

DURAND CASTRO NDJIMOU

Rail in Africa, a vector of regional integration



Development strategy by 2050

*To mom,
For your encouragements and infinite love.*

Acronyms and abbreviations

ACG	Aluminia Company of Guinea
ACP	Africa, Caribbean, Pacific
DNA	DeoxyriboNucleic Acid
FEA	French Equatorial Africa
FDA	French Development Agency
AICD	Africa Infrastructure Country Diagnostic
FWA	French West Africa
EPA	Economic Partnership Agreements
ARMP	Public Contracts Regulatory Agency
LSA	Logistics Support Analysis
VA	Value Analysis
ADB	African Development Bank
BASL	Logistics Support Databases
BBR	Beitbridge Bulawayo Railway
ECB	European Central Bank
BEA	Administrative Emphyteotic Leases
BEH	Emphyteotic Hospitals
IBRD	International Bank for Reconstruction and Development
C2D	Deleveraging and Development Contract

CAMRAIL	Cameroon Railway Corporation
CBD	Central Business District
BCG	Bauxite Company of Guinea
CCFB	Companhia dos Caminhos de Ferro da Beira
DOC	Design at Objective Cost
DER	Djibouto-Ethiopian Railway
CDN	Corredor de Desenvolvimento do Norte
PA	Partnership Agreement
AEC (1)	African Economic Community
UNECA (2)	United Nations Economic Commission for Africa
ECA (3)	Economic Commission for Africa
CEAR	Central East Africa Railways Corps
ECOWAS	Economic Community of West African States
ECCAS	Economic Community of Central African States
CEMAC	Economic and Monetary Community of Central Africa
CEN-SAD	Community of Sahelo-Sahelian States
ECGLC	Economic Community of Great Lakes Countries
REC	Regional Economic Community
CFA	Financial Community of Africa
COR	Congo-Ocean Railway
CFM	Caminhos de Ferro de Mozambique
CFMK	Matadi-Kinshasa Railway
TR	Togo Railways

CGP	Commissariat Général du Plan (French institution)
CGP	Global Cost of Ownership
CICID	Inter-ministerial Committee for International Cooperation and Development
CMP11	11th Meeting of the Parties to the Kyoto Protocol (Japan)
CO2	Carbon Gases
COMESA	Common Market for Eastern and Southern Africa
COP21	21st Conference of the Parties / 21st Conference of the Parties
CRBC	China Road and Bridge Corporation
DEA	Data Envelopment Analysis
DFID	Department for International Development
DMU	Decision Making Unit
DoD	Department of Defence
PSD	Public Service Delegations
EAC	East African Community
ENR	Egyptian National Railways
OE	Operational Efficiency
AI	Administrative Institutions
PIE	Public and Industrial Establishments
ERTMS	European Railway Traffic Management System
ESACC	African Higher School of Railways
ADF	African Development Fund

FDH	Free Disposal Hall
EDF	European Development Fund
FMDST	Reliability, Maintainability, Availability, Security, Testability
IMF	International Monetary Fund
NSF	Nigeria Special Fund
GRC	Ghana Railway Company
GRDA	Ghana Railway Development Authority
IDA	The International Development Association
FDI	Foreign Direct Investment
NIS	National Institute of Statistics (Cameroon)
KRC	Kenya Railways Corporation
LCC	Life Cycle Cost
MADARAIL	Madagascar Railways
MIE	Mechanism for Interconnection in Europe
Mil Std	Military Standard
MRL	Malawi Railways Limited
MTBF	Mean Time Between Failure
MTTR	Mean Time To Repair
NEPAD	New Partnership for Africa's Development
NLPI	New Limpopo Bridge Project Investments Ltd
NRC	Nigeria Railways Corporation
NRZ	National Railways of Zimbabwe
OAT-LOA	Authorization of Temporary Occupation-Rental with Purchase Option

OCBN	Organization Commune Benin - Niger
OCDE	Organization for Economic Co-operation and Development
OCTRA	Office of the Transgabonais Railway
OSA	Original-Sustainable-Acceptable
OFERFOM	Central Office of French Railways of Overseas
OFERMAT	Cooperation Office for Railways and Equipment
OFEROM	Central Office of the Overseas Railways
OMC	World Trade Organization
OMD	Millennium Development Goals
ONATRA	National Transport Office
ONCF	National Railways Office
ONCFG	Guinea National Railway Office
ONG	Non-Governmental Organization
OUA	Organization of African Unity
PAP	Priority Action Plan
PIB	Gross Domestic Product
PIPA	Infrastructure Development Program in Africa
PMA	Least Developed Countries
UNDP	United Nations Development Program
PPP	Public / Private Partnership
PPTE	Very Heavily Indebted Poor Countries
PRTSR	Analysis of transport and poverty reduction strategies

RAN	Abidjan - Niger Board
RDC	Democratic Republic of Congo
RETEX	Return of Experience
RNCFC	National Board of Railways of Cameroon
RSZ	Railway System of Zambia
RTE-T	Trans-European Transport Network
RVRC	Rift Valley Railway Corporation
SADC	Southern African Development Community
SCCF	Cameroonian Railways Company
SCFB	Burkina Faso Railway Company
SCTP	Transport and Shipping Corporation
SDN	
SdS	Support System
SETRAG	Transgabonese Operating Company
SICF	Ivorian Railways Company
SITARAIL	International African Rail Transport Company
SLI	Integrated Logistics Support
SNBG	National Forestry Company of Gabon
SNCC	National Railway Company of Congo
SNCF	French National Railway Company
SNCFT	National Railway Company of Tunisia
SNCZ	National Railway Company of Zaire
SNTF	National Railway Transport Company
SPOORNET	Railway Company of South Africa

SSATP	Transport Policy Program in Africa
SSATP	Transport Policy Program in Sub-Saharan Africa
TAZARA	Tanzania-Zambia Railway Authority
T-KM	Tonne - Kilometer
TRANSRAIL	Dakar-Bamako Railway Company
TRC	Tanzania Railways Corporation
TRL	Tanzania Railways Limited
TTU	Transit Title Single
UA	African Union
UAC	African Union of Railways
UE	European Union
UEMOA	West African Monetary Union
UIC	International Union of Railways
UMA	Arab Maghreb Union
UNICEF	United Nations Children's Fund
USA	United States of America
UT	Traffic unit
V-KM	Traveler - Kilometer
WACEM	West African Cement Company
ZRL	Zambia Railways Limited

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Foreword

From the world of engineering, but passionate about politics and international relations, I have chosen, within the framework of this work, to bring a scientific dimension, in favor of integration in Africa. This study starts from the observation that many failures in Africa are due not only to the lack of political will but also to a lack of knowledge of some engineering tools.

In this engineering approach, we want to demonstrate that the financing of a project is not enough for it to be viable. We also want to demonstrate that acquiring second-hand systems, or, gratisly receiving an aircraft, a locomotive, a ship or any other large system in diplomatic relations is not in itself a good deal, as long as the support system for the operation of this system is not well dimensioned in the user. From this point of view, it will be understood that the acquisition of second hand locomotives, almost obsolescent to their acquisition, for the African railway after independences, has been detrimental to the survival of these national companies already plagued by many difficulties.

To achieve this, it was necessary to understand the genesis of the construction of these networks, from the colonial period to the independence. Then, by analyzing the current functioning and the causes of the decline, develop a strategy that can bring to this sector its letters of nobility. We are convinced that, considering the prospects of population growth, rail will have to play a very important role in the integration of peoples, through its capacity of mass transport of people, and the transport of heavy

materials, with a better carbon footprint than other modes of transport.

Introduction

Most of Africa's railways, for almost a century (19-20s), are experiencing a decline that is unparalleled. After the hours of glory during colonization, then privatization in the last two decades, through nationalizations in the years of independence (1960), the railway in sub-Saharan Africa is today the shadow of itself.

Old rail infrastructures, inoperative tracks, locomotives of another time, whose costs of keeping in line of circulation are exorbitant, under the disastrous management of state companies. This is the actual image of this heritage.

Only, face to predominantly rainy climatic conditions, on average five months a year, and impassable roads, the railway has long been the ideal way to dispose of agricultural products, at the same time it was used for the transport of heavy materials and passengers.

Despite the ecological impact of roads, over the years this mode of transport has taken the ascendancy on the railway, because it operates in a zero-sum system, where the land gained by road was lost by the railway. Some transnational routes have been set up, particularly in West Africa. Projects are underway for a road corridor in eastern Africa.

Central Africa is at the heart of a 'conflictogenic' environment, facing instability with ethno-religious connotations in the Central African Republic, inter-ethnic rivalries in Burundi and Rwanda, and new types of conflicts with the emergence of the Boko Haram sect in Nigeria and Cameroon, that does not facilitate economic development and free movement of goods and people.

Gathered within the ECCAS (Economic Community of Central African States), these countries in a prospective vision, must now think of peace in terms of integration of peoples, rapprochement of values, and economic development.

Thus, considering sustainable development aspects, what role can railways play in this integration of peoples? Is the disintegration of rail in Africa reversible? What tools of diplomacy and engineering can enable the development of railways in sub-Saharan Africa?

In the world of globalization, peoples' mixing has become a pillar of stability and tolerance. Moving people requires controlling the communication channels, including fast lanes that drive the economy. However, putting these challenges into practice assumes, beyond the political will, the mastery of a specific approach to system engineering: the integrated logistical support. This approach makes it possible to take in consideration the specificities of support from the conception up to the dismantling.

In order to decipher these research questions, we will first tackle the history of railway in order to make a comparison with the existing and the possible market in a prospective momentum. Then, we will present the stakes of the control of integrated logistical support in the management of major projects with a long-life cycle (30-50 years minimum). And finally, we will present how this can promote integration of peoples, economic development and be a vector of peace, face to the beautiful perspective of the role to play by this region in the world over the coming decades.

I) Rail in Africa

Understanding the African railway requires to analyse as a matter of priority, all the genesis of its construction, from the operation of pre-colonial Africa, investments from the colonial era that structured the current railway, and then the post-independence decline. This development of the railway is inseparable not only from the traditional functioning of precolonial African societies, but also from the policy that each colonizer will apply in territories of domination. The railway legacy of the young independent states in the 1960s will be the fruit of this history. Far from the strategic objectives and ambitions of the colonizer, the life of the African railway was therefore to continue. Poorly thought and managed, in an absurd absence of strategy, these African railways will undergo a decline, which will paradoxically make of the colonial period, "*the golden age of the African railway*".

In this section, we briefly retrace the history of precolonial Africa in order to understand the functioning of this society as seen by the West before the beginning of colonization (see map [appendix 1](#)), then the conquest of territories and the sharing of Africa at the 1885 Berlin Conference. In each of these territories we shall list the activities and achievements of the railways.

We do not pretend to list all the lines constructed during the colonial era. This is practically impossible, since micro-lines with a gauge of less than one meter existed and intended for use in the transport of heavy loads over very short local distances. Lastly, we will mainly mention lines

that seem to be conducive to our understanding of the current scale of the existing railway lines in order to reflect better future prospects as a vector of integration.

1) From the pre-colonial period to the present day.

Long before the states of Europe began to explore Africa, first in exploration, then in the conquest of territories, African, European and Arab contacts existed in Africa. The political and cultural state of this era has always been unknown or little known. *Indeed, as no more than the Celts, Africans have not valued much writing to give a testimony of their past.* The report of travellers and conquerors through their experiences, are the main sources that relate the history of these peoples.

The African coast has been mapped since the end of the 15th century (see [appendix 2](#), map of the great African kingdoms since the 1000s). In the 1600s, Europeans were interested in the slave trade and the African coast (see [appendix 3](#), slave trade). Indeed, unlike the countries of the Aztecs or the Incas, Africa apparently has no resources. European countries come there for the slave trade that has run for at least a millennium on the east coast.

Since the seventeenth century, when the coastline is definitely under control, the interior remains a mystery. ***Inaccessibility makes the representation of inner rivers mysterious.***

In the middle of the nineteenth century, despite the condemnation of the slave trade by the treaty of Vienna of 1815, then the one of Aachen and Verona, trade continues its ravages on the African soil. This treaty will be definitively eradicated by the convention of Saint-Germain-en-Laye

(1909), then that of 1926 taken within the framework of the League of Nations. According to Anne stamm: *"Fighting against slave trade could only take place once States, individuals, and slave traders had found replacement goods for their trade. The English discovered a use of coconut oil: that of lubricating machines; The French succeed in extracting an edible oil from peanuts. Beets sugar replacing that of cane, one of the pillars of the triangular trade collapses."*¹

This is the starting point of colonization, with the first aim of conquering the land and thus the establishment of a market for the colonizer and the capture of raw materials for the metropolis.

1-1 Colonial Africa

Landing in Africa, the first clash of the colonizers was cultural. The old African societies, having their way of life and their traditional functioning, will be totally disrupted. This contact would be fatal to them, even if, in general, the colonizers did not intend to attack traditional heritage, except for what they considered unacceptable².

Convinced of the superiority of European civilization, the colonizers felt that the only legitimate needs were theirs. They were animated by needs of several orders:

- *The need to provide a living space for a surplus population;*
- *Desire to consume exotic foods and spices;*
- *Obligation to satisfy a certain spirit of adventure;*
- *The call to fulfill a civilizing or religious mission;*
- *The need to conquer commercial markets or pursue a policy of prestige.*

For each of the colonizing countries, the motives will be different. Indeed, some will choose for a leitmotiv, a religious orientation while others will see a quest and conquest of market shares. Others will cumulate many of these motives. The main European colonizing countries are as follows (see [appendix 4](#)):

- Italy
- France
- Great Britain
- Germany
- Portugal
- Spain
- Belgium

Each of these countries will have a different influence that will change the social, infrastructural and organizational structure of the society that covers its area of competence.

1-1-1 The Italian colonization

The colonial history of Italy began late compared to other European countries. As the Italian peninsula was facing strong demographic growth, the president of the council, Francesco CRISPI, had led his country in the conquest of territories with the primary objective of relying on the nearby Mediterranean cord. Indeed, Italy did not have the material resources to undertake an expansion in line with other European countries. *This colonization was more the result of a political will of prestige and ideology, than the resultant of economic interests.*

After defeats in Tunisia, and especially of what became known as the "*disaster of the Battle of Adoua*" in 1896, Crispi resigned, and Italy had only a footing in Tripolitania where it had for many years strong commercial interests. It

will also lose this hold between 1913 and 1914 after a revolt of the Senoussis, supported by the Ottomans and will retreat until the coast.

Benito Mussolini, who became president of the council in the years 1920-1922, will have these remarks reported in the *Popolo d'Italia* which set the tone of his ambitions in Africa: "*imperialism is the eternal and immutable law of life*". He added that it was necessary to make the Mediterranean "*an Italian lake*". In this impulse, after making definitively the present Lybia, an Italian colony (Cyrenaica and Tripolitania) consequent to a laborious reconquest, it continues to have authority on Somalia it has been managing since 1905.

The stock market crash of 1929 will accentuate the economic decline of the states and the lack of financial resources of Italy. Restrictions on the reception of Italian immigrants by European countries and the USA naturally push them towards the colonies. Thus, Mussolini will covet Ethiopia, a vast region with favourable climate, and a considerable agricultural potential capable of accommodating Italian immigrants. According to the Franco-Anglo-Italian tripartite agreement of 1906, only Ethiopia is an independent state. This country has good commercial relations with France in particular. This economic cooperation had made it possible to build the Djibouti / Addis Ababa railway line between 1898 and 1915. Ethiopia has been a member of the *League of Nations (SDN)* since September 1923. In the framework of cooperation between States, Italy had signed the Italo-Ethiopian treaty during a journey of *Ras Tafari* to Rome, which for Mussolini constituted an opportunity for a gentle penetration of that country.