

The Transformative Development of Postcolonial Africa:

*Voices of Pure and Natural
Scientists*

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Edited by

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PREFACE

By the end of the three-day international conference (Humboldt Kolleg) organized in Yaahot Hotel Yaounde in November 2022, the projects of rethinking postcolonial Africa for its transformative development were launched. Deliberations, discussions and debates during this conference culminated in the need for new scientific reflections from all the disciplines to chart new roadmaps that can pull the continent from its current developmental quagmire. The launching of the different projects immediately after the conference was therefore a sequel to the recognition that postcolonial Africa is plagued by different types of development-related problems and crises that cannot be addressed by a paradigm or a theoretical vision that pigeonholes development to only one aspect. This explains why a transformative vision is the main thrust of all the projects that were launched after the conference, including this one, entitled *The Transformative Development of Postcolonial Africa: Voices from Pure and Natural Scientists*. As shown clearly in this book, transformative development is characterized by a number of indicators, including the fact that it is holistically defined.

The book is therefore a forum for scientific reflections from pure and natural scientists on the transformative development of postcolonial Africa. Given the holistic definition of transformative development and its multifarious indicators, the book provides an opportunity for the voices of pure and natural scientists to be heard on the projects of rethinking and remaking postcolonial Africa, in order to pull it from its current developmental quagmire and bring about its holistic transformation. The book attempts to provide answers to many research questions, some of which include the following: What is actually delaying the development of postcolonial Africa, in spite of its rich multidimensional resources and the numerous development projects that are often initiated by development stakeholders? Which development indicators provide a complete picture of the actual development situation of the continent? Are development goals and the development agenda for the continent based on paradigms that address the problems and needs of Africa? What is the role of pure and natural sciences in the project of rethinking and remaking Africa and in the holistic transformation of the continent?

Many previous works have addressed the development of postcolonial Africa and that of developing countries, but these previous works have neither focused on the transformative development of the continent nor provided scientific reflections from pure and natural sciences in the context of the transformative development of the continent. This explains why this book is unique and offers fresh and innovative insights into the projects of re-thinking and re-making postcolonial Africa, a continent that is still plagued by multidimensional development problems and crises.

We are very grateful to the Humboldt Foundation that sponsored the Humboldt Kolleg of November 2022, which provided the interdisciplinary forum and the opportunity for the conception and conceptualization of this book project and similar ones, striving to chart new road maps for the re-writing of the development story of postcolonial Africa.

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July 2023

PART ONE:

INTRODUCTION AND A CASE FOR A TRANSFORMATIVE VISION IN THE DEVELOPMENT AGENDA OF POSTCOLONIAL AFRICA

CHAPTER ONE

INTRODUCTION

ANNIE SYLVIE BEYA WAKATA,
SIMÉON FOGUE KOUAM,
ROSEMARY TONJOCK KINGE,
TÉLESPHORE BENOIT NGUELEFACK
AND ALOYSIUS NGEFAC

Background, research problem and research questions

In spite of the fact that most African countries gained independence more than six decades ago and despite the numerous natural and human resources the continent is endowed with, postcolonial Africa continues to be the sympathy of the world. The World Bank Report has constantly ranked African nations as the least developed, given their despicable Human Development Index (HDI), which is persistently and consistently shrinking. With regard to the per capita gross domestic product (GDP) often used to evaluate the development of nations, statistics equally show a bleak picture for the continent, given that the GDP of most African nations reveals a development deficit that is a call for concern. Interestingly, this horrible development deficit that emerges from the HDI and the GDP of African nations does not even capture the full depth and scope of development-related problems plaguing postcolonial Africa. This is because the concept of development has previously been pigeonholed to the economic and industrial situation of the continent and understood out of the context of the multifarious problems plaguing postcolonial Africa.

The depth and scope of development-related problems characterizing postcolonial Africa can be understood better when we consider the devastating impact colonialism had on the continent, which has an undeniable connection with the current scenario. Through this dehumanizing practice, a continent that was previously considered as the

heart of darkness (see Joseph Conrad's (1899) *Heart of Darkness*) was raided, looted, upset, repackaged and redefined, thereby placing it in a dilapidating and chaotic state, full of a multitude of development-related problems and crises (e.g., economic crisis, political crisis, cultural crisis, identity crisis and mindset crisis). In order to carry out the colonial agenda hitch-free, the colonizers indoctrinated the people of Africa to believe that they were biologically and culturally inferior and needed to give up everything about themselves in order to receive the civilization package brought by the colonizers. The colonized people were then stripped of everything, including their worldviews, cultures, institutions, identities, resources and other aspects that linked them to their typical African roots. As an unavoidable consequence, things started falling apart, as best captured in the title of Chinua Achebe's classic novel, *Things fall Apart*, resulting in different types of development-related problems and crises.

This implies that many of the problems characterizing postcolonial Africa have their roots in the colonial era. For instance, many postcolonial people are experiencing an identity problem, believing that their own identity is inferior and struggling in vain to build one that links them to their colonial masters. This explains why some people in postcolonial African contexts struggle to mutilate their skin colour in order to look as white as their colonial masters, because of the inferiority complex they inherited (see Ngefac 2012). Furthermore, some people in postcolonial Africa have a mindset that associates their African potentials, resources and approaches with an inferiority complex and associates everything that comes from the West with a superiority complex. It is not surprising that development projects in many African countries are still based on Western models, which, in many cases, may tend to be significantly incompatible with the realities and needs of the African countries concerned. It is the same mindset that motivated the relegation of African indigenous languages to the background for many decades and rather shifted the attention to the vigorous and passionate promotion of colonial languages, even though the situation is significantly changing today. What explains the fact that the demand for goods produced in the Western world in most cases tends to be higher than the demand for locally produced ones? What explains the fact that in some African countries, most development projects are piloted by Western companies, as if such countries do not have the qualified human and technological resources to carry out the projects? Such a mindset that does not believe in African potentials and resources is simply one of the consequences of the colonial indoctrination, which consisted in instilling an inferiority complex in the minds of the colonized people of Africa.

When we consider the multidimensional problems plaguing the continent of Africa, which go far beyond the economic and industrial situation of the continent, it becomes obvious that postcolonial Africa needs a development paradigm or vision that is holistic in nature and can address the multifarious problems the continent is facing. It is for this reason that this book (like some of our recent books) argues against the tendency to pigeonhole the development of the continent to its economic and industrial progress and rather advocates a transformative vision in the development agenda of the continent. Transformative development, as shown in the next chapter, has five indicators. First, it is holistically defined and includes all the aspects and domains of society such as politics, economy, culture, social life, science, technology, history, language, literature, education, philosophy, mindset, attitudes, perception, and identity. This implies that a transformative vision values the contribution of every discipline to the development of the continent. Second, transformative development is initiated and piloted by decolonized African minds. The implication is that a development agenda that can bring about the transformation of the continent should not be influenced by the phenomena of coloniality and Eurocentrism. Third, transformative development is fashioned according to African problems and needs. This implies that a development agenda that can bring about the transformation of the continent is based on paradigms that are compatible with African realities. Fourth, transformative development is reflected in the economic and industrial evolution of the continent. This implies that industrial and economic progress, emphasized in the traditional definition of development, is just one of the indicators of transformative development. Fifth, transformative development is void of any inferiority complex and is a sequel to psychological independence. This implies that transformative development is only possible when postcolonial Africans are able to dream, champion and live their own dreams without any inferiority complex, instead of dreaming and living the dreams of their ex-colonial masters.

This book therefore provides an opportunity for the voices of pure and natural scientists to be heard on what can be done to pull Africa from its current developmental quagmire and bring about its holistic transformation. The book attempts answers to the following research questions: what is actually delaying the development of postcolonial Africa, in spite of its rich multifarious resources and the numerous development projects that are often initiated by development stakeholders? Which development indicators provide a complete picture of the actual development situation of the continent? Are development goals and the

development agenda of the continent based on paradigms that address the problems and needs of Africa? What can be done to re-write the development story of Africa? What is the role of pure and natural sciences in the project of rethinking and remaking Africa and in the holistic transformation of the continent? What is the role of pure and natural sciences in the project of deconstructing and reconstructing development paradigms that still incarnate colonial constructs that do not align with African realities? From the perspective of pure and natural sciences, what is the panacea that can ignite the transformation of the continent and pull it from its current despicable situation?

Structure of the book and contributions

The book is partitioned into four parts. Part One, entitled “Introduction and a Case for a Transformative Vision in the Development Agenda of Postcolonial Africa”, comprises two chapters. Part Two, entitled “Voices from Physicists and a Mathematician”, consists of four chapters. Part Three, Voices from Health Scientists and Chemists, is made up of four chapters as well. Part Four, entitled “Voices from Biological and Environmental Scientists”, comprises three chapters. This structure is described in greater details below.

Part One: Introduction and a Case for a Transformative Vision in the Development Agenda of Postcolonial Africa

This part contains two chapters; the first chapter is the introduction of the book, written by **Annie Sylvie Beya Wakata**, **Siméon Fogue Kouam**, **Rosemary Kinge Tonjock**, **Télesphore Benoit Nguelefac** and **Aloysius Ngefac**. This introductory chapter focuses on the background that motivated the project, the research problem and research questions. In addition, the structure of the book and the contributions to the volume are succinctly described.

In the second chapter, **Aloysius Ngefac** presents a case for a transformative vision in the development agenda of postcolonial Africa and argues that the development of the continent cannot be assessed only in terms of its economic and industrial progress, given that postcolonial Africa is plagued by a multitude of development-related problems and crises (economic crisis, cultural crisis, identity crisis, mindset crisis, etc.), some of which have their roots in the colonial era. This is why he argues that it is a transformative vision that can bring about a complete transformation of the continent. The chapter highlights the defining

hallmarks of transformative development. For instance, transformative development is holistically defined and includes all the aspects and domains of society; it is initiated and piloted by decolonized African minds who are not under the influence of coloniality and Eurocentrism; it is fashioned according to African realities and needs and based on paradigms that are compatible with African realities; it is reflected in the economic and industrial evolution of the continent; it is void of any inferiority complex and is a sequel to psychological independence. This implies that transformative development is only possible when postcolonial Africans are able to dream, champion and live their own dreams, instead of dreaming and living the dreams of their ex-colonial masters. As case studies, the chapter addresses the role of pure and natural sciences in the transformative development of the continent.

Part Two: Voices from Physicists and a Mathematician

In part two of this book, there are four chapters that focus on scientific contributions from physicists and a mathematician. The first chapter, entitled “Insights into the Ultrastructure and Physicochemical Characteristics of Wooden Cultural Heritage: Towards a Novel Approach for Non-invasive Ageing and Biodegradation Assessment”, is written by **Jacob Valdes Monempimb, Etienne Mfoumou and Annie S. Wakata**. The chapter studies the deterioration of wooden artifacts in the context of African cultural heritage and aims to identify the mechanisms that bring about the initiation and propagation of certain forms of deterioration in wooden sculptures from different Cameroonian wood species. Through a physico-chemical analysis and scanning electron microscopy, wood samples from Iroko, Fromager, Ayous, Doussie and Sipo were studied in terms of how wooden artefacts from these wood samples pass from deterioration to an advanced state of degradation. An analysis of the elemental composition of the samples revealed the presence of elements that are potential targets in the condition monitoring of wooden sculptures produced from these wood species. This finding enabled the authors to highlight the mechanisms of degradation of wood artefacts and bring to the limelight an emerging pattern of deterioration in these samples. The authors demonstrate that this deterioration begins on the surface, continues more rapidly in the porous zones (fibres, pores, vessels, parenchymatous zones) and facilitates the diffusion of water and air, which combine with temperature effects and stimulate the development of micro-organisms. The chapter contributes to the advancement and promotion of conservation practices and education, besides shedding light on the mechanisms of

degradation of wooden sculptures, which are pivotal for the analysis, diagnosis and development of conservation protocols in museums.

The second contribution, entitled “Race towards the quantum world: Can Africa be part of the next revolution?”, is authored by **Etienne Wamba**. Based on the numerous challenges characterizing postcolonial Africa (e.g., food insecurity, lack of potable water, and energy crisis), the author argues that the transformative development of the continent requires sustained and collective efforts, including a significant shift from agrarian-based economies to more industrialized and service-oriented economies. This explains why he argues that Africa needs to be actively involved in the race to the quantum revolution for its transformative development, given that the continent rather played a very passive role in the previous two industrial revolutions. The author therefore makes an appraisal of the previous industrial revolutions and discusses the on-going revolution that started with the birth of the quantum theory and the award of the Nobel Prize in quantum information theory in the early 1920s. The chapter underscores the potential of Africa to take part in the next revolution and proposes what it takes for this to be a reality, including learning from the so-called useless science, investing significantly in quantum research and education and developing low-cost science initiatives.

The next chapter, entitled “A review of high-performance passive inerter-based vibration control schemes: the impact on the stability of buildings”, is a contribution from **Emmanuel Fendzi-Donfack, Marcial Baduidana** and **Fernande Fotsa-Ngaffo**. Considering the limited lifespan and ineffectiveness of dynamic vibration absorbers (DVA) and tuned mass dampers (TMD) often used for the protection of structures against vibrations induced by dynamic loads and given that the inertia of these devices is limited by practical operational issues, several works have presented control systems incorporating an inertial device called inerter, which can totally or partially replace the mass of the DVA or the TMD. This explains why the authors carried out a review of the resulting high performance passive inerter-based vibration control schemes in the case where the mass of the DVA is entirely replaced. Their findings reveal that inerter-based control systems furnish an inertial advantage over DVA and prove that, in all cases of excitation considered, these systems have a better high control performance than the conventional DVA or TMD. This is why these inerter-based control systems are highly solicited nowadays in engineering practices, as the authors point out.

The final chapter in Part Two of the book, entitled “On the real Mathematics Education for fostering the development of African

countries: A perspective from a mathematical prism”, is a contribution from **Lawrence Diffo Lambo**. The chapter argues that, as a result of colonialism and neocolonialism, postcolonial Africa is witnessing a horrible underdevelopment scenario, given that the continent is plagued by different types of problems, including extreme poverty and severe economic crisis emanating from the wanton looting of their natural resources. Given this despicable development quagmire characterizing the continent, the author advocates a new vision for the genuine and sustainable development of the continent. This new vision, the author argues, should include Mathematics Education as a factor of development and should rely on a well-known mathematical problem-solving approach.

Part Three: Voices from Health Scientists and Chemists

There are four chapters in Part Three of this book. The first two chapters are contributions from health experts and the last two chapters are authored by chemists. As concerns the chapters that address health issues for postcolonial Africa, the first contribution, entitled “Viral Hepatitis Infection: Current Facts and Figures, and Contribution of the African Pharmacopeia”, is written by **Lionel Cyrille Kamga Bomgning, Mathias Kenfack Tsague, Agathe Lambou Fotio, Elvine Pami Nguelefack-Mbuyo and Télesphore Benoît Nguelefack**. In this chapter, the authors make a critical appraisal of the literature on the existence, characteristics and pathogenicity of new hepatitis viruses such as hepatitis G virus, hepatitis TT virus and hepatitis SEN. The picture that emerges from existing knowledge reveals that these hepatitis infections are not only under-diagnosed and under-reported, but their prevalence is on a steady rise, especially in low-income countries, despite the significant progress that has so far been made in their preventive and curative treatment and in the understanding of their pathogenesis. Considering that the treatment and management of these hepatitis infections in developing countries still face serious challenges, the authors advocate an alternative therapy with natural products from plant origin and recommend the use of African Pharmacopeia.

The next chapter that addresses a health issue is entitled “Traditional food processing methods in sub-Sahara Africa and its effects on nutritional content of food and health status of consumers” and is authored by **Germaine Sylvie Nkengfack Nembongwe and Sandra Aurelia Fomekong Tafotio**. In this chapter, the authors argue that, instead of addressing nutritional deficiencies and under-nutrition in Sub-Saharan Africa by focusing only on inadequate eating habits and lifestyles, there is

the need to focus also on indigenous food processing methods used in this region. This explains why they studied these food processing methods and identified their negative nutritional effects and the consequences on the health of the consumers. For instance, some of the food processing methods result in a significant loss of vitamins, soluble proteins, sugar and other health-promoting compounds. They go further to demonstrate that cooking vegetables by boiling them in a large quantity of water leads to an enormous loss of vitamin C by leaching into cooking water. Furthermore, inadequate processing of cereals can lead to food contamination by toxins such as aflatoxins, and this has severe health consequences. In addition, soaking beans (*Phaseolus vulgaris* L.) before cooking reduces the amount of anti-nutrients responsible for flatulence and digestibility. The authors therefore maintain that one of the main reasons for the continuous use of these traditional food processing methods in Sub-Saharan Africa is the lack of information on their inadequacies and health consequences.

Besides chapters addressing health issues, there are two contributions from chemists. The first one, authored by **Deccaux G. F. W. Kapche**, is entitled “Bioresources and Green Chemistry for the Sustainable Development of Cameroon”. The author acknowledges the importance of bioresources (i.e., life generated materials and processes that are naturally and sustainably renewable and biodegradable) in the sustainable and transformative development of Cameroon, but argues that their careless use and overexploitation can generate many undesirable consequences likely to be detrimental to the wellbeing of the nation, including the destruction of the country’s ecosystem and the environment. This explains why the chapter advocates the adoption and promotion of the “green chemistry” vision, which can guarantee Cameroon’s ambition to become an upper-middle income country by 2035, as envisaged in its 2035 development vision. This “green chemistry” vision consists in integrating the sustainable management of its biodiversity into its economic growth model.

In addition to the above chapter from a chemist, there is a chapter entitled “Future and Promising Targets in the Chemical Investigation of Natural Resources in Cameroon”, which is authored by **Joseph Tchamgoue and Simeon Fogue Kouam**. In this chapter, the authors focus on the natural resources Cameroon is endowed with (e.g., plants, animals, micro-organisms, mushrooms, algae, soil, water and minerals) and make an appraisal of past and current trends in their extraction, purification, characterization, and the biological evaluation of their bioactive constituents for the management of different ailments. They observe that many of these natural resources have received very little

scholarly attention, apart from organisms, especially fungi, that have witnessed the attention of some Cameroonian research groups. They, therefore, recommend an interdisciplinary approach and a methodological improvement in the exploitation of these natural resources and propose future targets in their chemical investigation.

Part Four: Voices from Biological and Environmental Scientists

Part Four of this book comprises three chapters that address biological and environmental issues. The first chapter, entitled “Hypotensive mechanisms of the aqueous extract of *Lophira lanceolata* (Ochnaceae) on Wistar rats”, is a contribution from **Esther Ngo Lemba Tom, Frida Longo, Ines Mbang Mani, Nyunaï Nyemb, Corine Girard-Thernier, Céline Demougeot and Théophile Dimo**. The authors submitted to a scientific investigation the aqueous stem bark extract of *Lophira lanceolata*, which has often been used in traditional medicine for the treatment of many diseases such as hypertension without a clear knowledge on the scientific mechanisms involved. The authors set out to investigate its scientific impact on arterial blood pressure and the involved mechanisms in urethane anaesthetized Wistar rats. After a preliminary phytochemical screening of an aqueous extract of *Lophira lanceolata*, the authors used anesthetized Wistar rats to assess its blood pressure reducing effect and its mechanism of action. Their investigation reveals a number of findings. First, intravenous injection of aqueous extract of *Lophira lanceolata* (5-20 mg/kg) induced a significant decrease in blood pressure at doses of 10, 15 and 20 mg/kg, due, predictably, to bioactive compounds such as flavonoids, phenols, tannins and saponins present in the extract. Second, the 20 mg/kg dose induced the most hypotensive effect and significantly reduced heart rate and this explains why it was used to study the mechanisms of the hypotensive activity. Third, pre-treatment with atropine (1 mg/kg) or reserpine (5 mg/kg) significantly reduced the hypotensive effect of aqueous extract of *Lophira lanceolata* by 17.58% ($P < 0.05$) and 13.33% ($P < 0.05$), respectively. Fourth, neither yohimbine (100 µg/kg), propranolol (100 µg/kg), nor indomethacin (5 mg/kg) affected the immediate hypotensive effect of the extract, even though the negative chronotropic effect of the extract, at the dose of 20 mg/kg, was significantly inhibited by the overall antagonists used. In conclusion, the authors maintain that these results suggest that the aqueous stem bark extract of *Lophira lanceolata* lowers blood pressure by a mechanism that does not involve α 2-adrenergic, β -adrenergic, cyclooxygenases pathways,

but involves at least in part muscarinic receptors and sympatholytic activity.

The next chapter under Part Four of this book, entitled “Ethnomycological Studies in Cameroon: Current and Future Perspectives”, is a contribution from **Clementine Azinue Lem, Genevieve Chia Kain and Rosemary Tonjock Kinge**. The chapter makes an appraisal of current and future perspectives in ethnomycological studies in Cameroon, focusing on the uses of mushrooms as food, medicine and mythology. The authors maintain that current perspectives in ethnomycological studies have involved the use of questionnaires, interviews, and group discussions in collecting ethnomycological data which has contributed significantly to the identification of diverse uses of macrofungal to communities and to the documentation of traditional knowledge. They, however, caution that future perspectives should include a combination of current methods and the databasing of ethnomycological knowledge, determine the nutritional content and efficacy of macrofungal used as food and medicine, and use multidisciplinary and interdisciplinary approaches in the collection of ethnomycological data.

In addition to the chapters focusing on biological sciences, there is a chapter that addresses an environmental issue. It is entitled “Evaluation of above-ground biomass of plant communities in marshy areas of the city of Yaoundé” and authored by **Jean Louis Fobane, Jean Moussoune, Léon Kono, Pierre Marie Chimi, Marie Madeleine Vicky Nkoula, Jules Christian Zekeng, Jean Michel Onana, William Armand Mala and Marie Marguerite Mbolo**. This contribution is couched in the premise that very little is known about the above-ground biomass of marshy environments, in spite of the fact that carbon stock in wetlands has become a means for optimal conservation of degraded marshlands. This explains why the authors investigated the above-ground biomass of plant species in marshy areas in the city of Yaoundé. With the help of a line transect data collection method, the authors conducted the study in six quarters of Yaoundé (Ngoa-Ekelé, Nkolbisson Tropicana, Awae, Odza and Nkondengui). Their findings revealed the presence of 113 species grouped into 98 genera and 42 families. The most diverse marsh was Awae (4.35 bit). The carbon storage in herbaceous species was highest in Tropicana (0.167 t C/ha) and lowest in Awae (0.08 tC/ha), while in woody species, Awae occupies the first place (1.518 t C/ha). They also discovered that biotope factors such as high anthropization and surface area have a negative impact on plant biomass. The authors therefore cautioned that there is an urgent need to set up an effective system for managing and protecting the biodiversity of these wetlands that play an important role in

regulating the climate, given the continuous intensification of human activities in the town.

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CHAPTER TWO

A TRANSFORMATIVE VISION IN THE DEVELOPMENT AGENDA OF POSTCOLONIAL AFRICA:¹ FOCUS ON PURE AND NATURAL SCIENCES

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1. Introduction

More than six decades after political independence, the development situation of postcolonial Africa has remained very precarious and a major call for concern. In spite of the liberation of the continent from the bondage of colonialism and in spite of the fact that Africans became the main architects of their own development more than six decades ago, the continent continues to be the sympathy, rather than the admiration, of the world. Interestingly, the rankings of African nations according to their Human Development Index (HDI) do not reveal any promising picture, according to the World Bank Report. When the HDI was first calculated in 1990, there were 16 African countries among the 20 nations with the lowest HDI. In 2019, there were up to 18 African countries out of the 20 with the lowest HDI, an indication that the development of the continent is rather shrinking. In terms of the per capita gross domestic product (GDP) often used as a development indicator, statistics show that Africa remains the least developed continent. For instance, out of the 20 countries with the lowest per capita GDP in the 1960s, 14 were African nations and in 2010, there were up to 19 African countries, out of the 20 with the lowest

¹ This case for a transformative vision is also presented (almost word verbatim) in other development-related projects we have piloted and published elsewhere, but with a focus on the disciplines under investigation.

per capita GDP, indicating that the development picture of African nations remains very precarious.

Despite the despicable development picture of the continent that emerges from its HDI and GDP, a full picture of the development quagmire that characterizes postcolonial Africa is still significantly masked, given that the development of the continent is, in most cases, measured only in terms of its economic or industrial evolution, coupled with the fact that the development of the continent is very often understood in the context of paradigms that are incompatible with African realities. Pigeonholing the development of the continent to its industrial or economic situation and measuring its development in terms of Western constructs conceal the multifarious development problems plaguing the continent and provide a misleading framework through which the development of the continent can be initiated and measured. Given this gloomy development scenario that characterizes postcolonial Africa, a number of questions unavoidably come to mind and beg for immediate answers, some of which include the following: what is actually delaying the development of postcolonial Africa, in spite of its rich natural resources and the numerous development projects that are often initiated by development stakeholders? Are development goals and the development agenda of the continent based on paradigms that address the problems and needs of Africa? What can be done to re-write the development story of Africa? What is the contribution of pure and natural sciences to the transformative development of postcolonial Africa?

As an attempt to provide answers to some of the above-mentioned questions, this chapter presents a case for a transformative vision in the development agenda of postcolonial Africa and defends the thesis that a development agenda that can ignite the transformation of postcolonial Africa or that can serve as the panacea (or call it the magic) necessary to get the continent out of its current developmental quagmire must be transformative in nature. As shall be shown in this chapter, a transformative vision in the development agenda of postcolonial Africa is holistically defined and does not limit itself to a single aspect of development; it is initiated and piloted by decolonized African minds who are not under the influence of coloniality and Eurocentricism; it is fashioned according to African realities and needs and based on paradigms that are compatible with African realities; it is reflected in the economic and industrial evolution of the continent and it promotes psychological independence for nations experiencing political independence. What this chapter refers to as transformative development is, therefore, significantly different from previous definitions of development, which have either

reduced it to the economic situation of the continent or have understood development in the context of misleading paradigms (see, for instance, Hegel, 1964; Rogers, 1969; Trevor-Roper, 1967; and Mabogunge, 1980). This implies that transformative development is only possible when postcolonial Africans are able to dream, champion and live their own dreams, instead of dreaming and living the dreams of their ex-colonial masters. As a case study, the chapter focuses on the contribution of pure and natural sciences to the transformative development of the continent.

2. The colonial experience, the development situation of postcolonial Africa and the need for a transformative vision

Before defending the thesis that it is transformative development that can pull postcolonial Africa from its current developmental quagmire, it is important to make an appraisal of the colonial era, the crises and problems that ensued from this dehumanizing practice and all the related ramifications, in order to understand the multidimensional and holistic nature of the problems plaguing postcolonial Africa, which necessitate a transformative vision. It is interesting to note that, before colonialism, Africa was perceived by the colonizers as a dark continent harbouring culturally and biologically inferior semi-savages without an identity, without a culture and without a worldview of their own. Because of this fallacious perception, the colonizers embarked on a civilization mission (“mission civilisatrice”) (see Wolf, 2001).

The starting point for the colonial governance of the continent was to indoctrinate the people to accept that they were inferior in all aspects and needed the civilization package brought by the colonizers. After gaining access to the people’s hearts and minds, the continent was invaded, looted, distorted, repackaged and redefined. As an unavoidable consequence, the continent was left in a dilapidating and chaotic state, full of different types of problems and crises, including economic crisis, political crisis, cultural crisis, identity crisis, linguistic crisis, and mindset or visionary crisis. The different crises Africa inherited from the colonial experience indicate that the development of the continent cannot be measured only in terms of its economic situation; the continent is, in fact, plagued with multidimensional problems. For instance, many Africans are experiencing an identity problem, as they believe that a Western identity is better than their African identity, based on the inferiority complex the continent inherited from the colonial indoctrination. Furthermore, the continent is inundated with cultural mulattoes or cultural hybrids who are neither connected to their

ancestral African roots nor connected to a typical European cosmology. In addition, psychological independence is still a far-fetched dream for many African countries, in spite of the fact that political independence took place many decades ago. Considering that postcolonial Africa is experiencing different types of problems, the development of the continent cannot be measured only in terms of its economic situation. The continent needs to develop in all the areas (culture, language, identity construction, attitudes, worldview, vision, etc.) in order to claim psychological independence. This explains why this chapter presents a case for a transformative vision in the development agenda of postcolonial Africa and defends the thesis that it is only transformative development that can pull the continent out of its current developmental quagmire.

3. A transformative vision in the development agenda of postcolonial Africa

It is claimed in this chapter that it is transformative development that can ignite the transformation of postcolonial Africa and pull it out of its current developmental quagmire. What this study considers as transformative development is inspired by Mezirow's (1997) transformative learning theory which advocates critical learning and encourages the deconstruction and reconstruction of theories and paradigms (see Mezirow's article, entitled "Transformative Learning: Theory to Practice"). This chapter therefore borrows the concept of "transformative" from Mezirow (1997) to propose the concept of transformative development, which differs significantly from definitions of development that are limited to the economic and industrial evolution of the continent. Indicators of what we consider as transformative development are many. As shall be shown in the next sub-sections, a transformative vision in the development agenda of postcolonial Africa is holistically defined; it is couched in "African-centredness" and disconnected from the phenomena of coloniality and Eurocentricism; it is based on paradigms that are compatible with African realities; and it is void of any inferiority complex and reminiscent of psychological independence. Each of these indicators will be discussed in greater detail below.

3.1 Transformative development is holistically defined

Given the multidimensional problems postcolonial Africa inherited from the colonial practice, it is misleading to assess the development of the continent only in terms of its economic situation. This explains why, unlike previous definitions of development that are limited to the

economic or industrial evolution of the continent, transformative development is holistically defined, given the multifarious problems and crises postcolonial Africa inherited from colonialism. In addition to economic problems affecting postcolonial Africa, the continent is also plagued by a political crisis, cultural crisis, linguistic crisis, identity crisis, psychological crisis, and visionary crisis. This implies that the different areas experiencing crises cannot be excluded in assessment of the development of the continent. After all, genuine development is “the holistic evolution of all the aspects of the society” (Chukwuokolo, 2009: 28). The holistic definition of transformative development includes such aspects as politics, economy, culture, social life, science, technology, history, language, literature, education, philosophy, mindset, attitude, perception, and identity. Transformative development therefore gives birth to political stability, economic growth, unemployment, scientific and technological innovations, peaceful co-existence, creativity, high self-esteem, cultural freedom, linguistic independence, pride in one’s identity, free exploitation of natural and local resources, and freedom in science and art. The holistic definition of transformative development implies that every discipline is indispensable in the development agenda of postcolonial Africa. For instance, to what extent has African history been re-written to debunk some earlier Eurocentric views that projected it as a dark continent without any history of its own, without any civilization and without any philosophy? Which attitudinal tendencies and mindsets characterize postcolonial Africa? In terms of science and technology, what has the continent done, how is it doing it and what more is supposed to be done for its genuine and transformative development in all aspects and in all sectors of the economy?

3.2 Transformative development is couched in “African-centredness” and disconnected from coloniality and Eurocentrism

The colonial indoctrination that instilled an inferiority complex in the colonized people of Africa has been camouflaged in the phenomena of coloniality and Eurocentrism, which continue to shape and orientate the actions and inactions of postcolonial African people. Coloniality refers to the colonial legacy that pervades all domains of life in postcolonial contexts and tends to shape and define knowledge systems, cultural values, attitudes, identity and the thoughts and tastes of postcolonial people. In other words, it is the perpetuation and incarnation of the colonial heritage in postcolonial contexts. Eurocentrism, on the other hand, is the tendency to undermine the values and contributions of the African continent (and those of non-European nations) to world history

and civilization, framing Europe as the model for universal values and development. A typical Eurocentric view is captured in the following statement from Trevor-Roper (1967: 9), quoted in Chukwuokolo (2009: 29):

It is fashionable to speak today as if European History were devalued: as if historians in the past have paid too much attention to it, and as if nowadays, we should pay less. Undergraduates seduced as always by the changing breath of journalistic fashion, demand that they should be taught the history of black Africa. Perhaps, in the future, there will be some African history to teach. But at present there is none or very little: there is only the history of Europeans in Africa. The rest is largely darkness, like the history of pre-European pre-Columbian America. And darkness is not a subject for history.

The Eurocentric overtones of the above excerpt are similar to those inherent in Hume's (1969: 208) description of the Negroes, a replica of the way Africans have been described by proponents of Eurocentrism. He states as follows:

I am apt to suspect the Negroes to be naturally inferior to the whites. There scarcely ever was a civilized nation of that complexion, nor even any individual eminent either in action or speculation. No ingenious manufactures among them, no arts, no sciences. On the other hand, the most rude and barbarous of the whites, such as the ancient Germans, the present TARTARS, have still something eminent about them, in their valour, form of government, or some other particular. Such a uniform and constant difference could not happen, in so many countries and ages, if nature had not made an original distinction between these breeds of men. Not to mention our colonies, these NEGRO slaves dispersed all over Europe, of whom none ever discovered any symptoms of ingenuity; though low people, without education, will start up among us and distinguish themselves in any profession. In JAMAICA, indeed, they talk of one Negro as a man of parts and learning, but it is likely he is admired for slender accomplishments like a parrot who speaks a few words plainly (Hume 1969: 208, quoted in Chukwuokolo 2009: 30).

According to Chukwuokolo (2009: 30), the most devastating impact of the Eurocentric viewpoint on the development of Africa is the subtle manipulation of "Africans to view the world from European perspectives in all spheres", including the political, economic, social, developmental, scientific, technological, and cultural domains (Chukwuokolo, 2009). What explains the fact that many Africans are still dreaming and living the dreams of their ex-colonial masters, instead of dreaming their own dreams, championing their own dreams and living their own dreams?

The implication is that the phenomena of Eurocentrism and coloniality have significantly shaped every aspect of the African continent, including development goals, the modus operandi adopted for the development of the continent, the exploitation of natural resources, knowledge systems, cultural values, attitudes, identity and the philosophical views of the people. Identity crisis and identity re-writings tend to be some of the hallmarks of postcolonial Africa, as some people try to change their identity to embrace that of their ex-colonial masters. This explains why Ngefac (2012) in an article, entitled “From skin colour mutilation to tongue rejection: Cameroonians’ attitudes towards their local languages”, points out that some people in postcolonial Africa are mutilating their skin colour in order to look as white as their ex-colonial masters. The mindset that seems to be the order of the day in postcolonial Africa is that Western constructs are necessarily superior to those of Africa, resulting in the fallacious belief that any genuine development model must be borrowed from the West. This explains why the demand for consumer goods produced beyond the frontiers of Africa tends to be higher. This also explains why most development projects carried out in many African countries are championed and managed by foreign companies and most of the projects are rooted in paradigms that do not even reflect the African realities. What explains the fact that linguistic imperialism is still the order of the day in many African countries? In other words, what explains the fact that African mother tongue languages are, in most cases, relegated to the background and ex-colonial languages are not only promoted with vigour and passion, but are used for official communication in many African countries? Why do many Africans still believe that what is produced in the West is necessarily superior to what is locally produced? Why is the demand for Western products higher than the demand for those produced in Africa? Only when Africans are delivered from this inferiority complex orientating their actions and inactions can they claim to have gained psychological independence. Transformative development therefore prioritizes “African centredness” and shuns neocolonial tendencies and aspects of other worldviews that are incompatible with African realities. In other words, transformative development encourages postcolonial Africa to dream its own dreams, champion its own dreams, and live its own dreams, instead of dreaming and living the dreams of its ex-colonial masters.