

Information circulation in rice production: The case of UNVDA and Ndop rice farmers, Cameroon

A Research Project Submitted to Van Hall Larenstein, University of Applied Sciences In Partial Fulfilment of the Degree of Masters In Management of Development, Specialization In Training, Rural Extension and Transformation



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DEDICATION

This work is dedicated to my lovely mother
Martha Yunyui Chindong,
my grandmother Julie Magho Shi,
to Winnie Kim Noah
and Joaquim Costa Andre

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LIST OF ABBREVIATIONS

MINADER:	Ministry of Agriculture and Rural Development
MRSI:	Ministry of Research and Scientific Innovation
MLFAI:	Ministry of Livestock, Fisheries and Animal Industries
IRAD:	Institute of Agricultural Research for Development
NAET	National Agriculture Extension and Training Programme
NAERP:	National Agricultural Extension and Research Programme (better know in French as PNVRA)
IRRI:	International Rice Research Institute
UNVDA:	Upper Nun Valley Development Authority
SEMRY:	la Société d'Expansion et de Modernisation de la riziculture à Yagoua
RDSS:	Rural Development Sector Strategy
APRV:	Amelioration de la productivite de la riziculture villageoise
WARDA:	Africa Rice Center
IITA:	International Institute of Tropical Agriculture
NERICA:	New rice for Africa
FSSRP:	Fertilizer Sub-Sector Reform Program

1 Euro=CFA Franc 650

GLOSSARY OF LOCAL TERMS

CFA Franc	Cameroonian currency
Tainain rice	Rice from Thailand
Ndop rice	Rice grown in Ndop area

ABSTRACT

This research project set out to identify and analyze the existing constraints on the current extension approaches used in the circulation of information in the rice sector in Ndop area, Ngoketunjia Division, Northwest Province of Cameroon. The study specifically sought to contribute to the strengthening of current extension approaches in information circulation in Ndop rice production by looking at the problems that hinders the flow of information between extension workers and farmers.

To realise this work, three main stakeholders were identified and interviews conducted with them. Two Focus Group Discussions were conducted using semi structure interviews. One FGD was conducted at the farmers' level during one of the CIG group meetings and the other with the frontline field demonstration extension workers in UNVDA head office in Ndop. In addition to this, individual interviews were conducted with 4 researchers from IRAD, 9 extension workers from UNVDA and 10 rice farmers.

The study revealed that the dominant Agricultural extension approaches used in the rice sector in Cameroon is ToT and T&V. The methods of information circulation using these approaches are individual and group methods. The extension approaches has been criticized for its ineffectiveness especially in the circulation of information in rice production. lack of room for participation in the manner of implementing agricultural approaches (ToT and T&V), government bias policy towards the rice sector, weak linkage of farmers to research and other NGOs for assistance, no accessibility of modern technologies like the radio because its too expensive, insufficient finance, shortage of extension workers, behavioural altitude of extension workers towards the farmers, and women low access to information because they are not involved in extension activities are among the most cited problems hindering the effectiveness of extension services in the rice sector in Cameroon. Apart from these general constraints, the finding revealed that the problems extension workers specifically faces that hinders their work performance in effective information circulation in rice production includes low salary, lack of technical aids, to many farmers to attain to, too technical information to communicate to farmers and no reliable transport.

In an attempt to improve the extension services in the rice sector in Cameroon, the information circulation frame work was established whereby the three main stakeholders involved in information circulation, that is research, extension and farmers organization were linked in such a way that each actor does what it can do best in enhancing dissemination and utilization of agricultural information all geared towards the rice famers. Whereas supportive government policy, creation of community radio stations, strong link between farmers and researchers and a bottom up implementation of extension approach in information dissemination in Ndop rice can be a good starting point for effective information circulation in Ndop rice production in Cameroon

The main recommendations proposed in information circulation in the sector re the following; the recruitment of staffs whose needs matches with that of the organisation, a more supportive government policy, selection of individual plots for demonstration should be rotational and a community radio created to enhance information circulation in the rice sector in Cameroon.

CHAPTER 1 INTRODUCTION

The importance of agriculture and its contribution to the economy of Cameroon is significant. Agriculture provides 60 percent of employment opportunity in the rural areas. It has also contributed 43 per cent to the GDP development (Cameroon, 2008). Also, this sector contributes more than 25 percent of the total exports earnings and 45 percent of government revenue, while providing for most of the country's food requirement. It has been serving as a major occupation of the people even during the colonial period. The colonial strategy of agricultural development at the time revolved on two axes: to discourage industrialization and encourage an agricultural sector based on mono-cultural plantation economy (Fonjong, 2004). After independence, the Cameroon government continued to show a lot of concern to the development of agriculture in its five-year development plans. The first five-year development plan of 1965–1967, for example, was dedicated to the farmers as it was called “the farmer's year” and the second plan (1966–1971) was captioned “the farmer's plan” (Fonjong, 2004). This solid early foundation explains the importance attached to the sector by the government. It also explains why Cameroon has remained for long the breadbasket of the Central African region. However, this did not last for long as the situation changed in recent times. Agricultural sector in Cameroon was changing rapidly and driven by a number of external and global factors. The challenges that face the sector were ever increasing and becoming more complex. So, the demands placed on extension services also increased enormously. This is because they have a crucial role to play in promoting agricultural innovation to keep pace with the changing context and improve livelihoods of the poor. A number of approaches and methods have been used in Cameroon agricultural extension to circulate information to the farmers. These approaches were to be adapted to respond to the demands and challenges of the time. Rice is one of the main and precious crop grown in Cameroon but the yields are increasingly falling from 6-7 tons/ha to 1-2 ton/ha since decades, in spite of the attention directed towards it by the Ministry of Agriculture and Rural Development (MINADER). This falling yields has been attributed, among other factors, to the neglect of the sector by the government and the ineffective implementation of the agricultural extension approaches used to circulate information in the rice sector in the country (MINADER, 2008).

According to MINADER, access to and availability of information on rice production to farmers is vital to increase rice production, in view of the current and dynamic production systems. Farmers in the area are not producing rice to the expected level in spite of the potentials it has to do so. This has affected the demand and supply balance in the domestic market. It has also raised a great concern among all stakeholders involved in the rice sector. Achieving sustainable agricultural development is not only based on material inputs (such as seeds and fertilizer) but on the institutions and people involved (FAO and GTZ, 2004). Besides the poor implementation of agricultural extension approaches, availability of adequate information on production techniques and the application of technologies are indispensable to improve production and productivity of rice.

Information is one of the most important inputs for agricultural development. As a result of this, agricultural research results constitute an important knowledge base that should be made available to farmers for increased food production (Dulle, 2000). The agricultural extension workers play an important role in linking researchers and farmers. This ensures that agricultural information resulting from agricultural research is utilised by farmers for agricultural development. The extension officers are therefore considered to occupy a very strategic position in the production cycle

(MINADER, 2008). Their role requires them to be more aware of village dynamics in decision making and to implement extension approaches properly, so as to achieve the desired results (UNVDA, 2007b).

Circulating information to rice farmers using effective agricultural extension approaches will be important to enhance social learning among stakeholders and also contribute to increase rice production in the area. For 'Information is power' so goes the old adage, and one that rings true in every situation. Information is the currency of today's world. Those who control information are the most powerful people on the planet. Information capture, or knowledge management, is fast becoming the true advantage of any extension approach in the world. People are certainly valuable resources, and the information they hold is useful, but far more so if shared with others. This is the dilemma facing many extension systems - how to find a balance between information overload and insufficient information for those that need it, like the rice farmers to increase production.

The main extension service provider in Cameroon is the government through the Ministry of Agriculture and Rural Development (MINADER). The extension approaches used in the rice sector are the Transfer of Technology (ToT) and Training and Visits (T&V). These two approaches deal with farmers and share some features of participation in it, like the use of contact farmers and group methods for communication. However they have been considered as top down because information circulation follows the same pattern in both cases that is from researchers to farmers through the extension worker and feedback from farmers to researchers through the extension worker. This has not enhanced rice production in any significant way because yields keep falling rapidly.

The Ndop plain in Cameroon is endowed with tremendous potentials for increasing rice production to self-sufficiency. Good soils, favourable climate, a strong technical know-how of the local population, the availability of rural manpower at a relatively low cost, a high local demand for rice, coupled with the rising needs of neighbouring countries like Nigeria and Gabon, and farmers' enthusiasm to learn new technologies. Yet rice yields keep declining yearly. For what is needed is the information on how to use technologies to increase output in rice production with the assistance of the extension workers. Information circulation is not effective and rice production has continued to decrease as a result of the ineffectiveness in the implementation of extension approaches in the rice sector.

This research project therefore seeks to identify and analyze the existing constraints on the current extension approaches used in the circulation of information in the rice sector in Ndop area, Ngoketunjia Division, Northwest Province of Cameroon. The study specifically focuses on how to contribute to the strengthening of current extension approaches in information circulation in Ndop rice production by looking at the problems that hinder the flow of information between extension workers and farmers.

1.1 Justification of the study

Rice farmers in Ndop area are suffering from low rice production, which has affected livelihood negatively and aggravated poverty in the region. Rice production since 2005, had experienced a continuous downward trend in production from 13,200 tons to about 4000 tons of which the rice cultivated in Ndop is 6231 tons (Laoumaye, 2007). The decrease in rice production is attributed to inadequate information on high productive rice variety; fertilizer application, access to credit facilities and marketing information. Above all, it has been attributed to the type of extension approaches used to communicate to farmers which is a mix of the ToT and T&V. Farmer to farmer

communication and participatory extension approach does not exist in the area in the real sense of the term even though it has many advantages in information circulation and knowledge sharing. T&V and ToT are not participatory as farmers are not involved in all processes of designing and implementation of technologies. T&V which is widely used is not implemented effectively as selection of 'contact farmers' is done at the head office and mostly are friends of extension workers. This approach has been term top down in spit of its participatory intensions. The objective of extension approach in Cameroon was to increase production and bring changes in the life of the rural community (PNVRA, 2008). Nevertheless, there was no improvement in production and livelihood of the target population. These constraints have led to low production of rice in the area. The situation justifies the urgent need for the intervention in the agricultural sector in general and rice sector in particular. This is in order to attain the fixed objective of doubling rice production set forth by MINADER by the year 2015. However, this will be realized if the constraints of existing extension approaches are identified and significant improvement is made based on the findings of this study.

1.2 Problem statement

As the historical account of the country's agricultural extension approach portray, the government of Cameroon has been adopting and implementing different types of extension approaches to boost agricultural production across the country. However, productivity and production of rice which is one of the main crop in the country has not been improved for decades rather it declines continuously. Most of the extension approaches employed in the government extension programmes are not participatory but top down in many matters. Farmers during the implementation of extension have no room to participate in extension policy. They have been considered as only information receivers but not information providers to the extension workers and researchers. This is seen when it comes to including their needs and priorities in the system. Information flow is vertical from only one direction, which is from the researchers/extension workers to the farmers that ultimately affect knowledge sharing between the end users of technologies and researchers. In the absence of information exchange directed towards the farmers who produces the crop and on the effect of the released technologies to them, how can one evaluate the released technologies are effective or not? Traditionally, the link between extension and research putting farmer at the centre of technology generation, has been overlooked for the last decades. This has been reflected on the continuous reduction in rice production. Therefore, it is relevant to identify and analyse the existing constraints during the implementation of the existing extension approaches in information circulation used in the rice sector.

1.3 Research objective

To identify and analyze the existing constraints in information circulation in the extension approaches within the Ndop rice sector and to make recommendations for improvement

1.4 Research Main and Sub Questions

Main Question

What are the main prevalent constraints of the extension approaches in circulating information within the rice sector?

Sub research questions

- 1 What are the agricultural extension approaches applied in Ndop rice production?
- 2 What are the communication methods used in circulating information on rice between rice farmers and the extension workers in UNVDA?
- 3 What are the problems encountered in information circulation between rice farmers, and UNVDA in rice production?

1.5 Limitations

This research was not easy to be carried out. Originally my intention was to study rice production in the whole of Ndop area. But on the field, I discover the area was too vast and there were too many farms to interview. So I decided to visit only the Babungo rice field.

More so, on many occasions, the objective of the interview questions was misconstrued. I was either considered as a spy or some security agent. There was the scarcity of available written material on this relatively new topic on extension approach in information circulation on rice production in Ndop.

Again to conduct interview with the extension workers in Ndop, I needed an authorization letter from MINADER that took some days, so I missed the first appointment I had for the group discussion with extension workers in Ndop. This interview finally took more time than was scheduled

Furthermore, it was extremely difficult for rice farmers to give me the constraints they were facing in rice production because I was accompanied by the field extension worker. His presence made the farmers to say all was good and fine. I had to come another day alone to conduct the interview. This also took more time than allocated. Finally the necessary financial means to carry out proper research of this magnitude was a handicap. However, using all my communication and facilitation skills in consultation with the help of my mother, I overcome these challenges and was able to collect the required information.

CHAPTER 2 LITERATURE REVIEW AND CONCEPTUAL FRAME WORK

A number of theoretical concepts will play an important role in this research. For this research, concepts on information circulation, Agricultural Knowledge Information System (AKIS) approach and agricultural extension approach based on Transfer of Technology, Training and Visits, farmer to farmer communication for innovation and Participatory agriculture extension approach will be reviewed from literature to provide insights and guidance during the research process.

2.1 Information circulation

Many authors have written about information. Information is seen basically as data which is more or less a passive commodity with little inherent value unless it enriches one or more of its recipients, either in terms of knowledge or in some other, material way (FAO and GTZ, 2006). Also, information is knowledge that has been stored in a physical form such as a book, leaflet, file, newspaper, picture, sound, website, etc (Leeuwis, 2004). Information as a concept bears a diversity of meanings, from everyday usage to technical settings. Generally speaking, the concept of information is closely related to the notions of, communication, control, data, instruction, knowledge, meaning, and mental stimulus (Leeuwis, 2004). Knowledge can be made tangible and converted into information and circulated through speech, written language, expressions, and graphic representations. If information is properly circulated, it can enhance development in general and rural development in particular. Information circulation therefore is an essential ingredient in agricultural development. Without the circulation of information, no innovation would be able to spread (Gesa W. (CTA). and Ir. Willemine B. (ETFRN), 2003). Information interruption will result to some gaps which are impediments to development (Gesa W. (CTA). and Ir. Willemine B. (ETFRN), 2003).

In this study information circulation will be view as the communication of messages between stakeholders. The figure below represents the transitions from data which represents a fact or statement of event without relation to other things, to information, knowledge, wisdom and finally to its application. The figure equally shows that it is understanding that support the transition from each stage to the next. Understanding is not a separate level of its own but what links the different steps to wisdom.



Figure 1: The transition of data to usable information

Source: <http://www.systems-thinking.org/dikw/dikw.htm>

What this figure is explaining in essential in view of this study is that, for information to develop any aspect of life, it must be useful and well understood by the end users so as to effectively put the message into practice. It is only in this direction that information can bring a meaningful change to development.

2.2 Agriculture Knowledge Information System (AKIS) Approach

AKIS has been defined in various ways by different authors. Birner et al (2006), sees it as a set of organisations and people engaged in knowledge and information processes; as computer-based 'intelligent' software (for instance expert system, artificial intelligence). Leeuwis (2004) definition confirm by (Ponniah et al., 2008) see AKIS as "An Agricultural Knowledge and Information System for Rural Development link people and institutions to promote mutual learning and generate, share and utilize agriculture-related technology, knowledge and information". The system integrates farmers, agricultural education educators, researchers and extension workers to harness knowledge and information from various sources for better farming and improved livelihood. Innovation according to this concept should be about network building and/or reconfiguring in existing network (Leeuwis, 2008). In the context of this work, AKIS will be regarded as the link between research organizations and other institutions of knowledge like the universities, extension services, NGOs and the farmers' themselves. The AKIS concept recognizes that research is not the only means of generating or gaining access to knowledge. Although the AKIS concept also focuses on research supply, it gives much more attention to the links between research, education, and extension and the identification of farmers' demand for new technologies.

The key tasks and activities to this effect are social learning and negotiation, as well as process management. However, such processes cannot start from a vacuum, and require that relevant stakeholders know each other and recognize each other as relevant partners in innovation process (The World Bank, 2006). This institutional approach looks at set of actors each engaged in different activities such as research, technology transfer, production or consumption. Each actor is playing a different yet complementary role, and hence functioning synergically, for instance land grant universities and cooperative extension systems (Leeuwis, 2004). The institutional approach leads to theory building about the way people and organizations receive, transform and communicate information about the interfaces between them and about the complementary roles institutions play in relation to each other. The purpose of this approach is to improve the management or design of the AKIS so as to make it function in ways deemed desirable by policy makers, farmers and other participants in the system. AKIS includes a number of basic knowledge processes such as generation, transformation, integration, storage and retrieval (Leeuwis, 2004).

Knowledge generation appears to be more effective when carried out in groups than when attempted by an individual. Empirical studies have shown that the productivity of research is related to the extent to which actors participate in the networks. Hence, the essence of an AKIS is that the knowledge generated in one part of the system is turned into information for use in another part of the system (Ponniah et al., 2008). The transformation taking places within an AKIS are as follows:

- From information on local farming systems to research problems
- From research problems to research findings
- From research findings to tentative solutions to problems (technologies)
- From technology to prototype recommendations for testing in farmers fields
- From recommendations to observations of farmers behavior (male, female and children)
- From technical recommendations to information affecting service (inputs and marketing)
- From adapted recommendations to information communication by extension workers
- From extension information to farmer knowledge

2.3 Extension approach

Extension is a series of embedded communicative interventions that are meant, among others, to develop and/or induce innovations which supposedly help to resolve (usually multi-actors) problematic situations (Leeuwis, 2004). Extension approach is the essence of an agricultural extension system. It refers to the style of action within a system which embodies the planning philosophy that is adopted by extension workers in providing services. In order to discuss this work properly three approaches will be used to explain this concept. Transfer of Technology, Training and Visit, Farmer to farmer communication for innovation. Although these approaches look different, all have a common characteristics which are: all function through non-formal education; all have content related to agriculture; all use communication techniques and aids; and all seek to improve the capabilities of rural people. The details description of these approaches is presented below.

(a) Transfer of Technology (ToT)

Transfer of Technology (ToT) is regarded here as transferring and disseminating ready-made knowledge from research to farmers, or from “early adopters” to other farmers. It is a top-down approach of information circulation, whereby researchers determine research needs, generate innovations that they think are good for the end users (farmers) and provide the results to the extension worker for communication (Chambers et al., 1989). The process of technology generation and transfer is seen as a linear process (Leeuwis, 2004), where scientists develop technology, demonstrate it to farmers through the extension agents, and the farmers adopt it in the final stages. Here research institutes are the sole source of technology. The major emphasis in this model is that it transfers knowledge and technology from researchers to farmers. The clear-cut features of this model give specific assignments to institutions and groups of people. Research institutes are to conduct research; extension agents are only to pass the result, while farmers are seen as technology adopters or people who have problems that are feedback to extension advisers and researchers (Cramb, 2004). The feedback of this model is weak, as extension workers and farmers do not make relevant participation in the technology generation process. Research institutes are located kilometres away from farmers’ field activities. This model assumes that technologies generated by research are very important for the farmers thus have chance for diffusion and adoption. This research-driven nature of the top-down process can result in technologies that could not fit the need of farmers at times.

(b) Training and Visit (T&V)

Training and Visits (T&V) is considered in this context as a centralized approach which is based on a rigorously planned schedule of visits to farmers and training by extension workers and subject matter specialists (Ponniah et al., 2008). Extension workers are only involved in technological transfer. Planning of this visit is controlled centrally (head office) and field personnel tend to be numerous at times and dependent on central resources. Success is measured in terms of production increase of a particular crop covered by the programme. The emphasis of T&V is on communicating unsophisticated, low-cost improved practices and teaching farmers and how to make the best use of available resources. In this system, the extension workers are trained every fortnight on relevant extension issues for that period of the year and the staffs later extend these messages to contact farmers who receive special attention. Field days and other visits are arranged on the farms of contact farmers (appointed or selected farmers) so that their neighbours can also benefit from the knowledge they have gained.

In T&V, extension workers could meet with a small group of contact farmers who are expected to communicate information to members of their respective communities and convey farmers opinions back to the field workers, thus creating a feedback mechanism absent in the prior system. With T&V, the field worker becomes the vital link between farmers and researchers which ensures a two-way communication. From the above, it is realized that T&V is a system which emphasizes simplicity in both objectives and operations. It provides continuous feedback from farmers to extension workers and to research staff; it allows for continuous adjustment to the farmers needs. It has spread rapidly around the world because it is seen as an effective means of increasing farm production and a flexible tool at all levels of any agricultural ministry programme (Ponniah et al., 2008). In Cameroon and in the rice sector in particular T&V is a dominant approach used in that extension workers meet every Monday in the UNVDA head office in Ndop to give feedback on their activities. They demonstrate to farmers on their own farms and that of close friends. Here, farm visits are not regular, shortage of staff and increase cost in carrying out the programme.

(c) Farmer to farmer communication for innovation

This approach is considered in this context as the horizontal exchange of information between farmers and farmers' entire responsibilities to take their problems to who ever they deem important could be of help to them. Farmers may for instance be asked to consult other farmers when faced with a particular problem at a time, when the extension worker is not available (Leeuwis, 2004). Similarly, contact farmers may act as facilitators in group meetings in the absence of a communication worker. This approach can be seen as a way to optimally use the available knowledge, experience and skills of farmers in a community. In this way farmers have several advantages for instance they speak the same language, literally and culturally, as their colleagues and are faced with similar constraints and problems as fellow farmers which may enhance the relevance and credibility of their advice and views. They can decide to take their problems to who ever they feel can assist them in solving it like the researchers or NGOs in the area. They make their decisions by themselves and are accountable for it. Communication methods between farmers through this approach are usually through church service, social gathering (weeding and funeral ceremonies), markets, beer bars, and village festivals. Farmers also learn through observation in their neighbours farms. The problem here is that farmers can only communicate what they understand. In Cameroon this approach is mostly practice in farmers groups in that farmers share ideas but the formation of the group is from the head office and decisions making do not depend on them but the extension workers.

(d) Participatory agriculture extension approach

Participation has been defined in various ways by different authors. For the purpose of this work, participation will be seen as a process through which stakeholders influence and share control over development initiative and the decision and resources that affect them (FAO 2004). According to the spectrum of public participation continuum, it involves a range of activities that varies from information, through consultation to direct involvement of the public in aspects of decision making. Five different level of public participation are identified by the International Association for Public Participation (SAIEA, 2005).

Inform - the objective here is to provide to the public the content and objective of information to enable them to understand the problem, alternative and/or possible solution;

Consult - the objective is to get public feedback on analysis, alternative and/or decisions;

Involve – here is to work directly with the public through the process to ensure that the public issues and concerns are understood and considered at all stages and it is directly reflected in the planning, assessment, implementation and management of a particular proposal or activity;

Collaborate – the aim is to work with the public as partners on each aspect of the decision, including development of alternatives and the identification of preferred solutions;

Empower – the objective here is to place the final decision-making in the hands of the public.

From the agricultural extension/research point of views all levels of participation can be applied based on the type of activities carried out starting from informing to decision-making.

The participatory agricultural extension approach assumes that farmers are skilled in food production from their land, but their level of production could be improved by additional knowledge (Ponniah et al., 2008). Active participation by farmers themselves is necessary and produces a reinforcing effect in group learning and group action. Much of the work is through group meetings, demonstrations, individual and group travel and local sharing of appropriate technologies. This approach often focuses on the expressed needs of farmers groups and its goal is to increase production and improve the quality of rural life. Implementation is often decentralized and flexible. Success is measure through the number of farmers actively participating and the continuity of the programme. There is much to be gained by combining indigenous knowledge with science. Expressed needs of farmers are targeted. Similarly, (Knox and Lilja, 2004) strengthen this idea in emphasizing that development efforts that ignore local circumstances, local technologies, and local systems of knowledge are wasting time and resources. The system requires that extension workers, who are also animators and catalysts, stimulate farmers to organize for group efforts (UNVDA, 2007b). Through this approach farmers' are able to evaluate their own programmes and play a role in establishing research agenda. The participatory agricultural extension approach costs less, fits needs well, and is more efficient. However in Cameroon, extension workers look at it to be more work to organized and motivate farmers. To work with adult who are barely literate to incorporate them in the system seems difficult. This approach has attracted many foreign donors to projects that apply it principles for funding.

To understand the nature of extension system in Cameroon, the information circulation frame worker was established (Verschuren and H, 2005) whereby the three main stakeholders in information circulation , that is research, extension and farmers organization should all direct their resources to the farmers and all should be linked in such a way that each actor does what it can do best in enhancing dissemination and utilization of agricultural information. The model indicates that, for rice yields to increase, these three actors must all channel their resources towards the farmers. This is because they are the rice grower and increase in rice production will depend very much on the message they get and how they understand it. In the course of analysis of this finding, the following criterion based on the model of the frame work is used.

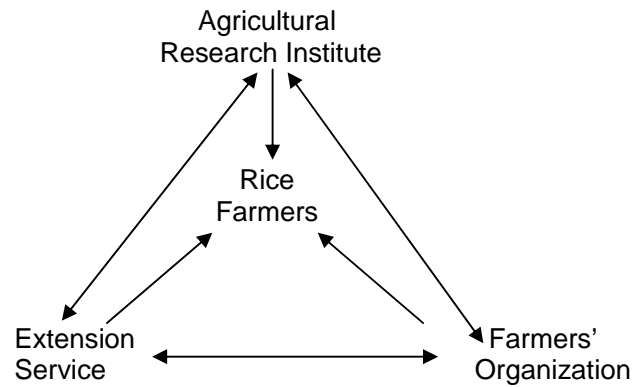


Figure 2: Information circulation model among stakeholders
 Source: Adapted from Ponniah et al., 2008, pg 94

In using this model, the following criteria will be used during analysis of findings.

- Involvement of stakeholders in rice production
- Level of participation of farmers in extension approach
- Effectiveness of different extension approach in information circulation
- How are farmers link to research for information

CHAPTER 3 AGRICULTURAL EXTENSION APPROACH IN CAMEROON

This chapter portrays the profile of the study area, rice growing areas in Ndop and the evolution of extension approaches in Cameroon and its contribution to the circulation of information in the rice sector.

3.1 Profile of the study area

Cameroon is a Central African nation on the Gulf of Guinea. It is located between latitude 1st and 13th degree North and between longitude the 8th and the 17th degrees East of the Equator. Cameroon is generally viewed as Africa in miniature because of her great diversities in terms of physical features and human resources (Cameroon, 2008). It is bordered by Nigeria, Chad, the Central African Republic, the Republic of Congo, Equatorial Guinea, and Gabon. Geographically Cameroon occupies a surface area of 475,650 sq. km; of which 460,050sq.km is dry land and 9600sq.km is marshy land. Cameroon population is estimated at 18 million inhabitants (Estimates, 2004). The country is made up of ten provinces namely Adamawa, Centre, East, Far North, Littoral, North, South, Southwest, West and Northwest (Cameroon, 2006). The Northwest province was previously made up of five divisions: Mezam, Bui, Momo, Donga-Mantung and Fundong. Recently two was added: Ngoketunjia (Ndop), carved out of Mezam, and Belo, carved out of Donga-Matung. Ndop also known as Bamunka, (Ramunka) is the only relatively flat plain area in the Northwest, where rice is grown. Geographically Ndop lies between latitude 6° 0' 0" North and longitude 10° 25' 0" East of the Greenwich Meridian. There are a variety of languages spoken in the province. The main languages are Pingin, Ndop-Bamunka, Bamunkun, Niemeng, Mbika, and Muka. Ndop population is estimated at 47,450. The division has a great geographical diversity with altitudes ranging from 1220 metres to 4005 meters above sea level (Ngoketunjia divisional office). The rainfall pattern in Ndop allows for one growing season of rice. The raining season starts from June to September. The planting of rice is during the month of July and harvesting is in November. The other months are dominated by dry weather (Ngoketunjia divisional office).

About 75 percents of the population in Cameroon live in the rural areas and 60 percent of them earn a living from agriculture. The agricultural sector has consistently been a central focus of the Cameroonian governments' development strategies and priorities. The sector has performed a major role in developing the Cameroonian economy, as it has contributed to the national economic (43 per cent to the GDP) development (Cameroon, 2008). Also, the sector contributes more than 25 percent of the total exports earnings and 45 percent of government revenue, while providing for most of the country's food requirement. In Cameroon on like in other West Africa countries 70-80 percent of rice is lowland irrigated on like upland irrigated rice practiced in West Africa. Rice is best grown in flooded fields. In Ndop and Babungo area in particular the type of rice grown is swamp rice grown on wet land as seen in figure 3.



Photo: by Patience Eshankeh Chindong

Figure 3: Babungo paddy field

The agricultural sector is estimated to have a further indirect contribution of nearly 27 percent of GDP through linkages with manufacturing, distribution and other service-related sectors (Cameroon, 2008). Since the economic crisis in the early 80s, this sector has continued to show its important role as a "buffer sector" in the economy although only about 15 percent of the land is arable. The main food consumed here are roots and tubers, banana/plantains and cereals among which is maize and rice (IRAD, 2008). Rice is one of the major cereal crops grown mainly under irrigation/rain fed and consumed in Cameroon. Rice cultivation is carried out in several areas in Cameroon according to the 2006 statistic of MINADER as portray in figure 4.

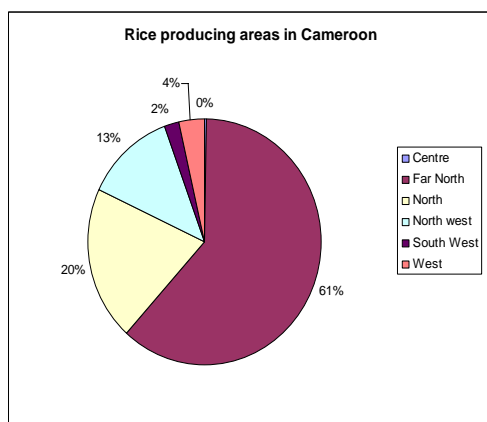


Figure 4: Rice producing areas in Cameroon
Source: MINADER Annual Report 2006

In the figure, rice is cultivated in three major valleys; in the Logone valley of Northern Cameroon, within the Menchum valley and the Upper Nun Valley in the North West Province, the Mbo plains in West Province, and around Nanga Eboko in the Centre Province. In addition to these general rice-producing areas, the major rice cultivation areas in the country are in Maga in the Far North Province and Ndop area (Ngoketunjia Divisional office) in the North West Province. (Details on the maps are indicated in the Annex).

The high number of population results in shortage of land for rice cultivation which has resulted in low production of rice. The low productivity and inadequate land, couple with the poor application of extension services in the area has lead to low income in households and aggravated poverty level in the area.

(a) Rice growing areas in Ndop

In Ndop region five rice cultivation areas are involved (see figure 5). There is the upper Bamunka area which include four villages (Bamunka, Balikumbat, Bamessing, and Babaki Tungo), and composed of fifteen rice farms. The lower Bamunka area that involves two villages (Bamali and Bamunka), and composed of fifteen rice farms. Bangolan area which includes four villages (Bangolan, Part of Babessi, Bangouren and Wase in Banso), and composed of nine rice farms. Ber also called Monoun area which is made up of three villages (Ber, Bamoun (Fumban) and Nkoutoupi area), and is composed of eight rice farms. Finally the Babungo area made up of three villages (Babungo, Baba 1 and Babessi) and composed of five rice farms (UNVDA, 2008a). The specific rice field where the study was undertaken is the Babungo rice field, situated along the borders between Babungo and Baba 1 (Ngwa, 1999). (Detail of this area is indicated in the annex). The types of rice cultivated in these areas is tainans (*T5*) known as Thailand rice, *VARIETE 14* (V14) and *Tox* (long grain). Rice production is the backbone of livelihoods in Ndop and is the main source of income in

the area. When the colonialists in the Ndop plain first introduced rice, most of those who were interested in its cultivation were men. The colonial authorities' policy favoured men over women as plantation labourers. There was a marked division of labour in the agricultural sector in which the women were exclusively concerned with food-crop production and the men with cash crop production. However, today, local and global economic dynamics have caused the situation to change. Both men and women have become competitive farmers in Ndop rice and in Cameroon as a whole. In 1978, an area of about 800 hectares was put under rice cultivation, with an average output of 6 to 7 tons per hectare in Ndop (Ngwa, 1999). Presently, the surface of land cultivated stands at about 1828.22 hectares with 1 to 2 tons/ha. The detail of the areas under cultivation in Ndop is presented in the figure below.

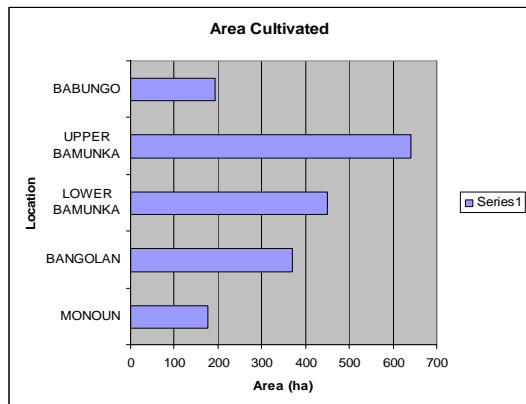


Figure 5: Farmer to farmer statistic on area cultivated
Source: UNVDA, 2007

The above figure indicates that upper and lower Bamunka cultivates the highest area of rice per hectare using canals. Babungo and Monoun (Ber) cultivates the least land which is dependent on rain fed only.

3.2 Evolution of extension approach in Cameroon

Extension in Cameroon is carry out by the Ministry of Agriculture and rural Development. This ministry is to formulate strategic policies with other subsystems, while the non-governmental organizations (NGO), apart from the direct implementation of extension services, are intermediate bodies linking the Government and the farmer subsystem. On the other hand, the farmer subsystem is very crucial in participatory technology development (PTD) and in providing information to the Government and the NGO during routine evaluations of the service.

Agricultural extension was officially launched in Cameroon in 1988 and was called National Agricultural Extension (NAE). The programme came into existence because the government of Cameroon saw that there were many parties like NGOs intervening in rural areas to help farmers to increase agricultural and livestock production (MINADER, 2008). Every party had its own message and those messages were not coordinated, thereby setting the less educated farmers into more confusion. This was because they did not know which of the information to rely on since some were contradictory.

The government through Cameroon Ministry of Agriculture and of Livestock, thought it wise to put in place a coordinated system of extension that could direct specific messages to the farmers at the village level. NAE was put in place in 1988 thanks to a loan from the World Bank. The pilot programme started in some provinces like the

North and South West Provinces and gradually spread to all the ten provinces in 1997 (PNVRA, 2008).

The goal of the programme was to increase agricultural and livestock production and increase the income of small scale farmers in a sustainable environment so that they may improve their living standards. The programme though lodged in the Ministry of Agriculture, was coordinated in union with the Ministry of Livestock, Fisheries and Animal Industries (MLFAI) because small scale farmers also keep small livestock (PNVRA, 2008).

The Extension Approach up till 2002 was the Training and Visit method. In this system trained extension staff from the various schools and colleges of agriculture was sent to the rural communities to extend their knowledge to the farmers and also train the farmers to use the knowledge. They lived with the farmers and socialized with them.

Though there was a national coordination unit of the programme in Yaounde, the NAE was well structured with provincial coordinators at the level of the province, divisional coordinators and the village extension workers. They were given vehicles and motorcycles that could enable them to meet their tasks. In the rice sector, extension is carried out under projects. For instance Ndop rice is under the UNVDA project and SEMRY is for rice produced in the Far North province. The extension workers from the MINADER are sent to support these projects. The director of these project can further recruit more staffs in the project if need be. At the provincial level therefore the rural development office is responsible for designing the extension organizational structure like the case of Ndop rice.

Before now, farmers worked hand-in-glove with the Upper Nun Valley Development Authority (UNVDA). From its creation to 1988, the UNVDA mobilised some 400.000 rice farmers with whom it developed 2532 hectares of paddy rice fields, constructed adequate irrigation and drainage patterns, bulldoze 268km of access and internal farm roads, built culverts, bridges, canals and a giant processing mill, as well as extended vital technical services, including farm inputs and improved rice seeds to farmers. Trucks and tractors were also hired out to farmers at the barest minimum rate. But presently, the story of UNVDA is pathetic. Its dilemma started in 1987 when the French Government, one of its major partners, stopped funding and withdrew its expatriate, leaving the corporation to lean solely on subventions from the government and the defunct National Produce Marketing Board (NPMB). The subventions later on froze when the government announced "economic crises" in 1988. Today, UNVDA is having no status and is undergoing restructurisation. Their staff dropped from 350 workers to 72.

Some extension workers from the Ministry of Agriculture were sent to boost extension services in UNVDA. All the workers had specific messages from the National Coordinator to all the provinces. The messages were delivered to the farmers in accordance with their farming activities during that period. According to PNVRA (2008) production actually increased at that time.

In 1992, the programme had existed in all the 10 provinces in Cameroon and the training aspect was added to its appellation. This was because the authorities thought it wise that the training of farmers to accept innovation was very vital, if they must succeed. The programme was now called the National Agriculture Extension and Training Programme (NAET).

In 1994 the research component was added and the name was again modified to National Agricultural Extension and Research Programme (NAERP), also known in French as PNVRA. The research component was added for easy diagnosis and incorporation of feedback and results into research. During this period the extension approach also changed and the World Bank started withdrawing its assistance from the programme (PNVRA, 2008).

The Training and Visit system where farmers were trained to adopt innovations through demonstration plots was modified. When the World Bank finally withdrew in 2002, the NAERP was managed only with the state budget. Leaving in crisis, the budget could not run the programme as before. So the T&V method of extension was modified to accompany the system and with group of farmers.

Its global vision NAERP was to improve on the development of the farmers' activities, the management of his natural resources and its environment in a bid to reduce poverty among farmers. To do so properly the NAERP programme reinforced the capacities of farmers' organizations. Since 2002, the extension has adopted the method of accompanying farmers' organizations in the;

- definition of their agricultural and development priorities
- Participative planning of strategies for production and the putting in place of new farms and rehabilitating old ones
- Follow-up and evaluation of their activities

The strategy the programme is now adopting is that in October and November of every year they collaborate with farmers' researchers and funding partners to;

- Organize activities geared towards the next farming season by reviewing the balance sheet of their activities for the year just ended and to draw an action plan for the year ahead.
- They also accompany the farmers organization in formulating their agricultural projects
- They plan and carry out workshop with the bottom up approach programming of farmers' activities
- Evaluation of activities through periodical meetings with farmers

For easy follow up of the farmers, the country is divided into 1710 extension zones, 228 sectors, 56 regions and 10 provincial supervision services. For the period 2006/2008, PNVRA has worked with 1000 extension agents (AVZ), 200 sector supervisors (SS). They have a deficit of 700 village extension workers and 20 sector supervisors (PNVRA, 2008).

As a result of the shortage of village extension workers, the goal of the NAERP programme can no longer be achieved totally. From 2006/2008, the programme had planned to work with 16,500 farmers organizations with 360,000 farmers to identify their production priority projects, formulate policies in favour of farmers and help execute them through evaluation and follow-up. They had also planned to build the capacity of these groups (PNVRA, 2008).

Financial support is from the annual budgets of MINADER and MINEPIA and from the funds of the Highly Indebted Poor Countries Initiative (HIPIC) Programme, sponsored by IMF and donor nations.

CHAPTER 4 METHODS OF DATA COLLECTION

4.1 Study area

This research was carried out in the town of Dschang, in the West province, Yaoundé, in the Center province and Ndop area in the Northwest province of Cameroon. These areas were chosen for various reasons; the first being that, the rice department of the Institute of Agricultural Research for Development (IRAD) is based in Dschang. The other reason is that the extension service of PNVRA and MINADER are based in Yaounde, in the Center province. Further more the UNVDA, which is basically concerned with extension in Ndop rice production, is in Ndop and the major rice producing fields are found there. The month of data collection (July) coincided with the planting of rice. This enables me to meet both the farmers and extension workers at work easily. Finally the researcher's knowledge about the local language for easy communication enhances the selection of the area. This research was carried out in the Babungo rice fields more specifically, involving three villages; Babungo, Baba 1 and Babessi. The unit of analysis was the case study of Ndop rice farmers, UNVDA extension service in charge of Ndop rice production and IRAD research institute in Dschang.

4.2 Methods of Data Collection

The research started with a desk study on the literature review and background information about the study area. The desk study comprise of, searching the internet, reviewing relevant books, journals, articles about the research topic to get information and concepts related to the study. The reports, workshop records and strategy documents of PNVRA, MINADER, UNVDA, some farmer groups and IRAD were reviewed to get secondary data that were supported by the primary data.

Lastly field visit was organised to the rice fields in Babungo area, the divisional office in Ngoketunjia, UNVDA head office in Ndop and IRAD Dschang. To achieve this, qualitative data collection method and techniques was used to get information. Observation of the behaviour of some of the extension workers/farmers during this planting period was helpful to know how each of them is involved in the activities of rice farming in the area. In depth semi structure interviews and Focus Group Discussions (FGD) was conducted to get views and perceptions of different stakeholders involved in research, rice farming and extension services. Two FGD were conducted, one in UNVDA head office in Ndop with extension workers and the other in Babungo village with rice farmers. The participants in each FGD couple with the individual interviews were selected based on random sampling. The selection of the interviewees was based on their position and responsibility in rice production.

The sample size of respondents consisted of 38 out of the 40 schedule that included; 4 interviews with staffs from IRAD, 9 extension workers from UNVDA, and 10 rice farmers. Two FGD was conducted with 8 farmers and 7 extension workers from UNVDA. The farmer FGD was conducted by talking to 8 rice farmers in Babungo area during one of their CIG meetings. The interviewees were selected in consultation with the CIG leader and accompanied by one extension worker from the Babungo rice field. Nine extension workers and 10 rice farmers were selected for the individual interviews. Women and men were represented respectively. Focus Group Discussions was used to get additional information on extension approach and methods of communication used in rice production in Ndop. Interviews was undertaken about extension approach in the rice sector, organisation of information circulation, organisation of farmers group, farmer to farmer communication, role of the different stakeholders in rice production and the constraints involve in information

circulation in rice production. It was intended to get different perceptions of stakeholders about the effectiveness of agricultural extension approach in information circulation in the rice sector and the constraining factors involved. A separate checklist was use for the different stakeholders and the same interview questions for both the individual and FGD for extension workers and farmers (See checklist in the annex).

For the research output, It is expected that constraints in information circulation in the different agricultural extension approaches use in the Ndop rice sector in Cameroon will be know and the research will yield into recommendations on appropriate extension strategies for strengthening them in the rice sector.

4.3 Method of Data Analysis

Information collected from interviews and Focus Group Discussion was analyzed using qualitative methods. The analysis of the data was based on the criteria set forth in the conceptual framework focussing on stakeholders' involvement in rice production, level of participation of farmers in extension, effectiveness of different extension approaches in rice production and the link between farmers and research. Frequency tables and figures were used to present the results. Due to time constraint I used limited sample size to collect the information for my study but if I had more time I could have conducted more interviews especially with farmers groups to get more views that can help to generate more insights on information circulation under the T &V extension approach more specifically.

CHAPTER 5 RESULTS OF FINDING

This section presents the results of the finding carried out during the field visit. A summary of the key findings of the interviews and FGD carried out are described and presented. It is based on the general background of respondents, trend of rice production in Ndop, agricultural extension approaches applied in the rice sector, communication methods used in circulating information and the constraining factors in information circulation.

5.1 The general background of respondents

Table 1, summaries the background of respondents. As earlier said the sample size of respondents was 38. This included; 4 staffs from IRAD, 6 field staffs and 3 office staffs from UNVDA, and 10 individual rice farmers. Two Focus Group Discussions with 8 farmers and 7 extension workers from UNVDA were also interviewed. The ages of respondents were between 20 to 45 years. This include both female and male respectively. The background information of the respondents during the research process is indicated below.

Table 1: Background of the respondents

S/N	Stakeholders	Gender		Percentage
		Male	Female	
	IRAD	4	-	11
	Field staff UNVDA	6	-	24
	Office staff	2	1	
	Rice farmers	5	5	26
	Farmer Focus Group Discussion	6	2	21
	Extension workers Focus Group Discussion	7	-	18
	Total	30	8 (38)	100

Source: Own study

It is noted from the table that as concern extension activities women are less represented and equally represented when it comes to the activity of rice farming (50%). On a whole the table shows male dominance with 78 percent as against 21 percent for female.

5.2 The trend of rice production in Ndop

To know the trend of rice production whether it was increasing or decreasing, interviews with farmers and extension workers revealed, the production of rice in Ndop general is decreasing specifically the yield per hectare. One hectare of rice amounted to about 6 to 7 tons of rice at first but today it's barely 1 to 2 tons. The farmers complained that it's because of various reasons; insufficiency of stable high yield varieties, insufficiency of improve varieties that are resistant to different types of stress such as cold and dryness, insufficiency of varieties resistant to diseases, lack of appropriate storing conditions, low output in factories, cumbersome cultivation techniques on land preparation, poor nature of the soils due to insufficient organic content, nursery, transplanting, fertilizer application, insufficient chemical for weeding, scaring of birds in the farm, harvesting and trenching (removing the paddy from the strew).

More importantly the cause of low rice production is due to the poor manner of the implementation of the different extension approaches in the rice sector in Ndop by the extension workers who come with too technical information that they can not understand. This is the case of the application of the Urea type of fertilizer in rice production. The extension workers on their part said it's because of the technicality of the message at the office level. This has affected the delivery of clear messages to the understanding of the farmers thereby contributing to decrease rice production. The downward trend of rice production is confirmed by statistics found in UNVDA head office as indicated in the figure below. The statistical confirmation is in the annex.

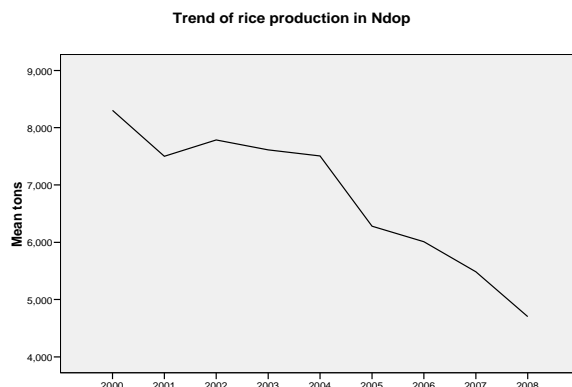


Figure 6: Production trend of rice in Ndop

Source: UNVDA, 2007

Interviews with the individual and FGD with farmers revealed, their motivations to cultivate rice in Ndop and to increase its production is because, rice is very prestigious in the area more than maize and cassava which is cultivated by everyone. Again the sales of rice generate much higher income that can improve the living conditions of farmers more that the other crops which is commonly cultivated in the area.

5.3 Agricultural extension approach applied in the area

To investigate the current agricultural extension approaches used to circulate information in the rice sector, it was revealed, the ToT, and T&V approaches are frequently used that equally has some elements of participation in it. In the ToT approach, interviews with researchers shown that, researchers get idea to

communicate to farmers from international bodies like Africa Rice Centre (WADAR), International Rice Research Institute (IRRI) and from other countries like International Institute of Tropical Agriculture (IITA) with headquarters in Nigeria. These ideas are approved by the ministries of agriculture (MINADER) and scientific research (MRSI). The extension service of UNVDA is to communicate the result package generated by the researchers to the farmers. This picture of how information circulates in the rice sector is shown in figure 7 below.

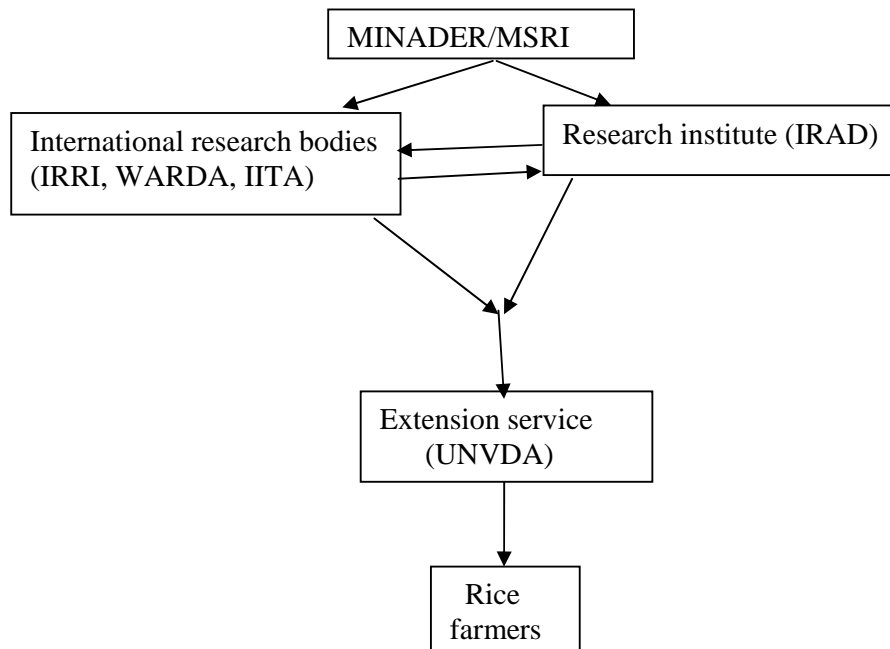


Figure 7: Stakeholders and agents involved in agricultural technology transfer

Source: Adapted from Ponniah et al., 2008, pg 94

The figure shows that researchers collaborate with international bodies to generate technologies with the approval of the ministries who also interact with these external bodies. The result package is communicated to the farmers with the help of the extension service of UNVDA.

Interview with the chief of rice sector indicated that T&V approach is the dominant approach used in the rice sector in Ndop. He affirms that the information is provided by 13 field extension workers commonly known as ‘sector chiefs and rice demonstrators’ in UNVDA through contact farmers and field demonstrations. But these extension workers are so few and the farmers/extension ratio so low that they cannot really take care of the farmers’ needs. This information was confirmed by the general manager in UNVDA who said the general staff in UNVDA is 72, 16 of whom are extension workers and 13 among them work with rice farmers at the grass root level. The number of farmers/extension workers ratio at the field level in Ndop area is indicated in table 2 below.

Table 2: Farmers/extension workers ratio per sector

Sector	Number of farmers	Number of extension workers	Farmers/Extension workers ratio
Monoun	981	2	490
Bangolan	981	3	327
Babungo	789	2	395
Lower Bamunka	2521	3	840
Upper Bamnuka	2530	3	843
Total/Average	7939	13	610

Source: UNVDA 2007 Annual Report

As seen the table above, average ratio of extension workers to farmers is 1:610. Interview with one of the extension worker affirms this fact when he said “we live with the farmers but reaching all of them so as to demonstrate to them is difficult because all do not come to the farm to work at once.” This indicates that field extension workers are not enough to reach and address the need of households in the area. The frequency of getting extension workers by farmers is very low due to the ratio between extension workers and farmers. Out of the 13 field extension workers in UNVDA, 2 are assigned to smaller areas of farming like the Babungo and Monoun rice fields and 3 to much larger areas like Upper and lower Bamunka areas as confirmed by the UNVDA annual report (UNVDA, 2006).

In addition to this, the respondents said, these few extension workers suffers from insufficient finance for transportation and buying of material to effectively carry out their job as a result of the pending statues of UNVDA. Even the basic information is not there because their skills are not frequently up graded as stipulated in the organisation constitution even though reports claims “Extension workers are train in various areas related to rice production like land preparation and transplanting techniques, harvesting and quality control of seeds” (UNVDA, 2008a) The use of agricultural libraries were very unpopular with the majority of the extension workers when interviewed.

The same report in 2004 also said they train farmers through demonstration in techniques like the seed selection techniques, transplanting, weeding, fertilizer application and harvesting. But interviews with farmers revealed it was a long time ago. The FGD with extension workers said, they visit farmers’ once or twice a week following a forth night meeting on every Monday with the chief of production. This visit is to find out how the farmers are farming and advise them on how to plant or weed better. After, they also ask farmers the difficulties they encounter. Interviews with the farmer groups said this visits were not regular.

Interviews with the FGD with extension workers revealed, the strategy used to communicate to the farmers by the extension workers is the advisory communication strategy where in they act like solution provider to the farmers. Farmer to farmer communication for innovation in rice production exist since farmers raise issues and discuss on different topics concerning rice production but it is not in the real sense of the term due to the traditional extension approach applied in the area.

5.4 Communication methods and information circulation

Questioned on the methods used by extension workers to circulate information to farmers, it was revealed by the two FGD with farmers and extension workers that, individual and group communication methods are the commonly used. This

communication method follows the top down approach where farmers are information receivers and extension workers are source of information, which fits in line with T&V approach. According to the extension workers, communication of information to farmers is through Common Initiative Groups (CIGs) which the farmers have formed at the base. The total number of farmers is 7939. Their membership in the group ranges from 10 to 30 farmers per CIG. As of present there are 5154 CIGs in Ndop area. Men and women are represented respectively in the groups as seen in the table below. The CIGs are later on divided into groups of 30 persons that form a union of which there exist 5 as of now that cater for the entire Ndop area. Twelve persons are later elected from the union to form a federation. There is one federation in existence in Ndop area. It is found out from interviews conducted with the farmers that, the existence of farmer groups in the area have been using good opportunity to circulate and collect information from different sources. The farmers' organization and the area for rice cultivation is indicated in table 3 as collected from the UNVDA statistic.

Table 3: Partition of rice farming in Ndop area

No	Sector	Number of Farmers			Area Cultivated			Farmers Organization			
		Male	Female	Total	Developed	Traditional	Total	No of CIG	Male	Female	Total
	MONOUN (Ber)	496	485	981	176.96	0	176.96	36	501	322	823
	BANGOLAN	520	601	981	287.89	81.42	369.31	36	232	297	529
	BABUNGO	522	264	786	0	192.6	192.6	12	206	118	324
	LOWER BAMUNKA	1181	1340	2521	401.54	238.81	640.35	67	702	843	1545
	UPPER BAMUNKA	1585	945	2530	168	281	449	53	1173	760	1933
	TOTAL	4304	3635	7939	1034.39	793.83	1828.22	204	2814	2340	5154

Source: Adapted from UNVDA statistic report 2007

Interviews with the extension workers said the language use to communicate to farmers and among farmers is English understood by all rice farmers in Ndop. Field days and demonstration are best organised on individual farms. It was revealed from interviews with the farmers that, information circulation on rice is through demonstration but not on farmers plots but on extension workers plot. Also weeding is supposed to be done by tractor, but it is most often done manually, because only one tractor exists for the entire Ndop area which is in a very bad condition, and which at times remains in the extension workers farm and those of their friends. Evaluation of information circulation in rice production is done through report writing, and workshops organised by IRAD.

FGD and interviews conducted with farmers revealed, contact farmers are selected from the office to conduct demonstration on their plots of which most at times are friends of the extension workers. Extension workers interviewed said other means of circulating information to farmers are through church announcement, festival, and village development meetings.

5.5 Factors constraining information circulation in rice production

Political: Interviews with field extension workers revealed, agricultural policy in Cameroon at first was biased towards the rice sector in favour of maize and cassava. This was because rice was always available in abundance from the Asian countries in the markets. It is in 2008, due to shortage of rice from Asian, the government turn towards boosting local production. It was during the launching the emergency food crisis in Cameroon that the vice Prime Minister, minister of agriculture and rural development said that the rehabilitation of the Ndop and the logone rice fields area were a priority. He revealed that cfa 800 million is allocated in the year budget for the rehabilitation. Coordination and links with complementary agricultural services were key problem for extension in UNVDA, especially the links with research, input supply system, credit and marketing organisation due to biased policy and low focus given for rice production. The government of the country favour circulation of information for research based technologies and information without considering the end users' needs and concerns. As it is found out from the interviews with extension workers, they had never created room for circulation of information for farmers to interact with other stakeholders in the system. This is due to a choice for T&V extension approach.

Technical: From the two FGD, weak linkage between farmers and research has been the main factor responsible for inadequate circulation of information in the rice sector in Cameroon. It is also noted that farmers contact with researchers and the use of agricultural libraries were very unpopular with the majority of the respondents.

According to the interviews conducted with farmers, new communication media like community (Abakwa FM and Afrique Nouvelle) which is widely use and cheap and can increase the impact of extension workers through rapid spread of information is too expensive to use by the extension workers to circulate information, because the air time is paid for. So it becomes difficult to reach a wider farmer audience only through demonstration on farmers plot. This has reduced information circulation seriously and as such yields remain low.

Economical: Interview with the general manager of UNVDA indicated that the institution has financial constraints due to the lack of budget to run extension activities in general and information circulation in particular. This has directly reflected on the type of extension services deliver by the workers to the farmers. UNVDA plays a key role in circulating information to farmers and other relevant actors in the rice sector in Ndop. Farmers have no access in the utilization of improve agricultural practices that affected the production and productivity of rice. In connection to this it is found out that, farmer did not apply fertilizers on the rice field in a way to be reached by the seed. This is due to inadequate information about the application of fertilizer as seen in the picture below.



Photo: by Patience Eshankeh Chindong
Figure 8: Rice planting pattern in Babungo rice paddy field

Social: From the farmers' group interviews, farmer organizations in Ndop are weak. They are poorly represented, badly managed, not transparent, fragmented, without a long term vision and/or not geared towards communication, with no sustainable degree of organization and self-finances. This has affected information circulation in that information is not adequately circulated as should have been the case to increase rice production. Farmers get discourage to witness demonstration and preferred to send their children to do so and to later apply it in the farm.

Communication methods: Interviews with extension workers and farmers revealed, the methods use for circulating information is through individual and the group methods. The farmers said even though the individual method is preferable because the demonstration is done in their farms, it has its own limitations as well. Farmers complained only few farmers are visited and most at times friends of the extension workers. The area covered is small since all the effort is concentrated on a few farmers. With visit to individual farmers, extension workers also complained it is expensive in terms of time and transportation. While with group method, respondents said it's good because farmers can easily learn and share information with each other.

Shortage of extension workers: From the field findings and observation, the total number of rice farmers according to the UNVDA statistic as indicated above is 7939. The total numbers of field extension workers were 13 and one went on retirement. The extension/farmer ratio is 1: 610 as mention before. Beside, the farmers are widely dispersed in many instances and very difficult to reach. The farmers generally are barely literate, and live far from information sources. The main manifestation of the magnitude of this problem is coverage. The services render are reaching only 10 percent of the potential farmers and mostly men. This has made the circulation of information on rice very difficult. The irregular visits of extension workers to the rice farmers as a result of their few in number has disrupt communication as a result, the farmers are not able to get information to improve on farming when it is needed.

Attitude and behaviour of extension workers: From my personal observation during the study, I discovered that extension workers spend three quarter of their time working in their own farms. They kept the feedback information from Monday session on how to improve rice production to themselves at the detriment of the farmers. As seen on the picture extension workers are buying chemicals not for the farmers but for their farms.



Photo: by Patience Eshankeh Chindong
Figure 9: Field extension workers buying chemical for planting

From the individual interviews and the FGD with extension workers, it was gathered from them that, so many problems hinders them from effectively carrying out extension which are summarised in the table 4 below.

Table 4: Problems hindering extension workers' effectiveness

Problem	Absolute respondent	Percentage
Low salary	5	31
Lack of teaching aids	3	19
Too many farmers to be served	4	25
Too technical information	3	19
Lack of reliable transport	1	6
Total	16	100

Source: Own study

Based on the percentage total of the respondents to each of the problems, low salary and too many farmers to be served was ranked at the top and lack of reliable transport at the bottom. Lack of teaching aids and too technical information to communicate were ranked equally (19%).

5.6 Gender issues in agricultural extension programme

Gender issues in the rice sector shows statistically that, the total number of male rice farmers is 4304 (54%) and 3635 of women (46%) see table three. From the findings of the empirical study it is confirmed that the participation of women in extension service is by far low. Therefore access to information for women is extremely low since they are not involved in the extension activities in rice production. Most of the women stay at home for domestic work that has an implication on them because women are not able to accessed socio-economic and other societal information necessary to increase output in rice due to their absence in the system.

5.7 Summary of finding

The findings revealed;

- 1 Agricultural extension approaches use in the circulation of information in rice sector is primarily top down and consist of ToT and T&V.
- 2 Farmers to extension workers ration ratio in Ndop rice production is low
- 3 Extension methods that have been employed in the area are found to be individual and group extension methods. As group extension methods, extension workers have been using demonstration on extension worker's plots and other farmers' plots chosen from the head office.
- 4 Evaluation of agricultural extension activities in information circulation is carried out through weekly report writing and periodic performance evaluation meeting.
- 5 Extension workers used advisory communication strategy to address the need and concern of the farmers but their role is beyond facilitation but act as the main decision maker in the extension system.
- 6 Farmer groups do exist in the area and they practice farmer to farmer communication for innovation but are weak and often mismanaged. They are overlooked in information circulation in the extension approach.
- 7 Factors constraining information circulation are
 - Politically, Agricultural sector in Cameroon was bias towards the rice sector because of it abundance in the market

- Government favour circulation of information for research based technologies and information without considering the end users' needs and concerns
- Technically, weak linkage of farmers to the researchers or to other NGOs for assistance
- Modern communication technologies like radio which is economically cheap and has a wider coverage exist but too expensive to use
- Economically, financial constrain exist on the part of the UNVDA and this affects directly the workers
- Socially, There is shortage of extension workers
- Attitude and behaviour of extension workers hinders information circulation
- Access to information for women is extremely low since they are not involved in extension activities

CHAPTER 6 DISCUSSION

Analyses are mainly based from the statistical analysis of the responses from researchers, extension workers and farmers involved in rice production in Ndop. It will be based on the type of agricultural extension approach implemented in the rice sector in Cameroon. How are they organized in information circulation, organization of farmers groups, communication methods used in circulating information, farmer -research linkage and gender issues in extension.

6.1 Type of extension approach use in Cameroon

Agricultural extension system in Cameroon uses various approaches in the rice sector. This includes ToT and T&V. Result of the finding show that the pattern of circulation of information in the existing extension approaches on rice production is vertical which follows Ministries-Research-Extension-Rice farmers. This is a pattern of the ToT, which is a top down approach that limits the information that should have been gathered from the farmers. This information may have significantly contributed to the improvement of the rice sector. In this approach scientists develop a technology with the approval of the ministry, demonstrate it to farmers through the extension workers, and the farmers adopt it in the final stages. In view of this, the relevant information for the farmers has not been considered in the approach. Research institutes are the sole source of technology and knowledge that overlooked the feedback of information to the farmers. This pattern has been criticized seriously by many authors (Leeuwis, 2004, Ponniah et al., 2008, The World Bank, 2006, FAO and GTZ, 2006, Rogers, 2003) as it assumes farmers can not generate technologies as such they have to accept the solution to their problems invented by the scientist. Farmers here are just passive receiver of information since they don't contribute in the process of generating this technology and during its implementation thereby negatively affecting rice production. This is so because their needs and priorities as grower of rice are not taken into consideration when designing the innovation but by international bodies who do not have any knowledge of the realities in the field.

From the spectrum of public participation continuum (SAIEA, 2005), discussed in the literature, in developing research, farmers should not remain at the level of receiving information only, for this cannot be considered as participation. This passive participant in information awareness concerning rice production only contributes more to the declining trend of rice yields in Ndop. Lessons learn from top-down approach in the circulation of information indicated that, it is difficult to develop or solve people's problem without involving them in the process (Kassa and Abebaw, 2004). Hence, it will never work no matter the good innovation generated and accessed to the farmers unless it fits with the context and realities in the area.

According to the World Bank, "the crisis of capacity building in Africa is more of institutional capacity (capacity utilization) than a crisis of technical capacity (availability of skills, methods, systems and technology). This institutional crisis, the report continues is born of structural and functional disconnect between indigenous institutions rooted in the region's history and cultural, and formal institutions mostly transplanted from outside" (The World Bank, 2006). When the World Bank made mention of disconnect institutions, it was referencing to a situation where a major decision concerning the community like innovations to increase rice production is taken outside that community and not involving the concern (farmers) in it and without any consultation what so ever with different stakeholders and actors in the field. Such transplanted models often fail to engender real ownership of the projects and really do undermine the participatory development processes which have been going on in this community for long. Sustainability of the innovation in rice production

remained the subject of discussion for the researchers and extension workers if not circulation of information has not been well thought out in the extension approach.

To ensure sustainability of rice production innovation and to enhance its dissemination rate, all stakeholders should participate at collaborative level and working directly with farmers as partners. This is to ensure that their feedback is incorporated in the final decision-making in designing research packages (King, 2000). For knowledge generation appears to be more effective when carried out in groups than when attempted by an individual. The AKIS model, recognizes the importance of the inclusion of all stakeholders at equal footing as very vital in generating appropriate innovation and facilitate information circulation among stakeholders (The World Bank, 2006). Top-down approach never include farmers views considering that farmers have no knowledge to be shared to the so called 'experts'. Top down approach is never participatory as there is no two way communication between farmers and researchers and consequently no feedbacks to improve on as shown in figure 6 above. This idea is confirmed by the participatory extension approach when it emphasis success of any project is measure through the number of farmers actively participating in it and the continuity of the programme.

For some time now very few results have come out from the laboratories in IRAD. No new varieties have been developed since the Tox rice variety was introduced in the 80s. This was due to the systematic neglect of the agricultural sector and rice in particular and its infrastructure by the Cameroonian government. At the same time, a lot of lip-service was paid to the importance of the rice sector to agriculture. This was because rice was always available and abundant in the market imported from Asia. Such abandonment of the nerve centre on which the Cameroonian economy revolves opened way for poverty and slowed down the living standards of the rural population. Although many are quick to attribute this situation to the economic crisis of the mid 80s and the harsh structural adjustment measures that followed in the 90s, the central issue remains that the deteriorating state of agro-pastoral infrastructure in Cameroon is a call for concern.

Presently there is a new high yielding rice variety in the market, which has helped farmers in other African countries like Benin, Ghana and Cote d'ivoire to double their rice production and improve on their living standards as shown in figure 10 below. But the information has just gotten to researchers and still to get to rice farmers in Cameroon. This is because farmers and researchers don't collaborate as it is suppose to be. AKIS approach makes it clear that the way people and organizations receive, transform and communicate information about the interfaces between them and about the complementary roles institutions play in relation to each other should be desirable to all and especially the farmers who are the crop grower. For as the saying goes 'information is power' but it gives more meaning if it is shared. It is obvious that if this slow trend of information flow persists, farmers in Cameroon in general and Ndop in particular, will always be behind and yields will continue to fall as observe in the present situation.



Picture adapted from the net
Figure 10: NERICA rice

Another agricultural extension approach dominantly applied in the rice sector is the T&V which is a modified from the ToT. This is indicated in the finding with the use of contact farmers and demonstration on farmers plot. According to the theory on T&V, it is to induce farmers to increase rice production based on regular visits to the farmers and training them on how to use innovations that can increase rice production (PNVRA, 208). In principle the extension worker applying the T&V is supposed to live and socialize with the farmer in the farmers' environment. That is eat and drink with them, in fact be part of their community so that he/she can observe the farmers problem (Chambers, 2005). This idea is also confirm by (UNVDA, 2007b) extension handbook that extension workers must live with the farmers. Even the things that the farmer does not see as problems, the extension worker is suppose to come to their assistance by provoking the farmers' thoughts to realise it. In such a way the farmer together with the extension worker will raise the problem and seek for solutions.

In the case of Ndop rice, the extension worker will cause the farmer to see what he/she needs to look for better ways to produce rice like high yielding variety, weeding method or type of fertilizer to use and how to apply it (UNVDA, 2008a). That is methods for instance which are less strenuous but profitable. The extension workers are to work with contact farmers who were expected to communicate the information on to fellow farmers with similar problems (UNVDA, 2006). This was to avoid, covering a vast range of farmers' directly and thus pre-programming constant failure. Finally, the extension was to channel the problem to the researcher through the fastest means for the researcher to incorporate the problem into his research package. To succeed in this the extension worker was to engaged exclusively in educational activities to help upgrade he/her skills so that they will be competent in their field of study and communication skill.

As revealed in the finding, some prominent constraints hindered effective commutation among extension workers especially financial constraints. According to Aina (1990), this problem is so severe that appointments are sometimes never respected by the extension work and a wider coverage of the farmers as planned is never accomplished. Even training for both extension workers and farmers (UNVDA, 2004) for upgrading of their skills is only on paper work. For these reasons and since they must submit a weekly report, they tend to create the demonstration plots in their own farms and that of their friends selected from the head office. When they discuss the results with other extension workers during their weekly meetings (every Mondays) they term it participatory. The selection of contact farmers in the head office makes this approach a top down like the ToT, leaving little possibility for participation and initiative both from the farmers and village extension workers. This idea is not amenable to participation using the bottom up approach, because the many layers in the hierarchy remove decision-makers from the field action. In the picture in figure 9, the extension workers are buying chemicals for their own farms and to call farmers to come, watch and apply. After that since the institution wants accurate reports to justify their activities to their donors,' extension workers write their reports depending on what they and their friends contact farmers have said and not what has been observed and tried with the targeted farmers in the farms.

It was also realized that educational activities like visiting agricultural libraries was very unpopular to the extension workers. Most of them were involved instead in other activities like election and campaigns. Visits to the farmers were not regular as revealed from the group discussion. But that with the chief of production and other extension workers every Mondays to present reports and feedback from the field were very regular at specific time intervals.

The findings further revealed, different communication strategies were used by extension workers during T&V among which was the advisory communication strategy (UNVDA, 2008b). Using this strategy has its own limitation in that farmers develop the tendency of relying too much on extension workers for solving their problems instead of developing the capacity to solve problems by themselves in their groups. This make it difficult for information to circulate in order to increase rice yields, if the extension workers do not visit, farmers will continue to use traditional way of farming thereby remaining at a low production rate or even reducing.

More so, information gathered in the field has shown that evaluation of information circulation in rice production is done through report writing, and workshops, weekly meetings precisely every Monday for field extension workers and field visits to farmers. This approach is time consuming because feedback does not get quickly to the research centres for improvement. Field visits to the rice fields are not regular because of shortage of extension workers. If information for innovation is organised in a way where in monitoring of activities could be carried out, faster data and information captured in this way can be used for lobbying governments, administrations and rural communities to ensure the release of resources, the removal of barriers and the development of a consensual approach.

T&V extension approach did not entertain circulating information about rice production. This have discourage many farmers and they started to turn to the production of other food crop (UNVDA, 2007a) as seen in table 5. This is because extension approach in these other crops follows a participatory in circulating information

Table 5: Production of other crops in paddy fields

Crop	Area under cultivation	Production in tons
		2007
Maize	1580	9,480
Solanum potatoes	424	1,720
Beans	1560	2,496
Tomatoes	72	1,080
Colocassia	415	4,980
Huckle berry	85	189

Source: UNVDA 2007 Annual Report

According to the participatory extension approach the goal of any agricultural extension approach should be to increase production and improve the quality of rural life. It is revealed from the above discussion that this two methods frequently used in the rice sector does not involved all stakeholders especially the farmers, is not participatory because the farmers who are to increase the production of rice is only involved at the level of informing. Thus one can rightly said that the T&V and ToT are not effective in bringing any meaningful change to information circulation and consequently to rice production in the area. This has been proven with the continuous decline in rice yields as seen in figure 6 above.

6.2 Organization of farmers groups

Literature shows that the essence behind the organization of farmers groups is that rural areas are usually low in density, heterogeneous and fragmented which makes it difficult for research and extension services to effectively serve them. The many individual small-scale farmers often lack the means and capacities to demand, organize or finance the information access and communication services that they need for development. In a group it is easy to achieve all these. Findings in the field revealed, farmer group exist as indicated in table 3 above. They exchange ideas and learn from one another. From the interviews conducted with farmers for instance, they affirm they learn more from their peers like preparing the nursery beds for planting. For instance one farmer said, "I learn how to prepare the beds to be soft so that the seeds can be easily removed for transplanting from my neighbour farmer." It was because as he explained, he observed from his neighbour farm that his seeds were doing well and his not. So he asked from him and he was shown how to do it. He even affirms that he is very proud of his planting seeds this year. Nevertheless, the existing farmer organizations do not practice farmers to farmers' communication in the real sense of the term.

This is because, these farmer groups still follow the T&V design in that the initiative to form these groups is not from the farmers themselves but from extension workers in UNVDA. They are control centrally from the UNVDA head office. They cannot channel their problems directly to the researcher without passing through the extension workers. This limits their level of participation as they rely too much on the extension worker to solve their problems. This hinders information circulation in that problems which could have been tackle by research directly needs to take a very long procedure for it to be done. Beside these groups are poorly organised and badly managed. For instance in 2007 the federation took a loan of CFA 3 million to buy inputs and distribute to farmers and the president of the federation was later on accused of mismanaging the CFA 3million loan. The farmers said this discourages them from taking part in most of the activities in the group and consequently distancing themselves from the group. As such valuable information that could have gained working in a group is lost. This hinders information circulation in that the farmers who are out of the group are not able to exchange what they have and do not have. This is reflected in the output of the rice harvest.

Further more mass media like radio that can reach a widen farmer range with a short time, even in the interior is not easily accessed because of network problems. This makes it difficult to communicate any new technology easily to the farmers in the absence of the extension worker. The farmers' organization is a good avenue to have close contact among members so that they can interact and communicate any matters that facilitate information circulation among members. Farmers' organization in the essence of extension approach has many advantages to facilitate farmers to farmers' communication since members have the opportunity to meet and communicate information and disseminate technologies among members. This can be effective if only the decisions are made by the farmers themselves.

Therefore if farmers, organizations are properly organized, they can be involved in adaptive research, participatory advisory services, information sharing among themselves, by sharing their knowledge and providing access as partners in communication (Wals, 2007). They can make better use of the new communication media, may even acquire their own infrastructure, organize embedded services and will be in a better position to pay for commercial services (FAO and GTZ, 2006). Even though small scale farmers' accessibility to agricultural innovations is often limited by unfavourable economic, socio-cultural and institutional conditions, they can

achieve some level of efficiency through deployment of their indigenous knowledge. If provided with the right inputs, feasible technology and relevant information, farmers are capable of transforming traditional agriculture into modern and innovative methods of farming and consequently increasing production a the objective of T&V stipulates (Aina, 1990).

6.3 Communication methods used in circulating information

As observed in the findings, communication methods frequently used are individual and farmer groups' methods. Discussion with the farmers indicated that, with the individual method, only few of them are visited, and sometimes only the plots of close friends to the extension workers are selected. The area covered is small since all the effort is concentrated on a few farmers. Information on chemicals like the compost manure available in the market remains only with the extension worker and is not shared with the rest of the farmers. At this level not all stakeholders are involve in acquiring information that can increase rice production. Consequently production constantly remains low. Like the case of the existence of the NERICA rice variety and improved fertilizer composition and its application which the farmers are not aware of during this planting season but some of the extension workers are aware of it. Information circulation is not timely when the information is relevant to be circulated. Even when the information is communicated, it is too technical for the farmers understanding. So they turn to apply it their own way. By so doing most of the fertilizer is wash away by water due to the pattern of planting and method of fertilizer application as seen in figure 8. As it is revealed from the interviews with farmers' relevant information on how to apply agricultural inputs like fertilizer have not been understood by the farmers who grow the crop which has ultimately affected rice production. This only affirms the transition of data to usable information in figure 1 that, farmers only apply what they understands and this is very vital in information circulation and also to increase rice product in Ndop.

Group method during T&V approach is suppose to be a forum for sharing knowledge among group members and for them to decide what they wish to have helped with and hence becoming somewhat farmer driven. This is what happens when a community freely sets its own development agenda and decides on the best means to pursue it (Ponniah et al., 2008). With the group method, using the T&V in the rice sector, most farmers see demonstration in the same farmers plot organized by extension workers as waste of time especially when demonstration is not rotating from farmer to farmer plot. In such occasions they mostly at times preferred sending their children to work in the rice. From the researcher observation, many of those who were involved in rice farming in the field during the first visits were children as seen in the figure below.



Photo: by Patience Eshankeh Chindong
Figure 11: children working in rice farm

From the communication methods discussed above one realized that not all farmers are involved during demonstration in farmers plot as they consider it as time wasting. This approach has some element of participation in it with the use of contact farmers and demonstrations in farmers' farms. But it is top down because the selection of contact farmers is from the head office, who are mostly friends of extension workers. Demonstration is in the same people's farmer and not rotating. As earlier said, this had discouraged most farmers in that they send children to represent them during demonstration. This has greatly reduced information circulation in that the real stakeholders who are the parents of these children are not present to witness the demonstration and the same errors keep repeating itself during planting. Therefore, information access to all farmers was biased towards the proximity with the extension workers that limited the circulation of information at large community.

6.4 Farmer- Research linkage

As earlier discussed in the result, there is a weak link between farmers and research in the rice sector. This weak linkage has made it difficult to increase rice yields. It has been considered that research institutions are the only source of information and knowledge to generate appropriate technologies that fits to the real situation of the rice farmers. But this has not brought significant change in rice production that should be considered in the extension approaches that the government is using.

The research ideas in the area are not generated by farmers but researchers without consultation and identifying the problem of farmers. Farmers in the area have no power to decide and choose the type of technologies and knowledge to be availed for them. They do not have the capacity to influence the research institutions and decide what types of services and information should be accessed. The technology generation and dissemination is not in line with the interest of farmers that affected the dissemination and adoption rate of the technologies and information.

According to the theory of participatory agricultural extension approach, research activities should begin and end with the farmers and not research-oriented. The farmers should be able to decide what technology they want researchers to generate for them to increase production. The information circulation model design in figure 2 indicates that, for rice yields to increase, research, extension and farmers organisation must all channel their resources towards the farmers. As explain in the framework, this is because they are the rice grower and increase in rice production will depend very much on the message they get and how they understand it. This model is supported by the world bank when it insisted, emphasis on information should be place on people rather than 'things' to decentralize, empower the participants, to value and work on what matters to participant, and to learn from the beneficiaries rather than teach them. Information circulation process should take people at the centre of the agenda to circulate the required information in all direction so that it speeds up the rate of circulation and reach many people at a time. The model presented in figure 2 enables us to get an idea on how effective information circulation between different actors look like putting farmers in the centre of the issue.

The attitude and behaviour of the extension workers and researchers towards farmers' knowledge is very low. This attitude blocks the inclusion of farmers' knowledge in the extension approaches and research activities that contributed negatively to the generation of technologies and later do not fit to the local context. For as Chambers (2005) say behavioural and altitudinal change is the key to improvement to development

6.6 Gender issues in agricultural Extension programme

Gender issues in recent times have been a call for concern. In Ndop statistically, the total number of male rice farmers is 4304 (54%) and that for women is 3635 (46%). The number shows the involvement of men and women in current rice production of which women labour input is far above that of men. Women play a vital role in rice marketing, and rely on income from rice to meet a variety of household and personal needs (Fonjong L. N. and Mbah F A, 2007). Yet, this important role of women income in both male-headed and single-headed households is either minimized or not well understood by agricultural authorities in Cameroon. From the finding, it was recall that in the past efforts to generate and transfer new rice technologies have most often by-passed women farmers. Thus, rural women are not usually aware of improved agricultural activities that are supposed to increase their productivity. With extension, as seen on the background, only one woman is involved in extension and at the office level and none at the field level. The FGD with the extension workers said it was as a result of the many workloads they have at home. In CIGs women were highly represented but when it comes to group meetings they were not always present for one reason or another. Of the 13 extension workers none was a woman. The absence of women in the extension system has an implication on the participation of women at field level since women can be transparent to talk and explain their socio economic and cultural issue for women extension workers but the field findings indicated that female extension workers are not assigned and working in that locality.

CHAPTER 7 CONCLUSION AND RECOMMENDATION

7.1 Conclusion

Field study and literature have revealed, different types of agricultural extension approaches have been applied in the rice sector in Cameroon specifically the ToT and T&V. Both follows a top down approach and information circulation is not multidirectional to reach many people at a time. This is because these approaches do influence the rice farmers who are the ones to increase rice production depending on the message they have. The participation of farmers in technology generation is very low since in the rice sector the sole generator of technologies are the researchers. As such the farmers' knowledge is not appreciated during the designing or implementation of innovations.

The relation between farmers and research is weak since the farmers cannot communicate directly with research without the extension workers. This is because of the choice of the extension approaches. As such there is no participation of farmers in knowledge generation in the rice sector. The links between research and other institution of knowledge like the farmers groups recognized by the concept of AKIS, farmer to farmer communication and participatory extension approach has not been respected in the rice sector. None of these approaches has really helped to increase rice production in the sector as a result of their application and consequently poverty among the rural poor has been aggravated.

The commonly used communication methods in the extension approaches are found to be group and individuals methods based on the situation and interest of farmers. Individual method is some time preferred by farmers since the service is provided in their fields. The problem raised is that the same farmers plot is selected for demonstration and the selection is not rotating. Group method has also an advantage to interact and generate new knowledge from fellow farmers and create good opportunity to share experiences among farmers. But visiting the same farmers has instead discouraged some farmers who preferred to send their children to witness and apply demonstrations in the farm.

The existence of biased policy towards the rice sector, weak linkage of farmers to research or other NGOs for assistance, no accessibility of modern technologies like the radio because its too expensive, insufficient finance, shortage of extension workers, attitude of extension workers towards the farmers, and women have low access to information because they are not involved in extension activities are among the most cited problems hindering the effectiveness of extension services in the rice sector in Cameroon. Apart from these general constraints, the finding revealed, the problems extension workers specifically faces that hinders their effectiveness in information circulation in rice production includes low salary, lack of technical aids, too many farmers to attend to, too technical information to communicate to farmers and no reliable transport are found to be the limiting factors for information circulation between farmers and extension workers.

7.2 Recommendations

Based on the findings and analysis the following recommendations are made.

- The government of Cameroon should modify the T&V extension approach to fit its context by giving equal emphasis for the knowledge and experience of farmers in technology generation and dissemination process. The public extension system should also consider farmers as the main stakeholders

having equal power in decision making during selection of technologies. Also the knowledge to the farming community to exercise bottom up extension approach within the framework of T&V should be implemented.

- The government of Cameroon should work to change the attitude of the extension workers towards working and living with the community to activate the existing knowledge of the community other than imposing packages of technologies on farmers to take and apply. The government extension system should establish motivation mechanism for extension workers to make them committed and appreciate the community's knowledge and facilitate information communication among the rice farmers and other stakeholders.
- The Cameroon government should modify and adjust the T&V approach in a way to absorb and consider the need and knowledge of the rice farmers and their role in decision making during the selection of the technologies and knowledge of the local people. T&V approach should be flexible, inclusive and should widen choices and options for the small scale rice farmers in Ndop. This will enable each stakeholder in the rice sector to be more committed in the sector thereby encouraging information sharing among them.
- The government should also redefine the statues of UNVDA and allocate sufficient budget for its mission. Budget allocation should consider the benefits of staffs to motivate and encourage working with the rural people giving high emphasis for needs and concern of the local people. This will enhance the achievement of personal and organizational goal that ultimately facilitate and enhance effective communication of information to the target groups which are the farmers, who are directly responsible for increase rice production.
- Community radio should be established by the Ndop community with the support of the government for effective information circulation and communications, so that a wider coverage of farmers can be reached within a short space of time.
- Information centers should be established with appropriate print materials so that the extension workers can consult it to upgrade skills instead of waiting only on UNVDA. Farmers who can read and write will be able to consult it and share the information with other farmers during their group meetings.
- Farmers' organization should be strengthened in terms of finance, technical competence and capacity to manage their development efforts. This can be done by allowing the farmers to select their own leaders whom they trust could manage their funds properly. In these groups, farmers should be able to ask for assistance from who ever they wish without the influence of UNVDA.
- The selection of contact farmers should be rotational so as to encourage farmers to get involved in team work and be engaged in it. This will enhance information circulation in that farmers will have a sense of belonging in the group and consequently will be able to share information with others which will contribute to increase rice production in Ndop.

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LIST OF ANNEXES

Annex 1

TOPIC: Information circulation in rice production: The case of UNVDA and Ndop rice farmers, Cameroon

These questions are mainly for academic research and will be used only for that purpose. There is no right or wrong answer, but your opinion, sincerity and objectivity in answering the questions will be of great help to the researcher. Confidentiality is assured. Thanks for your cooperation.

General Information

- 1) Name
- 2) Age
- 3) Village
- 4) Division
- 5) Occupation

Interview checklists for researchers in IRAD

1. How do you communicate result packages to farmers on rice production?
2. How are farmers' needs and priorities taken into consideration when carrying out research on rice?
3. What methods do you use to communicate result packages to farmers?
4. How do you evaluate the result of research packages to farmers?
5. What are the socio-economic, technical and political problems encountered in circulating information on rice production?
6. What do you suggest to improve information circulation between researchers, extension workers and rice famers?

Interview checklists for individual extension workers in UNVDA

1. In your opinion what is the trend of rice produce in Ndop?
2. What type of extension services do you offer to the rice farmers in Ndop?
3. What methods do you use to communicate to the farmers?
4. How often to do you visit rice farmers and where?
5. How do your services take into consideration farmers needs when taking feedback to researchers on Ndop rice?
6. How do you evaluate the results of communication to rice farmers?
7. What are the socio-economic, technical and political problems encountered in circulating information on rice production between
Extension and rice farmers?
Extension and research?
8. What do you suggest can improve information circulation between researchers, extension workers and rice famers?

Interview checklists for individual rice farmers

1. What kind of extension services do you get and from whom do you get it?
2. What kind of information do you need to boost rice production in Ndop?
3. What methods do you use to communicate with extension workers?
4. How often do extension workers visit you and where?
5. How is farmers' organizations form and how does it ensure that farmers needs are incorporated in extension workers feedback to researchers?
6. What are the socio-economic, technical and political problems encountered in circulating information on rice production between farmers and extension workers?
7. What do you suggest to improve information circulation between researchers, extension workers and rice famers?

Interview checklists for Rice Farmers Focus Group Discussion (FFGD)

- 1 What kind of extension services do you get and from whom do you get it?
- 2 What kind of information do you need to boost rice production in Ndop?
- 3 In your opinion what is the situation of rice production?
- 4 What information do you need to boost rice production?
- 5 What kind of information on extension service do you get and from whom?
- 6 What methods do you use to communicate with extension workers?
- 7 How often do extension workers visit you and where?
- 8 How do farmers organizations ensure that farmers needs and priorities are incorporated in extension workers feedback to researchers?
- 9 What are the socio-economic, technical and political problems encounters in circulating information on rice production between farmers and extension workers

Interview checklists for extension workers Focus Group Discussion (FGD)

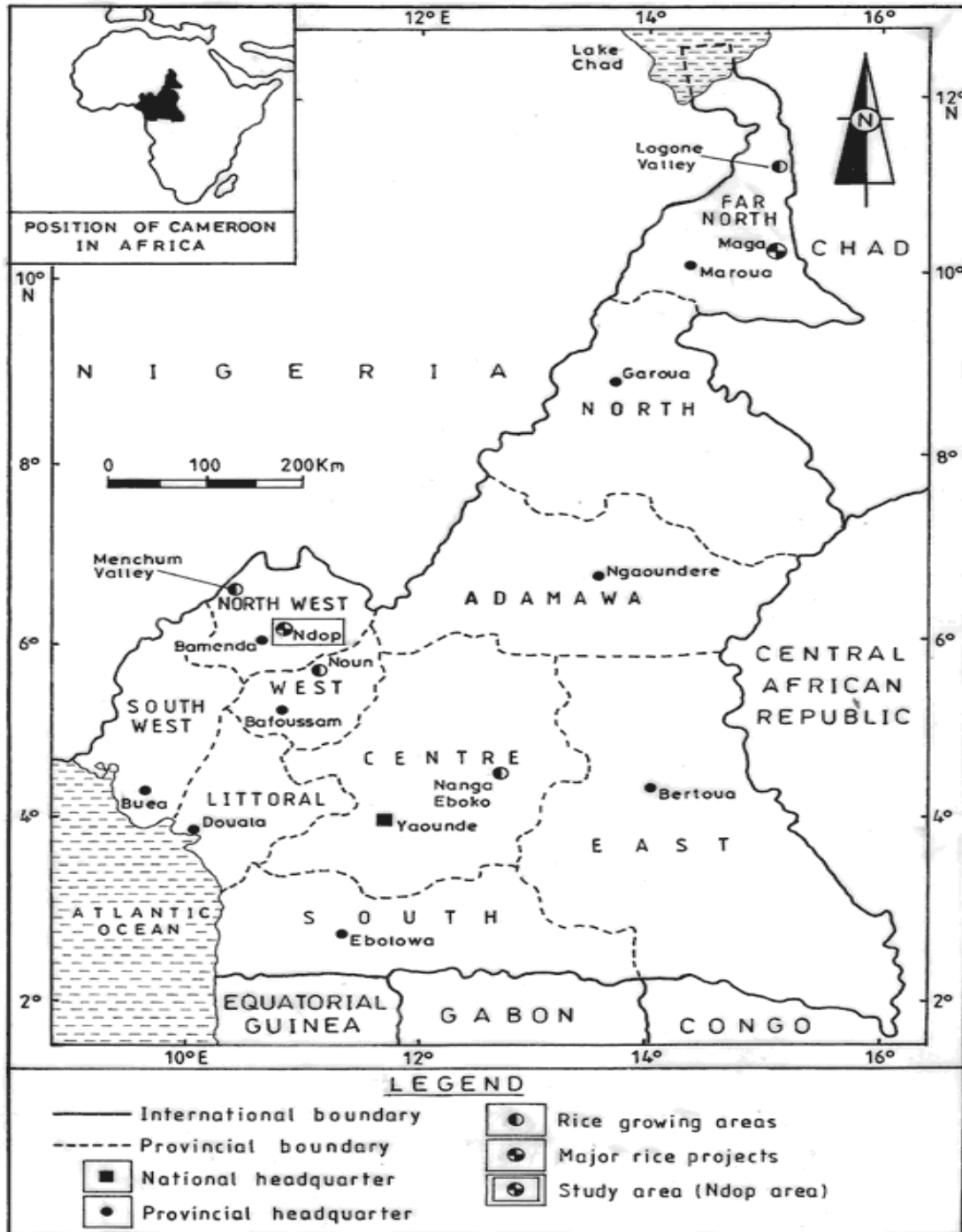
- 1 In your opinion, what is the trend of rice produce in Ndop
- 2 What type extension services do you offer to the rice farmers in Ndop?
- 3 What channels do you use to communicate to rice farmers?
- 4 How often do you visit rice farmers and where?
- 5 How do your services take into consideration farmers needs and requirements when carrying out feedback to researchers on Ndop rice?
- 6 How do you evaluate the results of communication to rice farmers?

- 7 What are the socio-economic, technical and political problems encountered in circulating information on rice production between
Extension and rice farmers?
Extension and research?

- 8 What do you suggest to improve information circulation between researchers, extension workers and rice farmers?

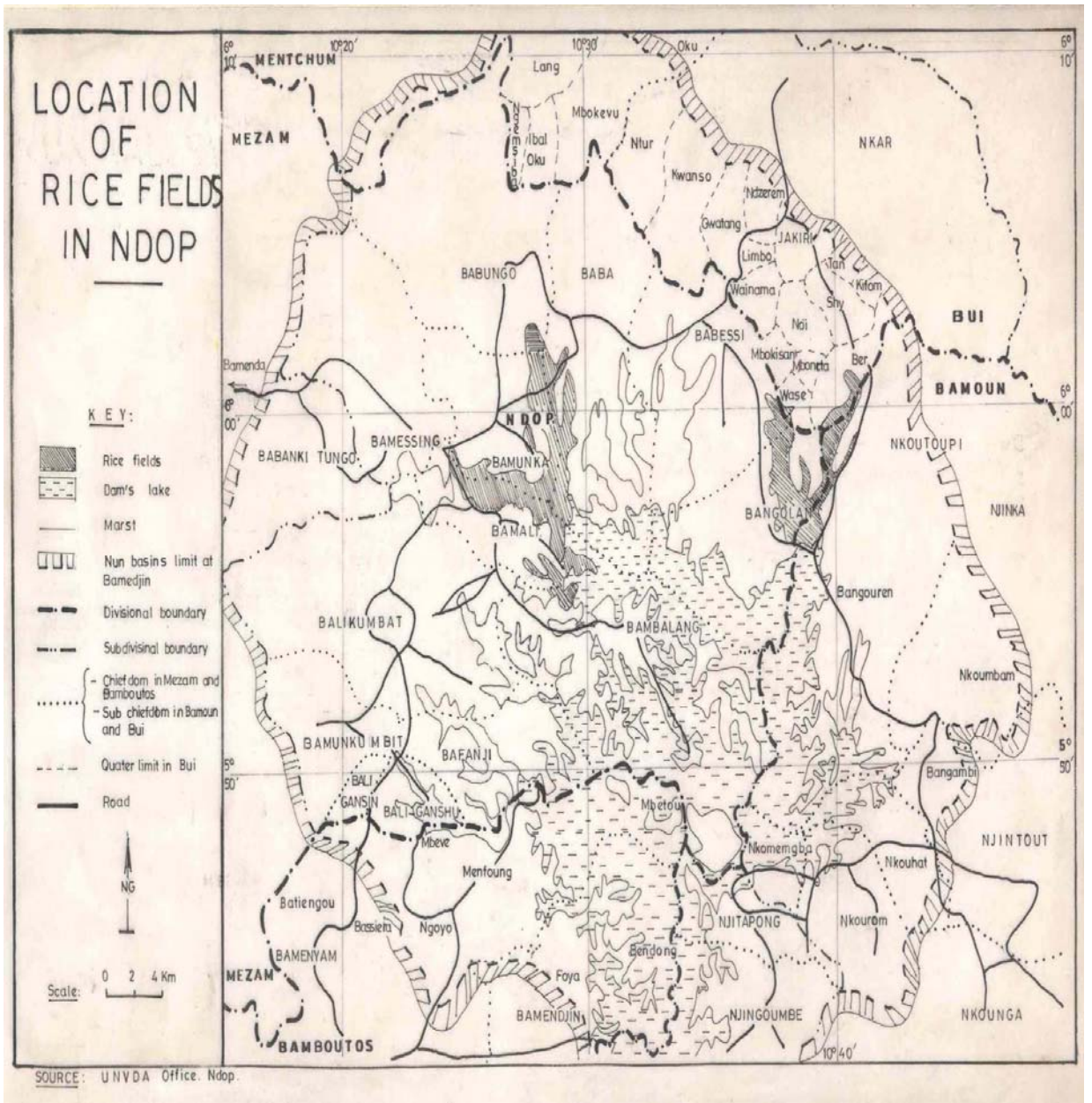
Annex 2

Map 1: Location of rice growing regions in Cameroon



Source: Adapted from Lotsmart et al 2007, pg134

Map 2: Location of rice fields in Ndop



Source: UNVDA head office Ndop

Annex 3

Table 1: Rice production areas in Cameroon

PROVINCE	DIVISION	SURFACE AREA	PRODUCTION	PRODUCTION in %
Centre	Mbam & Inoubou	171	161	0.2%
	Total Centre	171	161	
Far North	Diamare	4	8	62.48%
	Logone & Chari	3953	9653	
	Mayo-Danay	6757	27958	
	Mayo-Kani	558	173	
	Mayo-Sava	177	495	
	Total Far North	11 549	38 282	
North	Benoue	958	1475	20.44%
	Faro	1273	6365	
	Mayo-Louti	2306	4600	
	Mayo-Rey	40	88	
	Total North	4577	12 528	
North west	Boyo	229	112	12.76%
	Bui	10	23	
	Donga Mantum	214	523	
	Menchum	102	453	
	Mezam	158	476	
	Momo	1	4	
	Ngoketunjia	1561	6231	
	Total Nort West	2046	7822	
South West	Mamfe	949	1138	01.8%
	Total South West	949	1138	
West	Nde	358	942	03.8%
	Noun	496	397	
	Menoua	1000	1000	
	Total west	1854	2339	
GENERAL TOTAL		21 146	61 270	100

Source: MINADER Report (2006)

Table 2: Rice production in Ndop area from 1999 to 2008

Production year	Number of rice growing area (ha)	Surface area under cultivation (ha)	Average Surface area	Estimated production(t)
1999/2000	7.026	2.225	0,32	8.304
2000/2001	2.195	1.740	0,35	7.501
2001/2002	6.930	3.045	0,44	7.787
2002/2003	7.698	2.076	0,27	7.613
2003/2004	7.474	1.877	0,25	7.508
2004/2005	6.731	1.531,12	0,22	6.282
2005/2006	7.248	1.881,61	0,25	6.01
2006/2007	7.814	1.572,1	0,20	5.484
2007/2008	7.939	1.828,22	0,23	4.704

Source: UNVDA production statistic