project. These examples represent two of the main approaches to participation: a social movement perspective and a project-based or institutional perspective. These perspectives, however, share a common understanding of participation as the involvement of ordinary people in a development process leading to change. From the institutional perspective, participation can be used as tool to achieve a pre-established goal defined by someone external to the community involved. For the social movement, participation itself can be a goal as an empowering process.

According to Food and Agriculture Organisation (2014) participation entails the equitable and active involvement of all stakeholders in the formulation of development policies and strategies and in the analysis, planning, implementation, monitoring and evaluation of development activities. Participation is not merely enlisting community support for a development project or gathering information from community members about their problems or needs. Rural people should gain knowledge and awareness of their own social, economic and political conditions so they can deal with their common issues and consciously take the initiative to seek change, innovate and find solutions. In this process, experts are required but only as facilitators. This emerging paradigm has been given different names such as “another development,” “empowerment,” “participation,” and “multiplicity paradigm.”

While emphasising that meaningful participation cannot occur without communication, scholars also posited that too many development programmes, including community-driven ones, seem to overlook this aspect. While paying

attention to participation, they do not pay similar attention to communication, which should be the professional use of dialogic methods and tools to promote change. As Ali and Sonderling (2017) observe, lack of genuine participation in development process of the local community could be one of the major causes for the failure of development projects in achieving their targets. They therefore posit that academicians and practitioners seem to have learned from their past failures and they tend to understand the need for the participation of stakeholders in the development process by considering the paramount roles the stakeholders play for the success of the development projects.

The new paradigm is also changing the way communication is conceived and applied. It shifts the emphasis from information dissemination to situation analysis, from persuasion to participation. Rather than substituting for the old model, it is broadening its scope, maintaining the key functions of informing people and promoting change, yet emphasizing the importance of using communication to involve stakeholders in the development process. This new paradigm was used to understand the communication of agricultural research results by Rwanda Agriculture Board (RAB) focussing on farmers' happiness, well-being, satisfaction, participation, etc., as key elements in the New Development Paradigm. Farmers were viewed as the beneficiaries of agricultural research results produced by Rwanda Agriculture Board (RAB) who, in the new development paradigm, need to be empowered and need to participate in all endeavours geared towards their development. This communication was therefore analysed basing on the farmers' perspective.

2.3 Previous Research in Community Engagement in Research, Agriculture and Agricultural Research Communication

Scholars have demonstrated that community engagement is a core element of any research effort that claims to be in the interest of or involving communities (Ahmed & Palermo, 2010; McCloskey et al., 2011; DRUSSA, 2012). These scholars also indicated that endeavours in the development process, especially in developing countries, cannot leave aside the agricultural sector. They analysed the policies and assessed the sector and looked at how the quality and output of research can be improved. They came up with several conclusions and recommendations geared towards advancing and developing this sector. Most recommendations were addressed to the government, calling for more investments and more institutional restructuring, enticing the private sector and encouraging and supporting more research in the sector.

2.3.1 Community engagement and research

McCloskey *et al.,* (2011, p. 7) defined community engagement as the process of working collaboratively with and through groups of people affiliated by geographic proximity, special interest, or similar situations to address issues affecting the well-being of those people. It is a powerful vehicle for bringing about environmental and behavioural changes that will improve the health of the community and its members. It often involves partnerships and coalitions that help mobilize resources and influence systems, change relationships among partners, and serve as catalysts for changing policies, programs, and practices.

McCloskey et al. (2011, pp. 8-10) identified nine areas in which community engagement made a positive impact. Those nine areas and the corresponding benefits were as follows:

a. Agenda—Engagement changes the choice and focus of projects, how they are initiated, and their potential to obtain funding. New areas for collaboration are identified, and funding that requires community engagement becomes accessible.

b. Design and delivery—Improvements to study design, tools, interventions, representation/participation, data collection and analysis, communication, and dissemination can be implemented. New interventions or previously unappreciated causal links can be identified through the community's knowledge of local circumstances. The speed and efficiency of the project can be enhanced by rapidly engaging partners and participants and identifying new sources of information.

c. Implementation and change—Improvements can be made in the way research findings are used to bring about change (e.g., through new or improved services, policy or funding changes, or transformation of professional practices), and capacity for change and the maintenance of long-term partnerships can be expanded.

d. Ethics—Engagement creates opportunities to improve the consent process, identify ethical pitfalls, and create processes for resolving ethical problems when they arise.

e. The public involved in the project—The knowledge and skills of the public involved in the project can be enhanced, and their contributions can be recognized (possibly through financial rewards). These efforts foster goodwill and help lay the groundwork for subsequent collaborations.

f. Academic partners—Academic partners can gain enhanced understanding of the issue under study and appreciation of the role and value of community involvement, which sometimes result in direct career benefits. In addition, new insights into the relevance of a project and the various benefits to be gained from it can result in increased opportunities to disseminate its findings and their wider use.

g. Individual research participants—Improvements in the way studies are carried out can make it easier to participate in them and bring benefits to participants.

h. Community organizations—These organizations can gain enhanced knowledge, a higher profile in the community, more linkages with other community members and entities, and new organizational capacity. These benefits can create goodwill and help lay the groundwork for subsequent collaborations.

i. The general public—The general public is likely to be more receptive to the research and reap greater benefits from it.

McCloskey *et al.*, (2011, p.10) acknowledged that there can be costs associated with community engagement (for example, increased time and other resource needs, the need to develop new skill sets, increased expectations) but contended that these are more than outweighed by the positive impacts and generally can be addressed over time through training and experience.

According to Ahmed and Palermo (2010), community engagement in research is a process of inclusive participation that supports mutual respect of values, strategies, and actions for authentic partnership of people affiliated with or self-identified by

geographic proximity, special interest, or similar situations to address issues affecting the well-being of the community of focus. Community engagement is a core element of any research effort involving communities. It requires academic members to become part of the community and community members to become part of the research team, creating a unique working and learning environment before, during, and after the research.

Community engagement was defined as a process that requires power sharing, maintenance of equity, and flexibility in pursuing goals, methods, and time frames to fit the priorities, needs, and capacities within the cultural context of communities. Community engagement in research is often operationalized in the form of partnerships, collaborations, and coalitions that do the following: help mobilize resources and influence systems, change relationships among partners, and serve as catalysts for changing policies, programs, and practices (Ahmed & Palermo, 2010).

While talking about community engagement in research (also referred to as community-engaged research), Ahmed and Palermo (2010) explained that community engagement in research stems from demands by community leaders, policymakers, and funders for meaningful community involvement to address health problems facing communities. Several models for community engagement in research exist, including community-based participatory research, empowerment evaluation, participatory or community action research, and participatory rapid appraisal. Researchers conducting community engagement in research need appropriate education and training not typically offered by traditional doctoral and master's level curricula. The field clearly needs long-term programmes that integrate the knowledge and skills of experienced community and researcher partners in high-quality

participatory research to build the capacity of young and traditionally trained researchers and scientists interested in pursuing community engagement in research.

Scholars noted that the principle of community engagement has not been respected in most of the research that has been conducted. They highlighted the importance of educating investigators and communities on how to engage communities in research and ensuring that reviewers are also familiar with the principles of community engagement in research and understand the value of this approach. They believed that by incorporating the community engagement frameworks, funders, researchers, and communities will help expand the cadre of researchers who are well prepared to form authentic partnerships with communities and ensure that proposals for community engagement research receive a fair and appropriate review. This will then increase the amount of high-quality community engagement research that researchers and communities conduct. This will, in turn, have a positive impact on the health of communities (Ahmed & Palermo, 2010).

It is worth mentioning that most of the endeavours that are available in community engagement in research (also referred to as community-engaged research) are in the field of health research (Ahmed & Palermo, 2010; McCloskey et al., 2011; DRUSSA, 2012). The focus for this study was therefore community engagement in agricultural research in Rwanda.

2.3.2 Researchers and the communication of research output

Edge, Martin, Rudgard and Manning (2011, p. 3) found out that making a research output freely and openly available can be in the hands of the individual. These scholars realised that there are barriers to the communication of research outputs such as the lack of required resources and institutional policies to drive these activities.

They also realised that current behaviours in choosing routes to communicate research results are still strongly biased toward the traditional routes of publishing in journals and books and appearing at conferences. This puts aside people like farmers who are not highly educated and have little or no access to academic channels of communication. The most important factors these scholars say encourage researchers to communicate their research outputs effectively are related to 'opportunities for career enhancement', 'institutional demands to report or communicate outputs', and institutional capabilities. They also realised some role of direct monetary reward in relation to royalties and opportunities for personal development. Given the fact that those incentives are not always available, researchers do not adequately communicate their research results.

In the case of Rwanda, research and research communication seem to be the responsibility of higher learning and research institutions. The government of Rwanda has put a lot of emphasis on research and research results' generation. It has taken research as the indispensable drive to development. Rwandan research policy as presented in Ministerial Instructions N° 003/2010 of 09/12/2010 for Research Regulations; Organic Law no 20/2005 of 20/10/2005, Law no 23/2006 of 28/04/2006, Policy on Science, Technology and Innovation of October 2006, Higher Education Policy of July 2008, Presidential Order n° 51/01 of 13/07/2010, Vision 2020 and Economic Development and Poverty Reduction Strategy (EDPRS) shows that the Rwanda Government put a lot of emphasis in research results generation.

However, much as the research policies in Rwanda put a lot of emphasis on increasing the generation of quality research results, they seem to limit research communication to the publication of books and academic articles and papers. For example, according to the Presidential order n° 51/01 of 13/07/2010 establishing

quality standards in higher learning institutions, higher learning and research institutions must have policies and procedures to assure the quality of the research and consultancy undertaken by academic/research staff and students and its ethical acceptability. All higher learning institutions must keep a record of the research and publications of each of their academic staff. Research activity and publication data must be included in the institutional annual reports to the Higher Education Council. The publication of books and/or articles in recognized or accredited academic journals done by academic staff must also be emphasized. Scholars noted, however, that the publication of books and articles might not be the proper tool to communicate research results to all the people who might want to use the results.

Contrary to the practice of research in Rwanda, DRUSSA (2012) shows that it is only through proper communication, which goes beyond publishing books and articles that research findings can reach people who need to use them in order for the research to be useful. It gives an example of the research in drug abuse among the youth of Rwanda in 2011 by the Kigali Health Institute (KHI) that had significant impact in that country, not only changing its policy direction, but also giving rise to interventions by civil society and other stakeholders, ultimately leading to changes in behaviour at grassroots level. As DRUSSA (2012) explains, KHI communications officer collaborated with the directorate of research and the principal investigator, in disseminating the findings of the study. These were announced at a launch workshop that brought together all stakeholders, including the ministries of Health, Youth and Information and Communication Technology (ICT), Education, the Rwanda National Police, district mayors, teachers, researchers from other universities and civil society representatives. The event was also well attended by the national media. Several media-related events took place in the run up to the launch, including interviews with

the media and liaising with journalists. The research was subsequently communicated in all the national media, including print, radio stations and television. The communication strategy employed was appropriate because the research was of national concern and made good use of the channels and tools available (DRUSSA, 2012).

As DRUSSA (2012) highlights, the results also got shared on external forums and with researchers at other institutions, and got simplified and packaged into clear and candid messages for the public. Several campaigns were launched throughout the country—at grassroots level, in secondary schools and at universities, using sports, entertainment and education. DRUSSA (2012) says that after using the above communication tools, the following results were observed:

A technical committee to monitor substance use and abuse among the youth was established in the Ministry of Youth and ICT; a bigger committee composed of parliamentarians, ministers, police officers, the army and religious leaders was established to keep an eye on the problem; a module was developed at the Kigali Institute of Education, in collaboration with the National University of Rwanda, to train anti-drug campaigners on the effects of substance use and abuse; intervention programmes by civil society sprang up; an age-restriction was placed on the sale of alcoholic beverages, and the Police stepped up efforts to clamp down on illegal drugs, resulting in an increased drug-related arrest rate.

2.3.3 Relationship between agricultural research and development

Diao, Hazell, Resnick and Thurlow (2007, p.38) posit that according to economic theory, cross-country empirical studies, and the success of the green revolution in Asia, agriculture can play a critical role in the development process. These scholars

note that in much of the development literature, agricultural growth has been viewed as a precondition for industrialisation because the sector provides surplus labour to industry, savings for capital investment in non-agricultural sectors, and more food to meet the increasing demand of a growing non-agricultural labour force, without which labour costs in the industrial sector must rise.

In the case of Rwanda, the Institute of Policy Analysis and Research (2009, p.2) realised that the Rwandan economy is, and will remain for the foreseeable future, heavily dependent on the agricultural sector, as the sector employs around 90 percent of the population, provides 91 percent of the food consumed in the country, contributes 36 per cent of the Gross Domestic Product (GDP), and accounts for 70 per cent of revenue from exports. Diao, Bahiigwa and Pradesha (2014) also observed that agriculture continues to be one of the most important growth pillars for Rwanda, and a much higher growth target is set for agriculture under the new development strategy and investment plan. Bizimana *et al.,* (2012) linked development in agricultural sector in Rwanda with real poverty reduction. They observed that since most of the population living in poverty in Rwanda is located in the rural areas with their major activity being agriculture, the development of this sector is therefore synonymous with poverty reduction in general.

While also highlighting the role of agriculture in development of Rwanda, Gahakwa et al. (2014) chose to focus on agricultural research. They posited that agricultural research is the engine driving agricultural growth in Rwanda. They showed that research has developed and released high yielding, disease and pest resistant crop varieties, animal breeds/genotypes and other improved technologies. These have resulted in increased productivity/unit area while protecting the natural resource base.

In line with national policies, combating malnutrition and extreme poverty has also been a priority for agricultural research. These scholars say that the main challenge that still needs to be overcome is the effective and timely transfer of technologies to end users.

In their conclusions and recommendations, geared towards advancing and developing the agricultural sector these scholars addressed the government and development partners, calling for more investments and more structural change, enticing the private sector and encouraging and supporting more research in the sector. There has been little or no focus on farmers, the most important partners in agricultural development.

2.3.4 Agricultural Policies in Rwanda

It is worth mentioning that not all policies connected to agriculture and agricultural sector in Rwanda were reviewed in this study. Only policies that have more bearing on the study were reviewed. The main agricultural policies and strategies reflected in this study were drawn from different government documents such as Vision 2020; the Economic Development and Poverty Reduction Strategy (EDPRS) (2008–2012); the National Agricultural Policy 2004; Ministry of Agriculture Report 2008 & 2009, and Strategic Plan for Agricultural Transformation (PSTA) I, II, III & IV. To achieve the sustainable growth and development in the agriculture sector, the Government of Rwanda stressed the essential nature of strong strategic plans that are aligned with the Comprehensive Africa Agriculture Development Programme (CAADP) which is at the heart of efforts by African governments under the African Union (AU) and the New Partnership for Africa's Development (NEPAD) initiative to accelerate growth and eliminate poverty and hunger in Africa.

The National Agricultural Policy in Rwanda relies on four strategic axes: transformation and modernization of agriculture; agriculture value chains development; promotion of competitiveness for agricultural products, and development of entrepreneurship spirit. It aims to enable rural communities to develop a sense of responsibility as actors in agricultural development; to increase agriculture, animal and fish production as a result of improvements in productivity; to increase revenue as a result of diversification of economic activities in the rural sector; to strengthen the linkages between production and market, and to ensure the sustainable management of natural resources.

The key policy initiative has been the four-year Strategic Plan for Agricultural Transformation (PSTA) I and PSTA II. PSTA I was adopted in 2004 and ran from 2004 to 2008 while PSTA II was adopted in 2008 and ran from 2008 to 2012. Rwanda developed PSTA 2004–2008 using participatory methods and it is in line with the poverty reduction strategy paper and Vision 2020. This strategy had interrelated programmes such as intensification and development of sustainable production systems; support to the professionalization of producers; promotion of chains and development of agribusiness, and institutional development.

The PSTA II updates PSTA I by bringing it fully into consonance with recent national strategies such as EDPRS, the national investment policy and strategy, and the decentralization policy intended to involve local administration more directly in the development process. The government launched the Crop Intensification Programme (CIP) in 2007. CIP was launched as a pilot programme whose main goal was to increase agricultural productivity in high potential food crop areas to ensure food security and self-sufficiency.

The main components of CIP were incorporated in the Integrated Development Programme under eight pillars. These pillars are: land use consolidation; proper management and use of agricultural inputs such as fertilizers and improved seeds' purchase and distribution through the private sector; extension services; capacity building; access to finance; post-harvest handling and storage, and marketing.

Land Use Consolidation is the process whereby agricultural production efforts of individual landholdings or land tillers are integrated, coordinated or facilitated to achieve a unified production situation. This is characterized by collaboration in types of crops grown, sale of agricultural products, processing of agricultural products, and/or distribution and marketing of agricultural products. In a bid to improve land productivity and land management, Rwanda adopted the Land Use Consolidation Programme to speed up the development of the country towards Vision 2020; put in place the National Seed Policy (NSP) to lay the foundations of an organized and strong seed commodity chain in response to the challenges of intensification and promotion of other agriculture chains.

PSTA III had the same pillars as PSTA II but put more emphasis on markets and value chains; product quality and improved production technologies; increasing scale; increasing exports as well as increasing the involvement of the private sector. The PSTA IV was also developed but it was yet to be implemented at the time of the study. It has the same structure as PSTA III. It is also expected that it will put more emphasis on improving the scale and quality of PSTA III indicators, involvement of the private sector and stakeholder engagement.

Agricultural policies in Rwanda show the value that the government gives to agricultural development and agricultural research in Rwanda. However, the most

important partner in agricultural development, the farmer was not given ample consideration. This influenced the way agriculture and agricultural communication was envisioned, how agricultural research was conducted and the role farmers played in agricultural policies and activities.

2.3.5 Agricultural extension as a way of communicating agricultural research

The Concept of Agricultural Extension

Agricultural extension has traditionally been defined as the delivery of information and technologies to farmers, which leads to the technology transfer model of extension, seen by many as the main purpose of agricultural extension (Anandajayasekeram, Puskur, Workneh, and Hoekstra, 2008, p. 83). This is based on the idea that 'modern' knowledge and information is transferred through extension agents to recipient farmers. It limits itself to the dissemination of agricultural information. Although agricultural extension is thought as the only way to communicate agricultural research results for many organisations, it is basically rooted in westernisation and modernisation paradigm and seldom meets the needs of farmers. It does not empower them to own and make use of agricultural results.

Anandajayasekeram *et al.,* (2008) say that for a long time, development of agriculture in developing countries mainly consisted of farmers and communities being told what to do, often by institutions and agents who have not taken sufficient time to understand the farmers' real needs and practices. These scholars also add that over the last two decades, government and nongovernmental organizations have recognised the need to move away from instruction and blueprint solutions, towards more participatory approaches which involve communities in setting and fulfilling their own development goals and solutions. Hence, the system-oriented and participatory

approaches are being increasingly integrated into the emerging research and development (R&D) paradigm.

Agricultural Extension in Rwanda

The following is a history of agricultural extension in Rwanda. It was compiled from the Rwanda, National Agricultural Extension Strategy, 2009, Strategic Plan for Agricultural Transformation (PSTA) I, II, III & IV, and the United States Agency for International Development (USAID) project "Modernizing Extension and Advisory Services" (MEAS), 2011, Comprehensive Assessment of Extension Services in Rwanda. It is just an evolution of extension system in Rwanda. It is worth noting that this system was dominated by top-down approach and lack of involvement of farmers in agricultural practices.

The agricultural extension system has changed substantially since the colonial period (before 1962) and the post-colonial period up to 1980 where the primary focus was on export crops, including coffee, tea, pyrethrum and quinquina. During this earlier period, extension was a very top-down system where farmers were required to follow key production practices as defined by the colonial and post-colonial governments and as implemented by the field extension workers. During this post-colonial period, a large number of public extension workers were hired and began testing new extension methods. However, all of these methods were still top-down, without any serious participation of farmers in defining local needs and priorities.

From 1980 through 1994, the extension system was still dominated by the government using a top-down approach, including Training and Visit (T&V) Extension introduced by the World Bank (WB). At the same time the international NGOs began providing agricultural extension services. After the 1994 genocide, an

emergency phase was started (1994-1998) and both national and international NGOs began creating new farmer associations. Most of these NGOs did not and still do not work closely together in providing advisory service and coordinating their respective extension activities. Then in 1998, "sector-level" MINAGRI extension workers (i.e. agricultural monitors or MONAGRI) were officially removed as national government employees. This removal, however, created a serious gap between MINAGRI institutions and the farmers being served. However, there continued to be extension advisors for key export and cash crops (e.g. coffee, tea, Irish potatoes).

During the past decade, however, new extension approaches have been considered to provide improved advisory services to different categories of farmers. It has become widely accepted that extension services should be provided through a pluralistic extension system including the public sector (i.e. at the national, district and sector levels), international and local NGOs, as well as the private sector. It is also widely accepted that extension service providers should be more participatory (i.e. more farmer-driven) and market-oriented. For example, there is a strong focus on developing commodity chains for key staple crops (e.g. maize, beans, rice, wheat) to achieve national food security, as well as export crops (e.g. coffee, tea, and key horticultural crops) to improve rural livelihoods by increasing farm household income and, thereby, reducing rural poverty. Another key goal is to improve household nutrition by having one cow per family, especially among small farm households.

In the comprehensive assessment of extension services that was carried out by USAID Rwanda (2011), it was observed that the extension workers in most districts and sectors continue to implement a more top - down extension strategy that has limited impact on farmers. Organizational modifications at the national and zonal level, in the area of agricultural extension, did not address the major linkage problems that still

exist between the Ministry of Agriculture and Animal Resources in charge of agricultural sector in Rwanda and the Ministry of Local Government that employs district and sector extension workers. It was also observed that agricultural extension activities are not properly coordinated, especially between the national and district levels.

Communicational weaknesses of agricultural extension

Although agricultural extension has been treated as agricultural communication, scholars have demonstrated that agricultural extension should not be equated with agricultural communication. In his essay, *Extension or Communication,* Freire (1973) demonstrated the profound opposition which exists between extension and communication. In his understanding, extension agents, that he calls agronomists should have an educational task. He said that the agronomist-educator, like teachers in general, must choose communication if he/she genuinely wants to reach peasants/farmers, not by being abstract, but by being concrete, within a historical reality.

Freire showed that “extension” leads to actions which transform the peasant or farmer into a "thing," an object of development projects which negate him/her as a being capable of transforming his/her world. While linking this scenario with his understanding of education, Paulo Freire said that during extension, the peasant or farmer is not educated but instead is treated as a depository for propaganda from an alien cultural world, containing the things which the technician (who is modern and therefore superior) thinks the peasant/farmer ought to know in order for him/her to also become modern. Freire emphasized that from a humanist and scientific perspective, one cannot focus on technical capacitation except within the context of a total cultural reality. He said that peasant attitudes toward phenomena like planting,

harvest, erosion, and reforesting are related to their attitudes toward nature, their religious beliefs, their values, and so forth. The agronomist-educator cannot bring about a change of peasant attitudes in regard to a particular aspect of life unless he/she knows peasants' world view and confronts it in its totality (Freire, 1973).

Freire also criticised the concept of extension as cultural invasion, as an attitude contrary to the dialogue which forms the basis of an authentic education. He compared extension with the concept of domination, frequently found at the heart of traditional education, and showed how domination, instead of freeing men, enslaves them, reduces them to things, and manipulates them by not allowing them to act as subjects in history, and through this action, to become authentic persons. Freire also analysed the relationship between techniques, modernization and humanism and warned against falling into technological messianism as people try to avoid the traditionalism of the status quo. He affirmed that while "all development is modernization, not all modernization is development."

Freire also looked at the associative relationships which developed within the fields of meaning of the term "extension". As he expressed, analyses of "associative fields" of terms can reveal several different dimensions of the terms. He then attempted an analysis of this kind, taking the term extension as the subject, and seeking to discover the dimensions of its associative field. He then derived the following:

extension …. transmission

extension …. active Subject (who transmits)

extension .... content (chosen by the transmitter)

extension .... recipient (of the content)

extension …. delivering (e.g., in extramural activities—something brought by a Subject who is "within the wall" to those who are "beyond the wall" or "outside the wall")

extension .... messianism (of the extension agent)

extension …. superiority (of the thing given away by the person giving away)

extension …. inferiority (of those who receive)

extension …. mechanical transfer (the action of the extension agent)

extension …. cultural invasion (through what is brought, which reflects the bringers' vision of the world, and is imposed on those who passively receive)

Freire said that the main task of the agronomist-educator is to attempt to overcome the magic perception of reality, simultaneously achieving technical training. At the same time, he/she must overcome the "doxa" by the "logos" of reality. It is the attempt to extend knowledge which is largely sensuous to knowledge which, taking its departure from the sensuous, touches the raison d'être of reality. The more one approaches the objective, challenging the raison d'être of reality through action and reflection, the more one can reveal it by entering into it. Thus, as Freire put it, to substitute our "elaborated" techniques for the empirical manner of acting of the peasants is at once an anthropological, epistemological, and structural problem. This means that it cannot be solved through the gnosiological misinterpretation to which the concept of "extension" leads (Freire, 1973).

It was the belief of Freire (1973) that any attempt at mass education, whether associated with professional training or not, whether in the agricultural sphere or in the urban and industrial field, must possess a basic aim: to make it possible for human beings, through the problematizing of the unity being-world (or of human beings in their relations with the world and with other human beings) to penetrate more deeply

the ‘prise de conscience’ of the reality in which they exist. This deepening of the ‘prise de conscience’, which must develop in the action which transforms reality, produces with this action an overlaying of basically sensuous knowledge of reality which touches the raison d'être of this reality. This results in their discovering of their own presence within a totality, within a structure, and not as "imprisoned" or "stuck to" the structure or its parts. When they do not perceive reality as the totality within which the different parts interact, they lose themselves in a "focalist" vision of it. Perceiving reality partially deprives them of the possibility of a genuine action on reality.

According to Freire (1973), any attempt to manipulate people to adapt them to this reality (quite apart from being scientifically absurd, since adaptation implies the existence of a finished, static reality - not one which is being created) means taking from them their opportunity and their right to transform the world. For Freire, education cannot take this road, and for it to be authentic, it must be liberating. He explained that one of the basic preoccupations of education must be the greater penetration of the "prise de conscience" which operates in human beings when they act and when they work. This deepening of the prise de conscience, which takes place through conscientization, is not and never can be an intellectual or an individualistic effort. Conscientization cannot be arrived at by a psychological, idealist subjectivist road, nor through objectivism. Just as the prise de conscience cannot operate in isolated individuals, but through the relations of transformation they establish between themselves and the world; so also conscientization can only operate in this way.

In Freire’s understanding, the prise de conscience, which is a human characteristic, results in a person's coming face to face with the world and with concrete reality,

which is presented as a process of objectification. Any objectification implies a perception which is conditioned by the elements of its own reality. The prise de conscience exists at different levels. There is a magic level as well as a level in which the objectified fact fails to be apprehended in all its complexity. If the prise de conscience goes beyond the mere apprehension of the presence of a fact, and places it critically in the system of relationships within the totality in which it exists, it transcends itself, deepens, and becomes conscientization.

For Freire, this effort of the prise de conscience to transcend itself and achieve conscientization, which always requires one's critical insertion in the reality which one begins to unveil, cannot be individual but social. It is sufficient to know that conscientization does not take place in abstract beings in the air but in real men and women and in social structures, to understand that it cannot remain at the level of the individual. Conscientization, which can only be manifested in the concrete praxis (which can never be limited to the mere activity of the consciousness) is never neutral, and in the same way, education can never be neutral. In the conscientization process the educator has the right, as a person, to have options. What s/he does not have is the right to impose them. To do this is to prescribe these options for others. To prescribe is to manipulate. To manipulate is "to reify" and to reify is to establish a relationship of "domestication" which may be disguised behind an apparently inoffensive façade. In this case, it is impossible to speak of conscientization.

According to Freire, the false educator can only "domesticate" because instead of undertaking the critical task of demythifying reality, s/he mythifies it further. It is indispensable for such educators to issue communiqués instead of communicating and receiving communications. This kind of educator cannot establish a true gnosiological relationship since this would make manipulation impossible. Education as the practice

of freedom is not the transfer, or transmission of knowledge or cultures. It is not even the extension of technical knowledge. It is not the act of depositing reports or facts in the educatee. It is not the "perpetuation of the values of a given culture." It is not "an attempt to adapt the educatee to the milieu." Education as the practice of freedom is a true gnosiological situation. The act of knowing does not have its term in the knowable object since it is communicated to other subjects that are also capable of knowing.

Freire explains that in the educational process for liberation, educator-educatee and educatee-educator are both cognitive subjects before knowable objects which mediate them. Education through dialogue and communication is seen by false educators in their misinterpretation (whether erroneous or ideological) as a threat. It is in fact a threat to their false knowledge. Many of those who reject communication, and avoid the true state of knowing which is a state of participation with, do so because in the face of knowable objects, they are incapable of taking up a cognitive position. They remain in the realm of "doxa" beyond which they are the mere repeaters of texts read but not known. In true gnosiological education there is not one particular moment in which, all alone in a library or laboratory, the educator "knows," and another moment in which s/he simply narrates, discourses on, or explains the knowledge "received."

As Freire (1973) put it, at the moment in which educators carry out their research, when as cognitive subjects they stand face to face with a knowable object, they are only apparently alone. Not only do they establish a mysterious, invisible dialogue with those who carried out the same act of knowing before them, but they engage in a dialogue with themselves too. Place face to face before themselves they investigate and question themselves. The more they ask questions, the more they feel that their curiosity about the object of their knowledge is not decreasing. It only diminishes if it

is isolated from human beings and the world. This is why dialogue as a fundamental part of the structure of knowledge needs to be opened to other subjects in the knowing process. Thus, the class is not a class in the traditional sense, but a meeting-place where knowledge is sought and not where it is transmitted.

Freire posited that just because the educator's task is not dichotomized into two separate moments (one in which s/he "knows," and another in which s/he speaks about this "knowledge"), education is a permanent act of cognition. Educators never allow themselves to be bureaucratized by high-sounding, repetitious, mechanical explanations. So much so that whenever an educatee asks a question, educators in their explanations remake the whole previous effort of cognition. Remaking the effort does not, however, mean repeating it as it was. It means making a new effort, in a new situation, in which new aspects which were not clear before are clearly presented to the educatee. New ways of access to the object are opened to him or her. For Freire, the teachers who do not make this effort, because they merely memorize their lessons, must of necessity reject education as a gnosiological condition and can thus have no love for the dialogue of communication. Education for them is the transfer of "knowledge." It consists in extending this "knowledge" to passive educatees and preventing them from experiencing the development of the active, participatory condition, characteristic of someone who knows.

Freire explained that his false conception of education, based on the depositing of "reports" in the educatees, is a basic obstacle to transformation. It is an anti-historical conception of education. Educational systems based on this conception surround themselves with a "barricade" which inhibits creativity. For creativity does not develop within an empty formalism, but within the praxis of human beings with each other in the world and with the world. In this praxis action and reflection constantly

and mutually illuminate each other. Its practice, which involves a theory from which it is inseparable, also implies the attitude of someone seeking knowledge, and not someone passively receiving it. Thus, when education is not a truly gnosiological condition, it diminishes into a verbalism which, because it frustrates, is not inconsequential.

2.3.6 Communication channels in agricultural research communication

Scholars have come up with different ideas on the communication channels that should be used while communicating agricultural research results. Shahzad et al. (2011) show that various public and private organizations use communication channels such as print media in order to catalyse the agricultural innovation and diffusion process. The same scholars further show that print media were preferred by younger farmers compared to the older ones. However, Abubakar, Ango and Buhari (2009), showed that access to mass media on agricultural information is mainly through radio and television, and most of the farmers indicated that the media sources are conventional, accessible and they preferred to listen to the agricultural programmes in the night time (8pm-11.59pm).

Inagaka (2007) states that communication for development, for example, in the agricultural sector is presented with a multitude of communication approaches and techniques that can be adopted to pursue specific goals. Some of the strategies adopted include: entertainment-education, marital partners; peer education; interpersonal communication; community actions; media advocacy or even listening to indigenous music. Each of these strategies operates within a fairly tightly defined set of communication channels and spaces.

Ogola (2015) observed that Radio, fellow farmers and telephone calls are the channels that had numerous strengths hence were considered more advantageous by farmers compared with the other channels. Therefore, they are most suitable for the communication and dissemination of information and knowledge to farmers. Ogola (2015) said that extension officers and radio were the two channels that were considered by many farmers in her study to be accurate, informative and comprehensible.

However, there are scholars who highlighted the fact that mass media is not always effective in communicating development messages. The study that was carried out by UNDP Oslo Governance Centre & Communication for Social Change Consortium in 2010 in Ada, Ghana; Khoun, Lao People's Democratic Republic; and Dondo, Mozambique revealed that community radio meets the accessibility and appropriateness criteria regarded by many as essential if communication technologies are to contribute to poverty eradication. However, the same study indicated that this medium also has concerns over sustainability. Most of the country reports highlighted low levels of literacy and limited confidence and skills as a significant barrier to poor people using media to participate more fully in community and public life. Therefore, much as the research indicated that community radios provide familiar and trusted community space for participation, it also highlighted that even when communication mechanisms are available, the possibility for engagement cannot be taken for granted (UNDP Oslo Governance Centre & Communication for Social Change Consortium, 2010).

As UNDP revealed, while communicating for development, more attention needs to be given to creating the pre-conditions of voice through raising awareness and building confidence and capacity to speak out. This point is explicitly made in both

Nepal and Madagascar reports and is well articulated in the Madagascar report which states ‘radio alone is not able to effect long term change in people’s attitudes and practices and needs to be accompanied by face to face support and training’. The analysis of the data confirmed the paramount importance to poorer groups of traditional communication mechanisms and suggested that new information and communication technologies should not supplant traditional information channels such as village and church meetings (UNDP Oslo Governance Centre & Communication for Social Change Consortium, 2010).

From the above discussions, it is clear that researchers should be careful while choosing channels to be used while communicating to farmers. Mass media and new technologies might not fit all categories of farmers. Some farmers might not be able to access and use certain media. In the context of poor and illiterate farmers, channels that modern researchers consider to be traditional might yield better results. These might be more comfortable in interpersonal channels and face-to-face encounters. They will need approaches that can allow engagement, conscientization and empowerment.

2.3.7 Gaps emerging from the reviewed literature

While reviewing the literature, some gaps were identified and were expected to be addressed by this study. Those gaps include the following:

a) Research had focused on agricultural research results’ generation but little or no research was in the area of agricultural research results’ communication to farmers.
b) Research recommendations were addressed to the government, development partners and researchers. Farmers were not taken as an equally important partner in the development of the agricultural sector.

c) In agricultural sector in Rwanda, extension was conceived and discussed as synonymous with the communication of agricultural research results, whereas research has demonstrated that extension is far from communication.

d) The diffusion of innovation theory (characteristic of modernisation paradigm of development) dominated the agricultural sector in Rwanda and participatory involvement was predominantly lacking.

e) In spite of the changes that took place in the agricultural extension sector in Rwanda, the system remained largely "top-down", and farmers were always placed in the receiving end.

2.4 Summary

The literature review reveals that agriculture and agricultural research are an important drive to development especially in developing countries in general, and in Rwanda in particular. Researchers did a good job in assessing the sector performance and relevant policies, and providing recommendations towards its advancement and improvement. However, it was also observed that farmers, the most important partner in the agricultural sector, were not involved in the discussions and were not addressed by research recommendations. The literature also reveals that agricultural researchers had difficulties in allowing their research results to be out and reach the farmers. Researchers had been taking publishing books and academic articles as a good way to communicate their research findings but, they also acknowledged that for their research to be impactful, they needed to properly communicate their research results and go beyond publishing academic works.

The literature review also shows that Rwanda gave a lot of consideration to agriculture and agricultural research. It indicates that this country put in place policies in line with agricultural development. However, the literature also shows that much as

Rwanda considered agricultural research more important, agricultural research communication was not given appropriate attention. The literature also shows that agricultural communication was taken to solely mean “agricultural extension” whereas scholars revealed that extension is far different from communication. Agricultural research results’ communication to farmers; farmers’ conscientization; involvement of farmers as an equally important partner in the development of the agricultural sector as well as fostering farmers’ active participation were the focus of this study.

CHAPTER THREE

CONCEPTUAL FRAMEWORK

3.1 Introduction

The study of the communication of agricultural research results to farmers by the Rwanda Agriculture Board was enlightened by the new development paradigm. Far from being equated with modernisation and dependency, development was viewed from a multiplicity of angles (Mefalopulos, 2008; Imoh, 2013; Sylvester, 2016). It was viewed as participation, empowerment, happiness, well-being and associated or related concepts. Similarly, unlike many years before where communication was described using transmission or interactional models, a communication encounter was now seen as a transactional process whereby communicators co-create messages, information and knowledge. Here again participation of communicators was considered paramount in a relational, contextual, co-creation process.

According to McQuail and Windahl (1989) “Models” simplify reality, select key elements, and indicate relationships. The word 'model' refers to a representation of a process, and event or a situation. It is not a separate or independent method rather it is the representation of an existing object. The communication model is similarly a symbolic representation of the communication process. It does not show the details of a message; rather it presents only those elements which are related to the object of sending a message. The Transactional Model of Communication helped to analyse and describe this communication encounter. It helped to identify the main elements of this communication and how they relate to each other or one another. This model helped the researcher to answer the first research question: “How do agricultural

researchers at Rwanda Agricultural Board communicate their research findings to farmers?"

According to Griffin (2012), a theory consists of a set of systematic, informed hunches about the way things work or operate. There was a need to understand how the communication of agricultural research results operates at RAB, issues and challenges it faced and, probably, how it could be improved. The Diffusion of Innovation Theory, the Participatory Communication Approach, the Active Audience/Reception Theory and the Freire's Theory of Conscientization helped to understand that communication and to explain its related issues. These approaches/theories helped the researcher to answer the 2nd and 3rd research questions: How do farmers working with RAB make sense of RAB communication initiatives relating to research findings, and what can RAB do to improve the communication of research findings to farmers? The following table shows the relationship between the elements of the conceptual framework and the research questions:

Table 1: Relationship between the conceptual framework and research questions

Conceptual Framework	***Research Questions***
Transmission Model of Communication Transactional Model of Communication	Research Question 1: Describing the process of communicating agricultural research results to farmers by RAB
Diffusion of Innovations Theory Participatory Communication Approach Freire's Theory of Conscientization Active Audience / Reception Theory	Research Question 2 and 3: Explaining and appraising the process of communicating agricultural research results to farmers by RAB

3.2 Transmission Model of Communication

The transmission model of communication describes communication as a linear, one-way process in which a sender intentionally transmits a message to a receiver (Ellis & McClintock, 1990). This model focuses on the sender and message within a communication encounter. Although the receiver is included in the model, this role is viewed as more of a target or end point rather than part of an ongoing process. We are left to presume that the receiver either successfully receives and understands the message or does not. The scholars who designed this model extended on a linear model proposed by Aristotle centuries before that included a speaker, message, and hearer.

They were also influenced by the advent and spread of new communication technologies of the time such as telegraphy and radio, and one can probably see these technical influences within the model (Shannon & Weaver, 1949). If one thinks of how a radio message is sent from a person in the radio studio to a driver listening in the car. The sender is the radio announcer who encodes a verbal message that is transmitted by a radio tower through electromagnetic waves (the channel) and eventually reaches the driver' (the receiver's) ears via an antenna and speakers in order to be decoded.

The radio announcer doesn't really know if the driver receives his or her message or not, but if the equipment is working and the channel is free of static, then there is a good chance that the message was successfully received. The following is a schematic representation of Shannon & Weaver's Transmission Model of Communication:

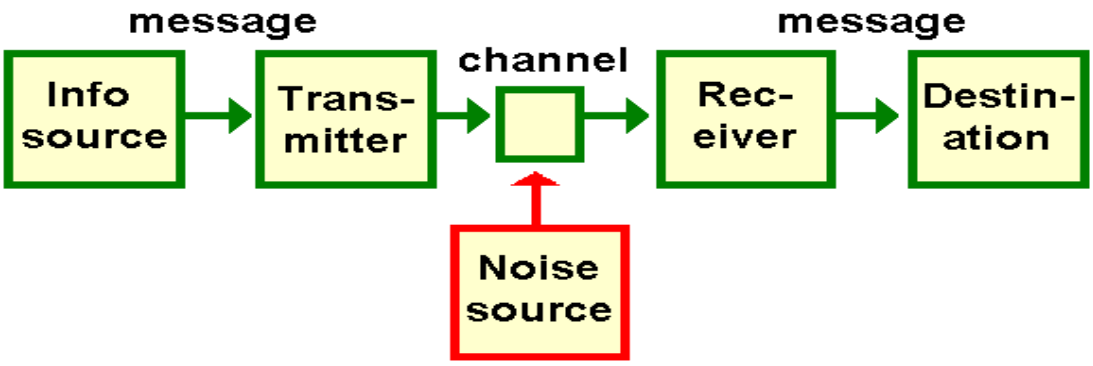

Figure 2: Shannon & Weaver's Transmission Model of Communication
***Source**: Chandler, 2014*

The transmission model of communication was not used as the preferred model depicting the most appropriate understanding of communication. It was simply used to help analyse the process of communicating agricultural research results at RAB. It was mainly referred to in isolating the elements of the communication process. It was however complemented and supplemented by the transactional model of communication to assist in comprehending the transactional nature of the relationship between RAB and farmers and to understand the context that shape the encounter between RAB and farmers.

3.3 Transactional Model of Communication

The transactional model of communication describes communication as a process in which communicators generate social realities within social, relational, and cultural contexts. The transaction model differs from the transmission and interaction models in significant ways, including the conceptualization of communication, the role of sender and receiver, and the role of context. In this model, communicators do not just communicate to exchange messages. They communicate to create relationships, form intercultural alliances, shape their self-concepts, and engage with others in dialogue to create communities. In short, according to this model, we do not communicate about

our realities; communication helps to construct our realities. The transaction model of communication views communication as a force that shapes our realities before and after specific interactions occur. It must account for contextual influences outside of a single interaction. To do this, the transaction model considers how social, relational, and cultural contexts frame and influence our communication encounters (The Saylor Foundation, 2016).

Creative Commons (2018) explained different aspects of context as follows:

> *Social context* refers to the stated rules or unstated norms that guide communication. As we are socialized into our various communities, we learn rules and implicitly pick up on norms for communicating. Some common rules that influence social contexts include "don't lie to people, don't interrupt people, don't pass people in line, greet people when they greet you, thank people when they pay you a compliment, and so on". Parents and teachers often explicitly convey these rules to their children or students. Rules may be stated over and over, and there may be punishment for not following them.
>
> *Relational context* includes the interpersonal history and type of relationship we have with a person. We communicate differently with someone we just met versus someone we have known for a long time. Initial interactions with people tend to be more highly scripted and governed by established norms and rules, but when we have an established relational context, we may be able to bend or break social norms and rules more easily. For example, you would likely follow social norms of politeness and attentiveness and might spend the whole day cleaning the house for the first time you invite your new neighbours to visit. Once the neighbours are in your house, you may also make them the

centre of your attention during their visit. If you end up becoming friends with your neighbours and establishing a relational context, you might not think as much about having everything cleaned and prepared or even giving them your whole attention during later visits.

Cultural context includes various aspects of identities such as race, gender, nationality, ethnicity, sexual orientation, class, and ability. It is important to understand that whether we are aware of it or not, we all have multiple cultural identities that influence our communication. Some people, especially those with identities that have been historically marginalized, are regularly aware of how their cultural identities influence their communication and influence how others communicate with them. Conversely, people with identities that are dominant or in the majority may rarely, if ever, think about the role their cultural identities play in their communication. When cultural context comes to the forefront of a communication encounter, it can be difficult to manage.

A competent communicator shouldn’t assume to know all the cultural contexts a person brings to an encounter, since not all cultural identities are visible. As with the other contexts, it requires skills to adapt to shifting contexts, and the best way to develop these skills is through practice and reflection.

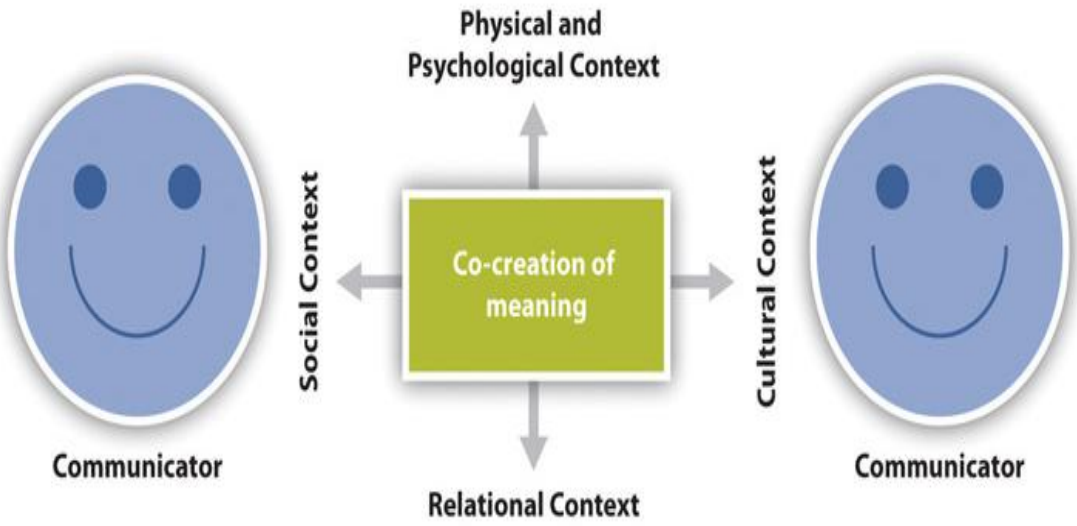

Figure 3: Transactional Model of Communication by Saylor Foundation
Source: *Saylor Foundation, 2016*

It is worth mentioning that different scholars such as Arnold and Underman Boggs (2011) talked about the same understanding of the communication process and simplified it for communicators in the health context. The following figure illustrates the transactional model of communication by Arnold and Underman Boggs:

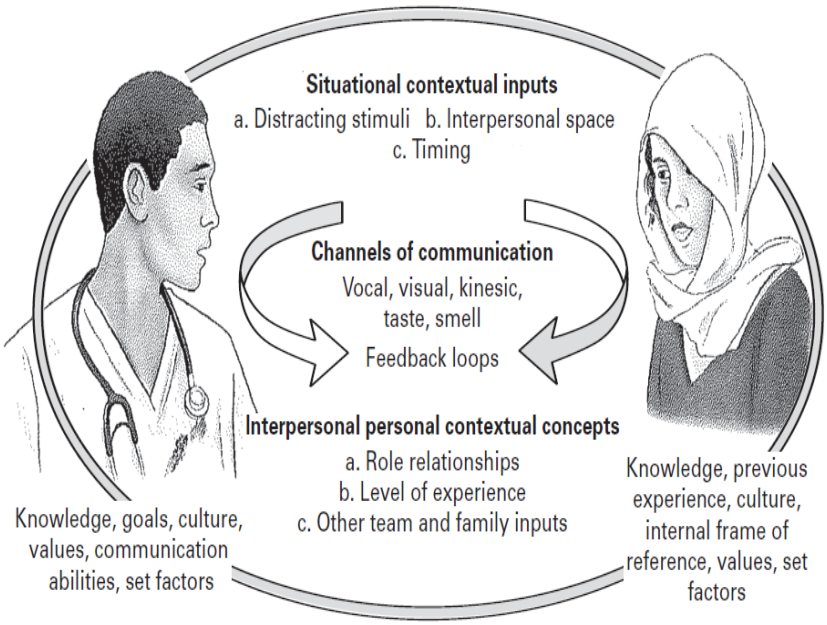

Figure 4: Transactional Model of Communication by Arnold and Underman Boggs

Source: *Arnold and Underman Boggs, 2011*

For Wood (2011), the Transactional Model of Communication can be expressed as follows:

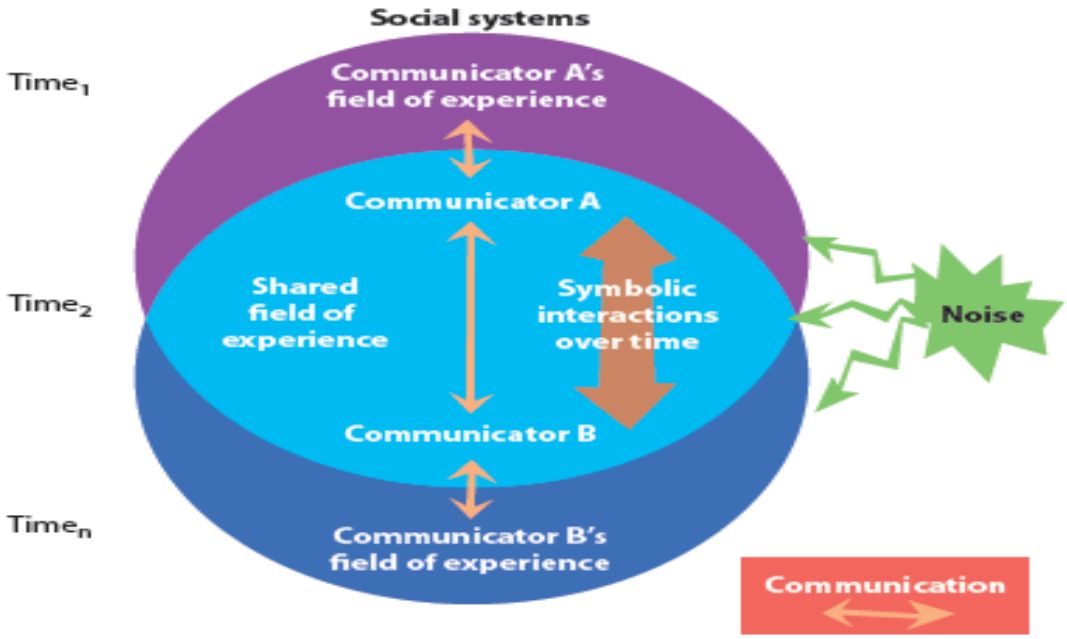

Figure 5: Transactional Model of Communication by Julia T. Wood
Source: *Wood (2011, p.11)*

The transactional model of communication transcends the transmissional and interactional models of communication and reflects the new understanding of communication. It was therefore chosen to help in describing and analysing the communication of agricultural research results to farmers by Rwanda Agriculture Board. The description and analysis were done by identifying and describing "transactants" and "transactions", their environment and relational context, as well as channels or means used to transact in their encounter. The model basically contributed to answering the first research question but also laid the ground for the answering of the second and third research questions.

3.4 Diffusion of Innovation Theory

Diffusion of Innovation (DOI) Theory, developed by E.M. Rogers in 1962, is one of the oldest social science theories. It originated in communication to explain how, over time, an idea or product gains momentum and diffuses (or spreads) through a specific population or social system. According to this theory, adoption of a new idea, behaviour, or product (i.e., "innovation") does not happen simultaneously in a social system; rather it is a process whereby some people are more apt to adopt the innovation than others (Boston University School of Public Health, 2018).

There are five established adopter categories, and while the majority of the general population tends to fall in the middle categories, it is still necessary to understand the characteristics of the target population. When promoting an innovation, there are different strategies used to appeal to the different adopter categories. Everett Rogers provides the distribution of the five adopter categories as follows: Innovators represent the first 2.5% of the group to adopt an innovation followed by 13.5% as early adopters, 34% as early majorities, 34% as late majorities, and 16% as laggards.

Innovators - These are people who want to be the first to try the innovation. They are venturesome and interested in new ideas. These people are very willing to take risks, and are often the first to develop new ideas. Very little, if anything, needs to be done to appeal to this population.

Early Adopters - These are people who represent opinion leaders. They enjoy leadership roles, and embrace change opportunities. They are already aware of the need to change and so are very comfortable adopting new ideas. Strategies to appeal to this population include how-to manuals and information sheets on implementation. They do not need information to convince them to change.

Early Majority - These people are rarely leaders, but they do adopt new ideas before the average person. That said, they typically need to see evidence that the innovation works before they are willing to adopt it. Strategies to appeal to this population include success stories and evidence of the innovation's effectiveness.

Late Majority - These people are skeptical of change, and will only adopt an innovation after it has been tried by the majority. Strategies to appeal to this population include information on how many other people have tried the innovation and have adopted it successfully.

Laggards - These people are bound by tradition and very conservative. They are very skeptical of change and are the hardest group to bring on board. Strategies to appeal to this population include statistics, fear appeals, and pressure from people in the other adopter groups.

The following figure summarises the above five adopter categories:

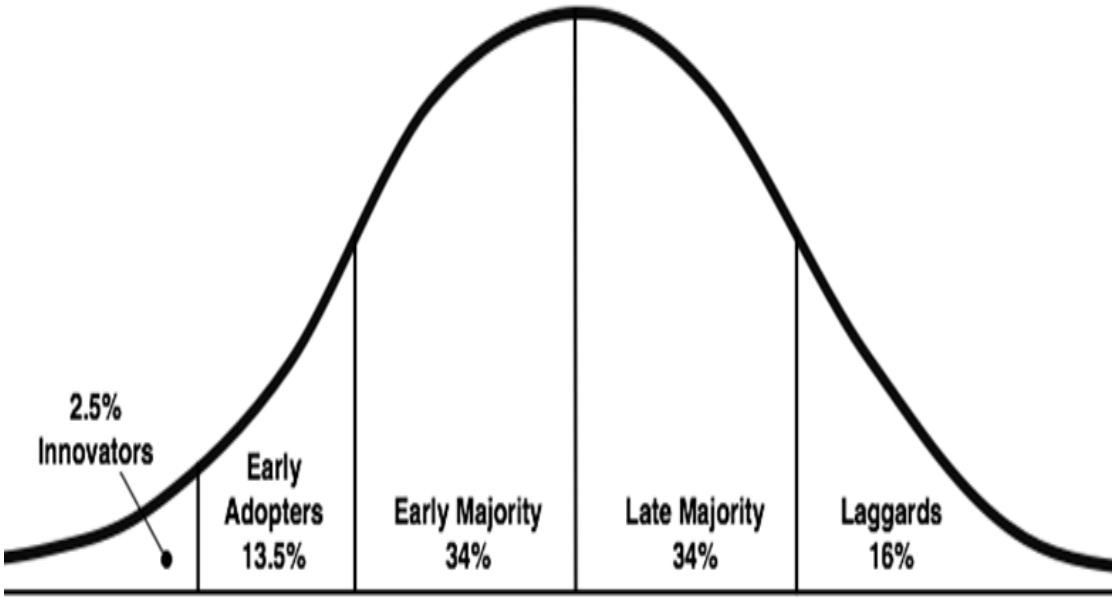

Figure 6: Everett Rogers' Adopter Categories
Source: *Boston University School of Public Health, 2018*

The stages by which a person adopts an innovation, and whereby diffusion is accomplished, include awareness of the need for an innovation, decision to adopt (or reject) the innovation, initial use of the innovation to test it, and continued use of the innovation. Everett Rogers identified five main factors that influence adoption of an innovation, and each of these factors is at play to a different extent in the five adopter categories. Those factors include relative advantage, compatibility, complexity, triability, and observability:

Relative Advantage - The degree to which an innovation is seen as better than the idea, program, or product it replaces.

Compatibility - How consistent the innovation is with the values, experiences, and needs of the potential adopters.

Complexity - How difficult the innovation is to understand and/or use.

Triability - The extent to which the innovation can be tested or experimented with before a commitment to adopt is made.

Observability - The extent to which the innovation provides tangible results.

It is worth noting that the Diffusion of Innovations Theory is linear and source dominated because it sees communication process from the point of view of the elite who has decided to diffuse information or an innovation. It does not involve the beneficiaries of innovations. In this study, the Diffusion of Innovations Theory was not used to understand how the communication of agricultural research results at RAB should be done. It was simply and briefly referred to get some explanations on how this communication was practised. RAB staff (researchers and extensionists), the elite, were the focus of the communication of agricultural results communication.

They would originate everything that beneficiaries, farmers, were supposed to get or undergo. In this study, Participatory Communication Approach, Freire's Theory of Conscientization as well as the Active Audience/Reception Theory were used to complement and supplement the Diffusion of Innovations Theory in order to better understand the communication of agricultural research results to farmers by RAB and come up with related recommendations.

3.5 Participatory Communication Approach

Participatory communication is an approach based on dialogue, which allows the sharing of information, perceptions and opinions among the various stakeholders and thereby facilitates their empowerment. It is not just the exchange of information and experiences: it is also the exploration and generation of new knowledge aimed at addressing situations that need to be improved. Participatory communication tends to be associated with community-driven development, but it could be used at any level of decision making (local, national, international) regardless of the diversity of groups involved (Tufte & Mefalopulos, 2009).

While the transmission and transactional models of communication were used to describe the communication of agricultural research results to farmers by Rwanda Agriculture Board, participatory communication approach was used to understand that communication and the role that stakeholders in that communication play, with a particular focus on how farmers are involved in that communication.

3.5.1 Participatory communication approach to development communication

Servaes and Malikhao (2005, pp.95-96) present two major approaches to participatory communication. The first approach is the dialogical pedagogy of Freire (1970, 1973, 1983, 1994). Freire insists that subjugated peoples must be treated as fully human

subjects in any political process, and this implies dialogical communication. The second approach involves the ideas of access, participation and self-management articulated in the UNESCO debates of the 1970s (Berrigan, 1977, 1979). This arose from the 1977 meeting in Belgrade, the former Yugoslavia (Servaes & Malikhao 2005, p.96).

As the final report of the 1977 meeting highlights, access refers to the use of media for public service. It may be defined in terms of the opportunities available to the public to choose varied and relevant programmes and to have a means of feedback to transmit its reactions and demands to production organisations. In the case of this study, this was in line with the way farmers access agricultural research results from RAB and different means used to help them access those findings.

The report also defines participation as a higher level of public involvement in communication systems. It includes the involvement of the public in the production process, and also in the management and planning of communication systems. It is more than representation and consultation of the public in decision-making. With regard to self-management, the 1977 UNESCO report defined it as the most advanced form of participation. Here, the public exercises the power of decision making within communication enterprises and is also fully involved in the formulation of communication policies and plans. In this study, participatory communication helped to understand the level of involvement of farmers in the whole process of agricultural research findings' generation and sharing.

Access by the community and participation of the community are to be considered key defining factors. Community media are media to which members of the community have access, for information, education, entertainment, when they want

access. They are media in which the community participates, as planners, producers, and performers. They are the means of expression of the community, rather than for the community (Servaes & Malikhao, 2005, p.97).

In participatory paradigm, development is perceived not as something that can be imported from western tradition but something that can emerge out of indigenous culture. The paradigm rejects the assumptions of modernisation paradigm that advocates a universal model of development, and instead advocates culture-specific and people-centred holistic development approaches. Development is therefore understood as a participatory process of social change within a given society, which needs genuine participation of the local community and the contextualisation of development works into local cultures and settings (Rogers, 1976; Servaes, 2008; Mefalopulos, 2008 as cited in Ali & Sonderling, 2017)

The concerned participatory model in this study is based on Freire's liberating pedagogy from the 1960s and renewed in more recent debates about development. This school takes globalization, transnational networking, new media and governance into account. These issues help to determine the strategic communication objectives. Rather than communicating the correct or relevant information to specific audiences, it is about articulating processes of collective action and reflection by relevant stakeholders. The centre of attention is the empowerment of citizens by their active involvement in the identification of problems, development of solutions and implementation of strategies. The participatory model is a dialogic and horizontal approach to communication and development (Tufte & Mefalopulos, 2009, p.7).

Msibi and Penzhorn (2010) gave a number of basic principles underlying the concept of participation which can guide a study in participatory communication, and which

also guided the understanding of how farmers got involved in the communication of agricultural research results. These are *Power and control, Liberation, Participation as a learning process, Self-reliance and self-confidence, Knowledge sharing,* and *Honesty, trust and commitment*.

In terms of power relations, encounters between researchers and farmers were characterised by power imbalance, and participatory communication helped to understand how the power of farmers was strengthened and the more equitable sharing of both political and economic power. This approach also helped to explore how farmers achieved the ability to determine the course of their own lives as well as the confidence, freedom and emancipation. Participatory communication also helped to explore how farmers are given the opportunity to set their own goals and take their own decisions, awakening their latent abilities by offering them choices to enable them to fully develop their potential. Participatory communication also helped explore how the communication of agricultural results to farmers develops esteem and self-confidence in farmers, providing a context for the recognition of their knowledge and abilities. This communication approach helped to explore how farmers contributed their knowledge and how their indigenous knowledge was used. Participatory communication also aided in finding out how farmers were listened to; how their attitudes were treated and respected as well as how they were trusted by researchers (Msibi & Penzhorn, 2010).

Participation has been viewed differently depending on the perspective applied. Some stakeholders define participation as the mobilization of people to eliminate unjust hierarchies of knowledge, power, and economic distribution. Others define it as the reach and inclusion of inputs by relevant groups in the design and implementation of a

development project. These examples represent two of the main approaches to participation: a social movement perspective and a project-based or institutional perspective. These perspectives share a common understanding of participation as the involvement of ordinary people in a development process leading to change (Tufte & Mefalopulos, 2009, p.4). From the institutional perspective mentioned above, participation can be used as a tool to achieve a pre-established goal defined by someone external to the community involved. For the social movement mentioned above, participation itself can be a goal as an empowering process.

Tufte and Mefalopulos (2009, p.5) observe that the outcomes of participatory strategies in an intervention can include the psycho-social outcomes of increased feelings of ownership of a problem and a commitment to do something about it; improvement of competencies and capacities required to engage with the defined development problem, and actual influence on institutions that can affect an individual or community.

This study was informed by both a social movement perspective and a project-based or institutional perspective of participation. From an institutional perspective, Tufte and Mefalopulos (2009, p.5) give stages of a development project where participation intervenes. These include the *research stage*, *design stage*, *implementation stage*, and *evaluation stage*. Those stages correspond to the stages of agricultural research communication at RAB where farmers can participate.

During the *research stage*, where the development problem is accurately defined, all relevant stakeholders need to be involved in this process. The research around the development problem can include studying previous experiences, individual and community knowledge and attitudes, existing policies and other relevant contextual

information related to socio-economic conditions, culture, spirituality, gender, etc. In the context of the study, this consisted in understanding how farmers get involved in defining their problems, coming up with research areas and topics.

During the *design stage*, where the actual activities are defined, a participatory approach helps to secure the ownership and commitment of the communities involved. Active participation by local citizens and other stakeholders aims to enhance both the quality and relevance of the suggested interventions. In this study, participation during the design stage consisted in appreciating how satisfied farmers were and how committed they were to using the agricultural research findings and the sense of ownership they had towards these agricultural research results.

During the *implementation stage,* when the planned intervention is implemented, participation increases commitment, relevance and sustainability. In the case of this study, it was very important to see how often farmers were using the results and how motivated they were to continue using them. Farmers were also given a chance to say how relevant they would find the research findings.

During the *Evaluation Stage,* where participation ensures that the most significant changes are voiced, brought to common attention and assessed, indicators and measurements should be defined in a participatory process at the very beginning of the initiative involving all relevant stakeholders. During the study, farmers were given an opportunity to express how to participate in evaluating agricultural research endeavours and how their ideas are taken into consideration.

While this study considered all levels of participation, the focus was on the higher level of participation where participants meaningfully participate and are involved in all stages of decision making and initiate actions, rather than simply being told, being

asked questions or being consulted. According to Van de Fliert (2010, p.96) there is *Passive Participation* where participants are told and follow and information belongs only to external professionals. There is also *Participation in Information Giving* where participants participate by only answering questions and have no opportunity to influence conclusions and decisions beyond the professionals, and there is also *Participation by Consultation* where participants participate by being consulted and their responses can be taken into consideration if professionals want to do so.

Van de Fliert (2010, p.96) also mentions *Participation for Material Incentive* where participants participate by providing resources, for example labour, in return for food, cash, or other material incentives; *Functional Participation* where participants participate by forming groups to meet predetermined objectives and instructions can be dependent on external initiators/facilitators or become self-dependent; *Interactive Participation* where participants participate in joint analysis, leading to action plans and formation of local institutions and groups take control over local decisions, as well as *Self-Mobilization* where participants participate by taking initiative independent of external institution to change systems.

3.5.2 From participation to participatory communication

Van de Fliert (2010, p.97) realised that facilitating participation does not imply "making others participate", but engaging stakeholder groups in a dialogue, or better a "multilogue". It requires open sharing of information and opinions in all directions, identifying areas of conflicting interests and collective assessment and testing of options that can fulfil needs while capitalising on opportunities and compromising on conflicts. This places participatory communication (rather than just participation with its various meanings and interpretations) at the core of sustainable development.

Van de Fliert (2010, p.97) argues that facilitation of participatory communication processes inherently implies "giving voice", hence power, to all parties involved. These processes should be based on a thorough stakeholder analysis. This analysis helps to understand who has what stake in the process and what functional and power relations exist amongst and within the different stakeholder groups. Understanding people's positions, interests and relations is required to design and employ the most suitable communication and engagement methods to raise interest in and initiate the dialogue. Rather than applying a standard set of recipes from a toolbox, situation-specific processes need to be designed with a clear and mutually agreed objective.

Van de Fliert (2010, p.97) believes that the process design should be based on considerations such as existing inter- and intra-group dynamics, language choice (both from an ethnic as a vocabulary perspective), access to and suitability of media or channels to be used, external noise that may occur and anticipated effects of both the internal processes and the external noise.

3.5.3 Communication for Empowerment

The concept of communication for empowerment (C4E) subscribes to the broader participatory communication approach but aims at empowering the poor, the vulnerable, and the marginalised. It emerged in recognition of the necessity to emphasize and address the specific information and communication needs of poor and vulnerable groups. It was initially introduced and conceptualized by the UNDP Oslo Governance Centre (OGC) and the Communication for Social Change Consortium in 2006. The C4E approach emphasizes the role of communications as an empowering mechanism to enhance inclusive participation and governance. It is based on the fundamental belief that social inclusion and participation through access to

information and effective communication channels are integral parts of democratic governance and sustainable development for the poor and for vulnerable and marginalized groups (UNDP, 2010). In essence, the C4E approach focuses on the governance dimensions of poverty, which recognizes the lack of voice, participation and choice as a result of social exclusion and discrimination.

Practically, Communication for Empowerment is closely related to the concept of Communication for Development which was defined in a UN General Assembly Resolution in 1996 as "communication for development stresses the need to support two-way communication systems that enable dialogue and that allow communities to speak out, express their aspirations and concerns and participate in the decisions that relate to their development" (UNDP Oslo Governance Centre & Communication for Social Change Consortium, 2010).

The study that was carried out by UNDP Oslo Governance Centre & Communication for Social Change Consortium in 2010 in Ada, Ghana; Khoun, Lao PDR; and Dondo, Mozambique revealed that community radio meets the accessibility and appropriateness criteria regarded by many as essential if communication technologies are to contribute to poverty eradication. However, the same study indicated that this medium also has concerns over sustainability. Most of the country reports highlight low levels of literacy and limited confidence and skills as a significant barrier to poor people using media to participate more fully in community and public life. Therefore, much as the research indicated that community radios provide familiar and trusted community space for participation, it also highlighted that even when communication mechanisms are available, the possibility for engagement cannot be taken for granted. More attention needs to be given to creating the pre-conditions of voice through raising awareness and building confidence and capacity to speak out. This point is

explicitly made in both Nepal and Madagascar reports and is well articulated in the Madagascar report which states ‘radio alone is not able to effect long term change in people’s attitudes and practices and needs to be accompanied by face to face support and training’.

The analysis of the data confirms the paramount importance to poorer groups of traditional communication mechanisms and suggests that new information and communication technologies should not supplant traditional information channels such as village and church meetings (UNDP Oslo Governance Centre & Communication for Social Change Consortium, 2010).

A revised framework for C4E would also incorporate a more explicit gender dimension and provide more guidance to addressing gender-related issues at local level. The framework should analyse and identify opportunities for promoting stronger national ownership of the C4E approach. It would also make provision to include more specific support to empower citizens to use media, or be linked more directly to civic education initiatives (UNDP Oslo Governance Centre & Communication for Social Change Consortium, 2010).

3.6 Freire’s Theory of Conscientization

According to Liu (2012) the original word for conscientization is “conscientizacao” in Portuguese. The term was first used by professors at Brazilian Institute of Higher Studies at their meetings and first introduced into the English world by Helder Camara (Roberts, 2000). It found its own way into international educational discourse through the first publication of Freire’s two essays, “Cultural Action and Conscientization” and “The Literacy Process as Cultural Action for Freedom” in Harvard Educational Review in 1970. The two essays were reprinted in the same

journal in 1998 as a tribute to Freire's life and work in broadening the spaces for democracy and dialogue by promoting education for possibility, solidarity and freedom. The concept is briefly defined in Pedagogy of the Oppressed as "learning to perceive social, political, and economic contradictions, and to take actions against the oppressive elements of reality". Thus, at its very beginning, the concept is basically about education for critical consciousness. Critical consciousness, developed from the literacy campaigns Freire ran for the peasants in the Northeast of Brazil in the 1950s and 1960s, is distinguished from two less critical forms: magical consciousness and naïve consciousness (Liu, 2012).

As Liu (2012) put it, magical consciousness refers to the state of consciousness that is semi-intransitive in closed structures, so it is difficult to discern social realities. In this state, discernment is difficult. Men confuse their perceptions of the objects and challenges of the environment, and fall prey to magical explanations because they cannot apprehend true causality. Magical consciousness was predominant in Brazilian rural areas at that time. The peasants in those areas, extremely limited by biological necessity under the pressure of survival, had to seek refuge in believing superstitious fatalism. Magical consciousness, marked by superstitious fatalism, stopped the peasants from comprehending reality and the meaning for their being in the world. It made their life groundless.

Naïve consciousness or transitivity, represents the state of thinking of the peasants in urban areas. It was predominant in Brazilian urban areas during the transitional period of the infrastructural change or abolition of slavery at the end of the nineteenth century. It lacks social explanation of social realities and merely stays superficial on appearance. The peasants with this mode of thinking imputed the root-causes of reality to individuals rather than the system. Naïve transitivity is characterised by an

over-simplification of problems; by a nostalgia for the past; by underestimation of the common man; by a strong tendency to gregariousness; by a lack of interest in investigation, accompanied by an accentuated taste for fanciful explanations; by fragility of argument; by a strongly emotional style; by the practice of polemics rather than dialogue; by magical explanations (Liu, 2012).

Critical consciousness stands in contrast to both a magical and naïve state of consciousness. The critically transitive consciousness is characterised by depth in the interpretation of problems; by the substitution of causal principles for magical explanations; by the testing of one's "findings" by openness to revision; by the attempt to avoid distortion when perceiving problems and to avoid preconceived notions when analysing them; by refusing to transfer responsibility; by rejecting passive positions; by soundness of argumentation; by the practice of dialogue rather than polemics; by receptivity to the new for reasons beyond mere novelty and by the good sense not to reject the old just because it is old by accepting what is valid in both old and new. Critical transitivity is characteristic of authentically democratic regimes and corresponds to highly permeable, interrogative, restless and dialogical forms of life in contrast to silence and inaction, in contrast to the rigid, militarily authoritarian state presently prevailing in Brazil, a historical retreat which the usurpers of power try to present as a reencounter with democracy (Liu, 2012).

Freire shows the importance of conscientization. He shows clearly that conscientization originates from overcoming "false consciousness" such as "a semi-intransitive or naïve transitive state of consciousness" (Freire, 1970, p.46). Freire says that conscientization is "the process in which men and women, not as recipients, but as knowing subjects, achieve a deepening awareness both of the socio-cultural reality which shapes their lives and their capacity to transform that reality".

Freire's concepts such as humanization, dehumanization, oppression and liberation seem inadequate for confronting the specifics of the problems of oppression in the post-modern world. However, Freire emphasised on collective conscientization. Collective conscientization is based on a belief in human capacity to feel, to know, and to change the world with the goals of social justice and empowerment. The realization of the Freirean vision requires a much fuller acknowledgement of differences and conflicts of struggling against oppression in specific situations (Freire, 1972b, p.51).

3.7 Active Audience / Reception Theory

According to Maroder, Milano, Nickels and O'Donoghue (2013), active audience/reception theory is the notion that audiences do not just absorb everything they are told but are actually involved, sometimes unconsciously, in making sense of any given message as it relates to them in their own personal contexts. People may interpret a message a certain way just from their own cultural background differently from someone else with a completely different background.

These same scholars see multiple signs and symbols as they take in information throughout the day, whether they know it or not, to make interpretations. For them, all media texts are ambiguous and completely interpretable in a multitude of ways. According to Yusuf and Liman (2015) the theory emphasized how the individuality of audience affects the way in which they receive and interpret text. Stuart Hall's encoding/decoding model (1973) which explains the relationship between text and audience is the foundation of this theory. To its advantage, this model is an interactive one between the encoder and the decoder.

Undoubtedly, one of the most influential proponents of reception theory, Stuart Hall, forced researchers to shift their attention to how audiences reacted and made sense of media. “One of its central features is its focus on how various types of audience members make sense of specific forms of content” (Baran & Davis, 2011, p.243).

With the ordinary reader or media consumer getting little attention, the relationship between reader, author and text had never been studied in this way before. Hall wanted to learn more about how the various types of media had different effects on different social groups. Although it is true that there can be variation in the interpretation among viewers, Hall took a broader look and aimed his attention at how larger social groups made sense of these messages.

The study about how Rwanda Agriculture Board (RAB) communicated agricultural research results to farmers had a particular focus on farmers. It purported to understand how that communication was done focusing on the farmer’ perspective. The active audience/reception theory guided in understanding how farmers make sense of different messages that were brought to them in different formats given their particular context.

3.8 Summary

This chapter discusses the conceptual framework for this study. The conceptual framework is based on models that were used to analyse the communication encounter between RAB researchers/extensionists and farmers as well as theories that were used to understand the communication encounter and appreciate how it takes place. In order to be able to analyse and describe the communication encounter between RAB researchers/extensionists and farmers, Transmission and Transactional Models of Communication were used. While the Transmission Model of

communication helped in isolating the elements of the process of communication of agricultural research results to farmers, the Transactional Model of communication also contributed in describing the communication by putting emphasis on the context that shaped the communication encounter. In order to be able to understand, explain and appreciate the communication encounter, the Participatory Communication Approach was used. Within the Participatory Communication Approach, special focus was put on Empowerment Participation.

This participatory communication level was taken in line with Communication for Empowerment concept, which is another relatively new concept in development communication scholarship. Communication for Empowerment was used because this is a study of the communication between unequal interactants. Considering the communication encounter, RAB researchers/extensionists were considered as more powerful while farmers were considered vulnerable. The study aimed at understanding unbalanced power relations in the communication between RAB researchers/extensionists and farmers. It is worth mentioning that the Active Audience/Reception Theory also guided in trying to apprehend how farmers made sense of different agricultural messages that were brought to them.

CHAPTER FOUR

RESEARCH METHODOLOGY

4.1 Introduction

This chapter is about the methodology that was used in the study. It presents the philosophical paradigm, approach to the study, research design, research method, sampling, data generation techniques, data analysis and discussion, trustworthiness and ethical considerations.

4.2 Research Philosophical Paradigm

Creswell (2014) says that in planning a study, researchers need to think through the philosophical worldview assumptions that they bring to the study, the research design that is related to this worldview, and the specific methods or procedures of research that translate the approach into practice. Creswell (2014) uses the term worldview to mean a basic set of beliefs that guide action, research philosophical paradigms. In this study, the concept "research philosophical paradigm" was used to mean the researcher's world view, his/her conception of the reality or what is (ontology); the nature and forms of knowledge/reality (epistemology), and how the reality can be conceptualised/ apprehended - issues related to why, what, from where, when and how data - about the reality- can be generated/collected, analysed and discussed (methodology).

Scotland (2012, p. 9) posits that a paradigm consists of ontology, epistemology, methodology, and methods. This scholar considers ontology as the study of being. Ontological assumptions are concerned with what constitutes reality, what is. As Scotland (2012, p. 9) puts it epistemology is concerned with the nature and forms of knowledge. Epistemological assumptions are concerned with how knowledge can be

created, acquired and communicated, what it means to know. Scotland (2012, p. 9) explains that methodology is the strategy or plan of action which lies behind the choice and use of particular methods dealing with why, what, from where, when and how data is collected and analysed. Scotland (2012, p. 9) considers methods as the specific techniques and procedures used to generate and analyse data.

This study was rooted in *Interpretivism* as a research philosophical paradigm. This paradigm considers the viewpoints and perspectives of the researcher in the quest of scientific inquiry. Individuals and institutions are fundamentally dissimilar from the natural sciences; hence, subjectivism or subjectivity plays substantial part in this paradigm. Interpretive research predominantly points to understand the social action to figure out the cause and effect of the social phenomena/reality. Interpretivism's ontological standpoint is relativism, which presupposes that every individual has subjective construction of reality mediated by human senses, which definitely needs to be addressed by the primary investigator to get the meaning of the diverse realities of individuals. Interpretive paradigm's methodology leads to discovering and understanding social phenomena from a co-researcher's standpoints including social interactions, cultural, and historical contexts in the social world/reality (Salvador, 2016).

Interpretivism concentrates on understanding; symbolic interactionism, and hermeneutic phenomenology. Amongst the methods widely used are role-playing, focus group discussion, interviews (semi-structured, questionnaires (open-ended), and direct observations. These methods focus on hermeneutics and dialectical dialogues to create refinement of individual constructions that is explicated and analysed through hermeneutic techniques determined in the methodology of the research. The primary objective is to create unanimity/commonality constructions of scholarly and

sophisticated emergent themes that would mirror the lived experiences of the participants. Dialectic validation of results from the participants would determine the output's trustworthiness, legitimacy, and validity (Salvador, 2016).

Interpretive paradigm often compromises the autonomy and privacy of the participants in conducting the methods of getting information such as intimacy and open-endedness and might prevent the participant from opening up his or her experience because the investigator might reveal confidential information, fallacious statements, and truths. This is the reason why ethical considerations are very important when conducting this qualitative research – autonomy and confidentiality should always be considered and be given top priority. Participants may withdraw from the inquiry anytime especially if the situation becomes uncomfortable and precarious (Salvador, 2016).

This study subscribes to relativism as the ontological position and interpretive epistemology. Scotland (2012, p. 11) views relativism as the view that reality is subjective and differs from person to person. For him, without consciousness, the world is meaningless and that reality emerges when consciousness engages with objects which are already pregnant with meaning. He says that reality is individually constructed and that there are as many realities as individuals. As in the view of relativists, it was believed that knowledge about the communication of agricultural information in Rwanda was not independent of participants involved in that communication. The reality about this communication would be arrived at by considering different realities about it as perceived, lived and/or experienced by its different stakeholders.

The study is also in line with the interpretive epistemology, as a subjectivism based on real world phenomena. It agrees with Creswell (2009, p. 8) that, in social world, interpretive methodology is directed at understanding phenomenon from an individual's perspective, investigating interaction among individuals as well as the historical and cultural contexts which people inhabit. Therefore, it was in the perspective of this study that the communication between agricultural researchers and farmers at Rwanda Agricultural Board could only be apprehended by listening to the concerned stakeholders about the way this communication was practised and observing how this communication practically happened in the real setting. This communication could better be understood by looking at the communication in the light of their users and holders and their multiple and varying views than trying to independently and impersonally analyse facts with no resort to their users and holders.

4.3 Research Approach

In this study, the concept "research approach" refers to the plan and procedure for research that span the steps from broad assumptions to detailed methods of data collection, analysis, and interpretation (Creswell, 2014). This plan involves several decisions to be made. The overall decision involves which approach should be used to study a topic. This decision should be informed by the philosophical assumptions the researcher brings to the study; procedures of inquiry (research designs); and specific research methods of data collection, analysis, and interpretation. As Creswell (2014) puts it, the selection of a research approach is also based on the nature of the research problem or issue being addressed, the researchers' personal experiences, and the audiences for the study.

Creswell (2014) and Jwan and Ong'ondo (2011) advance three research approaches: qualitative approach, quantitative approach, and mixed methods approach. However, Creswell (2014) argues that the three approaches are not as discrete as they first appear. Qualitative and quantitative approaches should not be viewed as rigid, distinct categories, polar opposites, or dichotomies. Instead, they represent different ends on a continuum. A study tends to be more qualitative than quantitative or vice versa. Mixed methods research resides in the middle of this continuum because it incorporates elements of both qualitative and quantitative approaches.

This study was qualitative in nature. Jwan and Ong'ondo (2011, p.3) define qualitative research as an approach to inquiry that emphasises a naturalistic search for relativity in meaning, multiplicity of interpretations, particularity, detail and flexibility in studying a phenomenon or the aspect(s) of it that a researcher chooses to focus on at a given time. To this explanation, Creswell (2014) adds that qualitative research is an approach for exploring and understanding the meaning individuals or groups ascribe to a social or human problem. The process of research involves emerging questions and procedures, data typically collected in the participant's setting, data analysis inductively building from particulars to general themes, and the researcher making interpretations of the meaning of the data. The final written report has a flexible structure. Those who engage in this form of inquiry support a way of looking at research that honours an inductive style, a focus on individual meaning, and the importance of rendering the complexity of a situation.

In studying the communication of agricultural research results at Rwanda Agricultural Board, I looked at how this communication happens and how it is practised by concerned stakeholders, that is, agricultural researchers and agricultural extensionists,

as well as farmers, with a focus on how farmers make sense of this communication. I therefore used the qualitative approach.

4.4 Research Design

Creswell (2014) defines "research designs" as types of inquiry within qualitative, quantitative, and mixed methods approaches that provide specific direction for procedures in a research. They are strategies of inquiry. In qualitative research approach, Creswell (2014) identifies *narrative research*, a design of inquiry from the humanities in which the researcher studies the lives of individuals and asks one or more individuals to provide stories about their lives; *phenomenological research*, a design of inquiry coming from philosophy and psychology in which the researcher describes the lived experiences of individuals about a phenomenon as described by participants; *grounded theory*, a design of inquiry from sociology in which the researcher derives a general, abstract theory of a process, action, or interaction grounded in the views of participants; *ethnography*, a design of inquiry coming from anthropology and sociology in which the researcher studies the shared patterns of behaviours, language, and actions of an intact cultural group in a natural setting over a prolonged period of time; and *case studies*, a design of inquiry found in many fields, especially evaluation, in which the researcher develops an in-depth analysis of a case, often a program, event, activity, process, or one or more individuals.

This study used *narrative research* as a strategy of inquiry. The researcher tried to understand the communication of agricultural research results to farmers at RAB basing on how stakeholders: researchers, extensionists and farmers experience and/or practice it. Consideration was given, therefore, to the way these stakeholders describe and narrate stories about this communication.

4.5 Research Methods

Walliman (2011) looks at "research methods" as the tools and techniques for doing research. Creswell (2014) says that research methods involve the forms of data collection, analysis, and interpretation that researchers propose for their studies. Since the study purported to understand the communication of agricultural research results to farmers at RAB from the way it is practised by stakeholders, the researcher chose data collection tools that would allow the stakeholders in that communication to talk about it. Those were mainly Personal Interviews and Focus Group Discussions.

Data were presented and analysed using thematic analysis and in line with research questions, and this was enlightened by the Transactional Model of Communication. Interpretation of data also followed the qualitative trend, was in line with research questions, and was enlightened by the participatory communication principles.

4.5.1 Population, sample and sampling technique

This section discusses the population that was concerned in this study as well as the population that was worked with as participants during interviews. The section also explains how these participants were selected and how they were reached during field work.

Study Population and Target Population

In line with policies and directives put in place by the Government of Rwanda through the Ministry of Agriculture and Animal Resources, agricultural research in Rwanda is mainly carried out by Rwanda Agriculture Board (RAB) coordinating agricultural research institutions and higher learning institutions dealing with agriculture. Agricultural research results are then taken to farmers through what is called "Extension Services". It is also worth mentioning that although RAB

approaches farmers in its units in four agricultural zones (Northern Zone, Southern Zone, Eastern Zone, and Western Zone), its communication practices are the same in all zones. I chose to work in the Southern Zone, the widest zone and with longest experience in agricultural research since the former and unique agricultural research institute, ISAR, was headquartered in that zone.

The population of this study included agricultural researchers including agricultural extension workers (also referred to as extensionists) at the Rwanda Agriculture Board (RAB) as well as farmers.

Sampling Technique

The aim of the study being deeper understanding of the communication of agricultural research results at Rwanda Agricultural Board, the sampling technique was purposive sampling technique. This is a non-probability/ non-random sampling whereby not all members of the target population have equal chances of being selected. It is a process where the researcher uses his/her own judgment to select a group of people who know about the problem. It is called purposive sampling because it involves a particular purpose. It is also called judgmental sampling (Rahi, 2017).

In this study, the purpose for sampling was to have people with the likelihood of having information of how the communication of agricultural research results to farmers is done at Rwanda Agricultural Board. I therefore chose to work with researchers representing different programmes and extensionists. I also worked with farmers that happened to work with RAB researchers/extensionists. These farmers were selected through RAB basing on how it interacts or works with them. I ensured that male and female farmers are represented to maximise the chances of having comprehensive information.

Sample Population

The communication of agricultural research results to farmers by Rwanda Agriculture Board involved several stakeholders: researchers, extensionists, librarian, and farmers. Researchers included crop and livestock researchers who are crop specific (maize, beans, soy bean, Irish potato, sweet potato, wheat, rice, banana, cassava, horticulture, sorghum, tea, coffee, agroforestry); or livestock-specific (cattle, fish, poultry, goat); natural resource management researchers (soil laboratory, soil health, water management, meteorology), and socioeconomic researchers. These would come up with different results that were supposed to be communicated to farmers.

Extentionists (extension workers) at Rwanda Agriculture Board were categorised according to 3 main programmes: Crop Intensification Programme (CIP), Livestock Intensification Programme (LIP), and natural resource management, Land husbandry, Irrigation and Mechanisation (LIM). The librarian kept the library, which served as an information centre that benefits RAB staff, interested and capable farmers and other people in need of agriculture related information.

Farmers that worked with RAB included individual male and female farmers as well as farmer cooperatives that were working or happened to work with RAB. RAB would choose farmers to work with depending on the programmes to be implemented, for example where crops or animals to be studied are found or the requirements of funders/donors. In most cases RAB would choose to work with farmers or cooperatives that operate in places that are accessible (e.g., near the road) in order for funders/donors to be able to visit and monitor what their money was used for.

Basing on people involved in the communication of agricultural research results to farmers in RAB, Southern Zone as described above, 70 participants (20 RAB staff

and 50 farmers) were targeted in this study. On the side of RAB Southern Zone staff, I worked with 20 staff (11 crop researchers, 2 livestock researchers, 1 natural resource researcher, 1 socioeconomic researcher, 2 extensionists, 1 horticulture researcher, 1 agroforestry researcher, 1 librarian). On the side of farmers, I chose to work with 2 cooperatives comprising both men and women and 2 groups of farmers that RAB said were not in cooperatives. In each chosen cooperative, 15 farmers (both men and women) participated while in each chosen group, 10 farmers (both men and women) participated. It was realised that these cooperatives/groups practised both crop and animal husbandry because for them to get good crop yield they needed manure that they would get from domestic animals.

4.5.2 Data generation techniques

This study mainly used Personal Interviews and Focus Group Discussions.

Personal Interviews

Personal Interviews were used with RAB researchers, extensionists and librarian. They were centred on the following topics: what RAB has as agricultural research results that need to be communicated to farmers; how these agricultural research results are communicated to farmers (channels that are used); the impact that agricultural research has had on farmers; appreciation of how agricultural research is communicated; hindrances/obstacles that this communication faces, and what can be done to better the communication of agricultural research at Rwanda Agricultural Board (refer to the Interview Guide in Appendix 1). Participants freely expressed themselves on these topics under the guidance of the researcher. The researcher would ask open-ended questions and would also use follow-up questions as conversations unfolded. Participants' productions were audio-recorded.

Focus Group Discussions

Four group discussions were held with farmers in 2 farmer cooperatives and 2 groups of farmers. These included one farmers' cooperative and one farmers' group near RAB and one farmers' cooperative and one farmers' group far from RAB. The identification of these two cooperatives was done with the help of RAB. In each cooperative, 15 farmers participated, and in each group, 10 farmers participated. This was geared towards finding out what farmers get from RAB, what they expect from RAB and to what extent they meet those expectations, channels through which they get information from RAB, and what they think should be done to better their communication with RAB (refer to the Focus Group Discussion Guide in Appendix 1). This discussion was also audio-recorded.

4.5.3 Data Presentation, Analysis and Discussion

All the data that were generated were transcribed, capturing everything. Since the study was qualitative, emphasis was not put on calculating numbers basing on observational results but on taping participants' narratives and recording research related elements that were generated through interviews and discussions. Direct quotations from interviews and discussions were also used to illustrate and support the discourse about the findings. All the necessary data were reduced to appropriate summaries. They were presented using a thick description including participants' voices.

Data generation and data analysis followed a process suggested by John W. Creswell (2014). This scholar suggested that data analysis in qualitative research will proceed hand-in-hand with other parts of developing the qualitative study, namely, the data collection and the write-up of findings. He posited that while interviews are going on, for example, researchers may be analysing an interview collected earlier, writing

memos that may ultimately be included as a narrative in the final report, and organizing the structure of the final report. John W. Creswell (2014) adds that qualitative data analysis will proceed on two levels: (a) the first is the more general procedure in analysing the data and (b) the second would be the analysis steps embedded within specific qualitative designs. He says, for example, that narrative research employs restorying the participants' stories using structural devices, such as plot, setting, activities, climax, and denouement.

Creswell (2014) suggests general steps that can be followed in qualitative data analysis which are (1) organizing and preparing the data for analysis – involving transcribing interviews, (2) reading or looking at all the data to get a general sense of the information and an opportunity to reflect on its overall meaning, (3) coding all the data, organizing the data by bracketing chunks (or text or image segments) and writing a word representing a category in the margins, (4) using the coding process to generate a description of the setting or people as well as categories or themes for analysis, (5) advancing how the description and themes will be represented in the qualitative narrative, and (6) making an interpretation in qualitative research of the findings or results - asking, "What were the lessons learned?"

On the coding step, Cresswell (2014) highlights 3 scenarios such as (a) where the researcher develops codes only on the basis of the emerging information collected from participants, (b) where the researcher uses predetermined codes and then fits the data to them, and (c) where the researcher uses some combination of emerging and predetermined codes. Given the nature of data needed to answer the research questions for this study a combination of emerging and predetermined codes was used. The study was about a description of the communication of agricultural research results to farmers as well as how farmers made sense of that communication, and

communication models used to describe the communication process (as discussed in the conceptual framework) gave elements of the communication process that formed the basis for predetermined codes which also got combined with codes that emerged during interviews and discussions to come up with themes on which the narrative of the findings was built.

The themes that were arrived at included relational context that shaped the encounter between RAB staff and farmers, agricultural research results that needed to be taken to farmers, channels that were used to communicate these research results to farmers, how target farmers were selected, how farmers reacted to RAB messages, impact that RAB messages had on farmers, and suggestions on what could be done to better the communication of agricultural research results. This culminated into a narrative report giving an account of what was captured in the field. This report was also shared with key participants to crosscheck its veracity (member checking).

The discussion and interpretation of findings also followed the process suggested by Creswell (2014). This scholar said that by asking, "What were the lessons learned?", the researcher can capture the essence of interpretation of findings. As he puts it, these lessons could be the researcher's personal interpretation, couched in the understanding that the inquirer brings to the study from a personal culture, history, and experiences. It could also be a meaning derived from a comparison of the findings with information gleaned from the literature or theories. In this way, authors suggest that the findings confirm past information or diverge from it. It can also suggest new questions that need to be asked—questions raised by the data and analysis that the inquirer had not foreseen earlier in the study.

In line with Creswell's suggestions, discussion and interpretation in this study were done by putting together lessons learnt from the study. This was done by trying to get meaning out of the organised data. Meaning was generated putting the data into context. Language and linguistic devices were scrutinised in order to get the real meaning of the data. While making sense of the meaning of the research data, I also referred to my own experience in the communication of agricultural research results in Rwanda and to the relevant literature and theory. This was done in a reflexive, iterative but systematic manner paying attention to the situation and circumstances and the context that agricultural researchers and farmers operate in in Rwanda.

4.6 Trustworthiness

In this study, I used trustworthiness to mean what Jwan and Ong'ondo (2011, p.13) defined as the extent to which the research is truthful, careful and rigorous enough to qualify to make claims that it does. To maximize the chances of achieving trustworthiness in this study I focused on the key factors that were suggested by Jwan and Ong'ondo (2011, p.13) which are: Credibility, Transferability, Dependability, and Confirmability.

4.6.1 Credibility

Credibility, which basically refers to the truthfulness of the data (Jwan & Ong'ondo (2011), can be built by prolonged engagement, persistent observation, use of triangulation techniques, peer debriefing, negative case analysis, referential adequacy, and member checks (Seale, 2000). During this study, data were generated over a period of 10 months. This was due to the fact that the researcher needed to be permitted by the Director General in Rwanda Agriculture Board to approach the researchers and other staff. Researchers at RAB also had varied availability periods.

The longer period was also necessitated by the fact that not all farmers had worked with RAB and it had proven to be not beneficial to land on farmers who knew nothing about RAB. There was therefore a need to get the help from RAB to identify the farmers that had worked with RAB. Now, once identified, farmers needed to first be approached and explained about the research that the researcher was conducting in order to get their consent. Some farmers were met in their farms.

The researcher also made sure that he gives his personal attention to each participant, be it in personal interviews or Focus Group Discussions. It was also realised that one data generation technique would not be convenient for all the participants in the study. For example, it was realised that farmers were not comfortable in expressing themselves when approached individually. However, farmers would express themselves in groups. Here, they would complete one another and produce good and lengthy narratives about their encounters with Rwanda Agriculture Board. It was also realised that researchers and extensionists were not comfortable to express themselves in groups. Some were more reserved when addressed together with others. The researcher therefore decided to conduct personal interviews with researchers and other RAB staff and conduct Focus Group Discussions with farmers.

It is also worth mentioning that the researcher interacted with his fellow colleagues and researchers to ensure that he comes up with good data generation instruments and follows the right process in generating data. The researcher would also consistently confirm with participants what their responses were (member checking or respondent validation). Even after putting together the narrative summarising the findings, the researcher went back to the participants to confirm with them that their narratives were properly summarised.

While triangulation consisted in ensuring all the sources likely to have required data are involved in the study (researchers, extensionists, librarian, and farmers), peer debriefing was ensured by allowing colleagues to look at the research and provide comments which were also considered. Negative case analysis consisted in analysing unexpected findings to provide more understanding. For example, contrary to what the researcher expected, farmers near RAB had not worked with RAB staff. This was due to the criteria that RAB used to select farmers to work with. Referential adequacy was ensured by keeping one transcript of a raw interview with a RAB researcher and one transcript of a raw discussion with farmers to allow the researcher and critics to access it later for the purpose of testing the analysis.

4.6.2 Transferability

Transferability is defined as the extent to which the research findings maybe generalised to other cases or contexts and it can be achieved by providing thick description of the situation studied (O'Donoghue, 2007). The sampling that was adopted allowed to get participants who had knowledge on the topic of the study. This allowed thick description of the phenomenon and provision of in-depth details of the topic. Much as the research was not primarily for generalization, the fact that all categories of participants that had relevant information were represented in the sample allowed certain levels of generalization of the findings, for example to other agricultural zones of RAB. In addition, theoretical/analytic generalisation as well as naturalistic generalization that are basically the main trait of qualitative studies were guaranteed.

4.6.3 Dependability

Dependability refers to the criterion of rigour related to the consistency of findings (O'Donoghue, 2007). It is about having a research procedure which is clear enough to

enable other researchers to replicate the study to see whether they can get similar results. It can be achieved by dependability auditing and thick description, (Seale, 2000). To ensure dependability, I maintained an audit of the entire process of data generation and consistency throughout the entire thesis. I also clearly and thickly described the entire research process so that anyone who might want to replicate the study is able to follow the same process.

4.6.4 Confirmability

Confirmability refers to the extent to which the data and interpretations of the study are grounded in events rather than the inquirer's personal constructions (O'Donghue, 2007). It can also be achieved by confirmability auditing and thick description. Though I did not keep a distance from the research process, as my intervention also mattered in qualitative research data generation, I ensured confirmability by trying to make sure that my influence does not significantly affect the results. I also made sure that the whole process of research is clearly and thickly described.

4.7 Ethical Considerations

In this study, it was considered paramount to protect the research participants; develop trust with them, and promote the integrity of research. Preliminary encounter with participants indicated that they needed to be guaranteed of their confidentiality. Participants also expressed the need of a clear explanation of what their productions would be used for.

4.7.1 Informed consent

At the beginning, I approached the participants and talked to them about the study and my wish to work with them. I explained to them the aims and methods of the study. I informed them of their right to abstain from participation in the research and their

right to terminate at any time their participation if they wished to. Given the nature of the research and the data needed, it was realised that the undertaking was not very sensitive. Therefore, since the undertaking was not sensitive and participants did not want their names to appear anywhere, participants' verbal consent to participate in the study was judged to be enough.

4.7.2 Confidentiality

Participants said that they did not want their names to appear anywhere. They were guaranteed that the researcher would only use their ideas and that he would not use their names. They were explained that where the source of the idea would be needed the researcher would be using pseudonyms or codes but not identifiable names. I explained that the research only aimed at understanding how agricultural research results are communicated. I also clarified that the study had only academic reasons and that it did not have any political or administrative motives. I communicated the results of the study to the participants through meetings with them during member checking and I also got their comments.

4.8 Summary

This chapter presents the methodology that was used in the study. This study subscribes to the interpretive paradigm and used interpretive methods. It is qualitative in nature and adopted narrative research as a strategy of inquiry. The study worked with a purposive sample of RAB researchers and extentionists as well as purposively selected farmers. Data were mainly generated using interviews and focus group discussions. Interviews were conducted with selected RAB staff while focus group discussions were held with selected farmers. Interview and discussion guides contained open questions in line with the research objective and research questions.

This chapter also explains that the researcher thoroughly described the entire process of the study in order to facilitate other researchers who might want to replicate the study. It also explains that to get participants' consent, the researcher guaranteed participants confidentiality and explained to them everything to do with the study, the fact that the study had no political or administrative motives, and the right of participants to terminate participation at any time they wanted to.

CHAPTER FIVE

PRESENTATION OF FINDINGS

5.1 Introduction

This chapter presents the findings of the study. The findings were derived from the data that were generated by interacting with researchers, extensionists and the librarian at the Rwanda Agriculture Board as well as farmers who work or worked with this research institution in the Southern Zone. Data from researchers, extensionists and the librarian were generated through interviews whereas findings from farmers were generated in Focus Group Discussions. Although researchers and extensionists at Rwanda Agriculture Board participated in providing a picture of how agricultural research was carried out and communicated as well as what farmers and researchers thought about it, the voice of the farmers was focused on to get their views on the established way of communicating research results to them and how it suited their wants and wishes.

Data were generated and analysed following the process suggested by Creswell (2014). After organising and getting familiar with the data, coding was done by combining the predetermined codes that resulted from the research questions and the models of communication that were used to describe the communication of agricultural results at RAB and the codes that emerged from the interviews and discussions. Out of these codes, a number of themes were identified.

The findings of the study are presented according to the research questions which were:

1. How does Rwanda Agriculture Board communicate agricultural research results to farmers?

2. How do farmers working with Rwanda Agriculture Board (RAB) make sense of RAB communication initiatives relating to research findings?

3. What can Rwanda Agriculture Board do to better the communication of research findings to farmers?

5.2 Description of the Process of Communication of Agricultural Research Results to Farmers by Rwanda Agriculture Board

This section presents findings in line with the data collected from participants in the study in response to the first and main research question: *How does Rwanda Agriculture Board communicate agricultural research results to farmers?* To understand how the communication encounter between RAB and farmers took place, the researcher allowed stakeholders/participants to describe how agricultural research results from RAB were communicated to them. The descriptions by these participants were guided and arranged basing on the elements of the process of communication depicted by the transmission model of communication, supplemented by the transactional model of communication. The main elements that were considered in the description included transactants or communicators, transactions, the messages or realities of transactions, the environment and relational context that shaped the transactions between RAB and farmers, sources of messages, and channels used to convey or share messages.

Generally, it was realised that RAB staff would originate agricultural, farming-related pieces of information – "instructions" that were supposed to be taken to and accepted by farmers through mainly mass media and limited face-to-face initiatives. This top-down transmission of instructions from RAB to farmers would take place in a socioeconomic, cultural and historical context that equipped farmers with certain

values, traditions and practices. These farmers' values, traditions and practices were considered by RAB staff as backward mind-set that farmers needed to abandon or change in order accommodate modern practices. In most cases, the fact that RAB staff considered farmers backward would prevent farmers from getting and up-taking messages. The following is a look at the main elements of the communication between RAB and farmers together with their communicational characteristics.

5.2.1 Describing the transactants, communicators or stakeholders in the communication encounter between RAB and farmers

While talking about how agricultural research results are communicated to farmers, researchers and extension workers at RAB mentioned more than one scenario. They said that research findings were either directly brought to farmers by researchers, especially for farmers that participated in certain trials, or indirectly through the Ministry of Agriculture and its collaborators like the Centre for Agricultural Information and Communication (CICA), RAB extensionists, local leaders or media. On the same question, farmers said that whatever they would get from RAB (that they still called ISAR) would come in form of instructions about farming practice from RAB or MINAGRI. As farmers indicated, these instructions were brought to them by RAB agents, Sector Agronomists, local authorities or Farmer Cooperative leaders. Farmers also indicated that there were instances where those instructions were published in media in order for some farmers, capable of accessing and using media to get them. The following was extracted from farmers' narrative during a focus group discussion:

> *[…….] yes, we always have instructions about farming. These come from ISAR or Ministry of Agriculture. They are brought to us by ISAR agents, Sector Agronomists, local authorities or our leaders in cooperatives. We sometimes hear that there are instructions that people got from radios, TVs or newspapers. [……] there are a few*

> *people who went to school who can read newspapers. [……] there are also a few people who have radios and TVs. We get to know different things* (Focus Group Discussion with farmers in Musasu, August 11, 2015).

According to RAB staff and farmers that participated in the study, the transactants/communicators/stakeholders in the encounter between RAB and farmers were various. They included The Ministry of Agriculture; Centre for Agricultural Information and Communication (CICA); RAB staff (researchers; RAB extensionists or extension workers, librarian); sector agronomists; local leaders; farmer cooperative leaders; selected farmers. However, for the purposes of this study, only stakeholders within the scope of the study participated in the field interviews/discussions. Since the study concerned the Rwanda Agriculture Board (RAB) and the farmers they worked with in the Southern Agricultural Zone, interactants/communicators that were involved in the study were RAB researchers, RAB extensionists (extension workers), RAB library (librarian) and selected farmers. The following is a description of these interactants/communicators as was extracted from their own narrations.

Researchers at Rwanda Agriculture Board and their Research

As they described their activities in the study, researchers at Rwanda Agriculture Board worked in different departments such as Crop Production & Food Security; Animal Resources and Land Husbandry, Irrigation & Mechanization. Within their departments, these researchers worked in different programmes which were crop and animal specific.

As these researchers explained, prior to July 2010, the Rwanda Agricultural Research Institute (ISAR) was mandated with conducting scientific and technical development of agricultural and animal resources in Rwanda to improve the livelihoods of low-income farmers. The Institute carried out research and promoted technologies in crop

production, livestock, forestry, agroforestry, post-harvest management, land conservation and water management. With the formation of the Rwanda Agriculture Board (after 2010), research was meant to continue to be implemented in these areas but with stronger synergies between research and extension to ensure that developed technologies were disseminated to the end users, farmers.

As RAB staff explained, researchers at RAB included crop researchers and livestock researchers. Crop researchers conducted their research through commodity programmes, covering the key food and cash crops grown in Rwanda. They worked in line with the country's Crop Intensification Programme (CIP) and aimed at developing improved varieties for different crops including beans, rice, wheat, maize, cassava, bananas, Irish potatoes, and sweet potatoes. They would produce resistant and adaptable seeds together with related farming practices. They would avail the seeds and compile reports and protocols comprising what they researched on and hand them over to the Ministry of agriculture, seed multipliers or extensionists who would also take them to farmers.

With regard to livestock researchers, these dealt with constraints to livestock production in Rwanda such as low producing breeds; limited land for quality feed production; limited capacity for rational utilization of crop residues and agro-industrial by-products; and limited capacity of poor farmers to access cost effective disease control practices. These would also produce quality animals together with related rearing practices. They would avail the animals and compile reports and protocols comprising what they researched on and hand them over to the Ministry of agriculture or extensionists who would in turn take them to farmers.

Extensionists at Rwanda Agriculture Board

According to the narratives of RAB staff, extensionists at Rwanda Agriculture Board included mainly the former staff of the former extension agencies, Rwanda Animal Resources Development Authority (RARDA) for animals, and the Rwanda Agricultural Development Authority (RADA) for crops. As extensionists at RAB explained, RADA extensionists were charged to support the improvement of soil fertility, the utilization of quality seeds, and the improvement of farming practices among other actions that were undertaken for food self-sufficiency. They were supposed to supply farmers with appropriate technologies in order to increase their production; to coordinate activities of farmers and other agricultural stakeholders, and to reinforce the farmers' technical capacity enabling them to be the pillar of their own development. They ensured the management of fertilizers imported by the Ministry of Agriculture and Animal Resources from foreign countries and the distribution of fertilisers by private retailers, farmers' associations or by districts.

Extensionists from RARDA had the same mission as those from RADA but they operated in the animal resources' sector. They were charged with providing improved technology and extension services to farmers and other individuals dealing with products of animal origin in order to help them modernise their operations so as to increase the marketing of products and raise their incomes. They would combat, monitor and control animal diseases and put in place measures to ensure diagnosis and treatment of animal diseases including those that are transmitted to man, and coordinate activities of professionals involved in farming activities and other partners dealing with products of animal origin. Extensionists were also charged with training farmers so that they would be able to play a more significant role in their profession and in the national development.

Concerning what was expected from extensionists in RAB, RAB staff said that after RADA and RARDA extensionists were grouped with ISAR researchers in one institution, RAB, the institution did not better reach and involve farmers as the Government had expected. Both RAB researchers and extensionists said that the Government of Rwanda was expecting the creation of RAB to remove the historical legacy that had created artificial gaps between research and extension, to strengthen the linkage with policy, and to establish efficiency in service delivery through institutional integration in the agricultural sector for improved livelihoods of the Rwandan people. As these RAB staff explained, this expectation was premised on physical proximity under one administrative structure, using a common standard operating procedure, which was expected to remove institutional boundaries by improving communication, mutual understanding and consensus building between extension, research and policy. However, as RAB extensionists said, after the creation of RAB, the communication function was confused with extension and it was assumed that the extensonists would also do everything to do with communication. The concept "extension" was kept and the most pronounced activities of extensionists continued to be transporting seeds, fertilisers, animals, medicine, among others, to farmers in different districts but participation, involvement and empowerment of farmers were not given ample consideration.

Farmers

The farmers that Rwanda Agriculture Board researchers and extensionists worked with that also participated in the study were mainly subsistence farmers. According to the narratives of RAB staff and farmers, these farmers lived on their small farms on which almost all their lives depended. Their farms were small agricultural production grounds that also sheltered all their animals and were entirely or partly used for

agricultural production. They were each composed of a compound with a main house and sometimes a small garden and a shed for some animals. Around the enclosure, there were, sometimes, a plantation of crops such as banana, beans, and vegetables. As farmers indicated, these grounds were periodically fertilized using the residues of kitchens or harvest and animal manure.

Most farmers that worked with Rwanda Agriculture Board researchers had small plots of land (on average 0.10 ha). Their harvest was not even enough for their food needs. There were several criteria that RAB researchers would base on to select farmers to work with. According to what RAB researchers stated during oral interviews, the criteria that researchers based on to select farmers they would work with included being in an area where the crop or animal being researched on was farmed; being in a place that was easy to reach; having a plot of land that could be used for trials and another one that could be used for usual practices; being a model farmer, and being willing to cooperate in the exercise.

As researchers at RAB indicated, not all crops or animals were farmed in all places in Rwanda. There were places where some crops or some animals were predominant whereas they were rare in other places. Researchers gave examples of Irish potatoes that were more frequent in the Northern agricultural zone and maize that was more frequent in the Southern agricultural zone. They also said that there were more cattle in Eastern and Southern provinces than in other provinces. They therefore said that while selecting farmers to work with, they would consider farmers from areas where crops or animals to be researched on were found.

Researchers indicated that they would only carry out their research activities in places that were accessible. Their funders and sponsors needed to always see how their funds

were utilised. They would therefore choose places that funders and sponsors would reach so that whenever they felt like visiting their activities, they could reach there and see what RAB researchers did with the funds they were given. So, places without roads stood less chances of hosting research activities. Again, in line with access, RAB researchers also indicated that when choosing a farmer or farmers to work with, they would also choose a place that other farmers could easily reach so that they could also come and see what was being done and therefore learn from the practice. Researchers said that they would choose farmers from places that would be easily accessed by funders and places that would serve as a learning environment for other farmers.

RAB researchers and extensionists also indicated that whenever they would want to do some trials, they would require farmers to farm RAB's varieties but also keep their traditional varieties apart so that they could be able to witness the differences. Since most farmers in Rwanda farmed for subsistence, they always needed to have at least some food crops for their subsistence. In this regard, farmers who could not have the trial piece of land and the piece of land to keep for their traditional varieties, would not find it helpful to allow researchers to use their plots of land. Researchers were, therefore, working with farmers with relatively large plots of land.

Researchers said that they would sometimes organise competitions to see farmers who were ahead of others in abiding by instructions from the Ministry of Agriculture and Rwanda Agriculture Board, for example, in taking care of their farms and plots of land; using modern farming techniques as per MINAGRI and RAB guidance and getting good harvest. These were therefore identified as model farmers and were most of the time resorted to when researchers wanted to work with farmers. Researchers

said that these farmers were chosen because they had the capacity to follow instructions that would be given by researchers and come up with good results.

Researchers and extensionists at Rwanda Agriculture Board also indicated that even if all the criteria or conditions mentioned above were fulfilled, a farmer would not be forced to work with RAB researchers and extensionists. A farmer needed to willingly accept to cooperate with RAB researchers and extensionists. As these RAB staff clarified, in order to get farmers to accept to cooperate, RAB staff would explain to them what they were required to do and what their benefits were. For example, the farmers whose plots were used while testing a seed variety would get that variety immediately after the test while other farmers would get the variety much later after the variety was handed to the Ministry of Agriculture and Animal Resources and seed multipliers, multiplied and was officially distributed to farmers in different places. RAB researchers and extensionists said that once they had tested the variety in farmers' plots and given it a local name, they would write a report describing the entire process of how the variety was arrived at and how it was tested. The report would therefore be sent to the Ministry of Agriculture which was mandated to multiply and distribute the variety using other affiliated institutions. This time, farmers who had not participated in the trials could also get the tested varieties.

The stakeholders in the communication between RAB and farmers that were concerned in this study were researchers and extensionists on one side and farmers on the other side of the communication. Researchers included crop and animal researchers in different programmes that were conducting research on topics they thought were important to farmers. Extensionists included extension agents from RADA and RARDA that were added to the researchers from ISAR. They were charged with reaching farmers with agricultural research knowledge and innovations.

Farmers included a few farmers in rural settings that were selected by RAB basing on a number of criteria.

5.2.2 The transactional nature of relationship between farmers and RAB staff in the communication of research results

After comparing the views of farmers and the views of other stakeholders on the issue of '*relationship between farmers and RAB staff*' in the communication of agricultural research results to farmers', it was realised that while farmers thought that they should be involved in the entire process and be allowed to actively participate and contribute ideas, RAB staff believed that only RAB staff should initiate the communication and that farmers should be faithful receivers of development messages.

RAB staff's views on the relationship between farmers and RAB staff in the communication of research results

During the study, Rwanda Agriculture Board (RAB), Southern Zone did not have a clear communication department, though all RAB staff that were contacted said that there should be a fully-fledged department in charge of effectively communicating the results to farmers and other parties. Researchers said that generally, information about agricultural research results would originate from researchers and would reach farmers via extensionists. They also said that they would sometimes reach farmers directly, especially when they used their plots of land for trials. They said that farmers would not initiate this communication. One of the researchers at Rwanda Agriculture Board expressed the following:

> *I think in our case, extensionists should be the ones taking the lead in communicating the research results. Normally, the practice is that researchers communicate to extensionists, who also need to reach farmers with the research results. However, since we also need to address the media, we should have another department that is in*

> *charge of regularly talking to media people and using them whenever there is something we want to communicate to our stakeholders. Er…, the practice here is that, in a sense, each staff member plays a role in communicating research results. Extensionists meet farmers, especially while distributing seeds and explaining to communities what they have to do to get good produce. Researchers also meet farmers, especially while testing the results of their studies in farmers' pieces of land* (Interview with a Researcher at RAB, Rubona, on February 11, 2016).

Farmers' views on the relationship between farmers and RAB staff in the communication of research results

According to farmers, all stakeholders (RAB staff and farmers) should take part in communicating agricultural research results. For them, either RAB staff or farmers could initiate the communication and there should be transaction or mutual exchange between RAB staff and farmers. Although farmers also said that RAB should have a department in charge of communication and accessible to all people who need agricultural information, they all suggested that all categories of RAB staff (researchers, extensionists, etc.) should take part in communicating agricultural research results. They said that anybody who worked at Rwanda Agriculture Board should answer at least basic questions that farmers might have. Farmers said that they were not happy with being told to wait for experts in charge (researchers) who would take long to come. Many farmers shared the following views in a Focus Group Discussion in Muhanga District:

> *[……..] We rarely meet these researchers. We only see them during a few occasions such as planned meetings, testing of their research results, announcing cultural seasons, seed distribution, and informal encounter when they are walking around or do some visits, etc. We always have questions and we want to benefit from any encounter with these researchers. We always feel uncomfortable when we ask a question to a RAB staff member and we are told that he/she is not the right person to be asked the question. We are often told to wait for experts [researchers] in charge who might end up not coming at all. We think that anybody working at ISAR should be actively participating in communicating agricultural research results at least to a certain extent. In most cases we lack basic information that we*

> *think anybody working there should be able to provide* (A farmer in a Focus Group Discussion with Farmers in Muhanga, on January 11, 2016).

Farmers also emphasised that they also had some knowledge that was almost always ignored. They expressed that they felt that they should be taking part in the discourses about agricultural research and agricultural research results. They said that they should be participating in all stages of research, including the planning stage. The following was recorded during a Focus Group Discussion in Muhanga District:

> *[……] Most of us did not go to school. We cannot claim to have carried out research but we have been living on agriculture for a very long time. We know what has been sustaining us. We know what crops can grow in certain places and in what seasons, at least to a certain extent. However, our voices are almost never heard. We have been planting maize where it does not grow on the orders of our leaders and in spite of ourselves, and we have been harvesting almost nothing. Some families have been living on sweet potatoes but these days they are not allowed to plant them. If we had been part of all the discourses, some famines would have been prevented* (A 75-year old male farmer in a Focus Group Discussion with Farmers in Muhanga, on January 11, 2016).

There were also some farmers who said that they were not much concerned with what was happening inside ISAR (now RAB). These said that they were not preoccupied by who should start the communication of agricultural research results at RAB. They said that what mattered for them was having people from ISAR (RAB) that they could meet physically and ask their questions with the hope of being understood and being given the right answers. The following was mentioned by one farmer at Rwabuye rice paddy, Huye District (a few other farmers were nodding, as he expressed himself, to show that they agreed with him):

> *I am not very much concerned with who should actually communicate agricultural research results to farmers at ISAR. What I wish, and I think that this is also what others wish, is to have people near us. We want people who have time for us. We want people who can come to us and demonstrate what is supposed to be done, when we can see instead of telling us to rely on technology and media which are not even accessible and beneficial to all of us. We want people we can ask questions and they can give answers. We*

> *want people who, when we fail to get words to express what our issues are, can read our gestures or even see them in our plots of land* (Focus Group Discussion with farmers at Rwabuye, on January 9, 2016).

RAB staff's and farmers' narratives indicated that there were no transaction or mutual exchange in the communication of agricultural research results to farmers. Everything would come from RAB staff through different types of mediation and farmers were only receivers. Apart from products such as seeds and animals that they would receive, all the messages were instructing farmers what to do or not to do and they would not contribute ideas. Farmers said that instead of mediated communication, they needed people who would come to them, give them time, listen to them, and answer their questions.

5.2.3 What RAB researchers and extensionists communicate to farmers

Messages that RAB has to be communicated to farmers

Researchers and extensionists at RAB said that it was not easy to express everything that farmers needed from them. Researchers said that they had a lot of things that could benefit farmers, although, as they added, these could not meet all the farmers' needs. They mentioned chemical and organic fertilizers; improved varieties of seeds and seedlings; animal feeds; plant protection chemicals; agricultural technologies and different modern farming techniques; post-harvest techniques; agricultural machinery and equipment; measures to fight problems such as pest hazards, weed control, moisture insufficiency, soil fertility, and soil erosion; knowledge about the environment farmers operated in; climate issues that could influence their practices; features and problems of soil and how to deal with them; quality seeds and animals; upgrading traditional/indigenous seeds and animals; soil protection; plant and animal

diseases and how to control and cure them; as well as agricultural market and marketing.

One extensionist mentioned the following:

> *[……] Er, it is not easy for me to relate to you all that RAB has that needs to be taken to farmers. You know farmers need everything to do with their farming career. They need products like seeds, seedlings, farm animals and all information related to how they are dealt with till harvest or production as well as the utilisation of the harvest and products in farmers' development and well-being [….]* (Personal Interview with an Extensionist at RAB, August 11, 2015).

Researchers and extensionists at the Rwanda Agriculture Board added that to succeed in their farming practices, farmers needed more than agricultural inputs. They said that farmers needed more knowledge about the environment they operated in; climate issues that could influence their practices; features and problems of their soil and how to deal with them; quality seeds and animals as well as how to upgrade their indigenous seeds and animals; modern farming methods and practices, soil protection, as well as diseases and how to control and cure them.

According to researchers and extensionists, if farmers were to fully benefit from their career, they needed to have enough knowledge about post-harvest practices and value addition. They needed to have knowledge about agricultural market and marketing so that they could be able to add value to their products and sell them to the appropriate price so that they could realise good profit. Although these researchers and extensionists said that they were not providing all that farmers needed since they would concentrate on agricultural inputs, they made it clear that farmers needed to be accompanied in all their farming practices from acquiring farming –related information, and planting up to harvesting, transforming their production to add more value to it and selling it to the buyers and making profit, as well as properly using the profit made so that they could keep making progress.

In the farmers' views, apart from seeds, seedlings and animals, all the messages they got from Rwanda Agriculture Board were put under what they qualified as "instructions". While talking about what they would get from RAB researchers and extensionists, farmers said that they would basically get seeds and seedlings from these staff and they were thankful for that. They also mentioned that some people would even get some domestic animals from the institution. Farmers said that they would sometimes get seeds from people whose plots were used in tests by RAB researchers or they would sometimes buy from RAB. However, with regard to farming-related knowledge and practices, farmers said that they did not feel that they were assisted appropriately. They said that they would get to know the practices after getting a chance to follow what researchers and extensionists did while testing their results in farmers' plots. They also said that they would also get messages from RAB through extensionists, sector agronomists and local leaders instructing them what they were supposed to do.

However, farmers said that they would also learn from other projects or programmes (which were not RAB initiatives) such as *TUBURA* and *NKUNGANIRE*. *TUBURA*, literally meaning "multiply", is a name given to One Acre Fund, an agricultural NGO operating in Rwanda, Kenya, Tanzania and Burundi that is innovating ways of helping farming families to achieve their full potential, while *NKUNGANIRE*, literally meaning "let me support you" is an agriculture subsidy scheme, whereby the Ministry of Agriculture in Rwanda sponsors farmers who grow priority crops in the planting season and help them acquire fertilisers at lower prices whereby they pay between 15 and 25 per cent of the cost. Farmers also said that they would also learn from the Sector agronomists in the existing administrative structures, though, as they said,

these were also rare occasions. The following was recorded during a focus group discussion with farmers in Nyamugari:

> *We are very grateful for instructions that ISAR people give us. Those instructions come with several important things. We get some seeds, seedlings and animals for a few of us who are able to purchase them. We are also grateful that they sometimes sell fertilisers and pest and disease control drugs. We also thank them for information they give us about different issues such as farming techniques, soil preparation, crop and animal follow-up and protection, value adding to harvest and production […….] I think that those who live near RAB can easily emulate what they see in RAB farms. I also see what is there when I am in the road. It is so beautiful to see. However, I feel that we need more than they provide because they, most of the time, bring instructions which do not take into consideration the uniqueness of some of our places* (Focus Group Discussion with Farmers in Nyamugari, February 14, 2016).

Participants in the study indicated that messages that RAB had and that were supposed to be communicated to farmers included seeds, seedling, animal varieties, fertilisers, pesticides, knowledge and information about soil and weather, planting, disease control, post-harvesting, and marketing. Apart from inputs or products that farmers got from RAB, all messages that farmers would get from RAB were qualified as instructions.

Sources of research topics that generate messages to be communicated to farmers

According to RAB researchers, the research carried out by Rwanda Agriculture Board was in line with the government vision and policies. The topics for research were mainly derived from the government policies and vision. Asked about where they would get topics for research, one researcher at RAB stated the following and many other researchers confirmed the same thing:

> *[…….] You know that RAB is a government institution. Can we go against government policies? No way. Actually, our mandate is to support the government and assist in the realisation of policies put in*

> *place and the implementation of the vision set. We are under the Ministry of Agriculture and Animal Resources and we work under their guidance and instructions* (Personal Interview with RAB Researcher, January 14, 2016).

The researchers also indicated that research topics would sometimes be derived from their own observations, research or information gathered by extensionists. Here, researchers would base their research on what they thought was needed or what they thought was important either for farmers, policy makers or other beneficiaries of RAB activities. They would then carry out the study, test the results and communicate the results to the beneficiaries as appropriate. A researcher expressed himself in the following words:

> *[……] Well, besides being government employees, we are also researchers. We even get promoted considering our research and publications. We therefore sometimes have ideas of what is happening and what should happen. We interact with extensionists and couple their ideas with what we know, what we read about or what we researched on. Here, we sometimes get to know what is urgent or important for our beneficiaries and carry out studies based on what we think is necessary. We then get the results, test them and communicate them to the appropriate beneficiaries. We actually send our findings to MINAGRI which will at its turn ensure that the results are communicated to all the needy beneficiaries, mainly farmers* (Personal Interview with RAB Researcher, December 18, 2015).

Researchers also mentioned that although it would be on rare occasions, researchers would sometimes take into considerations farmers' grievances, especially when there were serious problems that needed to be handled such as crop or animal diseases. They, however, said that such farmers' complaints and grievances were rarely taken into consideration. They said that this was because most farmers had limited understanding of most of the issues they faced in their sector. Some researchers also said that one of the reasons why farmers' ideas were sometimes ignored was that most farmers would act out of ignorance and would tend to dwell on traditional practices, even when there were no good reasons. Talking about how ideas and

complaints from farmers could also be considered when thinking about topics for research, most researchers agreed with the following researcher who expressed himself as follows:

> *[…….] It happens that we hear complaints from farmers over and over again. Sometimes we try to get to the roots of the matter and check whether the complaints are well-founded and we decide on what needs to be done. Of course, you cannot consider everything that farmers say. Most of them act out of ignorance and dwell on futilities inherited from their ancestors. Farmers always think that whatever their ancestors practiced cannot be reversed [changed]. You know research requires more than most farmers can afford. I think it might not always help to go by their thoughts* (Personal Interview with RAB Researcher, December 15, 2015).

While talking about the source of research topics and their role in originating research topics, farmers said that what they knew was that ISAR had researchers who would do research on crops and domestic animals. Farmers said that these researchers would carry out research on topics of their choice and test the results with farmers of their choice, whom they called "lucky farmers". They said that they did not play any role in originating research topics. Farmers associated what RAB extensionists would take to farmers with government instructions. They said that RAB research results that would be taken to them were in line with the government instructions. These would pass as policies that were supposed to be implemented. As farmers indicated, even when they were not comfortable with them or had other ideas that they thought should be taken into consideration, they would just keep quiet and abide by whatever was taken to them.

Farmers said that the only occasion when their voice was heard was when they had terrible Cassava Mosaic Disease in cassava plantations. They said that this is when farmers made a lot of noise to local leaders requesting help from researchers. They were told that researchers were handling the problem, though, as they indicated, they

were yet to get the answer at the time of the study. One of the farmers in Rusatira made the following statement:

> *[…….] We are too inferior to propose what needs be done. When you are uneducated, people will always underestimate your ideas. I might be having some ideas but who am I to challenge what the government thinks? However, as old as I am, and having lived here for more than fifty years, I know for example that you cannot plant rice or maize here [talking about the place. I know when to plant potatoes and beans, etc. I know which crops can sustain a family here and which ones need to be associated with others. However, you will come here with your own ideas and impose certain practices on me. If you feel that you do not need my thoughts, I will simply do as you want. I might even end up harvesting nothing* (Focus Group Discussion with Farmers in Rusatira, November 12, 2015).

RAB staff and farmers indicated that the research topics that would produce the findings that were supposed to be communicated to farmers would come from government policies or researchers' own observations and research. Farmers would never originate research topics.

5.2.4 The context that shaped the communication encounter with farmers at the Rwanda Agriculture Board

The transactional model of communication emphasises the environment and relational context as a determining factor in communication. In this study, the context was used to mean the circumstances surrounding a message. The context affects every interaction and influence what you say, how you say it, and how you respond to what others say. DeVito (2012, pp. 8-9) observed that all communication takes place in a context that has at least four dimensions: physical, social-psychological, temporal, and cultural. He explained those dimensions as follows:

> *The physical context* is the tangible or concrete environment in which communication takes place—the room or hallway or park, for example. This

physical context exerts some influence on the content of your messages (what you say) as well as on the form (how you say it).

The social–psychological context includes, for example, the status relationships among the participants, the roles and the games that people play, and the cultural rules of the society in which people are communicating. It also includes the friendliness or unfriendliness, formality or informality, and seriousness or humorousness of the situation. For example, communication that would be permitted at a graduation party might not be considered appropriate at a funeral.

The temporal (or time) context includes the time of day (for example, for some the morning is not a time for communication; for others, it's ideal), the time in history in which the communication takes place (for example, messages on racial, sexual, or religious attitudes cannot be fully understood outside of their time in history), and how a message fits into the sequence of communication events (for example, the meaning of a compliment would be greatly different depending on whether you said it immediately after your friend paid you a compliment, immediately before you asked your friend for a favour, or during an argument).

The cultural context has to do with your (and others') culture: the beliefs, values, and ways of behaving that are shared by a group of people and passed down from one generation to the next. Cultural factors affect every interaction and influence what you say, how you say it, and how you respond to what others say.

DeVito (2012, pp. 8-9) also realised that these four dimensions of context interact with one another. For example, arriving late for a scheduled lunch meeting (temporal context) might violate a cultural rule, which might lead to changes in the social–psychological context, perhaps creating tension and unfriendliness, which in turn might lead to changes in the physical context—for example, choosing a less intimate restaurant for your meeting (DeVito, 2012). Lum (2016) says that the context is among the most essential aspects in human communication because it gives meaning to what goes on in any communication process. How we communicate changes based on who we are with, what sort of events are occurring around us, our opinions and beliefs, and where we are. Anything, from an empty stomach to bad weather, to an awkward situation, can form the context that defines our ability to communicate. Great communicators need to know how to interact in any context.

For the sake of this study, "context" was taken holistically to mean all the physical, social-psychological, temporal, and cultural factors that can affect or influence the communication. The discussion with RAB staff and farmers indicated a number of complaints and misunderstandings between farmers and RAB staff which were linked to the context in which the communication of agricultural research results happened. The complaints and misunderstandings that characterised the discussion with the participants in the study were mainly related to social-psychological as well as cultural factors. They included biased conception of transactants and cultural and historical background.

Social and psychological context – biased conception of transactants

Although a few researchers considered farmers as important actors who could actively participate in their research, 70% of the researchers that were interviewed expressed

that farmers could not contribute anything to their studies since most of them were not educated and only practised agriculture as they inherited from their ancestors. These researchers said that the only occasion they felt they needed farmers is when they wanted to use farmers' plots to test their results. They said that farmers needed to be given verified information and people who could carefully think on their behalf and aim further than they could. The following was extracted from the production of a RAB researcher during an interview:

> *[…….] Of course, you cannot consider everything that farmers say. Most of them act out of ignorance and dwell on futilities inherited from their ancestors. Farmers always think that whatever their ancestors practiced cannot be reversed [changed]. You know research requires more than most farmers can afford. I think it might not always help to go by their thoughts […….] Farmers need people who can think on their behalf and give them verified information [.....]* (Personal Interview with RAB Researcher, December 15, 2015).

This biased conception of farmers affected the relationship between farmers and researchers and prevented researchers from involving farmers in the whole process of communication of agricultural research findings. This therefore contributed in creating a situation where everything was coming from RAB and farmers were supposed to be permanent receivers.

On the side of farmers, farmers would also see researchers as implementers of government policies. During focus group discussions, farmers said that the researchers' role was to bring to them a set of instructions that they had to agree with. They said that even when RAB researchers came to their fields, they would be preoccupied only by their career advancement activities. In a focus group discussion that was carried out with farmers at Musasu, Southern Province, one farmer loudly expressed the following:

> *[…….] I cannot say that ISAR researchers are not knowledgeable people. They carry out research related to the government policies.*

> *They only ask us questions related to their research. They even use our land for their own tests. However, they are preoccupied by what they can put in their reports and some of us feel not very much concerned [……] We know they are there to put into practice what they need for their own researches, and our ideas are seldom considered* (Focus Group Discussion with farmers in Musasu, November 11, 2015).

Some extensionists said that even before RAB was formed, they would take seeds, fertilisers, medicine and livestock as well as related instructions and training to farmers. They said that farmers would simply wait for whatever was supposed to be brought to them. In their views, farmers had not reached a point where they could soundly intervene at any level in agricultural research. They said that farmers knew that they had limited knowledge and capacity, and consequently, they were obedient and would rely on whatever was brought to them by experts.

In general, famers looked at Rwanda Agriculture Board as a government institution that did government-commanded research and helped in the implementation of government policies. They considered researchers/extensionists at RAB as transmitters of government "instructions". Farmers said that they were nurtured and trained to respect and abide by anything that came from authorities. They all believed that RAB staff were not any different from their local government authorities. They were also considered the channels that the government used to transmit its instructions. Farmers said that in most cases they had ideas and knowledge that they developed over time, and which were different from the ones from authorities but they could not easily voice them out. They said that they had in mind that they would face consequences if they dared say things that were against authorities' voices.

Cultural context - farmers' cultural and historical background

While describing their working environment, RAB staff said that their main preoccupation was research and science. They said that they had more training in

doing research and writing research reports, and that they were very much used to writing research reports intended for other researchers. However, most of them indicated that they were convinced that they also needed to communicate their research results to farmers, though they said that they found this challenging. They revealed that their communication was more effective when they were communicating to University professors, students and some policy makers, because these people were used to how research is conducted and could even be referred to other research reports.

RAB staff expressed that they were not happy with the way farmers behaved while they were communicating to them. They said that they would sometimes fail to understand why farmers behaved the way they would do. One extensionist used the following words while describing how farmers interpreted their interactions with them:

> *[……] Sometimes we find journalists writing stories about our interactions with farmers and we get surprised. Farmers are sometimes quoted saying what we never said. They sometimes base on their traditional and backward associations. They will not bother looking for facts or evidences. They will look at you and invent stories by associating events that were not even talked about instead of only reporting what we said using our own words. It is very funny but it happens* (Personal Interview with RAB extensionist, November 13, 2015).

The study also revealed that farmers had learnt some unspoken rules through socialisation and history which would also influence the way they would make sense of messages. In a discussion with farmers in Huye, they (complementing one another) produced the following statements:

> *[…….] We have been living here for years and years. We have never been asked to provide ideas on what can be done to better our lives or farming practices. We are simply blamed for not abiding by certain practices that we are sometimes not even aware of. Our everyday life is full of instructions that we have to respect. But we are good students. We do not need to be told that it is imperative for*

> *us to respect what we are told. We know what it means if you come with an Executive Secretary of a Sector or a Cell. We know what it means if a Mayor speaks. We know what it means when you say it has been decided or the government decided. We do not even need to ask questions* (Focus Group Discussion with farmers at Rwabuye, November 20, 2015).

During the study, it was also realised that most farmers wanted to hide in a group to be able to express their ideas. While some farmers did not want to say much when singled out, they were able to clearly express themselves in a group discussion while completing or complementing one another. This was also reflected in the complaints expressed by RAB staff during an interview:

> *We find it not easy to get farmers express what they feel about what we bring to them. They are not confident enough to speak out what they think. You will only get some voices in a group or crowd but nobody wants to clearly express him/herself on an individual basis. You know as educated people, we cannot rely on what a person cannot stand up and say. In most cases, whenever they do not clearly express any disagreement, we assume that they are contented by what we do* (Personal Interview with RAB extensionist, November 13, 2015).

The study also indicated that farmers had pre-set ideas and knowledge that researchers and extensionists needed to learn in order to properly interact with them. Extensionists said that they sometimes thought that farmers agreed with what they were told whereas they had other realities in mind. Farmers demonstrated that they had ideas that they accumulated over time that they would apply after RAB agents and authorities had gone. While commenting on how their context influenced the way they interpreted messages from RAB, farmers in Sogwe expressed the following:

> *[…….] We know very well that it might not work well for us to show ISAR agents that we do not agree with what they are telling us. We know that they are the voice of our authorities and that whatever they bring to us is what the authorities want. We accept most of the things they tell us when we see that they will help us. However, there are things that we do not accept, though we do not show them. So, we sometimes show them that we agree with what they are saying and practice what we feel should be done when they have gone. You know, they sometimes forget that we have been living on agriculture for years and years. How can they assume that we do not have any*

> *knowledge at all* (Focus Group Discussion with Farmers at Sogwe, Southern Province, September 1, 2015)?

As farmers were expressing their ideas, one complementing the other, they produced varying ideas showing that they actually had their own rules which could even supersede the instructions from RAB researchers and extensionists. During a dialogue, one farmer expressed the following in a low voice:

> *[……] When you have enough plot of land, sometimes you reserve a small piece of land where they can easily see. Whenever they come, you show them that piece and tell them that you practice whatever they told you. In that case, you do what you want in other somewhat hidden pieces. For example, ISAR and other programmes from MINAGRI do not allow us to mix crops whereas we know that that is the only way we have been surviving. So, we show them the small piece where we have not mixed crops so they know that we respect their orders when we very well know that we have to mix our crops somewhere* (Focus Group Discussion with Farmers at Sogwe, September 1, 2015).

According to what farmers expressed during a dialogue with them, they were mainly subsistence farmers. This is the farming that would give them only what to eat on a daily basis. They were predominantly illiterate. Many of them still practiced farming (crop farming and animal rearing) as they inherited from their ancestors. Their practices and behaviours were greatly influenced by how they had been living and how they had been interacting with leaders. They indicated that they were trained by history not to challenge or question what leaders said. In a Focus Group Discussion, farmers indicated an identity that they inherited from Rwandan history which, most of the time, influenced the way they behaved in their encounter with officials. When farmers were asked a question about the role they played in agricultural research results' generation, one farmer laughed and stated the following:

> *[…….] I think I am more than 80 now. I was born during monarchism. It has always been a taboo to speak when a chief has not asked you to speak and even hinted on what he wants you to say. Leaders always bring instructions to us. Basically, our role is and has always been to abide by what we are told by leaders or people they send. This is even how our parents and ancestors were*

> *nurtured. It might sound uncivil to align oneself with leaders or their envoys and start expressing one's backward ideas. Again, you know, farming has been taken as a profession that is practised by people who have failed elsewhere. Apart from a few changes that are being observed these days, farming was predominantly practised by people who cannot read and write. A farmer contributing to research…(*Focus Group Discussion with Farmers, October 11, 2015)?

Physical and temporal context - Differences in values vis-à-vis position and time while communicating

In a focus group discussion, farmers said that they would easily get messages when they were approached and were close to the agents rather than when they were addressed in meetings which would put together a lot of people and only allow nice and uninterrupted speeches to be delivered. In a Focus Group Discussion at Rubona, one female farmer stood up in the group and expressed her sentiments about the interns that came from ISAR whom she said she really appreciated. The way she described what made her happy showed that farmers really wanted people who could go down and get very close to them rather than formal speeches, meetings and different forms of mediated encounters:

> *[……..] I can very well remember the entire discussion I had with people who came from ISAR and said that they were University students doing their internship at ISAR. These students came to me, greeted me and shook my hand. They sat with me and explained to me a lot of things. I asked all the questions I had. I would look into their eyes as they were explaining and I would feel that these people were really preoccupied by my problems. Even this avocado you can see [pointing at an avocado tree near her house], I owe it to them. I think that whatever I know is what I got from those students. Unfortunately, they went and never came back. I wish we had researchers like those students* (Focus Group Discussion with Farmers at Rubona, September 10, 2015).

While RAB researchers and extensionists seemed to be very much concerned with the exact time for meetings, farmers would not feel concerned even if they failed to respect the time for meetings. This would sometimes originate some

misunderstandings in the communication between RAB agents and farmers. In an interview, RAB extensionists expressed that they would find it challenging to meet farmers. They said that, most of the time, getting a one-hour discussion with farmers would require them to dedicate the whole day. Extensionists said that whenever they would set an appointment in the morning, they would get farmers in the evening, and this was when they were lucky. Similarly, farmers also expressed that they sometimes felt dissatisfied and frustrated when they travelled long distances and reached places where they were supposed to meet ISAR staff and ended up being blamed of not respecting time. They said that RAB staff would overvalue their time at the expense of farmers' efforts and energy of walking from remote places on empty stomach. They also said that during their interactions with these researchers, they would sometimes get cut short before they could finish their arguments or questions and would be blamed of wasting time, narrating unnecessary stories.

The complaints that RAB staff had against farmers as well as the complaints that farmers had against RAB staff indicated that there were some contextual factors that were affecting their encounter. RAB staff had negative attitudes towards farmers and their knowledge, which prevented them from involving them in all research process. Farmers would also take RAB staff as government envoys working for their own interest without considering farmers' interests. This would also make farmers feel less concerned by RAB agricultural research.

5.2.5 Channels used to communicate agricultural research results to farmers

In this section, the word "channel" was taken holistically to mean different means, ways, approaches, methods, techniques, and tools that researchers, extensionists and other RAB staff members used to communicate to farmers. According to what the

stakeholders expressed during interviews, in the communication of agricultural research results at the Rwanda Agriculture Board, there were basically two broad types of approaches that RAB researchers used to reach farmers: direct approaches whereby they would meet farmers without any mediation and indirect approaches whereby farmers would be reached through several cases of mediation.

The direct approaches

As researchers at RAB indicated, the direct approaches consisted in RAB researchers directly meeting farmers. They included cases where researchers would decide to go out and meet farmers. They also included a few cases of farmers that would decide to go and meet RAB researchers at the RAB station when they had issues they wanted researchers to assist in. Researchers would take the decision to meet farmers when they were in the process of checking their products or when they wanted to collet some information from farmers.

RAB researchers said that in their research for publication, they would sometimes choose to work with farmers. In this case, the farmers would be selected depending on the topics as well as how researchers would chose to approach them. Here, not all farmers were considered. RAB researchers would also sometimes go to farmers when they had undertaken certain studies and had reached the stage of checking or testing in farmers' plots of land. RAB staff also said that there were several other occasions that would make them directly meet farmers, for example, when they wanted to demonstrate certain practices or to showcase certain products or techniques. It is worth mentioning that after comparing the narratives from all the participants, it was realised that some direct approaches that researchers mentioned during interviews were used when the institution was still called ISAR. However, researchers said that they were planning to revive some of them.

The following are some of the direct approaches that researchers and extensionists said they used in their encounter with farmers: Demonstration Plots using both on-station and on-farm trials; Integrated Watershed Management Approach; Integrated Agricultural Research for Development (IAR4D); Farmer - Field Schools; Farmer Cooperatives; Innovation Platforms; Local Agricultural Innovation Centres; Field Visits; Study Tours; National Agriculture Show, and Extension Windows.

i) Demonstration Plots - on-station and on-farm trials

a) RAB on-station trials

As RAB researchers expressed, field experiments were set in RAB stations by each crop research programmes such as rice, maize, cassava, sorghum, beans, and soybeans. All programmes would follow different research designs according to their research objectives: resistance to drought, pests and diseases; adaptability and adaptation to agro-ecological zones. Through 'open days' organised every year, farmers neighbouring RAB stations would adopt some of the technology packages after considering the advantages demonstrated by new ways of farming crops and livestock in the research stations.

RAB researchers and extensionists however, said that this approach had some challenges. They said that the field experiments and demonstration plots were inside RAB stations and could not be accessed or seen by the majority of beneficiaries.

b) RAB on-farm trials

As researchers and extensionists said, unlike on-station trials, on-farm trials were set up by RAB researchers and extensionists across the country in farmers' fields for adaptation and adaptability of crops to different agro-ecological zones of Rwanda. They were easy to establish because they constituted a repetition of the successful on-

station trials in farmers' fields. In addition to the eye-visit of neighbouring farmers, field days were regularly organised for farmers to select performing varieties and appropriate technology packages that they would use in their own fields.

However, researchers and extensionists said that this approach also had some challenges. Many farmers considered these on-farm trials as a RAB business, and not theirs. This resulted in many farmers being reluctant to cooperate and adopt the knowledge therein, and therefore technology spill-over became limited.

ii) Integrated Watershed Management approach (IWM)

According to Conservation Ontario (2012) a 'watershed' is an ecosystem with interacting natural systems such as water, plants, animals, wetlands, moraines, and forests. The Integrated Watershed Management Approach is the process of managing human activities and natural resources on a watershed basis, taking into account, social, economic and environmental issues, as well as community interests in order to manage water resources sustainably. Used as an approach to directly reach farmers, RAB researchers and extensionists said that this approach implied participation of the whole community. It was ideally a participatory and multidisciplinary approach implemented through farmers' cooperatives. RAB researchers and extensionists explained that the approach was initiated in 2006, when the institution was still called the Institute of Agricultural Sciences of Rwanda – ISAR. They said that while initiating the approach, a number of steps were followed. These included a country-wide tour aimed at creating awareness of the status of natural resources and of exploring possible solutions; a workshop to introduce the IWM approach to all RAB scientists; training workshops for RAB scientists and partners; selection of watersheds to sponsor; introduction of the approach to farmers in target watersheds; conducting diagnostic surveys to identify priority watershed problems and constraints and how to

address them, and developing and implementing Community Action Plans (CAPs) basing of survey results.

It is worth mentioning that this approach was amply utilised before ISAR became RAB though experiences that were acquired still hold under RAB. Researchers at RAB said that this approach also had challenges. They said that working in a multidisciplinary team was new and not easily understood by all researchers. They however added that the approach seemed to be the most effective and successful as it would help researchers interact more with farmers.

iii) Integrated Agricultural Research for Development (IAR4D)

Researchers at RAB said that this approach was intended to link farming activities with markets. They said that the major component of the IAR4D approach was implemented through the formation and operationalisation of Innovation Platforms (IPs) of stakeholders that were united by complementary interests in priority value chains identified in participatory manner and consensus building among stakeholders. RAB researchers said that this approach was characterised by training sessions on several issues such as post-harvest practices and seeds' selection, crop processing, hygiene and sanitation, preservation and packaging, production costing, hygienic milk production, milk handling and transportation. They gave steps that would be undertaken when developing an Innovation Platform such as identifying an opportunity or a problem with high potential, for example, low productivity of Irish/ Round Potatoes; formulating an "Innovation Challenge", that is asking questions such as how to increase productivity of potatoes; identifying the functions required to make the system work effectively; identifying the actors who could deliver these functions; inviting the promising actors to a first meeting and analysing the blockages and first

actions, and coming together regularly to review progress, handle blockages and define new actions.

RAB researchers said that though this approach was also expected to yield good results, it did not succeed as was expected. It also faced challenges. They said that the Innovation Platforms operated in vast zones (districts) and were not easy to follow up for the facilitators. It is also worth mentioning that this approach was also used when the institution was still called ISAR.

iv) Farmer Field Schools (FFS)

Researchers said that the Farmer Field School (FFS) approach was an extension approach that would ensure participation of farmers based on innovations and learning by discovery as they took up various enterprises. The researchers said that this approach was developed in Asia as a way for small-scale farmers to investigate and learn for themselves the skills required and get the appropriate benefits from Integrated Pest Management (IPM) practices in their paddy fields. The researchers added that the FFS approach was then extended to other countries with success stories in Latin America and in Africa, including Tanzania, Kenya and Uganda.

The FFS that were developed would be made up of 20-30 farmers who would work together and meet regularly. Trained facilitators (researchers or extensionists) would assist the farmers in coming up with certain topics in meetings, and the topics of each meeting would be related to the seasonal cycles of the practice being investigated. As researchers said in this school, farmers would learn by doing in their gardens where the local facilitators would meet them to analyse the problems that affected crops such as soil infertility. The graduates of FFS would then facilitate other farmers to start Farmer Run Field School (FRFS). Researchers said that the FFS approach was one of

the best agricultural approaches for the poor because it would empower their skills on the field through applying acquired knowledge by experimenting. Researchers said that FFS and FRFS would benefit farmers mainly if the facilitators were active and had internal residence in the watershed sites.

RAB researchers said that while setting up FFS, they followed a number of steps such as training of RAB researchers on FFS; Field visits to Kabale in Uganda where FFS were already established; Selecting extensionists for the chosen sites (agronomist and veterinarian) with residence in the chosen sites; training on farmers' fields and establishing FFS; organising field days; developing extension materials and diffusing them; and monitoring and evaluation.

Researchers said that this approach also faced a challenge. They said that some FFS facilitators were not paid and dropped out of the system while farmers were discouraged by unfavourable weather conditions. It is also worth mentioning that this was also used when the institution was still called ISAR.

v) National agriculture show

RAB researchers said that national agriculture shows were organised by the Ministry of Agriculture (MINAGRI) every year. Here, different programmes at Rwanda Agriculture Board would display their research results and/or technologies developed and a few farmer innovators would uptake them.

vi) Artificial insemination centres for genetic animal improvement

Researchers said that these were mainly for animal farmers. They were centres where animal farmers would go for genetic animal improvement where they would meet with experts and insemination was done in their presence. Researchers said that two Artificial Insemination Centres were established in Songa and Rubona (Southern

Province) in 2005 for improvement of livestock for cattle keepers. According to RAB researchers, these centres were still functional at the time of the study. However, during focus group discussions, farmers said that the centres were not as active as they were when the institution was still called ISAR.

vii) Farmer visits and Meetings with farmers

Researchers and extensionists said that in their direct approaches, they would visit farmers and see what they were doing. This would happen during different types of research whenever researchers and/or extensionists needed inputs from farmers. It entailed visiting farmers in cooperatives, farmers' gatherings, and visiting individual farmers in their homes or fields. These farmers were often asked questions and researchers and extensionists would carry out some observation. Researchers and extensionists also said that they had a series of meetings with farmers. They said that whenever they had information to convey to farmers or whenever they wanted to get ideas from farmers, they would work with local leaders and convene a meeting with farmers. However, as researchers and extensionists pointed out, these occasions were not frequent. They only happened when researchers and extensionists felt that there was a strong need to meet farmers.

viii) Visits to RAB by farmers

Researchers and extensionists at Rwanda Agriculture Board said that a few farmers who were relatively literate or advanced in their way of understanding farming issues would walk into RAB and ask any questions they had or request any information they needed. They would be allowed to meet any researcher or extensionist they wanted and/or would be given any information that they needed. Researchers said that farmers would take the decision to go to RAB when they had something very urgent they wanted to take there. They mostly went there when there were diseases that they

were unable to deal with or any other issues they felt they could not address on their own.

ix) Seminars, Conferences and Workshops

Researchers at the Rwanda Agriculture Board said that before anything else, they were researchers and had to fulfil the duties of researchers. They said that they would get promoted on the basis of their presentation of seminar and workshop papers as well as publications in journal articles, books and book chapters. These researchers said that seminars, conferences and workshops could also be considered as part of the direct approaches they would use to meet farmers because some farmer representatives and cooperative representatives would also be invited to attend these events.

It is worth mentioning that all researchers that were approached during the study said that they acknowledged that messages in these approaches (seminars, conferences and workshops) were not primarily packaged for farmers. They said that the messages there were primarily packaged for researchers and policymakers who could understand the language used and who could sometimes understand approaches that were used to get data and findings, and therefore, be able to replicate the research. The researchers that were approached also said that much as these approaches did not primarily target farmers, there were a few, relatively educated farmers who would attend some seminars and conferences and would manage to get the gist of the discussions. Unfortunately, all farmers that were approached in the study said that they did not attend any seminar, conference or workshop. They said that they had no idea about these events.

The following table summarises the channels or approaches that RAB uses to reach farmers directly:

Table 2: Summary of approaches that RAB uses to reach farmers directly

Channels/approaches	*Comments*
▪ Demonstration Plots	▪ Was mainly used by ISAR
▪ Integrated Watershed Management Approach	▪ Was mainly used by ISAR
▪ Integrated Agricultural Research for Development	▪ Was mainly used by ISAR
▪ Farmer - Field Schools	▪ Was mainly used by ISAR
▪ National agriculture show	▪ Still in use
▪ Artificial insemination centres for genetic animal improvement	▪ Was mainly used by ISAR
▪ Farmer visits by RAB	▪ Still in use but rarely
▪ Meetings with farmers	▪ Still in use but rarely
▪ Visits to RAB by farmers	▪ Very rare
▪ Seminars	▪ Not meant for poor farmers
▪ Conferences	▪ Not meant for poor farmers
▪ Workshops	▪ Not meant for poor farmers

Source: *Primary data*

The indirect approaches

In this study, "indirect approaches" refer to any approach, method, technique, means or channel that consisted in reaching farmers using different kinds of mediation and middle people, instead of RAB researchers meeting farmers directly. These middle people included extensionists, communication officers and librarian as well as local leaders. Other results were put in media messages that were sent via mass media (radio, TV and newspapers) and other PR tools such as booklets and leaflets.

i) Middle people

According to what researchers at Rwanda Agriculture Board said, it was not possible for them to always meet farmers directly and take to them the research results. In most cases, the results of their research could reach farmers through middle people such as extensionists, a communication officer, a librarian, as well as different local leaders that would deliver messages from RAB staff.

a) Extensionists

Although these extensionists worked at Rwanda Agriculture Board and participated in most research undertakings, they were put in indirect approaches because they would basically mediate between researchers and farmers. They would take information from researchers to farmers. Being charged with making information and technologies palatable to communities, they were supposed to get deeper understanding of all the information and technologies. They would therefore interact with researchers and other various sources of information in order to get enough information and technologies they would take to farmers.

b) RAB communication officer

During the study, the role of a communication or public relations officer was played by one of the extensionists. In addition to being in charge of the flow of information within and outside RAB, Southern Zone, this officer was also in charge of media relations. He would package information that was put in media such as radio, TV, newspapers, RAB website as well as in Hinga Worora Magazine (a magazine that was owned by the Ministry of Agriculture which was publishing on agriculture). While sourcing information to be communicated, this officer would draw from different

research reports at RAB and would interact with researchers in different programmes as well as other extensionists.

c) Librarian

The librarian at Rwanda Agriculture Board was in charge of managing the library resources at RAB. These resources included research reports from researchers in different programmes, different books and articles, magazines and newspapers, etc. They also included theses that were written by researchers in their studies and internship reports from students who would go to RAB for their internship. Most of those resources were related to agricultural research and interested people would go to this library to use them.

During an interview with RAB staff, it was revealed that this library mainly served RAB staff and its partners including students who would come to read those resources mainly when they were reviewing literature for their research. However, interviewed staff said that a few educated farmers would go to the library and do some reading on certain topics. However, none of the farmers that were approached during the study knew about this library.

d) Local leaders

Researchers indicated that they would very often work with local leaders. They said that these local leaders included District, Sector, Cell and Village leaders who would interact with farmers on a regular basis. RAB researchers said that they would not only approach leaders when they wanted to be facilitated to reach farmers they wanted to work with but they would also approach them when they wanted to give them messages to be taken to farmers.

ii) Mass media and technological devices

Researchers and extensionists at Rwanda Agriculture Board said that RAB used to have several media programmes that were used to disseminate information about their research. They said that they used to have three weekly Radio programmes broadcasted on Radio Rwanda, Radio Izuba and Radio Salus on ISAR technologies in 2005-2006. These researchers and extensionists said that these programmes were stopped because of lack of proper follow-up. At the time of the study, researchers said that RAB was mostly buying airtime and space in media outlets in Rwanda to disseminate information to farmers. They mentioned media outlets such as Radio Rwanda and Rwanda TV of Rwanda Broadcasting Agency (RBA), and *Imvaho Nshya,* the local newspaper publishing in Kinyarwanda. They also indicated that some of their research results were published in "*Hinga Worora*", an agricultural magazine owned by the Ministry of Agriculture as well as on RAB website.

Besides mass media, there were publications such as books, book chapters and journal articles that researchers said they also used to publish their findings. They said that though they would primarily come up with these publications to contribute to the existing body of knowledge and get promoted, there were a few educated farmers who could also access the publications and get the research findings. RAB researchers and extensionists also said that some information about their findings was also available on RAB website http://www.rab.gov.rw and could be accessed by all people with access to internet. They, however, said that practically, only a few farmers were able to visit this website due to general lack of literacy as well as financial limitations.

Closely related to mass media, there was also the use of technological devices for example telephone. Researchers said that they had started working with telephone network operators in Rwanda so that farmers could be getting agricultural messages

on their phones. They indicated that as telephone ownership is increasing and internet access is also increasing, they have to also think of applications that can be used for farmers to access agricultural messages. However, farmers said that most farmers do not have access to mass media and technological devices. They also added that these means leave out illiterate farmers who constitute the majority of farmers.

iii) Leaflets, flyers, booklets and brochures

Leaflets, flyers, booklets and brochures packaged for non-scientific audiences would be sent to various stakeholders and partners, including farmers. While explaining these tools, RAB staff said that a flyer, that they also called handbill, was generally an A4 size paper and was mostly used for small- scale marketing often covering a small region. They said that a leaflet was considered to have a better design as compared to a flyer, with the standard size of an A6 sheet. They said that these tools would be circulated by either handing them over to the concerned audience, inserting them in the local newspaper or tactically placing them in public places. These participants also said that brochures, that they also called pamphlets, were more expensive in comparison with flyers. They indicated that a brochure was generally a standard size of a single paper in multiple folds, each devoted to a specific type of information. Brochures were handed out to stakeholders including farmers to keep.

RAB researchers and extensionists said that while the tools that were targeting policy makers and other partners could be written in English or French, the ones targeting farmers were in Kinyarwanda so that they could benefit more farmers. In these approaches, key messages such as how quality maize seeds were obtained; improved methods of planting and weeding beans; how to deal with plant diseases like cassava mosaic, and how to identify diseased banana trees were disseminated. Farmers,

however said that these would only help a few farmers who could access the tools and read them.

Farmers indicated that they preferred personal communication channels where they could meet people, interact with them, ask questions and get answers. In this perspective, they said that they needed direct approaches and middle people in communicating agricultural research results instead of mass media. They explained that mass media and other forms of non-personal communication channels would only benefit a few educated farmers, leaving aside the majority of farmers who could not read and write or who could not access the media.

The following table summarises the indirect approaches that RAB uses to communicate with farmers:

Table 3: Indirect approaches that RAB uses to communicate with farmers

MASS MEDIA & TECHNOLOGIES	*MIDDLE PEOPLE*	*OTHER TOOLS*
Radio	Extensionists	Leaflets
TV	Communication officer	Flyers
Newspapers	Librarian	Brochures
Internet	Local leaders	Booklets
Websites		
Magazine		
Books		
Journals		
Conferences		
Workshops		
Telephones		

Source: *Primary data*

5.3 How Farmers Working with Rwanda Agriculture Board (RAB) Make Sense of RAB Communication Initiatives Relating to Research Findings

This section presents results that were generated from study participants in their response to the second research question: *How do farmers working with Rwanda Agriculture Board (RAB) make sense of RAB communication initiatives relating to research findings?* Here, participants were asked to describe how agricultural research results reached them and how they made sense of different messages that they received from RAB, as well as their feelings about those messages. In this section, the narrations by participants were guided by insights from the Active Audience/Message Reception Theory by Stuart Hall. Participants' productions were mainly around how farmers received messages from RAB (message reception) and their feelings about those messages (appreciation of messages from RAB).

5.3.1 Farmers' reception of agricultural research results

According to Maroder et al. (2013), active audience/ reception theory is the notion that audiences do not just absorb everything they are told but are actually involved, sometimes unconsciously, in making sense of any given message as it relates to them in their own contexts. These scholars posit that people may interpret a message in a certain way just from their own cultural background differently from someone else with a completely different background.

As researchers and extensionists at Rwanda Agriculture Board expressed, the ultimate targets in their communication of research results were farmers. Researchers and extensionists at RAB said that in their packaging of information from their research, they always took into consideration the farmers and their situations. However, farmers that were consulted said that messages from RAB were often confused with messages

from local leaders that were always in form of "instructions". The following was expressed by one farmer in a focus group discussion in Huye during the study but others would also chorus "yes" to show that they agreed with him:

> *[…….] We are always told what to do and what not to do. We are never asked what to do or what not to do. We only get "instructions" about what to do and what not to do. We get instructions from our local leaders; we get instructions from health workers; we get instructions from agronomists; we get instructions from ISAR people, etc. Our life is full of instructions and that is it* (Focus Group Discussion with paddy farmers in Huye District, December 10, 2015).

Farmers said that most of the messages that they would get from RAB people were received like laws, rules or instructions that were supposed to be respected the way they were. They said that they had always been treated like that, and that they had come to understand that that was the only way they had to live with these staff. Farmers expressed that they would sometimes face instructions that they would feel were not appropriate and were against their indigenous knowledge and common practice. However, as farmers expressed, they could not say anything against any instructions in the presence of officers that were bringing those instructions. They felt that their views were too inferior and that their knowledge was too basic to be considered by the extremely knowledgeable and suppressing officers. The following was extracted from the discussion held with farmers. One farmer started and others would confirm their agreement with him by either repeating the sentences or nodding:

> *[…….] We never believed that planting one crop in the entire region can help us but this is the same monotonous song by ISAR and authorities. Our land is too small and not fertile. What we harvest is even not enough for our food. For years and years, we have been surviving by intercropping and crop mixing. We used to have for example potatoes and sorghum planted together; maize and beans in one plot, etc. Here, if one crop failed to produce enough yield, then people would feed on the other or they would get small yield for one crop and supplement it with the yield of the other. There are also crops that do not harm each other when planted in the same plot. However, this is considered backward by our authorities. [….] They*

> *want us to consolidate our land and plant one single crop throughout the entire region. So, what we do, we take a plot that they can easily see and do as they instructed but find a way of reserving a small portion where we mix as we wish. This saves us when the new approaches fail to produce enough yield as it has been happening in different places* (Focus Group Discussion with farmers in Rubona, December 8, 2015).

While giving an example of where they felt that messages from researchers did not match their context and situation, a 65-year old male farmer, who said was not educated, expressed the following in a Focus Group Discussion in Rusatira Sector:

> *[……] We cannot understand how a person can spend weeks teaching people how to store their harvest when they do not even harvest enough for their own food. Some dictated practices leave us hungry. We listen to good words about quality seeds and animals but how many can buy seeds from ISAR with their prices? We make sure that we keep our traditional seeds because even for very few farmers who manage to buy from ISAR, they have to save enough money for the following planting season. Most seeds from ISAR are planted only once. You cannot get seeds from your harvest. You have to go there again to buy other seeds each season and again expensively. However, for our traditional seeds, you can reserve the seeds from your harvest and use them for the following planting season* (Focus Group Discussion with farmers in Rusatira, January 10, 2016).

Farmers, however, recalled some good practices that they kept from researchers and interns in the former ISAR. They gave examples of avocado seeds, banana seeds, some agroforestry tree species, farming practices such as planting in lines, cattle crossbreeds and insemination activities that they got from ISAR but added that some practices that were initiated by ISAR were not maintained after the creation of RAB.

5.3.2 Appreciation of the communication of agricultural research results to farmers

In a discussion about the communication of agricultural research results by Rwanda Agriculture Board, stakeholders in this communication expressed their feelings about this communication. Generally, researchers expressed their satisfaction. They said that the communication was effective and only mentioned a few additions that they

thought could be done to improve the communication which were in line with widening the use of mass media and new technologies. However, farmers expressed dissatisfaction and indicated the need of a radical change in the way the communication was done. They suggested that there was a need to meaningfully involve and empower farmers by carefully taking into account farmers' context and considering their indigenous knowledge.

Researchers and extensionists at Rwanda Agriculture Board said that they tried to use existing mass media like Radio, TV, and Newspapers, brochures, leaflets, booklets, middle people as well as some face-to-face encounters. They said that they only needed to add more efforts in using new technologies such as internet and telephone to reach farmers. They said that although the reading culture was still not developed in Rwandans in general and Rwandan farmers in particular, they intended to increase the mechanisms that would incite farmers to read and get agricultural information they needed in their daily practices. They said that they intended to multiply mass media messages intended for farmers and maximise the use of internet and phones to instantly reach farmers.

However, farmers said that the mediated communication that was used by RAB was not helpful to them since it was not taking into account their contexts. They said that the situation before RAB, when the institution was still ISAR was better because there were several instances of face-to-face encounters with researchers. Farmers said that during that time they would meet people who would listen to their problems and sympathise with them. The following sentiments were expressed by a woman in the early seventies while recalling what characterised her encounter with students that were doing internship at ISAR, though she could not recall the year:

> *[……..] Who would not listen to those wise and sympathising students? They would come and meet us in our poor households. They would ask us to provide our ideas on issues such as erosion control and plant diseases. They never forced us to remove our traditional seeds. They never imposed us to plant one crop. They never minded walking to the remote households and ask farmers about their farming concerns. They were there for us to demonstrate certain practices and we would ask whatever questions we had. [……..] If they remained around, we would be far by now [….]* (Focus Group Discussion with farmers at Musasu, November 11, 2015).

Farmers said that after the creation of RAB in 2010, face-to-face interaction with researchers and other RAB staff became limited and that more consideration was given to mediated communication. A male farmer in his late fifties who said that he had enough experience in farming expressed the following in Shyogwe Sector:

> *[……..] After the creation of the new ISAR [RAB], agronomists and local leaders would tell us to listen to the radio, watch television and read newspapers for information we need. They would tell us that we need to use technology [……..]. A few educated and literate farmers would sometimes get some small books that leaders said had information about farming practices and soil preparation and protection. [……..] We even heard that farmers with mobile phones would access information like market prices via their phones, etc. [….] How many of us own radio or television sets? How many own telephones? How many of us can read and write? I even wonder whether the few of us who can access these media can ask questions on those radios, TVs, newspapers [……]* (Focus Group Discussion with Farmers at Shyogwe, September 1, 2015).

5.4 What Rwanda Agriculture Board can do to Better the Communication of Research Findings to Farmers

This section describes what participants in the study said when they were asked to give their opinions about what RAB could do to better the communication of research findings to farmers. Although RAB researchers and extensionists were happy with the way they were communicating agricultural research results, they expressed that RAB needed a structural improvement and a stand-alone and well-staffed department in charge of communication instead of leaving everything to do with communication to

extension services. RAB staff also said that the terms of reference for extensionists needed to be redefined and clarified. They said that extensionists would only get clear tasks in the planting seasons when distributing seeds and seedlings as well as other agricultural inputs.

These RAB staff also stated that much as they had tried to use different channels to communicate to farmers, RAB needed more efforts in using mass media. They said that there was a need to increase the use of TV and radio as well as newspapers. They also said that more efforts were needed to use internet and internet-based media such as social media while targeting farmers. They also said that since telephone ownership in Rwanda had increased, RAB should think of increasing the ways to reach farmers via telephone. They said that there was already a telephone-linked initiative (e-Soko) by the Ministry of Agriculture and Animal Resources, through which farmers could get information about prices of agricultural items in different markets using their telephones. They said that RAB could also think of other initiatives of reaching farmers using telephones.

While RAB staff put more emphasis on mediated and technology-based message delivery, most farmers expressed some resentment towards mass media and technology-based message delivery. They all expressed the need of more personal and interpersonal encounters which they said reduced considerably after the creation of RAB. The following was produced by three farmers [one completing the other] in a focus group discussion in Shyogwe Sector:

> *[…….] For most of us illiterate and poor farmers, mass media might not be as helpful as you think. We need to have people who can come to us; people who can listen to us; people who can interact with us in our remote places, our cultures and traditions; people who can answer our questions; people who can look at our situations and help us solve our problems; people who can give us*

> *time and make our concerns a priority. However, face-to-face opportunities reduced considerably with the New ISAR. […….] After the New ISAR, agronomists and local leaders would tell us to listen to the radio, watch television and read newspapers for information we need. They would tell us that we need to use technology [……..] You know, when you come to us in our plots of land, you might for example even notice things that need to be addressed that we are not even able to describe properly* (Focus Group Discussion with Farmers at Shyogwe, September 1, 2015).

Farmers also indicated that the criteria that RAB used to select farmers they worked with could not allow all farmers to feel considered and valued. They said that farmers living in remote areas with limited access to the main road and poor farmers with small plots of land did not stand any chances of working with RAB researchers. These farmers said that RAB needed to device ways to reach more farmers including poor farmers in remote and not easily accessible places.

Farmers said that RAB staff had been considering farmers as inferior, passive and ignorant participants. They had been planning everything, and farmers had been passively receiving messages in form of "instructions". Farmers said that this would prevent farmers from up taking messages from RAB. They suggested that RAB had to think of various ways to involve farmers in all stages of their research, including setting priorities and originating topics, in order to maximise the chances of getting farmers' access and ownership of research results.

In their narratives, farmers indicated that they believed, not in messages that researchers sent to them, but in being associated in everything that concerned their lives as farmers. They believed that it would have been helpful to them if they had even taken part in determining what needed to be researched on in order to come up with research results that could help them solve their real problems. Farmers also said that they too had knowledge about the areas and practices they had been in for years, which they thought could be helpful if valued. They said that in some cases, some

endeavours would fail or take longer than necessary, just because farmers' knowledge was ignored.

5.5 Summary

This chapter presents the findings from the data that were generated during the study. Data were mainly generated using interviews and focus group discussions. During interviews and group discussions, participants in the study produced lengthy and multi-thematic narratives on how the research results are communicated to farmers by Rwanda Agriculture Board (RAB). This lengthy and multi-thematic narratives were arranged in different themes and sub-themes depending on what they had in common and in accordance with the research objectives and questions.

Generally, it was realised that RAB staff would originate all agricultural, farming-related pieces of information – "instructions" that were supposed to be taken to and accepted by farmers through mainly mass media and limited face-to-face initiatives. This process would take place in a context that was never analysed and understood, and which would prevent farmers from getting and up taking messages. The way agricultural research results were communicated at RAB suited the transmission model of communication and not the transactional model of communication. It is worth noting that participants mentioned several face-to-face initiatives that were used by the former ISAR, and which farmers liked, but which were stopped after the creation of RAB.

The productions of participants in the study were grouped in the main themes and sub-themes that include the process of communication of agricultural research results by Rwanda Agriculture Board (RAB) including stakeholders in the communication; the transactional nature of the relationship between farmers and RAB staff in the

communication of research results; the context that shaped this communication; messages that were communicated; channels that were used to communicate them; how farmers received the messages and appreciated the communication, as well as what participants in the study thought could be done to better the communication.

From the participants' description, while communicating agricultural research results, everything would come from RAB staff and farmers were supposed to only receive and accept messages from RAB. There was no obvious transaction. While farmers thought that they were supposed to actively participate and be involved in the entire process of communication, RAB staff believed that only RAB staff were supposed to initiate the communication and that farmers were supposed to be faithful receivers of development messages. Participants in the study indicated that the messages that would make the object of the communication between RAB and farmers included all information and knowledge that farmers needed in farming activities together with agricultural inputs such as fertilizers, improved varieties of seeds and seedlings, feeds, plant protection chemicals; agricultural technology and different farming techniques; agricultural machinery and equipment.

Findings also revealed that RAB staff had some attitudes towards farmers which were caused by certain behaviours that farmers would display. These behaviours were mainly linked to the physical, social, psychological, and cultural context that farmers were living in, as well as attitudes that farmers also had towards RAB staff that RAB staff needed to understand and consider while communicating to farmers.

While RAB staff demonstrated reliance on mass media and the use of new technologies, farmers expressed little interest and hope in mediated communication. They expressed that apart from a few educated and literate farmers, the vast majority

of farmers wished to have more personal communication. They said that they needed people who could come to them; listen to them; interact with them in their real places and answer their questions.

Among suggestions that participants gave on how to improve the communication between RAB staff and farmers were the betterment of the structure of RAB, clear terms of reference for extensionists, consideration of farmers' contexts and knowledge, and involving farmers in the entire process of research and value their indigenous knowledge.

CHAPTER SIX

DISCUSSION OF FINDINGS

6.1 Introduction

The previous chapter presented the findings of the study in line with the research questions. The findings were obtained after analysing and organising data that were generated using interviews and focus group discussions. It was realised that the communication of agricultural research results at RAB mainly consists in RAB staff originating all messages that farmers were supposed to receive and agree with. The communication was characterised by the confusion of communication and agricultural extension, dwelling on the top-down communication approach, over-reliance on mass media and new technologies, failure to understand the socioeconomic, historical and cultural context of interactants, and lack of engagement and empowerment of farmers.

This chapter presents the discussion of the findings that informed the conclusions of the study. The discussions presented constitute the key lessons that the researcher drew from the whole research process taking into consideration the research objectives, the literature, conceptual framework and the findings.

6.2 Discussion

The study was undertaken as a contribution to solving the problem of incommensurateness between the amount of agricultural research results that are generated by agricultural researchers and farmers' uptake and use of agricultural research results as well as agricultural sector performance in general. It was carried in the assumption that access to appropriate information and knowledge is one of the biggest determinants of agricultural production as scholars revealed (Masuki et al., 2010). After realising that there was enough funds in agricultural research and that there was enough agricultural research information that was made available by

Rwanda Agriculture Board (IRAR, 2009; RAB, 2013; Gahakwa et al., 2014), and that there was a failure of farmers to up-take the agriculture research results and the poor performance of the agricultural sector (IPAR, 2009; RDB, 2012), the researcher wanted to find out whether the problem could be linked to the poor communication of agricultural research results to farmers.

The findings of the study showed that the communication of agricultural research results by Rwanda Agriculture Board was not done effectively and that this could have prevented farmers from up taking and utilising the agricultural research results appropriately.

6.2.1 RAB relies only on agricultural extension whereas it is not effective communication

Findings revealed that Rwanda Agriculture Board did not have a communication department at the time of the study. The function of communication was assumed by one of the extentionists. As RAB staff expressed, RAB was created with the aim of reducing the gap between agricultural research and its utilisation by farmers. It was meant to focus more and involve farmers. However, as they added, even after the creation of RAB, the understanding of the concept "extension" did not change. The most pronounced activities of extensionists continued to be transporting seeds, fertilisers, animals, medicine, among others, to farmers in different districts. Findings of the study also indicated that extensionists were the ones that were charged with reaching out farmers and take to them the results of research.

The use of "extension" at RAB concurred with what was highlighted in the literature review that in agricultural research, the communication function is always left to agricultural extension and that it is assumed that extension workers can do everything

communicators do. The literature and conceptual framework underlined that agricultural extension is defined as the delivery of information and technologies to farmers, which leads to the technology transfer model in the diffusion of innovations theory, seen by many scholars as the main purpose of agricultural extension (Anandajayasekeram et al., 2008, p. 83).

The Diffusion of Innovations Theory is linear and source dominated because it sees communication process from the point of view of the elite who has decided to diffuse information or an innovation. It does not involve the beneficiaries of innovations. This is based on the idea that 'modern' knowledge or information is transferred through extension agents to recipient farmers. It limits itself to the dissemination of agricultural information. It is basically rooted in westernisation and modernisation paradigm and seldom meets the needs of farmers. It does not empower farmers to own and make use of agricultural research results. In line with this theory, RAB would originate all information that they think farmers need. Basing on a number of criteria, they would choose farmers who they thought would also help them in spreading the information to others (innovators) and they would feed them with the information using different forms of mediation.

Anandajayasekeram et al. (2008) say that although for a long time, development of agriculture in developing countries mainly consisted of farmers and communities being told what to do, often by institutions and agents who did not take sufficient time to understand the farmers' real needs and practices, over the last two decades, governments and nongovernmental organizations have recognised the need to move away from instruction and blueprint solutions, towards more participatory approaches which involve communities in setting and fulfilling their own development goals and solutions. Hence, the system-oriented and participatory approaches are being

increasingly integrated into the emerging research and development (R&D) paradigm. Freire (1973) also looked at the weaknesses of extension when it is considered as communication. He explained the profound opposition which exists between extension and communication by showing that “extension” leads to actions which transform the peasant or farmer into a "thing," an object of development projects which negate him/her as a being capable of transforming his/her world.

Freire (1973) said that during extension, the peasant or farmer is not educated but instead is treated as a depository for propaganda from an alien cultural world, containing the things which the technician (who considers him/herself modern and therefore superior) thinks the peasant/farmer ought to know in order for him/her to also become modern. He said that agronomists, like teachers in general, must choose communication if they genuinely want to reach peasants/farmers, not by being abstract, but by being concrete, within a historical reality and working with and involving peasants or farmers as important collaborators capable of understanding and transforming their own world.

The above scholars’ arguments show that the mere fact of conceiving agricultural research communication as agricultural extension can hamper the effectiveness of the communication of agricultural research results. It can prevent the involvement of farmers in agricultural research activities, reduce their degree of uptake and negatively affect the performance of the agricultural sector. Agricultural extension has some role to play in communicating agricultural research results but it has weaknesses that need to be addressed.

6.2.2 The top-down approach is not always effective in communicating development

The findings of the study indicated that the communication of agricultural research results by Rwanda Agriculture Board always followed the transmission model of communication, and was only characterised by the top-down approach. Although farmers said that they needed bottom-up endeavours, at the time of the study, the institution was not applying the bottom-up approach. The following figure represents the flow of information from Rwanda Agriculture Board as was described by participants during the study:

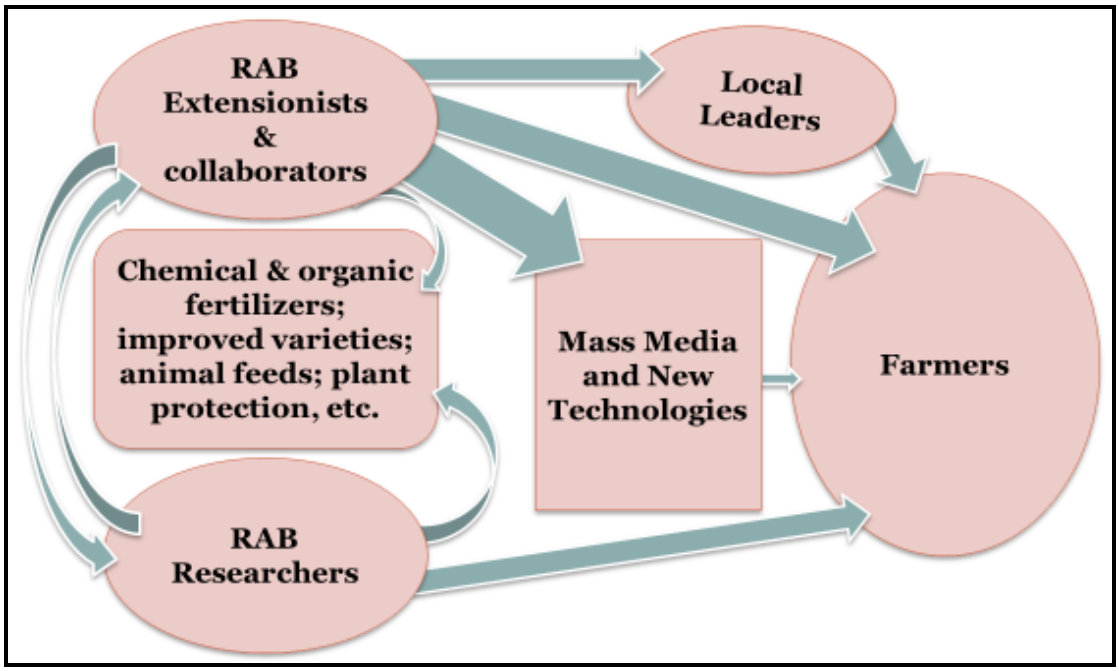

Figure 7: The flow of information from Rwanda Agriculture Board as was described by participants during the study
Source: *Primary data*

While researchers could interact with extension workers at the level of RAB, there was no interaction between RAB staff and farmers. Farmers were only receivers of instructions from extension workers and their collaborators. They would also

sometimes get some directives from researchers, especially when testing their results. As indicated in Figure 10, there were also information that were sent through media and new technological devices, with the assumption that farmers would get this information from media and new technological devices. However, very few farmers would get this information. This flow of information followed the transmission model of communication that scholars said lacks participation and interaction and therefore leads to ineffective results.

However, farmers expressed dissatisfaction with the way they were getting information from RAB. They said that there was a need to allow them to speak about their problems instead of only telling them what to do and what not to do. They said that RAB staff needed to meaningfully consult and involve farmers in their research activities. They said that they needed to actively participate in the discussions and decisions about their career. The following figure was drawn to depict the flow of information that farmers said should characterise their encounter with RAB staff:

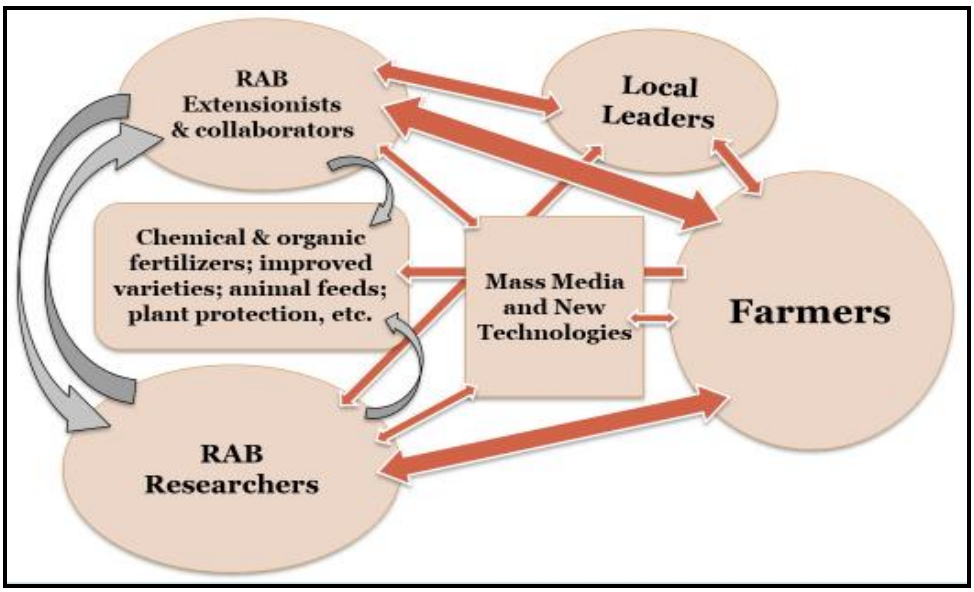

Figure 8: The flow of information from Rwanda Agriculture Board that farmers wished to have
Source: *Primary data*

Farmers said that they needed to be able to interact with RAB researchers, RAB extension people and all sources of agricultural information. Farmers said that they also needed to be listened to in matters pertaining to their career and be allowed to ask questions and contribute ideas. The flow of information that was suggested by farmers agrees with the effective communication that fosters community engagement and conscientization proposed by researchers in communication (Ahmed & Palermo, 2010; McCloskey et al., 2011; DRUSSA, 2012, and Freire, 1973).

The top-down approach as the sole flow of information in the communication of agricultural research results to farmers, as was confirmed by the research findings, also indicates that the communication of agricultural research results by Rwanda Agriculture Board was not effective and that it could not lead to effective uptake of agricultural research results by farmers and thereafter the good performance of the agricultural sector in the country.

As Freire (1970) clarified top-down communication cannot allow conscientization since it does not foster dialogues. Audiences remain recipients. Freire (1970, p.46) says that conscientization is “the process in which men and women, not as recipients, but as knowing subjects, achieve a deepening awareness both of the socio-cultural reality which shapes their lives and their capacity to transform that reality”. In line with the participatory communication approach, it is worth adding that the approaches that RAB uses do not foster active and meaningful participation of farmers. They do not allow the intervention of participation that Tufte and Mefalopulos (2009, p.5) define. These scholars explain that participation and involvement should include the research stage, design stage, implementation stage, and evaluation stage. Those stages correspond to the stages of agricultural research communication at RAB where farmers should participate.

6.2.3 Mass media and new technologies do not suit all contexts

Findings of the study indicated that there were basically two broad types of approaches that RAB researchers used to reach farmers: direct approaches whereby they would meet farmers without any mediation, and indirect approaches whereby farmers would be reached through various instances of mediation. The direct approaches were very limited whereas indirect approaches prevailed.

Indirect approaches referred to any approach, method, technique, means or channel that consisted in reaching farmers using different kinds of mediation and/or middle people. Findings of the study indicated that there were more direct and personal approaches in communicating with farmers when the institution was still called ISAR. However, after RAB was created, the trend changed and there was emphasis on the use of mass media and new technologies as indicated by the following table.

Table 4: Approaches that RAB mostly uses to communicate to farmers

Mass media	Middle people	Other tools
Radio	Extensionists	Leaflets
TV	Communication officer	Flyers
Newspapers	Librarian	Brochures
Internet and website	Local leaders	Booklets
Magazine		
Books and journals		
Conferences and workshops		
Telephones		

Source: *Primary data*

In line with the above scenario, the literature and conceptual framework highlighted the fact that mass media are not always effective in communicating development messages. Studies indicated that while communicating for development, more attention needs to be given to creating the pre-conditions of voice through raising awareness and building confidence and capacity to speak out. They pointed out that when one wants to effect long term change in people's attitudes and practices, there is a need for more face-to-face support and training (UNDP, 2010). UNDP (2010) also confirmed the paramount importance of traditional communication mechanisms to poorer groups and suggested that new information and communication technologies should not supplant traditional information channels such as village and church meetings to poorer groups.

The findings of the study together with literature and the conceptual framework confirm that although mass media and new technologies might be good tools to create awareness, they are not the best options when trying to effect long term effects. The reliance on these tools while communicating agricultural research results to farmers at RAB, therefore, contributed to rendering the communication less effective. In situations like the one of RAB, where uneducated and poor farmers are involved more personal and face-to-face encounters could yield better results.

6.2.4 Failure to understand the context of interactants can lead to ineffective communication

The findings of the study indicated that the communication of agricultural research results to farmers by Rwanda Agriculture Board happened in a context that stakeholders did not understand clearly in order to ensure effective communication. Lum (2016) as well as the Transactional Model of Communication emphasise the

importance of understanding the context in a human communication encounter. They clarify that failure to understand and consider the communicational context that characterise the encounter will always lead to the failure in getting one's messages across. The study revealed that each of the main parties in the communication of agricultural research results by RAB (RAB staff and farmers) would blame the other of acting or behaving in a way that hindered effective communication. Findings indicated that most of the blames were linked to prejudices; cultural and historical backgrounds as well as certain unique but undiscovered preferences on the side of RAB staff or farmers. This would hinder proper understanding and interpretation of certain messages, behaviours or practices.

On the one hand, researchers believed that farmers could not contribute anything to their studies since most of them were not educated and only practised agriculture as they inherited from their ancestors. RAB researchers thought that farmers needed people who could think on their behalf and give them verified information. On the other hand, farmers would see researchers as government envoys, pursuing their own interests and bringing to farmers a set of instructions that they had to agree with.

Findings revealed that RAB staff were used to communicating with other researchers and policymakers capable of understanding research reports. Researchers found it challenging to communicate with farmers who, as researchers said, would base on their backgrounds and cultures and misunderstand or misinterpret researchers' messages. RAB staff would sometimes assume that farmers understood or agreed with certain practices whereas it was the opposite or they would simply force farmers to do things they were not supportive of. Farmers would pretend to agree with RAB staff, just to please them, but would adopt different practices when they were alone.

Contrary to the researchers' assumptions that farmers would agree with and practice whatever RAB was sending them, the Active Audience/Reception Theory explains that audiences do not just absorb everything they are told but are actually involved, sometimes unconsciously, in making sense of any given message as it relates to them in their own personal contexts. People may interpret a message a certain way just from their own cultural background differently from someone else with a completely different background (Maroder *et al.,* 2013). Similarly, farmers would interpret RAB messages differently from researchers' expectations and would simply act basing on their own cultural background and since researchers had not studied the farmers' contexts properly, this would originate challenges in the communication.

Findings of the study also indicated that RAB staff had negative attitudes towards farmers. They would consider farmers as people without knowledge about their careers and this would prevent them from consulting and involving farmers in research activities. Farmers' knowledge was also not considered very important by researchers and was therefore not tapped in agricultural research endeavours. This would make farmers unhappy and think that researchers were not there to solve their problems.

According to the Transactional Model of Communication, understanding different aspects of the context that shapes the communication encounter is key to the effectiveness of the communication. Communicators must account for contextual influences that can affect the encounters. The transaction model, therefore, considers how social, relational, and cultural contexts frame and influence our communication encounters (The Saylor Foundation, 2016).

The relationship between RAB staff and farmers vis-à-vis the context that characterised their encounter showed that their communication was not effective and that it negatively affected the way farmers interpreted and used the information that was communicated to them. This situation would have been prevented by carefully taking time to understand the context farmers lived in, their culture, their values and their knowledge, and trying to take them into consideration in all encounters.

6.2.5 Lack of farmers' engagement, conscientization and empowerment leads to ineffective communication

The findings of the study revealed that while farmers were already disempowered by the fact that there was power imbalance between them and RAB staff, the communication that was used in their encounter with researchers and extensionists was disempowering them even more. Farmers demonstrated lack of concern, interest and trust in agricultural research results from RAB and this negatively affected the uptake of agricultural research information.

RAB staff had some suggestions towards a better communication with farmers. However, even the suggestions that they had were all geared towards bettering the information that farmers were supposed to receive and bettering the way this information was supposed to reach farmers by maximising the use of mass media and new technologies. There was nothing in line with engaging and involving farmers. There was no suggestion to make farmers critically conscious about their situation as important and capable farmers. There was no plan to empower farmers to understand and define their problems and actively participate in finding solutions to their problems. The existing communication practices were characteristic of ineffective

communication and plans that were envisaged to better the situation were also not in line with engaging and empowering farmers.

The literature and conceptual framework looked at lack of engagement and empowerment in agricultural communication as an instance of ineffective communication. They emphasised the need for communication for empowerment while communicating development issues. Msibi and Penzhorn (2010) explained that in terms of power relations, encounters between researchers and farmers were characterised by power imbalance, a characteristic of ineffective communication which could be solved by participatory communication approach. While explaining the importance of participatory approach in situations of power imbalance, Msibi and Penzhorn (2010) posited that participatory communication would help to explore how farmers were given the opportunity to set their own goals and take their own decisions, awakening their latent abilities by offering them choices to enable them to fully develop their potential. These scholars also explained that participatory communication approach helped to explore how farmers contributed their knowledge; how their indigenous knowledge was used; how farmers were listened to; how their attitudes were treated and respected as well as how they were trusted by researchers.

Servaes and Malikhao (2005); Freire (1973); Berrigan (1977, 1979); Rogers (1976); Searveas (2008), and Ali and Sonderling (2017) also studied how disempowered people could be handled in communication initiatives. They all suggested participatory communication as a solution. They looked at dialogical pedagogy as well as ideas of access, participation and self-management as being part of participatory communication approach. As they indicated, here, the public exercises

the power of decision making and is also fully involved in the formulation of policies and plans.

Basing on Freire's liberating pedagogy as well as Freire's theory of conscientization (Freire, 1973), rather than communicating the correct or relevant information to specific audiences, engagement and empowerment communication is about articulating processes of collective action and reflection by relevant stakeholders. The centre of attention is the empowerment of citizens by their active involvement in the identification of problems, development of solutions and implementation of strategies.

In line with the importance of community engagement, McCloskey *et al.*, (2011, pp. 8-10) identified nine areas in which community engagement made a positive impact and outlined the corresponding benefits. Although McCloskey and his collaborators focused on project development, the areas and benefits they indicated also suit well agricultural research generation and communication by RAB. The following is an adaptation of the areas and benefits in agricultural research generation and communication by RAB:

a. *Agenda* - Engagement of farmers can change the choice and focus of research topics, how they are initiated, and their potential to obtain funding. New areas for collaboration can be identified, and funding that requires farmer engagement can become accessible.

b. *Design and delivery* - Improvements to design of the researches, tools, interventions, representation/participation of farmers, data collection and analysis, findings and their communication. New interventions or previously

unappreciated causal links can be identified through the farmers' knowledge of local circumstances. Ownership and uptake can be enhanced.

c. *Implementation and change* - Improvements can be made in the way research findings are used to bring about change (e.g., through new or improved services to farmers, new ways for farmer engagement, or transformation of farming practices), and capacity for change and long-term partnerships between researchers and farmers can be expanded.

d. *Ethics* - Engagement creates opportunities to improve the farmer consent process, identify ethical pitfalls, and create processes for resolving ethical problems related working with farmers that may arise.

e. *Farmers involved in the research process* - The knowledge and skills of the farmers involved in agricultural research process can be enhanced, and farmers' contributions can be recognized. These efforts foster goodwill and help lay the groundwork for more collaboration with farmers.

f. *Other researchers* - Other researchers can gain enhanced understanding of the issue under study and appreciation of the role and value of farmers' involvement. In addition, new insights into the relevance of agricultural research and the various benefits to be gained from it can result in increased opportunities to disseminate its findings and their wider use.

g. *Individual research participants* - Improvements in the way studies are carried out can make it easier to participate in them and bring benefits to participants – farmers being one of the participants in research.

h. *Farmers' organizations* - These organizations can gain enhanced knowledge, a higher profile in farmers, more linkages with other farmers and entities, and new organizational capacity. These benefits can create goodwill and help lay the groundwork for more collaboration between researchers and farmers.

i. *Farmers in general* - Farmers in general are likely to be more receptive to the research and reap greater benefits from it.

The findings of the study together with the arguments of scholars in the field of communication showed the way Rwanda Agriculture Board communicated agricultural results to farmers made them disempowered and prevented them from up-taking agricultural research information. The study indicated that Rwanda Agriculture Board needed much more than getting verified information and instructions to be sent to farmers using various media and new technologies. The way communication was done was only making farmers more passive and unable to own and utilise agricultural research findings. It was characteristic of ineffective communication. Farmers needed critical consciousness about their situations as important and capable actors. They needed to be engaged through conscientization to understand their problems and get involved in finding solutions.

6.2.6 Ignorance of farmers' indigenous knowledge led to lack of farmers' uptake

Findings showed that farmers' own knowledge about their situation and farming practices was ignored by RAB staff. Findings also indicated that whenever farmers would realise that their knowledge is ignored, they would get unhappy and reluctant to abide by RAB instructions. Farmers showed instances of when their indigenous knowledge was ignored and they faced problems. They indicated cases where they were told to plant crops in areas where they knew that those crops would not grow

and ended up not getting good yield. They also indicated that for practices against their indigenous knowledge, they would pretend to agree with RAB staff and implement instructions when staff are around, but continue their usual and traditional practices in hidden plots, and whenever they are not controlled.

Literature and conceptual framework indicate that the challenge of leaving out the indigenous knowledge is overcome by using the participatory communication approach. While explaining how participatory communication approach helped in the communication of agricultural information to farmers, Msibi and Penzhorn (2010) emphasised that this communication helped explore how the communication of agricultural results to farmers develops esteem and self-confidence in farmers, providing a context for the recognition of their knowledge and abilities. This communication approach helped to explore how farmers contributed their knowledge and how their indigenous knowledge was used. Participatory communication also aided in finding out how farmers were listened to; how their attitudes were treated and respected as well as how they were trusted by researchers.

6.3 Summary

This chapter is about the key lessons that the researcher drew from the study after comparing the literature, conceptual framework, research objectives and questions as well as the findings of the study. The findings of the study, literature and conceptual framework confirmed that the communication of agricultural research results to farmers by Rwanda Agriculture Board was not effective. This led to the disempowerment of farmers and lack of farmers' uptake of agricultural research results, and could have contributed to the poor performance of agricultural sector in Rwanda.

The findings of the study indicated that there was a confusion of agricultural communication and agricultural extension at RAB. This institution did not have a communication department and the function of communication was assumed by an extensionist. It was believed that everything to do with communication would be done by extensionists but the reality proved the contrary. The literature review, as well as the conceptual framework also confirmed that it was not effective to take extension as synonymous with communication.

Findings also indicated that the communication of agricultural research results to farmers at Rwanda Agricultural Board always followed a top-down approach. This was done in form of taking instructions to farmers that they had to agree with. This would not allow farmers to participate and their ideas were not taken into consideration. Literature and conceptual framework also highlighted the dangers of the sole use of top-down approach in development communication.

Findings of the study also indicated that the communication of agricultural research results to farmers by Rwanda Agriculture Board was characterised by over-reliance on mass media and new technologies. Although RAB staff said that they wanted farmers to embrace the new era of communication and new technologies, farmers found the trend not helpful to them. Farmers indicated that they needed more personal engagement and face-to-face interactions. The literature and conceptual framework also confirmed that in communicating for development and social change, especially in rural and poor settings, mass media alone do not yield good results.

Findings also indicated that the communication of agricultural research results to farmers by Rwanda Agriculture Board was characterised by failure to understand the socioeconomic, historical and cultural context of interactants. It was realised that

researchers and extensionists had difficulties understanding certain practices and behaviours of farmers which were linked to farmers' socioeconomic, cultural and historical context. This would make RAB staff fail to effectively render certain messages or ensure that certain messages were properly digested. In this regard, literature and conceptual framework also emphasised the importance of understanding and taking into consideration the socioeconomic, historical and cultural context of communicators during development communication initiatives.

Findings also showed that the communication that was used to reach out farmers was making them more disempowered. It did not make farmers critically conscious of their own situations and to empower them to understand their problems and contribute to finding solutions. It was realised that most of the endeavours that RAB had undertaken or was planning to undertake were geared towards bettering the quality of information and messages they were supposed to take to farmers, as well as diversifying channels used to transfer those messages to farmers. There was little or no effort to devise mechanisms to engage farmers in understanding and defining their own problems and in meaningfully involving them in solving those problems.

Finally, findings indicated that farmers' indigenous knowledge was not taken into consideration by researchers. This would make farmers feel unhappy and reluctant to accept researchers' messages that they called instructions. In this regard, literature and conceptual framework underlined the importance of considering farmers' indigenous knowledge in order to develop esteem and self-confidence in farmers. Participatory communication approach can therefore allow farmers to contribute their knowledge. It can also allow farmers to be listened to, get their attitudes understood and respected, and get some level of trust from researchers.

CHAPTER SEVEN

GENERAL CONCLUSIONS AND RECOMMENDATIONS

7.1 General Conclusions

The study "Community Engagement on Scientific Research: The Process of Communicating Agricultural Research Results to Farmers by the Rwanda Agriculture Board" was undertaken to find out how agricultural research results are communicated to farmers in Rwanda, taking Rwanda Agriculture Board (RAB), the leading agricultural research institution, coordinating agricultural research in Rwanda, as the case for the study. It looked at how researchers, extentionists and farmers related during the communication of agricultural research results.

The study was geared towards describing this communication (first research question), finding out how farmers made sense of the RAB communication initiatives (second research question) and measures that could be taken to better that communication of agricultural research results at RAB (third research question). To be able to find answers to the research questions the study adopted a relativist ontology and interpretive epistemology. It heavily borrowed from the qualitative approach and narrative research methodology with interviews and Focus Group Discussions as the tools that were used to generate data from purposively selected RAB staff and farmers. The following answers were obtained:

Fist research question - How does Rwanda Agriculture Board communicate agricultural research results to farmers? The study revealed that RAB staff would originate all agricultural, farming-related pieces of information that they believed that farmers needed and were supposed to accept. These pieces of information would be disseminated mainly through mass media, technological devices and limited face-to-

face initiatives. This process would take place in a context that was never analysed and understood, and which would prevent farmers from getting and up taking messages.

Second research question - How do farmers working with Rwanda Agriculture Board (RAB) make sense of RAB communication initiatives relating to research findings? Farmers looked at messages from RAB as instructions which were not different from instructions from local leaders. They felt that their views were made too inferior and not considered by RAB. Farmers expressed dissatisfaction with the way agricultural research results were communicated to them. They suggested that there was a need to meaningfully involve and empower farmers by carefully taking into account their context and considering their indigenous knowledge. Farmers said that the mediated communication that RAB used was not helpful to poor farmers. They said that the situation before RAB, when the institution was still ISAR was better because there were several instances of face-to-face encounters with researchers. Farmers said that during that time they would meet people who would listen to their problems and answer their questions.

The study revealed that Rwanda Agriculture Board relied on agricultural extension as the communication that was supposed to help the institution to realise its communicational goals. All internal and external communication functions were assumed by extension workers that were also referred to as extensionists. Extensionists were charged with reducing the gap between agricultural research and farmers' uptake by ensuring that agricultural research results were effectively communicated to farmers but they kept the traditional understanding of "extension" which mainly consisted in distributing seeds, fertilisers and domestic animals.

Rwanda Agricultural Board always followed a top-down approach in all communication activities. All agricultural research topics would come from RAB and all agricultural research information would come from RAB researchers, be passed on to RAB extensionists, who at their turn would take it to farmers. Most messages would reach farmers in form of instructions that farmers had to agree with. Researchers would sometimes go to farmers directly when they wanted to test their results in farmers' fields.

While communicating agriculture research results, Rwanda Agriculture Board often used mass media and new technologies. RAB staff encouraged farmers to embrace the new era of communication and new technologies. However, farmers found the trend not very helpful to them and needed more personal engagement and face-to-face interactions. RAB stopped using some personal and face-to-face initiatives that were used by its predecessor, ISAR.

In their communication to farmers, RAB staff did not take into consideration the socioeconomic, historical and cultural context of farmers. They also ignored the farmers' knowledge. This would make RAB staff fail to effectively render certain messages or ensure that certain messages are properly digested. They would assume that farmers had agreed with them whereas farmers had other unexpressed interpretations. They would then get unintended results.

Generally, the process of communicating agricultural research results by Rwanda Agriculture Board made farmers more disempowered. It did not make farmers critically conscious of their own situations, and it did not empower them to understand their problems and contribute to finding solutions. Even the suggestions that RAB staff had towards bettering the communication with farmers were only

geared towards bettering the quality of information and messages they were supposed to take to farmers, as well as diversifying channels used to transfer those messages to farmers. There was little effort to devise mechanisms to engage farmers in understanding and defining their own problems and in involving farmers in solving those problems.

The study therefore confirmed that there was ineffective communication of agricultural research results to farmers by Rwanda Agriculture Board, which lead to lack of farmers' uptake of agricultural research information, and therefore, may have contributed to the poor performance of the agricultural sector in Rwanda.

7.2 Recommendations

The study indicated that the communication of agricultural research results to farmers at Rwanda Agricultural Board was not done in a way that engaged and empowered farmers. Therefore, farmers did not uptake agricultural research results appropriately. Since Rwanda Agricultural Board was a leading institution in Rwanda in agricultural research, which also coordinated agricultural research in Rwanda, ineffective communication of agricultural research results to farmers at RAB could have led to ineffective communication of agricultural research results in Rwanda in general, and this may also have contributed to the poor performance of the agricultural sector in Rwanda. Against this undesirable situation, the study formulated the following recommendations (which also served as answers to *the third research question - What can Rwanda Agriculture Board do to improve the communication of research findings to farmers?):*

- This study recommended that RAB should adopt the transactional model of communication, with farmers and RAB staff being treated as important

interactants, and taking into consideration the context of farmers and engaging them in all stages of research and aiming at empowering them to understand their situation and participate in solving their own problems.

- This study also recommended that RAB should treat communication as an important function instead of taking it as a secondary task that could be performed by extensionists. RAB should create a department in charge of communication, with staff spearheading the communication at RAB including the communication with farmers. RAB should train its researchers and extensionists on participatory communication in general and farmers' engagement and empowerment in particular.

- RAB researchers and extensionists were also recommended to consider farmers' indigenous knowledge in their agricultural research initiatives. They were recommended to allow farmers to give ideas on issues of their concern in order for them to own and uptake research results.

- RAB staff were also recommended to adopt the use of more interpersonal and face-to-face mechanisms for farmers in general and for uneducated and poor farmers in particular.

7.3 Suggestion for Future Research

Since this study focused only on Rwanda Agriculture Board, Southern Agricultural Zone, it recommended that further studies be carried out in other Agricultural Zones to see whether there were any similarities in the findings. Besides, this study only looked at the communication of agricultural research results. It, therefore, also recommended that further studies be carried out on how research results in other areas

were communicated to the needy people in Rwanda. The study also holistically looked at the process of communicating agricultural research results by RAB, taking into consideration all the elements such as researchers (source), agricultural research results (message), approaches and methods used to communicate research results (channels) and farmers (receiver). It then indicated a need to study the elements of the process of communication, for example, reassessing the choice and use of media and technologies such as radio and telephone and the way they are used to suit farmers' context and interests.

REFERENCES

Abubakar, B. Z., Ango, A. K., Buhari, U. (2009). The Roles of Mass Media in Disseminating Agricultural Information to Farmers in Birnin Kebbi Local Government Area of Kebbi State: A Case Study of State Fadama II Development Project. *Journal of Agricultural extension*. 13 (2), 42-54

Adom, D., Yeboah, A., and Ankrah, A. K. (2016). Constructivism Philosophical Paradigm: Implication for Research, Teaching and Learning. *Global Journal of Arts Humanities and Social Sciences*, *10* (4), 1-9.

Ahmed, S.M., and Palermo, A.G.S., (2010) Community Engagement in Research: Frameworks for Education and Peer Review. *American Journal of Public Health*, 2010, 100 (8), 1380-1387

Ali, A.C., and Sonderling, S. (2017). Factors Affecting Participatory Communication for Development: The Case of a Local Development Organization in Ethiopia. *Malaysian Journal of Communication, 33* (1), 80-97.

Alliance for Sustainability and Prosperity, (2013). *Toward a New Development Paradigm*. Retrieved from http://www.asap4all.com/toward-a-new-development-paradigm/

Anandajayasekeram, P., Puskur, R., & Workneh, S., and Hoekstra, D. (2008). *Concepts and practices in agricultural extension in developing countries: A source book*. Addis Ababa, Ethiopia: IFPRI (International Food Policy Research Institute) Washington, DC, USA, and ILRI (International Livestock Research Institute), Nairobi, Kenya.

Baran, S. J., & Davis, D. K. (2011). *Mass communication theory: foundations, ferment, and future.* Belmont, California. Wadsworth Pub. Co.

Bellù, L. G., (2011). *Development and Development Paradigms: A (Reasoned) Review of Prevailing Visions*. Rome: Food and Agriculture Organization of the United Nations (FAO)

Boston University, School of Public Health (2018) Diffusion of Innovation Theory. Retrieved from http://sphweb.bumc.bu.edu/otlt/MPH-Modules/SB/BehavioralChangeTheories/BehavioralChangeTheories4.html

Butera, V., Shyaka, J. G., and Habimana, D., (2012). Essay of Causes analysis of low level of Scientific Research in Higher Learning and Research Institutions in Rwanda. *East African Journal of Science and Technology,* 2012; 2(1):54-82 Retrieved from http://www.eajscience.com

Calhoun, C. (2011). Communication as Social Science (And More). *International Journal of Communication*. Retrieved from https://www.mcgill.ca/ahcs/files/ahcs/communication_as_social_science_and_more.pdf

Callon, M., Law, J., & Rip, A. (Eds.). (1986). *Mapping the dynamic of science and technology: Sociology of science in the Real World*. London: Macmillan.

Cape Peninsula University of Technology, (2012). Research Uptake and Research Uptake Management: Discussion Paper. Office of the DVC Research, Technology Innovation and Partnerships, Cape Peninsula University of Technology. Retrieved from https://www.cput.ac.za/storage/research/research_uptake_discussion_paper.pdf

Chandler, D. (2014). *The Transmission Model of Communication*. Retrieved from http://visual-memory.co.uk/daniel/Documents/short/trans.html

Conservation Ontario (2012). *Working Together: Protecting Natural Resources & Their Functions.* Retrieved from www.conservationhalton.ca/uploads/iwm_101_municipal_version_with_logo.pdf

Creative Commons (2018). A Primer on Communication Studies. Retrieved from https://2012books.lardbucket.org/books/a-primer-on-communication-studies/s01-02-the-communication-process.html

Creswell, J.W. (2014). *Research design: qualitative, quantitative, and mixed methods approaches* - 4th ed. London: SAGE Publications.

Darnhofer, I., Gibbon, D., and Dedieu, B. (2012) *Farming Systems Research into the 21st Century: The New Dynamic*. Netherlands: Springer

Denzin, N. K., & Lincoln, Y. S. (1994). *Handbook of Qualitative Research*. London: Sage.

Development Research Uptake in Sub-Saharan Africa (DRUSSA), (2012). Uptake of drug abuse research: Rwanda`s success story. Retrieved from http://www.drussa.net/index.php?option=com_content&view=article&id=1514%3Auptake-of-drug-abuse-research-rwandas-success-story&catid=209%3Aits-happening-here&Itemid=307&lang=en

Development Research Uptake in Sub-Saharan Africa (DRUSSA), (2013). *What is Research Uptake?* Retrieved from http://tiny.cc/1n4p3w

DeVito, J. A. (2012). *Human communication: the basic course.* Boston: Pearson Education, Inc

Diao, X., Bahiigwa, G., and Pradesha, A., (2014). The Role of Agriculture in the Fast-Growing Rwandan Economy: Assessing Growth Alternatives. The International Food Policy Research Institute (IFPRI). Retrieved from SSRN: https://ssrn.com/abstract=2483996 or http://dx.doi.org/10.2139/ssrn.2483996

Edge, P., Martin, F., Rudgard, S., and Manning, N.T. (2011) Researcher Attitudes and Behaviour Towards the 'Openness' of Research Outputs in Agriculture and Related Fields. Addis Ababa: Coherence in Information for Agricultural Research for Development-CIARD.

Ehsan Kabir. (2015). *Development Communication: Theories, Means and Methods.* Retrieved from *http://www.academia.edu/8054246/Development_Communication_Theories_Means_and_Methods*

Ellis, R., and McClintock, A. (1990) *You Take My Meaning: Theory into Practice in Human Communication.* London: Edward Arnold.

Farrington, J. (1994). *Public sector agricultural extension: Is there life after structural adjustment?* Retrieved from http://goo.gl/TIqUMF

Freire, P. (1973). *Extension or Communication*. New York: The Seabury Press. Retrieved from http://www.seedbed.org/wp-content/uploads/2013/09/Freire-Extension-or-Communication.pdf

Freire, P. (1972a). *Pedagogy of the Oppressed* (M. B. Ramos, Trans.). Harmondsworth, Middlesex: Penguin Education.

Freire, P. (1972b). *Cultural Action for Freedom.* Harmondsworth: Penguin Education.

Fritze, C., (2013). *The Theory of Paulo Freire.* Retrieved from http://www.stclares.ca/pdfs/The%20Theory%20of%20Paulo%20Freire.pdf

Gahakwa, D., Asiimwe, T., Nabahungu, N.L., Mutimura, M., Isibo, T., Mutaganda, A., and Ngaboyisonga, C., (2014) *A Decade of Agricultural Research in Rwanda: Achievements and the Way Forward*. Retrieved from https://link.springer.com/chapter/10.1007%2F978-3-319-07662-1_6

Garud, R., & Karnøe, P. (2001). *Path dependence and creation. London*: Lawrence Erlbaum Associates.

Geels, F. (2002). *Understanding the dynamics of technological transitions. A co-evolutionary and socio-technical analysis*. Enschede: Twente University Press.

Genaro, V. O. (1976). *From the Village to the Medium*. Manila: Communication Foundation for Asia.

Griffin, E. (2012). *A first look at Communication Theory*. New York: McGraw-Hill.

Grix, J. (2004). *The foundations of research*. London: Palgrave Macmillan.

Guba, E. G., & Lincoln, Y. S. (1994). Competing paradigms in qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of Qualitative Research* (pp. 105–117). London: Sage.

Hall, A. (2005). Capacity development for agricultural biotechnology in developing countries: An innovation systems view of what it is and how to develop it. *Journal of International, 17*(5), 611–630.

Hall, A., Bockett, G., Taylor, S., Sivamohan, M. V. K., & Clark, N. (2001). Why research partnerships really matter: Innovation theory, institutional arrangements and implications for developing new technology for the poor. *World Development, 29*(5).

Hall, E. T. (1977). *Beyond Culture*. USA: Anchor Books.

Heron, J., & Reason, P. (1997). A participatory inquiry paradigm. *Qualitative Inquiry, 3*(3), 274–294. Retrieved from http://dx.doi.org/10.1177/107780049700300302

Heylen, M., & Chappell, B. (2008). *Community Engagement Handbook: A Model Framework for Leading Practice in Local Government in South Australia.* South Australia: Local Government Association and the Government of South Australia.

Imoh, G.O., (2013). Application of Development Communication in Africa's Rural Development: Need for a Paradigm Shift. *Global Journal of Arts Humanities and Social Sciences, 1* (4), 15-33.

Inagaka, N. (2007). *Communicating the impact of communication for development: Recent trends in Empirical research.* Washington, DC: World bank

Institute of Policy Analysis and Research (IPAR). (2009). *Rwandan Agriculture Sector Situational Analysis: An IPAR sector review.* Kigali - Rwanda.

Institute of Policy Analysis and Research – Rwanda (IPAR). (2009). *Rwandan agriculture sector situational analysis*. Retrieved from http://tiny.cc/f29v2w

Jwan, J. O., & Ong'ondo, C. (2011). *Qualitative Research: An Introduction to Principles and Techniques*. Eldoret: Moi University Press.

Kalisa, A (2007). *Characterisation of farming systems in southern Rwanda* (Unpublished Bachelor's Dissertation). Huye: National University of Rwanda. Retrieved from

Kaminski, J. (2011). Diffusion of Innovation Theory: Theory in Nursing Informatics Column. *Canadian Journal of Nursing Informatics, 6*(2). Retrieved from http://cjni.net/journal/?p=1444

Kemp, R., A. Rip, & Schot, J. (2001). Constructing transition paths through the management of niches. In R. Garud & P. Karnøe (Eds.), *Path dependence and creation* (pp. 269–299). London: Lawrence Erlbaum Associates.

Kirkland, J., Mouton, J., & Coates, D. (2010). *Communicating Research for Utilisation (CRU). Specialist Professional and Institutional Capacity Building in Sub-Saharan Africa: Final Report of the CRU Scoping Study.* Retrieved from Association of Commonwealth Universities website: http://www.drussa.org/getfile.php?id=1301

Korten, D. (2013). *The Pursuit of Happiness: A New Development Paradigm.* Retrieved from http://davidkorten.org/new-development-paradigm/

Law, J., & Hassard, J. (1999). *Actor Network Theory and after. Blackwell Publishers: The Sociological Review*. Oxford: Malden, MA.

Leeuwis, C. (2010). Changing views of agricultural innovation: implications for communicative intervention and science. In F. G. Palis, G. R. Singleton, & Casimero, Madonna C, and Hardy, Bill (Eds.), *Research to impact: case studies for natural resource management for irrigated rice in Asia* (pp. 15–32). Los Baños (Philippines): International Rice Research Institute.

Leeuwis, C., and Aartsb, N. (2010). *Rethinking communication in innovation processes: creating space for change in Rethinking communication in innovation processes: creating space for change in complex systems*. Retrieved from http://www.researchintouse.com/resources/ext/Changing-views-of-agricultural.pdf

Liu, K.D. (2012) Conscientization and the Cultivation of Conscience. A PhD Thesis in Education, University of Canterbury. Retrieved from https://ir.canterbury.ac.nz/bitstream/handle/10092/7129/FinalcopyforConscientizationandtheCultivationofConscienceinaPDFformat.pdf?sequence=1

Lum, C.M.K. (2016) Using Action English Interculturally. Retrieved from http://course.go2school.com.tw/S90001/

Lundvall, B. A. (1992). *National systems of innovation: towards a theory of innovation and interactive learning*. London: Pinter.

MacDonald, S., & Headlam, N. (2013). *Research Methods Handbook: Introductory guide to research methods for social research.* Manchester: Centre for Local Economic Strategies.

Manuel, W. M. (2014). *Social Marketing in Healthcare*. Retrieved from https://wwww.google.rw/search?q=Manuel+W.+Mah,+Social+Marketing+in+Healthcare&newwindow=1&ei=RgHFVeTjKYuoeuW8jqAO&start=10&sa=N&biw=1366&bih=608

Maroder, T, Milano, T.J., Nickels, C., and O'Donoghue, M. (2013). *Active Audience / Reception Theory: An in depth analysis of Active Audience and the Reception Theory.* Retrieved from https://storify.com/Mike_OD42/active-audience-reception-theory.

Masuki, K. F., Mowo, J, G., Kamugisha, R., Tanui, J., Tukahirwa, J., and Adera, E, O., (2010). *Integrated information and communication technologies for farm-level access to natural resource management information: A case of South Western Uganda*. Kampala: Africa Highland initiative

McCloskey, D. J., Aguilar-Gaxiola, S., Akintobi, T. H., Bonham, A., Cook, J., Coyne-Beasle, T.,…White-Cooper, S.. (2011). *Principles of Community Engagement (Second Edition). USA: Clinical and Translational Science Awards Consortium Community Engagement Key Function Committee Task Force on the Principles of Community Engagement.* Department of Health & Human Services, NIH Publication. Retrieved from https://synergy.dartmouth.edu/sites/default/files/docs/Principles_of_Community_Engagment_NIH_2ndEdition.pdf

Mefalopulos, P. (2008). *Development Communication Sourcebook: Broadening the Boundaries of Communication*. Washington DC: The International Bank for Reconstruction and Development/The World Bank.

Melkote, S. R. (1991). *Communication for Development in the Third World: Theory and Practice*. Newbury Park: Sage.

Ministry of Agriculture and Animal Resources. (2009). *National Agricultural Extension Strategy*. Kigali - Rwanda.

Ministry of Agriculture and Animal Resources. (2009). *National Agricultural Extension Strategy*. Kigali - Rwanda. Retrieved from Ministry of Agriculture and Animal Resources website: http://goo.gl/Tu8o25

Ministry of Education. (2010). *The Ministerial Instructions N°003/2010 of 09/12/2010 regulating research activities in Rwanda*. Kigali - Rwanda.

Ministry of Finance and Economic Planning (MINECOFIN). (2007). *Enquête Intégrale des Conditions de Vie des Ménages (Integrated Living Conditions Survey) (EICV) poverty analysis for Rwanda's Economic Development and Poverty Reduction Strategy*. Kigali - Rwanda.

Msibi, F., and Penzhorn, C. (2010). *Participatory Communication for Local Government in South Africa: a study of the Kungwini Local Municipality.* Information Development. Retrieved from http://tinyurl.com/yc272had

New Charter University (2017). *Different Types of Communication and Channels.* Retrieved from https://web.archive.org/web/20160310233148/https://new.edu/resources/different-types-of-communication-and-channels--5

O'Donoghue, T. (2007). *Planning your qualitative research project: an introduction to interpretivist research in education*. New York: Routledge.

Ogola, P. A. (2015). *Assessing Communication Channels and the Impact of Agricultural Information Used by Farmers in Watermelon Production in Yimbo East Ward, Siaya County*. Masters Thesis: University of Nairobi. Retrieved from http://erepository.uonbi.ac.ke/bitstream/handle/11295/93475/Ogola_Assessing%20communication%20channels%20and%20the%20impact.pdf?sequence=3

Palis, F. G., Singleton, G. R., & Casimero, Madonna C, and Hardy, Bill (Eds.). (2010). *Research to impact: case studies for natural resource management for irrigated rice in Asia*. Los Baños (Philippines): International Rice Research Institute.

Pring, R. (2000). The 'false dualism' of educational research. *Journal of Philosophy of Education, 34*(2), 247–260. Retrieved from http://dx.doi.org/10.1111/1467-9752.00171

Rahi, S. (2017) Research Design and Methods: A Systematic Review of Research Paradigms, Sampling Issues and Instruments Development. *Int J Econ Manag Sci* 6: 403. doi: 10.4172/2162-6359.1000403

Republic of Rwanda. (2005). *The organic law no 20/2005 of 20/10/2005 governing the organization and functioning of higher education*. Kigali - Rwanda.

Republic of Rwanda. (2007). *Economic Development and Poverty Reduction Strategy (EDPRS) 2008-2010*. Kigali - Rwanda.

Republic of Rwanda. (2008). *Vision 2020, in Official Gazette, n° 47 of 25/02/2008*. Kigali - Rwanda.

Republic of Rwanda. (2010). *The Presidential Order n° 51/01 of 13/07/2010 establishing quality standards in higher learning institutions*. Kigali - Rwanda.

Ritchie, J., & Lewis, J. (2003). *Qualitative research practice: A guide for social students and researchers*. London: Sage.

Roberts, P. (2000). Education, Literacy and Humanization: Exploring the Work of Paulo Freire. Westport, Connecticut; London: Bergin & Garvey.

Röling, N. G. (1988). *Extension science: Information systems in agricultural development*. Cambridge: Cambridge University Press.

Rubin, R. B., Rubin, A. M., Haridakis, P. M., & Piele, L. J. (2010). *Communication Research: Strategies and Sources* (7th ed.). Boston: Wadsworth Cengage Learning.

Rwanda Agricultural Board (RAB). (2012). *Annual Report 2011-2012*. Kigali - Rwanda. Retrieved from Rwanda Agricultural Board website: http://www.rab.gov.rw/IMG/pdf/RAB_Annual_Repor_2011-2012.pdf

Rwanda Agricultural Board (RAB). (2013). *Overview of research*. Retrieved from http://www.rab.gov.rw/spip.php?article8

Rwanda Agriculture Board (RAB). (2012). *RAB Citizen Charter*. Retrieved from http://tiny.cc/qjbw2w

Rwanda Development Board (RDB). (2012). *Rwanda Skills Survey Report 2012: Agriculture Sector Report.* Kigali - Rwanda. Retrieved from http://www.lmis.gov.rw/scripts/publication/reports/Agriculture.pdf

Salvador, J.T. (2016). Revisiting the Philosophical Underpinnings of Qualitative Research. *International Education & Research Journal [IERJ], 6* (2), 4-6.

Satyanarayana, S. K. (2007). *Post Graduate Diploma in Agricultural Extension Management (PGDAEM): Communication and Diffusion of Agricultural Innovations. :*. Andhra Pradesh: National Institute of Agricultural Extension Management (An Organization of the Ministry of Agriculture, Government of India).

Scotland, J. (2012). *Exploring the Philosophical Underpinnings of Research: Relating Ontology and Epistemology to the Methodology and Methods of the Scientific, Interpretive, and Critical Research Paradigms*. Qatar: Canadian Centre of Science and Education. Retrieved from http://dx.doi.org/10.5539/elt.v5n9p9

Seale, C. (2000). *The Quality of Qualitative Research*. London: Sage.

Servaes, J. (2008). *Communication for Development and Social Change*. New Delhi: Sage Publications India Pvt Ltd.

Servaes, J., and Malikhao, P. (2005). Participatory communication: the new paradigm? In CLACSO (Ed.), *Media and Global Change. Rethinking communication for development*, pp. 91-103. Buenos Aires: CLACSO. Retrieved from http://biblioteca.clacso.edu.ar/ar/libros/edicion/media/09Chapter5.pdf

Shahzad, M., Islam, F., Umber, S., Khan, I, A., Abdal, M., and Asif Raza. M. (2011). Role of agricultural publications in disseminating agricultural information among farming community of District Faisalabad. *Pakistan Journal of Agricultural Sciences*, 48(3), 221-224

Shannon, C. and Weaver. W. (1949). *The Mathematical Theory of Communication*. Urbana, IL: University of Illinois Press.

Smits, R., Kuhlmann, S. (2004). The rise of systemic instruments in innovation policy. *International Journal of Foresight and Innovation Policy*, *1*, 4–32.

Social Pinpoint (2018). *Community Engagement, Public Participation, Civic Engagement – Let's define these terms.* Retrieved from https://www.socialpinpoint.com/blog/community-engagement-public-participation-civic-engagement-lets-define-these-terms/

The Cape Peninsula University of Technology, (2012). Research Uptake and Research Uptake Management: Discussion Paper. Office of the DVC Research, Technology Innovation and Partnerships, Cape Peninsula University of Technology. Retrieved from https://www.cput.ac.za/storage/research/research_uptake_discussion_paper.pdf

The Royal Government of Bhutan. (2013). *Happiness: Towards a New Development Paradigm.* Report of the Kingdom of Bhutan. Retrieved from http://www.newdevelopmentparadigm.bt/wp-content/uploads/2014/10/HappinessTowardsANewDevelopmentParadigm.pdf

Tufte, T. and Mefalopulos, P. (2009). *Participatory Communication: A Practical Guide*. Washington, D.C.: The International Bank for Reconstruction and Development / The World Bank. Retrieved from http://siteresources.worldbank.org/EXTDEVCOMMENG/Resources/Participatorycommunication.pdf

United Kingdom Agency for International Development (UKAID). (2013). *Research Uptake: A Guide for DFID-Funded Research Programmes*. Retrieved from http://www.researchtoaction.org/2013/09/research-uptake-a-guide-for-dfid-funded-research-programmes/

United Nations Development Programme (UNDP). (2011). *Human Development Report 2011*. New York. Retrieved from United Nations Development Programme website: http://www.undp.org/content/undp/en/home/librarypage/hdr/human_developmentreport2011.html

United Nations Development Programme (UNDP). (2010). *Communication for Empowerment in Nepal: An assessment of communication and media needs among indigenous peoples*. Bangkok: UNDP. Retrieved from http://www.undp.org/content/dam/nepal/docs/reports/governance/UNDP_NP_Communication%20for%20Empowerment%20in%20Nepal.pdf

United Nations Development Programme (UNDP) Oslo Governance Centre & Communication for Social Change Consortium, (2010). *Communication for Empowerment*. Global Report. Oslo (Norway) & South Orange (USA). Retrieved from http://www.communicationforsocialchange.org/pdfs/c4e-globalreport-june2010.pdf#page=1&zoom=auto,-99,798

United States Agency for International Development (USAID) project "Modernizing Extension and Advisory Services" (MEAS) (2011). *Comprehensive Assessment of Extension Services in Rwanda*. USAID. Retrieved from https://agrilinks.org/sites/default/files/resource/files/MEAS%20Country%20Report%20RWANDA%20-%20May%202011.pdf

Van de Fliert, E. (2010). Keynote Paper Participatory communication in rural development: What does it take for the established order? *Extension Farming Systems Journal*. 6(1), 95-99. Retrieved from http://www.csu.edu.au/faculty/science/saws/afbmnetwork/efsjournal/index.htm

Wilkins, K. G., Straubhaar J. D., and Kumaar S. (2014). *Global Communication: New Agendas in Communication.* New York: Routledge

Yusuf, M. K. and Liman, A. (2015) "Virtual Cultural Resonance" as an Evidence for "Media Effect by Consent": Notes on Media Audience Theories and Proposing New Communication Model. *The International Journal of Humanities & Social Studies*, 11 (3), 91-95

APPENDICES

Appendix 1: Data Collection Tools

A. INTERVIEW GUIDE (RESEARCHERS)

Interview with researchers at the Rwanda Agriculture Board was guided by the following broad questions. They were meant to allow researchers to freely express themselves and elaborate on their work as researchers in the agricultural sector:

1. Please share with me what you do in your agricultural research.
2. Who are the beneficiaries of your research and how do you relate to them?
3. Would you like to talk about the channels of communication that you use in communicating research results and how you go about them?
4. How do you ensure that the communication of research results to your beneficiaries is effective?
5. Talk about any challenges you face while communicating your research findings to beneficiaries, how you deal with them and what you think can be done to improve the communication of your research findings to beneficiaries.

Note: These questions were supplemented by probing questions that would depend on provided answers.

B. INTERVIEW GUIDE (EXTENSIONISTS)

Interview with extensionists at the Rwanda Agriculture Board was guided by the following broad questions. They were meant to allow these extentionists to freely express themselves and elaborate on their work in the agricultural sector:

1. Tell me about your day to day work with farmers
2. Would you like to talk about the channels of communication that you use in communicating research results and how you go about them.
3. How would you rate your communication with farmers?
4. Talk about any challenges you face while communicating your research findings to beneficiaries, how you deal with them and what you think can be done to improve the communication of your research findings to beneficiaries.

Note: These questions were supplemented by probing questions that would depend on provided answers.

C. INTERVIEW GUIDE (LIBRARIAN)

Interview with the Librarian at the Rwanda Agriculture Board Library was guided by the following broad questions. They were meant to allow the librarian to freely express himself and elaborate on his daily work:

1. Please talk about your daily work as a librarian?

2. Who are the beneficiaries of your library and how do you relate to them?

3. To what extent do you think farmers access the research findings and documents/information in your library?

4. Talk about any challenges you face while communicating your research findings to beneficiaries, how you deal with them and what you think can be done to improve the communication of your research findings to beneficiaries

Note: These questions were supplemented by probing questions that would depend on provided answers.

D. FOCUS GROUP DISCUSSION GUIDE (FARMERS)

The discussions with farmers was held in Kinyarwanda because most farmers in Rwanda do not speak English. However, the discussions was translated in English for the readers of the report to follow everything about the study. They were guided by the following broad questions:

1. Let's talk about your day to day work and how it relates to the agricultural research that is carried out by Rwanda Agricultural Board (RAB)

[Nimunganirize ku bikorwa byanyu bya buri munsi n'aho bihurira n'ubushakashatsi ku bijyanye n'ubuhinzi n'ubworozi bikorwa n'ikigo gishinzwe ubushakashatsi mu by'ubuhinzi n'ubworozi cyitwa RAB]

2. Please talk about channels that RAB use to communicate research findings to you and how they go about them.

[Nimuvuge ku miyoboro/uburyo ikigo RAB gikoresha mu kubagezaho ibyavuye mu bushakashatsi gikora mumbwire n'uko babikora]

3. Talk about any challenges you face while looking for information about agricultural research findings, how you deal with them and what you think can be done to improve the way RAB communicates research findings to you.

[Nimuvuge ku mbogamizi muhura na zo igihe mushakisha amakuru ajyanye n'ubushakashatsi ku buhinzi n'ubworozi, uko mubyitwaramo, n'icyo mutekereza cyakorwa kugirango itangazabumenyi ku bushakashatsi bukorwa n'ikigo RAB ku buhinzi n'ubworozi ribakorerwe neza kurushaho]

Note: These questions were supplemented by probing questions that would depend on provided answers.

Appendix 2: Sample Interview and FGD Transcripts

A. INTERVIEW TRANSRIPT - RAB RESEARCHER 1

[2nd encounter after the appointment was granted: Introduction of the Data Generator (DG); Talk about the research and re-negotiation of a discussion; Recalling that the DG was allowed to record the conversation just to allow him to get all the issues discussed; Researcher accepts to be recorded again]

Data Generator: You have told me that you are a researcher and that your research focuses on cassava. I would therefore like you to briefly describe for me your research activities in general.

Researcher: Thank you! As I have just said I work in the Rwanda Agriculture Board (RAB) in the Southern Province/ Rubona station. We conduct research on cassava plant. As you know, cassava is a plant which was recommended by the Ministry of Agriculture for the economic revolution program. It is an important plant in the fight against hunger, but it is also one of the income-generating plants. In research, we seek for good seeds, which are productive according to the farmer's wish. The evaluation is done through experiments looking for a plant that is resistant to pathology. That is, the wished qualities on behalf of the farmers. A plant can fall sick as a person does, for instance cassava gets attacked by several pathologies such as Cassava Mosaic Disease and a recent disease named Kabore [a disease causing cassava to rot], both of which being a subject of agricultural failure in productivity. Our most concern is to research for the varieties that are productive in different cassava-producing districts and which can resist against pathologies. Besides, we realize improvements on the cassava harvest, multiplication of the cassava productivity, we organize fields: how to plant, how to fertilize….

Data Generator: Before undertaking research, what motivation do you have to choose the research topic, to choose a given plant for experiments?

Researcher: Our motivation is …….Well, it is obvious that we have different research stations in different zones of the country: South, West, East, and North. But the northern Zone grows less cassava because it does not adequately adapt to the cold climate. But there, RAB deals with other crops such as Irish potatoes, wheat and so on. Everywhere the new variety gets planted in all stations of RAB after an

experiment of two or three years, depending on the time when we have started the experiment, and then we come down for experiment in the farmer's fields. When farmers have appreciated the variety, the variety is taken for multiplication and distribution to all people. After experiment in the garden, the variety is taken out to farmers and farmers may help us to appreciate it.

Data Generator: After experiment in the farmers' fields, does it often happen to go back to investigate how much the farmers have appreciated the variety?

Researcher: Distribution is the last step. We go for distribution after all steps have been concluded. After seeing how it can resist to diseases, carrying the variety to the farmers for planting is the last step. For experiment, we take about t four or five varieties in all stations such as Ruhango, Bugesera, Nyagatare to see whether the variety is healthy and productive in all places. Some varieties are resistant to pathologies in Ruhango while others are resistant to pathologies in Nyagatare. Taking such varieties to farmers for experiments aims at searching for a type that fits with every type of soil. We take different varieties and during the experiments we try to find how each variety behaves in different types of soil. The farmers, who have accommodated the experimentation in their fields, report about the state of behaviors in their fields. Maybe one variety is the most prosperous in one place, maybe, less productive in another. Productivity may be different in several types of soil. The farmers help us choose the varieties according to their different behaviors in different types of soil. They watch how a variety is healthy, how it is resistant to pathologies, and how it is productive. After all this, the variety is taken for multiplication and finally for distribution.

Data Generator: When you give a variety for distribution, do you oblige the farmers to abandon the previous varieties, telling them that the previous variety was attacked by pathologies? Do you ask them to stop planting the old variety and adopt a new one in the purpose to avoid association of the new variety with old variety? I think it may happen that the new healthy, resistant and prosperous variety may be associated with the old, vulnerable and infected variety, and then the new and safe variety may end up being also infected, which might cause less quality and quantity in production.

Researcher: It does not call for efforts and energy to convince a farmer to take a variety if they have appreciated the quality. The farmer would not hesitate to adopt a variety that can give for example 50 tons per acre and leave aside a variety that used to give only 10 tons per acre. Yu can understand what the farmer can choose. We tell and show them how the old type has been infected and unproductive as the reason why it has to be taken away, that it should not be associated with the new variety so as not to get it infected too. This is part of advice and instructions that we give to farmers in the purpose to raise the productivity. Associating the old infected variety would quickly infect the new one too. Within two or three years it can be infected. But when the farmers have seen that the variety gives more production, they voluntarily grasp it and adopt it.

Data Generator: I am afraid that sometimes the RAB agents may use special fertilizers during the experiments while farmers do not have and can't have access to the same fertilizers. The farmers can see and appreciate the results but when they try to do the same things alone, they may not come up with the same improvement. How do you instruct the farmers?

Researcher: During the experiments, the activities are done according to the capacity of the farmer who accommodates experiments in his/her land. If, for instance, the farmer does not use fertilizers, then we do not use fertilizers. We plant together a variety that is healthy, which is not infected and we do plant it as he does alone. In all this, the farmer practices and observes. Generally, it is not a habit of Rwandans to put fertilizers on cassava. They believe that fertilizers should be used in other plants such as beans, in cereals such as maize, wheat, rice….but that it is not necessary to fertilize potatoes. When our objective is to find out what variety should be adopted, we take the experimentation in the farmers' activities. And the farmers help in taking care of the variety. We harvest both the new variety and the old variety. The farmer will see and compare which variety is better for him/her. However, when we search for the improvement of the productivity, we teach farmers that they have to use fertilizers. But during the experiment we plant the old variety and compare it with the new variety when treated in the same conditions. Then the good seed is remarkable. Then, when a farmer has harvested for example 20 tones, we tell him/her that he/she has to

use the fertilizers in order to harvest 40 tones. But in the experiments we attempt to adopt the conditions of the farmer. The good variety is remarkable by the harvest.

Data Generator: We have talked about pathologies and I have wondered whether it would not be relevant to begin by trying to solve the problems of pathology of our traditional varieties instead of always looking for new varieties which might also end by getting infected.

Researcher: Yes, it is true that the traditional varieties of cassava had been planted since long and their quality was good though they got infected. We do not banish them all. Even in the RAB station we have a conservation germoplasm service where we conserve all the seeds that we have had in Rwanda. We organize a campaign of collecting all crops and we keep them. Thence it is possible to cross them with the new varieties. But also it is a way to conserve them as national patrimony. We only recommend farmers to take away the infected cassava trees but not to abandon any variety. Some good soils such as in Ngororero and Nyamasheke, only a few cassava trees get infected while many others are healthy. So farmers from there are told to remove only the infected trees and leave the healthy ones. But in our program there is a service of conserving all varieties.

Data Generator: Do some farmers bring complaints about the crops, for example the variety of improved cassava commonly known as “imituburano”?

Researcher: That problem occurred when we distributed the new variety in 2003/2004 when the Mosaic virus attacked cassava.

Data Generator: RAB which was still named ISAR hurried to distribute a new variety which was commonly known as “imituburano”.

Researcher: Whenever a new variety is not yet given the name, it is commonly called “imituburano”, but it does not refer to a single variety. At that time there was a famine. But due to the insufficiency of quantity of harvest, both seeds and harvest were urgently needed at the same time. They planted the variety and would cut trees for re-planting them again before cassava got mature. This corrupted the roots/cassava and that was the reason why people complained about the variety. But after they have got enough trees for re-planting, and that they no longer cut the trees before the

cassava are mature, consumers of "Ugali" – [cassava pudding] no longer complain about it. Even the Kinazi Food Processing Factory uses the same cassava. They process very good quality of cassava. I don't know if you have ever tasted it yourself: it is very tasty. At that time there were not enough cassava trees for re-planting. What was to be done, people cut the stems of the young cassava trees and would leave it to grow again, biasing the physiological quality of the roots. The consumers complained a lot that "imituburano" are not good. But that corruption was the result from the fact stated above. But if the plantation is left for two or three years the cassava gets mature and the crop is good. That period was an emergency case, but today the cassava of the same variety is appreciated by the factory owners, the farmers and the consumers.

Data Generator: When the farmers have got a problem, how do you get informed of their complaints?

Researcher: There is a time for the training of farmers, in which we teach farmers how to fight against pathologies, the farming technologies, and the improvement of productivity, fertilizing, chemicals, and we talk about all things in the context of agriculture. Thanks to the new technology of communication, some farmers can call us using their mobile phones. Sometimes they also organize excursions in the research center where they can report all the complaints they have in the village.

Data Generator: But the training or excursions focus on a limited number of participants.

Researcher: Yes, but these are influencing people of the community who may be representing cooperatives and who are aware of the complaints of the farmers. It is not possible to accommodate all farmers of the country. When they come, they get encouraged to work in cooperatives. These have enough information about crop and pathologies that exist in their areas….

Data Generator: Don't you think that a person may be chosen to be the president of the cooperative without having skills, motivation or willingness to share his/her experience with fellow farmers.

Researcher: Apart from the trainings, we go for field works to meet with farmers several times. We have got a direct way of interacting with farmers: in all villages, we

have the social workers that we have trained. You can understand how we can easily communicate with farmers. We also use radio shows on RC-Huye, and Radio Huguka in Muhanga. They have radio shows about cassava, maize …They follow it and they can call asking questions from any place. There we answer several questions.

Data Generator: Is it easy for a farmer to realize his/her dream of visiting the research centre about the cassava experiments? Are they free without applying for that?

Researcher: There is no problem at all. Any person is allowed to come to ask for explanations or for seeds. Everybody is allowed.

Data Generator: Do you give him/her time until he is satisfied?

Researcher: Yes, no problem at all.

Data Generator: Well! Some people are interested in modern farming practices while others are not. Practitioners who are interested always get instructions from RAB. Their fields look nice while other people do not have any idea about what RAB does. I think the objective of RAB is to extend farming technology to all farmers. Which strategies do you intend to use in order to spread the modern agricultural technology until the lowest farmer? I assume that the traditional methods would not lead Rwandans to the desired progress. Here one person is interested, there another person is not. Don't you think that there could be a problem of communication? What do you envisage to extend your findings and persuade all people to use your farming techniques?

Researcher: If a parson is not interested, it is not easy to persuade him/her to use the modern farming technology. To be a practitioner of our techniques, the farmer must be interested. When a person does not need something it is not possible to force him or her to do it. But it is possible to achieve something when an interested person is accompanied by an expert. That question has been raised several times by politicians who have been visiting this station: they have been asking "Why do the farmers in the neighbourhood, for instance at Musasu do not practice the same techniques as here? Why do we have best banana plantations in Kibungo whereby Kibungo farmers plant varieties from here at Rubona station, whereas neighbouring villages do not have

anything? It is not easy to explain. Maybe, it is due to lack of interest. We cannot proceed with the colonizer's methods of using whips and body punishments, harassment, and force….Our activities are benefited by all people, and are for the good of all. We have noticed that many people from the neighbouring villages are employed here as monthly workers, and behave like government monthly-paid officers. They have in mind that they are rather salaried workers than farmers. They help us in experimentation here. They know and practice the farming technology here, but they do not go home and practice their knowledge for themselves. What they count on is only the little monthly pay. On the one hand, that may be the reason why the people in the neighbouring villages do not practice the instructions from RAB. They are the ones who are hired to practice it here: they know to prepare the soil, to fertilize, to plant, to use chemicals…..Fortunately, the Ministry of Agriculture and RAB have initiated another programme named "Twigire Muhinzi" This program is rooted in the village where social workers create small groups of a few members of a least 15-20 members in each cell. It is the responsibility of the social workers to plan for activities in their villages. They can report their challenges such as lack of seeds, chemicals…. They have to submit their needs to the person responsible of the programme at the level of sectors, from the sector to districts, and from the districts to RAB. The structure of "Twigire Muhinzi" aims at generalizing the agricultural technology. The groups in Cells meet at the level of Sector, and groups in Sectors meet at the level of District. That programme is still new, but it is promising. It will help farmers express their feelings, report what they need, and their action plans. Besides, we have social workers who help us, and RAB has got extension officers in each District working in collaboration with Sector and District agronomists. These help in conveying the modern farming technologies to the farmers. The programme of "Twigire Muhinzi" will help a lot in extending the technology to farmers.

Data Generator: Who has the direct contact with the farmers during the extension? Is it the District or Sector agronomist or is it the RAB agent?

Researcher: During the extension, all of them (two District RAB agents together with the District and Sector agronomists) go down together to Cells. They are able to investigate problems that farmers may have about seeds, fertilizers, chemicals, and land consolidation. They have direct collaboration with them, especially at the

beginning of a season; they get information about the needed amount of seeds, and then, we know for example that in Gisagara there is prepared land, a need of such amount of seeds of beans, cassava, maize…

Data Generator: Does the District agronomist know RAB programmes?

Researcher: Yes, all of them help us.

Data Generator: That means that the District and Sector agronomists are also your extensionists.

Researcher: Yes, they are also a channel of communication.

Data Generator: How do you cooperate with other agricultural programmes such as Nkunganire and Tubura? How do you work with them? Some farmers complain that their seeds can be planted only once (in one session) but cannot be planted for the second time (the next season).

Researcher: Agriculture sector has got different stakeholders. These may be NGOs, projects, and so on…operating in different Districts, but I think all stakeholders at the District level meet in Joint Action Development Forums (JADF). Our agents are also members of JADF. They meet with other stakeholders such as Tubura, Nkunganire, together with the Sector and District agronomists. In their cooperation we know what their activities are. Those stakeholders have got also their groups of farmers that they assist. They assist them get seeds and fertilizers. But whatever their activities are, we must complete each other and have the same message to the farmer to avoid controversy, because we are all stakeholders in the agricultural sector. I think they have a capacity to multiply seeds which are provided by RAB.

Data Generator: Are their seeds from RAB?

Researcher: They are from RAB. Concerning the seeds that are planted once and of which derived seeds fail to germinate, this phenomenon may happen to hybrids. Hybrids are genetically modified. They are used in the attempt to maintain the amount of food. Farmers have to be given new seeds each season. This happens only on maize. But the fact is that when they have not been planted in isolation they may be pollinated by other varieties of maize around, if people are given seeds for one season.

As far as the stakeholders are concerned, they distribute seeds that have been tested and certified by RAB.

Data Generator: What do you think when farmers have appreciated a variety and decided to adopt it because they have envied its productivity from your experiments, but when in their attempt to do the same, they come up with failure because they do not have the same fertilizers and chemicals? Don't you show them the way they can get your special fertilizers?

Researcher: Everything about fertilizers and chemicals are in the responsibility of the Ministry of Agriculture. Even the fertilizers that we use are provided by the MINAGRI. From the MINAGRI some stakeholders may win the market of selling seeds and fertilizers. Those can go across the country in all sectors and bring fertilizers and seeds in all sectors and cells. With them, no farmers would need to travel from Gisagara to Rubona centre to ask for fertilizers. That is not in our capacity to move from here take fertilizers in every village. RAB uses the fertilizers that are available in MINAGRI, and the same fertilizers are sold by those agro-dealers. However, some infractions have been committed by some people who were caught selling them in neighbouring countries. This biased our expectations of crop. Though farmers say that we have special fertilizers, this is wrong. We all use fertilizers from MINAGRI.

Data Generator: As I was talking to farmers, some farmers who grew up in Nyamagabe said that there RAB is less known. What do you do to make farmers from different places know about RAB?

Researcher: I do not understand why those farmers said that RAB is not known in Nyamagabe whereas we have got a station there. There is a station at Sigira, very close to Nyungwe forest which deals with the multiplication of potato seeds. Though the station is at Nyamagabe, there are agents there, near the forest dealing with the making of terraces….We have different sites in Nyamagabe, for instance at Kanyirandoli, though there are not many people, but there are sites dealing with wheat and potato seeds….I do not expect our agents to go and reach every person and household.

Data Generator: I did not know that RAB comes down to meet farmers. Do you mean that if I told any farmer that RAB can give seeds it would be possible for him to come and ask for it here? You mean they can come for seeds, training, etc….?

Researcher: Yes, if a person wants to be a seed multiplier, there are instructions. Of course there are requirements for seed multipliers. A person who wishes it will have to apply for it and gets replied. At first, the soil to be used for multiplication must be checked. Then he must apply again to declare the fulfilment of the conditions.

Data Generator: In those conditions, do you impose to have special fertilizers, which is affordable for only a few?

Researcher: Of course, there must be some follow up to see if there would be no further problem that can affect seeds. The person must be registered and have a registration number. But for the ordinary farmers, the follow up is done in their cooperatives. In that channel, it is easy. But monitoring each farmer in privacy is impossible for us, under constraints of money and transport. But through cooperatives we can reach many farmers and assure the follow up. It is very difficult to visit farmers from house to house. But when people are grouped in cooperatives, it is easy. We have cooperatives of rice growers in Cyiri and in Huye. Being in cooperatives makes it easy to bring them seeds, rather than visiting each household.

Data Generator: I have been told that you dislike the technique of mixing up crops.

Researcher: The prohibition of mixing up crops is imposed to the people who have applied for multiplication of seeds. They are not allowed to associate crops. These have to make one single and isolated field and they have to respect instructions.

Data Generator: Is it not good to associate cassava with beans?

Researcher: The cultural association is allowed, but not for seed multipliers. The field of multiplication of seeds must be clean to keep the purity of the variety. But for a simple farmer who struggles for food, cultural association is allowed.

Data Generator: You always carry out the research activities in your daily work and you have time to write down documents. Who is your first beneficiary of your researches?

Researcher: As we have said at the beginning, we do not seek for seeds for ourselves but for the farmers. This means that the farmers are our preliminary beneficiaries. The destination of our findings is the farming population. We carry out research for farmers to fight pathologies or to have better varieties of seeds in the attempt to improve the productivity.

Data Generator: What kind of challenges do you meet with in the attempt to bring the findings of your studies to the farmers or in the attempt to persuade them to adopt your technology? I think it requires certain effort…what may be the challenges in your process of transmission of knowledge?

Researcher: Challenges are many. The invading pathologies are the first concern, when the seed is available. When we have certified the seeds, farmers are encouraged through radios, trainings, etc….to take them. The most zealous farmers get them in time. But for cassava, as we have said above, farmers have proved to be reluctant to abandon their traditional varieties, even though they are infected. That is a challenge. It is not easy to convince them that they should adopt new certified varieties. In fact farmers feel attached to the traditional varieties, but when they get a new variety, more prosperous and resistant than the old, vulnerable and less productive variety, they immediately feel interested in it. Maybe the challenge would be the transport to every place. But…of course we have stakeholders whose contribution is to reach villages and to give advice to farmers.

Data Generator: At what level do farmers have access to enter here for their private experiences?

Researcher: Every farmer is allowed in here. They may be limited by transport from their villages. At the gate, the security does not stop anybody from entering the station.

Data Generator: Sometimes, they have a complaint that scientists do not approve of the cultural association. In which channel can a farmer convey his/her feelings up to the research centre? If the farmers have got an interesting topic of research, in which way can the topic be presented and taken into consideration by researchers? They may even have some topics that are useful and which constitute relevant recommendations for researches. Does that happen to take their suggested topics?

Researcher: The problem is that we have never had such topics, but it would be helpful for us to get them, because we have to respond to the farmers' needs. It has not yet been a habit for farmers to bring their topics in their advantage. For example, it has been done on cultural association and it has been studied in CIAT projects of how to associate beans with….There are many leaflets teaching that there is a good success in cultural association. In leaflets, people are taught how to conserve seeds, fertilizers, chemicals, spacing techniques, etc. But this technique is not allowed for the multipliers of seeds. Cultural association is allowed for food production. But for seed multipliers, cultural association is not allowed at all. Seed multipliers have conditions that they have to plant a single variety in an isolated piece of land. This enables the seed to be pure. But private farmers for food may mix up plants and there is no problem at all.

Data Generator: A farmer might have another topic that is acceptable. Which way can he convey it in here?

Researcher: It can arrive through mentioned channels. In other countries, for instance, topics are gotten from beneficiaries. The topics can be brought by the extensionists who always meet farmers in the fields. When they go for on-farm work, they note the feedback of the trainings. They may come back saying: you want farmer to do that… but contrary, they want such…and such…It is helpful and there is no problem.

Data Generator: Are there any researches carried out to evaluate the effects of the implementation of your technologies?

Researcher: That work is operated by socio-economists. They go to the field, collect people at one place where they can ask several questions about their problems and needs. This has been done by socio-economists of ISAR. It is good because it helps us build our work on the wishes of the farmers, researches that can solve a relevant problem of the farmers.

Data Generator: When you get the results from there, do you sit down and discuss basing on the outcome?

Researcher: Just, it should be done like that. We study to find a solution of the reported problem. Yes it was supposed to be done like that.

Data Generator: What would you recommend for the direct interaction between farmers and RAB? Farmers that I talked to have been telling me: "Please, take our problems to RAB!" My assumption was that they should be having a direct means of communication with RAB.

Researcher: Yes, thanks to the programme entitled "Twigire Muhinzi" [Twigire Muhinzi Mworozi extension model is a national strategy decentralising extension services to the village level (Umudugudu), so as to empower the agricultural promoters living daily with farmers, especially 2500 certified facilitators of Farmer Field School disseminated in the whole country], it is possible to report the feedback even from the Cell level. For instance, the farmers of Mamba in Gisagara can report their wishes or suggestions through Twigire Muhinzi and the suggestions can reach RAB. There are also extensionists who cooperate with agronomists and who collect ideas from down in villages. In each village, there is a group of "Twigire Muhinzi". For example, in Huye, Rusatira, Nyamagabe, etc., people can express their feelings through the same channel of Twigire Muhinzi.

Data Generator: Was that the initiative of RAB?

Researcher: Yes.

Data Generator: Sometimes, the basic instances are resorted to in awakening people towards the implementation of your technology. In an unexpected way, they may rigidly impose orders to eradicate by force the old varieties and adopt the proposed one from RAB, pretending that it is approved by the policy of agriculture. What do you think?

Researcher: It cannot be done like that Twigire Muhinzi Mworozi is a forum where farmers are free to express their understanding. It was created in order to reverse the situation where the instructions used to be top-down. Now the instructions have to be bottom-up. As it used to be, institution had to imagine what beneficiaries needed and to impose solutions but the institutions have to learn about the beneficiaries' needs and work in attempt to solve them. In those groups people feel free to express

themselves about what they need. After that, they send them to the research centre rather than receiving instructions based on researchers' imagination, which is not appreciated by beneficiaries and finally fails.

Data Generator: I would like to thank you very much for having accepted to talk to me. I would also like to request you to allow me to come back to you, maybe in the future, if I realise that I need more information from you about the communication of agricultural research results at RAB.

Researcher: You are most welcome.

B. FGD TRANSCRIPT - FARMERS IN NYARUGENGE VILLAGE, MUSASU FORMER CELL, GIKIRAMBWA NEW CELL, RUSATIRA SECTOR, HUYE DISTRICT, SOUTHERN PROVINCE

[3rd encounter: Greetings; Introduction of the Data Generator (DG); Talk about the research and re-negotiation of a discussion; Recalling that the DG was allowed to record the conversation in the previous encounter, just to allow him to get all the issues discussed]

DG: What is the name of this cell?

Farmer: This cell is called Musasu and we are sitting in Nyarugenge Village….

DG: You said that you are a farmer and that that is why you are carrying manure….. Would you tell me how your day to day farming activities relate to the research activities of RAB?

Farmer: RAB has given us banana plants and taught us how to grow them. It is the reason why I am transporting this manure to my banana plantation. But it does not happen so many times for them to come and talk to us about other research results. They often come for bananas.

DG: What about other crops?

Farmer: RAB people seldom come to teach about other crops. The people who get information about other crops are day workers who work in RAB plots of land. However, they do not come to us and teach farmers how to grow other crops. They have remarkable interest in bananas.

DG: What are the activities in RAB?

Farmer: They conduct researches on plants and animals. With regard to animals, we have some animals provided by RAB. Some have been given cows which are commonly known as "Inka y'Akaguru" - "the track cows" where after producing a calf to a family it must be given to another family. You can understand that RAB has a direct role to play in animal husbandry.

DG: Do they follow up their growing?

Famer: Yes they do. They ensure their follow-up. When there is a problem, the owner has to report it, and a RAB agent comes and check what the problem is, and treats its pathologies.

DG: About the bananas, do they only show how to plant or do they follow up the way you do it to make sure it is being done the right way?

Farmer: RAB agents show us how to prepare the soil. They plant for us and give us conditions of putting some straws around the planted seeds. At that stage, they do not come back. I think there is no more to control except to telling us to put fertilizers in the distance of 60 centimeters from the plant.

DG: In which way do they present to you the findings from the research? For example about bananas…How do you know the new type of bananas and how do you get convinced that such a type of bananas is much more fruitful than the old type, so that you do not hesitate to reject the old type and go for the new one?

Farmer: As you can see, we are neighbouring RAB. We visit them first and see how a type of bananas is grown and what it looks like. For instance, today we are growing "FIA 17 and FIA 25". These are the new types from RAB that we are being encouraged to grow. FIA 25 can yield a bunch of bananas of around eighty (80) kilos. When properly maintained FIA 17 can produce a bunch of 50 kilogrammes. We were then given these varieties and we were requested to follow the way they were planted after appreciating their yields…….RAB people make sure that the product is different from the traditional types of bananas.

DG: Concerning other varieties of FIA species of bananas, did you know about fFIA 1, FIA 2, FIA 3 up to FIA 15 and FIA 17 up to FIA 25…? Did you know why some types were suppressed and how the new types were discovered?

Farmer: Well! We did not know about FIA 1, FIA 2 and so on….Only at the beginning we were given FIA 17 and FIA 25 but in my opinion these are productive. However, they require fertilizers…Although FIA 25 is somehow resistant, when it is not given enough fertilizers, it does not give enough yield. I think that is the reason why they give us cows to produce manure as fertilizer.

DG: Are the cows also a result of research?

Farmers: They give us cows from their experiments. They do not offer cows bought from markets.

DG: How do you appreciate them? Do you like the cows?

Farmers [Chorus]: Who cannot appreciate the cows? They are good and they give us calves, milk and manure. After giving birth the cow must be moved to another family. These cows help in providing manure. Therefore, RAB helps us a great deal.

DG: What about the seeds? Some people complain about seeds that are planted only one time and a farmer has to go back to buy seeds because they do not germinate when planted for the second time…

Farmers [Chorus]: Maybe those are the seeds of other crops of which we have not yet been beneficiaries.

Farmer [Individual]: I have not even experienced that among the neighbours. This is reported from other areas where the seed sellers give seeds, for example maize, which are planted once and cannot germinate when planted for the second time. The next time farmers want to plant maize, they have to go back to the market for seeds. Such seeds are not from RAB. They are provided by other sellers of fertilizers and seeds

DG: Does it mean that you have many other different agricultural extentionists who bring seeds which are not from RAB….?

Farmers: Yes, there is for example Tubura and Nkunganire. Nkunganire deals with the selling of seeds. Whether their seeds are out of date, I know nothing. For instance during the last season some people planted their seeds. The seeds grew up well but did not bear any fruits. Then people submitted their complaint to Tubura workers and got the answer that Tubura does not have such seeds. They were told to investigate and find out where the seeds were gotten from.

DG: That means that some seeds and fertilizers are brought from strange sources and can even be used without being sure whether they are a result of research and of good quality.

Farmers: Yes, for some seeds and fertilizers we do not know whether they are from the research or not. Those are mainly the ones which are not given by RAB because products from RAB are very trusted.

DG: I would like to ask you…You have told me that RAB scientists visit you and give you some farming practices which are trusted because they have been objects of experiments,…What are the channels of communication through which you get to know the findings from RAB? Do they for example give information through pupils at schools, advertising on the media, public meetings, or a meeting with a group which is experimenting techniques of RAB…How do you get to know the results from the research carried out by RAB?

Farmer 1: RAB does not call for a meeting of people from Musasu cell with the purpose of teaching them the results of findings but their agronomists come down to the fields to contact us.

Farmer 2: They come…. for instance…as…. I have told you that I got the bananas in my plantation from RAB agronomists. At that time they had gathered many people in a meeting, and we were told to prepare the soil for bananas if we wanted to plant bananas… We were asked to let them know when the field is ready. We then met at a gathering place, from where the agronomist had to come and teach us how to prepare the soil for bananas; how to plant and when to plant. However, we were not told that such and such seed has been under experiments from here and there…What interests them is to provide us with seeds and to show how to plant them, that is all.

DG: If you appreciate the results from experiments, for example the seeds that resulted from research, don't you sometimes suggest topics of research because, maybe, you find them important?

Farmers: Yes, sometimes we do…especially about cassava, for instance we have cassava varieties that are often attacked by diseases. People are scared of planting untrusted types of cassava. We then express our concerns and we get the answer that they are carrying out experiments. When the seed is available we get informed so that we can go and get it. However, the fact of expressing our concerns and requesting related research only occurred with cassava.

Data Generator: How free and what facility do you have to communicate to RAB? Do they give you audience and permission to go in there, as neighbours of the research centre, and see the research activities being carried out there or is it possible for you to call the people who contacted you at the moment of distributing the varieties of bananas? Are there people whom you can call for the improvement of your agricultural practices or for intervention in case of difficulties?

Farmers: Yes. Some people go inside for we, as neighbours, are allowed to enter the station. We go there to experience what is going on. For example, some people have learnt new practices, such as the transplantation of avocado trees. They go and learn how to do it and when they are here they can teach it to their neighbours. We have got a lot of avocado trees in this village. We have a lot of improved avocado variety trees. They do not stop any person from going there.

Data Generator: Do you go and tell a researcher to come and show you?

Farmers: Yes, they are willing to show. They are happy to see a farmer deciding to go and see what they are doing. But at first, they ask you if you are a farmer or if you are a student so that they can give you explanations according to your level of understanding. If you are a student, you are told many things but when you are a farmer, of course, you get taught what goes with your capacity.

Data Generator: Well! RAB deals with research: what channel do they use to communicate to you?

Farmers: Do you mean other projects?

Data Generator: Like other projects, or other communication means, so that people can understand what they are doing.

Farmers: Maybe, the Nkunganire and Tubura projects, but we do not know. When Tubura people come, they explain about their activities, but they do not tell us that they cooperate with RAB. The same as Nkunganire. They talk about their responsibility. No other projects that can be in cooperation with RAB. When RAB wants to present something to farmers, agronomists come down to farmers.

Data Generator: When they come to you, do they tell you to abandon your traditional varieties, because maybe they are bad and the new varieties are good? For

example: can they say “Look, your bananas are not good, so you should replace them with the new varieties”?

Farmers: Forcing us…..?

Data Generator: Requesting that a kind of crop should be adopted rather than others…

Farmers: They do not force us, they come first and teach us the best techniques that they want to bring to us. They tell us that the variety of crop which they intend to give us grows fast and produces more than the variety we already have does. From what I experienced, in some places they can establish an experimentation field “farmer field school” where they can demonstrate the difference between their variety and yours. People get slowly interested, which is different from saying “we banish this; we impose this”. They talk to us first and show us the difference between our agricultural practices and theirs.

Data Generator: In which way do they chose the person whose field should be taken for experimentation?

Farmers: It depends on the person having a big piece of land. They may come now as you have seen me and say: “I want to test my variety in this plot of yours. Now, what do you intend to plant in it?” Then I can say: “I intend to plant beans in it”. They can say: “let’s now plant our seed for experimentation and you will always harvest as it is supposed to be yours.

Data Generator: In that case, do they give you all the harvest, or do they take a tithe from it?

Farmers: They give you all the harvest because you were not supposed to give them any tithe. They give you all the harvest.

Data Generator: In that case, do they oblige you to give seeds to other people or do they oblige you to sow the same variety?

Farmers: They do not ask you to give the seeds to others, but the people living in the neighbourhood observe the practices as well as the productivity and very few can try the same in their pieces of land.

Data Generator: Why don't other farmers imitate it and produce the same things?

Farmers: We have a complicated mind-set which is attached to the mixing of crops that we think it is helpful, and I think it is really useful: let's consider if you mix beans and maize and harvest both. But when RAB comes, they ask to grow a single crop, either beans or maize. So, in case of drought, like in the today's climate instability, you may lose. If beans die from the sun, having planted neither cassava nor coco jam in it, you lose the total season. But if you have planted both of them, one crop may die while the other is healthy. That is why people do not get very interested in it.

Data Generator: Do you have time to speak with them on this and say for example: "For us we find crop mixing very useful. Please, can you conduct research on it"?

Farmers: We do not speak of that. We cannot even influence them about the cultural association. They cannot accept it, because… . . . you can see…when the government brings a policy, there is a common saying that "the government is a "mother" that cannot bring a hunger generating policy. We have studied it and come out with this as a solution to the problem of hunger." We, as farmers, cannot bring contradiction. We let the interested person do it. But we have not yet been forced to abandon our crops, but we slowly get convinced.

Data Generator: I think it can be good on your part to give suggestions like this "us we find much importance in the cultural association" and you are not the single voice which praises the advantages of cultural association. On their side, they may not be attached only on their knowledge; they may also study your case and see whether it is really useful.

Farmers: It is not usual that a peasant can expose a problem in that way and be considered except in the case of a visit like this. We may express it, and you may report it on our behalf, because nowadays the climate is irregular, and in case of failure we may die of hunger. But with the technique of mixing, one crop may die while the other is healthy, so that you can be saved from the famine. We would like to ask you to express this on our behalf so that they can conduct research on the "cultural association". Actually when you do it with fertilizers, you can mix them up and come up with good harvest of both crops.

Data Generator: So when you associate them you get good results. Don't you think that it is a problem if you do not express this to RAB researchers? You might be thinking: "this, they won't accept it; this, they can't do it; that is a practice of illiterate people, they may reject it though we have much interest in it, etc., simply because you did not bring it to their attention so that they can do research on it.

Farmers: It is a problem and we find it as a problem, but we are not yet forced to obey their recommendations. Anyway, when the weather has been fine and you have planted on the lines according to their farming techniques, you get sufficient harvest. But suppose that you are asked to plant only beans: you may grow them and harvest, we have very small plots of land, and we do not have enough land so as to have the surplus which is to be sold, would you accept living only on beans?

Data Generator: Maybe, one may not live only on beans.

Farmers: That is why we feel like mixing up crops. In beans you can also find cocoyam and the combination in a pot can effectively feed children.

Data Generator: What are the challenges that you face while trying to find research outcomes from RAB?

Farmers: The challenges are that we do not often meet them on time. They come unexpectedly, but no person can decide to call them for questions. That is a problem we always face. We should have a person representing Musasu and have continuous meetings for discussion on that issue. We see them promptly and stay for long without seeing them. But overall, the cooperation was fine, no problem.

Data Generator: You said that RAB people assist in bananas and cows only. What about other crops and animals? Do people use traditional techniques in those? Don't they need new technology there?

Farmers: We also receive cassava, and we receive also beans in case we need them but it is not so often that they may come and say: "you are about to plant maize; we are going to give you seeds..." We often go there and ask for seeds and plant them. Sometimes it can be even planted in the "Kinyarwanda" manner – the traditional way.

Data Generator: Don't you have any suggestion of a channel through which the farmer can communicate his/her wishes and RAB can persuade people to adopt their

technologies for everything to be alright in such a way that the landscape in Rubona be the same as the landscape in Musasu? What can be done so that the quality of agriculture in there can be the same as the one here?

Farmers: They should give us a researcher who is responsible of the villages around Rubona. There should be a researcher working in these hills so that we can be expecting him/her on such or such day of the week, having in mind that a technician will visit us on certain day, the next day he is going to Mara, another day he is going to Kato and Gatovu, etc. but especially here at Musasu, we are supposed to have a permanent researcher who would assure a permanent follow- up.

Data Generator: You mean there should be a permanent worker!

Farmers: Yes, maybe permanently in charge of the plantations neighbouring RAB.

Data Generator: Aren't there community mobilisers who cooperate with RAB whose job is to sensitize about what RAB is doing or expecting to publish as agricultural technologies so that you be prepared and convinced to adopt them in anticipation? Maybe this may be attracting the farmers to being curious and interested in their implementation.

Farmers: We have community mobilisers in the area of bananas, … about bananas…, we do not see others.

Data Generator: So, all the bananas that are spread in this village are from RAB.

Farmers: They are from RAB. They are from RAB, because the bananas that I am going to fertilize were provided by RAB. Around here another neighbour has been given bananas too. In fact, all Musasu villagers are given bananas by RAB.

Data Generator: Uhhhhhh!

Farmers: Yeeees!

Data Generator: When they come for evaluation, do they appreciate them or do they give advice on how you can better work on them?

Farmers: They appreciate them and felicitate us but the bananas are good depending on how wealthy the owner is. For example, if you do not have fertilizers to add, your

bananas will not look as healthy as the bananas of a person having fertilizers. I can give an example of my own case: I have bananas. I had planted the bananas after they had been given to me because I had enough fertilizers at that time. Now they look nice. But there are other bananas that I derived from them that I planted in Nyamuko. Now, since I did not have any means to transport manure from here (in Nyarugenge village) to Nyamuko (over there is Nyamuko village, here is Nyarugenge), they are not as nice as the ones that I had fertilized before. That is why I am trying to transport manure in order to see whether there can be any improvement in those other bananas (in Nyamuko village). That proves that a farmer who does not have manure will always have very unhealthy bananas.

Data Generator: Do you always use manure from domestic animals?

Farmers: We use biomass.

Data Generator: What about this manure, is it from animals?

Farmers: It may be cow dung, but they have taught us another way to make it in compost, but the compost is very demanding. So we do not practice it. The manure from animals is very practical but not everybody can afford it.

Data Generator: Uuuuuh!

Farmers: Yeeeeeees!

Data Generator: The compost requires the green grass…?

Farmers: It requires green grass; it also requires dry grass; it requires urine from animals or people, and in general it is complicated.

Data Generator: I think that's easy for a person who does not have animals and it may be accessible by all people.

Farmers: The fact of not having the cows implies that the urine is unavailable too. About human urine, we were told to go to the school to buy it. A jerry can cost two thousand, and it was also complicated for a farmer to find two thousand for urine. However, searching for the grass,….using it requires also…..maybe to be done in the context of cooperatives where it can be collected for one member one day and another

member the following day etc. Otherwise, people cannot afford the manure for bananas and for other crops at the same time.

Data Generator: Haven't they organized you and given you advice on the strategies of work on it, such as to go about it in a group and work for one person one day, and for another person a second day….?

Farmers: No!

Data Generator: Maybe if you gave the idea, it would be executed.

Farmers: If we gave such an idea it would be executed but the problem, as I have told you, is that we do not have a permanent worker who is interested in the village. We do not know to whom we can present our suggestion. That is the problem.

Data Generator: Uuuuuh! What would you want to say…..What would you suggest if you were lucky to meet with the researchers, in order for the communication between you and them to be active and effective?

Farmers: What I can say is that we wish we had a person in charge of the villages who would be available and to whom we would show difficulties in case of pathologies, in a few words, to make a fast communication. The ideas are given there, but sometimes too late. But if we had one technician around now, we would immediately show to him/her as soon as a banana became infected. He/she would work with us to save other bananas either by uprooting them depending on the ability of the disease to spread. If research proves the pathology to be incurable, we can clear them off.

Data Generator: You mean there are no other channels or means that are used or you think can be used in order for you to effectively get information from RAB? For example radio, TV, newspapers, telephone, internet, whatsapp, etc…? No other way?

Famers: No other way because even on the radio show of RAB, we listen to the general information about the institution. They never address our particular needs. As for those other things you mentioned like whatsapp, farmers do not know about them. There are no newspapers on RAB. If they were available, they would be brought to us for a few of us who can read and write. We would see them and see whether they can

be bought or not. But we do not see them. RAB communicates with us through people that come to visit us. We do not have further communication with RAB.

Data Generator: Are you free to speak with the technicians or researchers who come to visit you?

Farmers: We feel very comfortable with them, of course when they allow. We are not afraid of them when they do not despise farmers. We comfortably communicate when they come.

Data Generator: OK. That is good. I would like to thank you very much for having accepted to talk to me. I would also like to request you to allow me to come back to you, maybe in the future, if I realise that I need more information from you about the communication of agricultural research results by RAB.

Farmers: You are welcome!