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DEPARTMENT OF DEVELOPMENT STUDIES

**ENVIRONMENTAL AND SOCIAL IMPACTS OF
DEVELOPMENT INTERVENTIONS: CASE OF UNVDA IN
NDOP - NORTH WEST REGION, CAMEROON.**

A Thesis Submitted to the Department of Development Studies, in Partial Fulfilment of the
Requirements for the Award of a Master of Science (M.Sc.) degree in
Environment and Natural Resource Management

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BUEA, NOVEMBER 2015

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DEDICATION

This work is dedicated to all my brothers especially Mr Dogo Roland Tata and family and Mr Dogo Godwin Mbong and family. May the good God continue to make you people a blessing to others just as you have been and stood by me all this while; I love you all.

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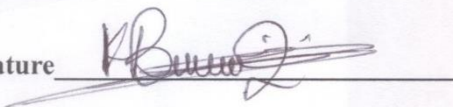
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ABSTRACT

Concern about the impacts of State Enterprises on society is a global one. Numerous efforts to reporting are unsatisfactory to stakeholders who demand ever more information on the impacts of state enterprises on the society and how they align these impacts with society's needs. This study evaluated the impacts of the activities of the Upper Noun Valley Development Authority (UNVDA) in Ndop. It specifically identified the implementation of various activities of the UNVDA; its environmental and social impacts in Ndop and eventually presented the challenges faced by the corporation in relation to these impacts. Purposeful sampling was used to administer questionnaires and interview the farmers while random availability sampling was used to interview and administer questionnaires to the workers. The study used observation, interviews, questionnaires and literature review to collect data. Data analysis employed quantitative and qualitative methods. Findings revealed that UNVDA carried out buildings (warehouses and residents), road construction and maintenance, dams and canal constructions, paddy purchase and rice marketing, the creation of farmer groups, construction of a water collection and distribution point, seed multiplication and distribution, and supplies of farm inputs to farmers. These activities have caused some impacts to the environmental and the society; the shrinking Lake Bamendjim, deforestation, habitat loss and fragmentation; as well as social impacts: road accessibility and facilities, fertilizer loans to farmers, providing facilities for seed multiplication and marketing. Also, the study revealed that the farmers were not in good terms with the corporation due to unpaid debts, high cost of loans and poor road maintenance. It was concluded that UNVDA respects four out of the ten standards outlined by the UN Global Compact that encourages business sustainability and social responsibility, although two of these principles were not so much applicable to the corporation. There is need for the corporation to reconsider its activities to prevent or mitigate the negative environmental and social impacts caused in its areas of intervention.

Key words: UNVDA, Development Authorities, Environmental impacts, Social impacts

RESUME

L'impact des entreprises d'états sur la société est une préoccupation mondiale. De nombreux efforts fournis ne sont pas satisfaisants pour les parties prenantes qui exigent toujours plus d'informations sur les impacts des entreprises d'états sur la société et sur comment ces impacts fusionnent avec les besoins de la société. Cette étude évalue l'impact des activités de Upper Noun Valley Development Authority (UNVDA) à Ndop. Elle identifie essentiellement des différentes activités du UNVDA effectuées, son environnement et son impact social à Ndop et présente éventuellement les défis rencontrés par l'entreprise relativement à cet impact. Un échantillon précis a été utilisé pour administrer les questionnaires et interviewer les agriculteurs alors qu'un prélèvement d'échantillons au hasard a été utilisé pour administrer les questionnaires aux employés. Dans cette étude, nous nous sommes servis des observations, des interviews, des questionnaires et de la revue de la littérature pour collecter les données. L'analyse des données utilise les méthodes quantitative et qualitative. Les résultats révèlent que l'UNVDA fait dans le bâtiments (entrepôts et résidences), la construction et l'entretien des routes, la construction des barrages et canaux, l'achat du riz non décortiqué et la commercialisation du riz traité, la création des groupes d'initiatives communes, la construction des points de collecte et de distribution d'eau, la multiplication et distribution des semences, les fournitures d'intrants agricoles aux agriculteurs. Ces activités ont causé des impacts sur l'environnement et la société. Les impacts environnementaux comprennent le rétrécissement du lac Bamendjim, la déforestation, la perte et la fragmentation de l'habitat. Quant aux impacts sociaux, ils comprennent entre autre. L'accès aux routes et les facilités routières, les prêts de fertilisants aux agriculteurs, la distribution des installations pour la multiplication et la commercialisation des semences. L'étude révèle par ailleurs que les agriculteurs n'étaient pas en bons termes avec l'entreprise à cause des dettes impayées, les couts élevés des prêts et le mauvais entretien des routes. Il a été conclu que UNVDA respecte cinq des dix normes édictées par le Pacte mondial des Nations Unies qui encouragent la durabilité de l'entreprise et la responsabilité sociale même si deux de ces normes ne sont pas tellement applicables à la société. L'entreprise doit revoir ses activités afin de prévenir ou de réduire les impacts environnement et sociaux négatifs causé dans son domaine d'intervention.

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LIST OF ACCRONYMS AND ABBREVIATION

ARMP	Agence de Régulation des Marchés Publics
BDPA	Bureau de Developpement de la Production Agricole
CDC	Cameroon Development Corporation
CFA	Communauté Financière Africaine
CNPS	Caisse Nationale de Prévoyance Sociale
EIA	Environmental Impact Assessment
FAO	Food and Agricultural Organization
GIS	Geographic Information System
ICIMOD	International Centre for Integrated Mountain Development
IRRI	International Rice Research Institute
ISAR	International Standard for Accounting and Reporting
IRAD	Institute de Recherche Agricole pour le Developpement
JICA	Japan International Corporation Agency
LCBDA	Lake Chad Basin Development Authority
LIFIDEP	Livestock and Fisheries Development Project
MIDENO	Mission de Développement de la province du Nord Ouest
MINEPDED	Ministère de l'Environnement, de la Protection de la Nature et du Développement durable
MINADER	Ministère de l'Agriculture et du Développement Rural
MINFI	Ministère de Finance
PACA	Project d'Amelioration de la Competitive Agricole
SONARA	Societe Nationale de Raffage
SPSS	Statistical Package for Social Science
SNH	Societe National de Hydrocarbon
SODERIMS	Société de Développement de la Riziculture dans la Plaine des Mbos
SODECOTON	Societe de Developpement du Cotton
SODECAO	Societe de Developpement du Cacao
SOCAPALM	Société Camerounaise de Palmeraies
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNVDA	Upper Noun Valley Development Authority
WADA	Wum Area Development Authority

CHAPTER ONE

INTRODUCTION

1.1. Background to the study

Despite decades of liberalization and privatization in many countries worldwide, State ownership and state-led business activities remain widespread (Aldo and Sergio, 2014). Governments use State Owned Enterprises (SOE) to secure Natural Monopolistic Markets and to promote development by investing in sectors where private investments are little. These government institutions carry different appellations in various countries and even within the same country as well. They could be termed Development Authorities, Government-owned Corporation, State-owned Company, State-owned Enterprise, State-owned Entity, State Enterprise, Public Corporation, Government Business Enterprise, Commercial Government Agency, Public Sector Undertaking, or Parastatals (Sovereign Wealth Fund of France, 2015). The common features of these institutions are that they have a distinct legal form and are established to operate in commercial affairs.

State Owned Enterprises (SOE) became very popular in the 20th century where many governments in Europe and beyond took control or ownership of almost every sector of its economy such as water, oil and gas explorations, electricity, telecommunications, shipping services, agricultural mechanization amongst others (Christiansen, 2013). This period became known as the age of state capitalism. As the importance of SOEs increased, the merits and demerits of the model became increasingly prominent. Governments frequently used SOEs artificially to maintain employment in the face of economic crises (such as after the oil shocks of the late 1970s) and even control consumer prices (Christiansen, 2013). On the contrary, SOEs lacked good managerial practices commonly found in private firms, such as close monitoring by independent board members, transparency, and high-powered incentives for their managers. Facing escalating debt and realizing the high opportunity cost of allocating state capital to unprofitable SOEs, many of the Western governments in the late 1970s and the turn of the 21st century experimented with reforms in the public sector (Max *et al.*, 2013; Aldo and Sergio, 2014) and eventually undertook large-scale privatization programs. Despite the efforts made by Western nations to promote the privatization of state assets, African governments especially had political and economic reasons to slow down the process and to keep some strategic assets under their control. With this understanding, one could, therefore, allege that state capitalism only went through some restructuring process as many African governments saw its importance in safeguarding some aspects of national interest as was deemed and therefore only partially privatized these corporations, having shares in most of them. One truth, however, remains that the significance

and the scope of the public enterprises in Africa do not in any way match up with what was practiced in the Communist world (Frank and Charles, 1968).

In Cameroon, over 200 State Corporations were covering every sector of the economy by 1988; following years of privatization and closure of some other corporations, the number however dropped to 125 (United States (US) US department of states, 2014). The government has however reinforced its foothold on the remaining ones found in domains of telecommunications, rail, electricity and potable water supply, oil and gas exploration, agriculture and real estate infrastructure, mail delivery, air transport, upstream and downstream petroleum distribution, textile manufacturing, mortgage financing and social security (Awung and Atanga, 2011; US department of States, 2014). Each State Owned Company has an appointed board of directors and a parent Ministry they have created Natural Monopolies in particular economic sectors and sometimes distort the competitive landscape. Generally, lack of transparency and little or no accountability sums up as the main weaknesses for SOE in Cameroon. Successive reports from the Audit Chambers of the Cameroon Supreme Court indicate that “only one in five SOEs actually produce yearly financial statements (Kiari, 2007; US Department of State, 2014). These weaknesses in the administration is accounted for by the fact that majority of the managers are political appointees, and retired civil servants; expertise is not necessary and once appointed, the management can remain in place for decades increasing serious risk of embezzlement, corruption, and conflicts of interest (Department of State, 2014). Of the 100 most prominent cases of embezzlement brought before the courts over the past decade, approximately 80% of them concerned top managers of SOEs” no doubt Yerima (2015) calls them illegal managers.

One remark concerning these SOE in Cameroon is that the government does not have complete ownership over several of them. Pressure from the IMF in the 1980s led to the partial privatization of several of these Government Owned Corporations. The reason for this privatization was to enhance the growth of Foreign Direct Investment into the Country which today stands at over \$500 million with the US, France and recently South Africa, China, Morocco and South Korea owning an increasing number of shares in some top Government Corporations in the country (FAO, 2012).

In the agricultural domain, the Cameroon government is the torchbearer in agricultural mechanization. The SOEs operate in the following fields;

- Cotton Production and Exports (SODECOTON)
- Banana, Rubber, Tea and Palm production (CDC)
- Cocoa Production (SODECAO)

- Rice Production (SEMRY, UNVDA)
- Palm Oil Production (SOCAPALM)
- Research in agricultural developments (IRAD)
- Agricultural training and seed supplies (MIDENO)
- Training and Support in Livestock and Fish Keeping (LIFIDEP) etc.

Based on the above facts it can, therefore, be said that the Cameroon government especially in the agricultural sector uses Development Authorities or State Owned Corporations as a key tool to achieving its ‘development’ objectives. The result has not been entirely a success story, though; the Wum Area Development Authority (WADA) in Wum, Commercial Wheat farming in Adamawa, Santa Coffee Estate in Santa, Société de Développement de la Riziculture dans la Plaine des Mbos (SODERIM) in Santchou are some few unfortunate cases of Development Authorities which folded-up. According to Awung and Atanga (2011), the reasons for the abysmal performance and eventual closure of some of these corporations are blamed on the fact that General Managers appointed are based on political loyalty rather than competence. Employment opportunities in these corporations are very much a function of political and tribal ties and corruption and embezzlement are all pervasive. By the 1990s, these SOEs became serious liabilities to the extent that the government was subsidizing them at a tune of 150 Billion FCFA. Without mixing words, it can be said that Cameroon has recorded a mixture of successes and failures as far as the management of State Owned Corporations is concerned.

In the 1960’s, the government of Cameroon sought to encourage agricultural production by launching the Green Revolution Program. It was based on this background that the Upper Noun Valley Development Authority (UNVDA) was created. The launching of this corporation followed the failure of some other agricultural establishments.

The UNVDA is a development corporation created in Ndop in 1970 as a mission by presidential Degree N^o 70/DF/529 of October 29/1970 and later transformed into a Development Authority by another Presidential Degree N^o 78/157 of May 11, 1978. Its present legal area of intervention covers five Divisions of the North West and West Regions of Cameroon namely: Mezam, Ngoketunjia and Bui in the North West; and Noun and Bamboutos in the West Regions. The head quarter, however, is in Ndop in the Ngohketunjia Division.

The UNVDA was widely expected to bring the benefits of modern agriculture to the local population and to launch the region into a trajectory of sustained economic and social development. It had the following general objectives;

- To reduce poverty amongst the inhabitants of its area of intervention,
- To contribute to food security in the area in particular and the country in general,
- To increase agricultural production and productivity in the area and
- To facilitate the processing and marketing of farmers' produce

The following were its strategic objectives

- To facilitate access to rural infrastructure for the farmers of the area,
- To ensure the sustainable management of the natural resources of the area and
- To facilitate the organization of the farmers in to professional groups

The decree creating the UNVDA allowed the corporation unrestricted latitude to experiment on a wide variety of crops suited for the Ndop ecological zone (Ngwa, 1995). Following a period of experimentation, the corporation settled on giving aids to the farmers in the cultivation of rice and lately maize, soya beans and green beans. Of these four crops, rice has received more attention than the others (and the other crops relegated). The strong attention paid to the cultivation of rice, the vast expanses of land allotted to its cultivation, its ubiquity in the region and the proportion of the population engaged in its cultivation are all indices of its importance.

The UNVDA has tried though with difficulties in meeting up with its stated objectives. Some objectives are being met, some only partially, and some others abandoned for various reasons. The summary of literature reviewed shows that UNVDA has been through three phases of growth and development

Rapid growth and development characterized Phase One (1970 to mid 1990s). During this phase the UNVDA seemed to be meeting up with its objectives, a lot more people were employed and output was on the rise. Phase Two (late 1990s up to 2006) was marked by budgetary cuts and managerial problems. During this period, the company was more or less the shadow of itself. It was characterized by the layoff of workers, falling output and abandonment of its usual projects of road maintenance, farm development, subsidized health care to workers, purchase and marketing of the peasant outputs at the normal rates. Phase Three (2006 to Present) is marked by a growing interest in the activities of the corporation. The government has revised its decision on agricultural establishments by increasing

its investments in them, increasing foreign aid is also making the UNVDA regain its status of yesteryears given the nearly two decades of recession thus, it is beginning to see the light of another era.

1.2. Description of study area

Ndop is one of the three Subdivisions that make up Ngohketunjia Division in the North West Region of Cameroon. Ngohketunjia Division consists of thirteen villages including Bamunka, Babungo, Baba I, Babessi and Bangolan to the east, Bali Gashu and Bali Gansin to the west; Bamessing and Bamali on the gateway from Bamenda, and to the south, Balikumbat, Bafanji, Bamukumbit and Bambalang situated near the River Noun. The Ngohketunjia Division contains Ndop, Babessi and Balikumbat subdivisions. The Division shares boundaries with Boyo Division to the northwest, with Mezam Division to the west and with the Noun and Bamboutos Division in the Western Region to the south. The area of study covers a total of 1,151km² and lies on an altitude of between 1,100 and 1,400meters above sea level.

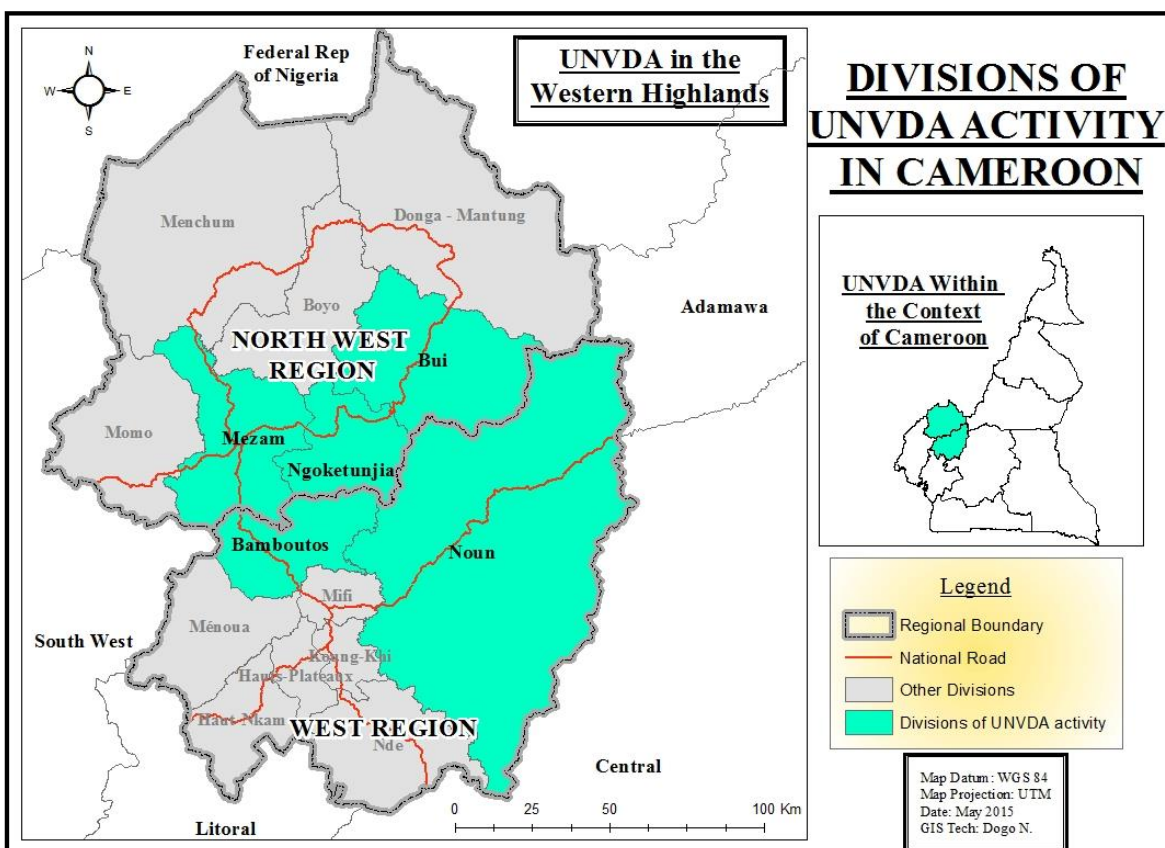


Figure 1.1: Divisions of UNVDA activity

The Ndop Plain is located between latitude 5°37'N and 6°14'N of the equator and between longitudes 10°23'E to 10°33'E. This region experiences an average maximum daily temperature of about

27.22°C. The hottest months are December, January, and February; with maximum average daily temperatures going up to 30°C. Average monthly rainfall totals are estimated at about 273mm for the wettest months which fluctuate around June, July and August. The rainy season generally begins around March and April while the dry season begins around October and November but the occurrence of climate change has made it difficult to determine precisely when the seasons starts or ends. A combination of these factors has favored agricultural practices in this region.

The Ndop Plain is located in the western highland Agro-Ecological Zone of the Country. The Ndop Plain is one of the major breadbaskets of Cameroon concerning its agricultural outputs which serve the main urban centers of the country. This Plain is estimated to have an area of 4000km² and directly sustains a population of over 200,000 inhabitants (Mphoweh, 2007).The inhabitants are mainly involved in crop cultivation, cattle rearing, and some fishing.

1.3. Statement of the problem

There has been growing concern in recent years about the impact that enterprises have on society. A large number of initiatives have been taken by various stakeholders to assess corporation's social and environmental impacts in New Zealand, Romania and Brazil and the findings revealed that, little was done by these corporations to remedy impacts created by them. These corporations were also performing poorly compared to the private sectors in these countries (UNCTAD, 2004; Sergio, 2014). Responding to these developments, the International Standards of Accounting and Reporting (ISAR) at its eighteenth session identified corporate social responsibility as one of the emerging issues in the area of corporate transparency. This identification of corporate social responsibility was followed the recommendations of the seventeenth session of ISAR for the UNCTAD secretariat to continue its efforts to promote sustainability reporting, which includes financial, environmental and social aspects of the activities of state enterprises.

Ndop Plain is known for its rich biodiversity of flora and fauna species. Studies by Mphoweh (2007) showed that over 18 local names were given to the fauna species that thrived in this area some of which included: Gorillas, Hippopotamus, Crocodiles, Cheetahs, Monkeys, Waterbucks, Antelopes, and several species of large snakes. Evidence of these could be seen from skins and skulls of animals that are displayed today in the chiefs' palaces and on the walls of some homes of hunters. Studies have also shown that the establishment of UNVDA in Ndop resulted to the existence of a multi-cultural population due to migration (Ngwa, 1995). In fact, the government continues to place emphasis in investing on this corporation since the year 2006 to improve on its productive potential.

However, this has resulted to a mixed reaction by the farmers who were the target beneficiaries (Fai, 2012).

The company's objective has been to develop the existing swamps into rice fields and encourage paddy rice production by providing farmers with support through loans. After that, the enterprise purchased the harvest from farmers, processed and then sold to consumers within the country. In the year 2002, over 3000 hectares of swamp land was already developed into rice fields and over 6000 registered farmers were actively working in these fields (Mphoweh, 2007; Lotsmart and Mbah, 2007). All in all, the UNVDA project has provided support to farmers as well as carried out numerous construction and maintenance activities across the Plain that may have impacts on the environment and the society in miniature. Unfortunately, evidence reveals that no Environmental and Social Impact Assessment was carried out before the commencement of any of these activities since the inception of this SOE in 1970 (Mphoweh, 2007). Therefore, this work is an effort to promote sustainability reporting of the environmental and social aspects of this corporation's activities in Ndop.

1.4. Objectives of the study

In order to properly carry out this study, the following objectives were stated:

1.4.1. Main Objective

- To evaluate the environmental and social impacts of the activities of the UNVDA in Ndop.

1.4.2. Specific Objectives

- To identify the implementation of activities carried out by UNVDA in Ndop
- To identify the environmental and social impacts of these activities in Ndop
- To identify the challenges faced by UNVDA in relation to environmental and social impacts

1.5. Research questions

- What are the various activities of the UNVDA in Ndop?
- What environmental and social impacts have been created as a result of this program?
- What has so far been done to minimize the negative impacts created?

1.6. Significance of the study

Significance to the Corporation

This study was aimed at identifying the environmental and social impacts that the UNVDA program had on the Ndop municipality. It brought out some environmental and social mitigative measures to

the curb the impacts identified. This in a way could act as a benchmark to enable a positive reaction from the corporation to solving major issues affecting them.

Significance to research

This study also provided more avenues for further research into the activities and impacts of the corporation on the inhabitation of the area and the environment. Its methodology could help in the proper study of other state corporations. Data generated in the study could as well serve as valuable information or literature to other studies around the area.

Significance to policy

The study proved that lack of adequate response to the impacts of the UNVDA on the environment and the society to some extent was because of some lapses in the policy put in place. Therefore, a proper response to these impacts will only be through drafting of environmentally sensitive and sustainable policies.

1.7. Scope of study

Although the statutory area of intervention of the UNVDA covers the entire Plain of Ndop including the Ngohketunjia, Mezam, Bui, Noun and Bamoutos Divisions, this study was limited to the two main rice producing sectors of the Upper and Lower Bamunkain Ndop. Even though the name Bamunka is originally taken to mean the town of Ndop, but this is interpreted differently when it concerns the corporation and how farmers are managed. The Upper Bamunka sector covers an area extending into Balikumbat subdivision while the lower Bamunka area extends into the Babessi sub-Division. To the best of the researcher's knowledge, Information was not available on the actual surface areas of these sectors. Therefore, results discussed in this study are taken to represent the environmental and social impacts of the UNVDA in Ngohketunjia Division.

1.8. Organization of the study

This thesis is organized in to five chapters. Chapter one covers the background information concerning the topic; it equally includes the geographical description of the area. Chapter Two deals with the review of related literature obtained from various published and unpublished reference materials and theoretical framework is also discussed here. Chapter three treats the research methods which were employed in the study and, Data presentation and analysis are done in chapter four. The fifth and last chapter makes up the conclusion and recommendation. References and appendices are also attached at the end of this thesis.

1.9. Definition of terms

Some major terms used in this thesis are defined in this sub-section

Natural monopoly

A natural monopoly is a particular type of monopoly that can arise when there are very high fixed costs or other barriers to entry in a business or delivering a product or service. This creates a situation where it is more efficient for one business to deliver a product than multiple businesses (Sovereign Wealth Fund of France, 2015).

Eutrophication

Eutrophication is when too many nutrients like nitrogen and phosphorous, are present in a water body, usually as a result of runoff from the surrounding land. Algae, plankton, and other microorganisms love these types of nutrients, and when they are plentiful, these aquatic organisms can colonize the ecosystem.

Development Authorities

A Development Authority is a legal entity that undertakes commercial activities on behalf of a government. They may carry several other appellations, and the defining characteristics are that they have a distinct legal form, and they are established to operate in commercial affairs although some usually operate with public policy objectives (Sovereign Wealth Fund of France, 2012).

Environmental Impact Assessment (EIA)

EIA is a formal process for identifying likely impacts of activities or projects on the environment, and on human health and welfare and which further looks into means and measures to mitigate and monitor these impacts. The purpose of EIA is to provide information for decision-making on the environmental consequences of proposed actions; and promote environmentally sound and sustainable development (USAID, 2012).

Carbon Sequestration

Carbon sequestration refers to the provision of long-term storage of carbon in the terrestrial biosphere, underground or in the oceans so that the carbon dioxide (CO₂) buildup in the atmosphere will decrease or slow. CO₂ makes up approximately 47% of greenhouse gases making it a primary contributor to global warming. (George, 2008).

Paddy

Paddy or paddy rice is the individual rice kernels that are in their natural, unprocessed state; sometimes referred to as rough rice. At processing, the protective hull or sack is removed, leaving only the actual rice kernel for consumption (IRRI, 2015).

Habitat fragmentation

Habitat fragmentation refers to the partition of a habitat or an ecosystem or biome into smaller patches usually by roads, farms or buildings. This fragmentation contributes to habitat shrinkage and further leads to wildlife extinction in such habitats (Inyang, 2014).

Corporate social responsibility

It constitutes actions whereby enterprises integrate societal concerns into their business policies and operations, including environmental, economic and social concerns. Compliance with the law is the minimum standard to be observed by enterprises. The scope of corporate social responsibility encompasses the direct impacts of enterprises' actions as well as the spillover effects they may have on society. The extent to which enterprises can be held responsible for such externalities is still being debated. (UNCTAD, 2004)

Soil Erosion

Soil erosion refers to the process of detachment and transport of soil particles by erosive agents. Usually, the erosive agents responsible for this process are water and the wind (Asong, 2014).

CHAPTER TWO

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1. Literature Review

The literature reviewed in this section has been structured according to the research questions

2.1.1. Activities of State Corporations worldwide

Frank and Charles (1968) in their study of private enterprises in Africa explained that most Sub-Saharan African Countries have some sort of a mixed economic system, but many states believe in a total state sovereignty over its main production assets. Most of these African governments over time have proven to lack the capabilities to perform all the activities of its vast private sector, and they have witnessed a slow unprecedented growth in their National Income over the years. In the 1980s in Cameroon, state Corporations had gone up to a number greater than 200 because of the myth that the economy will be much better if all its activities are nationalized by the state (US department of state, 2014).

Lotsmart and Fongkimeh (2007) in their study of female rice producers in Ndop mentioned that UNVDA handles rice cultivation, which dates back to the 1960s and that it is charged with the supervision of the production and marketing of rice in this area and the within the country at large. He goes further to mention that UNVDA evolved from the failure of an earlier project which started in 1967, Bureau de Developpement de la Production Agricole (BDPA). The failure of BDPA to obtain good results led to the creation of UNVDA in 1970. Just like all other government corporations, it suffered enormous setbacks during the mid-1980s' economic crisis in Cameroon and the harsh structural adjustment measures that later accompanied the crisis.

Lotsmart and Fongkimeh (2007) also commented on farm development and partitioning in the Ndop Plain when he mentioned that before the introduction of rice in Ndop, swamps were under the control of the traditional rulers of various areas across the Plain. As the UNVDA was created to take charge of rice cultivation in Ndop, these swamps were kept under the corporation's control, thus making it a state property. The swamps were developed and mapped out into plots (rice fields) of 10 meters wide and 20 meters long. Plots are rented out to farmers upon payment of registration fee ranging from 500FCFA to 2500FCFA or above, depending on the number of plots. The farmers are levied a development fee of 1000FCFA or a bucket of rice depending on the decision of committee members of their area. They are expected to give a bucket of paddy after each harvest to the royalty

of the area where they cultivate. If these conditions are fulfilled, then a farmer can continue to exercise right over the land.

Fai (2012) in his appraisal on the board of directors meeting of UNVDA in Bamenda, stated that one reason behind underdevelopment is because the culture, attitudes, norms, values, mind settings and needs of local people are in several occasions not taken into deliberation before any development project is launched. Therefore, this paves the way for exaggerated budgets which of course are no guarantee for success. One effect of such lofty investment in the case of UNVDA has been that some tribes have been treated as priorities while others have been reduced to second class.

Fai (2012) in this same report stated that a total of 11 billion was validated as the budget for UNVDA to use for rice production for 3 years. This led to in-house fighting amongst the board members as some information was hidden from others. No action plan has been developed for this 11 billion FCFA yet making one wonder how such a budget was established without an action plan for three years. Therefore (as Fai concluded) we are not very far from concluding this could be a strategy to siphon state funds.

Marrez (2015) defined development authorities as organizations which operate under government control and are mandated to solve particular problems identified in areas which could be a village, a town, a city, or an entire Region. The defining characteristics are that they have a distinct legal form, and they are established to operate in commercial affairs and may also have public policy objectives. The UNVDA Ndop has the mandate to boost rural development of the Ndop Plain by helping the farmers improve agricultural productivity and maintaining the farm to market roads amongst others.

According to Helena (2015), on several occasions, they are always sponsored by the national government. Development Authorities have been a very important tool for many government in the world. For instance, the New Delhi Development authority was created in 1947 to manage the urban problems of a growing city of Delhi, the Lake Chad Basin Development Authority LCBDA was created in 1973 by the governments of Chad, Nigeria, Cameroon and Niger to enhance the sustainable management of the lake and livelihood of over 30 million people living in this basin from all the countries involved.

Frank and Charles (1968) also mentioned that three types of industrialization were pursued by the newly independent African States; the first one involving heavy reliance on the private sector, the second involving both the private and public sector and the third involving a near complete control

by the state. Cameroon can be seen to be gradually moving from the third type to the second where some of the State Corporations are being privatized, enabling the private sector to have a meaningful share and contribution to the growth of the economy.

Following pressure from the International Monetary Fund (IMF) in the 1990s, the Government of Cameroon had to privatize some of the State Corporation. According to reports from the US Department of State in 2014; foreign bidders are permitted to participate in privatization programs. In Cameroon, total privatizations are rare, as the government often retains a minority stake. Of the 39 State-owned companies listed for privatization in the early 1990s, 24 were sold to national and foreign buyers. This as the government claimed was a strategy to better manage the activities of State Corporations in the country.

The impact of the public sector is felt more significantly in the non-agricultural sector such as mining, manufacturing, communication, utility, etc. and the few Corporation existing in this domain operate on a large scale are using modern methods of production (Frank and Charles,1968). In the Ndop Plain, the UNVDA encourages the use of modern farming methods including the use of tractors to tilled, improved rice seeds and fertilizers and pesticides.

An internal treasury paper published in 1996 on State Corporations mentioned that, both economic and environmental problems plaguing the New Zealand economy was because several of its key sectors were owned and controlled by the state. In the early 1980's the New Zealand economy was performing poorly compared to other western nations. There had been slow growth throughout the 1970s, high inflation, and sharply rising debt. The economy was heavily regulated and key sectors were dominated by State owned and operated businesses. This statement only affirms that what Frank and Charles (1968), and US Department of State, (2014) Yerima (2015), amongst other authors mentioned those state corporations are underutilizing state resources.

In "The Post" newspaper published in September 2015, Yerima reported that "Majority of General Managers (GMs) calling the shots at the helm of State Corporations have largely outlived the period of nine years as provided by the law". He continued that according to law N^o.99/016 of December 22, 1999, bordering on the status of Public institutions, Public enterprises and para-public establishments, GMs of such outfits are not supposed to hold office for more than nine years because they are appointed for period of three years renewable twice. According to Yerima, this law that was tailored to avoid eternal GMs has been violated with impunity; the list of companies with such illegal GMs included SNH, National Employment Fund, CRTV and CAMTEL amongst several others.

Yerima (2015) also asserts that several of the GMs of these top corporations are appointed by a single person-the President of Republic. And that some of those who are supposed to remind the President about such appointment usually stay mute because of their parochial interest.

Molua (2007) researched into the profitability and returns-on-investment for more than 150 companies in the country in an Entrepreneur Newspaper in Cameroon and ranked them according to their turnover capital. In this ranking, SONARA, Brasseries du Cameroun and Total Cameroon were the top three. At the seventh position was the first agricultural corporation; SODECOTON with a turnover capital of 160,112,000 US dollars. At position number, 13th and 14th was Group PHP and CDC with turnover capitals of 124,084,000 US dollars and 123,426,000 US dollars respectively. This ranks in a sense means that agriculture is a profitable business in Cameroon reason why the government in embarking on a large-scale agricultural mechanization.

Frank and Charles (1968) in his study on public and private enterprises stated that Poor management and administration is a major reason for the lack of success in the activities of many state Corporations; inadequate planning and feasibility studies also adds to it. Improper machinery and equipment are ordered because of greed, bribery, and corruption. Also, the operating managers and supervisors often lack organizational talents; they turn to overstaff their institutions which of cause many of them lack the proper technical competence. In cases of political competition, political power may reward allies or buy off potential rivals with sinecures in the government institutions.

A document from the US Department of State assesses that individual ministries' public contracts award committees, government institutions (including state Corporations), and municipal councils have the power to award contracts for smaller amounts, approximately less than \$10,000. The public tender process is rife with fraud at every step of the process (Frank and Charles 1968). Cameroon, however, has started to take small steps to streamline the process. Much more reform is needed to make the system more transparent and eliminate corruption. The UNVDA is a contracting authority, and most of its projects are given on contract to the best bidder.

Forfas (2010) mentioned that the commercial semi-state sector has made a significant contribution to the economic and social development of Ireland since independence. A range of SOEs initiated the provision of essential infrastructure and services that were critical to Ireland's economic development. In addition to providing critical infrastructures, early SOEs played a key role in enhancing skills (including technical and managerial skills) and entrepreneurship. The current range of activities span from transport and energy infrastructure and services provision, forestry, to

broadcasting, communications, and health insurance. This to a greater extent is synonymous to several achievements that the UNVDA has attained since its inception in the 1970s.

Studies in British Columbia (BC) by the BC Ministry of Environment (2007) pointed out that stream crossings (usually culverts and bridges) have been on the tremendous increase since the 1950s and it has negatively affected fish and aquatic ecosystems. This study looks more like the case with the UNVDA where bridges, Culverts and dam constructions are very much a part of their activities in the Plain. Bridges and culverts are very much a part of road construction in which this Corporation is involved.

Amongst this imported products is rice which is undermining the marketing of locally produced rice. Much importation according to the UNVDA is not helping to let the local rice produce have a meaningful share of the market profit.

Nguiffo (2002), while mentioning the structural adjustment programs imposed by the World Bank on Cameroon in 1988 stated that they have instead helped to finance Community disruption. The actions of privatization and state liberalization only plunged the country into more problems as it undermined local production and state sovereignty many multilateral agreements with some international corporations in the field of oil exploration and marketing, transport and communication.

Marrez (2014) said in a European Commission document on state owned enterprises in Romania that, Romanian SOEs are performing poorly compared to the private sector, with higher debt levels and lower profitability. As a result, loss-making SOEs constitute a burden on the government budget, while profit-making but-inefficiently-managed SOEs do not reach their full value-creation potential.

Nsairun *et al.*, (2013) in a training session of UNVDA staff, highlighted the importance of an organizational chart in public enterprises. According to him, organizational charts advertise to the public offices and activities carried out by the enterprise in question; it also defines functions and how hierarchy flows through the company. The UNVDA has an organizational chart which represents the corporation's activities and hierarchy of offices.

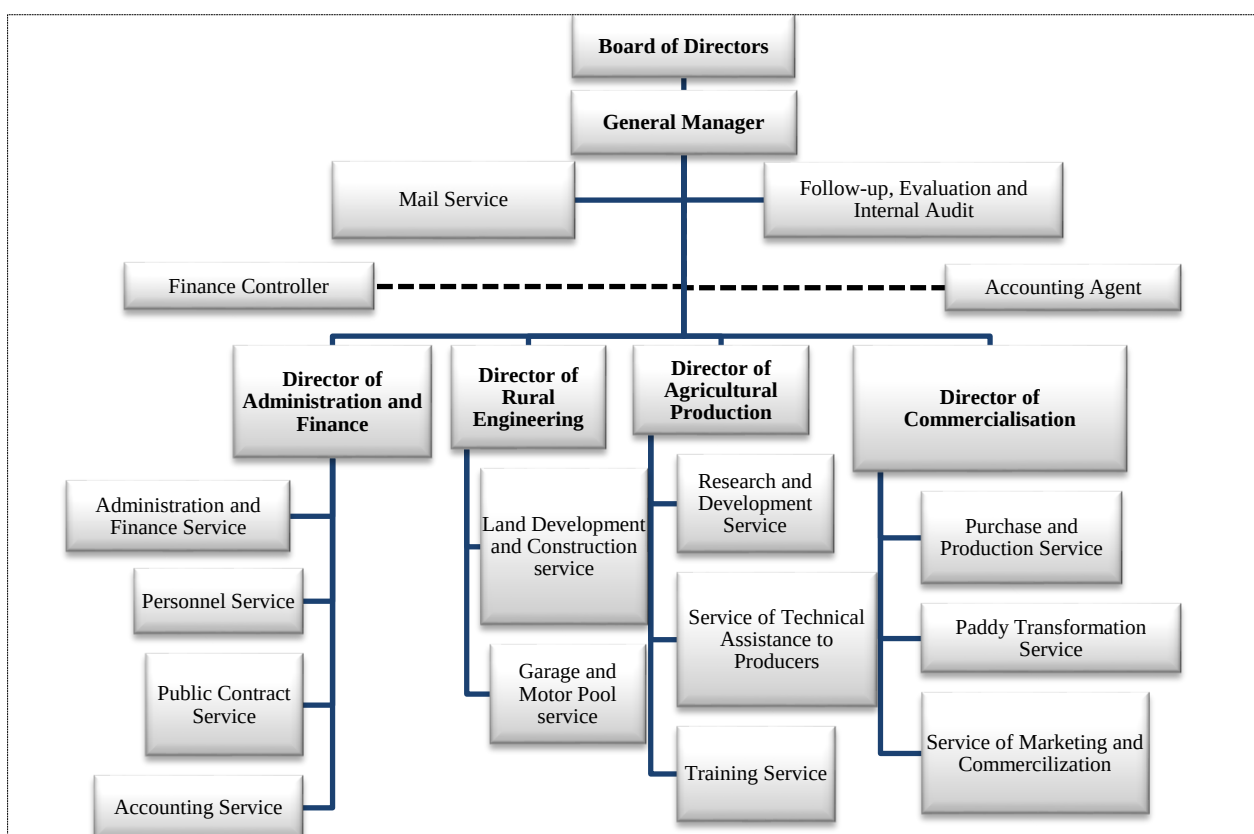


Figure 2 1: Organizational chart of UNVDA

Source: UNVDA 2015

2.1.2. Environmental and social impacts created by State Corporations worldwide

Earlier research done by Janos *et al.*, (2007) indicated that ecosystems provide a variety of services to the public including supporting services (e.g. nutrient recycling and soil formation), provisioning services (e.g. food, raw materials, and ornamental resources), regulating services (e.g. Carbon sequestration, waste decomposition and detoxication, climate change and pest and disease control) and cultural services (e.g. spiritual or historical sites, recreational experience, science and education). Also, according to these researchers, Ecosystem loss is the result of direct drivers such as land conversion leading to habitat change, deforestation with no regards for compensatory measures, pollution of streams by nutrients applied into farms and climate change. The impacts of the UNVDA activities include land conversion, habitat change, deforestation, water pollution amongst others which is so far undermining the ecosystem services of this Plain (Mphoweh, 2007).

One major consequence of agricultural extension to feed the growing mouths is deforestation; reason why Moll (1996) reported that growing export markets for rice, coffee, banana and cocoa have made

it difficult to protect forest reserves and swamps against encroachment. Locals and regional population growth have equally contributed seriously to biodiversity loss.

Issues related to environmental protection and restoration are rarely taken as a priority when it comes to project planning and implementation. This statement is based on this assertion which Chakravarty *et al.*, (2011) observed that “because we often take the benefits for granted, biodiversity is often undervalued when policy decisions are made”. He goes further to say that the attainment of sound and sustainable environmental management is one of humanity’s greatest challenges in the world at large and Africa in particular. Africa is still heavily dependent on the exploitation of natural and agricultural resources and is faced with a rapid population growth. Rice, corn and wheat make up about three-quarters of the total grains consumed in the world.

One of the greatest worries of mechanized agriculture has often been the fates of pesticides or fertilizers that never evaporated nor were absorbed by the crops or weeds in question. This worries prompted Andrzej *et al.*, (2002) who researched on the subject and discovered that dissolved fertilizers in water can be harmful to the larvae and when eaten up by fishes could be a slow poison to them. Dissolved fertilizers in water could lead to the growth of some unwanted plant species which competes with the plankton (the much-needed fish-food) in water. This unwanted plant species will lead to eutrophication, and this can have severe and long-term effects. The most notable effect of eutrophication is algal blooms. When a bloom occurs, the stream, river, lake or ocean becomes covered with algae, (usually bright green in nature). This covering blocks light from reaching the water and prevents the aquatic plants from photosynthesizing properly-a process which provides oxygen in the water to animals that need it, like fish and crabs.

Macroeconomic policies also contributed to land degradation. This was one of the points highlighted by Pamela (1998). The structural adjustment programs instituted by the IMF on Cameroon from 1984 up to the early 1990s have contributed to the degradation of habitat and loss of biodiversity without actually resolving economic problems. This structural adjustment programs reached the environment through changes in government budget and policy in trade and exchange rate. Fiscal austerity measure included cuts in rural credit and agricultural support services which discouraged intensification of land use and encouraged extensification. Cuts in spending on public utilities and parastatals aggravated rural poverty by releasing more people to full time agriculture. Pamela (1984) went further to argue that the respond on agriculture to structural adjustment has been governed

mostly by exchange rate. The appreciation of the FCFA in the 1980s squeezed the export sector and a consequent neglect of export crops and intensification increased on subsistent agriculture.

As the global population expands seemingly inexorably towards 9 billion, it is widely accepted that global food production will need to increase by at list 50% to feed the growing population and improve the living standards for billions of people. Food will also be needed to reduce hunger amongst the estimated 950 million people currently under-nourished (FAO, 2012). This projections means that more natural land needs to be conquered and developed for agriculture thereby accelerating environmental impacts in the area.

Boutin, and Jobin (1998) reported that one of the most significant habitat alterations of agriculture has been the loss of wetland habitats. Almost half of the wetlands in the contiguous United States have been converted to other uses. Conversion of land for agriculture is responsible for 80% of all wetland losses since colonial times. Between 1954 and 1975, 81% of the wetlands converted in the US were used for agriculture (Boutin, and Jobin, 1998). Recently, the importance of wetland functions has become better understood. Wetlands provide critical wildlife habitat for birds and other animals, temporary storm water storage, groundwater recharging, pollution control, and recreational activities. The myriad functions that wetlands perform make it imperative that these habitats are protected from future conversion to other uses.

Studies by International Centre for Integrated Mountain Development (ICIMOD, 2009) showed that the degradation of natural resources, particularly land and forests, has become a grave concern in developing countries where most rural people depend on these resources for sustenance. Deforestation and inappropriate agricultural practices have undermined the productive capacity of approximately two billion hectares (ha) of the world's agricultural land.

Gliessman (1998) stated that modern, or conventional, farming practices use intensive tillage, monoculture, irrigation, and application of in-organic fertilizers, chemical pest control, and plant genome modification to maximize profit and production. These practices (he continued) significantly increased crop yields, but do, however, have numerous long-term ecological impacts such as soil degradation, habitat alteration, water quality impacts, species composition impacts, and adverse effects of irrigation. He goes further to assert that land degradation is one of the most dangerous consequences of conventional agriculture. Estimates indicate that 38% of the land cultivated in the world has been damaged to some degree by these modern agricultural practices. Soil can be degraded

by salting, water logging, compaction, pesticide contamination, the decline in soil structure quality, loss of fertility, and erosion.

Generally numerous benefits accrue to roads and access, although most of these advantages are social or economic rather than environmental. Mafizul (2008) summarized some advantages of forest roads, including access to fire management, recreation, and commodity extraction. Also, resource roads facilitate public transportation, land and resource administration (e.g., research, monitoring), and traditional uses (e.g., plants, fruits, mushroom gathering etc.). Roads constructed by the UNVDA connect villages and farm to markets.

The Roads Analysis process of US Forest Service, (1999) poses an extensive list of social and economic questions for consideration during the assessment. In some instances, there are environmental benefits; for example, road corridors create edge habitat suitable for some flora and fauna species (e.g., moss and maimusa plants, jays, etc.), and roads also provide travel routes for other species (e.g., cattle like the case of Ndop Plain). Besides, transportation infrastructure can provide habitat (e.g., bridges may become bird nesting sites and tadpoles and hideouts for grass cutters).

Studies by Long (2007) on some environmental impacts of roads concluded that such impacts may vary from altered conditions that change soil pH, plant growth, to the vegetative community structure (i.e. light levels and water retention; soil displacement, temperature, and compaction; and dust). He went further to mention that reconfigured landforms can result in changed hydrologic regimes (e.g., altered water table position; interrupted groundwater flow diverted to surface systems; increased water temperatures; changes in the timing of runoff; drained natural wetland habitats; unintentional artificial wetlands; and restricted or altered channels which can result in altered streambed materials).

According to Terry, (2011) agricultural land uses can affect the quality of water and watersheds. The types of crops planted, tillage practices and various irrigation systems can limit the amount of water available for other uses. Livestock grazing in riparian zones can change landscape conditions by reducing stream bank vegetation and increasing water temperatures, sedimentation, and nutrient levels. Runoff from pesticides, fertilizers, and nutrients from animal manure can also degrade water quality. Additionally, agricultural land uses may result in loss of native habitats or increased wind erosion and dust, exposing humans to particulate matter and various chemicals.

Lumumba and Shawn (2009) in his study entitled “Neo-liberalism is theft in Cameroon” reported that the environment has been “raped”. He mentioned that State Corporations have viewed the ecosystem as something to exploit and destroy. The privatization of the forests has led to massive deforestation with as much as 200 000 hectares being destroyed every year by corporate logging operations. Likewise, as soon as the Chad-Cameroon pipeline was operational, oil spills began to occur. The result has been that numerous species are now critically endangered, and if the rate of exploitation continues, the prospect of the entire eco-system collapsing will become a reality.

Soils and salts that leach into water bodies degrade streams and wetlands as well as destroy fisheries (Gliessman, 1998). Siltation of waterways increases turbidity, which can lower productivity. Siltation can also reduce the useful life of water reserves, clog ditches and irrigation canals, and block navigation channels. Irrigation return waters can carry dissolved salts into surface or ground waters. Dissolved salts in public drinking water supplies can increase treatment costs and force development of alternate water supplies. Increased salt in surface waters can also harm aquatic life.

Hallberg, (1986) in his study on the impacts of herbicides on agriculture and groundwater quality stated that only 5% of pesticides applied to crops, however, actually reach target pests. Crop losses to pests have remained stable in recent years despite increased pesticide use. Chemical pesticides can control pests in the short-term but over time, pest problems may increase. This problem occurs because pesticides not only kill pests but pest predators as well. Also, the use of pesticides selects for pests that are immune to the pesticide and the pest population becomes increasingly resistant. As more pests survive, more and different pesticides are applied. This pattern results in increased pesticide use and increased pesticide pollution problems (Gliessman, 1998). Five percent of pesticides applied to crops are lost to surface and groundwater through runoff. Once pesticides reach surface or groundwater systems, they can harm aquatic organisms, damage fisheries, and pose human health problems (Hallberg, 1986).

Studies by Economic Resources Service (ERS, 1997) showed that fertilizers that leach into waterways are less directly toxic than pesticides, but these chemicals can cause eutrophication, which leads to oxygen depletion and death of organisms. Agrochemicals can also enter groundwater and contaminate drinking water reserves. Recently, concerns have been raised about nitrates leaching into groundwater. Most crops remove more nitrogen from the soil than any other nutrient so more nitrogen is applied as fertilizer (Hallberg, 1986). About 50% of the fertilizer nitrogen applied to crops is not taken up by the plant and remains as residue in the fields. This residue can easily leach into

groundwater especially when fields are irrigated. Recent research suggests that there is an association between nitrates in drinking water and human health problems such as fetal malformation and cancer (Hallberg, 1986).

In his studies in 1998, Gliessman again reported that agriculture accounts for a majority of water use in the United States and more specifically in the ACE Basin study area. Agriculture uses water wastefully because more than half of the water intended for crops is never taken up by the plants. Irrigation practices can have some ecological impacts. Irrigation can greatly increase soil erosion. Where water is dammed, dramatic ecological changes can occur. Where water is drawn from rivers, as is the case in the Edisto River sub-basin, competition with wildlife for this resource can occur. Irrigation practices where groundwater is removed faster than it is replaced by rainfall can cause land subsidence and if near the coast, saltwater intrusion. Extensive irrigation can also lead to changes in local climate. When water is transferred to fields, evaporation rates increase, and this can change humidity levels and rainfall patterns.

2.1.3. Efforts made to minimize the Negative Impacts Created by state corporations in the world

Mphoweh (2007) in his study on the environmental impacts of the corporation on the Plain proposed the application of agroforestry techniques on rice fields that have become food crop farms. By this means, tree species could be alley cropped in fields. In the long run, this will reduce floods and erosion on the one hand and on the other hand, it will ensure soil conservation and fuelwood security. Participatory exercises and education of the local population are also much needed in fighting against environmental problems which in some cases is caused by ignorance.

Frank and Charles (1968) proposed that a joined state and private enterprises can be more profitable than a wholly owned state enterprise. This joint administration may be because the private enterprise brings in a more efficient and strict managerial capabilities. More important however is the fact that private enterprises are less likely to invest in potentially non-profitable projects. Thus the ability to attract private investors may be one criterion to aid public corporations in choosing profitable business opportunities

Fannin *et al.*, (2007) proposed that an assessment of road systems for construction should be done at a watershed scale followed by field reconnaissance. Extensive thought to road routes, road design, drainage, and road-stream crossings such as culverts and Bridges should equally be given.

In order to reduce the destruction of flora, fauna and ecosystems in the process of road construction Roever *et al.*, (2008) proposed that the road right-of-way and roadside ditches can be narrowed.

Some efforts to mitigate environmental impacts were proposed by Moll, (1996) which he mentioned that road closure and decommissioning techniques have been suggested as a possible strategy to curb impacts of roads on soil and microorganisms. Road closure may involve rather simple techniques such as gates and berms. Decommissioning may range from relatively simple site-level techniques (e.g., removing culverts) to full obliteration (e.g., extensive re-contouring of road prisms to natural slopes). To achieve specific objectives, a combination of techniques is often used during road closure or obliteration for situations in which multiple environmental concerns are evident.

As a strategy to minimize rural land degradation, the FAO (2012) in Tanzania reported that Investments in agricultural production have the potential to supply developing countries with much-needed capital, contribute to the development of key infrastructure and spread of new technologies. Considering that agricultural growth has a bigger impact on poverty reduction than other sectors this trend can be seen as potentially very positive.

The FAO went further to assert that developing countries often face a lack of both domestic, private and governmental investment capacities. Foreign Direct Investments (FDI) in agriculture is, therefore, crucial for strengthening the agricultural sector. The agricultural sector in developing countries urgently needs capital; lack of investments has been identified as an underlying cause of the recent food crisis. FAO estimates that additional investments of \$83 billion annually are needed to deliver the necessary production increase to meet food needs in 2050. According to the FAO, farming is a risky business. Critical factors of production, such as weather and market price are mostly out of the control of the farm operator. For this reason, the government has been and must continue to be a partner, mitigating risk where possible. Government programs are essential in providing information, incentives, cost-sharing and when necessary, regulations to help farmers maintain a balance between profitability and environmental impact. But government programs may not always have the impacts intended

Creating partnerships in a business have always been seen as advantageous especially for smaller growing firms. This is the case of the International Rice Research Institute (IRRI) in the Philippines that has sort to encourage smaller rice-growing companies in many parts of the world including Africa. Some advantages accruing to this form of relationship could be the acquisition of developed excellent rice varieties that yield more grain and better withstand pests and disease as well as

flooding, drought, and other harmful effects of climate change. Also the development of new and improved methods and technologies that enable farmers to manage their farms profitably and sustainably, and recommend rice varieties and agricultural practices suitable to particular farm conditions as well as consumer preferences.

Gummert, a postharvest expert in the Philippines-in his publication at the International Rice Research Institute (IRRI) in 2015 stated that Rice husk was largely considered a waste product that was often burned or dumped in landfills, In fact, (he continued), rice husk is not waste any more in most countries.” Some enterprising companies are turning it into various products not only for the eco-conscious market place but also for the industrial sector. In India, a non-government organization uses rice husk to supply rural villages with cheap and affordable electricity. Another company (as Gummert mentioned) is bringing rice husk back to the dining table, not as food but as the main material for producing disposable chopsticks. The use of disposable wooden chopsticks which are cheap, convenient, and hygienic has a tremendous effect on the environment. In China alone, an estimated 45 billion pairs are used and thrown away every year, the equivalent of almost 4 million fully grown trees, according to a report by China Daily. If this Technology has its way, chopsticks will no longer “grow” on trees but come from byproducts of rice growing.

IRRI stands out as best practice for many agricultural based institutions around the world based on information from its website and brochures; “working with in-country partners, IRRI develops excellent rice varieties that yield more grain and better withstand pests and disease as well as flooding, drought, and other harmful effects of climate change. More than half of the rice area in Asia is planted to IRRI-bred varieties or their progenies. The institute develops new and improved methods and technologies that enable farmers to manage their farms profitably and sustainably and recommends rice varieties and agricultural practices suitable to particular farm conditions as well as consumer preferences. IRRI assists national agricultural research and extension systems in formulating and implementing country rice sector strategies”. Activities mentioned here are very similar to that which is which are carried out by UNVDA-though much needs to be done as far as research and the management of farmers in the corporation is concerned.

Marrez (2015) proposed that, under the next EU Balance-of-Payments (BoP) assistance programs to Romania, State-owned Enterprises (SOEs) have been identified as an area to be revamped. Improving performance of SOEs, including through privatizations, had a twofold purpose: (i) increase the potential of the Romanian economy, and (ii) reduce the risk to the government's budget.

Scenarios prepared by the Millennium ecosystem assessment suggest that agriculture in the future will need to focus more explicitly on ecologically sensitive management systems that give greater attention to biodiversity (Jeffery, 2005). Whether increased agricultural production is accomplished through the more intensive use of existing agricultural land or more extensive use of lands that are currently being used for other purposes biodiversity will come under increased pressure from this activity. But the better evil, they conclude, is a careful and sensible intensification to minimize the rate of deforestation and biodiversity loss.

Forms of agriculture that successfully balance productivity, improve livelihoods and biodiversity conservation at a landscape scale have been termed eco-agriculture (McNeely and Scherr, 2003). Reconciling rural development, poverty reduction, and biodiversity conservation is a key challenge facing societies today. They go further to say that; Agricultural biodiversity is understood to be the diversity in life forms used or able to be used directly or indirectly by humanity in efforts to secure the resources vital for survival. Some of these resources include; crops, forest, plants, livestock, fish and other aquatic life forms, microorganisms and others small live forms alike.

2.2. Theoretical framework

2.2.1. The Theory of ecological footprint by Mathis Wackernagel and William Rees

There is mounting evidence that ecosystems of the earth cannot sustain current levels of economic activities let alone increase levels (Wackernagel, 1995). The Ecological Footprint concept was developed by Mathis Wackernagel and William Rees at the University of British Columbia in the early 1990's. It is a metaphor for ecological impacts regardless of the where the impact occurs. Simply defined, the Ecological Footprint measures the amount of biologically productive land and water area required to produce all the resources an individual, population, or activity consumes, and to absorb the waste they generate, given prevailing technology and resource management practices. In other words, an Ecological Footprint is a measure of the amount of bio productive land and water area required to support a person's lifestyle. It includes the land needed to grow their food and other resources, dispose of their waste and absorb their carbon emissions. The footprint counts all the impacts of personal spending as well as the business and government expenditure on their behalf. As its originators note, the ecological footprint calculations have reinforced the view that if everyone enjoyed a North American standard of living then globally this would require three earths— although finding two other planets would be difficult. Simply stated, we are living beyond our biophysical means (Wackernagel and Rees, 1995).

According to Wackernagel and Rees (1995), the Ecological Footprint concept is based on the following fundamental assumptions;

- That majority of the resources people or activities consume, and the wastes they generate can be tracked.
- Most of these resources and waste flows can be measured in terms of the biologically productive area necessary to maintain them. Resource and waste flows that cannot be measured in terms of biologically productive area are excluded from the assessment
- By scaling each area in proportion to its bio productivity, different types of areas can be converted into the standard unit of average bio productivity-the global hectare. This unit is used to express both Footprint and bio capacity.
- Global hectares represent aggregate demand or ecological footprint and therefore, each hectare of productive area can be scaled according to its bio productivity and then added up to calculate bio capacity.
- As the ecological footprint is expressed in global hectares, human demand can be directly compared to global, regional, national, or local bio capacity.
- Area demanded can exceed the area available. If demand on a particular ecosystem exceeds that ecosystem's regenerative capacity, then the ecological assets are being diminished. For example, people can temporarily require resources from forests or fisheries faster than they can be renewed, but the consequences will be a gradual reduction of stocks in that ecosystem. When the human demand exceeds available bio capacity, there is said to be an overshoot.

Earth Overshoot means that we are reducing the ability of the earth's land and water (through over-exploitation of the earth's resources) to support human numbers and other species into the future. This can be liken to you spending more money than you earn, it is possible to exceed ecological limits, but this leads to the destruction of ecological assets on which our economy depends, such as depleted groundwater, collapsing fisheries, Carbon dioxide (CO₂), accumulation in the atmosphere, and deforestation.

Humanity is using the regenerative capacity of the Earth each year—the flow of resources—while at the same time eating into the standing stock of resources that has been building over time and accumulating waste in the environment. This process reduces our ability to harvest resources at the same rate in the future and which of course, leads to ecological overshoot and possible ecosystem collapse.

Studies by Ewing *et al.*, (2010) mentioned that the world-average ecological footprint in 2007 was 2.7 global hectares per person. But with a world average bio capacity of 1.8 global hectares per person means that there is an ecological deficit of 0.9 global hectares per person. If a country does not have enough ecological resources within its territory relative to its population, then there is a local ecological deficit and it is called an ecological debtor country. Otherwise, it has an ecological remainder is referred to an ecological creditor country. Out of the 158 countries whose ecological footprints were surveyed, 115 however are ecologically deficit countries as against 43 ecological remainder, or creditor countries. According to this list, however, Cameroon is still an ecological creditor country, but this credit is fast reducing.

Of course, the ecological footprint or impacts on the environment cannot only be blamed on the individual decisions and actions, but is also an issue of sharing the responsibility with the national governments and big businesses in the areas of concern (Alan and Jamie, 2007).

2.2.1.1. Application of the ecological footprint theory to the study

The Ndop Plain has an estimated population of more than 200,000 inhabitants as stated by Mphoweh (2007). The national census statistics have proven that this population is on the increase at the rate of about 2.24%. This means that more resources are being required from a limited natural capital stock year in year out to feed the growing population and to absorb their wastes; therefore the propensity for an increasing ecological impact on the Plain is no longer a matter of conjecture but that of certainty. A stable or declining bio productive land, on which a growing population depends on for resources and waste absorption, is already an indication of danger in the near future; hence, signaling a risk of ecological overshoot. In other words, the ecosystem of the Plain is losing its ability to continue sustaining the accelerating rate of economic activities of the area which of course is an indication of a problem.

At the helm of this agricultural dominated Plain, is the UNVDA that has been delegated powers to manage sustainably the resources of the Plain to ensure that issues regarding the environment and development initiatives are interdependent and mutually reinforcing (see strategic objective 1.3.2). The wellbeing of the inhabitation are however being sustained to some extent by this corporation but there is a permanent impact or ecological footprint that is being left on the environment. Little however is being done by the corporation to manage sustainably the natural capital stock and boost the regenerative ability of the existing resources of the Plain to avoid or minimize the situation of depleting the resources for the future generation. The consequences of this lack of appropriate action

by the corporation have been an ecological overshoot that is resulting from over exploitation of the some of the natural resources of the area beyond its regenerative capacity causing a depletion of the natural capital stock that may result to an ecosystem collapse.

Throughout the researcher's period in Ndop no evidence of tree planting was noticed but rather evidences of deforestation were abound with both the inhabitation of the Plain and the corporation. The natural vegetation is harvested as fuel wood and building materials by the inhabitation while the corporation destroys the vegetation through farm developments, road constructions and laterite excavation for road maintenance. This means that the vegetation stock of this Plain is on the decrease since it is being tapped at a rate beyond its regenerative ability.

One aspect of overshoot is the depleting fish resources of the Plain even though practically the corporation is currently not involved in this aspect but part of their objectives (in theory) require them to research into things like fish farms to counter and reduce the over dependence on the limited natural fish stock in the Plain.

Some discovery from interview with the staff of UNVDA and some middle men in the Plain who buy and sell their rice to Nigeria revealed that Majority of the rice that is produced in the Plain is actually consumed in Nigeria. This means that a growing appetite for Ndop rice in Nigeria is creating an ecological footprint in the Ndop Plain through the increasing use of fertilizers to get more yields, increasing the land area to cultivate more rice, digging of roads to evacuate the rice and so on.

Wackernagel and Rees (1995) seem to be concluding their theory on the same note with the principle of population and resources by Robert Thomas Malthus and equally in the same lines the concept of Carry Capacity; that if humanity continues to exploit its resources in this unsustainable way, the consequences will be a situation of humanity exceeding the carrying capacity or natural capital stock of the bio productive resources on which they depend. In fact, carrying capacity measures the number of people that can live sustainably on a given land, whereas, ecological footprint on its part instead measures the amount of land that can support a given number of people and absorb their waste. While applying this theory in his study, the researcher had this tree diagram in mind;

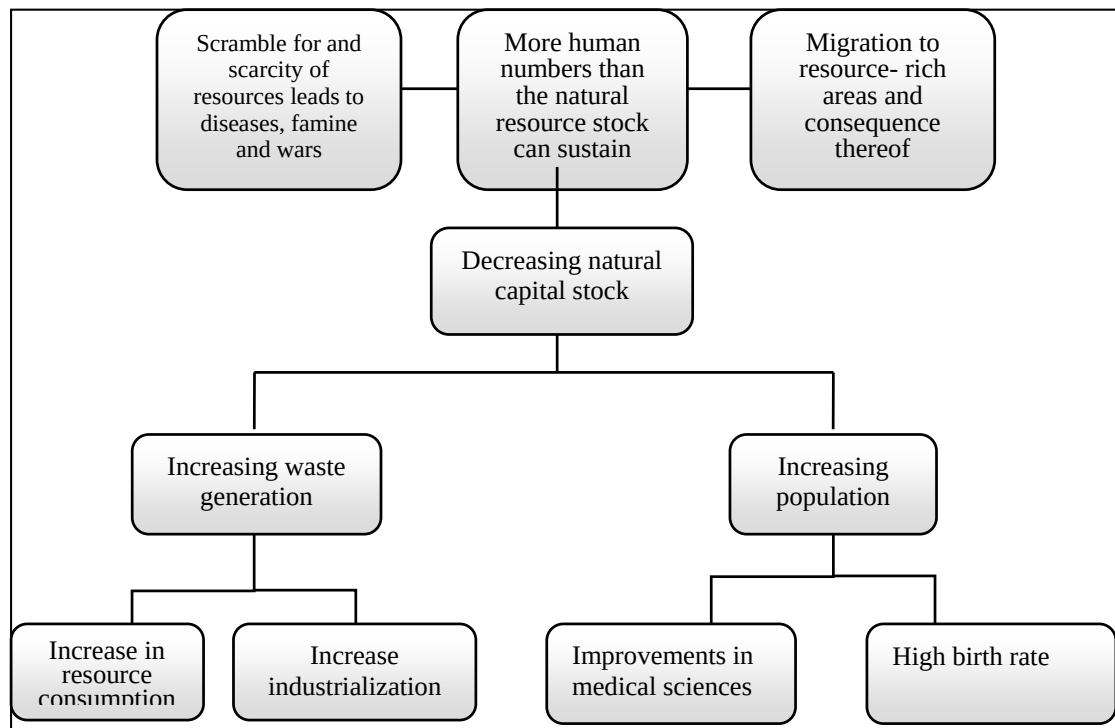


Figure 2.2: Description of the causes and consequences of decreasing natural capital stock

2.2.1.2. Advantages and limitations of the Ecological Footprint theory

There are several advantages and constraints associated with the development of the ecological footprint theory. Some of the Merits and Demerits as pointed out by Ian (2000) include the following;

Advantages

It gives a clear message often in easily digested form. The clarity of the message is an important function of any indicator for both policy makers and the general public.

The calculation upon which the ecological footprint is based is relatively easy to undertake and much of the data is available at different spatial scales.

Limitations

Just as in many other studies of sustainability, the role of technological change is ignored, but it would be worth exploring. Presumably, the ecological footprint could be substantially reduced by several practices. These would include using environmentally friendly technologies, using current technologies more efficiently or reducing the throughput of resources.

Finally, it offers no policy suggestions apart from either including more land, reducing population, or reducing consumption per head. The policy instruments required to achieve such desirable goals are not stated.

The ecological footprint represents a stock measure. It would be useful to integrate the stock measure with the flows into or out of an area. The use of material flows or integrated economic and environmental accounting linked to a dynamic model of sustainable development would help.

2.2.2. The UN Global Compact standards for proper management of Business institutions

The UN Global Compact was announced by the then UN Secretary-General Kofi Annan in an address to the World Economic Forum on January 31, 1999, and was officially launched at UN Headquarters in New York on July 26, 2000.

The UN Global Compact is a United Nations initiative to encourage businesses worldwide to adopt sustainable and socially responsible policies, and to report on their implementation. The UN Global Compact is a principle-based framework for businesses, stating ten principles in the areas of human rights, labour standards, the environment and anti-corruption. Under the Global Compact, companies are brought together with UN agencies, labour groups and civil society. Cities can join the Global Compact through the Cities Program.

The UN Global Compact is the world's largest corporate citizenship initiative with 10,000 corporate participants and other stakeholders over 130 countries with two objectives: "Mainstream the ten principles in business activities around the world" and "Catalyze actions in support of broader UN goals, such as the Millennium Development Goals (MDGs).

The Global Compact Office is supported by seven UN agencies: the United Nations Framework Convention on Climate Change (UNFCCC); the United Nations High Commissioner for Human Rights (UNHCHR); the United Nations Environment Program (UNEP); the International Labour Organization (ILO); the United Nations Development Program (UNDP); the United Nations Industrial Development Organization (UNIDO); and the United Nations Office on Drugs and Crime (UNODC).

The UN Global Compact was initially launched with nine Principles. On June 24, 2004, during the first Global Compact Leaders' Summit, Kofi Annan announced the addition of the tenth principle

against corruption in accordance with the United Nations Convention against Corruption adopted in 2003. The following principles are as follows;

2.2.2.1. Human Rights

Businesses should:

- Principle 1: Support and respect the protection of internationally proclaimed human rights; and
- Principle 2: Make sure that they are not complicit in human rights abuses.

2.2.2.2. Labour Standards

Businesses should uphold:

- Principle 3: the freedom of association and the effective recognition of the right to collective bargaining;
- Principle 4: the elimination of all forms of forced and compulsory labour;
- Principle 5: the effective abolition of child labour; and
- Principle 6: the elimination of discrimination in employment and occupation.

2.2.2.3. Environment

Businesses should:

- Principle 7: support a precautionary approach to environmental challenges;
- Principle 8: undertake initiatives to promote environmental responsibility; and
- Principle 9: encourage the development and diffusion of environmentally friendly technologies.

2.2.2.4. Anti-Corruption

- Principle 10: Businesses should work against corruption in all its forms, including extortion and bribery.

The UN Global Compact is a forum for discussion and a network for communication including governments, companies and labour organizations, whose actions it seeks to influence civil society organizations, representing its stakeholders.

The application of the UN Global Compact to the study was done in subsection 4.4 since it was also used as a model to assess the impacts of the corporation that was only discussed in chapter four.

Conclusion

The theory of Ecological footprint and UN Global Compact are both practical measures to check development and ensure that it is sustainable (providing the needs for the present generation without compromising the ability of the future generation to provide their needs), be it in the domains of

environmental, socio-economic or political. Even though ecological footprint looks more on the environmental impacts of human activities, it is important to note that most of these activities are driven by policies that could be political, economic, socially or culturally motivated. These stress the interrelationship between the environment, human society, and its policies enacted.

2.3. Gaps identified in the literature review

Despite the rich literature reviewed in this study, some gaps were still identified. Some of these areas that were lacking in literature and of which this study has to some degree attempted to fill are indicated in this subsection;

Information was lacking on environmental impact assessment and strategic impact assessment of state corporations in Cameroon, particularly in the UNVDA. However, this is one amongst the few studies that may have been carried out wholly on state corporations to understand their impacts on the environment and the society.

To the best of the researcher's knowledge, Information was also lacking on the history and socio economic as well as environmental impacts of Lake Bamendjim. This study could offer or trigger some inside for a thorough research into the history and impacts of the lake in the region.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1. Research design

The Mixed reports gotten from Ndop Plain concerning the impacts of the activities of the UNVDA prompted this research to be conceived. The study was aimed at identifying the environmental and the social impacts of the activities of UNVDA Ndop. Data for this study was obtained through the review of relevant literature (secondary data), site visit and recognizance survey in Ndop (primary data). Figure 3.1 below summarizes how the study was designed and carried out including the domains in which the literature was reviewed.

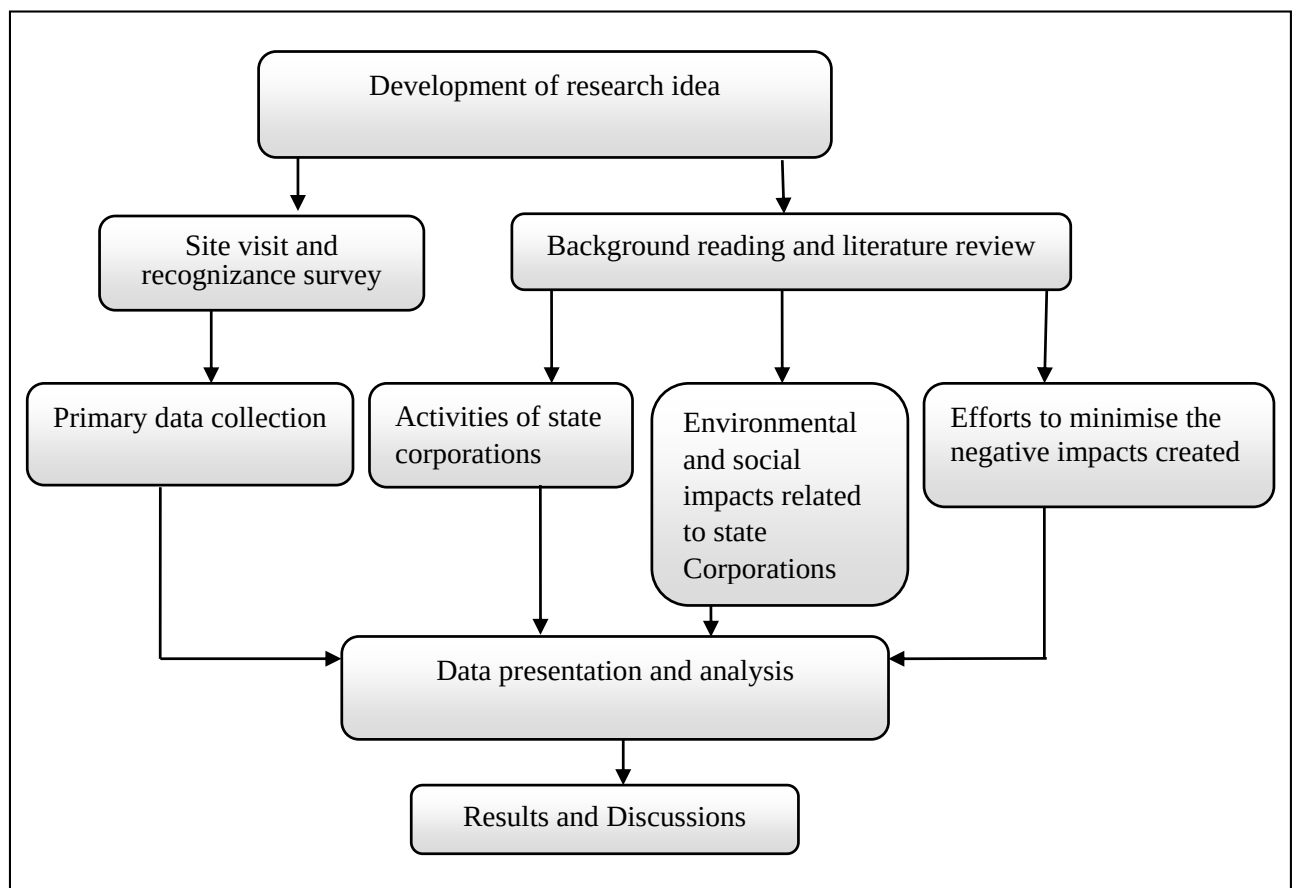


Figure 3 1: Research design

3.2. Sampling method

Some 60 out of 140 workers in the corporation were sampled, and questionnaires were administered to 50 of them (junior workers) while the other 10 were interviewed (senior workers). Pertaining to the farmers in lower and upper Bamunka, 7 *njanghi-groups* were sampled (three in Upper Bamunka and four in Lower Bamunka), and unstructured interviews were conducted to groups who could not

respond to the questionnaires because they were either too committed with their group business or they were shy. Questionnaires were eventually administered to one *njanghi-group* in Upper Bamunka and two *njanghi-groups* in Lower Bamunka. Purposeful sampling technique was employed at various levels. At the level of the farmers, questionnaires were only administered to those who belong to farmer groups (or those who have at some point in time belonged to the farmer groups) that were created through the assistance of the corporation or are known to them. The farmers were sampled purposively because several farmers existed in Plain that have no direct relationship with the UNVDA and only know very little about them; so this group was excluded from the study. Purposeful sampling was also used to interview former workers of the UNVDA, who were either retrenched or retired.

Stratified availability sampling technique was used to administer questionnaires to current employees of the corporation many of whom were at the Rice Mill and Garage and Motor Pool sectors. This was because the workers were initially divided into two strata; senior and junior workers. The reason for this stratification was to understand the perceived differences in job satisfaction between the senior and junior workers of the corporation.

3.3. Data collection method

3.3.1. Primary Data

Interviews

Two groups of people in the population under study were identified; the senior and junior workers currently working in the corporation, farmers and the former workers. The reason for this categorization was to ensure that adequate information concerning the activities and impacts of the corporation on the environment and the society of Ndop was acquired. a series of interviews (both structured and unstructured) were carried out with the senior workers of the corporation or Chiefs of Services following the timetable given by the corporation. Unstructured interviews were also done with the former workers of the corporation and some farmers. Some middlemen in the Plain, who also involved themselves in paddy purchase from the farmers outside the knowledge of the UNVDA, were also interviewed.

Administration of structured questionnaires

A total of 160 questionnaires were administered to the two groups of people; the junior workers currently working in the corporation, farmers and the former workers. 50 questionnaires were administered to the workers of the corporation, while 110 others were administered to the farmers of both Lower and Upper Bamunka. As a strategy to get more respondents, the researcher distributed

pens to anyone who filled a questionnaire or was individually interviewed. This initiative was developed to counter the reluctance of the farmers, since many shyed away from the activity. Questionnaires administered to the farmers were analysed separately from those administered to the workers. More than $\frac{3}{4}$ of the questions were closed ended with just a few open-ended ones. The questionnaire was designed this way to ease analysis.

Observation

Several data were also gathered through observation. The photos displayed in discussing the activities of the corporation were the result of observation. Snap-shots of these activities presented noticeable impacts on the environment which painted an image of likely environmental and social impacts that were to emanate from the corporation's activities with time.

3.3.2. Secondary data

Review of existing literature

A review of existing literature, reports, and publications related to the research area was conducted. Documents were sourced from personal and institutional libraries, and information was also downloaded from the internet. Archives of the survey and cartographic office of the UNVDA, National Cartographic Institute of Cameroon and Google Earth images helped to understand the degree of changes that have occurred in the environment since the 1960s to present, enabling a possible assessment of the environmental impacts. The nine principles of the UN Global Compact used in this study were in 4 domains involving human rights, labour standards, environment, and anti-corruption.

3.4. Analytical approach

Both qualitative and quantitative techniques were used for data analysis. Quantitative analysis employed descriptive statistics (percentages, means and tabular analysis, maps, ratios, rates and frequency distribution) while qualitatively, a thematic analysis was used to make inductive and deductive reasoning (reported discussions from the various stakeholders interviewed during field studies). Quantitative analyses were done using statistical software programs (including SPSS and Microsoft office package). ArcGis10.1 was employed in producing maps is used in the study together with a GPS, Google Earth images and base maps from the Survey Office of UNVDA.

The results of questionnaires and interviews collected from the farmers were analysed separately from the questionnaires and interviews collected from the workers. The reason for this separate analysis was to understand separately the perception of the farmers and workers on various aspects

of the study. Some information from the farmers and workers were jointly presented in order to properly view the contrast in opinions between the workers in the corporation and the farmers.

3.5. Validation of results

The corporation chosen for studies was entirely a state-sponsored enterprise, (having no other shareholder). The method used to collect data was triangulatory and conforms to related research methods. Necessary measures were taken to ensure the reliability of the data collection instruments, the validity of data collected, and analysis, procedures and interpretation of the results were appropriate. To ensure the reliability of the data collection instruments (that is, questionnaires), five questionnaires were randomly distributed as a pre-test to ensure that any misleading or unclear questions were corrected. At the end of the pre-test, some questions were added, some rephrased to reduce ambiguity, while others were discarded entirely. The questionnaires were personally administered in order to reduce the chances of acquiring sketchy data in the field.

Conclusions to this study were drawn based on a comparison of the results with the principles of the UN Global Compact standards and the results generated has been taken to represent the overall environmental and social impacts created by the UNVDA in Ngohketunjia.

CHAPTER FOUR PRESENTATION AND ANALYSIS OF DATA

The presentation of all results obtained from the field is discussed in this chapter

4.1. Socio-economic and demographic characteristics of sampled respondents

In this study, the questionnaire survey was conducted amongst 110 farmers and the results presented in figure 4.1 below. Males made up a bulk of the population scoring 54.5% as against 45.5% for females. Most of these farmers belonged to age cohorts ranging from 45 years and above, making a percentage greater than 47. The level of education amongst the farmers was considerably small, with up to 78.2% of them having been to or only completed primary school. The majority of these farmers are married, and up to 89% of them have been in Ndop for over 15 years.

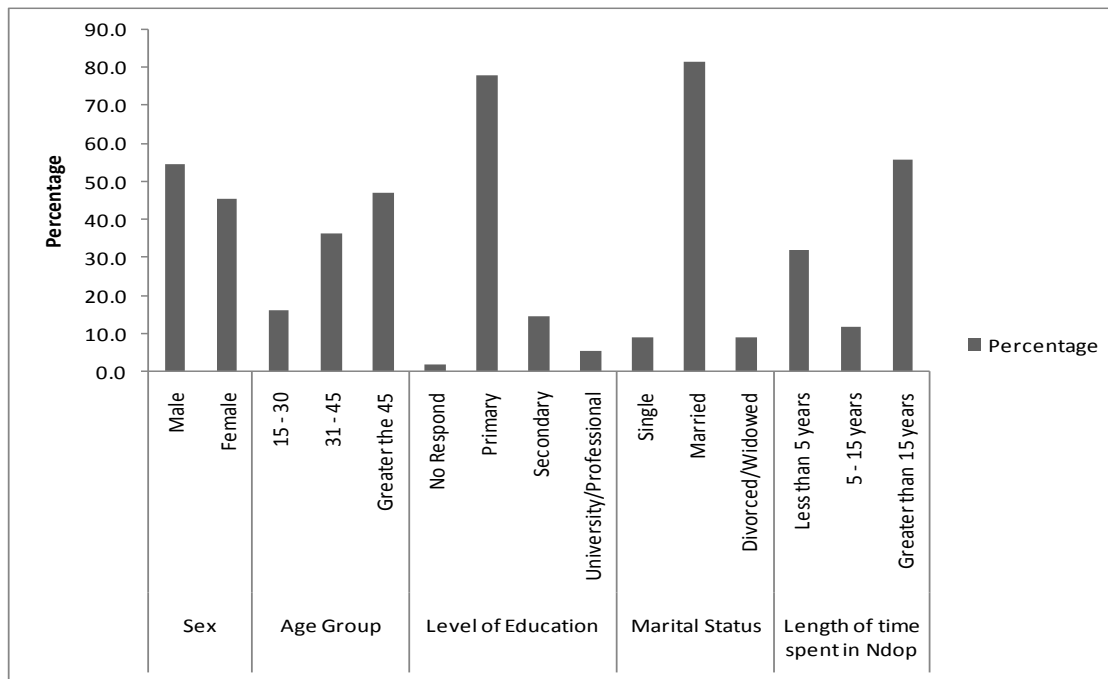


Figure 4.1: Socio-economic and demographic characteristics of farmers

50 questionnaires were also administered amongst the junior workers of the corporation. These are workers in the rice processing mill, and the Garage and motor pool service of the corporation and the results are presented in figure 4.2 below. Only one out of about 60 workers in these two services is a female; reason why all the 50 workers sampled were males. 40% of the workers were of the ages between 31 to 45 years, and 56% of them have only been to primary school as against 36% for secondary school. 80% of these workers are married and 56% of them have been in Ndop for over 15 years.

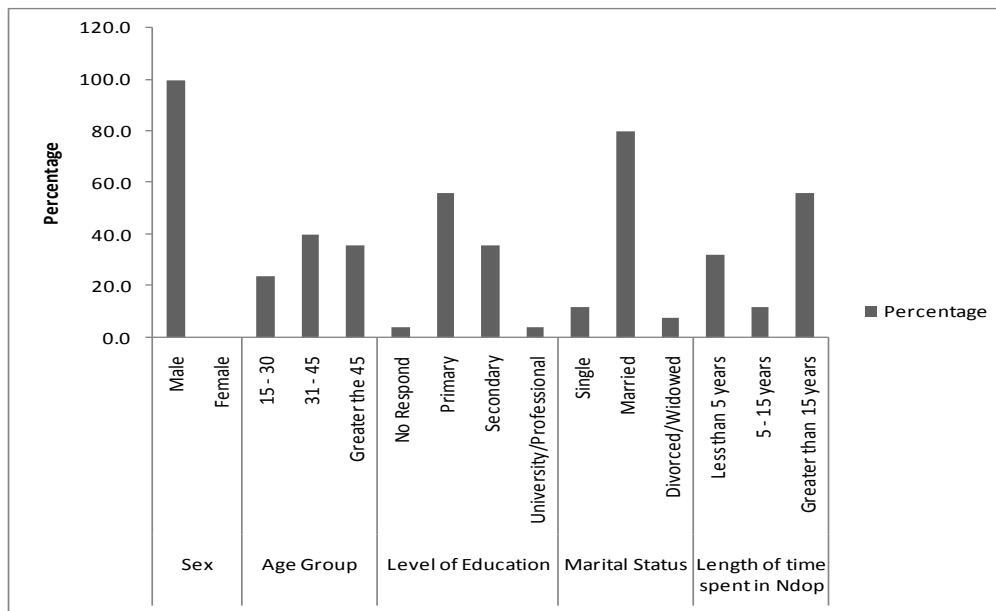


Figure 4.2: Socio-economic and demographic characteristics of workers

4.2. Activities of the UNVDA

Some of the objectives of the corporation were aimed at promoting agriculture and improving the situation of infrastructure in the Plain. These objectives were attained through the following activities;

4.2.1. Road construction and maintenance

Construction and maintenance of roads is one of the key activities of the corporation. It is well equipped with machinery for this activity. It has a Front head loader, and Excavator, a Grader, a Compactor and a Semi or Articulated Lorry that ensures the transportation of the heavy duty machines to the construction site. Throughout the 1970s, about 3000 km of roads were constructed by this Authority. At the time of research, attention was tilted towards maintaining and building roads in Balikumbat, Bamukumbit and Bafanji area where new farms were being developed (figure 4.3). It is currently on the verge of meeting up with its objective of completing up to 50 km of roads by the end of 2015. One other aspect of road construction is bridges and culverts. This year alone, up 15 bridges and culverts were built across the Plain much of it concentrated along the roads undergoing maintenance and construction.



Figure 4. 3: Road Maintenance and Bridge-Bali Road June 2015

4.2.2. Dam and Canal Construction

In other to ensure adequate distribution of water in the rice fields, mini-dams are constructed across rivers to hold back enough water that is later channeled through the canal to rice fields which have been developed (figure 4.4). Currently, six mini-dams have been built, and more than half a dozen canals stretching over 30 m exist in the Plain. The amount of water channeled to a particular field is controlled by junction structures called distributors.



Figure 4. 4: Canals to enhance water distribution in the rice fields

4.2.3. Building construction and maintenance

The corporation has constructed and is still constructing several warehouses across the Plain, which serve as buying and storage centers for paddy rice (figure 4.5). Besides these warehouses constructed, there are also residences which have been built to lodge the chiefs of sectors. At the time of study, 13 warehouses were already constructed and five chief of sector residents even though some were old dilapidated structures which were undergoing maintenance.



Figure 4. 5: Warehouse and dilapidated sector resident under repairs. July

4.2.4. Creation of farmer groups

The corporation has created farmer groups and supervises their activities in the various localities of the Plain. Currently, there are 188 Common Initiative Groups (CIG) spread all over the Ndop Plain. The whole of the Plain is divided into five sectors. These include the Upper Bamunka, Lower Bamunka, Bangolan, Babungo and the Monoun Sectors. Activities in all of these sectors are each headed by Chief of Sectors; and under these Sector-Chiefs, are Extension Workers (figure 4.6). The number of Extension Workers per sector depends on how large the sector is; that is (it could be) by geographical area and number of Common Initiative Groups found in the sector. This activity in the corporation is performed by the service of technical assistance to farmers in the Department of Agricultural production.

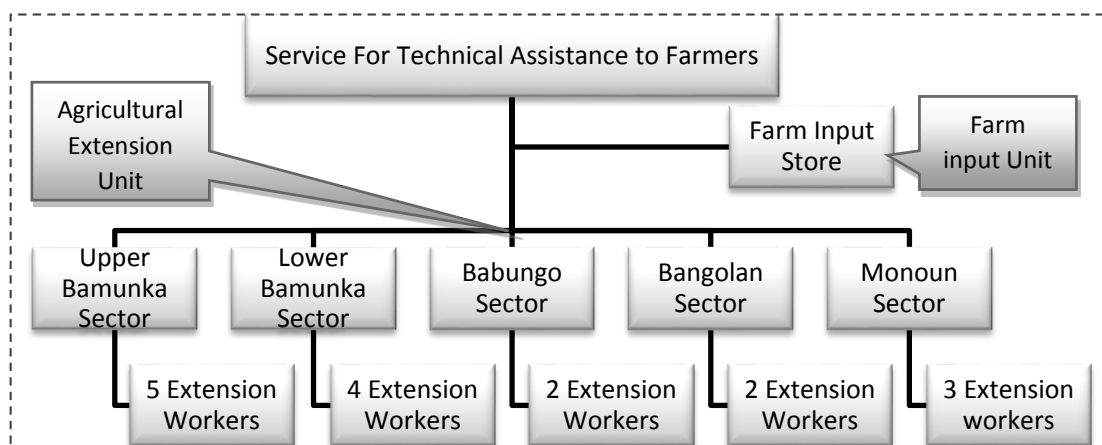


Figure 4.6: Organization of extension workers in the five sectors

The corporation does the purchase, storage and distribution of farm inputs to farmer groups under it. Main inputs given out by the department of technical assistance to farmers include: fertilizers, pesticides and the rice seeds. The inputs are usually given on loan to the farmers at market prices. This inputs given to farmers was to enable them improve crop production and protection. The corporation expects that all harvest from the farm should be sold to them. The cost of the total harvest is subjected to a calculation that repays the farmers loan and the balance is given to the farmers in monetary value. These are rules put in place by the corporation as a means to obtain the paddy rice from the farmers and recover the loans while the farmers make their profits.

4.2.5. Paddy purchase

The corporation under this activity is concerned with the buying and storage of paddy rice from farmers. Some price negotiation and quality control is done to ensure that what is bought is actually good; the paddy needs of the corporation are identified before the buying season starts. Scales are used to weigh

the bags and 1kg of paddy during the study period cost 120 CFA so that a bag of 100kg was sold at 12000FCFA. Unskilled labour is hired to ensure the transportation of the paddy from the various warehouses of the Plain to the rice mill at the UNVDA headquarters in Bamunka (figure 4.7). Each bag weighing 100kg is on-loaded on the truck and offloaded at 100FCFA. The store at the rice mill of the Corporation has only a capacity of 1000 tones. There are plans to build another warehouse at the rice mill as production is on the increase.



Figure 4. 7: Transportation and storage of paddy rice

4.2.6. Paddy rice processing and sales

The UNVDA does milling or processing of the paddy rice into edible forms. Milling is a crucial step in post-production of rice. The basic objective of a rice milling system is to remove the husk to get an edible, white rice kernel that is free of impurities. Depending on the requirements of the customer, the rice should have a minimum number of broken kernels. The rice husk (or hull) is the outermost layer of the paddy grain that is separated from the rice grains during the milling process. Around 25% of paddy weight is husk which is considered a waste. This is where the paddy from the field is processed into various grades including the clean or white rice, farrine based or unpolished rice, parboiled rice, Brissure or broken rice, farine and Vim (whitish powder) as shown in figure 4.8.

The corporation also does the sales of rice and its by-products. It observes the market trains and develops strategies to ensure an increase in sales. It has distribution centers in many parts of the country amongst which include Yaounde, Douala, Bafoussam, Bamenda, Buea, Mutengene, Tonga, Sabga, Kumbo, Adamawa, Jakiri, Nkambe and Belo.(See detail address at Appendix 6).



Figure 4. 8: Rice Mill and polished white rice

4.2.7. Farm development

The corporation uses tractors and bulldozers to clear the swamp vegetation and level the land to enable farmers to cultivate rice in them easily. The rice fields when leveled are capable of holding back enough water which enhances a proper rice growth and hence, high productivity.

4.2.8. Seed multiplication and distribution

The corporation carries out research on rice seed varieties that are locally available. The ones which have been proven to be adaptable to the environment are then produced in large quantities and sold to the farmers at affordable rates. Seeds from China and Japan were experimented periodically to see how they can adapt to the local conditions. The corporation works in close collaboration with IRAD and JICA for this research. So far, the types of seed which have been proven to be doing well here include Tox 3145, Nerica L36 and Nerica L42 (Nerica means New Rice for Africa and L stands for lowland). During this study, 12 hectares of land was already developed for lowland seed multiplication (figure 4.9). Nerica 3 and Nerica 8 are the upland species that are resistant to drought, but yields are low compared to the lowland species.



Figure 4. 9: Seed multiplication farms in Lower and Upper Bamunka

The corporation received small quantities of rice seeds as support from the government of Cameroon through the Ministry of Scientific Research (IRAD) and from the diaspora (Organizations from China and Japan, eg. JICA) and then multiply them on a large scale. The harvest is packaged and sold in bags to the farmers. One bag of rice seed weighs 10 kg and costs 1,500FCFA.

4.2.9. Water project scheme

The corporation has constructed a water catchment and piped the water to households in the neighborhood of Upper Bamunka. It was observed that the water was colored, and no initial treatment was done to disinfect the water from bacteria, but it was reported that households were drinking from the flowing stand taps. In 2013, a sieving system (sand filtration technology) was constructed around the water catchment but has not been put to use because it was not yet completed. This year (2016)

95,000,000 FCFA was proposed as budget to rehabilitate and complete the water catchment structure in order to produce safe drinking water to several households around Mile 25 in Upper Bamunka.



Figure 4. 10: Dilapidating water catchment(left) and purification tank (right)

4.2.10. Award of contracts

The UNVDA is a Contracting Authority which means that it is the vote holder and has a tender's board. The corporation launches contracts for which companies tender for them. A tender document is usually prepared by the Contracting Authority (UNVDA) to which bidders or contractors buy and use it to produce a Bid Document. The kinds of contracts awarded here includes, bridges and culvert construction, warehouse construction and maintenance, canals and dam construction, etc.

4.3. Ranking of the activities of the corporation

The activities were ranked based on the priorities of the corporation and the farmers to see whether the choice of activities of the corporation actually matched with what the farmers really wanted (table 4.1). The activities of the corporation were prioritized on the basis of the amount of resources (material, financial and human) devoted to them, the impacts it had both on the environment and the society, and the researcher's judgment based on how serious the corporation reacted to issues concerning the activity. On the table below, estimated human numbers were used to quantify the significance of the activities to the corporation. Even though the difficulties involved in using the human numbers was that variations existed depending on the intensity of the activity in question and also, once established, an activity may require just few human numbers for maintenance (reason why material and financial resources devoted to the activities was also of importance).

Table 4 1: Ranking of UNVDA activities

Activity	Estimated human numbers	Rank
General construction works including roads, bridges, houses	45	1
Farm development including dams and canal construction	45	1
Creation and management of farmer groups	19	2
Marketing	18	3
Paddy purchase	15	4

Activity	Estimated human numbers	Rank
Award of contracts	10	5
Paddy rice processing	10	5
Seed research, multiplication and distribution	8	6
Input loan scheme	3	7
Water project scheme	3	7

The farmers had to rank the top six most important activities which they could applaud the corporation for and which was more important to their wellbeing (figure 4.11). Significant differences existed between what the farmers wanted and what the corporation was doing.

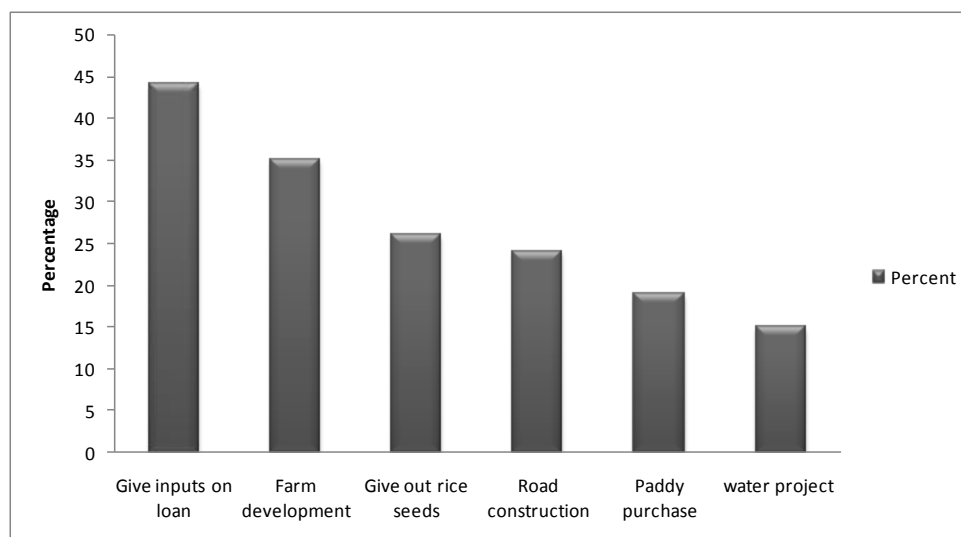


Figure 4.11: Ranking of UNVDA activities by farmers according to its importance to them

Both the rank of activities of the corporation and the priorities of the farmers were jointly tabulated to actually see if any differences existed as far as their priorities were concerned. Figure 4.2 below shows that inputs on loan represent the most important activity of the farmers. This however was ranked 7th on the corporation's list. This confirms the dichotomy existing between the priority of farmers and the priorities of the corporation. Seed multiplication and distribution was at rank number 6th but the farmers ranked it the 3rd. road construction was ranked 1st in the corporation's list but the farmers ranked it 4th. The reason for this low rank on roads were because farmers mostly evacuate their produce from farms through motorbikes rather than vehicles and so a road as large as a footpath may just be accessible enough for the bikes to cruise on. Water supply, however, would have been top priority for the farmers but it is only limited to the neighborhood of Upper Bamunka and so, the responses represented the views of the farmers of this area.

Table 4 2: Combination of ranks of both farmers and workers

S/N	Activities	Rank of workers	Rank of farmers
1	General construction works including roads, bridges, houses	1	4
2	Farm development including dams and canal construction	1	2
3	Creation and management of farmer groups	2	
4	Marketing	3	
5	Paddy purchase	4	5
6	Award of contracts	5	
7	Paddy rice processing	5	
8	Seed research, multiplication and distribution	6	3
9	Input loan scheme	7	1
10	Water project scheme	7	6

Based on the differences existing between priorities of the corporation's activities and that of the farmers, one can assert that cooperate social responsibility is not really respected in the corporation. This however ties with a statement directed to the UNVDA by Fai (2012) who mentioned that the culture, attitudes, norms, values, mind sets and needs of local farmers are in several occasions violated in the corporation's design and execution of activities.

4.4. Environmental and social impacts of the activities of UNVDA

4.4.1. Evolution of environmental impacts in the Plain

In order to properly understand the impacts and appreciate the degree to which it has occurred, it is important to get an understanding of how these impacts have evolved over time.

i. Fauna diversity

The Ndop Plain naturally had a unique habitat that favored the existence of several fauna species of birds, reptiles and mammals before the 1970s. Studies by Mphoweh (2007) showed that over 18 local (tribal) names were given to animal species that thrived in this area some of which included hippopotamus, crocodiles, cheetahs, monkeys, waterbucks, antelopes, various species of snakes amongst others. An old fisherman reported that they killed a hippopotamus in 1983 in the swamp within Bangorain subdivision which shares borders with the study area, since then till date, they have never set eyes again on any other hippopotamus in that area. More so, farmers reported that hunting was a very important practice in the area indicating that the region had a rich biodiversity before the 1970s

reason why several of the forefathers of the locals in this area were hunters. The establishment of the UNVDA through its activities of farm development and road construction amongst others significantly facilitated the disappearance or extinction of the plants and animals in this Plain.

ii. Impacts of bridges and roads

Before the establishment of the UNVDA, several bridges in the Plain were wooden, and were not motorable but after the corporation's intervention, several of these bridges have been transformed from wooden to concrete. About 25 bridges and culverts in the Plain (figure 4.12) had been transformed this way since 2006 when the government embarked on increasing its investments on state corporations nationwide.



Figure 4. 12: The situation before (left) and after the intervention of UNVDA (right)

These bridges constructed have had its share of environmental impacts. A visit to some of the sites where the bridges were constructed in Balikumbat revealed enormous impacts ranging from initial diversion of water courses, destruction of vegetation around the area directly under activity, changes in soil composition resulting from sand, stones and cement spillage. This is in confirmation to the studies in British Columbia by ministry of environment that made mention of the increasing rate of environmental impact of bridge construction.

Bridges are usually constructed to link roads (figure 4.13). This year alone (2015), 50km of roads were earmarked for maintenance and construction around Balikumbat subdivision. The process of constructing these roads has fragmented several habitats of this area, has increased the rate of soil erosion, destroyed the micro habitat of the areas concerned, facilitated invasion of weeds and pests, many of which are exotic to the environment. The process of road maintenance has resulted in the excavation of laterite from areas initially covered by vegetation and the result has been the destruction of vegetation in such areas. This is in confirmation to studies by Boutin and Jobin (1998), US forest service (1999) who researched on the ecological effects of roads in the United States and made similar findings.



Figure 4. 13: Road construction and related impacts at Bali road. July 2015

The ware houses and the residences of sector chiefs that were being constructed have equally caused its share of impacts. Most of these areas where these residences and ware houses have been built use to be covered either by vegetation or crops; and now with the construction of these buildings, the infiltration capacity of the area has been undermined, sheet erosion resulting from rain dropping off the zincs is common around areas with buildings. In several of the warehouses and buildings, rehabilitation works were being done and several parts of the houses have been chopped off to be rebuilt. Debris from these houses has changed the soil composition of these areas resulting from the dumping of cement, stone and sand debris.

iii. Impacts of farm development

The corporation has as objective to develop farms through clearing down the swamp vegetation, leveling the area, ensuring that adequate water is supplied to the area and digging roads to ensure access to and from the farms. The process of digging roads and clearing down swamp vegetation has resulted in logging and destruction of flora, fauna, habitat fragmentation and habitat destruction (figure 4.14). When this happens the ecosystem services are undermined; its maintenance services (e.g. nutrient cycling), provisioning services (e.g. food, palm wind, palm oil, wild fruits, fuel wood), regulatory services (e.g. Carbon sequestration) and cultural services (e.g. spiritual and recreational) are either threatened or completely destroyed. Similar findings were made by Janos et al., (2007) on the consequences of human activities on the environment.



Figure 4. 14: Destruction of vegetation during farm development in Balikumbat

Figure 4.15 below shows the extent to which crops, raffia palms, fruit trees and fishing grounds are destroyed during farm development. This confirms the research by Janos *et al.*, (2007) on the threats of ecosystem services during bush clearing for agricultural purposes.

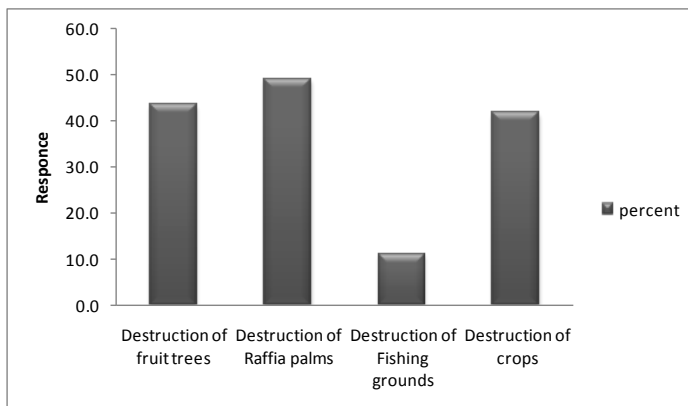


Figure 4.15: Extent of destruction of some environmental components

iv. **Impacts at the rice mill**

Paddy rice from the farm is processed at the rice mill in the corporation. During rice processing, the rice husk is removed as waste and burned; this burning is a source of air pollution and therefore, constitutes environmental impacts. The milling machine produces fumes which also act as a source of air pollution.

v. **Impacts of dams**

Mini-dams and canals constructed across this Plain have also had its own share of impacts on the environment. The reservoir created as a result of the dam construction has changed completely the ecosystem of the area altering the composition of its biodiversity. The reservoir created has increased the surface area of water exposed to solar insulation thus increasing the rate of evaporation. The process of constructing these dams has significantly reduced the share of water moving down stream. The Lake

Bamendjim is being fed by several of these rivers amongst which include the Noun, Ntembou and the Monoun flowing from Sabga, Oku, Kutupit and Wainamah down to this lake alongside its tributaries. Several mini dams have been constructed across these streams and its tributaries, reducing the volume of water that should have been flowing into the Lake (figure 4.16)



Human activities within the watershed and along the rivers flowing into the Ndop Plain have also exposed the rivers living them without shed from the sun and therefore accelerating the rate of evaporation. Field survey showed that majority of the respondents were quick to affirm that the increasing environmental impacts of the Plain were the responsibility of both the corporation and the inhabitants (figure 4.17). this is affirming what Kiari (2007) said about the impacts left on the environment and society by state corporations and their negligence in handling the impacts created around their area of intervention in Kenya.

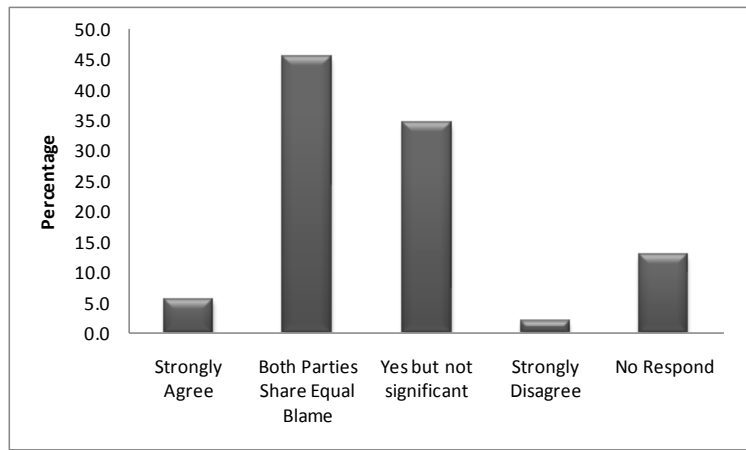


Figure 4.17: The inhabitants of Ndop have also contributed to these environmental problems

More than 45% of the respondents agreed that both parties share equal blame for the impacts which are now becoming visible in the Plain amongst which include, decrease in volume of streams around this area, deforestation, declining biodiversity and soil erosion. One of these impacts is the Lake

Bamendjim which has gradually been on the decrease over the past years. One could attribute the cause of this decreasing lake to be two-fold; the micro cause being the activities of the corporation and the inhabitants of the Plain and the macro cause - being the global warming which is evident in the Plain as indicated by Lotsmart *et al.*, (2007) in his study on female rice producers in the Plain.

vi. Impacts on the lake Bamendjim

Lake Bamendjim was constructed by the French in 1974 with the aim to make more water available for cereal cultivation in the Ndop Plain. Prior to this year, there was no lake in the Plain it was just a swampy environment with rivers winding within. The area of swamps was much larger before the 1970s than it was, when the dam has already been built by 1978. The swamps occupied an area covering 34,528.04 hectares and after dam construction by 1978, the Swamp land had reduced to 19,528.04 hectares. Today, the corporation talks of 15,000 hectares of swamp land available for rice cultivation. Figure 4.18 below shows the area of Ndop Plain before the construction of the Bamendjim dam.

A study of Lake Bamendjim over the past decades has proven that the lake has been shrinking over time. The map of Lake Bamendjim, drawn in 1978 was overlaid on the satellite image of the same lake in 2015 and the findings made were that the number of islands in the lake are on the increase, the surface area of the lake has significantly reduced; it was 377.28km² in 1978 and in 2015, it has dropped to just 159.34km², meaning that it has decreased by more than 55% over the past 37 years. Finally, much of what was identified as swamps in 1978 are today dry lands while most of what has been demarcated in 2015 as swamps is what was the lake in 1978.

Figure 4.18 Shows the Ndop Plain before the construction of Lake Bamendjim and figure 4.19 situates the location of Lake Bamendjim within the context of the country, regions, Divisions and subdivisions. Figure 4.20 shows the lake in 1978. It can be observed from the map that the number of Islands in the lake is on the increase; the base map of Lake Bamendjim in 1978 showed that it had just three islands, but today in 2015 (figure 4.21), several other islands have appeared in the lake. This to some extent is justification for the fact that the lake is drying out and getting shallower with time and therefore, exposing some areas that were formally the lake floor to the surface.

Figure 4.22 demonstrates a comparative view of swamps in 1978 and 2015. The dotted areas in blue represents what was called the swamps in 1978. Most of these areas that were formerly swamps are today dry lands though at the peak of rainy season (July, August and September) the lake might still expand up to some of these areas when the water table rises, but for most of the year, the areas remain dry. A closer look at the present day swamps shows that it is directly occupying a much greater part of

what was demarcated in 1978 as the lake. The sky-blue shadow at the back represents the aerial extent of the lake in 1978 while the deep blue layer represents the lake in 2015. Viewing all of these maps simultaneously, one can clearly see and appreciate the extent to which this lake has decreased over the years.

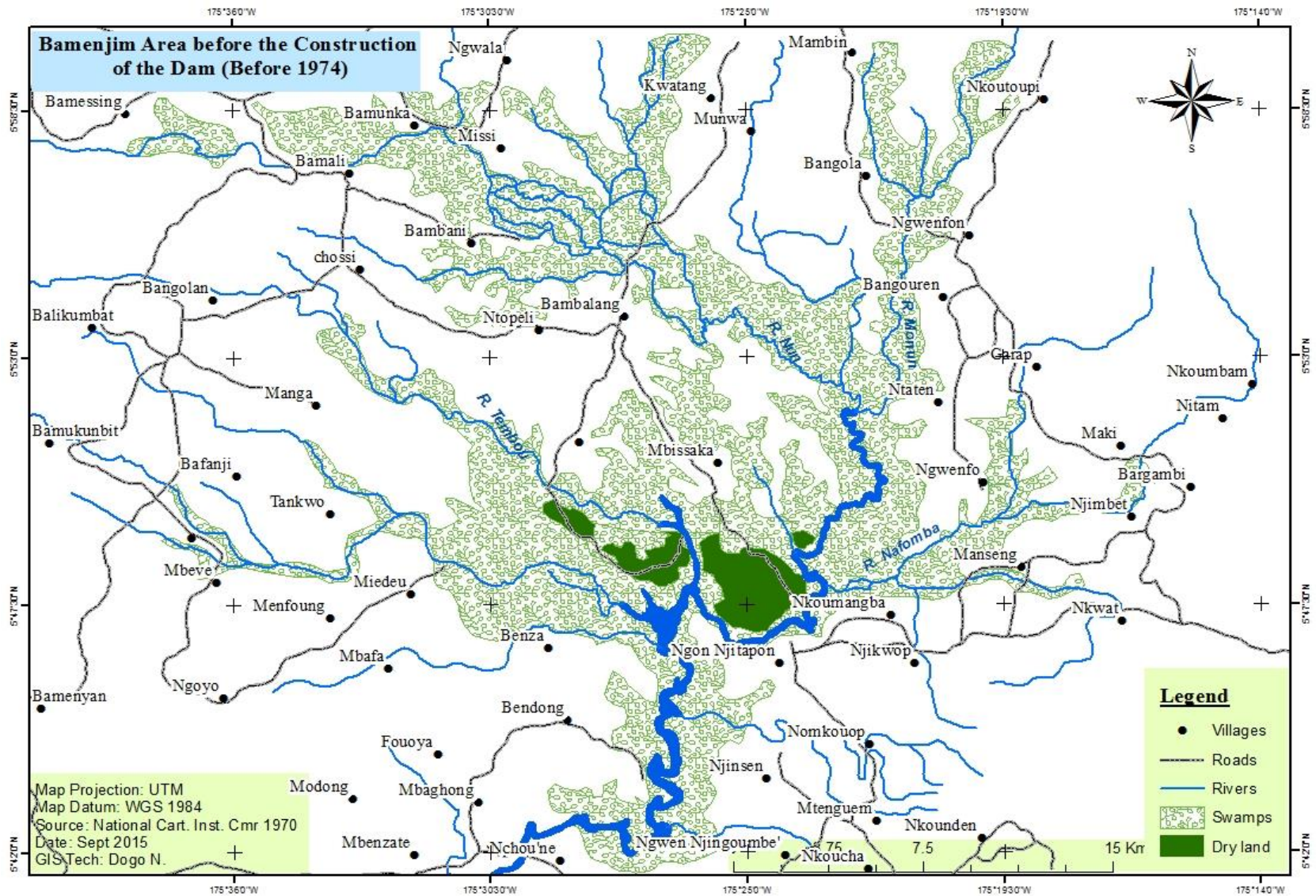


Figure 4.18: Ndop Plain before the construction of the Bamendjim dam

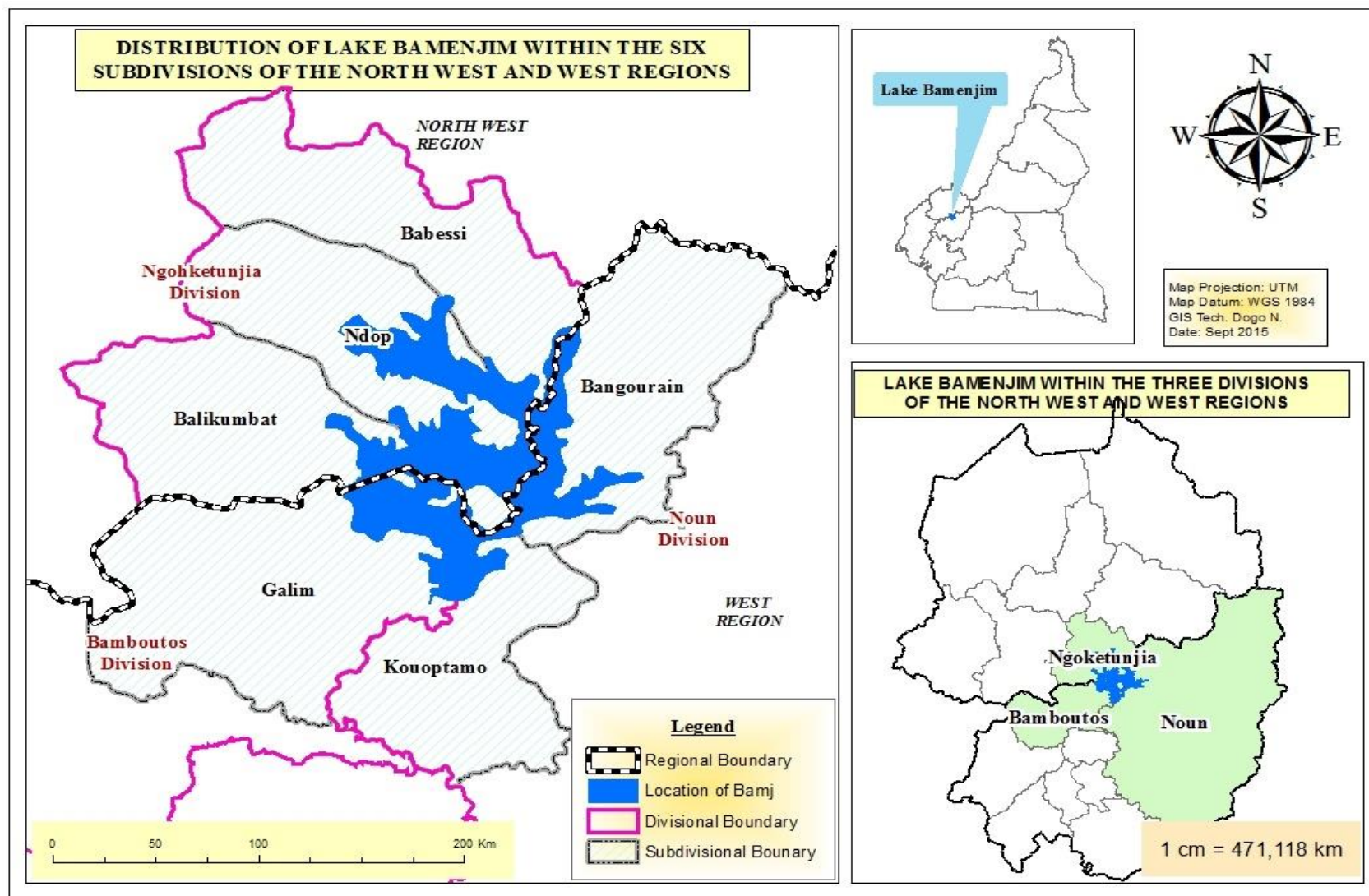


Figure 4.19: Location map of Lake Bamendjim

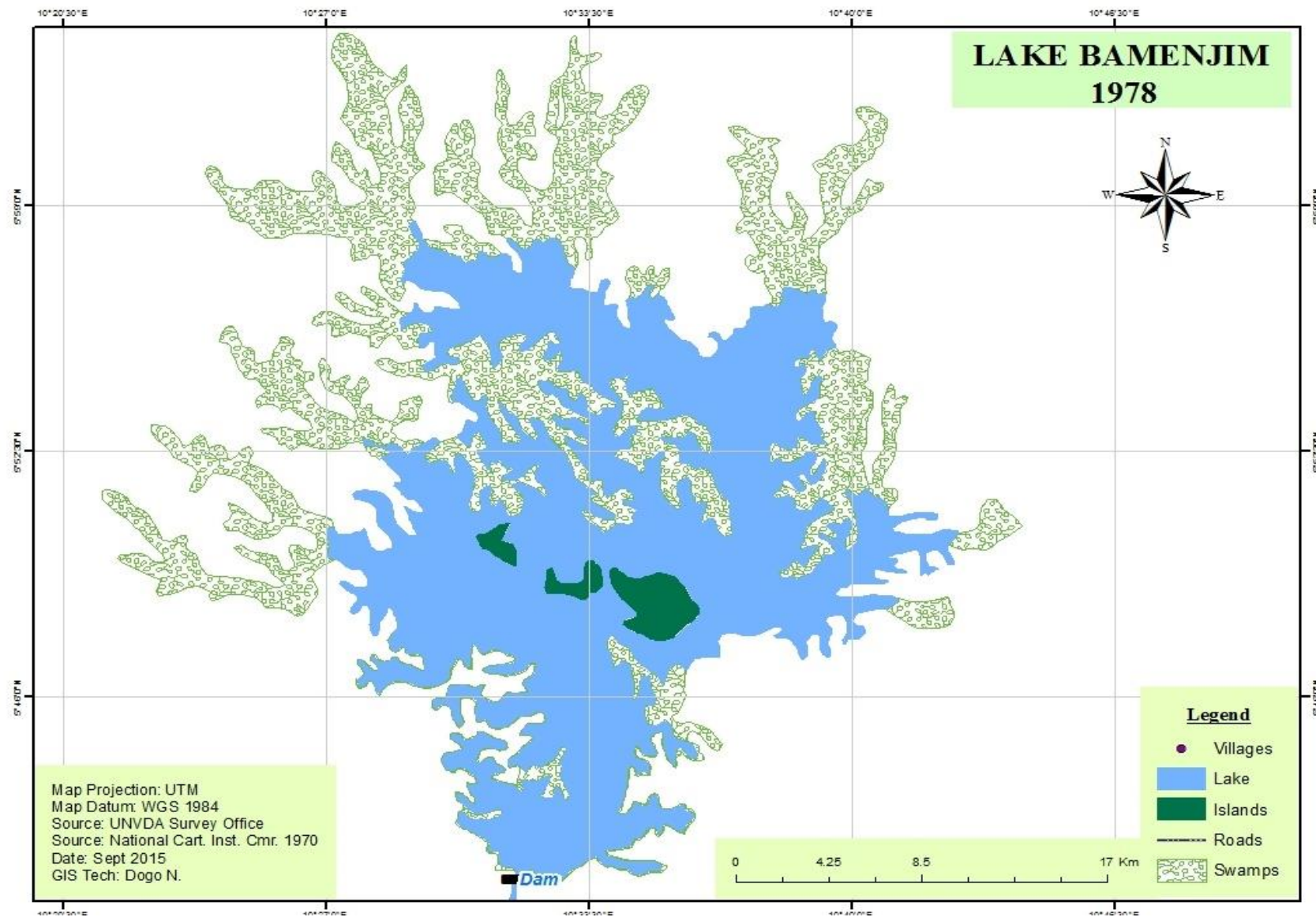


Figure 4.20: Lake Bamendjim - 1978

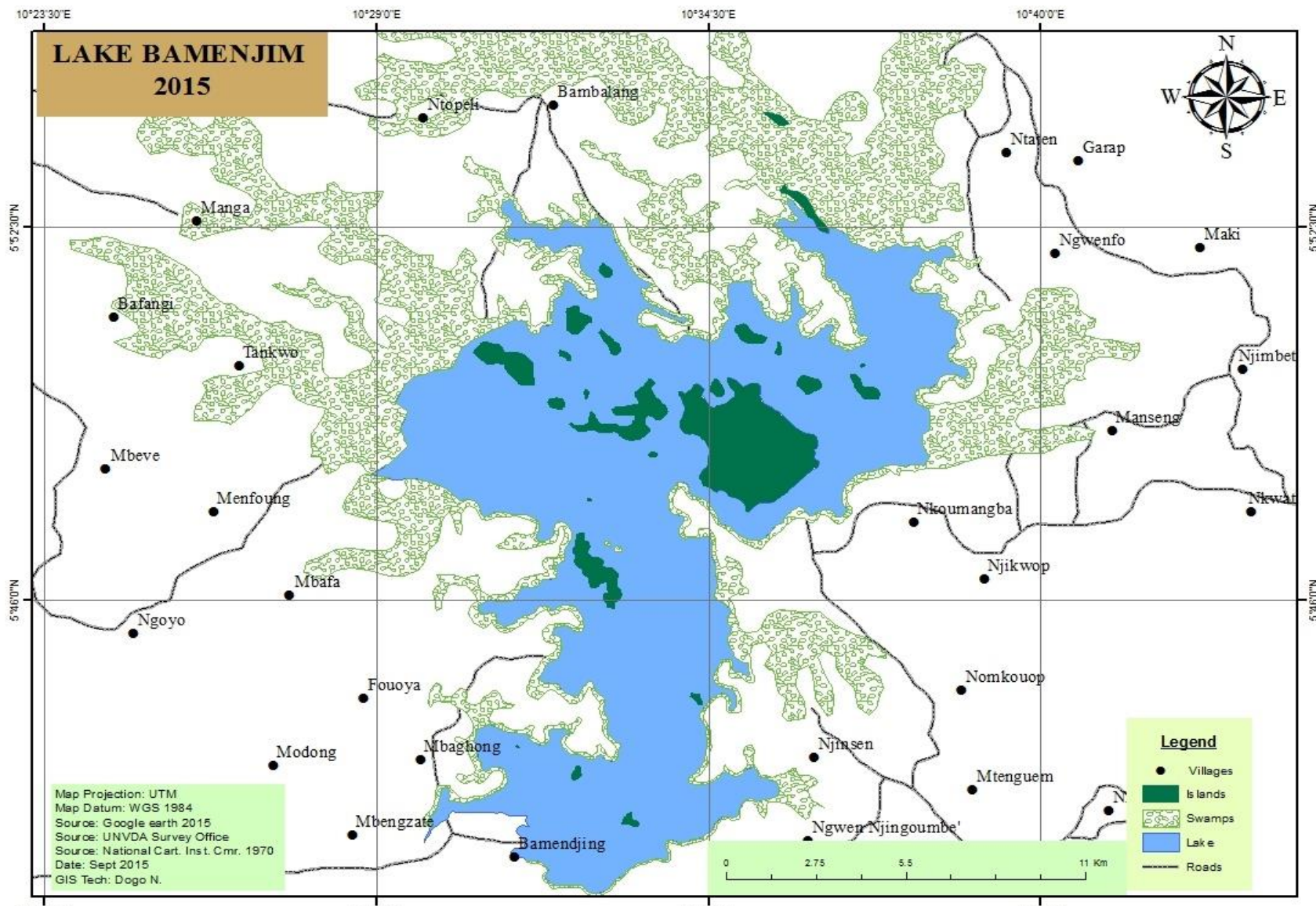


Figure 4.21: Lake Bamendjim - 2015

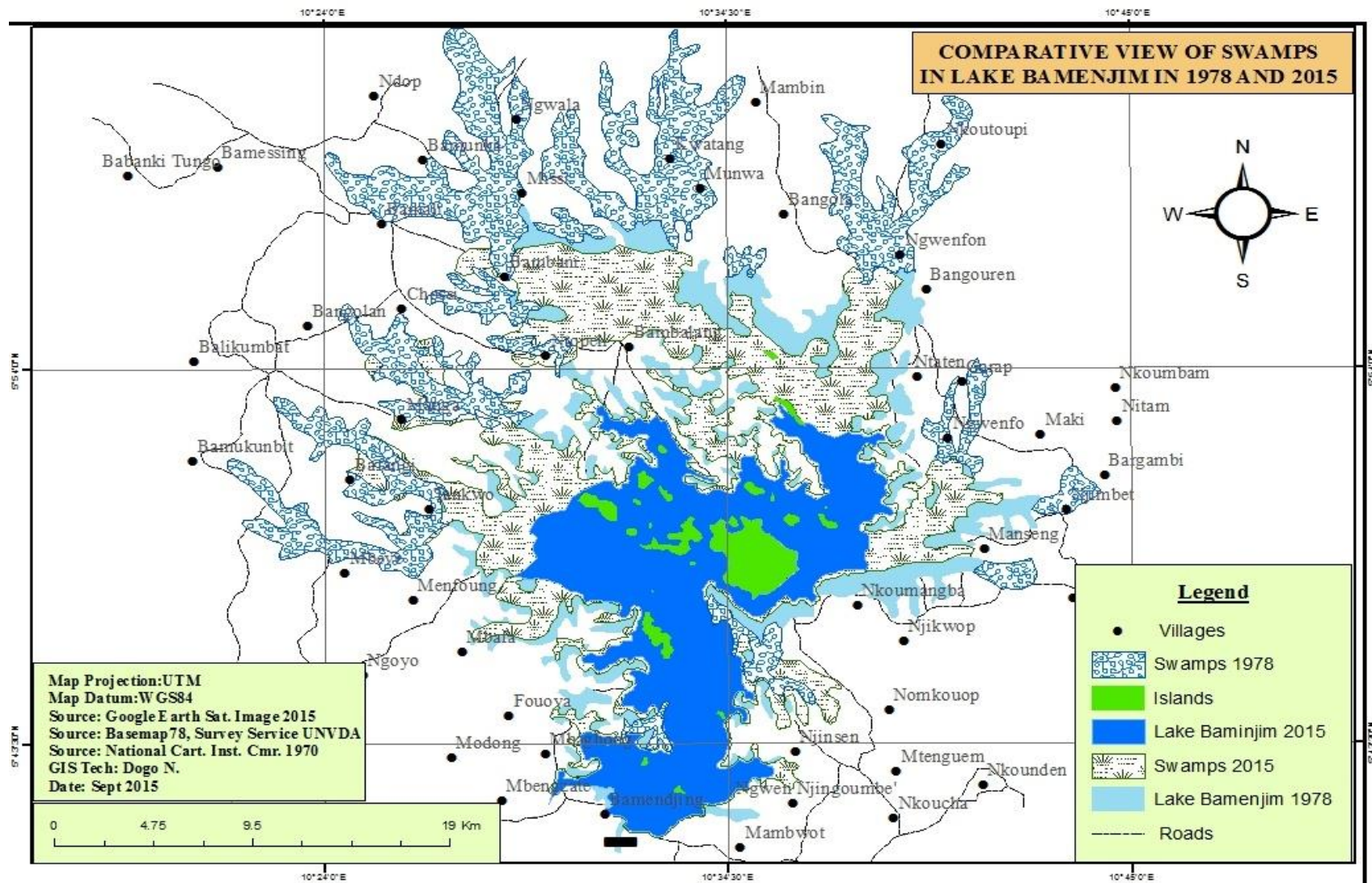


Figure 4.22: Comparative view of swamps in Lake Bamendjim - 1978 and 2015

Positive environmental impacts of these activities

Development activities by this corporation cannot entirely be canceled out from the viewpoint of the negative impacts it has created on the environment. There is also a share of positive environmental impacts that have emerged from these activities.

The construction and maintenance of roads could serve as fire-traps for bush fires, bridges and culverts could serve as nesting grounds for aquatic organisms, provide travel routes for some animal species and some may even become hide-outs for rodents and a combination of roads and bridges might as well create edge habitats. The edge habitats created could widen the scope of biodiversity for such an area. This is in line with findings by Boutin and Jobin (1998), US Forest service (1999) and who mentioned a list of probable positive impacts that roads and bridges could have on the environment.

In other to ensure that water is adequately distributed in the farms, dams are constructed to retain water. This creates a reservoir in a place where it did not exist before meaning that the natural landscape is modified. This modification suits and favors the growth of some organisms in the area concerned. A good example of this is the lake Bamendjim which only appeared after the dam was built in 1974 and since then, several fresh water fish and aquatic species have appeared and multiplied in the Plain because of the favorable conditions created by this lake. The impact of the dam construction has also gone on to check food security in the Plain and employment opportunities for fishermen in this area. The new ecosystem and biodiversity created by such modification of the river regimes in this Plain has therefore created some positive environmental impacts that could as well be appreciated.

The construction of houses by this corporation in various sectors of the Plain means that people were delegated to live in them. Humans are a good source of seed dispersal and biodiversity enrichment where ever they settle; planting of several fruit trees, cultivation of crop, planting of ornamental trees and flowers including the conservation of some natural vegetation and trees around his/her vicinity can be listed amongst the probable positive impacts that could be expected from the construction of these residents.

The positive and negative environmental impacts discussed above have been summarized on the table below and some possible mitigation strategies suggested as measure to promote corporate social responsibility in the Plain by this corporation.

Table 4 3: Summary of environmental impacts

S/N	Activity	Environmental Impacts		Mitigation
		Negative	Positive	
1	Road, bridges and culvert construction	- Initial diversion of water courses - Destruction of vegetation around the area directly under activity - Change in soil composition resulting from sand, stones and cement spillage - Destruction in the micro habitat of the area - Habitat fragmentation - Increase rate of soil erosion - Siltation of surrounding rivers - Reduction in infiltration capacity of the soil. - Air pollution caused by exhaust fumes from caterpillars and excavators - Increase road kills of animals and insects	- Creation of micro habitats along roads and under bridges. - Roads could serve as fire traps for bush fires. - Bridges and culverts could serve as nesting grounds for aquatic organisms. - Bridges could be hideout for rodents and snakes	- Check for possibility of transplanting some vegetation species. - Do an afforestation initiative else were. - Keep the inhabitants informed of any activity. - Educate the locals on the importance of morals & cultural heritage - Create a park in the plain free from human activities
2	Dam and canal Construction	- Diversion of water courses - Destruction of vegetation around the area of construction - Destruction of breeding grounds for aquatic ecosystem of the area - Creation of a reservoir in what was initially in dry land - Destruction of aquatic habitat of the area - Destruction of fishing grounds for the inhabitants around. - Change in land use of the site - Alteration of the ecosystem services and function	- Creation of a new habitat - Creation of a new ecosystem	- Consider an afforestation initiative to compensate for vegetation loss. - Check for possibility of transplanting any endangered vegetation specie. - Keep inhabitants informed on any activity - Create a park in the plain free from human activities
3	Building construction and maintenance	- Destruction of crops and fruit trees - Reduction in infiltration capacity - Change in soil composition resulting from the dumping of cement, stone and sand debris - Increase in sheet erosion resulting from rain drops from the zinc - Some air pollution from external toilets - Change in land use	- Potential for planting fruit trees and vegetation around the area. - Enrichment of biodiversity	- Inform the people through their rural authority on the development initiative - Dispose debris properly - Create a park in the plain free from human activities
7	Paddy rice processing	- Fumes from the rice mill pollute the air - Heaps of rice husk stands as source of environmental pollution	If well discarded heaps of rice husk could serve as source of organic manure	- A research on recycling of husk be done - Workers involved be better equipped

S/N	Activity	Environmental Impacts		Mitigation
		Negative	Positive	
8	Farm development and machinery maintenance	– Destruction of more swamp land to create farms – Destruction of fish ponds – Destruction of aquatic habitat – Land pollution from oil leakage and land pollution	– Modification of the ecosystem (agricultural biodiversity)	– inform people through traditional structures on swamp development
9	Seed multiplication and distribution	– Fertilizer application leading to Eutrophication of streams – Inappropriate disposal of torn/old packaging bags and pesticide sacks	– High yields from developed seeds means intensification will be encouraged, therefore saving more land	– Dispose old packaging bags and pesticide sacks appropriately – Choice of fertilizers be once with minimal impacts
10	Marketing	– Some rice sacks are not biodegradable – No environmental tax levied on packaged rice destined for the market	– Some packaging bags are biodegradable	– Get proper bio-friendly bag

4.4.2. Evolution of social impacts in the Plain

i. Impacts of the corporation on livelihood

The results showed that the establishment of UNVDA since 1970 has provoked a sequence of economic activities around the municipality of Ndop. Between 1977 and 1995, up to 3,460,791,000 FCFA (Three billion, four hundred and sixty million, seven hundred and ninety-one thousand FCFA) was spent in purchasing paddy rice solely from close to 3000 farmers. Farmers who were involved with this initiative since the early 1980's made sufficient income that enabled them to set up small businesses including beer parlors, real estate, grinding mills, petit trade, and construction of modern homes. The result revealed three categories of farmers who had experience with UNVDA (figure 4.23). The first category of farmers involved those in rice cultivation and other businesses. Farmers under this group cultivated large parcels of land; hence they harvested greater quantities of rice, enabling them to earn more income. These farmers (15 %) attested that they use the income from rice cultivation to establish other business so that they could have other sources of income. The second category was those involved only with the cultivation of rice. The farmers under this group (60 %), were only involved with rice production and chose not to get involved with other business activities due to other household responsibilities. They attested that they prefer to concentrate only on rice production and depend solely on the income. The third category was those who have abandoned the rice production activity. The farmers under this group (25 %) reported that they abandoned rice production because of reasons such as aging, ill-health and alternative job opportunities. This is in confirmation to studies by Ngwa (1995),

who mentioned that before the advent of UNVDA, “Ndop was a ‘dull village’ without lights, pipe-borne water and anything to entertain the public, aluminum-roofed houses were scarce” and of course, the establishment of the corporation has brought in water to homes, increase in safe content houses amongst others.

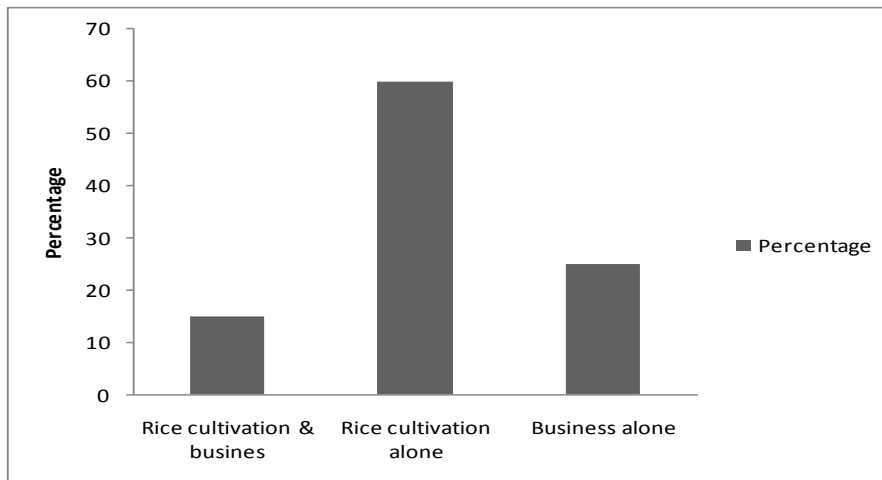


Figure 4.23: Major sources of farmers' income

Results also showed that the number of farmers joining the rice production initiative has steadily been on the increase within the Plain and the surface area under cultivation as well (figure 4.24). This increase is suggested to have resulted from in-migration of individuals from neighboring villages including; Kumbo, Oku, Tubah and Jakiri amongst others (Ngwa, 1995).

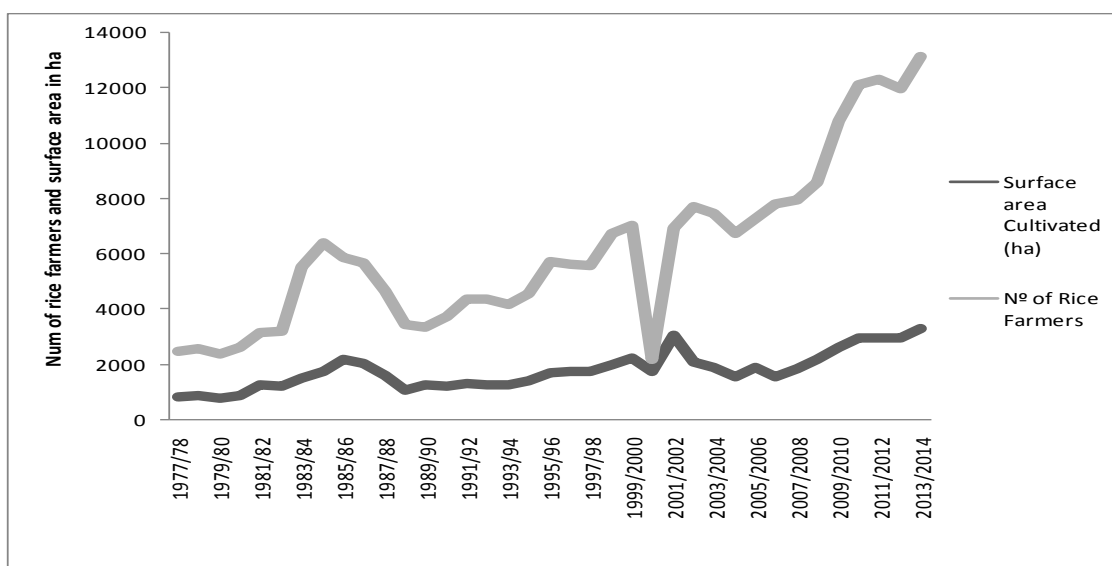


Figure 4.24: Rice cultivation information since 1977. Source: UNVDA 2015

The figure above describes the rate of increase in number of farmers in relation to the area cultivated. By 1977 (when the corporation started keeping the records), up to 2,500 registered farmers were already cultivating 824 hectares of land and by 2002. The surface area cultivated was already more than 3,000 hectares involving 6,930 farmers. The significant increase in number of farmers and area cultivated could be attributed the change in administration and management of swamps from the traditional rulers across the Plain to the UNVDA. This in a glimpse, makes us to understand the extent to which the environment in the Plain has progressively been colonized for agricultural activities over time with the coming of the UNVDA.

ii. Impact on employment

Besides the assistance given to farmers, the corporation has also directly employed over 140 people specialized in various domains; including motor mechanics, rice hulling and packaging agricultural technicians (to assist farmers in the field), financial administrators and marketing, and also several other engineers who tender for and execute contracts launched by the corporation. The degree of these impacts could be seen from the extent of their job satisfaction and their (Table 4.4) rating of the corporation. All the 10 Chiefs of services (Financial administrators, agriculture technicians, and engineers) interviewed and all the workers to whom questionnaires were administered (50 in total) scored UNVDA on a total of 10 points. The result of 45 junior workers who responded to this question showed that on the score board, the UNVDA was given an average of 4.91 points out of a possible 10 points. Eight out of all ‘Chiefs of Services’(high class workers) interviewed responded to this question and on the score board, the UNVDA was given an average of 7.25 points out of a possible 10 points.

Table 4.4: Score of the Low class and high class workers

Score	1	2	3	4	5	6	7	8	9	10	Av. Score
Low class	0	4	3	16	2	10	4	2	2	2	4.91
High class	0	0	0	0	0	3	2	1	2	0	7.25

This is proof that workers on higher positions are more satisfied and like their positions as well as their jobs than less privileged or lower level workers. Thus the degree to which impacts of the UNVDA is felt on the workers depend on what position the worker occupies in the corporation. The reason for the low score given by the junior workers was attributed to their low salaries, working conditions and lack of reliable panels to table their complaints.

iii. Impact on Accessibility

The roads and bridges built across this Plain have also socially impacted the lives of the people across the area. Some of these impacts includes increase automobile circulation, opening up of the surrounding villages, facilitated the evacuation of produce from farms, increased economic activities of the Plain, increased accessibility to social infrastructure and increase in the wellbeing of the rural dwellers in the aspect of health and education amongst others.

iv. Impact of Common Initiative Groups

The corporation in other to ensure effective supervision of the farmers assisted them in creating Common Initiative Groups (CIG) to which several of the farmers interested in getting assistance from the corporation enrolled. Through these CIGs, inputs such as fertilizers and pesticides are given on loan while tractors are rented. Their extent of progress in the farming is supervised, and advice and guidance are easily given on how to cultivate the various rice brands and, increasing productivity has been the result. Statistics were gathered on when these farmers enrolled into their Common Initiative Groups and the results are shown in figure 4.25.

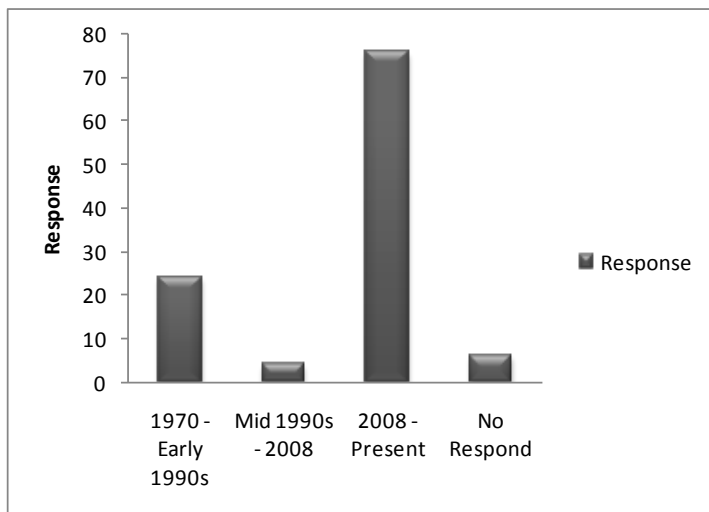


Figure 4.25: Year of enrollment into your farming groups

Most of the farmer groups have only been recently created – since 2008. This is because since the mid-1990s up to 2006, the corporation has been through financial problems that could not enable it to execute its functions properly. These CIG groups create a sense of communal belonging, favorable conditions for funding and support, stronger bargaining power for the sale of produce amongst others. At the time of research, over 188 CIG existed in the Plain with a total enrollment of over 13000 farmers.

v. Impacts on food security

Food security exists when people have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life. The coming of UNVDA to this Plain has significantly contributed to food security especially in the domain of rice production. Figure 4.26 shows that there has been a significant increase in rice production in the Plain; by 1977, up to 2,884 tons of rice was produced from farms developed by this corporation. By 1988, rice production had increased to more than 8,000 tons and from 2006, rice production has really been on the increase and now stands at over 17,000 tons annually thanks to the promotion of high-yielding seeds, fertilizers and pesticides by the corporation. The figure below represents only the quantity that is purchased by UNVDA; several thousand tons of rice are being sold to the middlemen outside the knowledge of the corporation. Thus, this represents a major contribution to food security in this Plain and the country at large.

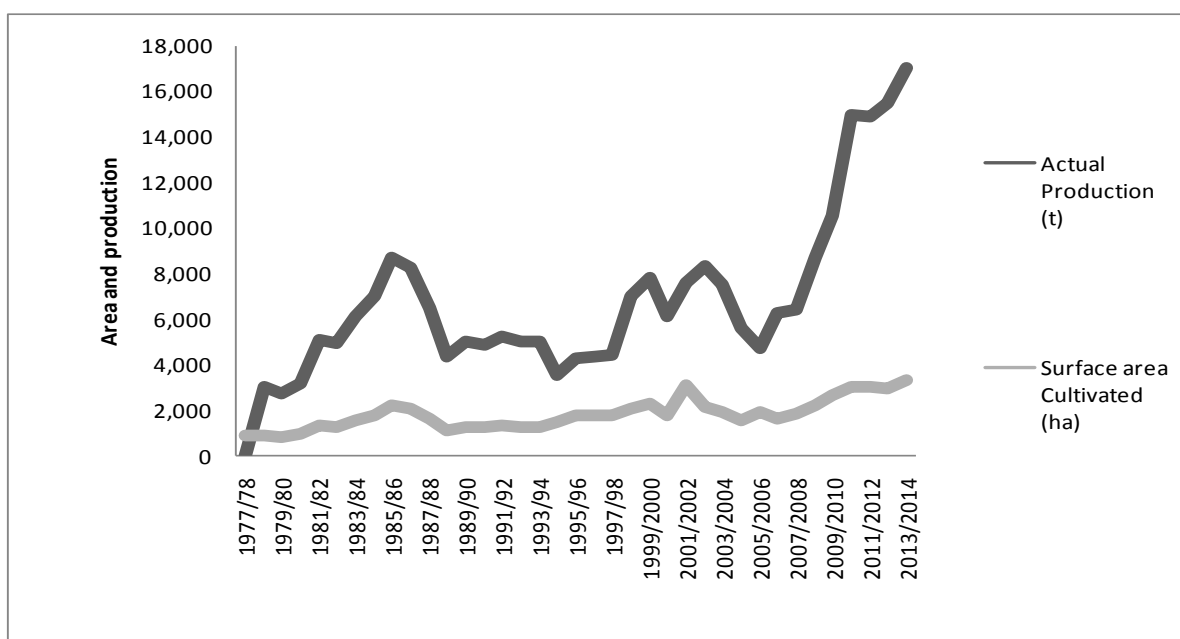


Figure 4.26: Rice production and surface area cultivated since 1977

As a strategy to increase productivity, the corporation brought in the idea to give inputs to farmers on loan upon their demand. Usually, the farmers are given fertilizers and pesticides on a zero percent interest rate to various farming groups based on their demand and supervised by field staffs. The farmers, in turn, use these inputs in their farms and at harvest; they pay for these inputs with paddy rice. As soon as their debts are covered, the remaining paddy is exchanged for money which stands as income for the farmers. The impacts of this initiative are that there has been increase in productivity

thus enhancing the wellbeing of the farmers even though the increasing use of fertilizers on the environment is growing concern.

Through farm development in the Plain, crop rotation has been made easy and beneficial for the farmers. The possibility of regulating the quantity of water entering any particular field means that crops can be grown without fear of damage by too much water or insufficient water as the case may be. Crop rotation is a farming practice that is very common in the Ndop Plain. Usually when rice is harvested, the fields are immediately replaced with corn usually alongside other crops such as beans and soybeans. This farming practice testifies a great deal of how food security has been enhanced in the Plain thanks to the farm development initiative of the corporation. This fact was also supported by Ngwa (1995) in his study of environmental impacts of the UNVDA in the Ndop Plain.

vi. *Impact on Gender*

The objective of encouraging rice production in the Plain has also significantly impacted the lives of women and their social statuses have increased with respect to that of men. The increase cultivation and sale of paddy rice has boosted their financial capabilities and therefore increased their influence in societal issues thanks to the UNVDA's initiative to encourage rice production in the area. This impact has been confirmed by Lotsmart and Fongkimeh (2007) in his studies on female rice cultivators in the Ndop Plain.

vii. *Impacts on Culture*

At a glance, one may be tempted to think that the staple food of Ndop people is rice. This is because of the increasing attention paid to rice cultivation by the UNVDA that has made rice even more pronounced than 'Tilapia fish and fufu corn' which is actually the staple food of the locals in this Plain. Over time, the popularity of this staple food has been declining because of decreasing quantities of fish in the surrounding water around and the growing popularity of rice. The culture of the Bamunka people have also intermingled with that of other in-migrants from other villages surrounding the Plain.

Negative social impacts of the corporation

However, not all the social impacts on the corporation have been positive; some of these impacts of the corporation's activities have come in as a mixed blessing to the beneficiaries of these program. Roads constructed and maintained to link up villages and towns in this Plain has paved the exit corridor for rural exodus, presented a risk of cultural and moral decedents in the villages concerned and has also

created a potential for a growing crime wave in the villages concerned. This tie to studies by the USAID (2009) on the socio-economic importance roads in Pakistan.

The creation of farmer groups in the Plain has instead been a source of conflicts and undesired competition amongst the farmers. Such conflicts have resulted from the mismanagement of groups finances and assets entrusted to the hands of its leaders, lack of corporation from group members and some difficulties in meeting up with the loan that may have been taken from the corporation.

Farmers who wait for the loan scheme from the corporation usually have to wait for too long a time in other to get the inputs for their farms. When inputs are not applied on time, there is an effect on productivity.

Some farmer groups have often been caught in the web of adverse climatic conditions such that realizing enough yields to pay for loan has not been possible and the corporation had not been sympathetic when such issues come to their knowledge.

The table 4.6 summarizes the social impacts of the corporation in Ndop and some some possible mitigation strategies suggested as measures to promote corporate social responsibility amongst the communities of the Plain by this corporation.

Table 4.5: Social impacts of UNVDA activities in Ndop

S/N	Activity	Social Impacts		Mitigation
		Positive	Negative	
1	Road, bridges and culvert construction	- Facilitate automobile circulation - Disenclave the surrounding villages - Increase in economic activities. - Lower road transport time - Lower road transport cost - Increase in the wellbeing of the rural dwellers in the aspect of health, education, etc. - Greater accessibility to social infrastructure	- Rural exodus - Risk of moral and cultural decadence in the rural communities - Potential for increased crime rate	Educate the locals on the importance of valuing morals & cultural heritage
2	Dam and canal Construction	- Developed farms for rice cultivation - Make water available for the various farms - Increase productivity - Available potential fishing grounds	- Loss of agricultural land in the reservoir - A potential nesting ground for mosquitoes	Keep inhabitants informed on any activity
3	Building construction and maintenance	- Facilitate the buying and sale of farm produce - Enhance safe storage of the produce - Reduced chances of crop spoilage - Guaranteed security of marketing productivity - Employment	Land grabbing	- Inform the people through their rural authority on the development initiative - Buildings be sited on soils not too fertile.

S/N	Activity	Social Impacts		Mitigation
		Positive	Negative	
4	Creation of farmer groups	– Increase productivity – Communal belonging – Favorable conditions for funding and support – Stronger bargaining power for sale of produce	– Possibility of mismanagement of resources put under the group leadership	– Cultural values and norms be considered in the creation and function of farmer groups
5	Input loan scheme	– Increase productivity – Enhances the wellbeing of farmers	– Inputs too expensive – Has created conflict between the corporation and farmers	– Over dependence on the corporation for the loan scheme
6	Paddy purchase and storage	– Increase income of farmers – Employment – Gain experience of bargaining power for their produce	– Risk of delay in payment for their paddy supplied	– Dispose old packaging bags and pesticide sacks appropriately
7	Paddy rice processing	– Employment – Availability of various brands of edible rice – Availability of by-products as animal feed	– Dust from the mill could cause illness to workers	– Workers involved be better equipped
8	Farm development and machinery maintenance	– Employment – Easy to cultivate – Favorable for mechanization – Guarantees high productivity	– Land confiscation – Annual bills and royalties to pay developed farms – Periodic maintenance of canals	– Keep the locals and traditional authorities informed on these activities
9	Seed multiplication and distribution	– Increase productivity – Increase variety of rice – More adaptable environments for cultivation	– Expensive to afford – Requires lots of fertilizers – Needs a lot of care	– Dispose old packaging bags and pesticide sacks appropriately
10	Marketing	– Employment – Promotion of homemade rice	– Decrease sales of locally processed rice by natives	– Check for possibility of coordinating the marketing of rice from the Plain

4.5. Challenges faced by UNVDA in relation to environmental and social impacts

4.5.1. Environmental Challenges

The UNVDA in theory seems to be zealous in aspects regarding environmental remediation and preservation but the implementation is where there exists a serious challenge for the corporation. The corporation faced difficulties of noticing the impacts created on the environment because no experts exist in the corporation to identify and understand the gravity to which the impacts are felt. Mitigating the environmental impacts is eventually another challenge plaguing the corporation.

4.5.2. Social Challenges

The corporation faced several challenges of adequately implementing its social objectives within its area influence. Several of such challenges have emanated during the process of implementing its activities.

Challenges of paddy purchase

Usually the farmers cultivate their rice on farms that were developed by the corporation and at harvest; the paddy rice is sold to the corporation (figure 4.27). But this year alone, the farmers have complained of an unusual problem; the money for paddy which they supplied since January 2015 has not been paid yet. The consequences of such a frustration have been the increase in sales of Ndop rice to middle men who process and carry them to Nigeria. The excuse given here by the corporation was that they had financial problems at the time.

Money used to purchase the paddy from the farmers is usually money that is obtained from sales of the processed rice. So, during the last harvest season, much paddy was bought in anticipation of greater sales but that has not really been the case. Sales have not really been growing as it was anticipated thus; there is shortage of money to pay the farmers. Money used for this activity is in some sort of a revolving fun and receives little or no subvention from the government. This has been a major challenge for the corporation particularly this year.

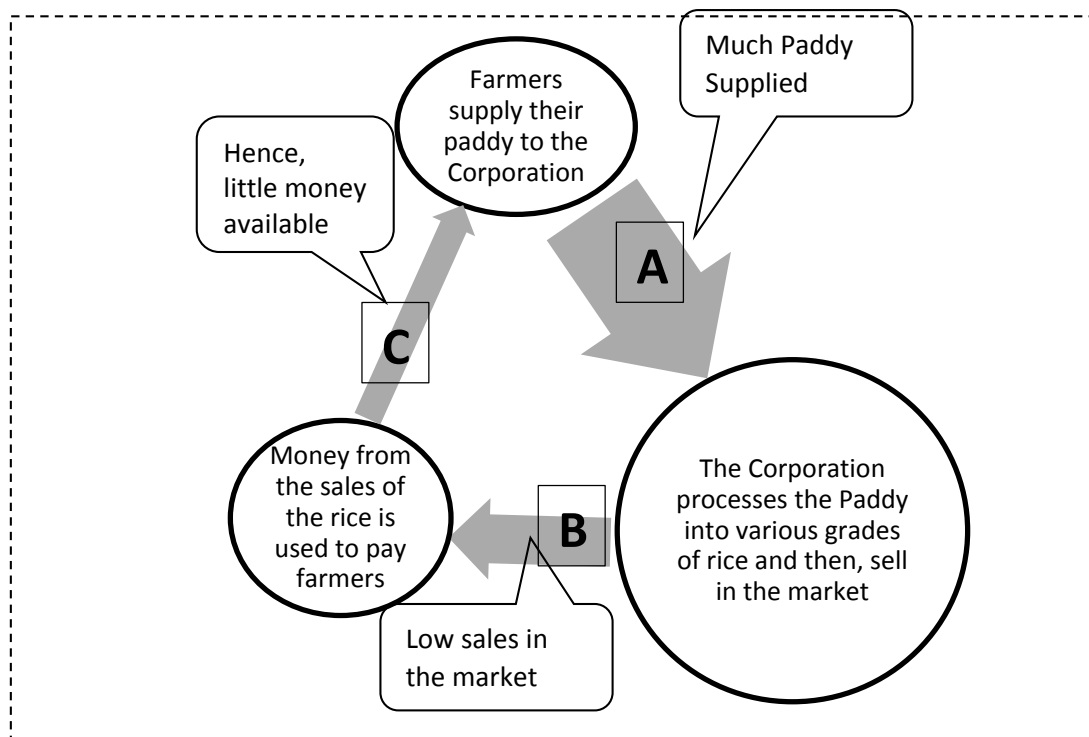


Figure 4.27: Processes involved in purchase of paddy and payment for paddy

The figure 4.27 demonstrates that the farmers supplied much paddy to the corporation, but the corporation doesn't really sell much of the rice in the market as it is supposed to be sold. So, much of the paddy remain stocked up in the warehouses owned by the corporation around the Plain. This is to the disadvantage of the farmers or the producers since their payment for paddy is very much a function of how much sales the corporation does in the market.

Challenges of Job satisfaction

Although the corporation can boast of employing over 140 people, this opportunity could be described as mixed blessing since findings revealed that the workers are not very satisfied with their working conditions; because they believe that they work for longer hours and are paid relatively little. They are barely managing because according to them, what they earn is highly insufficient compared to the work they do given that up to 80% of them are married.

Approximately 80% of the Workers who responded to questionnaires earn less than 100,000FCFA and a more curious discussion with them revealed that more than 60% (of those earning less than 100,000) earn less than 50,000, with average salaries hovering around 30,000 and 35,000 FCFA (figure 4.28). Probably the reason for these low salaries could have been based on their level of education. Approximately 56% of these workers have only attended primary education.

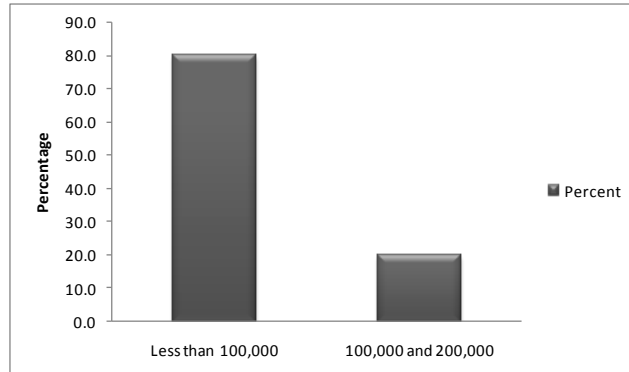


Figure 4.28: The salaries earned

The workers affirmed that their salaries are not really helping in enhancing their wellbeing because findings showed that the workers have difficulties obtaining the basic necessities in life. Figure 4.29 demonstrate that 60% of the farmers are barely managing to pay rents from the meager salaries they are receiving while 56%, 32% 40% and 60% of the workers are barely managing to pay their children's school fees, Invest in to businesses, help external families and increase in their living standards respectively. This means that the challenge of having to satisfy the workers is a major task

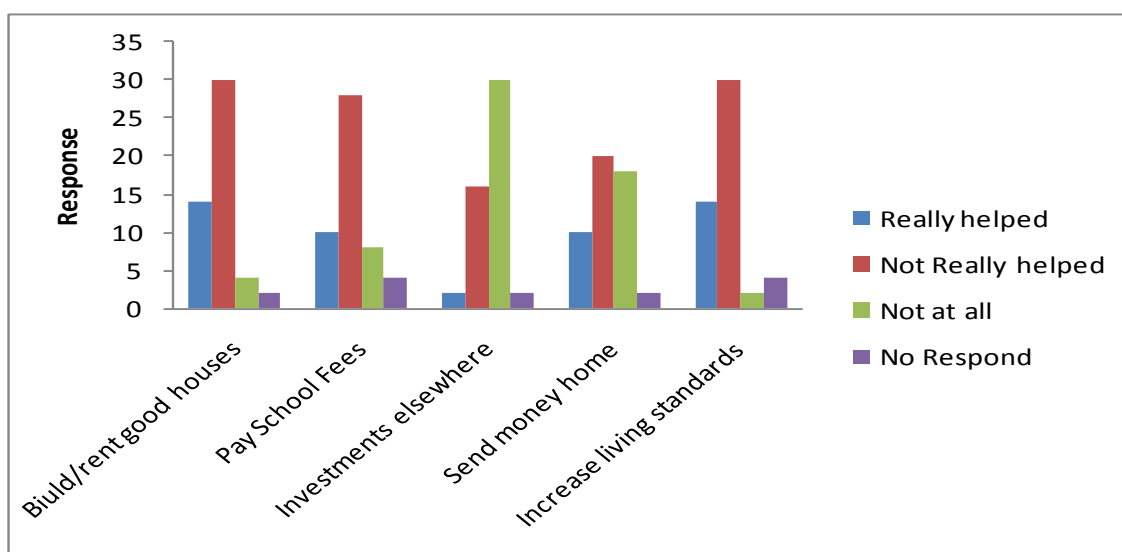


Figure 4.29: How UNVDA is enhancing the wellbeing of workers

One major challenge facing especially the senior workers in the corporation was that, workers were not actually put in positions that reflected their specialty; a common proverb amongst several staff of the corporation went thus; “in UNVDA, square pegs don’t actually fit into square holes”. This proverb was taken to mean that either people occupied positions which were different from their areas of specialty or they occupied positions which did not really match with their qualification.

Challenges of road maintenance

Despite the enormous credits the corporation enjoyed from road maintenance, a major challenge still loomed on the horizon. Several of the farms to market roads in the Plain were still in bad shape (figure 4.30). The farmers especially those of lower Bamunka complained often of insufficient and bad state of their farm to market roads.



Figure 4. 30: State of some roads in Bamunka-Ndop

The corn fields you see on the figure above are also rice fields; usually when rice is harvested, corn is immediately planted – a sort of crop rotation with corn and rice.

Challenges of Input delivery

One other challenge facing the corporation has been the slow pace at which inputs are supplied on loan to the farmers and the prices at which they are given. The farmers of this Plain recently, have complained of some problems not really making them enjoy this privilege; the delivery of these inputs to them is usually late when the season for their application has passed and the fertilizers and pesticides are given at higher than the market prices (according to the farmers). A look at the major problems facing the farmers (figure 4.31) showed that expensive rates of fertilizers is the second most important of all the problems.

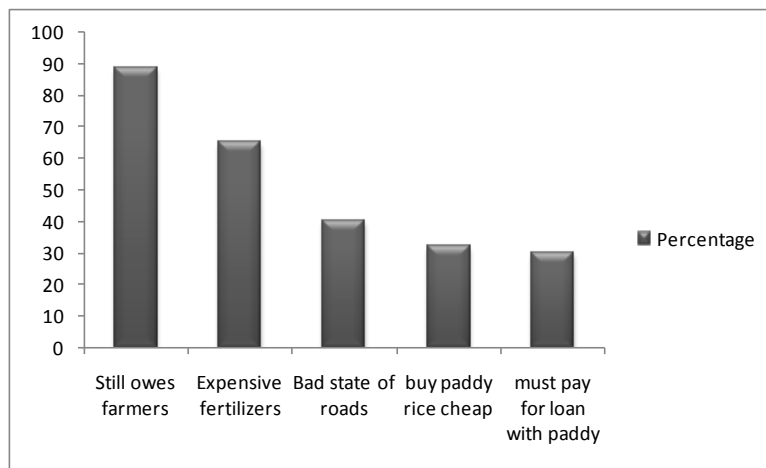


Figure 4.31: Major grievances of the farmers

The farmers explained that fertilizers sold in the market at 17,000 or 18,000FCFA is instead given to them on loan at 19,500 or 20,000 FCFA. The corporation in turn, cancelled this allegation by arguing that the prices are fair and that the cheap rates in the market is because the people either mix theirs with sand or reduce them to maximize profits.

Also, the procedure to acquire some needs of the corporation was really long; for instance, when the contract to supply inputs like fertilizers and pesticides was launched and by the time it got to the end of the tender process where the contractor had to do the supplies, it is already getting late. This year for example, the farmers had already planted their rice and were yet to receive the fertilizers on loan from the corporation. Usually, the first dosage of fertilizers is applied just when the rice is transplanted from the nursery (NPK 20, 10, 10), and later Urea is applied in a period of about six weeks. The period for applying the first phase had already past (Usually in August) and the second phase of this fertilizer application was soon approaching (usually in October) and yet, the corporation had not yet made the fertilizers available for the farmers who depend very much on it.

4.6. Comparison of the UN Global Compact standard for management of institutions with the situation of UNVDA

The UN Global Compact is a United Nations initiative to encourage businesses worldwide to adopt sustainable and socially responsible policies, and to report on their implementation. The UN Global Compact is a principle-based framework for businesses, stating ten principles in the areas of human rights, labour, the environment and anti-corruption. These ten principles were compared with the extent to which UNVDA was applying them and the results are tabulated in table 4.7.

Table 4.6: Comparison of UN Global Compact and the activities of the corporation

S/N	Domain	UN Global Compact Principles	Extent of Application in UNVDA
01	Human Rights	Principle 1: Support and respect the protection of internationally proclaimed human rights	Some respect for human rights in the corporation
		Principle 2: Make sure that they are not complicit in human rights abuses.	No evidence of human rights violation was noticed in the corporation
02	Labour Standards	Principle 3: the freedom of association and the effective recognition of the right to collective bargaining	Field survey suggest some lack of recognition of rights to collective bargaining
		Principle 4 the elimination of all forms of forced and compulsory labour	No form of forced labour was noticed in the corporation
		Principle 5: the effective abolition of child labour	No effort to abolish child labour was noticed from the corporation
		Principle 6: The elimination of discrimination in employment and occupation.	Field survey suggest Some evidence of discrimination
03	Environment	Principle 7: support a precautionary approach to environmental challenges	No precautionary approach undertaken
		Principle 8: undertake initiatives to promote environmental responsibility	Environmental principles put in place but not really applied
		Principle 9: Encourage the development and diffusion of environmentally friendly technologies.	No environmentally friendly technologies exist in the corporation
04	Anti-Corruption	Principle 10: Businesses should work against corruption in all its forms, including extortion and bribery.	Field survey suggest some evidence of corruption

Out of the ten UN Global Compact principles mentioned above, the UNVDA was found to have fallen short of six out of ten principles outlined that was verified based on information gathered from interview with stakeholders, questionnaire administration and field observation. These six principles were in the domain of labour standard, Environment and anti-corruption.

4.5.1 Labour Standards

Under the domain of labour standards, principle six talks of the elimination of discrimination in employment and occupation. Statistics gathered from questionnaire administration and interview with farmers show that there exists some degree of tribalism in the corporation. Tribal affiliation in institutions is a form of discrimination in employment. Statistics from questionnaire administered testified that the farmers are strongly in agreement with the fact that some degree of tribalism exist in the corporation. This same question was ask to workers and several of them left the space blank because they considered such information too confidential to give out for fear that it might jeopardize their jobs these information are demonstrated in figure 4.32.

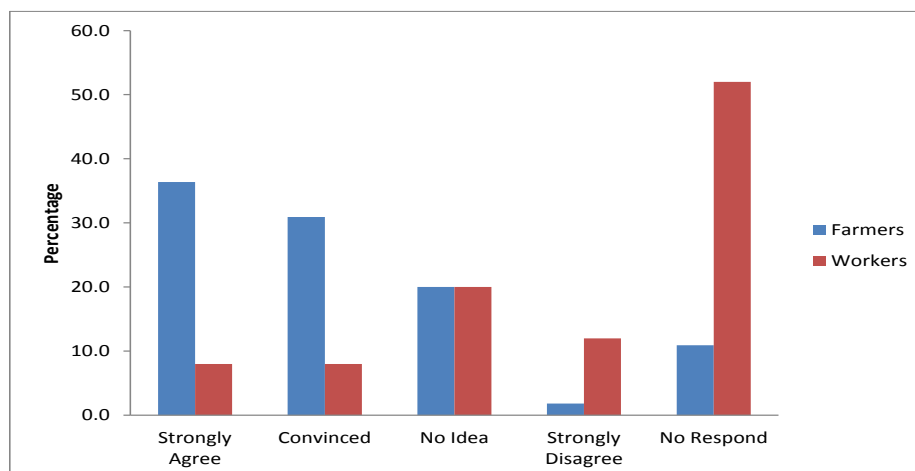


Figure 4.32: *Employment in the corporation sometime based on tribal ties*

The freedom of association and the effective recognition of the right to collective bargaining are also violated to some degree especially when it concerns the junior workers of the corporation. the results of questionnaires administered showed that its takes too long for request to be treated or it may not be treated at all, (figure 4.33) they have no say in the salaries on which they are put and especially those of the rice mill complained so much of their working conditions but they can't air these things out because they may be sacked (so they said).

This finding is in confirmation to what Awung and Atangana (2014) reported about state corporations in Cameroon that the reason for their poor performance is partly due to tribalism.

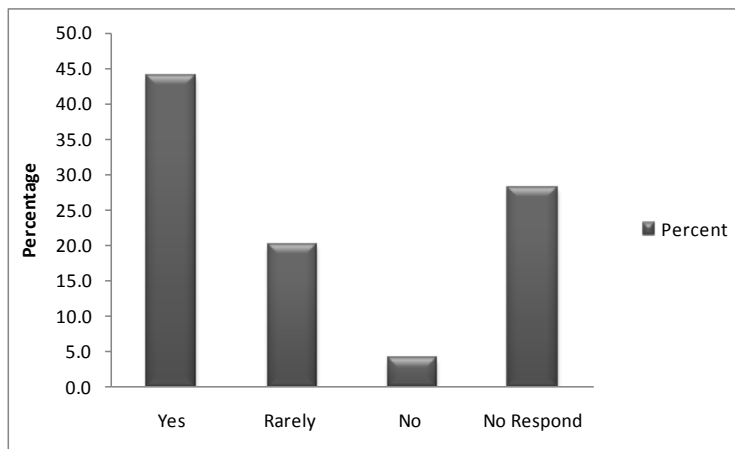


Figure 4.33: No timely respond to employee compliance

4.5.2 Environment

Under this domain, Principle 7 talks of supporting a precautionary approach to environmental challenges. Prevention and control measures are not really taken into account prior to project planning and execution in the corporation. For several of its projects, no screening or preliminary assessment is done to check for environmental impacts.

Principle 8 talks of undertaking initiatives to promote environmental responsibility. Field observation show that not much is done as far as mitigating environmental impacts in the corporation is concerned. Some environmentally responsible practices carried out by the corporation includes filling the laterite pits with soils after excavation is complete (an area that was initially vegetation) to enable quick vegetation regeneration. Emptied chemical containers are locked up in a cage to keep out of rich of children (since they are potential poisonous substances); they are later burned. Mitigation measures like taking note of the vegetation to be destroyed in other to consider replanting them elsewhere is not considered. Replanting trees in areas where laterite has been excavated is equally not done. These amongst other environmental remediation and compensatory measures are violated.

Principle 9 talks of Encouraging the development and diffusion of environmentally friendly technologies. The UNVDA is yet to attain this level; at the time of the research there was no evidence of any environmental friendly scheme or technology neither were they any plans for them to be enacted even though pressure from the delegation of environment and nature protection is making them to consider the use of biodegradable plastics for packaging.

A remark that one could make here is that in theory, environmental principles are well stated in documents guiding the proper functioning of the corporation but the practical part is really lacking.

4.5.3 Anti-Corruption

Principle 10 encourages businesses to work against corruption in all its forms, including extortion and bribery. Effort is being put in the corporation to fight against corruption, extortion and bribery but analyzed statistics from the field suggest that some form of corruption still exist in the corporation (figure 4.34).

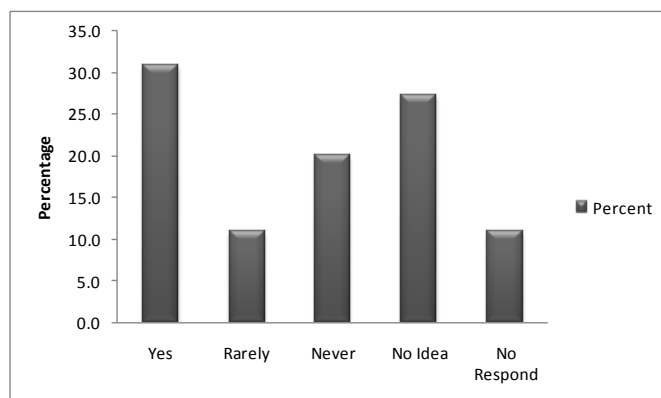


Figure 4.34: Any idea of corruption, bribery or extortion in the corporation

Approximately 30% of the respondents testified that they have in one way or the other witnessed cases of bribery or corruption in the corporation. This means that the corporation has to do a lot more to fight against this disease that seem to be prevalent in almost every government institution in the country. A farmer testified that on several occasions, they have to bribe the tractor drivers before they make it to their farms on time.

4.7. Gender mainstreaming in UNVDA

One aspect that is increasingly becoming an indicator for sustainable development is gender; the extent to which gender is mainstreamed in an institution to a greater extent determines how sustainable the institution can be classified when it comes to human resource management. Out of the 140 staff currently working in the UNVDA at the time, only 13 were females. One reason for the highly unbalanced gender representation was because some of the jobs are considered too labour intensive and so most women shy away from them e.g. all the staffs numbering up to 45 at the Service of Garage and Motor Pool service are males; it is very much a similar case at the Rice Mill Service were only one is a female.

4.8. Waste management in UNVDA

Several categories of wastes are generated from the activities of this corporation.

Types of wastes generated

Both the non-hazardous and hazardous wastes are generated from the activities of this corporation. Some examples of the non-hazardous wastes generated include the rice-husks generated from paddy processing in the rice mill, wastes papers, plastic wrappings, glass and food wastes. Hazardous wastes generated here include containers and plastics from which pesticides and insecticides are emptied and fumes from their machineries.

How the wastes are managed-recycled

Some recycling of wastes materials exist in the institution. The rice husk which is a waste material from the rice mill is incinerated and the ash from it called vim is locally used for washing pots and for brushing teeth even though the researcher could not confirm how healthy the Vim powder can be considered a teeth-cleaning detergent. Such habits are increasingly becoming unpopular in the area.

Containers from which the fertilizers and pesticides have been removed are all put together in a cage to prevent children from laying hands or playing with them (figure 4.35). When it gets full, it is gathered together and incinerated.



Figure 4. 35: Waste management and disposal in UNVDA

No form of waste separation exist in UNVDA, all wastes generated are confined in garbage cans and then thrown into a small stream which flow through the corporation. When there is heavy rainfall, rain water carries the wastes away. Habits like this are not sustainable.

Inside the UNVDA Campus especially at the Garage and Motor Pool Service, pieces of metals and abandoned heavy machineries can be found haphazardly rooted in positions around the area. These are metals which can be scrapped and sold to companies in charge of metal recycling.

4.9. Implication of the results

In view of the results discussed throughout this chapter, one can assert that the UNVDA is trying to ensure that its objectives are met especially in the domain of road construction and maintenance, swamp

development for agricultural mechanization, seed multiplication and purification. All of which was very much applauded by the farmers even though they really fell short of supplying fertilizers to the farmers on time and at a fair and appreciable prices. If this conflict with the farmers is not addressed on time, the consequences could be increasing evacuation of the much needed home-made rice to Nigeria – a trend which has been on the increase each time the conflict or mistrust between the corporation and farmers widens.

In the commercial domain, the corporation has also done a good job by making homemade rice available in the market but has also fallen short in some aspects of how their marketing strategies are carried out. For instance, their website, one of the avenue through which it could take advantage of to market their produce is hardly used. Other social media like facebook is equally lacking which could in some way be of help to them to promote the marketing of its products. If strategies like this are not done, the corporation could still be left limping as far as sales are concerned.

The Ndop rice currently sell at a higher price than other imported rice in the country, if a promotion or sensitization campaign is not embarked upon, winning the market could still be a farfetched dream for the corporation

Based on field data analyzed above, one could assert that the farmers who are supposed to be the direct beneficiaries of this scheme are not really feeling the positive impact of it. Some of the biting problems identified by the farmers like their hard-earned paddy money still with the corporation since January 2015, the prices of fertilizers which the farmers say is more expensive, the state of roads amongst others could cause more farmers to withdraw from the supervision of the corporation as some are already doing.

On the site of the workers, especially the junior workers, many of them were at list thankful to have gained employment under the corporation even though many did not really show any sign of job satisfaction especially in the aspect of salary scheme, and length of time which request and compliance do take before the reply is given. Such a working atmosphere undermines the rights and privileges of the workers and this could have an adverse effect on productivity.

4.10. Limitations of the study

Some difficulties were encountered in the field during this research period; they are discussed under the following headings

Climatic Constraints

The weather was a problem for the researcher. Frequent rainfall made it difficult to actually execute activities within the scheduled time frame.

Difficulties of scheduling meetings with farmers

There were some difficulties in meeting with the farmers. No time was favorable for meeting the farmers in their homes for any proper discussion. So the way out was to know when their ‘contry-Sundays’ fall and when and where their local ‘*njanghi*’ meetings hold. Using this strategy, most of the needed information was obtained. Even at this level, the difficulties faced with some ‘*njanghi*’ houses were that they were either preparing to mourn their death on their meeting days or they had serious disciplinary issues that made it difficult for the sampling exercise to be hitch-free.

Administrative Constraints

There were some difficulties in administering questionnaires with some of the workers in the corporation. Some refused to fill in the questionnaires because they feared any information they gave could put their job at risk and so they thought they were playing-safe by not attending to the researcher. Amongst the few who answered the questions, many spaces in the questionnaire were left blank because they probably believed that responding to such questions which they considered sensitive could put them into trouble. There were some minor difficulties in interviewing some staff or officers because they were either too busy or they thought that the researcher’s specialty was not of any interest to them.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1. Summary of findings

Findings presented in this section were based on the stated objectives of this study.

i. Activities of the UNVDA

The activities carried out by the corporation included road construction and maintenance, dams and canal construction, paddy purchase, paddy rice processing, Marketing of clean rice, seed multiplication and distribution, building construction and maintenance, the creation of farmer groups, water project scheme and award of contracts. Environmental impact mitigation measures were not put in place despite its emphasis as a strategic objective of the corporation.

ii. Environmental and social impacts of the UNVDA

Environmental impacts: eminent environmental impacts on the Plain include: destruction of the natural swamp vegetation, habitat fragmentation and destruction, destruction of crops and fruit trees, alteration of the ecosystem functions and services, soil erosion, siltation of surrounding rivers, diversion of water courses, eutrophication in streams, reduction in infiltration capacity of the soil, creation of reservoirs in what was initially a dry land and the destruction of micro habitat and reduction in the size of Lake Bamendjim.

Social impacts: the social impacts include: provided sources of income, employment, farm to market accessibility, social groups created, communal belonging, food security enhanced, reduced imbalance in gender status and culture.

iii. Challenges faced by the corporation in relation to social and environmental impacts

Environmental challenges: the corporation was faced with the inability of providing and implementing mitigation strategies to compensate for impacts created.

Social challenge: The Corporation faced challenges in several aspects which included: difficulties in paying for paddy rice purchased from farmers, difficulties of ensuring job satisfaction of all its workers, difficulties of maintaining good farm to market roads across the Plain and challenges of delivering inputs on timely bases to the farmers who were desperate for such help.

5.2. Conclusion

It can be concluded that UNVDA Ndop is involved in several activities, many of which includes road construction and maintenance, bridge and culvert construction, farm development, dams and canal construction, building construction and maintenance, water supply scheme, purchase of paddy rice,

marketing of rice and creation of farmer group (CIGs). These activities have presented both positive and negative environmental and social impacts in the area. However very limited voluntary effort has been made towards mitigating the impacts created by the project's activities; therefore, the assertion that environmental remediation measures are always neglected when it comes to development projects in developing countries is no frivolous statement.

5.3. Recommendations

Based on the findings listed above, recommendations were made with regards to the problems identified following the research objectives.

i. Activities of the corporation

Activities like input scheme and seed multiplication and distribution should be prioritized by the corporation since they are what the farmer's desire most.

A service of GIS and environmental affairs should be created to manage the environmental impacts and mitigation aspects of this Plain. Besides acting as a tool for the environmentalist, GIS will also be important in assisting the cartographic and survey office to building databases for various spatial data or phenomena in the field such as establishing coordinates for bridges, length of roads, surface areas of farms, sectors etc.

In other to boost the relationship with farmers, a periodic forum could be launched where the farmers will have the opportunity to present the biting issues affecting them. The corporation could also broaden their scope of inputs to include rain-boots given at subsidized rates by some 10-15%. Interview with the farmers showed that up to about 70% of them carry out rice cultivation without boots. The corporation could equally boost the social atmosphere by organizing annual games where the farmers will have the opportunity to socialize with the workers of the corporation.

Also communication between the farmers and corporation should be improved to ensure that its activities respects the culture, attitudes, norms, values, priorities and needs of local people before any development project is launched. These are measures that should be taken to ensure that corporate social responsibility is implemented.

The Board of Directors for this corporation could also look into the possibility of bringing in the private sector to manage an activity like marketing that the corporation doesn't really seem to have mastery of it. Probably better results could be obtained with such an approach.

ii. Impacts of the activities of the UNVDA

In other to fight against the shrinking lake Bamendjim, the corporation could spearhead a massive tree planting campaign. Such a campaign would ensure that all watersheds and river banks are identified and trees planted in the watershed along their banks. Besides the local authorities, the corporation in this exercise could work in association with the delegation of Forestry and Wildlife (MINFOF) and Environment, Nature Protection and Sustainable Development (MINEPDED) and or any other interested firm or NGOs to implement this objective.

The corporation should see how to avoid core parts of rich natural ecosystems in the Plain when constructing roads. Such environmental considerations will minimize the degree to which habitats are fragmented and destroyed.

In order to reduce the degree of soil erosion, siltation and possible blockage of the bridges and culverts in the Plain, research could be done to see how possible some protective structures could be built at the mouth of the bridges and culverts, such as figure 5.1 by Mnsanji (2014).

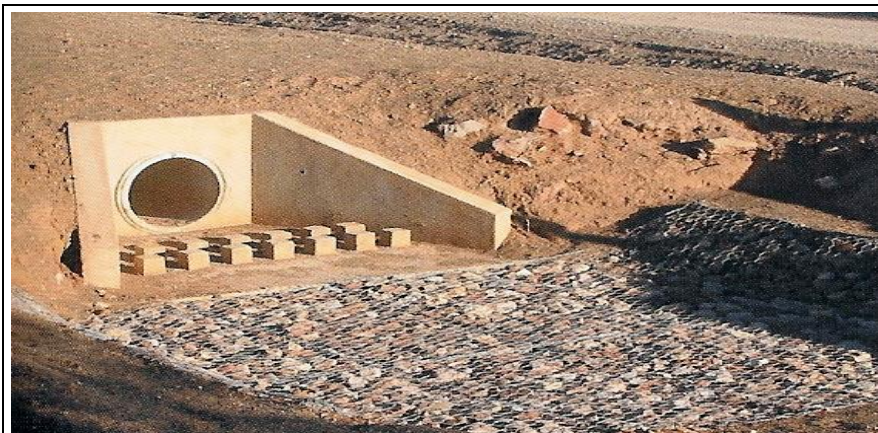


Figure 5 1: Example of culvert to prevent siltation

Streams especially those in which dams have been constructed or are earmarked to be constructed should be traced right to its watershed to ensure that human activities like farming along the streams are prohibited and afforestation encouraged.

Rice husk discarded as waste from the rice mill could be composted and used as manure for some upland farming practices while research could be done into how these husks could be put into more efficient use. More than 30,000 tons of rice is annually produced in Ndop meaning that significant chunk of husk is produced. This rice husk is used in Asia to generate electricity and produce chop sticks.

Instead of turning all the wetlands or swamps into rice fields, a portion of these wetlands could be reserved and banned from any human activity to maintain some natural heritage of the area and prevent extinction of all its flora and fauna of the rich ecosystem in this Plain.

iii. Challenges faced in relation to the impacts created

The Department of Commercialization in the corporation could embark on online publication campaigns and create Facebook pages to advertise their products. Currently, the rice from UNVDA sales is at a higher market price than the imported rice. So a strategy could be to embark on massive advertisement in popular television stations around the nation and also reduce the price of the rice in some form of promotion sales to ensure that many get to know and taste of the product.

The corporation could partner with a private sector to ensure more efficiency in the marketing domain. To boost the relationship with farmers, a periodic forum could be launched where the farmers will have the opportunity to present the important issues.

The corporation could decide to start the procedure of the contract for supply of inputs earlier enough about 4-5 months before the actual time in order to enable the inputs reach the farmers on time. Better still; a reliable dealer in agricultural inputs could be entrusted with such a deal for a time period in order to increase efficiency of the entire process.

5.4. Suggested areas for further research

Further research could be done on the quality of water in the Plain that is, collecting water samples and making analysis in the lab to determine the effects that fertilizer application has on water quality.

A comparative study of state corporations could be done to see how possible best practices in one could be copied in another.

A comparative study could be done involving a state corporation that is in partnership with a private enterprise and another one which is wholly under the government to see which of them can be more efficient.

Research could be done into how much the rice husk can be recycled and processed to something that can be of help to people.

Studies could be done on Lake Bamendjim to understand the socio-economic and environmental consequences that must have occurred following the construction of the dam in 1974.

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APPENDIXES

Appendix 1; structured questionnaire for Workers

SURVEY QUESTIONNAIRE ON UNVDA NDOP (Workers)

I am a Student at the Pan-African Institute for Development of West Africa (PAID-WA) in Buea. I am researching on the activities and impacts of the UNVDA in Ndop. Any information given here shall be considered confidential and will only be used for the purpose for which it is intended. Please tick in the appropriate brackets and make any necessary remarks.

Questions not applicable to you may not be answered!

SECTION ONE: GENERAL INFORMATION

1. Sex (1=Male), (2=Female)
2. Tribe (1=Ethnic Group within Ndop), (2=Ethnic Group within the Division), (3=Ethnic Group outside the Division)
3. Region of Origin (1=North West), (2=West), (3=South West), (4=Others)
4. Religion (1=Christianity), (2=Islam), (3=Traditional)
5. Marital Status (1=Single), (2=Married) (3=Divorced/widowed)
6. Age group (1=less than 15), (2=15 to 30), (3=31 to 45), (4=Greater than 45)
7. Length of time spent in Ndop (1=Less than 5 years), (2=5 to 15 years), (3=Greater than 15)
8. Level of education attained (1=Primary), (2=Secondary), (3=University/Professional)
9. Do you know anything about UNVDA and its activities? (1=Yes), (2=No)
10. Have worked/is working with UNVDA (1=Yes), (2=No)

SECTION TWO: ACTIVITIES AND IMPACTS OF UNVDA SINCE CREATION

11. The period you worked with UNVDA (1=1970 to Early 1990s), (2=late 1990s to 2008), (3=2008 to present) *You can tick more than one option*
12. The monthly salaries you earned/earn (1= Less than 100,000), (2= 100,000 to 200,000), (3= Greater than 200,000)
13. How would you describe your overall job satisfaction during your time with UNVDA (1=Very Satisfied), (2=just satisfied), (3=somewhat dissatisfied), (4= very dissatisfied)
14. From the table below, try to determine the extent to which money from UNVDA helped you people. *(you may add some if you still remember)*

S/N	Aspects	Really helped	Not really helped	Has not helped at all
1	Built or rent comfortable houses			
2	Sent Children to School			
3	Investments into other businesses			
4	Sent some money home			
5	Increase in general living standards			

15. How you terminated your contract (if you no longer work with UNVDA) (1=Retired), (2=Retrenched), (3=Resigned), (4= Sacked),
16. Did you witness any salary cuts during your time? (1=Yes), (2=No)
17. Were you/are you well paid? (1=Yes) (2=No)
18. Did you notice any extortion or bribery in UNVDA (1=Yes), (2= Rarely), (3=Never), (4=No Idea)
19. The rights of employees are/were respected irrespective of their functions (1=Yes) (2=Not really), (3= No), (4=No Idea)

20. Employment in the corporation is/was sometimes based on political and/or tribal ties (1=Strongly agree) (2=Convinced), (3=No Idea), (4=Strongly disagree)

21. The following environmental problems are thought to have resulted from the UNVDA Activities. From the table below, state whether or not it is true and then determine the intensity of the environmental problems. (*You may also add some if you still remember some*)

S/N	Problems	Yes/No	High Intensity/Frequency	Moderate Intensity/Sometimes	Low Intensity /Hardly experienced	No Idea
1	Flooded Roads					
2	Destruction of crops					
3	Destruction of raffia Palms					
4	Destruction of forest					
5	Water pollution					

22. The growing population of Ndop has also significantly contributed to these environmental problems (1=Strongly Agree), (2=both parties share equal blame), (3=Yes but not significant), (4=Strongly disagree)

23.

24. Any idea of strategies developed by UNVDA to combat these environmental problems?

25. Any idea of companies or NGOs that are currently working with the UNVDA to achieve its objectives? Please list them/it.

26. On a scale of 10 (with 10 being the highest) what mark would you give UNVDA based on their present performance?

27. If you have any other thing that you **LIKE** or **DON'T LIKE** about UNVDA please write them below and make the necessary proposals.

Thanks a lot for Cooperating! Any Remarks could be made at the back

Appendix2; structured questionnaire for Farmers

SURVEY QUESTIONNAIRE ON UNVDA NDOP (farmers)

I am a Student at the Pan-African Institute for Development of West Africa (PAID-WA) in Buea. I am researching on the activities and impacts of the UNVDA in Ndop. Any information given here shall be considered confidential and will only be used for the purpose for which it is intended. Please tick in the appropriate brackets and make any necessary remarks.

Questions not applicable to you may not be answered!

SECTION ONE: GENERAL INFORMATION

1. Sex (1=Male), (2=Female)
2. Tribe (1=Ethnic Group within Ndop), (2=Ethnic Group within the Division), (3=Ethnic Group outside the Division)
3. Region of Origin (1=North West), (2=West), (3=South West), (4=Others)
4. Religion (1=Christianity), (2=Islam), (3=Traditional)
5. Marital Status (1=Single), (2=Married) (3=Divorced/widowed)
6. Age group (1=less than 15), (2=15 to 30), (3=31 to 45), (4=Greater than 45)
7. Length of time spent in Ndop (1=Less than 5 years), (2=5 to 15 years), (3=Greater than 15)
8. Level of education attained (1=Primary), (2=Secondary), (3=University/Professional)
9. Do you know anything about UNVDA and its activities? (1=Yes), (2=No)
10. Do you belong to any farming group that benefit from UNVDA loans? (1=Yes), (2=No)

SECTION TWO: ACTIVITIES AND IMPACTS OF UNVDA SINCE CREATION

11. When did you enroll into this farming group? (1=1970 to Early 1990s), (2=late 1990s to 2008), (3=2008 to present)
You can tick more than one option
12. Do you make any profits from this relationship you have with UNVDA? (1=Yes), (2=No),
13. How would you describe your overall satisfaction with UNVDA (1=Very Satisfied), (2=just satisfied), (3=just Managing), (4= very dissatisfied/disappointed)
14. From the table below, try to determine the extent to which money from UNVDA helped you people. *(you may add some if you still remember)*

S/N	Aspects	Really helped	Not really helped	Has not helped at all
1	Built or rent comfortable houses			
3	Sent Children to School			
4	Investments into other businesses			
7	Sent some money home			
8	Increase in general living standards			

15. How will you evaluate your relationship with UNVDA? (1=Growing), (2=Declining), (3=Stagnant)
16. Did you notice any extortion or bribery in UNVDA (1=Yes), (2= Rarely), (3=Never), (4=No Idea)
17. Employment in the corporation is/was sometimes based on political and/or tribal ties (1=Strongly agree) (2=Convinced), (3=No Idea), (4=Strongly disagree)
18. The following environmental problems are thought to have resulted from the UNVDA Activities. From the table below, state whether or not it is true and then determine the intensity of the environmental problems. *(You may also add some if you still remember some)*

S/N	Problems	Yes/No	High Intensity/Frequency	Moderate Intensity/Sometimes	Low Intensity /Hardly experienced	No Idea
1	Flooded Roads					
3	Destruction of crops					
4	Destruction of raffia Palms					

19. The growing population of Ndop has also significantly contributed to these environmental problems (1=Strongly Agree),(2=both parties share equal blame),(3=Yes but not significant),(4=Strongly disagree)

20. Any idea of strategies developed by UNVDA to combat these environmental problems?

21. Would you say you have really learnt from the training and technical assistance offered by UNVDA to you? UNVDA (1=Yes), (2= Not really), (3=No)

22. On the table below try to list the things you **LIKE** and the things you **DON'T LIKE** about UNVDA and its activities.

23. Any proposals to make in order to help the management do better to help you?

Thanks a lot for Cooperating! Any Remarks could be made at the back

Appendix3: Draft sample questions used during unstructured interview

- Tribe
- Region of Origin
- Length of time spent in Ndop
- Level of education attained
- The period u started working with UNVDA
- The period you enrolled into a farming group
- How has income from the Corporation helped you?
- What are your major sources of income?
- Do you use rain boots during farming?
- Some social problems that existed in the Corporation in your time and their extent of severity
- Any knowledge of eminent environmental problems that have resulted from the activities of the Corporation?
- Any knowledge of some services which the Corporation stopped performing during its period of crises
- Will you attribute all the blames of environmental degradation on the Corporation? or you think that the dwellers equally share to it
- Have you noticed any bribery tribalism corruption in the Corporation?
- How these crises affected you if you experienced it
- How you managed to cope during this period
- Thinks you like and thinks you don't like about the Corporation
- On a scale of 10 (with 10 being the highest) how much will you score the Corporation?
- Any proposals to make for a better UNVDA

Appendix 4: Ndop Rice Sales Outlets

Name of Town/City	Sales Points	Contact
Yaounde	Carrefour Obili, M&B Business Center	677 700 464
Yaounde	Melen; Adjacent Auto ecole Kassap Express Business Group/Cameroon organic foods	677 403 860
Yaounde	Bastos le'mplette Boutique Marche Nkoletou	678 157 751
	Coopsuna (Police Social Service Canteen)	677 630 504
	CONSOCAM; Santa Babara	675 297 563
Douala	UNVDA Depot and Sales Point, opposite Royal Palace Hotel	674 212 638
Bafoussam	Shudzeka Clement besides Hotel Federal	677 660 206
Buea	Ama Enterprise; Street 2, Soppo	
	Agromart, Molyko; Opposite Paramount Hotel	
Mutengene	Ets Dunamis; Adjacent Garanti Express	675 085 357
Tonga	Tonton Moise	699 637 005
Bamenda	Baf Shop opposite Park Pharmacy Ntarinkon.	677 655 055
	Oscar Shop Ntarinkon	
	Jana Shop, Nkwen	
	Mile 2 junction	699 879 461
	Opposite Oilybia Nkwen mile 5.	675 005 251
	Main Market; shed 541	
Sabga	Mallam Sanda Store	677 881 995
Adamawa	a' Ngaoundal s/c	677 394 336
Kumbo	Promise Enterprise.	677 297 553
	Imex Business Group.	677 161 496
Jakiri	Nturbe Adelbert	650 565 453
Belo	Medland Construct and GC	678 519 018
Fundong	Farm House Store	673 586 043
Nkambe	Clepat Enterprise	677 858 089
Bamessing	End of Tar	676 223 466

Appendix 5: Gallery Pictures



Interview with former worker at his shoe mending site



Incineration of rice husk behind the rice factory



Rice harvesting at the seed multiplication farm



Rice processing and packaging at the rice mill



Some rice-eating birds



Paddy rice threshing in process



Rice nesting at the seed farm



Partial view of the UNVDA headquarters in Bamunka-Ndop