



Delimitation and Demarcation of Boundaries in Africa



General Issues and Case Studies



African Union Border Programme (AUBP)

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© Commission of the African Union, Department of Peace and Security,
Addis Ababa, September 2013

2nd edition, August 2014

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Design and typesetting Ira Olaleye, Eschborn, Germany

ISBN 978-99944-890-8-4

The African Union expresses its gratitude to the extensive support of the Government of the Federal Republic of Germany as well as the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH whose assistance has enabled the African Union Border Programme to record significant results in all related activities. The document at hand serves as one piece of evidence and successful outcome of the combined efforts of the African Union Commission/Peace and Security Department and the German Development Cooperation.



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Foreword

Ambassador Ramtane Lamamra
African Union Commissioner
for Peace and Security



Since the accession of African States to independence, borders have been a recurrent source of conflicts and disputes on the continent. The African Heads of State or Government, aware of this fact, have, in the early days, at the Summit of Cairo in July 1964, adopted Resolution AHG/Res. 16 (1) proclaiming the preservation of existing borders at the time of the accession to independence. Therefore, the principle of intangibility of borders, *uti possidetis*, applies within the framework of the Organisation of African Unity.

Despite this formalised respect for the existing delimitation of most African boundaries, follow-up in terms of their physical demarcation has been very limited in the past. In 2011, approximately one third of African land boundaries was demarcated.¹ Other boundaries were demarcated according to river courses or imprecise, perfunctory, or out-dated boundary-marking techniques. Sometimes, boundary commission officials demarcated borders by merely following local tracks or marking trees. As a result, the majority of Africa's current borders, even where there is absolutely no territorial dispute, cannot be considered to be demarcated.

Moreover, when countries acting with the best of neighbourly intentions have engaged in joint demarcation exercises, they have often had to struggle with the imprecise nature of the delimitation descriptions. That said, there is evidence from numerous cases, among others, those described in this book, that satisfactory solutions can be found if both states involved find the political will to jointly undertake the demarcation of their borders.

Africa is finally waking up to the fact that the absence of visible boundaries on the ground can hamper the coexistence and trade that are driving Africa's demographic and economic dynamism. The African Union Border Programme (AUBP) is a vital factor in improving and modernising the continent's border regimes. The delimitation and demarca-

¹ According to a survey conducted by the AUBP, 2011.

tion initiative meets three imperative needs: The first is **geopolitical**, concerning the peace, security and stability that derive from conflict prevention. The Programme does not aim for a new ‘Balkanisation’; rather, it is a way to reinforce State territorial sovereignty that brings with it the freedom to open up and integrate. The second need is **geo-economic**: a visible, well-managed border encourages trade. The third need is **socio-economic**, as local cross-border cooperation initiatives between committed neighbouring communities can be supported. Africa’s borders should become a source of peace, security, and integration for the continent. They should constitute a perfect equation, harmoniously balancing all relevant factors – including the legal determinants and human realities on the ground – to promote the shared, common values of the populations concerned.

This Programme therefore has a multidimensional character. It establishes, both conceptually and operationally, the connection between peace and security, economic and social development, and the shared objective of regional and continental integration. In according full importance to local and regional levels, the African Union Border Programme (AUBP) seeks to act as a unifying force in the process of African integration.

The AUBP aims to complete the demarcation of all land borders as soon as possible. With the delivery deadline of 2017 agreed upon at the 17th Ordinary Session of the Assembly of the African Union (June/July 2011), everything possible must be done to achieve our targets. Good techniques and practices to do this are presented in this handbook, compiled by leading experts and practitioners. The AUBP will help develop the technical capacities of officials and staff, share good practice and pilot programme experience, and promote research into finding affordable and sustainable demarcation solutions. The AUBP encourages the delivery of training and the use of this handbook, which is a valuable tool to help meet the 2017 deadline. Published in 2013, the year that celebrates the 50th anniversary of the establishment of the Organisation of African Unity / African Union, this book is intended to represent and place into concrete terms the role of the **African boundary** in the spirit of harmonious, peaceful and happy coexistence and prosperity.

Ambassador Ramtane Lamamra
March 2013
Commissioner for Peace and Security

An Overview of the African Union Border Programme



Ambassador Aguibou Diarrah
Head of the African Union
Border Programme

Introduction

At its 11th Ordinary Session held in Accra, Ghana, from 25th to 29th June 2007, the Executive Council of the African Union Commission achieved another milestone when it endorsed the Declaration on the African Union Border Programme (AUBP) and its Implementation Modalities, as adopted by the Conference of African Ministers in Charge of Border Issues, held in Addis Ababa, on 7th June 2007.

Background

Since the attainment of Independence, the borders that African States inherited from colonial times have been a recurrent source of tensions, conflicts and even crises between and within several African countries. A number of political and legal measures have been taken by African leaders to address the question of boundaries in Africa. These include:

- ▶ The 1st Ordinary Session of the Assembly of Heads of State and Government of the Organisation of African Unity (OAU), held in Cairo (Egypt) in July 1964, as well as Article 4(b) of the Constitutive Act of the African Union (AU), which adopted the principle of respect of existing borders on achievement of national independence;
- ▶ The 44th Ordinary Session of the Council of Ministers of the OAU, held in Addis Ababa (Ethiopia) in July 1986, as well as the relevant provisions of the Peace and Security Council of the African Union which adopted the principle of negotiated settlement of border disputes;
- ▶ The Assembly of Heads of State and Government, held in Durban (South Africa) in July 2002, which provides for the delimitation and demarcation of African boundaries where such an exercise has not yet taken place. This confirms the shared commitment to pursue the border delimitation and demarcation exercise as factors for peace, security and economic and social progress;

- ▶ The Constitutive Act, stipulating the will to accelerate and deepen the political and socio-economic integration of the continent and to provide it with a popular base;
- ▶ The 8th Ordinary Session of the Assembly of Heads of State and Government of the African Union, held in Addis Ababa in January 2007, which adopted the declaration on encouraging the Commission to pursue its efforts of structural prevention of conflicts, especially through the implementation of the African Union Border Programme (AUBP).

It is these measures, taken by the AU and its predecessor, the OAU, which resulted in the adoption of the Declaration on the AUBP by the first ever Conference of African Ministers in Charge of Border Issues, held in Addis Ababa on 7th June 2007. Therefore, the African Union Border Programme (AUBP) is both a product and an integral part of the AU's architecture for the structural prevention of conflicts.

Objectives

The objectives of the AUBP include to:

- ▶ support and facilitate the delimitation and demarcation of African boundaries where such exercise has not yet taken place;
- ▶ reinforce of the integration process within the framework of the Regional Economic Communities (RECs) and other large-scale cooperation initiatives;
- ▶ develop local cross-border cooperation initiatives, both within the framework of the RECs and other regional integration mechanisms;
- ▶ build capacities in the area of border management, including the development of special education and research programmes;
- ▶ increase the number of Member States engaged in the delimitation and demarcation process;
- ▶ create and maintain sustainable regional funds committed to cross-border initiatives;
- ▶ increase cross-border cooperation and cross-border agreements;
- ▶ increase awareness of the AUBP and its work;
- ▶ increase awareness of and sensitivity for border issues;
- ▶ increase formal partnerships with relevant stakeholders; and
- ▶ increase funding commitments for the AUBP projects.

Implementation

The AUBP is being implemented through three overlapping focus areas:

- ▶ **Delimitation and Demarcation** of borders, where this has not been done, re-affirmation where existing demarcation so requires, and densification in places where visibility on the ground has not been achieved;
- ▶ **Promotion of Cross-border Cooperation**, including mutual confidence building through joint planning and development of cross-border areas and wider infrastructural facilities for regional integration, especially those facilities relating to transportation and communication networks; and
- ▶ **Capacity Building**, notably training and research activities, the development of infrastructure and specialised institutions in support of pragmatic border management and regional integration activities.

Progress

The list below presents some of the achievements to this date:

- ▶ Adoption of the first Declaration on the AUBP by African Ministers in Charge of Border Issues on 7th June 2007, and the endorsement of the Declaration and its Implementation Modalities at the 11th Session of the AU Executive Council on 27th June 2007;
- ▶ The second Declaration on the African Union Border Programme and the Modalities for the Pursuit and Acceleration of its Implementation by the African Ministers in Charge of Border Issues in Addis Ababa, Ethiopia, on 25th March 2010;
- ▶ The third Declaration on the African Union Border Programme and its Status of Implementation by the African Ministers in Charge of Border Issues in Niamey, Niger, on 17th May 2012;
- ▶ Provision of technical and financial assistance, covering, among others, crucial equipment and training for various countries implementing the AUBP;
- ▶ Completion of the demarcation of the remaining 413 km of the Burkina Faso-Mali border;
- ▶ Completion of the delimitation of the maritime boundary between the Comoros, Seychelles and Tanzania;
- ▶ Completion of the reaffirmation exercises between Mozambique and Zambia (330 km);
- ▶ Completion of the reaffirmation exercises between Zambia and Malawi (805 km);

- ▶ Ongoing reaffirmation exercises between Mozambique-Tanzania, Malawi-Mozambique, Mali-Senegal.
- ▶ Presentation of the AUBP and systematic sensitisation at RECs- and Member State levels by means of joint sensitisation workshops with the RECs;
- ▶ Launch of a continent-wide survey of African borders by means of a questionnaire sent to all Member States;
- ▶ Establishment of the African Union Boundary Information System (AUBIS) – a database containing information on African boundaries;
- ▶ Partnership with development actors, including the Government of the Federal Republic of Germany especially through the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, as well as multilateral organisations, such as the United Nations (UN), the European Union (EU), the Organization of American States (OAS), etc.;
- ▶ Securing of direct GIZ support for some Member States' efforts towards delimitation and demarcation of their boundaries;
- ▶ Organisation of a Pan-African Conference on Maritime Boundaries and the Continental Shelf in Accra, Ghana, November 2009;
- ▶ Adoption of the Convention on Cross-Border Cooperation in Niamey, Niger, in 2012;
- ▶ Institutionalisation of 7th June as the African Border Day to be celebrated annually;
- ▶ Ongoing publication of the AUBP book series, including, among others, practical guides on African boundary delimitation and demarcation, the implementation of cross-border infrastructure projects, the creation and operation of boundary commissions, border dispute settlement, as well as a collection of all AU documents, resolutions and declarations issued between 1963 and 2012 pertaining to African borders.

As a new initiative, the African Union Border Programme aims to systematically change the predominantly negative perception of African boundaries as 'barriers' into an acknowledgement of borders as 'bridges' with inherently positive roles and functions.

Introduction

African Boundaries and the Imperative of Definition

Dr. Muhammad B. Ahmad

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Overview

Compared to Europe and North America, Africa is relatively new to the Westphalian concept of boundaries. That is not to suggest in any way that borders did not exist in Africa before the contact with external influence, particularly that of Europe. 'Borders' have always existed as social phenomena that govern inter-human and inter-communal relationships. Similarly, African pre-colonial socio-political structures and institutions have, in their own rights, functional categorisations that can be equated to present-day borders. There are about 110 inter-state boundaries in Africa and numerous other intra-state borders that criss-cross the length and breadth of the African continent. The origins of all of these borders can be traced to colonialism and imperialism during the late nineteenth and early twentieth centuries. Therefore it was the treaties, agreements and exchanges of notes and protocols between the various colonial powers that provided the legal basis for the boundaries. This essay discusses the characteristics of African borders, the difficulties encountered by various African countries, individually and collectively, in coexisting with the given borders, as well as the imperative of defining borders as part of the peace and security architecture of the continent. **Definition** here is used in the wider context to refer to all the processes of boundary-making, including delimitation, delineation, demarcation, reaffirmation, and maintenance.

Characteristics of African borders

The Berlin Conference of November 1884 to February 1885 and the events that followed had the effect of not just giving Africa its present borders; it also attempted to integrate Africa into the European concept of nation-states with clearly defined and demarcated borders. The scramble for Africa by imperial Europe, and to that effect, the beginning of the rudimentary aspects of nation-state-type borders in Africa, had begun before the Conference. The Berlin Conference only served to regulate the imperial process of claiming territory. It was naturally followed by even more competitiveness amongst the European powers

because more than ever before, the concept of effective occupation had been added to the game. In this context, the borders imposed on Africa were conceived to be exclusive, meant to separate one sovereignty from another and supposed to be mirror-reflections of the European nation-states' borders with their characteristic dual role of peace and war as famously observed by Lord Curzon (1907) "*Frontiers are indeed the razor's edge on which hang suspended the modern issues of war and peace, of life or death to nations.*"

Arguments abound that tend to qualify or even to denounce the artificiality and arbitrariness of African borders, but realities on the ground and testimonies from the key actors at the time when the boundaries were being designed and constructed, conclusively confirm that the borders are indeed arbitrary and artificial. A few examples relating to the Nigerian borders will suffice to demonstrate this. On the occasion of signing the Anglo-French Convention on the Nigeria-Niger boundary in 1906, Lord Salisbury, then British Prime Minister, was credited to have remarked:

*"We [the British and the French] have been engaged in drawing lines upon maps where no white man's foot ever trod: we have been giving away mountains and rivers and lakes to each other, only hindered by the small impediments that we never knew exactly where the mountains and rivers and lakes were".*²

Regarding Nigeria's eastern border with Cameroon, a British Colonial officer recorded the method used in delimiting the borders. He says:

*"In those days, we just took a blue pencil and a ruler and we put it down at Old Calabar, and drew that blue line to Yola [...] I recollect thinking when I was sitting, having an audience with the Emir (of Adamawa), surrounded by his tribe, that it was a very good thing that he did not know, that I, with a blue pencil, had drawn a line through his territory".*³

Naturally, the result of this exercise common all over Africa, was division of peoples, bifurcated political and social systems, and fractured cultural areas which eventually led to further dislocations and disorien-

² Lord Salisbury quoted in Anene, J.C. (1970), *The International Boundaries of Nigeria, 1885-1960: The Framework of an Emergent African Nation*, London, Longman, p.3.

³ Ibid.

tations, particularly amongst the border populations. On this, Asiwaju (1984) has confirmed that:

“... Boundaries were drawn across well-established lines of communication, including: a sense of community based on tradition concerning common ancestry, usually very strong kinship ties, shared socio-political institutions and economic resources, common customs and practices, and sometimes acceptance of a common political control. In many instances [...] the boundary has separated communities of worshippers from age-old sacred groves and shrines. In other instances, well exemplified by the Somalis, the water resources in a predominantly nomadic culture area were located in one state and the pastures were in another.”⁴

The borders were thus arrived at largely without reference at all to the social, political, or cultural characteristics of the people they partitioned. According to Posner (2006), a clear indication of the arbitrariness of the borders is the fact that 44 per cent of African boundaries either follow meridians or parallels, and another 30 per cent follow other rectilinear or curved lines. Further indication of their disrespect to the people they partitioned comes from Asiwaju’s (1985) estimate that the 104 international borders existing in Africa in 1984 and 1985 have dissected 177 culture areas or groups.

The artificiality and arbitrariness of African borders are also the products and reflections of the rivalries between the imperial powers in the late nineteenth and early twentieth centuries. In addition to these rivalries were the obsessions to exclusively claim certain real or imagined African resources. More often the imperial powers were interested in one resource or the other, the control of commerce and markets or access to trade routes and rivers transport systems. The colonial states and the borders that emerged out of these rivalries largely depended on how one imperial power outsmarted its rival. The borders around the Lake Chad region, for instance, were drawn to reflect the rivalries between, and the intrigues of, the three dominant imperial interests: the Germans, the French and the British. In this case the interests of the Borno and Mandara Sultanates and their people evidently did not matter at all. Similarly, the border between Nigeria and Benin reflects the interests and rivalries of the British and the French, especially over the control of the Niger bend area near Nikki, the ancient capital of

⁴ Asiwaju, A.I. (1984), *The Conceptual Framework*, in Asiwaju, A.I., *Partitioned Africans: Ethnic Relations Across Africa’s International Boundaries 1884-1984*, London, C. Hurst & Co. Publishers, p. 3.

the Borgu Kingdom. The Kenya-Tanzania-Uganda-Rwanda borders in part reflect the British obsession with controlling the source of the Nile and the colonial intrigues to gain access to the mineral wealth in the eastern part of the present-day Democratic Republic of Congo (DRC). The overriding principle was the enhancement of imperial interests, disregarding the interests of the peoples of Africa. On the few occasions when the interests of the colonial powers aligned with those of the colonised peoples – such as in the areas of the maintenance of peace and security – deliberate efforts were made to maintain pre-colonial political entities and/or culture areas. But in most cases it was the interests of the colonising country that dominated.

In addition to being arbitrary and artificial, there are other liabilities associated with certain African States' boundaries. They were ill-defined, poorly delimited and demarcated – and in some areas, such as the major part of the Cameroon-Nigeria boundary – they were not demarcated at all. The above examples serve to confirm that the European imperial colonisers had little or no knowledge of the geography of Africa, particularly the “hinter”-areas. Apart from the fact that the locations of the natural features which the imperial powers used to delimit the boundaries were faulty, some of the colonial powers did not know the extent of their territories until much later in the early twentieth century. For instance, Okumu (2006) points out that in eastern Africa several mistakes resulted from geographic ignorance of the Germans, Belgians and British colonial officials when delimitating ‘their possessions’ beginning in 1885 after the conclusion of the Berlin Conference. Accordingly, the Anglo-Belgian Agreement of 1894 initially defined the international boundary in the areas between Lakes Edward and Albert along the 30°E meridian. Okumu stresses that this:

“... revealed the ignorance of the colonialists as far as the geography of Africa was concerned. It was easy to write down the meridian on paper at a conference in Brussels, but when it came to the demarcation and delimitation of the boundary on land, the colonial administrators in the Congo and Uganda could not easily trace the meridian on the ground.”⁵

For a very long time, the territory and people in between belonged to neither the British nor Belgian (Uganda or Democratic Republic of Congo) colonial administrations. Similarly in the estuarial area of the

⁵ Okumu, W. (2009), *Resources and Border Disputes in Eastern Africa: case studies of Lakes Victoria, Albert and Malawi*. Presentation at the 2009 Meeting of ABORNE, Johannesburg, 13 September.

Cameroon-Nigeria boundary, the 1894 Anglo-German Treaty described the Akwayafe as a river, rather than as an estuary into which many rivers flow. Much later, this mistake would, in part, lead to a monumental crisis between the two countries, including shootouts and extensive litigation at the International Court of Justice (ICJ).

Regarding coexistence within their colonially inherited borders, two options presented themselves to post-colonial African States at independence. They could either maintain the status quo by accepting the imperfections inherent in the colonial partitions with the attendant consequences of managing separatists' and irredentists' tendencies, or make the effort to re-design the borders. As we shall demonstrate in the following section, African countries opted, and rightly so, for maintaining the *status quo*.

While independence struggles were going on, especially in the second half of the 1950s, two other movements that were to determine inter-African relationships were going on simultaneously. Firstly, there were the separatist tendencies arising out of the desires of some communities for self-determination within the colonial states. These were manifested to varying degrees all over Sub-Saharan Africa. The most prominent examples of these include separatist tendencies within mandated territories of the United Nations – notably the Ewe peoples of Eastern Ghana and the peoples of Southern Cameroon under the British Colonial administration of Nigeria. In Nigeria, the Muslim-dominated northern region had also shown some indications of going its own way in the late 1950s. While the Ewe justified their demands for separation from Ghana to join their kith and kin in Togo, the peoples of Southern Cameroon wanted independence as a state of their own. Also in this category were those aligned with the secessionist movement in the Congo (now DRC) – associated with the Bakongo peoples and later, the Katanga Province in the early 1960s. In the Ivory Coast, the Sanwis rose to claim the right to secede, while in Kenya's coastal provinces, strong sentiments abounded for union with Zanzibar.⁶

Secondly, and potentially more worrisome, there were the movements and actions arising out of Somali nationalism in the Horn of Africa and the claim, on historical grounds, of Morocco over territories in Maghribi Africa, notably that of the Saharawi Arab Republic and at least some parts of Mauritania. But while the Ewe's separatist tendency was to seek accommodation under the umbrella of Nkrumah's Pan-Africanist

⁶ Touval, S. (1984), *Partitioned Groups and Inter-state Relations*, in Asiwaju, A.I. (ed.) (1984), *Partitioned Africans*, London, C. Hurst & Co. Publishers, p. 226.

Ghana, Somali nationalism, or failure to find a solution to it, was to destabilise the whole of the Horn of Africa continuously and with devastating consequences in the 1970s. The question that independent African States faced in the run-up to the Organisation of African Unity's Second Assembly of Heads of State in Cairo (1964) was: Which political approach to adopt in order to finally curb the devastating consequences of separatism and irredentism?

In recent years, negative developments in terms of border-relations have emerged in a number of African countries, highlighting anew the relevance of the border question and the measures being taken to address it by the African Union. This ugly development is on the rise and could be said to be spreading like wildfire in resource-based border disputes. A recent study indicates:

*"[...] heightened tensions and increasing potential for inter-state conflicts in Eastern Africa due to growing discoveries, or rumours of existence, of natural resources on borders or in borderlands [...] This inevitably increased the values of territories that were hitherto neglected and marginalised as governments partitioned the land into concessionary blocks that were awarded to Chinese and Western companies to hunt for natural resources. Interestingly some of the highly sought after minerals such as hydrocarbons, iron ore, bauxite/alumina, copper, manganese, molybdenum (moly), uranium, zinc and platinum group metals (PGMs), were located in borderlands [...] Since the eruption of war between Ethiopia and Eritrea over their common boundary in 1998, and the subsequent failure to demarcate it, there has been a growing concern that there could be more inter-state disputes in Eastern Africa as natural wealth is discovered in the borderlands. The current stand-off between Kenya and Uganda over the ownership of Misingo Island in Lake Victoria, last year's border incident between Eritrea and Djibouti, the continuing Somali nationalism in the region, and border skirmishes between Uganda and the DRC over the oil-rich Lake Albert region, are indicators that border disputes are on the rise and some of them could result in full-scale armed wars and other forms of hostilities. Additionally, undemarcated, indefinite, porous, and unmanaged boundaries are being used for illegal cross-border activities that are threatening national sovereignties and destabilising regional peace."*⁷

⁷ Okumu, W. (2009), *Resources and Border Disputes in Eastern Africa: case studies of Lakes Victoria, Albert and Malawi*. Presentation at the 2009 Meeting of ABORNE, Johannesburg, 13 September.

There is no doubt that this development calls for African border definition to proceed quickly while being done carefully.

The African Union Border Programme and Boundary Definition

Because of the aforementioned characteristics of African borders and the problems faced by various African States in coexisting within them, African borders have never ceased to be recurrent factors in conflicts and even crises. Among the major border crises which Africa has witnessed, mention must be made of the Ogaden war in the Horn of Africa involving Ethiopia, Kenya, and Somalia; the Chad-Libya war over the then disputed Aouzou strip; the Burkina Faso-Mali wars; the Eritrean-Ethiopian war; and the shootouts between Cameroon and Nigeria and between Guinea and Senegal. Border tensions are known to exist between several neighbouring African countries including Guinea and Liberia; Liberia and Sierra Leone; Eritrea and Sudan; Sudan and South Sudan; South Sudan and Uganda; Kenya and Uganda; Equatorial Guinea and Gabon; Rwanda and DRC; Burundi and DRC; Angola and Congo; etc. Therefore, it is not an overstatement to say that border-related conflicts have generated a large proportion of all conflicts that African countries have encountered. At the centre of all the African border wars, conflicts, and tensions have been the poorly-defined and undemarcated borders as well as questions over border-related pre-colonial territorial claims such as that of the Somalia government in relation to ethnic Somalis in neighbouring countries and that of Morocco over her claims of the Saharawi Arab Republic territory. There is no doubt that Africa is challenged to find solutions to the recurrent border conflicts.

The border question therefore has always been a central issue in African peace and security strategies. As a result, African leaders have adopted a number of decisions to tackle the border issue as a security concern. In their wisdom, the Founding Fathers of the Organisation of African Unity (OAU), decided to retain the boundaries as inherited when each of the Member States of the Organisation attained independence. This was certainly a security guarantee of a sort, to avoid political problems and the insecurity that redrawing the borders would have generated. It was one way of achieving continental peace. Thus, the principle of the respect of borders existing at the time of the achievement of independence, which is enshrined in both the Charter of the OAU (Resolution AHG/R.S. 16(1)) and the Constitutive Act (Article 4b) of the African Union (AU) and subsequent political and legal

actions of the two bodies, is designed to reduce the conflict-inducing characteristics of Africa's borders. Retrospectively, pondering the OAU's Cairo resolution, one might say that it could have achieved more success if it had been followed by certain actions and/or programmes that would have defined the borders and made them more visible. This failure of a follow-up action on the part of the OAU may have prevented the continental body from reaping the benefits of such an excellent and thoughtful Declaration.

But it was the commitment of the AU to delimit and demarcate African boundaries within the ambitious time-frame given for the completion of the exercise by 2012, as contained in the Memorandum of Understanding on Security, Stability, Development, and Cooperation in Africa (CSSDCA) adopted by the Assembly of Heads of State and Government, held in Durban, South Africa, in July 2002. This ambition was reconfirmed during the Ordinary Summit of the Assembly in July 2011, at which the deadline for delimitating and demarcating African boundaries was shifted to 2017.

The African Union Border Programme (AUBP) emerged as a basic component of the 2004-2007 Plan of Action, derived from its Vision and Mission as well as the Strategic Framework with three major objectives:

- (i) To complete the delimitation and demarcation of African land and maritime boundaries, so that they may cease to be potential sources of problems, tensions, and crises;
- (ii) To strengthen institutional integration dynamics within the framework of the Regional Economic Communities (RECs) and other wide-scale regional initiatives by means of cross-border cooperation and cooperation between state services, civil society associations and NGOs; and
- (iii) To develop Pan-African capacity building mechanisms to engage in research and training for a pragmatic border management that promotes regional integration.⁸

That the AUBP has given highest priority to the delimitation and demarcation of African Borders in its aims and objectives, confirms the AU Commission's determination to comprehensively address the problems of border definition in Africa. Of course, the second and third components of the AUBP's objectives, i.e. to promote cross-border coopera-

⁸ Declaration on the African Union Border Programme and its Implementation Modalities adopted by the African Ministers in Charge of Border Issues at Addis Ababa, Ethiopia, 7th June 2007.

tion and to build other integration mechanisms and programmes can only be achieved through the effective demarcation of borders. The centrality of delimitation and demarcation as the pivot over which all mechanisms and programmes for peace, cooperation, and integration are built, is undisputable.

It is necessary at this point to emphasise that of all the processes involved in boundary-making, **demarcation** – that is, the process that makes the boundary visible on the ground – stands out as the most important building block, since it makes the boundary a reality to all stakeholders, especially the border populations. Demarcation is therefore necessary for peace because, the absence of a visible border will continue to be a potential source of tensions, disputes, conflicts, and even crises to neighbouring states and their citizens, especially the borderland communities. Owing to its cost, associated logistical problems, and time constraints, demarcation is often not given the required attention it deserves. In Africa, reasons for this may include a dearth of resources and manpower, poor equipment, and the lack of political will.

In 2006, the role of border demarcation in the creation of the necessary foundations for peaceful relationships was stressed. Participants at the end of the *First International Symposium on Land and River Boundaries Demarcation and Maintenance in Support of Borderland Development* held in Bangkok, Thailand, concluded that:

“4.2 Uncertainty over boundary alignment increases the risk of disputes between states and hinders borderland development. Making boundaries visible on the ground may help to eliminate such uncertainty and can provide the foundation for development. However, demarcation should not be seen as an end in itself – it is only part of the on-going process of boundary-making.”

4.3 Since a well-defined boundary will help resolve misunderstandings and tensions arising from any unclear or disputed border areas, the progress of land and river boundary demarcation between countries, together with cooperative on-going maintenance will enhance excellent international relations and will promote peace and security in any region of the world. A well-defined international boundary will also lead to greater economic cooperation between countries and facilitate contact between peoples in the borderland areas”⁹

⁹ Conclusions of the *First International Symposium on Land and River Boundaries Demarcation and Maintenance in Support of Borderland Development* held in Bangkok, Thailand, 7-9 November 2006.

There are indications that African participants at this symposium have taken the above resolutions as a challenge. This must explain why at the *Second International Symposium on Land, River, and Lake Boundaries Management* held in Maputo, Mozambique, from 17-19 December 2008, participants recommended:

- (i) The establishment by the AU Commission of a working group to prepare a practical handbook on delimitation and demarcation in Africa, highlighting good practice in and guidelines for delimitation, demarcation, maintenance, reaffirmation, and recovery of boundary markers of African boundaries. This working group could also be charged with preparing a lexicon of relevant terms as highlighted above;
- (ii) The launching by the AU Commission of a consultancy to: (a) identify options for enhancing boundary delimitation and demarcation research and training capacity in African universities and technical agencies (for example: national survey authorities); (b) to map African capacity needs in delimitation, demarcation, reaffirmation, and maintenance and to source for assistance from development partners.¹⁰

These recommendations are challenges that have been taken up by the African Union Commission.

Conclusion

There is no doubt that the challenges ahead concerning the delimitation and demarcation of African boundaries are daunting, especially in view of the obvious gaps in resources, technical knowledge, and the political will required to engage neighbouring countries in long term meaningful dialogue. But if, as we have observed, African countries have seen the wisdom of maintaining the status quo of the colonial boundaries, the need to take further actions to safeguard the borders and build upon them structures of integration should not pose problems. The commendable efforts of the AUBP in providing a manual of good practice in border delimitation and demarcation should be complemented by positive commitments from Member States of the African Union.

¹⁰ Conclusions of the *Second International Symposium on Land, River and Lake Boundaries Management* held in Maputo, Republic of Mozambique, 17-19 December 2008.

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Executive Summary

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Introduction

It has been forty-nine years since the independent States of Africa, under the auspices of the Organisation of African Unity (OAU), famously pledged to respect their territorial boundaries inherited from the colonial period at the Cairo Conference of 1964. Since that time, this acceptance of the territorial status quo at independence has been relatively successful in preventing major conflicts over territorial claims in Africa. However, often the popular understanding of ‘keeping the territorial status quo’ has also dissuaded African States from dealing with residual problems embedded in the out-dated, ambiguous and often problematic boundary definitions left by the former colonial powers. Luckily, these ambiguities have rarely resulted in full scale conflict. However, the lack of clear boundary delimitation and demarcation based on the current realities of border landscapes continues to provoke disputes between some neighbouring states across Africa and hinders greater cooperation within borderland areas.

All international boundaries in Africa have been defined in some form, but the precision of the definition varies considerably. In contrast to the Preamble of Resolution 16(1) of the 1964 Cairo Declaration that described all African boundaries as a “tangible reality,” the quality of definition for those boundaries inherited by African States at independence varies considerably. Some African boundaries are tangibly and clearly marked by pillars. However, many other boundaries remain poorly defined, being described only by vague, out-dated treaty language or depicted on maps of widely varying quality. In addition, the conditions of the border areas will have changed, sometimes dramatically, from the date of initial boundary definition. A key point is that the principle of respect for the boundaries that existed on achievement of national independence does not preclude the adjustment of boundary alignment to meet local requirements, if both governments agree that such adjustments are desirable. This may be the case if it is discovered that a boundary, as originally defined in relevant treaties, produces a line that

would divide a village or separate a village from its traditional farmland or water supply.

The overall goal of clear international boundary definition (including both delimitation and demarcation) is to prevent disputes between neighbouring states. The clearer the definition of a boundary, the fewer ambiguities that could result in overlapping jurisdictional claims that frequently can lead to conflict. Removing the potential for conflict, paves the way for boundaries to stitch neighbouring states closer together rather than remaining the sensitive issue that divides them. Perhaps more importantly, removing the spectre of potential boundary conflicts and disputed claims helps promote economic and civil development within borderland regions.

Boundary-making practices

Delimitation and demarcation are terms used to describe aspects of the process of boundary definition. Traditionally, delimitation has been used to refer to the definition of a boundary in a treaty or other legal instrument, while demarcation refers to the physical marking of the boundary on the ground. However, in the preparation of this book, it became clear that (a) in different languages and cultures the terms are interpreted slightly differently, and (b) they are only two of several terms used to describe boundary-making practices. Other relevant terms include: abornement/bornage, maintenance, reaffirmation, recovery and delineation. The precise meanings of these terms are outlined in the Lexicon at the end of this handbook, but in some ways the distinctions between them are not of critical importance. Whichever terms are used, the goal remains the same: international boundaries need to be defined as unambiguously as possible, made sufficiently visible on the ground and maintained on an on-going basis in order to prevent misunderstandings that lead to disputes.

Delimitation and demarcation have often been described in a manner which suggests that they are both separate and ‘one-time only’ activities – a boundary is first delimited in an agreement and then demarcated on the ground. In reality, the two activities are closely interrelated and mutually reinforcing because both contribute to the definition of the line, and the physical marking of a boundary often produces additional boundary coordinates that need to be incorporated into a revised legal instrument. In many cases, the physical marking of the boundary takes place in stages over a number of years, with each phase

helping to produce a clearer definition of the boundary. Indeed, it could be argued that no boundary is ever 'finished', because there is almost always scope for further clarification of the alignment of the line on the ground. However, in reality the clarification process will eventually reach a stage when both governments feel that the boundary is defined with sufficient clarity for practical purposes – and it is towards that stage that the AUBP is encouraging Member States to work.

There are no international regulations or mandatory standards that govern the way international boundaries are delimited and demarcated. Neighbouring states are free to adopt whatever methodology they feel is most appropriate for agreeing the limits of their territorial sovereignty and making it visible on the ground. Likewise, this is not an instruction manual. The range of physical and human border landscapes, and of political, economic and social contexts across Africa is significant, and no single set of boundary-making practices and procedures will fit every boundary. Nor is it possible to address every single legal and technical issue that may arise during boundary delimitation and demarcation, or the complex issues related to maritime boundaries in this accessible format. Instead, this handbook seeks to share the experiences of a range of experts in aspects of land boundary delimitation and demarcation, and to highlight examples of good practice that policymakers and practitioners may wish to consider when planning their own delimitation and demarcation activities.

Content of the Handbook

The views expressed in the chapters of this book are those of the chapter authors. However, each chapter was discussed in-depth at a meeting of contributors held in Addis Ababa from 28th September to 2nd October 2009, and all chapters have been revised considerably as a result of the input from other contributors. The Handbook is organised in three sections.

SECTION I: Boundaries and boundary-making

The first section (comprising Chapters 1-8) provides analysis and insight into the general issues concerning boundary delimitation and demarcation in Africa. It begins with a masterly introduction to the roles and functions of international boundaries in the African context by Dr. Wafula Okumu in Chapter One. Underlining the inherent arbitrariness of imperial boundary definition and the alien nature of imposed

European notions of land division in Africa during the colonial period, Dr. Okumu reflects on how these boundaries were accepted by and assumed distinct functionality for, post-independence African States. He points out that boundary disputes continue to plague the African continent and highlights the economic impact of boundary disputes on bilateral trade. In the final analysis, Dr. Okumu challenges African States to move beyond the possessive disagreements about the defined location of boundaries and towards long-term engagement, concluding that “a boundary only becomes a source of conflict depending on how it is used, controlled, administered and managed.”

Following this general framework on international boundaries in Africa, Mr. Mahdi Boudjema explains in Chapter Two the detailed nuances of boundary-making processes. Emphasising the bilateral nature of boundary delimitation, Mr. Mahdi explains the structural parameters of delimitation treaties and how they operate in a legal context.

As bilateral practices, boundary delimitation and demarcation are usually carried out by commissions with representatives from both neighbouring states. In Chapter Three Dr. John Donaldson outlines the common organisational structures of most bilateral and national boundary commissions, based on African case studies included in this work. He also provides good practice guidelines for how a joint commission might be set-up through a bilateral agreement, detailing aspects of its legal mandate, structure and dispute resolution mechanisms. He also offers suggestions on how a commission structure deals with operational issues in the field.

A key aspect of boundary delimitation and demarcation practices for many African States is the recovery of boundaries that may have been defined many decades ago. Many boundary disputes are based on the ambiguities of the original boundary definition. Archival records can be essential for understanding the original boundary delimitation. As Mr. Aly Ongoiba explains in Chapter Four, research in African government archives and in the archives of former colonial powers can be complex but ultimately beneficial in recovering and reaffirming an older boundary definition particularly within the context of international litigation.

Dr. Martin Pratt expands this theme in Chapter Five and reveals many of the more accessible sources of historical boundary information available to African States. Based on extensive experience, Mr. Pratt also includes practical advice on how to access archival and cartographic

information, and how it can be integrated into a boundary information system.

Mapping has traditionally been a core component of boundary-making practices. As Mr. Alastair Macdonald explains in Chapter Six, older mapping can be of vital importance for understanding the intentions of an original boundary agreement or demarcation. He indicates the various types of colonial mapping that can be useful in gaining a geographical understanding of the border landscapes that existed when many African boundaries were originally defined or revised. Mr. Macdonald also explains how mapping and remotely-sensed imagery can assist in the interpretation of the current physical and human geography of border areas prior to undertaking new delimitation and demarcation.

As the documenting evidence of boundary demarcation, boundary mapping is crucial for helping document an agreed boundary definition and allowing that boundary to be recovered on the ground in the future if markers disappear. Demystifying the complex field of geomatics, Professor Abdullah Elsadig Ali explains in Chapter Seven how modern mapping is produced and emphasises its application in boundary-making practices. Utilising his extensive experience in modern survey techniques, Professor Elsadig offers practical suggestions concerning how boundary mapping can be produced more cost-effectively while maintaining accuracy and providing a good quality product. He reveals the important applications of all aspects of geomatics throughout boundary-making and border management practices.

Amid the political and technical challenges that influence boundary delimitation and demarcation, in Chapter Eight, Professor Anthony Asiwaju provides a timely reminder at the end of the first section that boundaries always run through local human landscapes. Based on his life's work on cross-border relationships in Africa, Professor Asiwaju urges today's African boundary makers not to ignore local borderland populations when undertaking delimitation and demarcation exercises. He highlights the good practice Nigeria has undertaken in cooperating with its neighbouring states in the use of straddling natural resources, and the importance of local engagement that has been an integral part of the Cameroon-Nigeria Mixed Commission. He suggests that cultivating effective bilateral cooperation and engagement with local communities lies at the very heart of the AUBP's pursuit of creating peaceful and prosperous border communities across the continent.

SECTION II: Case studies

The second section of the handbook (Chapters 9-11) consists of four case studies of recent boundary delimitation and demarcation practices in different parts of the African continent. In Chapter Nine, Col. Kesraoui Azreki provides an overview of Algeria's experience in boundary demarcation with several of its neighbouring states, some of the longest and most inaccessible land boundaries in Africa. He then shares some of the technical lessons that have been derived from these experiences and outlines an ideal framework for boundary delimitation and demarcation.

Mr. Issa Coulibaly then provides a detailed chapter on the history of delimitation and demarcation along the Burkina Faso-Mali boundary, recalling the post-conflict nature of the International Court of Justice (ICJ) settlement and the many delays to demarcation work over several decades. He explains how, with limited external financial support, the two States have recently been able to demarcate the majority of their boundary through cost-effective and efficient cooperation. Based on this up-to-date experience, Mr. Coulibaly provides a comprehensive recommended model for a demarcation exercise.

Chapter 11, which was co-authored by Mr. Ali Touré from Cameroon and Surveyor Sani Isa from Nigeria, gives a fantastic joint insight into the on-going demarcation work of the Cameroon-Nigeria Mixed Commission. Explaining the sophisticated technical specifications and requirements for implementation of the 2002 ICJ boundary Judgement, the authors reveal how a complex set of contracts and the overly-bureaucratic involvement of the United Nations has impeded the overall process of boundary demarcation following the 2002 ICJ Judgement. Based on their experience, the authors conclude that, wherever possible, African States should address demarcation bilaterally with technical specifications that are appropriate for each individual African boundary.

Eng. José Elias Mucombo completes the case studies in Chapter 12 with an in-depth look at the practical nature of demarcation fieldwork in the context of Mozambique and its neighbours. Outlining the internal structure of Mozambique's Instituto Nacional do Mar e Fronteiras (IMAF), he first explains how this structure facilitates close interaction between internal government agencies and provides a strong degree of domestic political support to undertake boundary reaffirmation, delimitation and demarcation practices. Based on his extensive experience with Mozam-

bique's neighbours, Eng. Mucombo also reviews many of the practical challenges involved with boundary delimitation and demarcation, particularly in the field. He moreover provides invaluable advice about techniques for boundary maintenance, emphasising the continuous nature of boundary-making.

SECTION III: **Lexicon and appendices**

The third section of the Handbook is comprised of a Lexicon and three Appendices.

The terms and phrases used by boundary scholars and practitioners can be difficult to interpret for those unfamiliar with the discipline. Within the Lexicon, Mr. Tim Daniel has compiled one of the most immediately practical glossaries. Using straight-forward and clearly understandable language, he elucidates the terms likely to be used in land boundary delimitation and demarcation practices. As a valuable future reference, these definitions help to clarify what can seem to be an unapproachable vocabulary.

Three detailed appendices follow the boundary lexicon. The first, Appendix A, by Professor Elsadig explains the technical issues surrounding mapping standards. The second, Appendix B, by Mr. Mahdi Boudjema provides further details about the options for the peaceful resolution of international boundary disputes when they arise. These appendices will be of particular interest to legal and technical boundary practitioners. Finally, Appendix C lists all Judgements of the International Court of Justice and international arbitral awards that have concerned land boundaries of territory in Africa since independence.

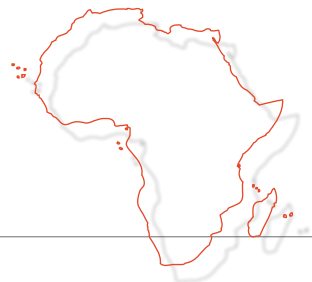
Key conclusions

This Handbook has been assembled to support the initiatives of the African Union (AU) Border Programme. The authors encourage all Member States to contribute to the development of the AU Boundary Information System (AUBIS) by completing the questionnaire that has been distributed to all AU Member States and, where possible, by supplying copies of relevant agreements, maps and demarcation reports. Such documentation will both facilitate planning of future AUBP-supported activities and provide further examples of good practice from which other Member States will be able to draw.

The specifications and practices of international boundary delimitation and demarcation should be tailored to fit the specific border region landscapes and the individual circumstances of neighbouring states. While the involvement of third parties in post-conflict boundary demarcation may be a political necessity, the authors' experiences suggest that such involvement tends to slow down the demarcation process, and make it more expensive than if the parties were allowed to undertake the process on their own. The political will of the two neighbouring states involved is the key to successful delimitation and demarcation of African boundaries.

Indeed, the authors will argue that any legal, technical or political problems encountered in boundary delimitation and demarcation can be overcome if both states are willing to seek equitable and practical solutions. A clearly defined and agreed boundary will prevent future disagreements and disputes between neighbouring states, which have immediate impact on the development of borderland areas. Local administrations will be brought closer together rather than pushed apart by an ill-defined no man's land. Companies are more willing to invest and people will feel more secure in borderland areas if there is no risk of a boundary dispute flaring up.

Even more tangibly, the very exercise of boundary delimitation and demarcation opens up dialogue between officials in neighbouring states and creates more open and comfortable relationships. Approaching boundaries as a shared responsibility rather than as a source of contestation, builds the foundation for on-going cooperation between neighbouring administrations on other aspects of border management. With clear boundary definition eliminating potential disputes and the bilateral practices of delimitation and demarcation building bilateral trust, the primary goal of the AU Border Programme – to enhance borderland development and cross-border cooperation – appears within sight. This is the future of African boundaries, and the authors hope that this Handbook will be a useful tool in facilitating progress towards that future.



Section I

Boundaries and Boundary- Making



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Chapter 1

The Purpose and Functions of International Boundaries: With Specific Reference to Africa



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Introduction

Understanding the purposes and functions of international boundaries is critical in determining their relation to peace, integration, and development of a nation-state or a sub-region. Boundaries serve different purposes and have numerous functions depending on what those who drew them had in mind and how those living along them want to use them. The nature of an international boundary also has an impact on the livelihoods of local communities and the stability of a nation-state. Having knowledge of the nature, purposes and functions of international boundaries is very helpful when dealing with disputes relating to their location, management and administration. Such knowledge, according to Johanson, is critical in diffusing inter-state border tensions and providing solutions such as altering boundaries or changing their functions to make them “more flexible and open to passage.”¹² Johanson adds that the “purposes and aims” of international boundaries are determined by their “existence and location.” Some of a boundary’s purposes and aims may be common to states, while many others may reflect the specific characteristics of communities. However, a boundary’s functionality—how it works in practice—“is determined by [its] location and by how restrictive or open the state or neighbouring states wish [it] to be.”¹³

¹¹ The author would like to thank Mr J. Larsen for his research assistance in gathering and analysing data used in this chapter.

¹² See Johanson, M.C. (2004), *Self-Determination and Borders*, p. 197.

¹³ *Ibid.*

A state's attitude to its boundaries is influenced by many factors such as security, trade, cross-border population movements, and illegal activities across the borders. A boundary's function and location also affects borderland populations. Nevertheless, according to Johanson, "these effects may or may not correspond with the original objectives for which a boundary was construed or agreed to, or the functions that states wished it to have." For instance, as will be illustrated later, boundaries such as those imposed by colonial administrations to serve the interests of Europeans profoundly affected identities of ethnic groups that were divided between colonies. Interestingly, despite "defying all the logic except that of the former colonial powers,"¹⁴ these boundaries were accepted at independence, and even assigned new functions. In order to fully appreciate the purposes and functions of African boundaries, it is instructive to reflect on their characters, history, and classifications. This chapter begins with an overview of the history and character of African boundaries, provides a broad classification of international boundaries, then examines their purposes and functions, and ends with a conclusion that highlights the benefits of having clearly defined and understood purposes and functions of international boundaries.

A Contextualisation of African Boundaries

It is inconceivable to define a "state" in international law without a territory or a geographical base.¹⁵ Although a state's frontiers can be disputed, it must be based on "some piece of land"; that is, a territory that "constitutes the tangible framework for the manifestation of power by the accepted authorities of the state in question." One of the classic international legal criteria for recognising a state is its ability to control and secure its population and territory. The ascription of territory to statehood can be traced generally to the Peace of Westphalia in 1648, which resulted in the devolution of the Holy Roman Empire and the beginnings of territorial units that we today call states. This inevitably ended "the concept of personal allegiance as the foundation of political society" and ushered in the "Westphalian concept of the territorial sovereign state."¹⁶ Territorial sovereignty, in turn, implies boundaries. A "state would not even be considered to be a State under

¹⁴ Bradshaw, R. (2005), *Re-defining the Nature and Function of Boundaries*, p. 40.

¹⁵ Shaw, M. (1986), *Title to Territory in Africa—International Legal Issues*, p. 1.

¹⁶ See *Ibid.*, p. 2. For more discussions on state and territory, see Ajomo, M.A. (1989), *Legal Perspective on Border Issues*, pp. 37-43.

[...] (public international law)” if “a majority of its borders (are not) defined.”¹⁷ But delimiting a boundary implies more than defining it in a treaty. It also implies determining its purposes and functions before or after the demarcation. How a state defines or determines the purposes and functions of its boundaries is essential to its success in controlling its territory, and this, in turn, has profound impacts on its neighbouring states in a number of ways. For instance, in securing the territory and controlling other states’ population from freely crossing its boundaries, a state may create friction with neighbouring states that are also engaged in similar exercises.

In order to understand how boundaries are perceived, used, maintained, and administered in post-colonial Africa, it is helpful to reflect on how Africans traditionally related to the land. While to Europeans, boundaries have, since the end of the feudal period and the dawn of modernity, denoted ownership of land and the exclusive use of property by the owner and others authorised for its use, in traditional African societies land was neither individually owned nor used, making physical boundaries almost nonexistent. There was a general understanding of the span of the area in which the community could either grow its food and/or graze its animals. However, this was the state of things until populations started to increase and Europeans arrived with an ideology of private ownership. Nonetheless, this new ideology of individualism did not completely transform how Africans relate to borders due to the cultural practices of reciprocity that allowed the use of others’ land when needed, so long as it did not lead to a permanent occupation. According to Engelbert *et al.* (2002), “the concept of territorial delimitation of political control was by and large culturally alien” in pre-colonial Africa.¹⁸ This means that “the concept of territorially defined statehood is a European import” and this makes colonially-imposed boundaries “alien” to Africa.

McEwen (1971) points out that “the concept of linear boundary was alien to Africa” due to “an absence of centralised ‘state’ structures or entities. Some areas remained unappropriated by any clan or state [...]. There was a general (but not total) absence of modern methods of physical marking of alignments.”¹⁹ However, this does not mean that Africans generally did not have linear boundaries, as even pastoralists

¹⁷ Johanson, M.C. (2004), *Self-Determination and Borders*, p. 200.

¹⁸ Engelbert, P.S., S. Tarango and P. Carter (2002), *Dismemberment and Suffocation—A Contribution to the Debate on African Boundaries*, p. 1095.

¹⁹ McEwen, A.C. (1971), *International boundaries of East Africa*, p. 8.

had a conception of the limits of their pastures. In fact, according to Adekunle Ajala (1983), pre-colonial Africa had systems of using **zones** or border marches as buffers between kingdoms. Such zones were of varying width and they fell into three distinct categories during the 19th Century: “**frontiers of contact** for cultural and political groups to co-exist; **frontiers of separation** where communities were separated by a buffer zone, which did not fall under the authority of either community; and **enclaves** for migratory communities.”²⁰ It is notable that these pre-colonial African boundaries “were not static” and fluctuated “in the period immediately before the imposition of colonial rule and the ensuing boundaries.”²¹

Herbst (1989) argues that boundaries are political creations that reflect the mind-set and needs of those in power. It is important to understand this mind-set in order to comprehend why they were created and maintained the way they are today. Almost all the current African boundaries were created, beginning in 1885, as “a rational response by the colonialists” to “their political needs.”²² These boundaries were adopted and maintained by the post-colonial African leadership because they also served “their political needs.” Herbst predicts that colonially inherited borders will last until African leaders find their preservation “to be more costly than other alternatives,” decisions which will be made based on “a large number of political calculations,”²³ such as the costs of losing territory, natural wealth, and population.

African boundaries “are of relatively recent origin and thus do not even possess the sanctity that derives from age. The majority of African boundaries were delimited between 1884 and 1904 and the definitive partition was completed in 1920.”²⁴ The speed with which African boundaries were defined and marked, in view of the lack of resources and knowledge about the vast continent, meant that numerous errors, some of which have not been corrected to date, were committed. According to Kapil (1966), “delimitation agreements were negotiated before detailed knowledge of terrains and peoples in the interior of

²⁰ Ajala, A. (1983), *The Nature of African Boundaries*, pp. 178-9.

²¹ *Ibid.*, p. 179.

²² Herbst, J. (1989), *The Creation and Maintenance of National Boundaries in Africa*, p. 692.

²³ *Ibid.*

²⁴ Kapil, R. (1966), *On the Conflict Potential of Inherited Boundaries in Africa*, p. 659. See also Herbst, E. (1909), *Map of Africa by Treaty*.

the continent was available.²⁵ Consequently, the vast majority of the boundaries were defined in terms of astronomical or mathematical criteria or by reference to gross physical features.”²⁶ Despite the ease of delimiting African boundaries, it was a different story when it came to demarcating, managing and administering them. In some cases the period between delimitation and demarcation took as many as 30 years, such as the Kenya-Ethiopia boundary.²⁷ In other cases, such as the disputed Ilemi triangle between Kenya and South Sudan, it has not been done yet. Due to this huge gap between delimitation and demarcation (followed by administration) of African boundaries, most of them can be regarded “to have been operationally nonexistent for the major portion of their history.”²⁸

Despite the large portion of African boundaries being poorly delimited, inadequately demarcated and minimally administered over a long period of time, there have been only two types of territorial claims—historic²⁹ and ethnic.³⁰ Otherwise, “there have been no instances so far in which territorial claims have been advanced on grounds of geographical continuity, economic necessity,³¹ rights of passage, compensation, strategic requirements, discovery, prescription, or accretion, all of which have at one point or another been the basis of territorial disputes between states in Europe and the Americas.”³²

²⁵ An example where lack of knowledge in delimiting boundaries has immensely contributed to current problems, is in the Horn of Africa where the boundary between Ethiopia and present Somaliland was partitioned in 1890s but systematic surveys of grazing lands were not available until after WWII. See *ibid*, p. 667.

²⁶ *Ibid*, p. 660.

²⁷ This boundary was delimited in 1907 but demarcated in 1947 but the final agreement was signed in 1970.

²⁸ Kapil, R. (1966), *On the Conflict Potential of Inherited Boundaries in Africa*, p. 660.

²⁹ For example, Morocco’s territorial claims to parts of Algeria, Mali and Mauritania were based on pre-colonial history, and Ethiopia’s claim to former Italian East Africa (Eritrea and Italian Somaliland). See *ibid*, p. 663. Morocco’s claims include 419,000 sq miles of Mauritanian territory, about 150,000 sq miles of Malian territory, and about 350,000 sq miles of Algerian territory. See Reyner, A.M. (1963), *Morocco’s International Boundaries*, pp. 313-26; and Mariam, M.W. (1964), *Background of the Ethiopian-Somalian Boundary Dispute*, pp. 155-73.

³⁰ The Ghana-Togo, and Somalia-Kenya-Ethiopia disputes are some examples.

³¹ However, this is changing due to discoveries of natural wealth in borderlands. See Okumu, W. (2009), *Resources and Border Disputes in Eastern Africa*. Forthcoming in *Journal of Eastern African Studies*.

³² Kapil, R. (1966), *On the Conflict Potential of Inherited Boundaries in Africa*, pp. 663-664.

The making of African boundaries had three distinct phases:

Phase I (1850-86) – *Conquering and mischievous acquisition of territories by the British, French, Germans, Belgians, Portuguese, and Italians. Colonial mischief in territorial acquisition and boundary-making included the deceit, fraud, intimidation, bribery, and confusion of the African rulers. In territories that were highly regarded as rich in mineral wealth, such as the Uganda-Congo border, Europeans also tried to cheat each other.*

Phase II (1886-1900) – *Pacification and creation of colonial states through small-scale mapping and treaties. Many errors were made due to scant knowledge of the continent and the rudimentary maps in existence. In the words of Lord Salisbury in 1890, the Europeans were “engaged in drawing lines on maps where no white man’s foot ever trod; we have been giving away mountains and rivers to each other” without knowing where they were.* ³³

Phase III (1900-1930) – *Completion of cartographic and geographic surveys of territories by boundary commissions that enabled total domination of colonies. These commissions were tasked with the responsibilities of carrying out geographic explorations, geodetic and topographic surveys, and demarcations.* ³⁴

³³ Quoted in Wilson, H.S. (1977), *The Imperial Experience in Sub-Saharan Africa Since 1870*, St. Paul: University of Minnesota Press, p. 95.

³⁴ Donaldson, J. (2008), *Pillars and perspective: demarcation of the Belgian Congo-Northern Rhodesia boundary*, p. 478.

The acquisition of African territories and the definition of their boundaries was done by the following means:

- (a) **Cessation through treaties and agreements**³⁵. This favoured European interests and took advantage of the lack of African codified laws. Major Arthur Blyford Thruston described a common practice of colonial treaty making as follows:

*“I had a bundle of printed treaties which I was to make as many people sign as possible. This signing is an amicable farce, which is supposed to impose upon foreign government, and to be an equivalent of an occupation [...]. A ragged untidy European, who in any civilised country would be in danger of being taken up by the police as a vagrant, lands in a native village, the people run away; he shouts after them to come back, holding out before them a shilling’s worth of beads [...] the so-called interpreter pretends to explain the treaty to the chief. The chief does not understand a word of it, but he looks pleased as he receives another present of beads; a mark is made on a printed treaty by the chief and another by the interpreter, the vagrant, who professes to be the representative of a great empire, signs his name. The boat sails away, and the new ally and protégé of England or France immediately throws the treaty into the fire.”*³⁶

Although there is widespread criticism of how Europeans acquired African colonial territories, the negative attitude towards colonial treaties is balanced by the *uti possidetis* principle.³⁷ It is worthwhile to note that despite the OAU declaring respect for the inherited boundaries, it did not do much (or, in some cases, anything) to determine whether or not they actually existed or where they ran.³⁸ There were approximately 25,000 miles of African boundaries that had not been demarcated when the OAU was formed in 1963.³⁹ The OAU’s procrastination in undertaking this task is for another forum to discuss but it suffices to point out here that a boundary remains merely a line on the map without its demarcation and administration.⁴⁰

³⁵ Shaw, M. (1986), *Title to Territory in Africa—International Legal Issues*, pp. 38-45.

³⁶ Thruston, A.B. (1900), *African Incidents: Personal Experiences in Egypt and Unyoro*. Quoted in Ajala, A. (1983), *The Nature of African Boundaries*, pp. 179-180.

³⁷ Allot, A. (1969), *Boundaries and Law in Africa*, p. 17.

³⁸ Ibid.

³⁹ According to Hodgson, R.D. and E.A. Stoneman (1963), *The Changing Map of Africa*, pp. 66-67.

⁴⁰ Kapil, R. (1966), *On the Conflict Potential of Inherited Boundaries in Africa*, p. 660.

- (b) **Conquest**⁴¹. As of 1876, Africans ruled more than 90 per cent of the African continent, but by 1914 only Liberia and Ethiopia had not been brought under the control of European powers using advanced weapons.⁴² These conquests were characterised by massive human rights abuses, wanton looting, and the sadistic use of violence.⁴³
- (c) **Occupation through *terra nullius***⁴⁴. Using this principle, Europeans proceeded to “civilise” Africans, since they were “not recognised as belonging to the great family of states to whom international law applied” but were rather “savage, barbarous tribes” that had to be civilised.⁴⁵ A French colonial historian, George Hardy, characterised Africa as a mediocre land with a hostile climate and poor or absent political organisations which “spread unchecked like mushrooms and know no natural borders.”⁴⁶ The French, according to Robert Delavignette, saw their African colonies as “purely administrative lots” that were created and could be abolished by “decree.” They were “strangely” and “coldly” created through “arbitrary delimitation” that had no regard for natural features or cultural identities.⁴⁷ This “artificiality” of African colonial entities made them subject to arbitrary manipulations and rearrangements.

Europeans arrogantly assumed Africans had no states. International law then defined states through “basic attributes of formal juridical equality, independence, and sovereignty, a fixed locality or territory, and a political society organised into a government.”⁴⁸ Using this legal premise, Europeans acquired and put under their control “territories which they did not recognise as states.”⁴⁹ The nature of present African boundaries can be traced to the way that colonialists carved the continent up and the motivations that drove the quest for African land—either economic motives or desire for sheer space.

⁴¹ Shaw, M. (1986), pp. 45-46.

⁴² See Vandervort, B. (1998), *Wars of Imperial Conquest in Africa 1830-1914*.

⁴³ See Conklin, A. (1989), *Colonialism and Human Rights, A Contradiction in Terms?*

⁴⁴ Means land without master or no man’s land. See Shaw, M. (1986), pp. 31-38.

⁴⁵ Pomeroy, J.N. (1886), *Lectures on International Law in Time of Peace*, p. 96.

⁴⁶ Lefebvre, C. (2008), *Artificiality, Divide, Scramble: Telling the Tale of African Borders*.

⁴⁷ Ibid.

⁴⁸ Wa Mutua, M. (1995), *Why Redraw the Map of Africa: A Legal and Moral Inquiry*, p. 1124.

⁴⁹ Ibid, p. 1126.

- (d) **Usage and sufferance.** Some of the territories fell under certain colonial administrations by virtue of being used by nationals of a specific colonial power. Examples of such territories are the islands of Likoma and Chizumulu in Lake Malawi, which fell under British colonial rule due to the presence of missionaries from the United Kingdom.

With this background, the OAU, in July 1964, made Resolution AHG/ Res. 16(1) at the Cairo Summit that bound African States to “respect the borders existing on their achievement of national independence.”⁵⁰ This principle of *uti possidetis* is generally regarded as playing a major role in preventing conflicts in two ways. First, changing borders leads to more changes, which leads to instability. This is what underlies the “stability of borders means peace” argument. Johanson contends that “stability, often meaning continuation, of boundaries is understood as fundamental to the international order and peace [...]. But stability is not necessarily maintained by preserving the status quo or by, as seems to have been the case so far, considering the functionality of boundaries as unrelated to peace.”⁵¹

The “stable borders of peace” argument has its shortcomings. First, it should be noted that, generally, it is “not changes to boundaries, but the methods by which these are brought about, that may prove a threat to peace.”⁵² However, this problem can be overcome not by prohibiting border changes but rather by establishing “clear guidelines as to when and how discussion regarding border changes may be affected.”⁵³ Second, retaining a boundary does not mean “that the *status quo* is actually preserved.”⁵⁴ The assumption that retaining a boundary is tantamount to maintaining a status quo is reflective of the “misconception that borders are similar and have like effect on those affected by it, whatever their status or functionality.” Johanson argues further that “the status quo may in some cases facilitate peace, while in situations that are practically intolerable it may instead threaten peace.”⁵⁵ Thus, “uniformity by reference to *uti possidetis* is no universal panacea to conflict, but instead a dangerous substitute for contextualisation.”

⁵⁰ See African Union (2009), *From Barriers to Bridges – The African Union Border Programme*.

⁵¹ Johanson, M.C. (2004), *Self-Determination and Borders*, p. 24.

⁵² *Ibid.*, pp. 24-25.

⁵³ *Ibid.*, p. 25.

⁵⁴ *Ibid.*

⁵⁵ *Ibid.*

The second argument in favour of the *uti possidetis* principle is that changing borders through force is not acceptable and would be unsuccessful. This position is based on the understanding that the use of force, either directly or through a proxy, to enhance a country's national interest vis-à-vis another one is banned by international law. However, it should be noted that despite international law proscribing the use of war or threats to use force to achieve national interests, it does not prohibit insurgencies or secessionism. Self-determination to claim territory is not an illegal act in international law. This legal premise presents a conundrum to African States that gained their independence through liberation struggles that were recognised under international law as legitimate and yet may face future secessions in the guise of self-determination to create new states.

International Boundary Classifications

There are two classifications that have been commonly used to identify international boundaries:

- 1 The **Boggs' Classification** (1940) identifies the following types of international boundaries:⁵⁶
 - (a) **Physical or natural:** these types of boundaries follow a particular natural feature such as a river, watershed, mountain range, etc. According to Griffiths (1996), there are about 45 per cent of African boundaries that follow rivers or watersheds.⁵⁷
 - (b) **Geometric:** these boundaries follow straight lines, arcs of a circle such as longitude and latitude. While 44 per cent of African boundaries are straight lines, 30 per cent follow other rectilinear or curved lines.⁵⁸
 - (c) **Anthropo-geographical:** these types of boundaries relate to various human settlements, culture, and language.
 - (d) **Compounded:** these types of boundaries comprise various basic elements mentioned above.

⁵⁶ See Boggs, S.W. (1940), *International Boundaries*.

⁵⁷ Griffiths, I. (1996), *Permeable Boundaries in Africa*, p. 68. But Barbour, K.M. (1961), (p. 305) estimates that 26 per cent of African boundaries are defined in reference to topographical features such as rivers, streams, watersheds, mountains, and valleys.

⁵⁸ *Ibid*, p. 68.

- 2 The **Hartshorne classification** (1938) identifies the following types of international boundaries:⁵⁹
- (a) **Antecedent boundaries:** are drawn before cultural landscapes are developed. According to Kapil (1966), “antecedent boundaries exist wherever political jurisdictions have been formally allocated before human settlement has taken place or, at least, before major socio-cultural features, such as industrial growth, markets, or regions of circulation and movement, have had time to develop.”⁶⁰
 - (b) **Consequent/subsequent boundaries:** On the other hand, consequent boundaries “are those delimited after such features have already emerged, which coincide with social, economic, cultural, or linguistic discontinuities.” It is also referred to as a subsequent boundary since it is drawn after the development of the cultural landscape and follows cultural lines.
 - (c) **Superimposed boundaries:** are drawn after the development of the cultural landscape but without regard to possible cultural boundaries. These “boundaries are those that do not coincide with [...] discontinuities” as those in consequent boundaries.⁶¹ In his book on *Partitioned Africans*, Asiwaju (1984) points out that there are 109 international borders that divide 177 cultural or ethnic groups in Africa.⁶² African boundaries were drawn without reference to socio-cultural characteristics of the people they partitioned. Almost all present African boundaries were drawn during the colonial period purely for administrative purposes and not in the interest of the local communities. Although there were some exceptions, African boundaries “are often characterised as artificial and arbitrary on the basis of the fact that they do not respond to what people believe to be rational demographic, ethnographic, and topographic boundaries. However, borders are always artificial because states are not natural creations.”⁶³ Tagil (1969) adds that: “since every boundary divides people and not geographical units, all boundaries must in one sense be considered artificial.” Kapil (1966) also argues that “there is

⁵⁹ Hartshorne, R. (1938), *A Survey of the Boundary Problems of Europe*. This classification is also used by Norman Pounds, *Political Geography*.

⁶⁰ Kapil, R. (1966), *On the Conflict Potential of Inherited Boundaries in Africa*, p. 657.

⁶¹ Ibid.

⁶² See Asiwaju, A.I. (1984), *Partitioned Africans*. See also Posner, D.N. (2006), *African Borders as Sources of Natural Experiments*.

⁶³ Tagil, S. (1969), *The Study of Boundaries and Boundary Disputes*, p. 24.

nothing inherently natural or authentic about the political boundaries of any state” since “all territorial political units have always been the product of social and political action.” In other words, according to Richard Hartshorne (1938), it is “man and not nature that determines the location of (political boundaries).”⁶⁴ Accordingly, it must be stressed that all political and administrative boundaries are man-made.

- (d) **Relict boundaries:** are those that can still be seen in the cultural landscape, even though they no longer have any function of political division. Examples of relict boundaries are the “Great Wall of China,” the “Berlin Wall” that separated East and West Berlin, and “Hadrian’s Wall” in the United Kingdom that was built in AD 122 to demarcate the northernmost boundary of the Roman Empire.⁶⁵

In terms of how these boundaries relate to peace, superimposed ones have the highest potential to cause conflicts. Antecedent or consequent boundaries are less likely to cause conflicts “because their disruptive impact is low and the boundary itself helps shape emergent discontinuities.”⁶⁶ Kapil (1966) argues that “superimposed boundaries generate conflict by creating a disjunction between the interactions of the socio-cultural system on the one hand and the political system on the other.” Surprisingly, despite the extensive divisions of cultural identities by boundaries, the level of *irredentism* has been low in Africa. Instead, these divisions have sometimes acted as a check on territorial expansionism in the guise of unifying a divided population (or culture).⁶⁷ But in the final analysis, as it will be pointed out later, a boundary only becomes a source of conflict depending on how it is used, controlled, administered, and managed.

⁶⁴ Hartshorne, R. (1938), *A Survey of the Boundary Problems of Europe*, p. 164. Also quoted in Kapil, R. (1966), *On the Conflict Potential of Inherited Boundaries in Africa*, p. 659.

⁶⁵ See Divine, D. (1995), *Hadrian’s Wall*.

⁶⁶ Kapil, R. (1966), *On the Conflict Potential of Inherited Boundaries in Africa*, p. 657.

⁶⁷ See Touval, S. (1973), *The Boundary Politics of Independent Africa*.

Purposes of International Boundaries

International boundaries have many purposes but the basic one is to identify a territory within which a state administers laws, collects taxes, and provides defence. An international boundary may also serve the purposes of allocating, dividing, or controlling a territory, as illustrated below:

- (a) It divides territories with unique characteristics into distinct entities. These may include history, language, culture, etc. In other words, international boundaries separate or unite, include or exclude, and control and shape, what is inside the demarcated territory.
- (b) It allocates “territory to states and political units which have international status and role [...]”⁶⁸ Accordingly, international boundaries give political units identities under international law and bestow sovereign equality among states, making tiny Liechtenstein and expansive Russia equals in the eyes of international law.
- (c) It ensures that the territory is distinct for economic activities such as mineral exploitation. Nonexistent or poorly defined boundaries could lead to inter-state conflict if mining companies, for example, enter into agreements with a government to explore for natural resources within its borders only to discover, once the exercise is underway, that the lands belong to another country. When countries sign contradictory agreements with companies to locate natural resources within their borders, the exploration could easily meet with violence if the border is not already agreed upon and clearly marked. When such conflicts occur, there can be a negative impact on economic relations, as Table I below shows. For instance, the border dispute between Kenya and Ethiopia, from 1963 to 1970, cost them an estimated “\$44 million in bilateral trade, which was more than 11 percent of Kenya’s and about 23 percent of Ethiopia’s total overseas development assistance received during the same period.”⁶⁹

⁶⁸ McEwen, A.C. (1971), *International Boundaries of East Africa*, p. 3.

⁶⁹ Simmons, B. (2005), *Rules Over Real Estate: Trade, Territorial Conflict, and International Borders as Institution*, p. 838.

Table I: Estimated Effects of Territorial Disputes on Trade, 1950-1995 (millions of USD)

Country Pairs	Years of Territorial Dispute	Estimated Cumulative Impact of Dispute
Argentina-Uruguay	1950–1973	981
Chile-Argentina	1950–1995	32,897
Cyprus-Turkey	1974–1995	782
USSR-Japan	1952–1995	534,879
Chad-Libya	1960–1994	32
Ethiopia-Kenya	1963–1970	44
China-Vietnam	1976–1995	397
Malaysia-Indonesia	1980–1995	11,511
Iraq-Iran	1950–1995	52
Egypt-Israel	1950v1988	103

Adapted from: Simmons 2005

- (d) When linked to “strengthening...the norm of territorial integrity”, an international boundary can play a critical role in assisting a state to overcome irredentist and secessionist challenges.⁷⁰ Countries that have faced, or are facing, secessionism have found the “norm of territorial integrity” to work very well if they invoke it to defend the inviolability of their boundaries. This is reinforced by the *uti possidetis* principle that make African boundaries inherited from colonialists almost sacrosanct. Although *uti possidetis* was originally not formally binding but applied on the basis of the conference diplomacy of African leaders in 1964,⁷¹ it has been formally adopted as a legally binding principle in the Constitutive Act of African Union (Article 4b) in 2002.

Functions of International Boundaries

S. Whittemore Boggs (1940) enumerates a number of functions a boundary plays in our daily lives. A boundary determines “for millions of people the language and the ideas which their children would be taught at school, the books and newspapers they would be able to buy and read, the kind of money they would use, the markets in which they would buy and sell, and even sometimes the kinds of food they might

⁷⁰ Herbst, J. (1989), *The Creation and Maintenance of National Boundaries in Africa*, p. 690.

⁷¹ See Kingsbury, B. (2003), *People and Boundaries: An Internationalized Public Law Approach*, p.302.

be permitted to eat. Besides, it determines their national culture with which they shall be identified, the army they might serve and also the soil which they might be called upon to defend with their lives whether or not they choose to defend it.”⁷² Thus, international boundaries “not only provide physical security and resources but also order national and transnational economic and social life. When they are uncontested, they clarify and stabilize transnational actors’ property rights.”⁷³

The negative function of an international boundary is that of partitioning people, even those who speak the same language and practice the same culture, into separate political units with different national orientations. One such ethnic group are the Maasai of East Africa who were first divided by an international boundary between the German East Africa and the British East Africa colonies, and later between socialist Tanzania and capitalist Kenya. This boundary, despite specifying “the basic structure of property rights and control of the state,”⁷⁴ has practically no meaning to the Maasai, as other boundaries are to transhumant communities.

Johanson (2004) contends, “boundaries have traditionally been considered to fall within the internal affairs of the states. As sovereign states they, and they alone, determine how the boundaries are to function and whether they are to have an ‘open’ or ‘closed’ character.”⁷⁵ In other words, boundaries can be used as **barriers or as bridges**, according to Caramondani and Stadel (2004).⁷⁶ Consequently, on the one hand, and as illustrated below, boundaries that are **barriers** are characterised by:

- ▶ Stagnant/peripheral regions
- ▶ Political/administrative constraints
- ▶ Historical inertia
- ▶ Topographic barriers
- ▶ Perceptual barriers

⁷² Boggs, S.W. (1940), *International Boundaries—A Study of Boundary Functions and Problems*, p. 5. Quoted in Ajala, A. (1983), *The Nature of African Boundaries*, p. 177.

⁷³ Simmons, B. (2005), *Rules Over Real Estate: Trade, Territorial Conflict, and International Borders as Institution*, p. 827.

⁷⁴ North, D. (1981), *Structure and Change in Economic History*, pp. 201-202.

⁷⁵ Johanson, M.C. (2004), *Self-Determination and Borders*, p. 17.

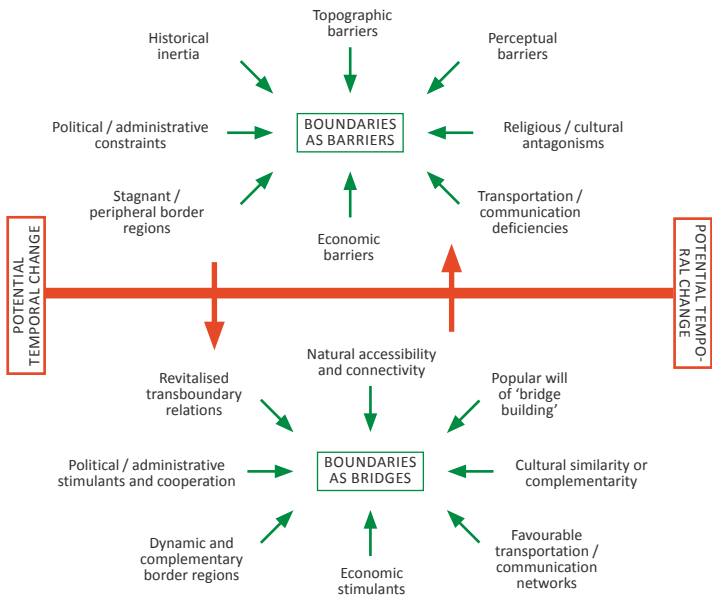
⁷⁶ See Caramondani, A. and C. Stadel (2004), *Shaping the Outskirts: Boundaries as Bridges or Barriers for Urban Development? The Cases of Salzburg (Austria) and Nicosia (Cyprus)*. Presentation made at a meeting on European Cities: Insights on Outskirts, Paris, France. Web link: <http://www.gub.ac.uk/ep/research/costc10/findoc/.../stadel-17-3-6.pdf>

- ▶ Religious/cultural antagonisms
- ▶ Transport/communication deficiencies
- ▶ Economic barriers

At the same time, on the other hand, boundaries that are bridges are characterised by:

- ▶ Economic stimulants
- ▶ Natural accessibility and connectivity
- ▶ Popular will to engage in “bridging” activities
- ▶ Cultural similarity or complementarity
- ▶ Favourable transportation/communication networks
- ▶ Dynamic and complementary border regions
- ▶ Political/administrative stimulants and cooperation
- ▶ Revitalised trans-boundary relations

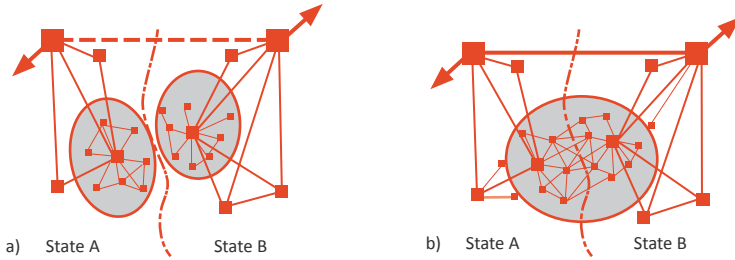
Boundaries as Barriers or Bridges



Adapted from: Caramondani and Stadel (2004)

Hence, depending on whether an international boundary becomes a barrier or a bridge, it can create different types of border towns, such as the ones illustrated by Caramondani and Stadel (2004):

Boundaries as Barriers or Bridges



Adapted from: Caramondani and Stadel (2004)

The functionality of an international boundary is multi-dimensional. First, a boundary can play a very critical role in determining relations between neighbouring states. For instance, if a state in a region has territorial interests in two of its neighbours' territories, they may find it convenient to establish harmonious relations between them to checkmate the hostile neighbour. This could include the two threatened neighbours expeditiously delimiting and demarcating their common boundaries. The type of relationship between two neighbours will also determine how they allow their citizens to move across and use the border.

Second, a boundary is critical in inter-state trade and commerce as it can be used to ensure that revenues are collected in forms of customs duty and goods are not smuggled across. Controlling trade across the border can create conflict between the state and local communities if such controls take away the benefits those communities enjoyed prior to the introduction of the border controls. Many borderland communities have benefitted from the borders in various ways. They may evade paying taxes on one side of the border, enjoy services such as health care and education on the other side, and have access to goods that are reasonably priced on either side of the border. However, a conflict can arise as a result of one state seeking to stringently administer its borders through controls, inspections, restrictions of trans-boundary populations, etc. A conflict is inevitable if such regulations are "applied to a population whose search for grass and water [make] it particu-

larly prone to reject their legitimacy.”⁷⁷ Johanson reiterates this view by pointing out that a border conflict may be triggered “by restrictive boundary functions that hinder groups from carrying out their affairs and conducting relations with the ‘other side.’”⁷⁸ Besides neighbouring states disagreeing over a common boundary’s functions, other boundary disputes can arise as a result of where it actually lies (positional), ownership of a particular area (territorial), and trans-boundary resources.

Third, boundaries have also been established, maintained, and administered for security and military purposes. Such considerations are made to curb or address illegal activities and armed insurgencies that are prevalent in the borderlands. Relations between two neighbouring states may revolve around border security issues such as cattle rustling, drug trafficking, human trafficking, gun smuggling, and auto theft. Other security issues may relate to terrorist activities; undocumented immigration through illegal border points by community members with family on both sides of the border; and illegal cross-border activities such as the use of herd boys as informers for human traffickers and monitoring the movements of the patrol teams. While a boundary may be established to demarcate the territory of a political unit and maintained for security reasons, it can also be used, as the Great Wall of China was, to build a nation and centralise a state, and for other purposes such as transportation.⁷⁹

Fourth, according to Allot (1969), boundaries have legal and administrative functions, which can be either positive or negative, cordial or unfriendly.⁸⁰ A primary function of a boundary is “to define the limits of governmental authority, as exercised in a given state or political unit.”⁸¹ Once drawn, a boundary gives a government authority to control a territory and to “perform acts of administration” within it, including providing essential services. It also defines, “though not in an exclusive manner, the nationality of those born or living within” the state frontiers.⁸² In essence, a boundary bestows a “nationality.”

⁷⁷ Kapil, R. (1966), *On the Conflict Potential of Inherited Boundaries in Africa*, p. 667.

⁷⁸ Johanson, M.C. (2004), *Self-Determination and Borders*, p. 17.

⁷⁹ Ibid, p. 200.

⁸⁰ Allot, A. (1969), *Boundaries and Law in Africa*, p. 11.

⁸¹ Ibid.

⁸² Ibid.

Fifth, a boundary can also be exclusionary by defining an “area from which other authorities and peoples will be excluded, unless they have permission of controlling authority.”⁸³ A boundary controls passage of people between countries (keeps out immigrants, mainly “illegals”) and separates “states from one another, stopping expansion and delimiting where trespass would occur.”⁸⁴

Sixth, besides the above internal dimensions, a modern international boundary also has external dimensions. In this regard, “it delimits the state’s jurisdiction, its ‘political space’ and the territory within which it acts as it pleases: determining which goods are imported, what school textbooks are used and songs learnt, which national culture is identified with, what news is accessible, which army the inhabitants are to serve in, and rates of taxation.”⁸⁵

Overall, an international boundary is a paradoxical phenomenon in the sense that it “is a zone where not only is activity created but also restrained [...] it is both a restrictor and an encourager, it is at the same time both a constrainer and an initiator.”⁸⁶ A boundary while constraining “activities such as social interactions, economic exchange and generally the day-to-day busyness of life (going to school, policing, shopping, etc.)” it also “encourages and initiates activities that would not otherwise occur.”⁸⁷ Another paradox about an international boundary is its cultural aspects of identity and sense of belonging—those on “the other side” of the border might be feared, hated, and disliked and at the same time seen as attractive, exotic, and unique. The “neighbours across” the border could be culturally despised but may also be relatives who are valued for their social capital in times of calamities or hardships.

The functions that are assigned to an international boundary are to a large extent influenced by how it is conceptualised. There are three common conceptualisations of an international boundary that can be drawn from to determine its purposes and functions. The first one is based on a metaphor of a boundary as the edges of a “container”

⁸³ Allot, A. (1969), *Boundaries and Law in Africa*, p. 12.

⁸⁴ Ibid.

⁸⁵ Johanson, M.C. (2004), *Self-Determination and Borders*, p. 200.

⁸⁶ Bradshaw, R. (2005), *Re-defining the Nature and Function of Boundaries*, p. 52.

⁸⁷ Ibid. Such activities include the legal ones such as cross-border trading and illegal ones such as cross-border smuggling, gambling and prostitution.

[state].⁸⁸ In this view, according to Bradshaw, boundaries are viewed “from within the container and [they are seen] as a line where authority ends.” This implies nonexistent “cross-border activity.” However, this view has been modified to one of a “leaky container,” in the sense that “it is not entirely watertight and that some activities manage to seep through [its] gaps.” Although “this metaphor is an improvement [compared to the previous one] in that it does permit cross-border activity but suffers the disadvantage that it is tolerant of all activities seeping through, whereas in the real world restrictions are often placed on certain cross-border relations.”⁸⁹

A third view is that of a boundary serving as a “filter” that “permits certain chemicals in solution to pass through but restrains others.” The attraction of this view is that such a boundary restrains certain activities and permits others. Yet, this view does not allow us to understand all the activities in the borderlands. For instance, besides the traditional activities of trade and transport, “borderlands may be attractive to guerrilla movements,” smugglers, and criminal elements engaged in illegal activities.⁹⁰

Regardless of how an international boundary is viewed, Bradshaw points out the following premises:⁹¹

- ▶ *“All boundaries are leaky no matter how well they are fenced and patrolled by police or military forces.”* This is illustrated by how people – particularly spies and refugees – and goods have been able to pass through the demilitarised zone between North and South Korea, or to circumvent the Berlin Wall before its collapse in 1989. This simply shows that despite restrictions, it is almost impossible to stop the flow of human populations or goods across a boundary.
- ▶ *“All boundaries generate interaction across both sides of the border.”* Each side of an international boundary has advantages that attract or generate cross-border activities in trade or services such as education and health care. People living in borderlands will always find these opportunities, and exploit them to their advantage. Restriction or curtailment of these opportunities could generate resentment toward the government that imposes them.

⁸⁸ Ibid., p. 51.

⁸⁹ Ibid.

⁹⁰ Ibid.

⁹¹ Ibid., pp. 51-52.

- *“Some boundaries will generate more interaction than others depending on the gradient and the wealth of the two bordering states.”* There will be more interactions between two wealthy neighbours than between two poor states or between a rich and a poor state. The wealth statuses of neighbouring states will also determine the direction of their interaction; more people will flow from a poorer state to a richer one but there will be flows in both directions if the states are at same levels of development.

Conclusion

An international boundary has many purposes and functions that are determined by those who use and live on or near it—particularly the national elite and the borderland communities. Although a boundary may be delimited and demarcated for a specific function, this may change over time, and it may attain more, or even serve totally different purposes than those initially intended. For instance, a border may have been established by a colonial administration to weaken a community by dividing it, but the community can later adapt to the boundary and find ways of using it to its benefit.

In a nutshell, the functions of boundaries can be summed up as military/security/protective, legal, economic, ideological, socio-psychological. But technology and globalisation have redefined and greatly diminished the protective and economic functions of boundaries. There are now predictions of an emergent borderless world or “global village” due to technological advancement, globalisation and regional integration processes. Although some regions have moved closer to realising this dream, others such as Africa, are still deeply divided by political boundaries. Interestingly, the creation of a supposedly borderless Europe has resulted in the movement of its countries’ hard borders further south, mainly to Africa.⁹² In a fast changing world, it is important to reconceptualise international boundaries in ways that do not define them as nonexistent features with negative functions or as realities that must be strictly controlled. International boundaries, according to Schelling (1980), should be characterised by mutual dependence and partnership, mixed with some competition and conflict.⁹³ If it is borne in mind that the primary purpose of an international boundary

⁹² European countries have expanded their boundaries southwards by locating their border controls in Africa, particularly at airports. On average, British immigration officials and airline staff subject Africans travelling to the UK through Johannesburg airport to at least five interrogations and scrutiny of their passports and visas to determine their validity.

⁹³ Schelling, T. (1980), *The Strategy of Conflict*, p. 89.

is to serve local, national, regional, and international interests such as peaceful coexistence and human security, then it is easy to assign it functions that complement this objective.

Although border demarcation may identify a “territory that has symbolic, political, historical, or other kinds of significance that make it difficult for states to give it up,” it must also be noted that “well-accepted international border arrangements provide mutual benefits for states that may be very difficult for either to realise through unilateral policies.”⁹⁴ The benefits of mutual agreements on the nature, locations, purposes and functions of international boundaries are many. These include “drastically [reducing] external challenges to a government’s legitimate authority to create domestic institutions and policies within a clear physical domain,”⁹⁵ enhancing cross-border trading, peaceful coexistence of borderland communities, forging closer inter-state relations, and maintaining regional peace and stability.

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⁹⁴ Simmons, B. (2005), *Rules Over Real Estate: Trade, Territorial Conflict, and International Borders as Institution*, p. 827.

⁹⁵ Ibid.

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Chapter 2

International Border Delimitation



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The Importance of this Issue

The definition of borders (delimitation) has always been a very important activity both in terms of international law and, generally, in terms of international relations. By legally and definitively establishing a line – or the border – between two neighbouring States, delimitation, in principle, puts an end to all related territorial claims. This being the case, delimitation constitutes a factor for peace between these States. In the recent past, delimitation has often been an outcome following the end of a war and, as such, has formed part of peace treaties that, in principle, have as their objective and purpose the definitive settlement of the conflict in question.

Plan

Before working in some detail through the delimitation operation itself – that includes definition, methods, general types and rules, processes, delimitation treaty, mapping, reaffirmation, updating and modification – it is worth exploring, as succinctly as possible, the very concept of the border.

International Border – a Definition

Border issues have been very much brought to the fore in the last few decades as a notable consequence of the appearance of new States on the international stage – the break-up of the USSR from 1991 and of Yugoslavia in 1992. Subsequently, border issues have since then assumed prominence due to globalisation and the associated rapid growth of the world economy, trade, organised crime, terrorism, cross-border pollution, poverty, disease, etc. These events do not seem, however, to have had any notable consequences for the actual concept of

the boundary in terms of how it is discussed or written about in specialist material on this subject. It will, therefore, suffice to set down below the classical threefold definition of the international border based on terminology, the law and doctrine.

- 1 **The terminological perspective.** A distinction is usually made between 'boundary' (the linear concept) that describes a line as it traverses the land and maritime regions of the earth's surface, and 'border' (a spatial concept) that relates to the zone extending along either side of this line. However, conceptually the term 'border' in reality defines both 'the boundary' and 'the delimited zone', even though current usage most often reflects the following: 'the line delimiting the area under the jurisdiction of each of the States'.
- 2 **The legal perspective.** The examination of the substance of treaties generally indicates that the border is defined, from a legal viewpoint, as 'the line that separates the territory of one State from the territories of neighbouring States.' It is understood that each of the States exercises its sovereignty within the confines of its territorial space. International jurisprudence considers in this respect that the border is, amongst other definitions, 'the line created by the succession of the furthestmost points of the spatial domain valid for a State's legal system'; or also, '[...] a line separating territorial spaces where two different sovereignties are exercised [...]'⁹⁶ Furthermore, other writers highlight the distinction again made in jurisprudence between boundaries and borders. The first defines the State's territorial scope, the second 'the international border,' defined as 'a line employed to determine the territory as well as its land and maritime [...] boundaries.'⁹⁷
- 3 **The doctrinal perspective.** The border has been notably described as '[...] an artificial line drawn by humankind in order to separate/ share human entities between themselves,'⁹⁸ or as a line 'describing the boundary of the territory occupied by the State and over which it exercises sovereignty'.⁹⁹ Certain writers, however, understand the border as a line '[...] having as its function the separation

⁹⁶ Judgement of the International Court of Justice (ICJ) of 03 February 1994 in relation to the territorial dispute between the Libyan Arab Jamahiriya and Chad, recommendation, p. 20.

⁹⁷ ICJ, *op. cit.*

⁹⁸ Blumann, C. (1980), *Frontières et limites, la Frontière*, Poitiers Colloquium, Pédone, Paris, p. 3.

⁹⁹ Prescott, J.R.V. (1967), *Geography of frontiers and boundaries*. London, pp. 33-35.

of different sovereignties [...]’¹⁰⁰, or even as a line that ‘[...] establishes where the sovereignty of one State ends and that of another State begins’.¹⁰¹

For the purposes of this chapter, the terms ‘border/s’ and ‘boundary/ies’ will be used interchangeably to mean the ‘international boundary’. In summary, one can perceive, especially a land border in both general and specific terms.

Generally, the border, ‘if it can be legally presented as a line, is in fact constituted [...] of a vertical surface, separating the ground, the subsoil and the territorial airspace of the corresponding neighbouring zones, and a horizontal surface separating airspace from outer space’.¹⁰²

Specifically, the concept of border can be summarised as ‘a legal, artificial line and in the case of land borders is often marked on the ground with physical signage. The border is copied onto geographical maps, delineated according to the relevant rules of international law relating to this area (technical factor), with the mutual consent of the Governments of State concerned (political factor) in order to mark the boundary of a State’s territory and to separate it either from another State’s territory or from an international space and, as such, preserve State sovereignties and avoid any disputes arising between the two States in relation to this boundary (objective factor)’.

Furthermore, the border is closely linked to:

- (a) The existence of the Nation-State as it delimits the geographical area within which the State can exercise all the powers and jurisdiction bestowed upon it by international law;
- (b) Territory, a constituent part of the State, in terms of the title and seat of the exercise of sovereignty;
- (c) The exercise of territorial sovereignty itself by the State (delimitation of the area of international responsibility);
- (d) The consent of the Governments of State concerned, as a result of a political and technical negotiation;

¹⁰⁰ Rezek, A.R. (1995), Doctoral thesis: *Principe de la permanence des frontières internationales et leur caractère final*. University of Cairo, Faculty of Law, p. 45.

¹⁰¹ Ali, I. (1995), *Théorie générale des frontières internationales*. Published by La Renaissance Arabe, Cairo, p. 19.

¹⁰² Thierry, H., Combacau, J., Sur, S. and C. Vallée (1981), *Droit international public. DOMAT Handbook*. Published by Montchrestien (Paris), p. 246.

- (e) A technical dossier (legal texts, geographical maps, geodetic coordinates, a description of the borderline, boundary marker data sheets, minutes, etc.);
- (f) The legal rules and principles, written or otherwise, enforceable against all States, whether Parties or not to the border delimitation treaty, and this with a view to preserving the peace, security, legal stability and cooperation between States as members of the international community.

International Border Delimitation – a Definition

Delimitation as an operation enters into effect by means of an international legal instrument and in accordance with international rules of a general settlement (determination) of the borderline between neighbouring States, whether land, maritime, lacustrine or fluvial. But delimitation is also in fact, an abstract operation that often takes on a declarative and/or confirmative character with regard to existing rights and obligations. Its main interest is to legally – and therefore politically – establish a previous or new placement of the said borderline.

The execution of the delimitation (and subsequent demarcation), on the contrary, means physically translating the line described in legal texts and maps on the terrain. This operation is usually undertaken using physical signs (boundary markers, illuminated signs, floating markers, etc.), surveying geodetic coordinates and mapping the border area, among other activities.

Delimitation methods: When two States on the African continent decide to delimit their shared border, they proceed in accordance with one of two options:

- 1 Delimitation of a **pre-existing international border** that the two new States have inherited post-decolonisation. This paradigm also pertains to the secession of Member States from a former political union, such as happened in the former Socialist Federal Republic of Yugoslavia. For new, decolonised States, ‘it is supposed that the legal title that the colonial power held over the territory in question, is one which provides for continuity by means of a type of title transfer [...]’ as a basis for the new State’s territorial sovereignty¹⁰³.

¹⁰³ Judgement of the ICJ of 22 December 1986 relating to the frontier dispute between Burkina Faso and the Republic of Mali. Recommendation, p. 566.

With regard to secessionist States, they 'regain' as their boundary the former border that separated their territories prior to the constitution of the Union.

- 2 The subject border is a **pre-existing internal administrative boundary**. Such is the case for many African and Latin American countries which, throughout the second half of the 20th century and the first half of the 19th century respectively, adopted as post-independence boundaries the borders that former colonial countries set to divide up their possessions into administrative (territorial) districts.

In the two options above, the principle used for delimitation relates to maintaining the status quo otherwise known as *uti possidetis* or the intangibility of borders. The application of the said principle will first transform simple administrative boundaries that at one time separated two colonial territories of a single colonial power into international borders. In addition, it confirms, as with option one above, the character of international borders as the dividing boundaries between colonial territories that at one time fell under the sovereignty of two different colonial powers.¹⁰⁴

This principle, which was used to settle the borders of the new European States born out of the break-up of Yugoslavia, is nowadays systematically quoted as having become a general principle. Its application in the present case is designed to protect the independence and stability of young States, particularly African States, which have an 'essential requirement of stability in order to survive, to develop and gradually to consolidate their independence...'¹⁰⁵

General types and rules of delimitation: These rules vary depending on whether the boundary is artificial or natural.

- 1 **Artificial boundaries** are laid down often when no clear natural obstacle separates the physical terrain. There are two types:
 - (a) Astronomical boundaries are delineated according to parallels of latitude or longitude. Several boundaries have been set this way: the boundary delimiting Algeria and Mauritania; the boundary separating Alaska (USA) from the Yukon (Canada); and many other African States serve as examples of this approach.

¹⁰⁴ Pancraccio, J.-P. (1997), *Droit international des espaces*. Published by Armand Colin, Paris, p. 14.

¹⁰⁵ Pancraccio, J.-P., Op.cit. Page 15.

(b) Geometrical boundaries consist of either a straight line connecting two known points, or an arc of a circle.

2 Natural (or geographical) boundaries. This category of border is by far the most preferred by States and is subdivided into four different types:

(a) **Orographic boundaries** pertain to mountainous regions and can be configured in three different ways:

(i) **Crest lines:** In other words the ideal line that links the highest summits of a single chain of mountains (for example, the southern segment of the Algeria-Libya border);

(ii) **Watersheds:** The borderline is situated between two hydrographic basins and passes along the physical division of the two catchment areas (for example, the Franco-Italian border);

(i) **Line along the foot of mountains:** With this approach, the border passes along the base of mountain massifs.

(b) **Fluvial boundaries** are drawn where river watercourses serve as borders. There are three different types:

(i) The **thalweg** places the dividing line in the deepest point of the riverbed or sometimes sinuous line of the navigable channel. Otherwise, a central line can run equidistant from each bank (for example, the Rhine between France and Germany and the Rio Grande between the USA and Mexico);

(ii) The **riverbank boundary** system utilises one of the riverbanks as the border and, as such, the entire river falls under the sovereignty of a single State;

(iii) Delimitation by **reaches** (sectors) is an approach used in times past for delimiting colonial possessions. ¹⁰⁶

(c) **Lacustrine boundaries** pass normally through the centre of a lake when that body of water is shared between just two States. However, where the lake is shared by more than two States or is associated with 'special circumstances', such as islands, or clear historic title, its mode of division is, in principle, established through a common agreement of the States concerned.

Delimitation processes. The delimitation operation is usually carried

¹⁰⁶Rousseau, C. (1973), *Droit international public*. Dalloz (Paris), seventh edition, p.165.

out by means of a bilaterally negotiated agreement (treaty) between two neighbouring States, such as the Algeria-Niger demarcation agreement of 1983, which set the definitive borderline between the two States.

Delimitation can also result from a multilateral convention, such as that adopted at the London Conference of 1830 to define the borders of the new Belgian State.

With the considerable growth of international law to bring about the peaceful settlement of disputes between States, it is becoming more and more common for a disputed land or maritime border to be determined or confirmed either by an international legal authority, such as the International Court of Justice (ICJ), or by means of international arbitration. Regarding these two approaches, it is worth mentioning that the determination or confirmation of the border cannot be initiated or executed other than by means of a special agreement ('compromis'), which is generally reached by the affected States before submitting the dispute to the international legal authority or an international court of arbitration. As a result, at the root of any delimitation operation, there is always a voluntary agreement by the Parties concerned, which in legal terms takes the form of an international agreement (treaty).

The International Treaty

Definition: Whatever it is called (agreement, convention, protocol, pact, act, etc.), the international treaty is always an agreement between the subjects of international law (States, international organisations) designed to bring about certain legal effects (rights and obligations). In its strict sense, the international treaty is defined by the process used for its conclusion; in other words, by its form rather than its content. As such, treaties are characterised by two traits:

- (a) The mediated conclusion comprising three distinct phases (negotiation, signature, ratification);
- (b) A single legal instrument (the operative text, appendices, etc.)

Agreements in simplified form: An alternative to international treaties is an agreement in simplified form, which does not require ratification by the State organ invested with 'treaty making power' (generally the Head of State). They are usually drawn up by Ministers of Foreign Affairs and diplomatic agents and are characterised as:

- (a) Always having an immediate conclusion (negotiation and signature);
- (b) Frequently, but not always, by the plurality of legal instruments (exchange of letters, notes, declaration).

The presence or absence of ratification thus constitutes the sole legal criteria for differentiating the treaties per se from international agreements in simplified form. This distinction does not, however, relate to a difference in content, because there is no objective hierarchy between formal treaties and agreements in simplified form.¹⁰⁷

Classification of treaties: In the context of this chapter, one material classification is of methodological interest: the one that distinguishes between contract treaties and law-making treaties. This classification is based on the legal functions to be performed by the treaties, namely: undertaking a legal operation (contract treaties), such as alliance, trade or delimitation treaties, etc.; or, the institution of rules of law, such as the UN Charter, the UN Convention on the Law of the Sea of 1982, and the Constitutive Act of the African Union.

The Delimitation Treaty

Definition: As with all treaties, the delimitation treaty constitutes a written agreement concluded in accordance with the current rules of international law and which issues from the common will of two States. It aims to pacifically, permanently and definitively settle the limits of each State's territories, as well as the space in which they exercise their respective sovereignties. One of the characteristics of this treaty is the creation of a legal regime (statute) for the border shared by the two States. Where they accord specific (autonomous) territorial status to border regions, the provisions are enforceable upon all States, whether or not they are States Parties to the treaty. The procedure for concluding delimitation treaties is the same as that used in other treaties: negotiation, signature, and ratification.

Classification: There are four discernable types of treaty depending on the objective: the general treaty, the specific treaty, a treaty establishing a State's territorial sovereignty, and a treaty granting independence to a State. This classification has only methodological significance, however.

¹⁰⁷ Rousseau, C. (1973), *Droit international public*, Dalloz, Paris, seventh edition, p. 23.

- 1 The **general treaty** includes peace, friendship, cooperation and good neighbourliness treaties. The purpose of these agreements is to address a range of issues related to the future relations between States Parties and, in this way, include many sections on cooperation ranging from the end of a state of war; mutual recognition; border delimitation; as well as economic, legal and other types of cooperation. This type of treaty aims, in principle, to establish a durable peace between Parties concerned, to guarantee the territorial integrity of each party, to renounce the use of all force, and often to carry out territorial concessions or boundary modifications between States.
- 2 The **specific treaty** comprises, in principle, an agreement within a single instrument, whose sole aim is, for example, to delimit a border or part of a border. As a consequence, a border treaty establishes an appropriate territorial statute for the border in question, laying down the rights and obligations of States Parties.
- 3 A **treaty establishing a State's territorial sovereignty** includes agreements that governed the sharing (condominium) of the exercise of sovereignty over the territory of a given State. An example is the Anglo-Egyptian Agreement of 1899, which established a condominium over the Sudan.
- 4 A **treaty granting independence to a State**: pertains primarily to agreements between new States created following decolonisation, particularly in Africa. Specifically, this treaty defines the territory of the new State and, furthermore, establishes a new legal framework for future cooperation between the predecessor State and the successor State. ¹⁰⁸

Negotiation Framework

Negotiations normally take place within a joint framework such as in bilateral commissions between pre-established national structures (national boundary commissions). These structures are, in principle, composed of representatives of the relevant technical bodies, diplomats, legal experts, and other specialists in areas such as topography, mapping, geodesy, etc. They begin as political decision to implement the text of an agreement, rendered even in a simplified form or a *procès-verbal*, drawn up by both countries' authorities.

In general, discussions are initiated on the basis of either one or two draft texts submitted by Parties, and cover the body of documentation

¹⁰⁸ Saad, A.O. (2007), *International boundaries* (in Arabic). Published by Houma, Algiers.

related or linked to the border in question (legal texts, geographical maps, notes, reports, etc.) that the Parties possess. The objective of the discussions, when the work is completed, is to draw up the draft text of a definitive treaty comprising a delimitation that must be:

- (a) Complete and apply to the entire border;
- (b) Precise and avoid vague and indeterminate expressions like “the border will extend ‘up to’ such and such a point”;
- (c) Exact; in other words, match in practice the geographical data.

Contents of the Treaty

The treaty generally consists of the following elements:

The **preamble documents**, in particular, commitments and principles between and among the negotiating parties related to, amongst others, sovereign equality, security, territorial integrity, the inviolability of borders, etc. This section of the treaty also mentions the political, legal or other motives and principles that have brought these States to conclude the act of delimitation at hand or form the basis of such conclusion.

The **scheme** amongst other things, describes in detail the borderline, dividing it up where necessary into segments. The scheme also establishes the rights and obligations of each of the Parties in relation to the border; it stipulates, where possible, the methods and conditions for exploiting the natural resources that straddle the border; it often defines how boundary markers (pillars) will be built and how geographical maps and other documents will be drawn up; it creates a mechanism for implementing the demarcation of the border, which is generally done through a bilateral technical commission that determines its composition, missions and remit.

If the border is being delimited in the context of a peace treaty, scheme is carried out within a multilateral rather than bilateral structure, tasked with the delivery of the mission.

Final provisions define in particular the methods for:

- (a) Bringing the treaty into force which, in most cases, focus the treaty’s implementation on the accomplishment by each State Party of the procedure required for these ends; in other words,

the ratification or acceptance of the treaty by the appropriate constitutionally empowered authority;

- (b) Settling the disputes that can arise when interpreting or implementing the treaty. In particular, these plan for diplomatic negotiations as a first option, then the submission of the dispute to a court of arbitration or international court of law as a last option.

Appendices contain protocols consisting of certain clauses or concepts, geographical maps, model official documentation, etc. attached to the main treaty instrument. These appendices must, in principle, form an integral part of the treaty at hand and, as a consequence, have the same legal value as the said treaty.

Particular rules governing the delimitation treaty

Three specific rules (or principles) characterise the delimitation treaty and distinguish it from all other international treaties. These rules were developed on the basis of the fundamental principle of respect for territorial sovereignty and border stability, in response to the major concern of States to confer complete and permanent legal stability upon their borders and, as such, upon their related treaties.

- 1 The **rule of automatic succession for border treaties**. Established by the 1978 Vienna Convention on the Succession of States in respect of Treaties (articles 11, 34 and 35), which obliges the successor State to respect, without special procedure, the pre-existing territorial borders of the predecessor State, from which it has succeeded.
- 2 The **rule prohibiting the enactment of the principle of a 'fundamental change of circumstances' (*rebus sic stantibus*)** with regard to border treaties. Codified by Article 62 of the 1969 Vienna Convention on the Law of Treaties and Article 11 of the 1978 Vienna Convention on the Succession of States in respect of Treaties, this rule prohibits, in substance, a State-Party of a border treaty from invoking a 'fundamental change of circumstances' in order to terminate the treaty or withdraw from it, unless otherwise agreed by both Parties.
- 3 The **rule of the continuity of border treaty provisions beyond the period of validity of said treaty**. Established by Article 62 of the 1969 Vienna Convention on the Law of Treaties, which indicates that the rights accorded to the State over its territorial space by the abovementioned provisions are definitive and permanent and

comply with the relevant rules and principles of international law. In other words, the treaty provisions relating to borders maintain their own continuity and operate independently from the treaty as a whole (as in the case of general delimitation treaties whose period of validity is determined).¹⁰⁹

Registration and publication procedure

Registering delimitation treaties with the Secretary-General of the United Nations (UN) in accordance with Article 102 of the Charter carries a particular importance because a State, according to the terms of said Article, cannot bring said treaty before UN organs – notably the International Court of Justice – in the case of a dispute with another Member State in this respect, without first having completed this procedure. The procedure consists of registration of the treaty and its publication by the Secretary-General's office. In boundary-making, it can be undertaken in two phases: first, just after the conclusion of the delimitation treaty; and second, after the completion of demarcation works. For the latter, the registration documentation must include the set of documents related to demarcation, including the description of the borderline, geodetic coordinates, geographical maps, etc. as well as documents pertaining to densification or any other modifications made to the borderline.

Mapping

Succinctly stated, the legal value of geographical maps varies and, in particular, depends on whether they are drawn up as part of a delimitation treaty or unilaterally, subsequent to the conclusion of the treaty, be they appended to said treaty or not. A map appended to the legal text agreed by the two States in question is by far the most clear-cut form of evidence for settling legal disputes based on cartographic evidence.

¹⁰⁹ Saad, A.O. (2007), *International boundaries* (in Arabic). Published by Houma, Algiers.

In the other instances, if the mapping quality conforms to international technical standards, the court of arbitration or adjudication examining the cartographic evidence may confer a wholly indicative or relative value upon the material, according to the circumstances of each case under examination taken in isolation.

Delimitation reaffirmation, updating and modification

Reaffirmation of a border's delimitation is common in countries created by colonisation, particularly in Africa. It basically deems that the border has already undergone delimitation at some point in the past and that, for diverse reasons after independence the border needs to be reaffirmed, established and internationally recognised by the authorities of the new States. Reaffirmation occurs, for example, when the colonial delimitation is the consequence of several legal instruments that usually date quite far back in time and have undergone repeated modification or poorly define the border.

In principle, the conclusion of the reaffirmation treaty follows the same stages and procedures used when concluding any other delimitation treaty. Moreover, it is subject to the same rules and is governed by the same abiding legal principles as a new delimitation treaty.

Updating, in reality, does not relate to delimitation as such, but solely to confirming and remarking, if necessary, the physical signage marking the borderline. This can include reconstruction of damaged boundary markers and densification of existing boundary markers, in order to provide a clearer distinction between the respective territories of each State for populations living near the border. Updating can also include the revision of maps of the border area in question.

A rare occurrence in international practice, but **delimitation modification** is undertaken especially to address the hypothetical movement of watercourses where this affects fluvial delimitation. In order to be accorded any legal value, modification must be carried out with the mutual consent of both States using an international legal instrument concluded in accordance with the relevant international rules of law.

Said legal instrument must respect the set of conditions and procedures required for delimitation treaties.

Conclusion

To wrap up this chapter – but not this subject – it remains to be said that international border delimitation, as set out schematically above, is a complex procedural operation with an essentially legal character, whose completion is dependent, in principle, on the political will of the States concerned. Delimitation requires as much time and means as are necessary for this to happen, particularly given the importance this has in terms of international relations.

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Chapter 3

Boundary Commissions: Creating Effective Structures and Practices

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Introduction

As the dividing lines between neighbouring territorial sovereignties, international boundaries are strictly bilateral in nature. This means that any practices related to boundaries require the active participation or consent of both neighbouring States. International boundary commissions play a crucial and yet many times underappreciated role in the on-going practices of improving and maintaining the definition of an international boundary in order to prevent disputes between the neighbouring States and pave the way for greater cross-border cooperation. Their mandates and structures have varied widely through history, as the arbitral tribunal in the recent 2009 Abyei case suggests: “Historically, many bodies, with many different titles, have been endowed with the specific task of delineating and/or demarcating boundaries. The role and mandate of such bodies differ as a function of the parties’ agreement on what each particular ‘boundary commission,’ ‘boundary committee,’ ‘mixed commission,’ etc. was designed to do.” ¹¹⁰

While their structures and mandates continue to vary, the inherent *raison d’être* of a boundary commission is to improve the definition of boundaries with the active representation or explicit consent from both neighbouring States. In doing so, boundary commissions undertake the often difficult challenge of balancing national-level political deci-

¹¹⁰ Final Award of 22 July 2009, p. 162 paragraph 456.

sions with the realities of the local border landscape.¹¹¹ This chapter will examine the organisational structure of different types of joint and national boundary commissions, highlighting the relative strengths and weaknesses of these structures. Drawing from both historical and modern examples, the chapter will outline some good practice guidelines for how a boundary commission might be established (or revised), including recommendations for: constitutive agreement, operational structure, authoritative mandate, technical instructions and dispute resolution mechanisms. These guidelines are tailored to advise the creation or revision of commissions that are established to recover and re-demarcate older or ambiguously defined boundaries, since this is the key challenge posed to many African governments in the context of the African Union Border Programme (AUBP).

Modern Boundary Commissions

Today, international boundary commissions have a range of structures and responsibilities, but the focus of this chapter is on those commissions that are responsible for boundary definition, including legal delimitation and physical demarcation. It is important to identify the different types of boundary commission structure to see how those practices have been undertaken. Generally modern boundary commissions can be categorised as joint boundary commissions (both temporary and permanent) or as national boundary commissions. The former involves active participation of both neighbouring States, while the latter is the domestic government agency responsible for boundary issues. Although these categories are not exclusive and some commissions may overlap into other types, it is a good way to begin understanding how they are structured and how they operate.

Joint Boundary Commissions

Many joint boundary commissions are established to fulfil a certain, finite objective, usually the completion of boundary demarcation. This means that they are temporary in nature and usually are dissolved upon completion of the allotted task. The majority of modern temporary boundary commissions will just include representatives from the two neighbouring States. They are normally responsible for recovering a pre-existent boundary and improving its definition both on the ground and in legal delimitation texts. In some cases, this involves up-

¹¹¹ See Donaldson, J. (2008), *Politics and scale in boundary-making: the work of boundary commissions*, in *Journal of Historical Geography*, Vol. 34, no. 3, pp. 393-396.

grading a former internal administrative boundary to an international boundary. Following the break-up of the USSR, the independent States of the former Soviet republic established temporary joint commissions to identify the former Soviet administrative boundaries and demarcate them as international boundaries. This has also been the case with commissions set-up to upgrade boundaries of the former Yugoslav republics. Similarly, some temporary commissions may be established to recover a boundary that may have previously been delimited or demarcated but has disappeared from the landscape. This is the case with many post-colonial States that may not have maintained or improved the definition of their boundaries since independence. The distinguishing characteristic of these boundary commissions is that they are temporary in duration, with a finite responsibility usually to recover and demarcate a boundary.

Some temporary commissions will include third-party participation and are sometimes established following an inter-State conflict. This structure is similar to boundary commissions of the nineteenth century that included chairmen or mediators from third-party States, such as those in Europe and the Near/Middle East that were effectively imposed following conflicts and included 'neutral' commissioners from third-party States, usually one of the main imperial powers such as Great Britain, France or Russia. Following the Crimean War, the Treaties of Paris and Neuchatel established a mixed commission to define the boundary between Russia and the Ottoman Empire that included a British representative to act as mediator. The 1847 Treaty of Erzeroum [Erzurum] established a quadripartite commission to define the Ottoman-Persian boundary, including British and Russian representatives again acting as mediators.¹¹² More recent examples include the various boundary commissions across Europe and the Middle East in the 1920s that were set up by the Paris Peace treaties following the First World War and included third-party observers/monitors. The 1947 boundary commission that partitioned India at independence included commissioners from India and Pakistan as well as a commission chairman, Cyril Radcliffe, who was appointed by the British government. Observers from the United Nations (UN) monitored both the 1993 Iraq-Kuwait Boundary Demarcation Commission and 2000 definition of the Israel-Lebanon line of withdrawal. Current UN representation on the Cameroon-Nigeria Mixed Commission is analysed in greater depth by Mr. Ali Touré and Surveyor Sani Isa in Chapter 11.

¹¹² Schofield, R. (1989), *The Iran-Iraq Border 1840-1958*, Vol. 1, Archive Editions.

The role played by the third party will also vary according to the circumstances of the dispute settlement and the authority given to it by the States involved. The level of third-party involvement can be seen on a scale, from serving as an identified arbiter who is mandated to give judgements through to a representative, tasked with simply observing the activities of the commission without having any influence on decision-making.

Arbitral Tribunal



(Increasing authority of third-party representation within a boundary commission)

UN-mandated Observer

The Eritrea-Ethiopia Boundary Commission was made up of international jurists who acted as a legal tribunal with the mandate to delimit and demarcate the disputed boundary. The 1947 Radcliffe commission effectively served as an arbitration since Radcliffe himself, as the commission chairman, made the vast majority of decisions. The four representatives, two each from India's Congress Party and Pakistan's Muslim League, failed to agree on most points.¹¹³ The 1993 Iraq-Kuwait Boundary Demarcation Commission included five members, one each from Iraq and Kuwait, as well as three independent members. According to Jan Klabbers, these independent members remained as neutral as possible, but the UN Security Council remained aware of the commission proceedings and UN personnel assisted in the physical demarcation exercise.¹¹⁴ In other cases, a third-party representative may only act as an outside observer without any influence over commission proceedings. This is the case with the UN involvement in the Cameroon-Nigeria Mixed Commission since it acts only as an observer or facilitator, and cannot make judgement on any disagreements that arise.

Permanent Joint Boundary Commissions

Since boundary markers and tracks defining a boundary are exposed to natural and human forces, many States have realised that boundary demarcation is not a finite practice. In fact, at the conclusion of many 'temporary' demarcation exercises, a regime may be specified in the

¹¹³ Chester, L. (2008), *Boundary commissions as tools to safeguard British interests at the end of empire*, in *Journal of Historical Geography*, Vol. 34, no. 3.

¹¹⁴ Klabbers, J. (1994), *No more shifting lines? The Report of the Iraq-Kuwait Boundary Demarcation Commission*, in *International and Comparative Law Quarterly*, Vol.43, no. 3, pp. 904-913.

final agreement to maintain boundary pillars and keep them intervisible. After the conclusion of the Algeria-Mali mixed commission, the commission was dissolved and a permanent commission was created to conduct on-going maintenance and densification of the boundary (see Chapter 9). In some cases, a temporary boundary commission that had been responsible for boundary recovery or demarcation can be extended to conduct on-going boundary maintenance. This was the case in 1925 when Canada and the USA agreed to convert their previously temporary International Boundary Commission (IBC) into a permanent commission with on-going responsibilities for boundary maintenance. The IBC is empowered by their governments to maintain an “effective” boundary, which includes responsibility for repairing and rebuilding pillars, building new pillars to improve visibility, clearing the ‘vista’ so pillars are intervisible as well as addressing any infrastructure that might encroach within 10 feet (3 metres) on either side of the boundary line.¹¹⁵ The IBC has a permanent budget allocated from both States and the commissioners meet regularly, undertaking maintenance fieldwork every summer season.

There are many examples of permanent boundary commissions that have responsibilities other than boundary demarcation and maintenance. Some deal with issues such as cross-border water management, environmental management, security/access management and the often poorly-defined task of general trans-border cooperation (for more specific recommendations see Professor A. Asiwaju’s work in Chapter 8). Many African States, maintain local joint commissions that may deal with local security and access border management issues, such as seasonal livestock grazing and cattle rustling. These local commissions usually are not responsible for boundary demarcation and maintenance issues, which remain a responsibility of the national governments. In dealing specifically with boundary demarcation and maintenance, the permanent boundary commission structure has several benefits. The platform provides a high political level of interaction between neighbouring States and can provide a permanent forum for the two States to share information. The IBWC example shows how permanent commissions related to maintenance can be expanded to deal with other issues of border management. In addition, having a permanent commission indicates that both neighbouring States view boundary maintenance and management as continuing responsibilities, and are committed to keeping a platform for joint discussions on border issues permanently open.

¹¹⁵ See especially www.internationalboundarycommission.org

National Boundary Commissions

National boundary commissions are different from joint boundary commissions in that they are exclusively unilateral, established within an individual government hierarchy through domestic legislation. They are the national departments responsible for boundary issues that support the work of bilateral commissions (either temporary or permanent) established with neighbouring States. In many cases, the domestic national boundary commission will be a division within the Ministry of Foreign Affairs or in the Ministry of the Interior. Although situated within these ministries, given their specific focus on boundary issues it is important that national boundary commissions have a strong degree of autonomy. Mr. Kesraoui highlights in Chapter 9 that Algeria's national boundaries division is organised within the ministry of External Relations, but has an independent budget. This is also the case with the American section of the Canada-USA IBC. Without such distinct autonomy, national boundary commissions can be subject to the budgetary constraints of a specific ministry and may not be able to engage consistently with their colleagues in neighbouring States outside of formal diplomatic channels.

To overcome problems encountered within being organised within a specific ministry, some African States have established national boundary commissions that are distinct departments or agencies. This can provide greater flexibility for a State's delegation participating in joint boundary commissions. An autonomous national boundary commission may also be able to coordinate activities across other domestic departments or ministries, making it able to deal with other issues of border management beyond the practices of delimitation and demarcation. Given their work in local borderland areas, national boundary commissions are ideally placed to advise and address other issues of border management on their respective side of the boundary line.

When Professor Anthony Asiwaju envisioned the Nigerian National Boundary Commission (NBC) in the late 1980s, it was in response to what he saw as the limitations of the North American model of permanent joint commissions. He felt that their respective mandates were too limited on technical aspects, providing little room for expanding to include other aspects of border management.¹¹⁶ The NBC is now a

¹¹⁶ Asiwaju, A.I. (1989), *National boundary commissions as problem-solving institutions: Preliminary research notes on Nigeria, Niger and Mali*, in *International Boundaries and Boundary Conflict Resolution, 1989 Conference Proceedings* Durham, International Boundaries Research Unit (IBRU), p. 20.

bespoke government agency organised within Nigeria's Office of the President. Its managerial council is chaired by the Vice President of the Federal Government and includes ministers from most government ministries (such as Defence, Internal Affairs, External Affairs, Police etc.). It can also include governors of individual federal states if issues relate to their respective constituencies. The Director General leads the NBC's day-to-day operations with this managerial council structure being repeated down the federal administrative levels through to local districts.

Although it was created initially to address international boundary issues, the NBC now deals mainly with internal boundary issues, between federal states and other local administrative districts. Although NBC staff is frequently involved, the responsibility for international boundary maintenance is now held by the Nigerian Survey Department that deals on an *ad hoc* basis with neighbouring States. This is the case with the Cameroon-Nigeria Mixed Commission, a temporary commission undertaking boundary demarcation following the 2002 Judgement of the International Court of Justice.¹¹⁷ The strength of the Nigerian NBC structure is its ability to relay local boundary issues through a defined administrative hierarchy to higher political decision-makers.

As outlined by Mr. José Elias Mucombo in Chapter 12, Mozambique has a similar domestic arrangement. The Prime Minister chairs the Inter-Ministerial Commission on Sea and Boundaries, which provides political authority and oversees the main operational body – the National Institute of the Sea and Boundaries (*Instituto Nacional do Mar e Fronteiras – IMAF*). IMAF contains three directorates dealing with maritime issues, land boundary issues and legal issues (including extended continental shelf claims). The Institute then coordinates commissions of experts and technical committees that engage with neighbouring States in joint boundary commissions. As distinct government agencies rather than being organised exclusively within an existing ministry, the Nigerian and Mozambique national boundary structures are able to coordinate activities with other government agencies to generate political influence and engage more directly with colleagues in neighbouring States.

¹¹⁷ More information on the work of the Cameroon-Nigeria mixed commission can be found in Chapter 11.

Setting Up or Revising a Boundary Commission

Within the AUBP initiative, many African States may be at the stage of recovering older boundary definitions and re-demarcating them on the ground, practices that are explained in Chapters 1 and 2. Whether setting up a new joint boundary commission or revising an existing commission to undertake this work, it is important for neighbouring governments to agree a common goal and provide the political will to achieve a clearly defined boundary line that is least likely to cause future disputes. The historical, geographical and political context of every boundary across Africa is unique which makes it difficult to outline a single commission structure that will be applicable in every case. In addition, there are no international legal regulations governing the structure or work of a boundary commission which means that neighbouring States have maximum flexibility in creating a boundary commission that is acceptable to both sides and is best suited to their specific boundary. However, based on the experiences and examples of existing boundary commissions, particularly in Africa, it is possible to outline some good practice guidelines that may help governments create an effective joint boundary commission that is more likely to achieve whatever goal has been agreed. In setting up a new boundary commission or revising an existing one, there are five key areas of concern that need to be addressed.

1. Constitutive Agreement

Since boundaries are of such importance to each State as a whole, it is preferable that a boundary commission be set-up or revised through a binding constituent agreement, such as a fully ratified treaty. This will describe the mandate, structure, technical specifications and dispute resolution mechanisms that are examined in more detail below. Depending on the constitutional arrangement of the neighbouring States, ratifying a bilateral treaty may be a long and difficult political process. However, once it is ratified a treaty becomes a binding mechanism that commits both States to completing the task given the boundary commission. Under a binding treaty, reports and decisions of a boundary commission can be integrated directly into the domestic legislation of both States. It may be easier to gain domestic political approval for a commission to be set-up under an inter-ministerial memorandum of understanding (MoU) or other less formal bilateral arrangement. If there is good political will from both States, certainly good progress can

be achieved under a less formal agreement. However, if there is a less binding commitment by both States, it may be easier for the progress of a commission to stall when a disagreement emerges, since the full commitment of both governments is not enshrined in a binding treaty. In addition, it could be difficult for the final reports/decisions of the boundary commission to be ratified by the respective governments if the work is undertaken under a less formal agreement or there is a lack of political will on either side.

2. Mandate

Second, and perhaps most important, is the mandate given to a joint boundary commission, specifying its authority and jurisdiction. The mandate given a boundary commission can be placed along a scale or spectrum of authority, where at one end is a strong or direct mandate and at the other end is a weak or indirect mandate. A strong mandate will be outlined in clear and unambiguous language within the treaty. The commission may be given distinct legal personality so that it can enter directly into contracts with any relevant outside groups, as is the case with the Nigeria-São Tomé and Príncipe Joint Development Authority established to manage their joint development maritime area.¹¹⁸ Under a strong mandate, negotiations would be carried out between the two delegations within the commission and their agreed decisions would be submitted to the highest levels in their respective governments for approval. In this regard, the decisions of the commission would be directly linked with the domestic legislation of the neighbouring States.

A strong mandate also gives a commission the authority to interpret an old or ambiguous boundary definition and to adapt the boundary to the current conditions of the landscape. A stronger mandate may specify that a commission is guided by older (often colonial) agreements or documents, but would allow a commission to find the most suitable and acceptable course for the boundary in the present-day, local border landscape. For example, the 1927-33 Anglo-Belgian boundary commission that demarcated sections of the DRC-Zambia boundary along the Congo-Zambezi watershed was permitted to make boundary adjustments on the ground of up to 500 metres. The commission could even propose adjustments beyond 500 metres to the respective governments for approval. The instructions issued to the Anglo-Belgian

¹¹⁸ For more information see www.nigeriasaotomeida.org

boundary commission were outlined in the 1927 Brussels agreement, and Article 2 provides an excellent example of a strongly empowered mandate:

- 1 The Commissioners shall have authority, generally, to make such minor rectifications, and adjustments, to the ideal watershed as are necessary to avoid the troubles that might arise from a literal interpretation of the treaty.
- 2 The present position of the boundary pillars shall be accepted where they lie not further than 200 metres from the ideal watershed. In exceptional circumstances, and in areas of no particular known economic value, errors of position up to 500 metres may be allowed. In adjusting such departures from the ideal watershed to the general run of the boundary, no sharp re-entrants will be formed.
- 3 Where there are alternative ideal watersheds, including undrained basins, the Commissioners shall agree upon, and demarcate, a compromise line.
- 4 In all cases of encroachment by the nationals of either party, the Commissioners will be guided by the following general principles:
 - (a) Properties and enclosures which lie athwart the ideal watershed shall be left undivided as far as possible, whether they be State, corporation, tribal or individual, in character.
 - (b) The good faith and economic importance of any encroachment shall be taken into account.
 - (c) No encroachment of a date subsequent to the signature of this agreement shall be considered.
- 5 In the possible event of a difference of opinion, each Commissioner will forward an immediate report embodying the view of both parties to:
 - (a) The home authority.
 - (b) The local authority, together with a request that local views may be represented as early as possible to the home authority.

In the above case, the ideal watershed will be marked temporarily, but adequately, during the progress of discussion. ¹¹⁹

The Brussels agreement was a pragmatic attempt to give the boundary commissioners a strong degree of flexibility when interpreting

¹¹⁹ Reproduced in Brownlie, I. (1979), *African Boundaries: A Legal and Diplomatic Encyclopaedia*. London, Hurst and Co., pp. 709-710.

the delimited boundary on the ground based on the conditions of the landscape. This included dealing with the encroachment of settlements across a boundary that had previously been invisible on the ground. Given the age of colonial boundary definitions, present-day boundary commissions in Africa implementing the AUBP will almost certainly be faced with serious discrepancies between the boundary as described in older documents and the reality of local border landscape. Therefore it is essential that commissions be clearly mandated to deal with these discrepancies.

A commission with a weak or indirect mandate will only play an advisory role in boundary negotiations. Such a commission may only be tasked with gathering documentary evidence and advising their respective foreign ministries. In this case, negotiations are then conducted through standard diplomatic channels rather than within the commission itself. If a commission is unable to conduct negotiations or make decisions outside of the normal channels of foreign relations, it is difficult to see the point in creating a commission at all. Even if a commission with an indirect mandate is allowed to conduct negotiations, it will be given little flexibility to interpret documentation. Instead a narrow mandate would direct the commission to take a strict interpretation of material and to apply an older boundary definition with rigidity. This could easily lead to problems if the older definition is ambiguous or incomplete. If a commission is directed to take a strict interpretation of one aspect of definition (such as documentary evidence or mapping) and there is any ambiguity in that definition, then the commission is unlikely to work through any opposing interpretations of the definition.

3. Structure

Third, the structure of the commission is another important factor in how effective it will be. Most current joint boundary commissions in Africa have a similar, general structure that includes three identifiable levels:

- ▶ Joint ministerial council;
- ▶ Joint technical committee/commission;
- ▶ Technical field sub-teams.

Although the names of the respective levels may be different, this form of structural arrangement is common. Within this structure, the joint ministerial council will be formed by an equal number of ministers from

both States, usually including the ministers of foreign affairs, interior, lands, customs/immigration and defence. This ministerial body provides the political authority to the boundary commission and is usually mandated to approve the work and reports submitted by the joint technical commission. It will also be mandated to settle any disputes that emerge in, and are submitted by, the joint technical commission. The ministerial council will usually meet only once or perhaps twice a year in the respective capitals, largely dependent on the work of the joint technical commission. Unless there is an appointed third-party chairman, the meetings of ministerial councils will be chaired by an identified minister in the government hosting the meeting.

There is no requirement for boundary commissions to include a council of ministers. Neighbouring States are able to structure a boundary commission in whatever form they desire, as long as there is necessary political influence and technical capacity to achieve the agreed goals of the commission. Traditionally, boundary commissions prior to the mid-late twentieth century did not include a council of ministers so the lead commissioners themselves were often given a great deal of authority and flexibility in order to achieve a boundary settlement. As outlined by Mr. Coulibaly in Chapter 10, the mixed technical commission between Burkina Faso and Mali was given strong political influence so a ministerial council was not necessary to complete the demarcation exercise. It is difficult to coordinate meetings with numerous ministers who each have busy schedules. Given the complexity of boundary practices of recovery/delimitation/demarcation, it is also difficult for a ministerial council that meets just once a year to stay fully informed about what can be a variety of complex issues.

The joint technical commission/committee is the heart of boundary commission, as it is usually responsible for planning and executing the work involved in recovering, defining and demarcating a boundary. The number of representatives within the joint technical commission can vary widely, but the respective surveyor generals or national boundary commissioners will normally jointly lead it. Ideally a small core staff with a good balance of relevant technical skills and training (surveying, legal, political, GIS, etc.) should aid the leaders of the joint technical commission. The two commissioners should be well respected within their respective governments and able to call on different ministries, departments and agencies for information and assistance, as it is required. Any disagreement or dispute that cannot be resolved by the leaders of the joint technical commission will usually be referred to the

ministerial council or even the heads of state for resolution. If a settlement still cannot be reached, disputes should be referred to a specified dispute resolution mechanism (see section 3.5 below).

The relationship between the two leaders of the joint technical commission is crucial to the overall success of the boundary commission. Some joint technical commissions today are still led by surveyors (particularly those permanent commissions dealing with issues of boundary maintenance) such as the Canadian Commissioner on the IBC who is also surveyor general of Canada Lands. However, foreign ministry representatives now many times lead boundary commissions. While a diplomatic or political background can provide a commissioner with more political influence within his/her respective government, a surveying background can provide the technical skills more suitable for demarcation fieldwork and boundary mapping. Perhaps ideally a commissioner should have both surveying expertise/experience alongside strong political influence/diplomatic skills. Depending on the mandate given to the boundary commissioners and their individual qualities, they can play key roles in keeping up momentum within the commission. If the two head commissioners can forge a close working relationship built on trust, the commission is much more likely to reach agreement.

The joint technical commission often creates a series of sub-committees to undertake defined tasks such as the collection of archival material, survey and mapping, local borderland engagement/sensitisation and demarcation. These sub-committees may undertake the fieldwork themselves or appoint joint working teams, often from local border areas. In essence, these groups are responsible for collecting information from the field, and reporting this information back to the joint technical commission. The sub-committees would also normally be responsible for implementing decisions of the joint technical commission and undertaking the work of demarcation. Any disputes that emerge within the working/field sub-committees will normally be referred to the joint technical commission for resolution.

4. Technical Specifications

Fourth, an agreement establishing a boundary commission for boundary recovery and re-demarcation should also outline, as much as possible, the technical specifications involved in boundary demarcation and mapping. More information on recommended technical specifications can be found in Chapter 6 and 7, Appendix A and is analysed in greater detail in the specific contexts of the case studies included

below (Chapters 9-12). Generally speaking, if demarcation is part of the mandate of a boundary commission, it would be best to agree dimensions of the boundary pillars/marks and some guidelines concerning the frequency of pillars in advance. If boundary mapping is required, a commission could be more efficient if issues such as a common geodetic datum, scale and cartographic requirements (language, place names, formatting, etc.) are all specified in the initial agreement or agreed by the commission very early on. If technical specifications are not specified within the constituent agreement, a commission may spend a significant amount of time and goodwill just negotiating these issues. However, as is the case with the Cameroon-Nigeria experience highlights below, it may also be beneficial if the commission is given some flexibility to interpret the technical specifications based on local conditions and on the available budget.

5. Dispute Resolution Mechanisms

Fifth, mechanisms for dispute resolution are also an important part of the constitutive agreement that sets up or revises a boundary commission responsible for recovering and/or re-demarcating an older boundary definition. Unless a boundary commission is mandated specifically as an arbitral tribunal (such as the Eritrea-Ethiopia Boundary Commission), the boundary commission itself is set up to act effectively as a boundary dispute resolution mechanism. Based on the general structure of current boundary commissions in Africa, if a dispute emerges within the joint technical commission over interpreting information (either documentary or on the ground) it is then forwarded to the joint ministerial council for resolution. Ideally, these disagreements will be resolved through negotiations within the joint ministerial council and provided to the joint technical commission so progress can continue. However, if a joint ministerial council cannot resolve a disagreement that threatens to stop progress of the commission, it is advisable to have additional dispute resolution mechanisms specified in the constitutive agreement.

The constitutive agreement should specify a series of non-binding and/or binding third-party mechanisms for dispute resolution. More effective mechanisms will provide decisions on disagreements that are binding on both parties. These include:

- ▶ Adjudication by a standing court – such as the International Court of Justice, International Tribunal for the Law of the Sea or the African Court of Justice.

- ▶ *Ad hoc* arbitration – such as a tribunal organised within the Permanent Court of Arbitration, or by a specified arbitrator such as a mutually-agreed, third-party head-of-state.

The 2002 Timor Sea treaty, detailing the maritime boundary arrangements between Australia and East Timor, includes an attached annex that clearly outlines a dispute resolution procedure for creating an *ad hoc* arbitral tribunal.¹²⁰ Such a complex arrangement may not be necessary in every case, but it is essential that the mechanism is acceptable to both sides and they agree that the decision is final and binding.

Although they may not be binding, other forms of third-party involvement for dispute resolution can also be effective at helping resolve a disagreement that may be impeding the progress of a boundary commission. Non-binding mechanisms allow the States to retain a strong degree of control over discussions, and provide the option of accepting or rejecting settlement proposals. Forms of non-binding, third-party involvement include:

- ▶ Conciliation by a defined panel of outside experts, providing non-binding recommendations for settlement.
- ▶ Involvement of third-party ‘guarantor’ States, regional or international organisations (AU, ECOWAS, IGAD, SADC, etc.) – such as the involvement of the four guarantor States in the boundary dispute between Ecuador-Peru.
- ▶ Mediation through a specific individual, organisation or State – such as using the ‘good offices’ of the UN Secretary-General that are now mediating negotiations between Gabon and Equatorial Guinea.
- ▶ Track-Two negotiations that may be conducted by respected individuals from both States.

The recommendations of third-parties, such as independent conciliation commissions, may bring new ideas or experiences for resolving a specific issue. Involving disinterested third-party states may also bring external political influence that may help unlock a dispute. The 1942 Rio Protocol which established the Ecuador-Peru Boundary Demarcation Commission specified that four ‘guarantor’ governments (Argentina, Brazil, Chile and the United States) would provide support for the commission. Under this commitment, the United States undertook aerial surveys of the Ecuador-Peru border in 1946 to produce border mapping. However, the commission was unable to resolve all outstand-

¹²⁰ See Annex B, of the 2002 Timor Sea Treaty.

ing issues at that time and conflict reignited again in the 1990s. Once again, the four guarantor governments played a key role in proposing a final solution in 1998 that was eventually accepted by Ecuador and Peru in 2000. ¹²¹

Reference to dispute resolution mechanisms that are not binding or do not specify third-party involvement are much less likely to remove a disagreement quickly and facilitate successful completion of a commission's work. Weaker forms of resolution include resolving disputes through:

- ▶ Negotiation;
- ▶ Consultation between the parties;
- ▶ Standard diplomatic channels;
- ▶ 'Through some method to be defined by the two parties.'

These terms and phrases are frequently too ambiguous to be used by the parties as effective dispute resolution mechanisms. Indeed, negotiation and consultation should be utilised within that boundary commission itself. If the parties within a commission cannot agree a specific point of interpretation or detail, it is unlikely that the dispute would be resolved through negotiation, consultation or standard diplomatic channels. In addition, if left undefined, it could take many years for the parties to agree a binding dispute resolution mechanism once a disagreement has already stopped the progress of the commission and provoked tension. ¹²²

If a commission's constitutive agreement includes these less effective types of non-binding mechanisms, it can be difficult for a boundary commission to overcome a specific problem and continue its work. Two States that establish a commission and specify binding resolution mechanisms demonstrate a greater commitment to working through any problems and having the commission reach a successful outcome. As a warning, dispute resolution mechanisms are intended to remove impediments to progress and if every minor dispute was submitted to a court or tribunal it would cause significant delays for the commission and be extremely expensive for both governments. Therefore it may be beneficial for an agreement to specify multiple forms of dispute

¹²¹ See especially St. John, R.B. (2000), *The Ecuador-Peru Boundary Dispute: The Road to Settlement in Boundary and Territory Briefing* 3:1, International Boundaries Research Unit, p. 43.

¹²² Disagreement over the third-party mechanism is contributing to the significant delays in resolving the current land and maritime boundary dispute between Croatia and Slovenia.

resolution rather than going directly to adjudication. For example, a commission's constitutive agreement could outline successive stages of resolution:

- (a) Resolve disputes through negotiation.
- (b) If settlement cannot be reached through negotiation, the parties may call on the mediation of specified individual (such as the Secretary-General of the United Nations).
- (c) If resolution cannot be achieved through mediation, the parties could submit the dispute to a defined conciliation commission that would provide non-binding recommendations for settlement.
- (d) If the recommendations of a conciliation commission are not accepted by both parties, the dispute will be referred to the International Court of Justice with both parties accepting the decision as final and binding.

Having multiple methods of dispute resolution allows the two States to retain a strong degree of control over settlement. As is the case with Equatorial Guinea and Gabon, mediation through the offices of a trusted international figure, such as the UN Secretary-General, is one method of retaining control over the discussions. Settlement through adjudication of arbitration shifts control over the dispute from the two parties to a legal court/tribunal. This does provide a binding resolution to the dispute (as specified by the parties), but it may still leave questions unresolved, as has been found in the Cameroon-Nigeria situation explained in Chapter 11.

Work of the Commission

The work of a boundary commission will be determined largely by how it is initially established, but each scenario will be affected by additional widely ranging factors. Obviously the human and physical geography of the border areas will affect the commission's work in the field. The internal government structure (a federal or centralised system) will affect how the commission acts with domestic political actors, especially in the border areas, and with their respective internal government departments/ministries. In addition, funding will play perhaps the most important role in how a boundary commission operates. Hopefully, if two States have committed themselves to clearly defining their boundary and solving any related disputes, they will dedicate sufficient resources to fulfil those commitments or seek external assistance.

Although the range of various elements that will affect the work of boundary commissions makes it difficult to provide specific recommendations for good practice, there are some general thoughts that may be useful. Since the joint technical commission is usually responsible for the majority of work, consistency within that body is vital to successful progress.

- ▶ All members of a commission may come from a variety of backgrounds and may not all be familiar with boundary-making techniques. Likewise, it is important for all members of a commission to have the same level of training on boundary practices so that there is a consistent knowledge base across both sides of the commission.
- ▶ If a commission is recovering an older boundary, it is important that the two sides gather historical/archive material together or at least share all information gathered. Remember that unless a boundary commission is specifically mandated as an arbitral tribunal, there is no distinct judge/adjudicator to whom the parties are presenting their cases. A commission will need to interpret the historical evidence together and achieve an outcome that is acceptable to both sides, rather than having a tribunal rule on which of two divergent interpretations is legally valid.
- ▶ When undertaking fieldwork, again it is important that both sides work together. This means that both sides have a consistent understanding of the local landscapes. It also means that local border populations will see the commission working together which could generate more respect for the commission within local border communities.

A clearly defined international boundary is important not only for the respective national governments, it is also a feature of the local border landscape that both local people and travellers from farther afield will need to recognise and understand. If local populations do not understand the role of a boundary commission and respect its work, then they will be more likely to cause difficulties for the commission in the field and for the on-going maintenance of pillars. An international boundary commission has a difficult role in applying national political decisions on the local landscape. From Professor Asiwaju's suggestions in Chapter 8, if the commission respects the conditions of the local border landscape, in turn the local border population is more likely to respect the work of the commission. With that mutual respect of national and local interests, the stage is set for a boundary that is least likely to cause disputes between neighbouring States and more likely to facilitate contact and promote development within borderland areas.

Chapter 4

Archival Boundary Records and the Role of Research in Settling International Boundary Disputes

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Introduction

Purpose

The following guidelines define procedures for identifying archive information that relates to African national boundaries. The inclusion in this handbook of a chapter on researching boundary-related archival information is important because:

- ▶ Archives are a primary research tool and a scientific and legal instrument that form the bedrock of constitutional legality, the healthy functioning of institutions and good governance;
- ▶ Objective empirical facts about human activity are stored in archive institutions in administrative, legal, or political collections that grow organically over time as new documents are created. These seemingly endless reams of documentation shed light on the ‘why’ and ‘how’ of political and administrative decisions;
- ▶ The African Union Border Programme steering committee understands the need for, and relevance of, introducing archival research into boundary delimitation and demarcation processes;
- ▶ When available scientific information proves insufficient to shed light on or settle disputes (often leading to arbitrary or legally unsound decision-making that fails to serve the interests of the people), the final recourse is to consult archival material held in national archives.

However, it is worth discussing at this juncture the many problems that can arise when consulting these materials. For example:

- ▶ With archival information, problems can arise when referencing chronologies with actual events. Similarly, the failure to apply certain

decisions post-adoption or to update scientific and cartographic data resulting from such decisions can further cloud the picture.

- ▶ Not all States' archival institutions maintain equal standards for the management and preservation of their boundary-related records.
- ▶ Filing and classification processes used by archive institutions lack conformity due either to a lack of relevant legislation or to inadequate adherence to such laws where they exist. This has resulted in communication problems among various national public archives, evidencing the need not only to create laws, but to also ensure conformity.

The support of the AUBP will help States to upgrade and modernise their public archives so they can facilitate the sourcing and communication of boundary-related material. The AUBP must encourage political decision-makers, land managers, research students, surveyors, and agricultural engineers who, whether in the private or public sector, all have a stake in:

- ▶ Defining the components of a boundary agreement;
- ▶ Reaffirming established borders;
- ▶ Updating and modifying delimitations;
- ▶ Setting cartographic boundaries.

Overview

Each country dealing with a boundary issue is responsible for organising its own archival research for boundary-related material. This might be required following border incidents or as part of the political or legal delimitation processes involved in cooperation agreements. This will entail:

- ▶ Raising funds for national missions;
- ▶ Raising funds for international missions;
- ▶ Securing access to the national archives of different African countries.

African Union Member States working under the aegis of an international institution or a programme of the AU or other decision-making body (like the International Court of Justice) are responsible for undertaking their own research to source concrete documentary evidence of delimitations agreed by the relevant States. Hence the need prevails to:

- ▶ Recruit first-rate archivists who, as specially-commissioned researchers with access to public, private, national, and foreign archives,

can be guaranteed safe conduct or are granted authorisation by a relevant international body;

- ▶ Prepare well in advance for the inevitably problematic nature of gaining access to historic archive collections held in different countries' national public archives;
- ▶ Gain prior authorisation from the highest relevant authorities in each country before undertaking any research mission.

The best way to ensure these factors are properly considered is to put the work out to tender. Bidding researchers should be assessed on the basis of their professional qualifications, their levels of experience in researching boundary-related matters in national archives, and their proposed fees.

To counter the deterioration of State archive services or the loss of important boundary-related documentation, the AUBP must set up a network and database to collect boundary-related archive material. This will entail:

- ▶ Supplementing existing sources by gathering oral translations of boundary-related material;
- ▶ Obtaining the wealth of documentation that has been issued by tribunals or international organisations such as the International Court of Justice in recent years;
- ▶ Acquiring catalogues of each national archive institution for study by experts.

The Elements of Border Agreements Found in Archive Information

Defining a common history of cross-border communities is sadly impossible because of the repeated carving-up of the continent during the conquests and re-conquests of warring colonisers. And for the colonisers, subjugated populations were often simply considered French, English, German, Portuguese, Spanish, Moroccan, etc. Therefore it is important to:

- ▶ Consult all historic archives using the research tools available for each country: detailed analytical catalogues, summary inventories, expert guides to collections, national and regional guides, administrative libraries, and collections of maps which include colonial mapping;

- ▶ Ensure transparency of the process by employing an expert, independent archivist who answers solely to an international, AU-affiliated organisation;
- ▶ Ensure that the letter of assignment introducing the expert to the senior political and administrative authorities of relevant countries, requests transparency in all dealings and provides for full, unfettered access to all archive collections.

The existence of historic agreements between resident populations and their colonial administrations helps establish the bases for boundary agreements on a human rather than political level. Indeed, in former French colonies, the option to adopt customary law or the Indigenous Code and the existence of intertribal agreements has helped settle many issues. Historical monographs produced following colonial conquest must be carefully conserved and be made available to the relevant experts. Other essential texts for researchers include:

- ▶ Political and administrative reports made during the tours of colonial administrators, which relate, on the one hand, the routes taken and the mind-sets of peoples encountered and, on the other, the reasons and requirements expressed for dividing or unifying certain districts or administrative circles;
- ▶ The vast amount of population census data, some of it dating back to the foundation of the colonies;
- ▶ Specific legal texts, acts, decrees and orders relating to territorial reorganisation have proved useful in facilitating border agreements and cover the administrative division of villages, districts, subdivisions, circles, and colonies as well as defining official borders;
- ▶ The wealth of manuscript and printed maps or other printed matter covering: journey itineraries; geographical expeditions; and geological, hydrogeological and mining explorations. These were often produced as part of the colonial administrator's inspection reporting and offer the opportunity to study information gathered about the peoples resident in these areas – their social practices, customs, habitats, and ethnologies.

Equally worth mentioning are the official mapping services, including those of the Navy and the French National Geographic Institute (IGN), where mapping experts have been attempting to establish the different borders of each colony at each point in their respective histories by using border agreements and administrative division data. These collections are held in Paris and Aix-en-Provence, hence the need for nationally-embedded foreign researchers as part of the team.

The Elements of Boundary Agreements Found in Political Agreements or the Peaceful Settlement of Boundary Issues by a Court of Law

The charter of the former Organisation of African Unity (OAU), now the African Union (AU), on the intangibility of former colonial borders, banishes all threat of military intervention in boundary conflicts. However, there is a need to:

- ▶ Institute by presidential decree a national border commission in each country to represent all members and institutions working with boundary issues, specifically the National Directorate for Borders and the National Directorate for Archives.
- ▶ Establish joint border dispute missions to sort out problems and facilitate unplanned visits and consultations by non-staff researchers. Joint missions are based on agreements that operate with the highest levels of transparency (with equal levels of member representation in each commission).
- ▶ Form joint research missions to identify dispute-related archive material given that both countries affected support the work equally.
- ▶ Ensure that archival research activities are governed by a joint agreement requiring reciprocal provision of all dispute-related material. This means no party must hold any documentation that it has not been shared with its partner country.
- ▶ Inclusion of research at foreign archive institutions by the joint missions of national border commissions. For example, information on former French colonies can be found in the Senegalese National Archives in Dakar, the Centre for Overseas Archives and the French National Geographic Institute.

In countries where there are no border disputes, boundary-related archival research should be delivered through national policy. Each national directorate for borders will be tasked to draw up and deliver concrete action plans to enforce boundaries with bordering States. This should be undertaken with the support of national, private sector, or expatriate experts.

Issues That Can Arise When Using Private Non-mandated Experts

A constant source of problems to be avoided is the employment of independent private experts who source unreliable material of dubious provenance. Trustworthy and genuine boundary-related material is best sourced from our respective national archive collections. Successful and impartial work based on the principle of reciprocal provision of all materials resulting from such collaboration brings important benefits: it promotes the detection of false documents in sketch and draft form, and helps to expose unreliable, unapproved sources.

Demarcation, or the physical creation of borders, can occur once the agreement and decision of both parties is reached following an International Court of Justice ruling.

Where the demarcation or physical creation of undisputed boundaries takes place, boundary-related archival research must again adhere to the national boundary policy of each country's national directorate for borders and use genuine documents (texts or maps) that have been approved by both neighbouring States.

Updating and Modifying Delimitations Following Identification of Genuine Border Documentation

The AUBP regulations stipulate that each country affected by the updating or modification of its delimitations, whether following a legal order or in the framework of sub-regional collaboration, should always aim to reach peaceful or amicable settlements, and that these settlements will be closely monitored by African Union authorities. Normally, an agreement protocol to this regard should be signed in advance. The experts in charge of boundary-related archival research must always provide professional and impartial advice whatever country is their paymaster. Researchers must at all times profess to serve the interests of Africa and must not be recruited for missions that are incompatible with their past or present obligations towards other countries for whom they have provided private consultancy. It is important that:

- ▶ Conflicts of interest in providing services to two conflicting countries are avoided.
- ▶ Conflicts between advisory missions where expert consultants advise on different areas of the same project, and thereby act as judge and

jury, are avoided. An expert commissioned to advise one country that is in dispute with another country must not be appointed to work in the context of the same dispute against a third country even if he or she has been commissioned to do so by the AUBP.

- ▶ Priority for boundary-related archival research is given to joint national missions bound by bilateral agreements, rather than to private consultancy research that has been unilaterally commissioned by a given country.

Where Mapping is Insufficient, Limited, and Not Applicable

The history of Africa's peoples is of greater importance than its border issues. Maps often do not accurately reflect administrative, political, demographic, or economic realities.

Where a people has been divided by borders, it follows that the border must not become a matrimonial and economic barrier, hence the need for a solution based on positive cross-border collaboration to tackle these issues. Furthermore, the new boundary demarcation process must:

- ▶ Provide training to strengthen sub-regional organisations and their economic, monetary, and political integration.
- ▶ Foster understanding between peoples by promoting cultural meetings that draw on shared pastimes or blood relations to strengthen kinship ties and creating diverse citizens' associations.
- ▶ Consider that maps may have been configured to work in one country's favour since the colonial era, yet the area's population may have remained rooted in the same places. For this reason it is important to observe the status quo of habitation patterns.
- ▶ Undertake expert in-depth boundary research using alternative means.

Research should seek to draw out unifying factors, specifically by revisiting and updating old, sub-regional development projects and historic economic infrastructure creation projects that have been ignored or abandoned in the impenetrable mass of historic archive collections found in certain African – and even American and European – countries.

Some classic examples of State creation, such as the Organisation of Saharan States, were abandoned in order to allow France to establish

independent countries like Algeria, Niger, Mauritania, and so on, as de-colonisation approached. Today, good collaboration and clear borders will mean these countries can reach across their national boundaries and draw on the economic, social, and cultural ties that existed long before the arrival of the European colonisers.

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Chapter 5

Sources of Information for Boundary Recovery



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Introduction

Most international boundaries have complex histories. Even those that have never been actively disputed have usually had their alignment clarified and/or adjusted several times since they were originally delimited, and many have been demarcated in a rather sporadic and haphazard manner. Some have also had special management regimes applied along part, or all, of their course on either a permanent or temporary basis.

Any government seeking to develop an effective delimitation and demarcation strategy will first wish to identify: (i) the level of precision with which the boundary has been delimited in treaties and other legal instruments, and (ii) how clearly it is already marked on the ground. This process is sometimes referred to as boundary **recovery** and involves acquiring information from a variety of sources. This chapter examines sources of boundary-related information and discusses practical aspects of researching the history of an international boundary.

Organising Boundary Recovery

Most governments already possess at least some information relating to the definition of their country's boundaries. However, that information has often been collected on an *ad hoc* basis and can be scattered across a variety of government departments. In such cases, it makes sense to nominate a single agency to assemble and organise existing information. Such an agency will be able to identify information gaps,

and coordinate the acquisition, storage and dissemination of missing information. Since the most efficient tool for managing boundary-related information is a geographic information system (GIS), it may make sense to nominate the national survey authority to undertake this work so the information can be integrated into a GIS format. However, whichever agency is chosen, the key to success is ensuring that the personnel involved in the process are well trained in boundary practices, highly motivated and provided with sufficient resources to perform the task effectively.

For the purposes of this chapter, it will be assumed that a government is uncertain about the extent and quality of its records, and has decided to begin the information collection process from scratch in order to ensure that it does not miss any critical documents.

Primary Sources

In most cases, the principal source of information on the evolution of a country's international boundaries will be government archives. This will include the archives of neighbouring States and, where applicable, the archives of former colonial powers. Boundaries have long been considered highly significant in terms of international relations. Likewise, colonial administrations were generally careful to retain not only key documents, such as treaties, but the majority of correspondence relating to the negotiation of those treaties and subsequent demarcation, maintenance and management activities. While the attitudes and policies revealed in such correspondence are often far from palatable to the modern reader, it remains invaluable in terms of establishing knowledge of how a boundary evolved and why certain decisions were taken.

However, while archive research is essential in boundary recovery, government archives are probably not the best place to start the research process. The sheer size of many archives makes them daunting realms of research. Even small archives often hold tens of thousands of records, and the national archives of imperial powers such as France and Great Britain contain many millions of records – the French *Archives nationales d'outre-mer* alone take up 37 kilometres of shelf space! While online catalogues are making the task of locating relevant material in archives significantly easier than it used to be, many archives have yet to make the transition from paper catalogues to computer-based systems. It can sometimes take a researcher several days just to become familiar with the file classes in which boundary-related records

are held. In this context, it makes sense to undertake preliminary research using secondary sources where possible. This will allow key dates, actors and activities to be targeted for in-depth research using the primary documents held in national archives and other historical collections.

Secondary Sources

For boundaries in Africa, an invaluable secondary resource is Professor Ian Brownlie's *African Boundaries: A Legal and Diplomatic Encyclopaedia*, which contains systematic studies of every international boundary in Africa that existed in 1977. It includes the texts of every boundary agreement and demarcation report that Professor Brownlie and his research team were able to locate in nine years of research in European and (to a lesser extent) African archives and libraries. The collection is particularly strong on boundary evolution up to World War II, but considerable efforts were made to obtain copies of post-war agreements and reports that had not been made publicly available in national archives at the time of research.¹²³ While *African Boundaries* may not contain absolutely every key document for every boundary, it is nonetheless an essential reference volume for anyone wishing to gain an understanding of the definition and evolution of international boundaries in Africa. The book can be ordered from the publisher C. Hurst & Co,¹²⁴ and can be previewed and searched for free on the Google Books website.¹²⁵

Another useful collection of studies of 87 international boundaries in Africa is the *International Boundary Studies* series that was prepared by the Office of the Geographer of the United States Department of State in the 1960s and 1970s. While the studies are short and generally only contain extracts from relevant delimitation and demarcation texts (rather than the full texts provided by Brownlie), they are nevertheless well researched and provide a useful introduction to the boundaries in question. They are also freely available for download from the Florida State University College of Law website.¹²⁶

¹²³ Most governments have traditionally insisted on official records remaining closed to the public for several decades – typically thirty years, but sometimes fifty or even a hundred years – after they are transferred to the national archives.

¹²⁴ <http://www.hurstpub.co.uk/BookDetails.aspx?BookId=18>. The price at the time of writing was GBP 105, which is excellent value for a book that extends to more than 1,350 pages.

¹²⁵ <http://books.google.com/books?id=A8Du4k0udx4C&pg>

¹²⁶ <http://www.law.fsu.edu/library/collection/LimitsinSeas/numericalibs-template.html>

Cartographic Information

Both *African Boundaries* and the *International Boundary Studies* contain small-scale illustrative maps indicating the general alignment of the boundary under consideration. More usefully for boundary recovery purposes, both sources also note what the authors considered to be the best available mapping of the boundary at the time of writing. Copies of some maps attached to boundary treaties have been included in the United Nations Treaty Series, access to which is now available online for free.¹²⁷ Some of the maps identified in the studies can be found alongside other boundary records in files held in government archives.¹²⁸ Others, particularly topographic maps, are only available in specialist map collections.

In many African countries historical mapping of boundary regions is scarce, and research may be required in map libraries in Europe and possibly the USA.¹²⁹ The collections of the British Library¹³⁰ and Royal Geographical Society¹³¹ in London as well as the *Institut Géographique National*¹³² in Paris are particularly rich resources. Many universities also have substantial African map holdings.¹³³

For topographic mapping, the International Cartographic Association's *Inventory of World Topographic Mapping* provides an invaluable overview of which areas of individual countries had been mapped at different scales up to the late 1980s; Africa is covered in volume 2 of the three-volume series.¹³⁴ The series is now out of print and difficult to purchase, but copies are available in many good research libraries.

¹²⁷ <http://treaties.un.org>

¹²⁸ Some national archives have (or had in the past) a policy of removing maps from correspondence files and storing them in separate map collections.

¹²⁹ Although the United States was not directly involved in boundary-making in Africa, the Geography and Map Division at the Library of Congress has custody of the largest and most comprehensive cartographic collection in the world, with collections numbering over 5.5 million maps: see <http://www.loc.gov/rr/geogmap/gmpage.html>.

¹³⁰ <http://www.bl.uk/reshelp/findhelpregion/africa/africa/acmaps/index.html>

¹³¹ <http://www.rgs.org/OurWork/Collections/Collections.htm>

¹³² www.ign.fr

¹³³ Oddens Bookmarks (<http://oddens.geog.uu.nl/index.php>) provides links to many of the world's map collections, although sadly the site is no longer actively maintained.

¹³⁴ Böhme, R. (1991), *Inventory of World Topographic Mapping*, Vol.2, South America, Central America and Africa, London. Elsevier Applied Science on behalf of the International Cartographic Association.

A small but growing number of historical boundary-related maps have been scanned and made available online, including the maps in Sir Edward Hertslet's 1891 collection *The Map of Africa by Treaty*.¹³⁵ The map holdings in Durham University's Sudan Archive will also shortly be made available online.¹³⁶

An important consideration when planning map research is the issue of making copies. Many map curators insist on the use of specialist scanning equipment to prevent damage to the map, which makes copying time-consuming and expensive. Even more problematic, maps published in the past seventy years are usually protected by copyright, and laws may prohibit reproduction of more than a small part of the map. In such cases, permission to acquire a copy of the map in question may require resort to diplomatic channels.

Working in Archives

Government archives vary considerably in their organisation and accessibility. Many national archives in Africa are terribly under-resourced and, as a result, the records they hold are often poorly indexed, hard to locate, and sometimes in a very poor physical condition. Some archives have limited opening hours and place restrictions on the numbers of documents that can be viewed per visit. Researchers therefore need to be patient, and to plan their research time as carefully as possible. A reconnaissance visit is usually advisable, during which the principle aim should not be to gather documents but to learn about how the archive works, how it is organised and how much relevant material is likely to be available. This will make it easier to plan how much time will be required to review relevant material and what material to prioritise. Developing a good working relationship with the staff of the archives is often the key to a successful research project. In some archives asking the staff is the only way to identify and locate relevant records. However, even where good finding aids are available, drawing on the knowledge and experience of the record keepers not only speeds up the research process but often also points the researcher towards valuable documents which are not readily identifiable in the catalogues.

As well as the domestic national archives, the archives of the neighbouring State with which a boundary is shared are also usually an

¹³⁵ *The Map of Africa by Treaty* has been made available online by the United States Library of Congress (<http://hdl.loc.gov/loc/gmd/g8200m.gct00004>).

¹³⁶ <http://www.dur.ac.uk/library/asc/sudan>

important source of information. Although there is likely to be a considerable amount of duplicate material in the two archives, it is not unusual for significant documents to be found in only one of them. As boundaries are usually considered to be quite sensitive politically, careful thought needs to be given to the way in which archive research in neighbouring States is conducted. Simply turning up and demanding to be given access to all documents relating to the boundary is unlikely to be very productive! Many archivists are instructed not to make sensitive files available to foreign researchers without approval from the director of the archives (or even from the head of the ministry which oversees the archives) so it is usually advisable for a formal diplomatic request for access to be submitted in advance.

In principle, access is not an issue in the national archives of the former colonial powers in Africa – anyone who qualifies for a reader ticket has a right to view all documents that are not subject to closure orders. (The only requirement for a reader ticket is usually proof of identity, although it is advisable to check with the archive in advance.) However, the sheer size of European government archives can make finding what you are looking for a challenging task. Fortunately, most European archives have knowledgeable and helpful research staff, as well as useful finding aids. For example, the UK National Archives has produced a guide to researching international boundaries that highlights record groups likely to be particularly relevant.¹³⁷ Other research guides explain how different government departments organised their records in different periods.

The advent of online catalogues which allow keyword searches has made locating relevant records much less labour-intensive than it is in archives which still rely on printed catalogues or card indexes. However, it is important to note that many European government departments filed a lot of correspondence under headings like ‘general correspondence’ and the contents of general correspondence files have not always been catalogued. Keyword searches should therefore only be treated as a useful starting point for archive research; they are unlikely to identify all relevant material. When researching colonial boundaries, it is also important to search for colonial geographical names as well as those used after independence.

¹³⁷ <http://www.nationalarchives.gov.uk/catalogue/RdLeaflet.asp?sLeafletID=387&j=1>

Successful archive research is founded on four cornerstones: preparation, organisation, patience and courtesy. Regardless of how well organised and efficient an archive is, it is very easy to underestimate how much time will be required to complete a research project. The key to making the best possible use of the time available for research is to prepare as thoroughly as possible and to have a clear idea of the kind of information that is being sought. The more focused the research questions are, the more likely it is that the archives staff will be able to identify where the answers are likely to be found. It is important to remember, however, that archives only contain what has been selected for preservation by the relevant government departments, and believing that a particular map or document should be in a particular archive does not mean that it actually is.

If it is impossible to complete the required research within the time available, many archives keep lists of professional researchers who can be recruited to undertake research on a contract basis.

Boundary Information Systems

Boundary recovery research is likely to uncover information in a variety of forms, including not only treaty texts but also demarcation reports, boundary maps, aerial photographs and satellite imagery, information on the location and status of boundary monuments, maintenance schedules, border patrol routes, etc. For this information to be useful, it needs to be both organised and accessible. There are, of course, many possible approaches to managing information, and different systems suit different individuals and organisations. However, because boundaries are defined in geographic terms and run through real physical and human landscapes, the use of a geographical information system (GIS) to store the relevant data is worth serious consideration. Discussion of how best to structure a boundary-focused GIS is beyond the scope of this chapter, but the African Union Border Programme has been developing a prototype 'Boundary Information System' which AU Member States should consider adopting to facilitate efficient storage, retrieval and analysis of their hard-earned boundary information.

Chapter 6

Preparation for Boundary Recovery and Demarcation



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Introduction

When preparing for a demarcation exercise in the field, it is important to spend some time in preparation for the exercise, assembling the relevant materials, visiting relevant archives and generally achieving a good level of understanding of the landscape features of the boundary that is to be demarcated and the problems that might arise. Teams from both countries working bilaterally together will derive the most benefit from this exercise but, if the situation does not allow this level of cooperation, benefit will still be derived from using available sources unilaterally. As in any field survey exercise, time spent on reconnaissance is never wasted. This applies as much to office research as to field visits.

This chapter uses the term “delimitation” to mean the description of a boundary line contained in a legal agreement such as a treaty. “Demarcation” refers to the field exercise that follows delimitation when a joint team of surveyors and administrative officials goes on the ground to mark the boundary in such a way that, at both local and national level, there is no misunderstanding as to where the boundary line runs.

In the colonial era, it was usual to give the demarcation team some latitude to interpret the delimitation and move the line to fit the circumstances found on the ground. In modern times, this flexibility occurs less often but should remain the ideal. Where a demarcation is taking place many years after the original delimitation, or where a boundary recovery exercise is taking place to restore and/or improve the marking of the boundary on the ground, significant changes of land use will have

occurred. There may have been encroachment across the boundary by local farmers; rivers may have changed course by significant amounts; roads and tracks referred to in the Treaty may have become disused and disappeared. To cope with these changes, it is advantageous for the demarcation team to have some latitude in interpreting the delimitation.

Collection of Documentary Evidence

The Material Required

The first stage of a demarcation exercise is to assemble all the necessary documentation. This material can be classified under five headings:

- ▶ Legal documents;
- ▶ Maps in use at delimitation;
- ▶ Maps from the modern era;
- ▶ Imagery;
- ▶ Other Archival material.

Legal Documents

It goes without saying that it is necessary to have copies of all the relevant treaties, administrative orders and legal Judgements from bodies such as the ICJ that refer to the boundary in question. These should include earlier treaties even when they have been superseded by later versions as they may contain information that helps to clarify the later delimitation.

During the colonial era, provincial boundaries were often defined by administrative order and these orders will be important where an old provincial border has been raised to the status of international (for example: in the case of Cameroon-Nigeria). Similarly, the French colonial territories were formed by decrees and laws promulgated by the French authorities (for example: to define the line that is now the boundary between Burkina Faso and Mali).

Legal Judgements are, of course, binding on the parties but courts such as the ICJ do not always check their values for latitude and longitude sufficiently carefully and mistakes do occur. Any references of this nature should be rigorously checked for gross error and reliability. To complicate matters further, courts frequently omit to mention the datum

to which their latitudes and longitudes have been referred. Both these mistakes can give rise to argument over interpretation at the demarcation stage and are to be deplored. Nevertheless, if they occur, it is the demarcation teams that have to find solutions.

A useful reference for treaties is Ian Brownlie's *African Boundaries – A Legal and Diplomatic Encyclopaedia* first published in 1979.

Maps in Use at the Time of Delimitation

It is very common to find a map or a series of maps supporting the treaty defining the delimitation. In most cases, the textual definition in the treaty takes precedence but the map is a useful picture of the route of the line. The map will also reflect the state of knowledge of the topography at the time of the delimitation. A comparison with modern maps or imagery will indicate where the early understanding was problematic. In such an event, it will be necessary to agree a modern interpretation between the parties. It will be useful to have studied the problem on the ground beforehand when negotiations take place.

There are a number of dangers when using old maps constructed in the early days of the twentieth century. Problems or interpretation will be encountered if insufficient account is taken of factors such as the following:

- ▶ Magnetic declination will have changed significantly, often by a large amount.
- ▶ Positions on the map will often be based on a series of astronomically fixed points. The accuracy of the map will then depend on the care taken over the astronomical observations and the skill of the observer. Before 1920, errors in time could result in significant errors in longitude.
- ▶ Old maps in countries once subject to French colonial rule may have longitudes based on the Paris Observatory. These will differ by 2° 20' 14" from longitudes based on Greenwich.
- ▶ Contours, when they exist, will not have been based on a sufficiently dense network of known heights. If contours are very rounded in form and the country is mountainous, regard them with great caution.
- ▶ The detail of the topography may also be quite generalised and the features followed by the boundary may have proved, over time, to be much more convoluted than the original Treaty Map implied.

Taking each of these in turn, it is useful to consider how these factors might affect a demarcation.

Magnetic Declination: If a treaty defines the boundary as following a straight line of a certain magnetic bearing, it is important to remember that this bearing is in terms of the magnetic declination at the time of the Treaty. It will be necessary to correct the bearing to reflect the declination at the time of demarcation. If magnetic declination is quoted on a Treaty Map, then it is a simple matter to change the bearing to reflect the change in declination since delimitation. If not, accessing a historical magnetic model of the earth can reveal the old value for declination in a source such as <http://www.ngdc.noaa.gov/geomag-web>

Latitude and Longitude Positions based on Astronomical Observations: If it is suspected that the Treaty Map is based on astronomical values and the Treaty itself contains boundary points defined by latitude and longitude, it is essential to carry out a comparison of the Treaty map with a modern map (ideally the map prepared for the demarcation) so as to determine whether there is any significant difference between the latitude/longitude values used on the Treaty map and those, based on a national Datum or on the global datum, WGS84, now being used for GPS.

The checks can be carried out by examining the Treaty Map for points of detail, which are unlikely to have moved even over the time that has elapsed since the Treaty map was drawn. Examples include:

- ▶ River confluences in hilly country where the courses of the rivers are unlikely to have changed.
- ▶ Major buildings (for example: a mosque) that are known to have been in existence at the time of the Treaty.
- ▶ Railway lines.

If modern mapping is available, the positions of the chosen points can be taken off and compared with the values taken from the Treaty map. If there is no mapping available or if there is a particular need to have a comparison with WGS84, these points should be visited and observations made with a GPS unit.

The differences calculated in this exercise are known as a Datum Shift and the same shift can be applied to any boundary points defined in the treaty by latitude and longitude to bring them into line with, say, WGS84 or whatever other datum may be in use for the demarcation.

Contours and Topography: Many African boundary treaties use watersheds for significant sections. If the contours are poorly depicted on the Treaty Map, then the watershed will be shown in a generalised form. The reality on the ground may be quite different and the watershed may be very convoluted. This is not a problem if the Treaty itself clearly stipulates that the watershed is to be followed but it is prudent to be prepared. For example, a more convoluted boundary may require many more boundary pillars to make the line visible.

Maps from the Modern Era

If there are modern maps available of the border area, constructed from aerial photography or satellite imagery, a full set should be acquired prior to demarcation. Ideally, scales from 1:25,000 to 1:100,000 are the most useful though, in areas where there is little human settlement, a scale of 1:200,000 might be acceptable.

If the maps have been constructed from aerial photography, the user can have confidence in the depiction of the topography. Indeed, in many African countries, the first maps to use aerial photography were the first maps to show reliable topography. It is important to be able to read the Treaty with a complete understanding of the topography of the border areas.

Many African countries were mapped between the end of the Second World War and the date of independence (or later) by the colonial powers. Most of these maps were constructed from aerial photography and depict reliable topography. Even if these maps have been superseded by more modern series based on better information, they still have value, especially for interpreting the original delimitation treaties. A reliable map produced in the 1950's or the 1960's shows the landscape as it was almost half way back to the time of most delimitation treaties. This allows for a reasonable understanding to be gained of:

- ▶ The size of towns in the border area 50 years ago. The amount of expansion of such towns in the first half of the 20th century is unlikely to have been very great so, in effect, the towns shown on maps of the 1950s or 1960s may be much as they were at the time of the treaties.
- ▶ The amount of development that has taken place since the time the map was produced which can be important to assess where encroachment has occurred.
- ▶ The movement of meandering rivers in the plains and, by comparison

with modern mapping, the identification of man-made deviations over the last 50 years. ¹³⁸

- ▶ Place names that feature in the delimitation treaty but which have fallen out of use in the 21st Century.
- ▶ Roads and tracks that were important in the treaty era but have been abandoned and lost sight of by the 21st century. A 50 year old map may show the alignments of these routes.

The maps made by the Colonial Powers may now be in short supply or no longer available in the countries concerned. It is possible to acquire copies of these maps from various archives in Europe though sometimes at considerable expense. Figure 1 shows the coverage of 1:50,000 and 1:100,000 regular mapping undertaken by the British Directorate of Overseas Surveys from 1946 to 1982 across West Africa.

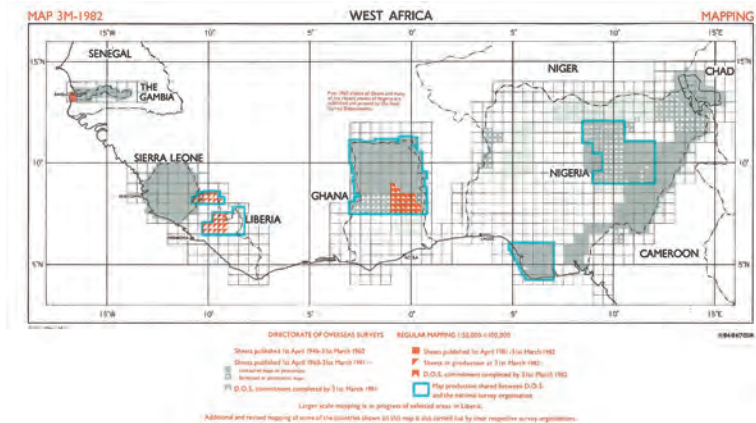


Figure 1 Directorate of Overseas Surveys, Mapping coverage in West Africa 1946–1982

Imagery

This term covers aerial photography, both old and new, and satellite imagery, either acquired from commercial sources or accessed in the readily available form of Google Earth on the World Wide Web.

¹³⁸ This is important because the boundary generally moves with the river as it moves but does not move with a man-made diversion of the river.

Aerial Photography has two great advantages over mapping:

- 1 It contains a far greater amount of detail such as individual huts, the complete drainage system of a river (useful when deciding on the “source”), and a complete network of tracks. All these details will have been generalized to some degree on the map and the actual situation on the ground can be extremely helpful when interpreting the treaty.¹³⁹
- 2 It allows the viewing of a three dimensional model of the surface using overlapping prints and a small hand stereoscope.

Many countries will have been covered by aerial photography in whole or in part during the colonial era. Figure 2 displays an example of the aerial photography obtained by the Directorate of Overseas Surveys on behalf of countries in West Africa from 1949 until its dissolution in 1982. Such photography is now around 40 to 60 years old and the negatives may no longer be in usable form. Archives in Europe do hold single prints of these films, though in many cases not the film itself. It is, however, often possible to obtain scanned copies of the prints from some archives.

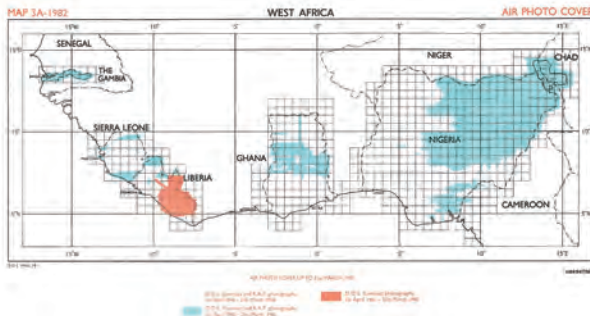


Figure 2 Directorate of Overseas Surveys, coverage of aerial photography in West Africa, 1946–1982

¹³⁹ For examination of the aerial photography in 3D, it will be necessary to have a small pocket stereoscope. This item, if not available locally, can be purchased through online survey equipment sites for around \$50.

It may be worth acquiring prints of specific parts of the boundary where a detailed study in 3D might prove valuable for example: a meandering river or an area where the Treaty specifies that the boundary follows a feature, such as a small stream, that is not shown on the map.

As with the colonial era mapping, the photography may take the viewer half way back to the time of the delimitation Treaty and can be valuable for interpreting the landscape at that time. There is much more detail on an aerial photograph than on, for instance, even a 1:50,000 map. Encroachment of settlements sited on watershed boundaries can be examined in detail.

The colonial photography will be of varying quality but usually photography taken in the 1960's will be of good quality even if only in black and white. Modern aerial photography is, of course, normally of much better quality and it is normal nowadays for it to be in colour. If such cover is available, it can be a great bonus for it will allow a detailed and rapid examination of the boundary. This can produce an understanding of the problems that will need to be dealt with in the field in the light of modern settlement and cultivation patterns.

Satellite Imagery: Satellite imagery has now reached resolution standards which make it almost as good as the best aerial photography. However, the acquisition of commercially available high-resolution imagery can be prohibitively expensive. For instance, one scene from the Quickbird archive with 1 m resolution can cost US\$ 4,000 if already in the library (one scene covers 272 square kilometres). Requests for specific coverage not available from the supplier's library can be much more expensive – from US\$ 5,500 to 10,000. Orthophotos (where elevation errors have been removed) can be purchased for between \$ 14 and \$ 40 per square kilometres. ¹⁴⁰

As another example, a single SPOT (*Satellite Pour l'Observation de la Terre*) scene covers a footprint of 3,600 square kilometres at resolutions of 20 metres to 2.5 metres, with a locational accuracy up to 10 metres. Prices range from \$1,900 for 10-metre black-and-white to \$ 8,100 for 2.5-metre colour scenes ¹⁴¹. The quality is exceptional but satellite imagery, like aerial photography, remains susceptible to cloud cover

¹⁴⁰ Precise charges depend on area and quotes have to be obtained from <http://www.mapmart.com/Products/satelliteimagery.aspx>

¹⁴¹ More details at http://www2.astrium-geo.com/files/pmedia/public/r146_9_pricelist_spot_en_2012.pdf

and it is still difficult to get complete coverage in areas of West Africa, for example.¹⁴²

Various sources of high-resolution imagery are available and include:

- ▶ SPOT (20 metres up to 2.5 metres resolution);
- ▶ Quickbird (0.6 metre resolution in panchromatic; 2.4 metres resolution in multispectral);
- ▶ Geo-Eye (0.5 metres resolution).



Figure 3 DigitalGlobe high resolution image of Bangui, C.A.R.

However, it is not necessary to spend large amounts of money on satellite imagery if a lower resolution is acceptable. This type of imagery will not reveal the less conspicuous features such as small footpaths and individual dwellings within settlements but it will show the broader picture of the border area. Landsat 7 is the latest in a series of vehicles and was launched in 1999. It provides regular coverage of the whole of Africa with a resolution of 15 metres.

¹⁴² A discussion of the value of radar imagery in such circumstances occurs in Chapter 10 of this volume.

The imagery can be obtained on no cost through the website <http://glcf.umd.edu/data/landsat> and can be viewed online at scales of up to 1:72,000 at <http://landsatlook.usgs.gov>.

Google Earth: An alternative way to access the Landsat imagery is through the freely available system known as Google Earth (GE) (www.googleearth.com). This can be downloaded on to any modern computer without charge. The facility provides software to view satellite imagery of the whole planet and its use is intuitive and easy. Some of the imagery is Landsat+ with a resolution of 15 m. but more and more areas are now covered by high resolution imagery such as Quickbird (or other high resolution scanners) with 1 m. resolution. It incorporates a basic digital terrain model, which allows it to provide a facility to view the imagery in simulated 3D, either from an oblique or even a horizontal angle. Where users have uploaded photographs of the area, these can be viewed. A measurement tool is available for horizontal distances and a continuous readout gives the latitude, longitude and height of the viewing icon.

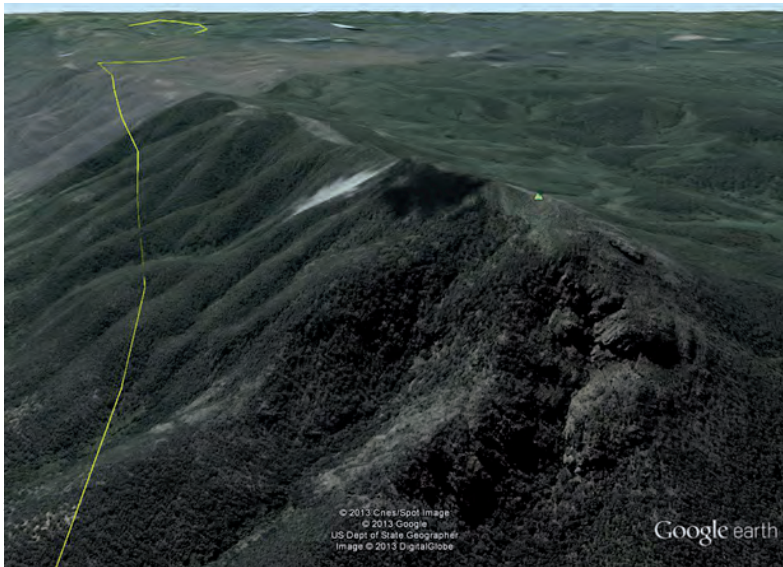


Figure 4 Malawi – Zambia border on the Nyika Plateau (the yellow line is an approximation to the boundary line which runs along the top of the ridge)

Source: Google Earth

Google itself has superimposed its own interpretation of international boundaries on the imagery. It is best to ignore these yellow lines as they are generally placed inaccurately and do not take account of uncertainties and disputed sections. It also provides a skeleton road network in yellow, which again is inaccurate although useful in helping the user to find the road in the imagery.

The amount of information about a border area that can be taken from this system is impressive. The vertical views are particularly impressive if Quickbird imagery is available. The horizontal view can be useful for highlighting a watershed section of a boundary. Problems with river channels can be assessed (see Figure 5 where the potential for river (and hence, potentially, boundary) movement is obvious) and it is even possible to detect a boundary from a change in road surface (see Figure 6).



Figure 5 A Boundary River set in its clearly defined flood plain

Source: Google Earth



Figure 6 Google Earth image: Road surface change – tarmac to dirt – indicating boundary

Source: Google Earth

Other Web Satellite Sources: Google Earth is not the only source available for viewing satellite imagery. An alternative is Bing Maps, which markets a Microsoft product. See www.microsoft.com/maps. This is more cumbersome than Google Earth but may occasionally be found to have better imagery.

Other Sources

It will always be worth accessing the national archives for files from the colonial era during which there may have been extensive correspondence on the interpretation of boundary agreements with the neighbouring administration. This can be a time-consuming process but may provide important evidence for the demarcation phase.

One example of the value of archival searching comes from Sapeo, Nigeria. The treaty was not clear about the alignment of the boundary and its wording made no sense when applied to a modern understanding of the topography. However, a document, which sets out quite clearly a description of the boundary agreed to by British and French administrators in 1930, was discovered in the Nigerian Archives. A field visit in 2000 revealed that two of the cairns (boundary monuments) referred to in the document were still in existence and in good order. This evidence was sufficient for the ICJ to accept the Nigerian claim.

Preliminary assessment of the boundary

The Purpose

A preliminary assessment of the boundary line is a valuable planning exercise. Its purpose is to classify the boundary into sections reflecting the degree of clarity with which the delimitation has defined them. This can lead on to the identification of sections that would benefit from a field visit to achieve a better understanding of the area before demarcation starts.

Initial Delineation

The first task is to assemble the best available mapping and, using the relevant treaties and other documents obtained during the collection phase, to draw on the maps a best estimate of the line of the boundary. This exercise concentrates the mind on the problem of interpreting the words of a legal delimitation into a practical line on the ground.

The result of this exercise can be formally presented by overprinting the base map with the line and the relevant part of any treaty that defines it. Figure 7 provides an example.

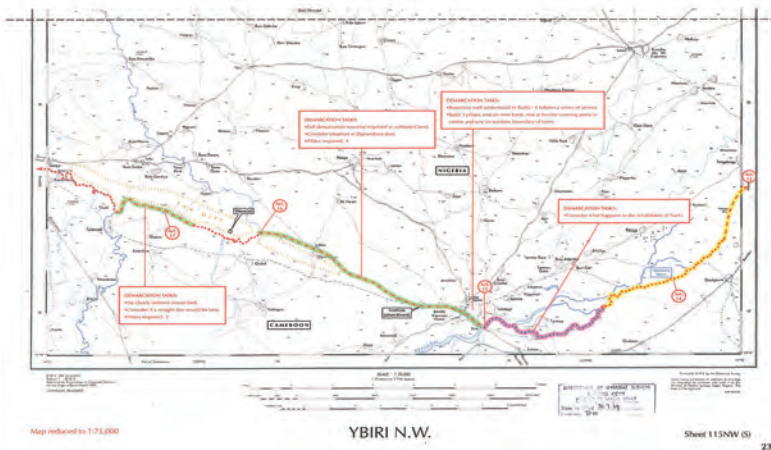


Figure 7 Proposed demarcation plan using initial boundary estimates on base mapping

The opportunity should be taken to differentiate between the parts of the boundary which can be delineated with certainty, those about which there is doubt or more than one interpretation, and those for which no line can be easily determined.

Boundary Inventory

Once the initial delineation is complete, it is useful to divide the boundary into shorter sections that are differentiated by the type of feature that defines that part of the boundary. For the well-defined parts of the boundary, these features might include watersheds, rivers, lines following man-made features such as roads or railways, lines of latitude or longitude or straight lines joining fixed points. The poorly defined parts would form sections of their own.

The inventory would include, for each section, the following information:

- ▶ The extent of the section between defined latitude/longitude positions together with its length and any names for the terminals;
- ▶ Details of the document that sets out the delimitation for the section;
- ▶ Details of any other documents (such as process verbaux) that may affect the demarcation;
- ▶ Maps that cover the section area;
- ▶ Aerial photography and/or satellite imagery that covers the section area;
- ▶ General description of the terrain through which the section runs with particular reference to the natural features that are followed by the delimitation;
- ▶ An outline discussion of any uncertainties that may apply to the section;
- ▶ A discussion of the documents, maps and images for the section with an assessment of their relevance and usefulness;
- ▶ The need for a field visit and the purpose such a visit would serve.

Field Visits

If examination of the boundary has revealed some areas of uncertainty, a preliminary visit prior to the joint demarcation phase is essential. It will assist an understanding of the current local situation.

The treaty may not have clearly indicated where the boundary should run but it is always possible that the local inhabitants have resolved the uncertainty amicably with their neighbours. Alternatively, the uncertainty may have led to tensions, which need to be discussed with the local people and understood.

More generally, any field visit to the boundary area provides an opportunity to explain the demarcation project and to describe its potential benefits to the local people. This applies to the whole of the boundary line to be demarcated, irrespective of the clarity of the delimitation.

Preliminary Assessment of Technical Options

At this time of rapid technological development and significant financing difficulties, it will be sensible to spend some time checking out in advance the latest technical options for the demarcation work and making sure that their implications are fully understood. The aim should always be to do as much work locally as possible. The use of outside contractors from overseas can lead to over-elaborate solutions and to significant delays in the letting and execution of contracts, as is highlighted in Chapter 10 concerning the Cameroon-Nigeria experience.

A good example of technological development is the post-processing of GPS observations. In recent demarcations, such as Eritrea-Ethiopia and Cameroon-Nigeria, primary and secondary networks have been established by outside contractors at considerable expense and delay. As an alternative, the parties might consider using a provider of wide-area differential GPS correction services. With adequate training and compatible equipment, local technicians will be able to record 2-3 hours dual frequency observations from a suitable GPS instrument¹⁴³ set up on the site of a boundary mark and then dispatch the data via the Internet to one of these services, many of which are free. One example of a free service can be found at <http://www.ga.gov.au/geodesy/sgc/www-gps>.¹⁴⁴ The 2-3 hours of dual frequency observations should produce a result with an accuracy of about 5 cm. A similar service is available from NASA and JPL in the United States (<http://apps.gdgps.net>) and from some other agencies around the world. Using one of these services will eliminate the need for external contractors and should reduce the cost of a demarcation significantly.

¹⁴³ The instrument should be capable of recording data in the international RINEX format.

¹⁴⁴ The reference contains full information about how to access and use the service.

A further example is the design of boundary pillars. Again, the above mentioned demarcations have found themselves encumbered by over-elaborate pillar designs which involve the use of outside contractors, expensive helicopters, complex specifications, etc. If some initial trouble is taken to evaluate the capability of local contractors and to design boundary marks that they can tender for and execute reliably, then once again much time and expense can be saved.



Chapter 7

Managing Boundary Information

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Introduction

The principal boundary-makers are statesmen, politicians, diplomats, lawyers, federal government officials, etc. However, the technical background knowledge of these officials in geomatics (surveying, cartography, geodesy, remote sensing, global satellite positioning [GPS], digital image processing and geographic information systems [GIS]) is generally limited. Statesmen and other government officials are the actors who initiate boundary line negotiations. Yet, in order to conduct these negotiations, geomatic engineers must be involved to bring field experience to the negotiating table and to provide the negotiators with various levels of geographic information. During the compilation stage of the boundary delineation (delimitation) documents, geomatic engineers carry out the fundamental preliminary geodetic work in order to prepare the complex data interpretation and analysis during the subsequent demarcation stage and the on-going boundary line management.

Delimitation can be considered both a technical and a juridical undertaking since legal documents and official maps (produced and published by official, mainly national, mapping organisations) are usually employed.

Demarcation, on the other hand, is a purely technical process. Its purpose is to transfer the delimitation to the ground, using appropriate surveying instruments and following well-known and established mathematical, scientific and technical procedures. Based on the delimitation evidence derived from treaties, geomatic engineers carry out the demarcation as agreed upon by both parties. The result is a record of

of high technical standard and value.¹⁴⁵ It is this record that plays a vital role in avoiding future disputes between countries along their boundary line.¹⁴⁶ A closely related expression is "delineation" which is the mathematical and/or graphical representation of the geometry or "locus" or "trajectory" of the boundary line. Computer software (proprietary or open source) can be utilized to produce the delineation information.

The desired benefits of an unambiguously delimited, delineated and demarcated boundary line are:

- (i) Prevalence of peace;
- (ii) Reaffirmation of sovereignty and independence of the two States;
- (iii) Creation of security and general stability in the area; and
- (iv) Peaceful management, cooperation, administration and coexistence on both sides of the line including trans-border development projects.

Geomatics, through all its activities, has always played a significant role in achieving these noble goals. Geomatic engineers assist in the initial negotiations by collecting and sorting out documentary maps and sketch routes, evaluate and assess the accuracy of old maps and, if necessary, update their data.

Delimitation is a technical as well as political process in which geomatic engineers play a vital role. Map scales, direction of true and magnetic north, type of cartographic reference system used, effects of paper shrinkage and expansion over the years on point or feature location, validity of map symbols and legends, etc. are all important factors to consider during the delimitation stage. Geomatic engineers must be available to resolve ambiguities related to such issues. As mentioned earlier, demarcation consists of a series of purely technical operations all of which are carried out by geomatic engineers. After demarcation, they provide important boundary line maintenance and reaffirmation services apart from their vital role in initiation, design, implementation and quality control of trans-border development projects.¹⁴⁷

¹⁴⁵ Adler, R. (2002), *Surveyors Role in Delineation and Demarcation of International Land Boundaries*, in *Proceedings of the International Congress of the International Federation of Surveyors* 19-26, Washington D.C. (U.S.A.)

¹⁴⁶ Rushworth, D. (1996), *Mapping in Support of Frontier Arbitration (2)*, in *Boundary and Security Bulletin*, Vol. 4, no. 3, pp. 60-61

¹⁴⁷ McMahan, H. (1935), *International Boundaries*, in *Journal of the Royal Society of Arts*, vol. 84, no. 4, p. 330

What is Geomatics?

Geomatics is a relatively new but commonly-applied term that encompasses the areas of practice formerly identified as surveying. The name has gained widespread acceptance in most regions of the Anglophone world. In the United States, the Surveying Engineering Division of the American Society of Civil Engineers recently changed its name to the Geomatics Division. Many college and university programmes in the United States that were formerly identified as 'Surveying' or 'Surveying Engineering' are now referred to as 'Geomatics' or 'Geomatics Engineering'.

The principal reason cited for switching the name is that the manner and scope of practice in surveying have changed dramatically in recent years. This has occurred in part because of recent technological developments that have provided surveyors with new tools for measuring and/or collecting information, for computing, and for displaying and disseminating information. Increasing concerns about the local, regional and global environment have also prompted the name change due to the need to monitor, manage and regulate the use of our land, water, air, and other natural resources. These circumstances, and others, have spurred the vast increase in demands for new spatially-related information.

Three of the nine basic definitions of geomatics recently adopted by the International Federation of Surveyors (FIG) relate directly to national and international boundary-making: ¹⁴⁸

- (i) Determination of the positions of boundaries of public or private land, including national and international boundaries, and registration of those lands with appropriate authorities.
- (ii) Design, establishment and administration of land and geographic information systems and the collection, storage, analysis and management of data within those systems (i.e., initial decision-making regarding boundary area management).
- (iii) Study of the national and social environment, measurement of land and marine resources and the use of data in social and economic development (for example managing the boundary line area for the welfare of the boundary people).

¹⁴⁸ See Wolf, P.R., and C.D. Gillani (2002), *Elementary Surveying: An Introduction To Geomatics*, 10th Edition. Prentice Hall, N.J., U.S.A.

From these definitions, one may consider the science and technology of geomatics as essential in almost all stages of boundary-making.

Today, the geomatic engineer's kit of tools used to measure and collect boundary information includes total stations (instruments that electronically measure distances and angles), global navigation satellite systems (GNSS) which allow to quickly obtain precise positions of widely spaced points, and modern digital aerial or satellite imaging sensors and associated processing systems that allow to quickly map and collect other forms of data about an area. In addition, high performance computer systems are available that can process the measured boundary data and produce maps and other products at speeds unheard of even a few years ago. Furthermore, the resulting products are in electronic formats and, given a strong and stable internet connection, can be transmitted to remote locations.

Concurrent with the development of these new data collection and processing technologies, geographic information systems (GIS) can be used to great advantage in boundary-making. For example, a GIS boundary database can assist in proper and efficient design and implementation of cross-border development schemes, since these computer-based systems enable virtually any type of spatially related information about the environment to be integrated, analysed, displayed and disseminated. The key to successfully operating geographic information systems is acquiring high-quality spatial data. The collection and processing of such data has placed great new demands upon the geomatics community.

Geomatics Technologies for Boundary-making

Prominent geomatics technologies used in boundary-making and management are:

- 1 Global Navigation Satellite Systems (GNSS);
- 2 Digital photogrammetric systems;
- 3 Remote sensing systems;
- 4 Total Stations; and
- 5 Geographic information systems (GIS).

The subsequent subsections briefly describe each of these technologies:

Global Navigation Satellite Systems (GNSS)

GNSS is the scientific term covering all satellite based navigation systems. Two systems (the US-American GPS and the Russian GLONASS) are currently operational, while two additional ones (the Chinese COMPASS and the European GALILEO) are under construction. As GPS is by far the most used, the following chapter focuses on this system. However, the other systems are operating mainly along the same principles.

The Global Positioning System (GPS) was established by the United States Department of Defense to aid their navigation and positioning on a worldwide basis. Its use has expanded from the military and GPS is now employed in many different types of civilian applications, boundary surveys being just one of them. The system takes observations from electromagnetic signals transmitted from a constellation of 24 earth-orbiting satellites, each of which is circling the Earth in a precisely fixed orbit. GPS receivers not only capture the satellite signals, but they also measure the precise instants of time the signals are received. Distances (ranges) from the satellites to the receivers are then determined multiplying the speed of the signal (a constant 300'000 km/s) by the time of travel, enabling receiver positions to be computed.

GPS techniques are broadly classified as (i) static; (ii) real-time kinematic (RTK); and (iii) single frequency navigation-type hand-held. The first type is suitable for very high accuracy (within a few millimetres) work and is thus used, if the need arises, in establishing geodetic networks on both sides of the boundary line on which pillar position computations are based. The RTK approach is capable of achieving accuracies of a few centimetres and are thus commensurate with erection of most pillar positions in boundary surveys and for referencing critical features in high-value parts of the boundary line. Hand-held GPS receivers (Figure 2) only use a single frequency of the GPS signal. While they are cheap (a few hundred dollars for one unit) and light-weight, the positional accuracy levels obtained with these instruments range from a few metres to several tens of metres. This type of receiver is, however, not recommendable for boundary demarcation.

GPS is being used in nearly all types of surveys (maybe with the exception of construction sites and underground surveys), but they are exceptionally useful for the establishment of boundary line pillars and

surveys associated with these pillars. The theory, design and operation of field and office procedures to follow when using GPS are found in standard textbooks on geomatics. ¹⁴⁹



Figure 1 Differential GPS Receiver



Figure 2 A Hand-held GPS Receiver

Digital Photogrammetric Systems

Survey engineers have used photogrammetry in boundary-making for many years. However, with progressing computerisation in various professional fields, the manner by which photogrammetric projects are accomplished has changed dramatically. In traditional (analogue) photogrammetric procedures, the spatial locations of objects on aerial photos have been determined using either analogue or semi-analytical instruments known as stereo plotters (Figure 3), or by employing purely analytical methods such as space resection or aerial triangulation techniques. In the analogue procedures, a model of the terrain is created either optically or mechanically. This model is then measured and/or mapped. In the analytical method, coordinates of image points

¹⁴⁹ Such as Wolf, P.R., and C.D. Gillani (2002), and Kavanagh, B.F. (2003), *Geomatics, First Edition*. Prentice Hall, N.J., U.S.A.

along the boundary line are measured in a reference coordinate system defined by the camera (sometimes referred to as “image coordinates”), and from them the positions of these points are computed in a ground coordinate system.

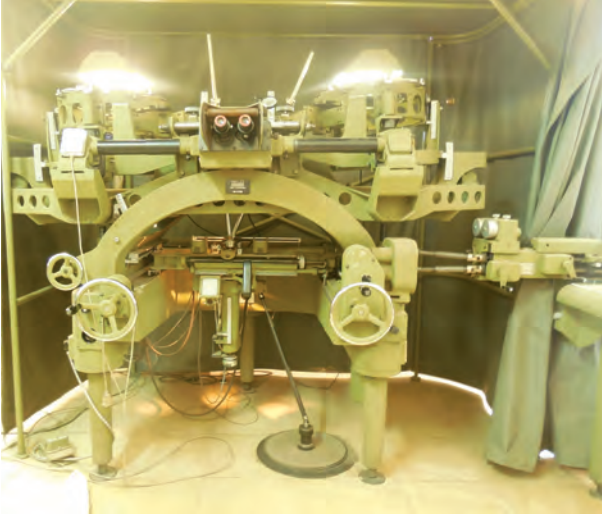


Figure 3 Photogrammetric Stereoplottor – Wild A8

In modern digital photogrammetry, aerial photos are a raster of pixels (picture elements), each of which has its raster row and column location, and its intensity. To obtain this raster of image information, existing photographs taken with analogue film cameras can be scanned, or a digital camera can capture images directly in raster format. Positional information, map profiles and other information are then produced digitally from the raster information using computerised softcopy stereo plotters, so-called because their operations are based on soft-copy (digital) rather than hard-copy (paper, film) images. Digital photogrammetry is highly versatile, and can achieve better accuracies than those of traditional analogue and analytical methods. With its labour saving features, digital photogrammetry can provide significant cost savings.

Low-cost non-metric digital cameras likewise provide another innovative digital photogrammetric technique. Such non-metric cameras have been used extensively with appropriate software and low flying heights, including agricultural mapping applications in Scandinavia. Mapping

scales as large as 1:5'000 are possible.¹⁵⁰ Aerial photography was flown over Sudan's central city of Medani in 2009. This type of camera outfitting on a special metal frame bracket was used as a camera attached to a Twin-Otter survey aircraft owned by Sudan National Survey Authority (SNSA). City maps at scale of 1:10'000 were produced. Such type of cameras may support boundary-making tasks provided that appropriate software and a survey aircraft are available.

Remote Sensing Systems

Remote sensing systems, other than aerial photography, are nowadays quite ubiquitous, and imagery from sensors aboard earth-orbiting satellites has played an important role in a multitude of earth resources surveys, including:

- ▶ Monitoring global changes;
- ▶ Environmental mapping and charting;
- ▶ Geological and soil surveys;
- ▶ Forestry, agriculture and crop yield estimation;
- ▶ Early warning and disaster assessment;
- ▶ Land use / land cover mapping;
- ▶ Population estimation;
- ▶ Hydrographic surveys and other water-body mapping;
- ▶ Topographic mapping at scales ranging from 1:5'000 to 1:100'000;
- ▶ Boundary-line surveys.

Remote sensing instruments used to acquire terrain data vary in construction, design and operation. Multispectral scanners (MSS) and return-beam vidicon (RBV) cameras were carried onboard the first generation of the American series of satellites Landsat-1, 2 and 3 (1972 to 1985). These images had planimetric accuracy levels of 80 metres for the MSS and 30 metres for the RBV. Images from these sensors were used in some parts of the world during the reconnaissance stage of boundary-line surveys. A thematic mapper (TM) sensor and its enhanced equivalent (ETM) were carried on board the Landsat 5 and Landsat 7. Images produced by this sensor had resolutions of 30 metres for the TM and 15 metres for the ETM. According to the NATO map accuracy standards, the latter satisfies the requirements of mapping at scales of 1:50'000 and smaller. This is sufficient map scale range for most initial stages of boundary area re-connaissance and for estimating

¹⁵⁰ Warner, W.S. Graham, R.W. and R.E. Read (1997), *Small format aerial photography*, American Society for Photogrammetry and Remote Sensing. Interprint LTD, Malte

vista lengths along boundary line sections. The French-designed push-broom scanner sensors were installed on the SPOT series of French satellites first launched in February 1986. Initially, two distinct resolution values were possible: the 20 metres resolution in the multispectral mode (XS1, XS2, XS3) and the 10 metres resolution in the panchromatic (black and white) mode. Later generations of these sensors have 2.5-meter resolutions. SPOT data was used in delimiting the boundary between Cameroon and Nigeria where preliminary map sheets at the scale of 1:50'000 were prepared for field reconnaissance.

Other satellite-borne sensors whose data is used extensively for mapping are those on board the Indian remote sensing series (IRS-I,II), and synthetic aperture radar imagery such as the Canadian Radarsat and the U.S. Shuttle Imaging Radar (SIR). The latter created a 90-metre resolution digital terrain model used to ortho-rectify SPOT-5 imagery, which was employed in delimiting the boundary between Cameroon and Nigeria.

For detailed base mapping of important, high-value boundary line sections or densely-populated areas, high resolution satellite images must be used. Such imagery is obtained through sensors carried aboard Ikonos, Quickbird, Pléiades or Geo-Eye satellites. Images from these sensors have resolutions ranging from 1 to 2 metres for Ikonos to 0.4 metres for Geo-Eye sensors. Published research and practical findings demonstrate that map scales as large as 1:5'000 were successfully achieved in various parts of the world. Despite the (relatively high) cost of such data, they are indispensable in all boundary line surveys in areas of high economic, social, and cultural values.

Google Earth images may also be useful in the initial reconnaissance stages of both delimitation and demarcation processes. The precision of these images is in many parts of the world, especially in Africa, rather low. However, the practical application of Google Earth images has much to offer to boundary-makers worldwide.

Total Stations

Total stations play a minor role in boundary making as they require a dense network of trig-points to unleash their full potential and accuracy. They might be required to establish boundaries in densely populated areas with high conflict proclivity. The following chapter is mainly meant to complete the overview on survey techniques.

Total stations combine an automated Electronic Distance Measuring (EDM) component with a vertical and a horizontal electronic angle measuring unit. Results can be displayed as well as stored. The on-board computer converts the measurements in real time to x/y/z-coordinates of points, boundary marks. Figure 4 shows the Leica TPS 1200 total station instrument. In order to use a total station in the field, it is mounted on a tripod or a permanent pillar. ¹⁵¹



Figure 4 Leica TPS 1200 Total Station

Prior to the advent of total station instruments, angles used to be measured manually, using so-called theodolites and reading was recorded manually. Theodolites can be thought of as Total Stations without an EDM. To avoid having to measure distances using tapes or chains (which are not very accurate), a single “base line” was measured. In order to determine the coordinates of the other points, a so called “triangulation” was done. Once the length of one side of a triangle is known, the other sides can be calculated using the angles as measured by the Theodolite. Using this method, coordinates over large areas can be determined by only measuring a single distance (the base line) and the angles between those points (triangulation). More detailed discussion of the components of total station instruments and methods employed in measuring distances and angles can be found in standard surveying textbooks.

¹⁵¹ See especially Ali, A.E. (1987), *Geometric Accuracy Testing of Orbital Radar Imagery*, in *Photogrammetric Engineering and Remote Sensing* 53:11. pp. 1533-1537.

Geographic Information Systems (GIS)

As generally defined, a geographic information system (GIS) is a computerised data management system for the capturing, storage, retrieval, analysis and display of geospatial data. The latter is divided into a) raster and b) vector data. While raster data is cell-based, the smallest entity of vector data is an x/y-coordinate. Vector data can be further sub-divided into points (or nodes), lines and polygons (enclosures). GIS permits a composite display of two or three-dimensional data layers. Vector data can be enhanced with “attributes” e.g. a road line can bear the name, slope, length, width, type, condition, speed limit, etc. of the said line. Typical fields of application are topography, hydrography, toponymy (names), elevation/depths, and, of course, boundaries.

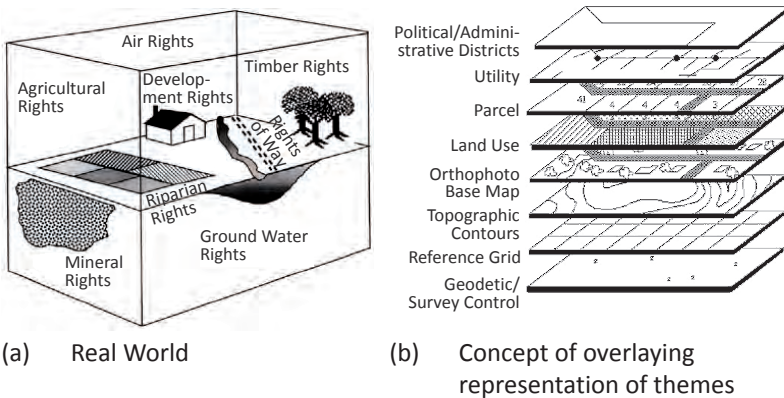


Figure 5 Basic Concept of GIS

To manipulate spatial data in a GIS context, the computer must be able to read and correlate:

- (i) Referenced geographic coordinate systems specifying the precise geophysical location of the feature;
- (ii) The identity of each feature (attribute information); and
- (iii) The spatial relationship of each feature with respect to its surroundings or environs.

These conditions apply to the delimitation process in both land and maritime boundary-making. Points may correlate to geographic features on boundary lines, like isolated rocks, mountain peaks, confluence points of rivers, etc. Lines may correspond to straight sections of the boundary; while polygons may represent exclaves, islands, inland water bodies, etc. The GIS integrates all of these features (points, lines, polygons and rasters) into a common spatial environment (or 'neighbourhood').

The Concept of Map Accuracy in Boundary-making

Generally, a map is defined as "a graphical, analytical or digital representation of the surface of the Earth showing all relevant features on, above or below the surface." Boundary-makers use maps at virtually all stages, right from negotiations, through delimitation to demarcation and management.

As such, like any other technical product, a GIS map serving whatever purpose, must satisfy certain "quality" standards of accuracy before being used for various applications. Otherwise, it is considered non-compliant. A boundary-maker must therefore compile maps that conform to accuracy tests. Sets of these standards and the various procedures used to implement them are explained in Appendix A.

Pillar Position Referencing, Documentation and Maintenance

After the demarcation process is complete, the erected primary pillars should be carefully and accurately referenced by placing smaller-sized pillars along the line and perpendicular to it at distances of between 100 metres and 150 metres from the main pillar. Steel tapes (measurement accuracy at the scale of 1:2'000) are the easiest means of establishing these tertiary pillars (also known as witness marks). Tertiary pillars are also shown on the boundary maps and stored in the GIS as a separate data layer. Their main purpose is to act as reference information for pillar re-establishment if a main pillar is destroyed by vandals or lost. Also, high-quality terrestrial photographs of every main and secondary pillar must be taken and added to the database as a GIS layer. Natural features around each pillar may also be tied and added.

A permanent joint committee from both parties customarily carries out the management and maintenance of the boundary line.

The committee holds regular meetings to discuss the need for any sort of repair, maintenance or re-location of pillars. Reports of this committee are normally passed on to higher authorities in the two countries for approval and/or amendment.

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Chapter 8

The Factor of Affected Local Populations



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Conceptual and Global Focus

Boundaries of modern States, all of them created on the model or influence of European Westphalian tradition, are notorious for their ubiquitous tendency to side-step the interests of affected local populations through whose pre-inhabited territories or homelands the alignments have had to be drawn, demarcated and maintained. Being, by definition, installations of the sovereign Nation-States, modern international boundaries are not intended to serve any other purposes higher than those of the sovereigns who initiated and authorised them in the first instance.

In Europe, as the exemplary case study of the Catalans straddling the Franco-Spanish border in the Eastern Pyrenees demonstrates¹⁵² that the interests of the State of France, on the one hand, and Spain, on the other, were what mattered and were put in sharpest focus by agents commissioned to carry out the delimitation in the 1660s and final demarcation in the 1860s. In pursuit of divergent national agendas, each side took delight in diplomatically derogating the other and, in the process, they observed no morality in the methods used, which came to include plain forgery and falsified interpretation of historical records and documents.¹⁵³ This was much like in the situation of widespread incidents of forged treaties with local indigenous rulers that European powers later came to use against one another in their imperialist claims to African territories in the era of the Scramble and Partition.¹⁵⁴ In such circumstances, whether in Europe or, later, in Africa and the wider

¹⁵² Sahlins, P. (1989), *Boundaries: The Making of France and Spain in the Eastern Pyrenees*, Berkeley, University of California Press.

¹⁵³ *Ibid.*

¹⁵⁴ This immorality was especially rife with the Germans in East Africa.

European imperial world, local interests might and would be served only when they coincided with the over-towering purpose of nation or empire.

In Africa, the interests of local populations on the path of modern State boundaries suffered double jeopardy as the States defined by new alignments were not only structurally different from those of the territorially more flexible rule of preceding eras of history, the makers were also racially and culturally distinct and originated from unfamiliar lands of a foreign and distant continent. While the thesis of 'Continuity of African institutions under colonialism'¹⁵⁵ has received some boosting in supportive scholarly arguments about 'indigenisation' or 'provincialisation' of European Colonialism¹⁵⁶, suggestions that tend to present African borderlands communities as rational-choice beneficiaries and supporters¹⁵⁷ would appear to mistake effects for cause or African response and adaptation for ownership of the European imperialist and colonialist initiatives, including the boundary-making process.

European colonial boundary-making, as has been convincingly argued in respect of the boundaries of Nigeria *vis-à-vis* each of her neighbours¹⁵⁸ or that between Ghana and Togo¹⁵⁹, might have taken advantage of pre-existing familiar-type 'frontier' conditions, so admirably described in Ivor Kopytoff's book-length Introduction to his edited volume on *The African Frontier*¹⁶⁰. However, any ensuing coincidence of interests between locality and in-coming European hegemonies must be understood for what it was: an incidental affair. There is no question about such numerous instances where, in defending basically imperial-

¹⁵⁵ Ajayi, J.F. Ade (1968), *Continuity of African Institutions Under Colonialism*, in Ranger, T.O., (Ed.) *Emerging Themes in African History* (Nairobi) and 'Colonialism: An Episode in African History', in Gann, L.H. & Duignan, P., Eds. (1969) *Colonialism in Africa*, Vol.1, Cambridge, Cambridge University Press.

¹⁵⁶ Asiwaju, A.I. (1988), *Indigenisation of European Colonialism in Africa: Processes in Yorubaland and Dahomey. Since 1860*, in Forster, S., Mommsen, W. J. and Robinson, R., (Eds.) *Bismarck, Europe & Africa: Berlin Africa Conference 1884-1885 and the Onset of Partition*, Oxford, Oxford University Press, 441-451. 'Provincialisation', as derived from Dipesh Chakrabarty (2000) *Provincialising Europe: Postcolonial thought and Historical Difference* (Princeton University Press), carries the same notion as 'indigenisation'.

¹⁵⁷ Nugent, P. (2002), *Smugglers, Secessionists and Loyal Citizens on the Ghana-Togo frontier*, Oxford, James Currey. Many local border communities may have come to see and, indeed utilize the boundaries as essential components of their economies, but this does not mean that this was part of the calculation for creating the boundaries.

¹⁵⁸ Anene, J.C. (1970), *The International Boundaries of Nigeria, 1860-1960: The Framework of an Emergent African Nation*, London, Longman.

¹⁵⁹ Nugent, Ibid.

¹⁶⁰ Kopytoff, I. (1987), *The African Frontier*, Bloomington, Indiana Umo. Press.

ist interests, European agents are known to have insisted on adjusting delimitations to achieve demarcations that would ensure the integrity of certain 'tribal' territories. But as was stated with an air of characteristic imperialist arrogance by a British colonial official in respect of the Watavi in the Said zone of the Ethiopia-Sudan border in 1902, "Taken as a whole, the Watavi of Dul [or any other pre-existing African State territory, for that matter] cannot be regarded as deserving of any consideration, if it should appear expedient to draw the boundary through their midst."¹⁶¹ It was this essentially arbitrary manner of European imperialist boundary-making that has given rise to the continent-wide phenomenon of 'dismemberment'¹⁶² and the resultant case of 'Partitioned Africans'¹⁶³, now 'Caught in the Middle', like other 'Border Communities in the Era of Globalisation.'¹⁶⁴

The continuous disregard for the plight of inherently affected border communities, leading to their widely recognised structural disadvantage in peripheralisation and insecurity, has for long been sustained by the traditional sovereignty perspective in international law that regards only States as 'proper subjects' while the people, the border communities in this case, as 'mere objects.'¹⁶⁵ Happily, as has been richly elucidated in the discussion of 'Straddling Settlements' and the inter-connected issue of 'Straddling Resources' in a pertinent essay on the legal definition of delimitation.¹⁶⁶ An alternative trend also found in International Law that is not only sensitive to the interests of the people, as distinct from those of the sovereign States, but tends even to emphasise States as means and people as end.

On the one hand, this jurisprudential stress on law, including international law, as an instrument for positive social change, has given rise not only to such applicable international instruments as the 1948

¹⁶¹ Zewde, B. (1976), *Relations Between Ethiopia and the Sudan on the Western Ethiopian Frontier, 1889-1935*, Ph.D Thesis, London, p. 102.

¹⁶² See Englebert, P. et al. (2002), *Dismemberment and Suffocation, A Contribution to the Debate on African Boundaries*, in *Comparative Political Studies*, Vol. 35, no. 10, 1093-1117.

¹⁶³ Asiwaju, A.I. (Ed.) (1984), *Partitioned Africans*, London, C. Hurst & Co. Publishers.

¹⁶⁴ Papademetriou, D.G. and D.W. Meyers (Eds.) (2001), *Caught in the Middle: Border Communities in An Era of Globalization*, Washington, DC, Carnegie Endowment for International Peace.

¹⁶⁵ McEwen, A.C. (1971), *International Boundaries of East Africa*, Oxford, Oxford University Press, p. 16.

¹⁶⁶ Oduntan, G. (2009), *Legal Aspects of Delimitation and Demarcation*, Presentation at the Second Symposium on Delimitation and Demarcation of River and Lake Boundaries, Maputo, December, 2-4. Also see Ouguergouz, F. (2007), *Délimitation des Frontières en Afrique – Quelques Aspects Juridiques Dégagés de la Jurisprudence de la Cour Internationale de Justice*, A Presentation at the Conference of African Ministers in Charge of Border Issues, Addis Ababa, June 4-7.

United Nations Convention on Human Rights and, lately, the more specifically relevant Draft United Nations Declaration on the Rights of Indigenous Peoples. This offers “a chance to change older strategies of top-down unilateral governmentalism to multilateral deliberative forms of governance.”¹⁶⁷ On the other hand, there are also regional instruments that have given rise to such innovative structures as the African Court of Human and Peoples’ Rights and the Courts of Justice that have been set up within the framework of such regional and sub-regional organisations as the African Union and the Economic Community of West African States (ECOWAS) with jurisdiction, in each case, that covers individual citizens or groups.

The point of this chapter, then, is to focus attention on the sensitivities of local communities inhabiting areas along and across specific segments of the boundary alignments. They need to be taken into account in order to expect to make a difference between delimitations and demarcations of the European colonial era, on the one hand, and the present exercise aimed at repossessing the initiative and African ownership of both the process and the products within the context of the African Union Border Programme on the other. The original European imperialist instruments continue to matter to the extent that Africa’s history fits into today’s wider Nation-State world through a well-reasoned adoption of colonially arranged State territories and boundaries. However, the processes of delimitation, demarcation, and re-affirmation under the AUBP cannot afford to ignore, as was the case in the age of European imperialism, human rights and popular concerns.

This essay emphasises the need to: 1) focus specifically on delimitation and demarcation as means and not ends in themselves; 2) see people more as beneficiaries of State action on delimitation and demarcation; 3) employ down-to-earth, simple and flexible procedures that would not only minimise, if not eliminate, familiar diplomatic wrangling on delimitation, but adopt measures to install inexpensive and cost-effective boundary markers; 4) remain conscious every inch of the way about the wider policy context – notably the interconnectedness of delimitation and demarcation with the core objectives of the AUBP, namely, the issues of cross-border cooperation and special development focus on lands and people along and across the boundary alignments in the context of an over-all policy concern for conflict prevention, peace building,

¹⁶⁷ See Zips-Mairitsch, M. and W. Zips, (2009), *Kalahari Governance: Nature Conservation and Indigeneity in Southern Africa’s Borderlands*, Paper Presented to the 4th Annual Meeting of the African Borderlands Research Network (ABORNE), Johannesburg, Sept. 10-13, 2009.

regional integration and sustainable socio-economic development; 5) recognise the imperative for consultation and collaboration, including the absolute necessity for systematic and sustained programmes of grassroots public education in every affected locality in order to ensure cooperation and collaboration of the local communities during demarcation and post-demarcation maintenance.

So the AUBP may keep local populations foremost in the delimitation and demarcation exercise, good care must be taken to ensure a multidisciplinary collaboration of seasoned historians and ethnographers with relevant local knowledge, to say nothing of media practitioners with appropriate background, who should work closely with legal experts during delimitation and surveyors during the critical stages of demarcation or re-affirmation. The remainder of this essay focuses on the actual experience of Nigeria by noting achievements and challenges in border delimitation and demarcation over the past two decades, and pointing out the extent to which a focus on affected populations and the adoption of multidisciplinary have facilitated the processes.

Nigeria's Actual Experience Since 1989

Strategically situated in the eastern extremity of the Gulf of Guinea and stretching furthest inland along its longest and most 'troublesome border'¹⁶⁸ with Cameroon, with a length of over 2,000 kilometres, Nigeria shares substantial land and maritime boundaries with seven sovereign African States diversely situated in two of Africa's five major constituent Regional Economic Communities: three (Benin and Niger plus Ghana in the high seas) in the Economic Community of West African States (ECOWAS) and four (Cameroon, Chad, Equatorial Guinea, and São Tomé and Príncipe) in the Economic Community of Central African States (ECCAS).¹⁶⁹

Not only has significant progress been recorded in the delimitation, demarcation and related matters of management on all of these boundaries, Nigeria has also enjoyed the cooperation and concurrence of its neighbours in the recent application submitted jointly to the United Nations Commission on the Limits of the Continental Shelf for the extension of its continental shelf claims beyond the current exclusive

¹⁶⁸ Borrowed from Martinez, O.J. (1988), *Troublesome Border*, Tucson, The University of Arizona Press, A history textbook on the U.S.-Mexico borderlands.

¹⁶⁹ More details in *Nigeria and Its International Boundaries: A Status report*, Presentation by the Nigerian Boundary Commission at the Meeting of Experts, Conference of African Ministers in Charge of Border Issues, Addis Ababa, June 4, 2007.

economic zone limit of 200 nautical miles. Beginning with limitrophe neighbours in ECOWAS, more than 90 per cent of the land border of about 800 kilometres with Benin has been concretely re-demarcated, and the maritime extension, hitherto undefined, has been delimited in a bilateral agreement signed in 2006. The Niger-Nigeria boundary of about 1,500 kilometres has been more completely re-affirmed and all the old boundary pillars recovered and re-emplaced. Discussions with Ghana have already been initiated regarding the eight-nautical-mile maritime boundary.

With respect to the neighbouring countries in ECCAS, the intra-lacus-trine border of about 75 kilometres (the shortest of Nigeria's international boundaries) with Chad has been firmly established on the basis of the 1991 demarcation by the four-nation Lake Chad Basin Commission, as confirmed in the ICJ Judgement of 2002 in the famous Cameroon-Nigeria case. The ICJ Judgement also settled the matter of the delineation of the entire land and maritime boundary with Cameroon; and the demarcation process is proceeding in strict adherence to the Court's verdict. The maritime border with Equatorial Guinea has also been confirmed in a bilateral treaty of 2006, thanks to the acceleration of the process by the ICJ's concurrent confirmation of the tripartite point with Cameroon in the sensitive oil-rich Gulf of Guinea.

Straddling oil fields that could cause dispute with Equatorial Guinea have been unitised and the concessions jointly managed on the basis of a mutually agreed formula for sharing profit. In respect of the delimitation of the maritime boundary with São Tomé and Príncipe, the problem posed by rival and competing claim lines in the overlapping Exclusive Economic Zones of both countries has been solved through a bilateral agreement in 2002 to suspend the dispute for 40 years in the first instance. The disputed area has then been organised into a Joint Development Zone where, as in the case of straddling oil fields on the border with Equatorial Guinea, the oil concessions are managed by a Joint Development Authority that shares the profits on the agreed ratio of 60:40 in favour of Nigeria.

This essay essentially argues that the truly phenomenal advancements in the delimitation and demarcation activities on all of Nigeria's international boundaries would have been impossible without prior establishment of an enabling atmosphere of peace, a methodical application of active consultation and collaboration not only at international, but also the national and local levels. A wider policy contextualisation was

carefully considered for the purpose of eliminating conflicts, systematically promoting cooperation, enhancing durable peace, and pursuing sustainable development that included programmes and projects specifically focused on the structurally disadvantaged border regions and affected local communities.

In Nigeria, a deliberate policy turn-around, noticeable in the mid-1980s, resulted in a major paradigm shift from the traditional State-centric and legalistic stance to a modern regional-development perspective and people-oriented emphasis. This policy re-focusing ensured a transformation from an existing conflictual environment to a cooperative border and cross-border regime in the service of a wider African regional integration agenda. Significantly, the new policy agenda operated and still operates on the basis of continuous consultation and collaboration at all levels and a programme directed at articulating affirmative action favouring adversely affected border communities.

The most fundamental feature of the new policy turn-around has been the institutionalisation of a specialised agency, the National Boundary Commission¹⁷⁰ that, though legislated into existence by a law of 17 December 1987, began operation on a permanent basis only in January 1989. Recommendations flowing from a substantial corpus of scientifically researched material importantly informed the decision to establish the Commission, including an officially commissioned study that focused on a detailed analysis of Nigerian and other African borderlands.¹⁷¹

While not ignoring the traditional strategic or statist considerations, the studies that led to the enactment of the structurally multi-ministerial and functionally multi-disciplinary Commission in December 1987 and, especially, its permanent establishment and operation since January 1989, rather emphatically stressed the interests of lands and peoples in the immediate localities along and, inherently, across the international boundaries. In addition to delimitation and demarcation, the Commis-

¹⁷⁰ A history of the Commission is chronicled in Barkindo, B., (Ed.) (1992) *The National Boundary Commission*, Lagos. The writer was the foundation Commissioner (International Boundaries) from 1989 to 1994 and recently re-appointed (2008) as a Member representing the Southwest Geopolitical zone on the new Board of the Commission.

¹⁷¹ See, for example, Asiwaju, A.I. (1984), *Artificial Boundaries*, Lagos: University of Lagos Press Inaugural Lectures Series, Asiwaju, A.I. (Ed.), *Partitioned Africans*, op.cit, Asiwaju, A.I. and P.O. Adeniyi, Ed. (1989), *Borderlands in Africa*, Lagos: University of Lagos Press, and NIPSS, Kuru, (1987), *Report of the Research Project on Border Defence and Security*, in Six Volumes (Kuru, Jos: National Institute for Policy and Strategic Studies (NIPSS)).

sion provides a range of services aimed at the affected border areas and communities, recognising them as points of convergence for the nation's border policy concerns. Accordingly, border areas and communities are the most recurrent references in the series of consultations and related initiatives undertaken vis-à-vis each of the neighbouring countries prior, during and after the delimitation and, more importantly, the demarcation exercises.

Three inter-phasing modes of popular consultations characterise the practice in Nigeria from the mid-1980s and particularly since the National Boundary Commission commenced operation on a permanent basis in 1989. The first, which predated the Commission but was intensified in the early years of the Commission's operation, was a programme of regular joint ministerial border tours. Each lasted three working days, usually from Tuesday to Thursday, which included spending two nights together, one night on each side of the border. The tour programme, initiated by Nigeria, was one in which the Nigerian Minister of Internal Affairs (now called Minister of Interior in an apparent effort to harmonise with the terminology current in the neighbouring countries) undertook joint tours of selected border settlements on both sides, to identify with the border communities, to assure them of government attention and support, and to solicit their cooperation on the on-coming demarcation exercise as activity within wider beneficial concerns for the two governments to bring about peace and stability in the border areas.

Often embracing the participation of senior border-enforcement officials as well as local and regional authorities and the presence of the Ambassadors of each other's State party or their staff, the Joint Ministerial Border Tours provided the platform for demonstrating the solidarity between the countries by creatively bringing diplomacy to the grassroots level of cross-border cooperative and bilateral governance. The first such innovative Joint Border Tour was successfully undertaken in February 1986 focused on Illo, the Nigerian border town in close proximity to the Nigeria-Benin-Niger tri-point on the River Niger in the Borgu area. This first joint border tour set the stage for the historic Nigeria-Benin Trans-border Cooperation Workshop in Badagry in May 1988, the first in series of consultative trans-border cooperation workshops to be held, again, with each neighbouring country. In 1989 and 1990, other Joint Border Tours were undertaken for the Niger-Nigeria border areas.

The second mode of popular consultation deployed by Nigeria to facilitate delimitation and demarcation of its borders vis-à-vis its proximate

neighbours was the organisation of a series of bilateral Trans-border Cooperation Workshops, initially planned to feature each one of the international boundaries. Inaugurated, as we have already noted, with the Nigeria-Benin event at the Administrative Staff College of Nigeria (ASCON) in Badagry in May 1988, the other Workshops were subsequently hosted for Niger in Kano in July 1989; for Cameroon in Yola in May 1992; and for Equatorial Guinea in Calabar in November 1992; and ‘the bilateral Summits’ of the Presidents in 1999 on the maritime boundary delineation and trans-border cooperation between Nigeria and São Tomé and Príncipe, leading ultimately to the establishment in 2001 of the Joint Development Zone and Joint Development Authority between the two countries.¹⁷² Although the crisis in Chad resulted in the suspension of the Chadian session planned for Maiduguri, a rescheduled workshop was held for the Niger-Nigeria borderlands in Sokoto in 2001.¹⁷³

A recent academic presentation observed, “the Trans-border Cooperation Workshops were an open market of ideas and opportunities”¹⁷⁴ for active exchange, not just between scholars and technocrats (legal experts and surveyors) from the participating State Parties but also among traditional rulers, high-ranking regional and local authorities, and local opinion leaders, including operators of cross-border businesses. The Trans-border Cooperation Workshop Series thus came to serve the unique purpose of consultation not just between national authorities and sub-national territorial communities and local governments on each side, but they also provided the opportunity for vital cross-border and bilateral interactions.

The third mode relates to confidence-building missions. It was especially well developed and effectively deployed within the framework of the activities of the National Boundary Commission. The most spectacular

¹⁷² See Ahmad, M.B. (2009), *Integration and Peace Through Border Delimitation and Demarcation: The Nigerian Experience*, Presentation at the 2009 Meeting of ABORNE, Johannesburg, Sept. 10-13. Note that the proceedings of the bilateral Workshops have been published, except those of Yola, with Cameroon, see, for example: Asiwaju, A.I. and O. J. P. Igue, (Eds.) (1994), *The Nigeria-Benin Transborder Cooperation*, Lagos, University of Lagos Press, for the National Boundary Commission; Asiwaju, A.I. and B.M. Barkindo (Eds.) (1993), *The Nigeria-Niger Transborder Cooperation*, Lagos, Malthouse Press, for the Commission; Asiwaju, A.I., Barkindo, B.M. and R.E. Mabale, (Eds.) (1997), *The Nigeria-Equatorial Guinea transborder Cooperation*, The Commission.

¹⁷³ Amdii, S., Bobbo, D., and M. Koraou (Eds.) (2003), *The Nigeria-Niger Transborder Cooperation and Management*, Abuja: The Commission.

¹⁷⁴ Ahmad, M.B., *Ibid.*

mission was the one led by the Minister of Foreign Affairs to Yaoundé, Cameroon, in 1991.¹⁷⁵ Others were conducted in Cotonou, Benin; Niamey, Niger; N'Djamena, Chad; and Malabo, Equatorial Guinea, in 1990, 1991 and 1992, respectively. Apart from serving the purpose of a formal introduction of the Commission to the various national authorities, the confidence-building missions also combined the objective of initiating discussions for a Transborder Cooperation Workshop with each of the bordering countries. Regular exchange of visits were also undertaken by Governors of Nigerian border states and *Prefets* of the adjoining *Departements* in the mostly francophone neighbouring countries.

The National Boundary Commission strengthened consultation and collaboration in other directions not only to invigorate existing collaborative mechanisms such as the Nigeria-Niger Joint Commission on Cooperation and the four-nation Lake Chad Basin Commission, but also to create new regional institutions such as the Gulf of Guinea Commission, aimed at institutionalising cross-border cooperation. Of particular relevance to the local people are the Local Bilateral Committees that constitute key active elements in the operation of the Nigeria-Niger Joint Commission since the early 1990s when they were created. A similar institutional framework is promised for Nigeria and Benin, if and when the already engrossed Treaty on Trans-border Cooperation between the two countries, based on the recommendations of the historic bilateral workshop of 1988, is signed and operationalised.

Given the active participation and interaction of diplomats and surveyors in the three main modes of consultative activities jointly organised by Nigeria with each of the bordering countries, an atmosphere was generated that drastically reduced the usual wranglings between diplomats on delimitations and surveyors on the actual demarcations. It is to this fact of enabling an environment of collaboration between diplomats and surveyors on both sides of the particular borders that Nigeria, with each neighbour, owes the ease by which they resort to mutual concessions in the name of 'African brotherhood'. Such an environment

¹⁷⁵ The special high-profile Mission to Cameroon in 1991 helped to re-open discussion on the border after more than 15 years of Cameroonian withdrawal following Nigeria's repudiation of the 1975 Maroua Declaration in 1976.

permitted Benin to attain its full extent of 200 nautical miles of Exclusive Economic Zone in the Atlantic Ocean.¹⁷⁶

Of the measures taken within the framework of the operation of the National Boundary Commission, none sensitises border communities more to the relevance of State action about demarcation than the enunciation of a special development focus on their areas. Beginning with the hosting of the historic First National Planning Conference for the Development of Border regions in Lagos in August 1989¹⁷⁷, the Commission was able to coalesce truly widespread and entrenched local interests around the national space with visible efforts at providing and improving infrastructural facilities in the border regions. Resettlement projects for communities that had to be displaced because of demarcations, and substantial compensations paid to individuals for properties that had to be demolished to give way to clearer border vistas, (like those in Ilara and Iwoye in Ogun State, where the alignments pass through built-up areas), had a particularly local impact.

The celebrated 2002 Judgement by the International Court of Justice (ICJ) boosted the concern for border communities. With respect to settlements suspected by the Court to straddle the border like “**the Village of Turu**” and “Kotcha (Koja)”, the Court urged the two State parties to “[ensure] that the rights and interests of the local populations are respected”. **More explicitly, the Court urged “the Parties [...] to cooperate in the interests of the population concerned, in order to notably enable it to continue to have access to educational and health services comparable to those it currently enjoys [...]”** (emphasis that of the author).¹⁷⁸

The Court’s emphasis on ‘the interests of the population concerned’ was notably respected in the arrangements made for implementing

¹⁷⁶ This point of minor territorial concessions to its neighbours in the name of ‘African brotherhood’ was especially elaborated in the oral presentation of the Nigerian position at the historic Conference of Ministers in Charge of Border Issues, 4-7 June 2007. The practice was also noticeable in the 1975 Maroua Declaration on the initial 3-nautical-mile extension of the Cameroon-Nigeria maritime boundary up to Point G, whereby Nigeria conceded a pre-existing Cameroonian oil platform by allowing an arc to be drawn around it to place it securely on the Cameroonian side. Contrary to popular and factually erroneous belief, this (not the Bakassi Peninsula that had long been settled for Cameroon by the Anglo-German Treaty of 1913) was the only concession made to Cameroon under President Ahidjo by Nigeria under General Gowon as Head of State.

¹⁷⁷ Asiwaju, A.I., (Ed.) (1993), *Border Region Development*, Proceeding of the First National Planning Conference, Durbar Hotel, Lagos, August 10-12, Lagos, National Boundary Commission and Second Edition: Imeko, African Regional Institute, 2008.

¹⁷⁸ See Paragraphs 107, 120 and 316 of the Judgement.

the Judgement. Thus, while immediate attention was focused on the demarcation of the boundary on the basis of the delimitation in the Court's Judgement, one of the two operational sub-commissions set up by the UN-Cameroon-Nigeria Mixed Commission, established to implement the ICJ verdict, was the Sub-Commission on Affected Populations.¹⁷⁹ The UN-Cameroon-Nigeria Sub-Commission on Affected Populations supported the primacy of the affected local populations in delimitation and demarcation by working hand-in-hand with the Sub-Commission on Delimitation and Demarcation, the other working sub-commission created by the main Mixed Commission in its effort to give effect to the Court's decision.

As expected, the Sub-Commission on Affected Populations preceded the other Sub-Commission and, indeed, the Mixed Commission itself in entering the field 'after the Judgement day', as it were.¹⁸⁰ It made the first major direct contact with the populations after the Judgement, ahead of the team of surveyors. In executing its mandate, the Sub-Commission on Affected Populations, from May 2003 to April 2004, methodically and painstakingly conducted well-organised missions that thoroughly investigated and critically assessed the situation of each of the affected local communities. From Darak in the Lake Chad region to Limbe on the Atlantic seacoast, the Sub-Commission criss-crossed (by road, water and air/helicopter, by day and night) the rather difficult terrain of the Cameroon-Nigeria borderlands, interacting intensively and listening patiently to the people, including those on the highly volatile Bakassi Peninsula. It is the report of this obviously critical Sub-Commission that guided the Mixed Commission and formed the basis for the drafting of the now famous Greentree Agreement of 12 June 2006. The Agreement paved the way for the on-going demarcation and inter-related processes and activities. The discontinuance of the Sub-Commission on Affected Populations after submission of its report eventually led to the undesirable effect of officials showing disproportionately less interest in people than the States.¹⁸¹

¹⁷⁹ The author was privileged to serve as the Leader of the Nigerian Delegation to the UN-Cameroon-Nigeria Sub-Commission on Affected Populations.

¹⁸⁰ Daniel, T. (2002), *After Judgement Day*, in Schofield, C., D. Newman, A. Drysdale and J.A. Brown, (Eds.) *The Razor's Edge: International Boundaries and Political Geography*, The Hague, Kluwer Law International, pp. 269-286. This is a very fascinating comparative scholarly essay on the effects of boundary and territorial Judgements handed down by the ICJ, including in the Cameroon-Nigeria case.

¹⁸¹ The result has been the subsequent and current over-emphasis on delimitation and demarcation at the expense of a special development focus on the adversely affected border areas and local communities. The fund-raising effort by the Mixed Commission was for demarcation works, not border communities development purposes.

In Nigeria, far more needs to be done than has been done to right the wrong wrought on the nation's border communities by the history of the nation's boundaries; but government's sincerity of purpose is evidenced in the promulgation of the Border Communities Development Agency (Establishment) Act 2003, Amended 2006. The widespread enthusiasm, including the massive criticisms of the performance so far of the Commission's implementation of border region development projects¹⁸², at the National Conference of Stakeholders hosted by the National Boundary Commission in early December 2007, demonstrated the success of a policy aimed at stimulating local involvement in the new border policy design. The serious intent of government at the Federal level is complemented in quite a number of the scheduled border States such as Adamawa, Cross River and Ogun, which have set up their own specialised agencies for border communities development. These include a Ministry of Border Region Development in Adamawa; a Border Region Development Commission in Cross River; and a Border Region Development Agency in Ogun. In both letter and spirit, the Nigerian experience has notably facilitated the support it accorded to wider regional policy formulations such as the 2005 ECOWAS Cross-Border Initiatives Programme (CIP), with a pilot project launched for the Kano-Katsina-Maradi section of the Niger-Nigeria borderlands in September 2007, and the more continental African Union Border Programme (AUBP) in June 2007.¹⁸³

The focus on Nigeria as African best-practice in pre-demarcation consultations, including with sub-national authorities at the grassroots level and local border communities along and across the international boundaries, is not to suggest that there are not other African examples. It takes two to tango, so even the Nigerian best-practice must be viewed to include all of Nigeria's neighbours and their inter-connecting borderland communities, whose cooperation constitutes an important part of the explanation of the Nigerian success story.

Outside the area of Nigeria and its proximate neighbours in West and Central Africa, good practices in other African countries stand out

¹⁸² The emergent problems include an over-sprawling and ever expanding bureaucracy; inadequacy of relevant capacity-building especially in the area of regional planning with special reference to border and cross-border areas; and less than required attention to supportive research within and outside the commission.

¹⁸³ For an elaboration of both the CIP and AUBP and relevance to Nigeria, see Asiwaju A.I., (Ed.) (2008), *Development of Border Regions: Nigeria and Proximate Neighbours in West and Central Africa*, Proceedings of a National Workshop, African University Institute, Imeko, Dec. 5-7, 2006, Imeko, African University Institute.

with respect to delimitation and demarcation exercises. In the Burkina Faso-Mali case included in this volume¹⁸⁴, the active involvement of local territorial authorities and local communities (traditional rulers and other local elites) has been found to be of crucial importance to undertaking demarcation following the ICJ Judgement on the case between the two countries. Significantly, even when the Tuareg rebellion in Mali interrupted the process, the boundary markers were not tampered with. Nor were other border-area development infrastructural facilities and installations (clinics, dams, electricity projects, and so on) under the Liptako-Gourma Integrated Authority operating in the wider Mali-Niger-Burkina border areas.¹⁸⁵ Situations such as these prove the point that local communities are capable of being persuaded to perceive delimitation and demarcation in the wider context of beneficial presence of the State in their midst. Nigeria's practice of unitization and joint utilization of cross-border resources are also found in other African countries, notably in Eastern and Southern Africa, with respect to matters of wildlife management. Hopefully, the cross-border collaboration on wildlife conservation and international parks management in Southern and Eastern Africa would also be used to advance the cause of acceleration of border delimitation and demarcation within the two sub-regions.¹⁸⁶

Implications for Delimitation and Demarcation under the AUBP

This presentation points out that border delimitation and demarcation under the AUBP cannot afford to be the kind of top-down operations used in the era of European imperialism and colonialism that, unarguably, bequeathed the territories and boundaries to the independent African States.

The concrete example of Nigeria demonstrates that the experience is not without flaws and draw-backs, but delimitation and demarcation

¹⁸⁴ See Coulibaly, I., *Demarcating Africa's Post-Conflict Boundaries: The Burkina Faso-Mali Experience* in Chapter 10 of this volume.

¹⁸⁵ The comparative findings in respect of the Liptako-Gourma Integration Authority, a creative border region development agency jointly established by the three West Africa's land-locked countries in 1970, are contained in Asiwaju, A.I. and L.B. One (1994), *Study on the Creation of Inter-State Industrial Zone in West Africa*, Lagos, ECOWAS Executive Secretariat Department of Industries, Agriculture and Natural Resources.

¹⁸⁶ For an informed discussion of cross-border collaborative management of wild life, Nature Conservation and Parks, see Mandima, J.J. and D. Sumba (2007), *Highlights of African Wild Life Foundation's Conservation Work in Transboundary Landscapes of Africa*, AUBP Meeting of Experts, Bamako, March 2007, and Zips, *op.cit.*

under the AUBP should be enabled to rest, *inter alia*, on the following prerequisites:

- (i) Sensitivity to the interests and rights of locally affected indigenous communities, and the obligation to back up the boundary-making process with works by professional historians and ethnographers possessing relevant local knowledge;
- (ii) A well articulated and strongly sustained programme of consultations and collaboration at the levels of:
 - (a) The national and sub-national authorities on each side of the border of Member States;
 - (b) Cross-border collaboration between State Parties and constituent local territorial authorities and local communities;
- (iii) Confidence-building measures, including programmes and projects that boost the trust of the affected local populations;
- (iv) Due cognisance of the provisions of international law, including relevant judicial pronouncements that address fundamental human rights and the rights of indigenous populations in the structurally disadvantaged locations on the national peripheries;
- (v) The obligation to focus on special development that helps the cause of de-marginalisation and integration into the nation and wider region;
- (vi) The imperative for wider policy contextualisation focused on the inter-phasing goals of conflict prevention, cooperation promotion, systematic peace-building, and sustainable development via regional integration. Wider and higher policy goals should be cognisant of:
 - (a) Reducing, if not eliminating the usual diplomatic wrangling among national bureaucrats in discussions of delimitation and demarcation;
 - (b) Simplifying demarcation and post-demarcation maintenance through the use of cost-effective local materials to construct border markers and involve the local people (like nearby farm owners on stipends) in pillar and vista maintenance. Expensive fortress-type structures do not enhance cross-border cooperation, concerted border regional planning and development, or regional integration. A simplification of procedures and processes is the only guarantee for ensuring a completion of demarcation by the deadline of 2017 set by the AUBP;
 - (c) Marketing the principles and practice of suspending sovereignty for the sake of joint exploration, exploitation, and profit-sharing on the model of the Nigerian practice with Equatorial

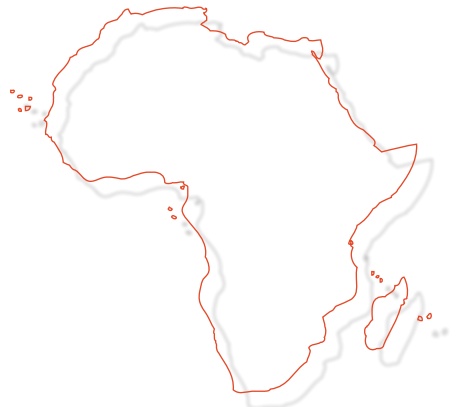
- Guinea and, more elaborately, with São Tomé and Príncipe;
- (d) Demonstrating the need for each Member State to consider setting up an appropriate functional specialised agency, as has indeed been urged in the 1993 ECOWAS Revised Treaty and strongly anticipated in the 2007 Ministerial Declaration on the African Union Border Programme.

The operationalisation of these interwoven perspectives appears to have facilitated the remarkable success that Nigeria has achieved in matters of delimitation and demarcation. This may well prove the case for success elsewhere in Africa.

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Section II

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Chapter 9

Algeria's Experience in the Delimitation and Demarcation of its Boundaries



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Introduction

Algeria is one of the biggest countries of Africa with a total surface of 2,381,741 square kilometres, approximately corresponding to one-twelfth of the total surface of Africa. More than two million square kilometres of the area is occupied by the Sahara Desert, which covers five-sixths of the surface of the country. Algeria is bordered on the north by the Mediterranean Sea, to the east by Tunisia and Libya, in the southeast by Niger, in the southwest by Mali and Mauritania, and to the west by the Saharawi Arab Democratic Republic and Morocco.

- ▶ Land surface area: 2,381,741 square kilometres
- ▶ Length of coastline: 1,672 kilometres
- ▶ Total length of land boundaries: 6,527 kilometres

Delimitation and Demarcation of the Algerian Boundaries

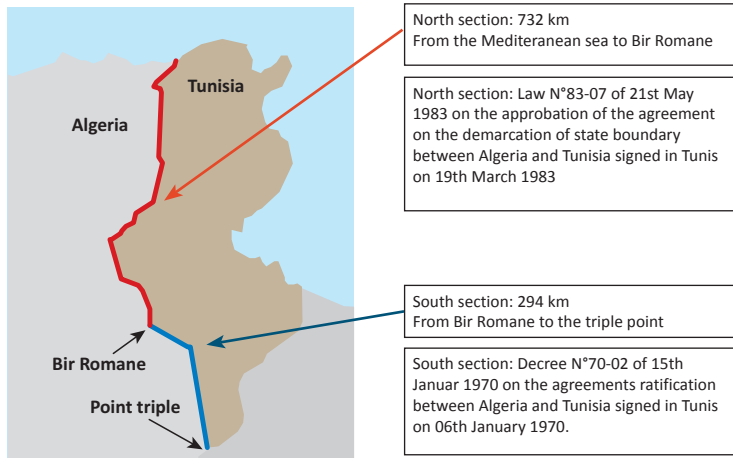
Algeria-Tunisia Boundary

- ▶ Total length of the boundary: 1,026 kilometres
- ▶ Total number of pillars: 685

The land boundary between Algeria and Tunisia, with a length of 1,026 kilometres, runs from the Mediterranean Sea in the north and Bordj El Khadra in the south (former Fort Saint) to the Algeria-Tunisia-Libya

tripoint. Demarcation was accomplished in two steps:

- The south section between Bir Romane and Fort Saint was demarcated in 1968 and the pillars densified in 1970.
- The north section between the Mediterranean Sea and Bir Romane was demarcated in 1993 and densified in 1997.



Boundary Pillar: N° 01

Location: Oued Eddezzana



Figure 1 Panoramic photo of Pillar No. 1 of the Algeria-Tunisia boundary

Boundary Pillar: N° 338

Location: Bir Zenigra

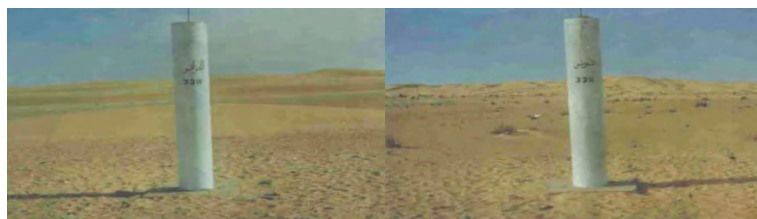


Figure 2 Panoramic photo of Pillar No. 338 of the Algeria-Tunisia boundary

Note: A permanent mixed technical committee, led on the Algerian side by the General Director of INCT, has held a meeting once a year alternatively in Algiers and Tunis to handle work related to the maintenance of the boundary pillars.

Algeria-Libya Boundary

- ▶ Total length of the boundary: 982 kilometres
- ▶ Total number of pillars of north section: 209 (erected)

The Algeria-Libya boundary is composed of three sections each defined by a particular agreement.

First section (from the Algeria-Tunisia-Libya tripoint to Pillar No. 17 at Garet El Hamel): The boundary is composed of a succession of lines joining thirteen intermediary pillars. This section was determined by the agreement between the French Republic and representatives of Sublime Porte on 12 May 1910 and the minutes of the demarcation of 1911.

Second section: From Garet El Hamel to Pillar No. 93 (point T) situated on the Ghat parallel in Libya. France unilaterally marked this section in 1957-1958. The boundary is defined by straight lines connecting to stone pillars. This section is defined by the French-Libyan agreements of 25 December 1956, ratified by both parties and deposited at the United Nations.

Third section: From point T (Pillar No. 93) at Ghat elevation to the Algeria-Libya-Niger tripoint (Point 1010 or Gareit Dherouet El Djemel). The Franco-Italian Arrangement of 12 September 1919 and the Franco-Libyan Treaty of Friendship and Good Neighbourliness of 10 August 1955, also deposited at the United Nations, define this boundary.

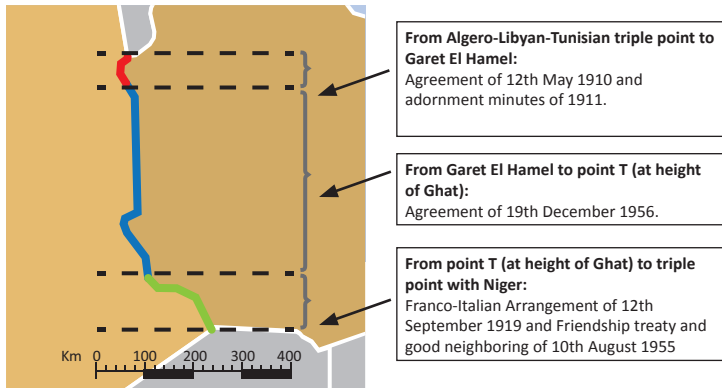
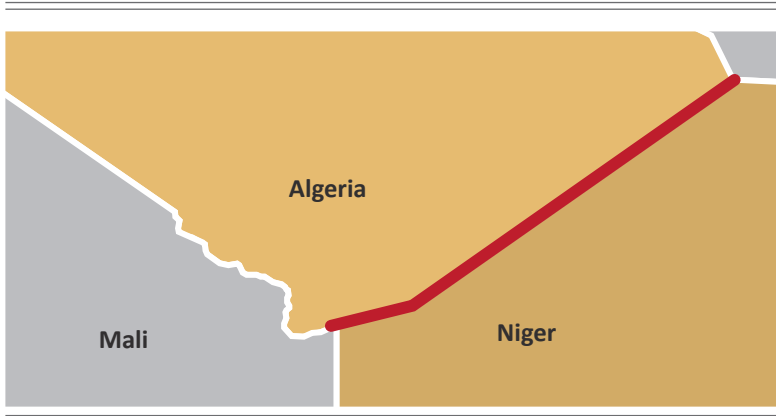


Figure 3 Panoramic photo of Pillar No. 1 of the Algeria-Libya boundary

Algeria-Niger Boundary

- ▶ Total length of the boundary: 951 kilometres
- ▶ Total number of pillars: 12



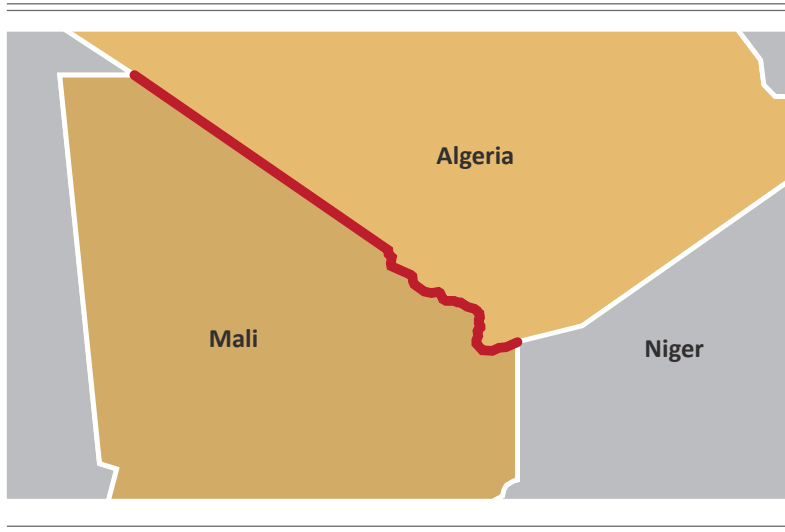
The boundary between Algeria and Niger is defined in the Agreement on the Demarcation of State Boundary between Niger and Algeria signed in Algiers on 5 January 1983 and ratified by decree No. 83-379 of 28 May 1983. The corresponding documents on the demarcation of the boundary have been deposited at the United Nations.



Figure 4 Panoramic photo of pillar No. 1 of the Algeria-Niger boundary

Algeria-Mali boundary

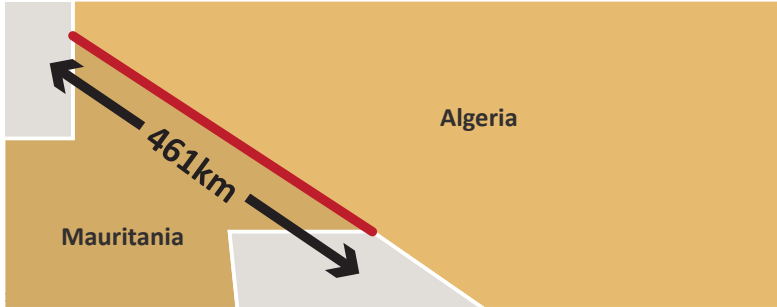
- ▶ Total length of the boundary: 1,329 kilometres
- ▶ Total number of pillars: 17



The boundary between Algeria and Mali was defined in the Agreement on the Demarcation of the State Boundary between Algeria and Mali signed in Algiers on 8 May 1983 and ratified by Law No. 83-09 of 21 May 1983. The relevant documents of the demarcation of the boundary have been deposited at the United Nations.

Algeria-Mauritania boundary

- ▶ Total length of the boundary: 461 kilometres
- ▶ Total number of pillars: 9



The Demarcation Agreement of the State Boundaries between Algeria and the Islamic Republic of Mauritania was signed in 13 December 1983 and ratified by Decree No. 84-33 of 18 February 1984. The relevant documents of the demarcation of the boundary were deposited at the United Nations. Each boundary pillar also has a technical record form with details about the position of the pillar and the corresponding directional marks.

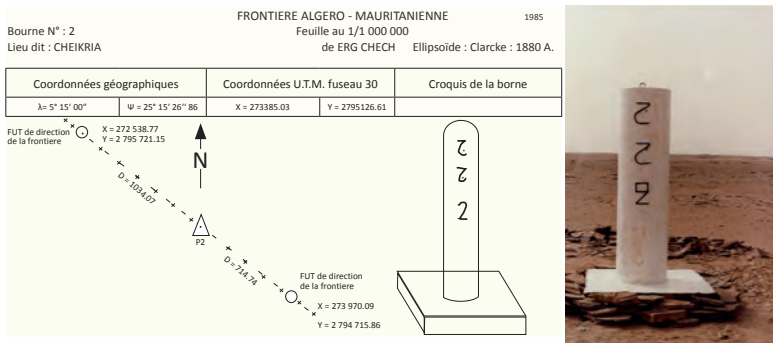


Figure 5 Example of a technical form and a panoramic photo of Pillar No. 2 of the Algeria-Mauritania boundary



Figure 6 Pillar No. 8 of the Algeria-Mauritania boundary

Algeria-Sahrawi Arab Democratic Republic Boundary

- ▶ Total length of the boundary: 39 kilometres
- ▶ Total number of pillars: 3



The boundary between Algeria and the Sahrawi Arab Democratic Republic is defined by the Agreement on the Delimitation and Demarcation of the Spanish Sahara Boundary and the French Territories to the East of 19 December 1956.

Algeria-Morocco boundary

- ▶ Total length of the boundary: 1,739 kilometres
- ▶ Total number of pillars: none



The boundary between Algeria and the Moroccan kingdom is about 1,739 kilometres in length. This boundary is divided into two parts or sections:

The Northern section extends for about 140 kilometres from Théniet El Sassi to the Mediterranean Sea. This section is delimited by the Treaty of Lalla Maghnia of 18 March 1845.

The Southern section extends from Théniet El Sassi at the point with coordinates 8°40' West and 27°40' North. The boundary is defined by the agreement signed in Rabat on 15 June 1972, and ratified by Algeria and Morocco respectively on 17 May 1973 (Ordnance 73-20) and on 22 June 1992 (Dhahir Echarif N: 01-89-48). This agreement takes in consideration the treaty of Lalla Maghnia of 18 March 1845, which delimits the North section. Demarcation of this section has not been achieved on the ground.

Technical Lessons Learnt from the Algerian Experience

Definitions

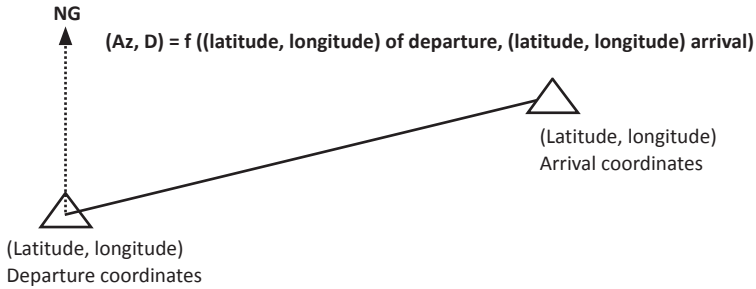
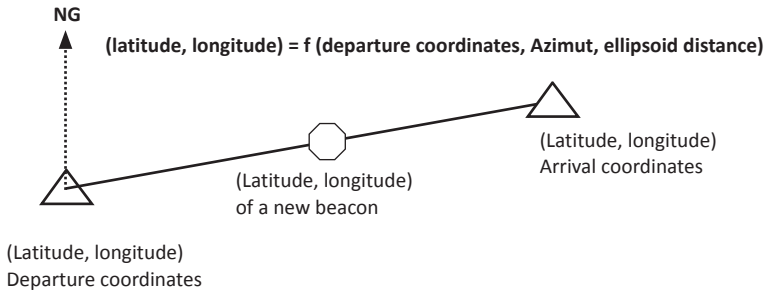
The boundary is the limit separating two or more States. We distinguish two types of boundaries:

- 1 Boundaries defined by winding lines (natural boundaries): a boundary formed by a natural terrain element (river, mountain, and track).
- 2 Boundaries formed by straight-line segments, aligned by a set of points. These points are defined by azimuth and distance.

Principles of Calculating Coordinates

a) Straight-line segments

Calculation of the geographic coordinates (latitude, longitude) of pillars erected along the course of a boundary defined by a set of straight-line segments is achieved according to the geodetic 'Direct and Inverse Principle.' Knowing the geographical coordinates (latitude and longitude) of both extremities of a straight-line segment (starting [departure] and end [arrival] points), one calculates its geodetic azimuth and its elliptic distance. Hence, the coordinates of a new Pillar M to be installed on the ground are a function of the azimuth and the distance of point M from the starting point.

Inverse problem**Direct problem****b) Winding lines**

Geographical coordinates (latitude, longitude) of pillars constructed along boundaries defined by winding lines are extracted directly from the numerical survey list.

Technical specifications**Pillar characteristics**

Boundary pillars must have a distinctive construction design and the demarcation must ensure the longevity of the pillar. The boundary pillars are constructed from a uniform and unique model. They consist of metallic posts set in the ground in part on concrete base. The height

and diameter of pillars vary depending on the nature of the terrain. The diameter of pillars usually used is about 20 to 30 centimetres. The height is about 1.5 metres for the points with difficult access and 3 metres for the others.

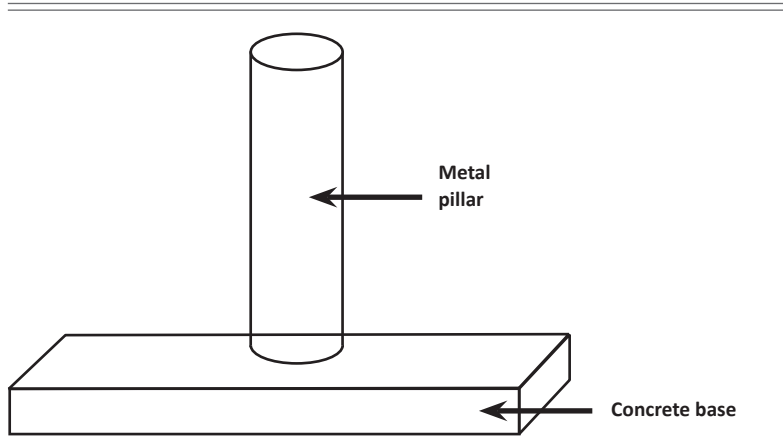


Figure 7 Description of a boundary pillar

Presentation of a Technical Form of a Boundary Pillar

The recorded technical forms of the boundary pillars contain all information related to the construction and position of each pillar, including:

- ▶ Number;
- ▶ Toponym (local place name);
- ▶ Description;
- ▶ Coordinates;
- ▶ Situation scheme;
- ▶ Elevation scheme;
- ▶ Map of the zone;
- ▶ Colour panoramic photos, etc.

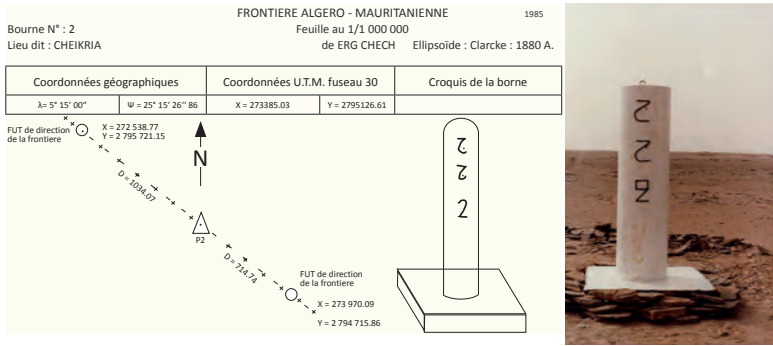


Figure 8 Example of a Technical Form

Pillar Survey Criteria

Boundary pillars are surveyed using GPS techniques operating in the static mode.

To achieve better accuracy, we observe the following points:

- ▶ Each pillar must be defined using a minimum of two vectors;
- ▶ All pillars must be surveyed using the same criteria;
- ▶ A minimum of 10 per cent of the number of pillars must be surveyed at least twice.

All the survey observation must be planned with the following:

- ▶ Minimum number of satellites: 4;
- ▶ Positional Dilution of Precision (PDOP) < 4;
- ▶ Recording spacing: 20 seconds;
- ▶ Mask angle: 15°;
- ▶ Observation mode: static.

Pillar Siting Methods

Siting a location to install a pillar involves the topographic process of determining points on the ground as defined in the plan elaborated during the demarcation project. Topometric operations involving

ground reporting of calculated data (angles, distances) establish siting points. Locating pillar siting points on the ground using coordinates is performed either with GPS receivers in the real time kinematic mode (RTK), or by the classic procedure using electronic total station instruments.

REAL TIME KINEMATIC (RTK) mode

Siting in the RTK mode is realised with a pair of bifrequency GPS receivers. This involves a base station with known coordinates and a mobile station (or rover) used to site the pillars.

Topometric process

One determines at least two points in proximity to the pillar site to be constructed, preferring a point to the west of the pillar site and the other to the east at distances of hundred metres. The angle and the distance of both objectives are determined before siting with a total station.

Model of a Boundary Delimitation Project Based on the Algerian Experience

- ▶ Designation of a mixed technical demarcation commission;
- ▶ Archival analysis (legal documents, textual or numerical geographical information);
- ▶ Selection of legal texts from which the delimitation will be done;
- ▶ Document inventory to be included in the technical dossier;
- ▶ Establishment of the operating foundation (geodetic pillars, levelling, astronomy, GPS);
- ▶ Technical specifications selection (geodetic system, map projection, cartographic scale, map legend, glossary);
- ▶ Definition of essential project fabrication phases (geodetic canvas, aerial photography or satellite imagery, stereo-preparation, aerial-triangulation, recovery, process, structure and database integration, field work, cartographic mapping, offset printing);
- ▶ Establishment of a technical procedure for each phase;
- ▶ Elaboration of a proposed project for each step of product fabrication;
- ▶ Realisation of works phase-by-phase based on interval planning;
- ▶ Control of each work phase execution.

1 Phase: Geodetic works

- Adoption of geodetic system and projection;
- Equipment selection (GPS, total station etc.);
- Data processing software acquisition;
- Site identification;
- Demarcation;
- Survey observation;
- Processing and compilation;
- Analysis of results.

2 Phase: Aerial photography works

- Photo scale selection;
- Flight axis determination;
- Analogue or raster camera selection;
- Flight elevation determination;
- Aircraft selection;
- Preparation of assembly sheet (tiling) tables;
- Execution of the mission.

3 Phase: Photogrammetric works

- Adoption of geodetic system and projection;
- Over-flight programming (office stereo-preparation);
- Review and analysis of collected photos;
- Aerial-triangulation;
- Feature identification;
- Control.

4 Phase: Process and data integration in database

- Data processes;
- GIS-compatible data structure;
- Database data integration.

5 Phase: Photo identification and field work

► Office:

- Acquisition of aerial photos covering the map sheet;
- Identification of unidentified details;
- Preparation and establishment of layers (tiling).

► Field:

- Mapping of unidentified details on the ground;
- Verification and identification of vegetation;
- Verification of hydrography and orography;
- Toponym (name place) collection.

6 Phase: Field data integration during the database

- Processes for collecting data from field;
- Integration.

7 Phase: Mapping

- Symbolisation;
- Processing;
- Map format;
- Draft version print;
- Control;
- Final version print;
- Control;
- Offset printing.



Chapter 10

Demarcating Africa's Post-Conflict Boundaries: The Burkina Faso-Mali Experience



Mr. Issa Coulibaly

Former Member, Joint Technical Commission for the Demarcation of the Burkina Faso-Mali Boundary
Republic of Mali

Historical context

The Burkina Faso-Mali border is 1,280 kilometres long. Burkina Faso (formerly Upper Volta) was created in 1919 by the decree of 1st March 1919, and was formed out of what was at the time the Upper Senegal and Niger colony. Abolished in 1932 by the decree of 5th September 1932, its lands were shared out amongst three neighbouring colonies: Ivory Coast, French Sudan and Niger. Upper Volta was eventually reinstated in 1947 (Act No. 47-1707 of 4 September 1947) with its 1932 borders. The territorial changes Burkina Faso experienced throughout the colonial era would prove unhelpful in finding legal solutions to the border issues that have arisen since independence.

Early on, Mali and Burkina Faso opened up dialogues to determine their common boundary. In accordance with the Bobo-Dioulasso protocol of agreement of 30th August 1966, the two countries met to review the basic elements – legal texts such as orders, decrees, minutes and administrative decisions, as well as colonial maps – for determining the border.

Also at Bobo-Dioulasso, on 25th and 26th July 1968, a bilateral meeting established the foundation for the creation of a Joint Technical Commission to study and survey the border in accordance with the pre-independence documentation held by both countries.

On 29th and 30th September 1969, at the Bamako meeting of the Permanent Joint Commission, it was agreed to uphold Order No. 2728/AP

of 27th November 1935 made by the Governor General of French West Africa which delimits the Douentza-Djibo (Burkina Faso) border section.

At the meeting held on 24th and 25th June 1970, the Burkina delegation challenged the validity of Order No. 2728/AP of 27th November 1935 made by the Governor General of French West Africa, which delimits the administrative circles of Bafoulabé, Bamako and Mopti (French Sudan), citing the supremacy of Act No.47-1707 of 4th November 1947 in this regard. The villages at issue were Dioulouna, Kobou, Agoulourou and Oukoulou.

The Burkina Faso delegation asserted that Order No. 2728/AP of 27th November 1935 (which assigned sovereignty of the villages to Mali) was irrelevant to the boundary delimitation in this case as the 1947 Act reinstated Upper Volta according to its 1932 borders.

Mali, on the other hand, countered that the 1947 Act did not alter the 1935 Order, given that the Act solely delimited French Sudanese administrative circles. As a consequence, the two texts could not be used in any way to rule on the same object. In addition, the Béli region (in the nomadic zone) with its series of large ponds also became contested.

These disputes eventually led the two nations to armed conflict in 1974 and 1985. The International Court of Justice finally decided this contentious border on 22nd December 1986.

The delimitation of the Burkina Faso-Mali Border

The border in question is now divided into two sections:

I. Section Delimited by the States

Following an in-depth study of legal, administrative and cartographic documents, the two parties reached an agreement on the delineation of a 1,000 kilometre-long section. Thus, after numerous meetings, the two parties using colonial documentation were able to define a 1,000-kilometre stretch of their mutual border.

This borderline is marked on the French National Geographic Institute (IGN) 1:200,000 scale map running from its far south-westerly point at latitude 10° 25' 51" N, longitude 5° 31' 00" W, to its north-easterly point

at latitude 14° 11' 30" N, longitude 2° 00' 00" W (Koro-Ouahigouya sector).

This final agreement was confirmed by a Treaty between the Government of the Republic of Mali and the Revolutionary Government of Burkina Faso to demarcate their delimited boundaries. The treaty was signed at Bamako on 16th May 1989 by the Heads of State of Burkina Faso and Mali.

The protocol of agreement on the application of the Burkina Faso-Mali Demarcation Treaty for Delimited Boundaries was signed in Ouagadougou on 20th May 1989 by each country's Minister of Foreign Affairs and International Cooperation.

The Treaty's seven articles

The first article defines the delineation of the border section as equal to that set out on the IGN first edition 1:200,000 scale West Africa map.

Article two establishes the Joint Technical Commission whose composition and activities will be defined by an Agreement Protocol between the two States.

Article three sets out the equal contributions required of each State and the creation of a border demarcation fund whose management regime will be defined in the protocol of agreement.

Article four details how the border community property affected by the border route will be managed.

Article five sets the date for the commencement of demarcation works at one month after the Treaty comes into force.

Article six requires the amicable resolution of all disputes that may occur during the application of the Treaty.

Article seven stipulates that the Treaty will enter into force as soon as the two parties provide notice that they have ratified it.

The Agreement Protocol's five chapters and 24 articles

The First Chapter contains one article that delimits the 1,000 kilometre-long border section.

Chapter Two contains four articles that establish the Joint Technical Commission and define its composition of six representatives from each State. Chairmanship is to be handled by the host nation, with the visiting nation acting as rapporteur. The Commission is tasked to demarcate the border and report on progress in its physical delivery. It produces an estimate for the demarcation works and submits the estimate to both governments for approval.

Chapter Three covers the border demarcation fund, which is to be based in Burkina Faso. The cheque signatory is the Malian chair of the Joint Technical Commission. Modes of payment into the fund and fund management are also described.

Chapter Four deals with border community property affected by the boundary route. Rights of use, the legal status of international water-courses and buildings affected by the boundary demarcation are each tackled by different articles in this chapter.

Chapter Five discusses the peaceful agreement of all disputes and the denunciation of the Protocol.

The Protocol comes into force on the day it is signed.

II. Section of the Border Delimited by the International Court of Justice (ICJ)

A 280-kilometre section is delimited by the International Court of Justice Judgement, dated 22 December 1986.

Demarcating the Border

I. Section delimited by the International Court of Justice (280 kilometres)

Pursuant to the ICJ Judgement on the Burkina Faso-Mali border dispute, as well as to recommendations and decisions issuing from ministerial and Joint Technical Commission meetings, the definitive boundary demarcation process for this 280-kilometre stretch began on 5th January 1990.

Likewise, a Joint Technical Commission for Boundary Demarcation was created, comprising six representatives from Mali and six from Burkina Faso, appointed by their respective Ministries of Territorial Administra-

tion. The commission was tasked to deliver the demarcation works in conjunction with three ICJ-appointed experts assisting both parties.

From 5th to 12th January 1990, surveys were undertaken with the support of the three ICJ experts, and the approximate locations of points A to M cited in the Judgement were identified.

The two States decided to demarcate this section independently using their own national geographic services. This decision was communicated to the ICJ, which accepted the approach on condition that the two States committed to consulting the court should any differences arise in interpreting the Judgement.

The Burkina Faso Geographic Institute shot 1:50,000 scale aerial photographs of the entire border. From 5th to 27th April and 6th to 8th June 1990, the Joint Technical Committee tasked with demarcation began work to develop a basic geodetic framework. Geodetic studies for the Soum Pond and for demarcation began on 12th April 1991 and continued until June of that year, resulting in the installation of boundary markers for points A, B, and C. It should be pointed out that the Soum and In Abao Ponds required mapping to ensure their equal partition between both countries. Therefore, the pond region was mapped to facilitate the demarcation of both bodies of water.

It must be remembered that, from June 1991 to February 1993, works were halted because of an insurgency occurring in the north and north-west of Mali. From 28th March to 25th May 1993, the deployment of a military detachment to provide security for the technical teams and their equipment meant the joint team could continue with boundary demarcation operations. During this period, 72 boundary markers were emplaced between points A and F, covering a distance of some 80 kilometres. From May 1993 to April 1995, the works were once again held up because of the continuing Malian insurgency. From 15th March to 30th May 1995, another security detachment was deployed, similar to that of 1993, which allowed the joint technical team to continue works, resulting in the installation of 88 new boundary markers, over a 129-kilometre length of border.

A 209-kilometre section of the ICJ-delimited border was now complete with kilometre-spaced boundary markers emplaced in the vicinity of villages, water points, main roads and grazing routes. Only 71 kilometres remained to be demarcated to complete this border section. However,

from 1995 to 2003, works halted once again, this time due to the difficult economic circumstances affecting both countries.

Works restarted in 2004 and the final 71 kilometres of boundary markers were installed. The technical dossier was then prepared for the ICJ and the UN.

II. The Section Delimited by the States (1,000 kilometres)

The methodology used to mark this section is exactly the same as the one used to deliver the ICJ delimited section.

The distances achieved each year between 2005 and 2009 are:

- ▶ 159 kilometres in the 2005 campaign
- ▶ 250 kilometres in the 2006 campaign
- ▶ 200 kilometres in the 2007 campaign
- ▶ 200 kilometres in the 2008 campaign
- ▶ 191 kilometres in the 2009 campaign

In 2008, the Federal Foreign Office of Germany agreed as part of the African Union Border Programme to finance the remaining 400 kilometres. It provided technical material and four-wheel-drive vehicles to help the two States complete their border demarcation. The 2008 campaign was entirely funded by the German Development Cooperation, as was the 2009 campaign, at the end of which all border demarcation was completed.

Lessons Learnt

The border demarcation programme was made possible by securing political buy-in at the highest levels in each country. Authorities of both States accepted the ICJ Judgement. The heads of state agreed to fund the boundary demarcation programme despite the economic difficulties facing both nations. The border dispute settlement has brought peace between the two countries. The Joint Technical Commission for Border Demarcation was able to complete its work because of the mutual understanding and sense of fraternity that prevailed.

Each country's technicians lived together on site and work activities were grounded in mutual trust and understanding. When working on site, the border authorities joined in with the delivery of sensitisation

work for local people living on either side of the border. During periods affected by the insurgency, both armies joined forces to provide security for the technical demarcation teams. Demarcation has clarified the route of the boundary and improved security along the length of the border. Border cooperation between Mali and Burkina Faso is very proactive, with meetings taking places at the ministerial level and between administrative authorities and security forces. These meetings were formalised in 1988 as follows:

- ▶ Once a year for ministers in charge of territorial administration;
- ▶ Half-yearly for Malian governors and their counterparts in Burkina Faso;
- ▶ Quarterly for heads of administrative circles and their counterparts in Burkina Faso.

All these authorities are prepared to meet as required to solve any problems that may arise. These meetings are held regularly and tackle all areas of cooperation, for example:

- ▶ Periodic meetings;
- ▶ Promoting cooperation through twinning;
- ▶ Transhumance;
- ▶ Environmental management;
- ▶ Combating fraud and other customs and excise issues;
- ▶ The circulation of people and goods;
- ▶ Security;
- ▶ Development prospects;
- ▶ Boundary demarcation.

International Cooperation

1 Support from the Swiss Agency for Development and Cooperation (SDC)

In the context of acting upon the ICJ Judgement, Mali and Burkina Faso made a joint request to the Swiss Government for support in demarcating the ICJ-delimited border section – some 280 kilometres in total.

Switzerland awarded a package of CHF 130 million, which covered the purchasing of modern technical equipment and transport vehicles for demarcation activities. The training of four engineers – two from each country's respective geographic institutes – was carried out by Switzerland.

With the technical equipment provided by the Swiss side, the Joint Technical Commission was able to commence demarcation works.

2 Support from the German Development Cooperation

In the context of the African Union Border Programme, the *Deutsche Gesellschaft für Internationale Zusammenarbeit* (then GTZ, today GIZ) decided to support Mali and Burkina Faso to complete their boundary-marking programme by funding the delivery of 400 kilometres of demarcated border.

The funding was used to purchase modern technical equipment and transport vehicles, and to provide the working capital required to sustain the joint technical team demarcating the boundary.

Around 200 kilometres of boundary were demarcated in 2008, and the remaining 200-kilometre section in 2009, thanks to the German funding.

Training Each Country's Technicians in Physical Boundary Demarcation

Switzerland trained two engineers from each country. The technical staff tasked with the physical demarcation were trained in terms of how to use the modern equipment purchased for the operation in order to ensure its correct and safe use.

Capacity building is a focus in all African Union Border Programme activities.

Security Problems

Works were interrupted twice by Malian insurgency. To enable the demarcation team to work in safety, both countries provided military support to ensure the security of staff, logistical operations, technical equipment, water and fuel storage, and the boundary markers installed. This armed support meant that works could continue safely and without disturbance.

It is worth pointing out that insurgents have destroyed none of the boundary markers. Several boundary marker inspections have been carried out and the joint technical team has detected no damage whatsoever.

Sensitisation of Cross-Border Communities

Each country's minister in charge of border demarcation held several meetings to sensitise border administration bodies and local authorities in affected areas. Site-based sensitisation meetings for cross-border communities were organised with the support of village chiefs and local leaders. The border authorities meet every quarter and village chiefs meet on an *ad hoc* basis whenever problems arise. Throughout the works we witnessed excellent interrelations between communities on either side of the border, often due to the kinship ties that exist between them.

It should be noted that the Burkina Faso-Mali demarcation exercise typifies exemplary cooperation between neighbouring States. The political will on both sides meant all obstacles could be overcome. The Joint Technical Commission for demarcation was able to complete its work thanks to the support of the Swiss Agency for Development and Cooperation, the *Deutsche Gesellschaft für Internationale Zusammenarbeit* (then GTZ, today GIZ), and the funding provisions from each of the two governments. The demarcation work was completed on the ground in December 2009.

African Border Delimitation Procedure

The procedure for delimiting African borders is as follows:

Set up a Technical Commission for border demarcation

A Joint Technical Commission for Border Demarcation supervises the demarcation. It normally consists of:

- ▶ A representative from the ministry in charge of borders;
- ▶ The National Director of Borders;
- ▶ International relations experts;
- ▶ The head of the Geographic Institute;
- ▶ Surveyors and cartographers;
- ▶ A representative for the defence sector;
- ▶ A representative for the security sector;
- ▶ Resource staff.

Joint documentary research

Documentary research includes:

- ▶ Legal documents (laws, decrees, orders, treaties, conventions, agreements, agreement protocols, visit reports, administrative correspond-

ence);

- ▶ 1:200'000 scale geographical maps;
- ▶ Aerial photography of the border zone;
- ▶ Astronomical and geodetic data;
- ▶ Mapping files;
- ▶ Border area toponymic files;
- ▶ Technical files on old border delimitation maps.

The Joint Technical Commission draws up an exhaustive list of required documents, held in the libraries of the former colonial powers. It also identifies the relevant libraries and any other resources for obtaining information related to the boundary in question. The Commission sets a joint research budget, which ensures equal funding responsibility for each country. It should be pointed out that each country undertakes an internal programme of research for relevant information.

The Commission organises a joint research mission, which begins with the partners copying in duplicate all gathered documentation. Once complete, minutes are drawn up along with a complete inventory and timetable for the analysis of the documentation.

Analysis of gathered documentation (legal texts, administrative documents, astronomical and geodetic data, aerial photography, old and new maps)

Each party undertakes its own in-depth study of all documentation to gather all the data relevant to defining the border. Preferably, the delimitation documents inherited at independence are retained. The aim of the analysis is to gather documentation that covers the entire length of the border, in order to reach an agreement on the border delineation.

Choosing Legal and Administrative Texts and Technical Documents to Support Negotiations for Agreeing on the Border

The Joint Commission meets to sift through the documentation and retain that which is likely to cover the entire length of the border. In the analysis of legal and administrative texts and technical documentation, items covering the whole border area and those forming the corpus of border documentation inherited at independence are retained for the

border definition process. The Joint Commission draws up two original and identical sets of minutes that include a list of all documentation. Each page is initialled and the whole document is signed by the Chairs of the Joint Technical Commission for Boundary Demarcation. At one of these Commission meetings, a timetable is produced for each party, setting deadlines for their in-depth study of documentation.

Working with the Retained Documentation

Each country's experts analyse the complete set of retained documentation and trace the precise route of the border on a map, as acknowledged by both parties.

Each party examines the documentation with a view to marking out the single boundary in accordance with the findings of the documentary research. Negotiations now begin with the aim of generating sufficient shared understanding to set a boundary that both parties can accept. This consensual draft of the boundary is drawn up on a geographical map and each party is tasked to write up the delimitation.

Negotiation Meetings to Create Alignment

Negotiation meetings to agree on the boundary are held alternatively in each country. The National Border Commission of each country prepares a draft boundary plan that is submitted to the minister in charge of borders for approval. The position accepted by the minister is then presented to the government for adoption.

Defining the Boundary when it is Formalised by an Agreement, Convention or Treaty Resulting from the Work of the Joint Technical Commission for Boundary Demarcation

To reach an agreement, the Joint Technical Commission for Boundary Demarcation adopts a mutually agreed draft land border plan delineated on a geographical map and prepares a draft boundary delimitation text. The draft delineation and delimitation text are then submitted by the minister in charge of borders to the government for examination and adoption. These documents are then submitted to parliament for examination and adoption. Once they have been adopted, the signing and initialling of the documents is carried out at a meeting between the highest authorities of the neighbour countries.

Demarcating the Boundary

When demarcating, the main objective is to physically mark out the boundary described in the delimitation documents as precisely as possible.

The boundary demarcation process comprises the following steps:

- ▶ Setting up the Joint Technical Commission for Boundary Demarcation;
- ▶ Producing cost estimates for the boundary marking programme;
- ▶ Undertaking a field survey of border crossing points;
- ▶ Procuring technical equipment for the works;
- ▶ Setting up the joint technical team who will install the boundary markers;
- ▶ Training each country's geographical service staff;
- ▶ Setting the budget for the demarcation programme;
- ▶ Carrying out field assessments to plan the emplacement of geodetic control network points;
- ▶ Selecting densification points along the boundary in the vicinity of villages, water courses, main roads and cultivated land;
- ▶ Selecting locations for the geodetic control network points;
- ▶ Installing the geodetic control network points;
- ▶ Undertaking surveys of astronomical and geodetic points on both sides of the boundary;
- ▶ Collecting astronomical and geodetic point data and set the parameters for converting GPS coordinates to map coordinates;
- ▶ Determining the boundary route using the geodetic control network;
- ▶ Producing the geodetic control network technical dossier;
- ▶ Determining where the main boundary markers are to be emplaced;
- ▶ Determining the coordinates for the densification points;
- ▶ Determining the location factors for boundary markers;
- ▶ Installing boundary markers;
- ▶ Undertaking a quality control survey of established geodetic control points;
- ▶ Producing the boundary marker technical dossier;
- ▶ Writing up a detailed record of each stage of the border installation process;
- ▶ Writing a final report summarising the demarcation process.

The demarcation process entails the physical installation of the land border in accordance with the agreement ratified by both nations.

The agreement specifies the main points along the boundary, which might be:

- ▶ Natural points;
- ▶ Mapped boundaries;
- ▶ Coordinate-defined;
- ▶ Written specifications.

Demarcation requires high-precision methods for determining the land border, namely spatial geodesy. Where the boundary does not follow a natural line, it can be physically marked using boundary markers. The type of marker deployed depends on the nature of the terrain in which it is placed. The boundary is defined as precisely as possible (using boundary markers and natural lines) and is then mapped. The demarcation process completes with the signature of a treaty, which is registered with the United Nations.

Border demarcation involves geodesy and mapping. The process should aim to:

- ▶ Install a physical land border in accordance with the treaty signed by neighbouring States and map its coordinates;
- ▶ Set up a geodetic control system that links up with the each country's existing control systems;
- ▶ Incorporate, where possible, the geodetic control points already existing in each country into the boundary geodetic control network;
- ▶ Set coordinate conversion parameters so they can also express the boundary coordinates logged in each country's own geodetic system.

Installing the Main Boundary Points

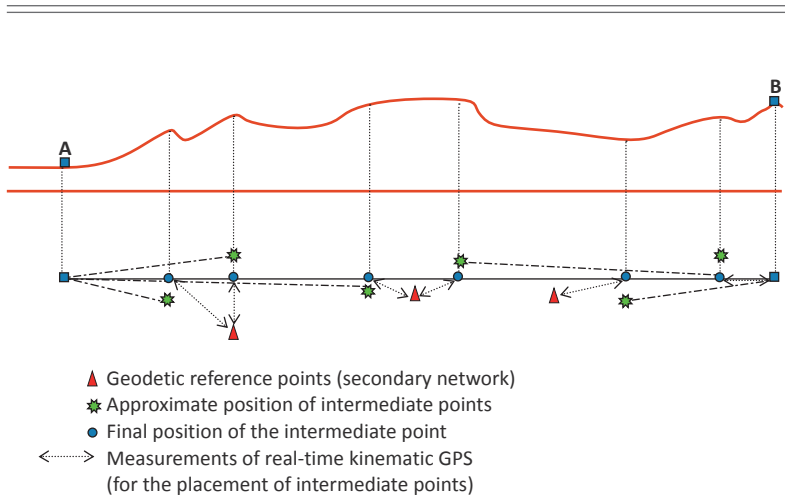
With the geodetic control network in place, the main boundary points (sited where changes in direction occur) can be installed. These points, which are specified by coordinates set out in the agreement (treaty), are physically placed using Global Positioning System (GPS) techniques.

When a boundary section runs in a straight line (a geodetic line between two main points), the position of intermediary points is calculated by taking the mean of the geodetic and loxodromic coordinates. The coordinates resulting from this calculation form the definitive intermediary points where markers should be installed.

It is possible to select intermediary points for the physical land border using the map with plane coordinates being plotted on the map. The main boundary points are physically installed using GPS and starting from the nearest point on the geodetic network.

Installing Densification Points

Once the main boundary markers are installed, the geodetic reference network can be made denser. The first step is to calculate the location factors for the intermediary boundary markers. Then, using the network densification point and the location factors, emplacement sites are located and points installed using real-time kinematic GPS. This work requires intervisibility between markers.



The boundary markers physically manifest the border and guarantee the longevity of the boundary position. At present, the World Geodetic System and GPS ensure a boundary's longevity by providing extremely precise coordinates to define the boundary's constituent parts (boundary markers, river axes). The boundary markers indicate the location of the border. The most costly part of a demarcation process is the construction of boundary markers. In order to keep costs down, the type of boundary marker selected should reflect the quality of its site and a compromise should be found between longevity, visibility and density.

Below are some examples of the different types of boundary markers used to demarcate the Burkina Faso-Mali border.

Burkina Faso



Republic of Mali



BURKINA FASO – REPUBLIC OF MALI BORDER

Delineation defined by the Judgement of 22 December 1986 –

General List No. 69 of the International Court of Justice

Type of boundary marker installed at each kilometre along the boundary

IDENTIFICATION SHEET

Boundary marker number: B1 Boundary Marker Sheet at scale 1:200,000: **DJIBO**

COORDINATES

Ellipsoid: WGS 84

Latitude [DMS] 14° 28' 34,85966" N	Longitude [DMS] 1° 58' 19,22282" W	H ellipsoidal [m]
X [m] 610,786.59	Y [m] 1,600,657.75	H orthometric [m]

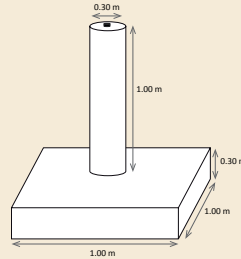
Ellipsoid: CLARKE 1880

Latitude [DMS] 14° 28' 35,90643" N	Longitude [DMS] 1° 58' 17,37828" W	H ellipsoidal [m]
X [m] 610,844.00	Y [m] 1,600,547.97	H orthometric [m]

Notes

1. The plane coordinates are defined in the projection:
UTM, Zone 30 North
2. The parameters used to convert between WGS 84 and CLARKE 1880 are those determined by the Joint Sub-Commission for Boundary Demarcation, Burkina Faso-Mali in 1990

Sketch (not to scale)



Burkina Faso



Republic of Mali



BURKINA FASO – REPUBLIC OF MALI BORDER

Delineation defined by the Judgement of 22 December 1986 –

General List No. 69 of the International Court of Justice

Type of boundary marker installed at each kilometre along the boundary

IDENTIFICATION SHEET

Boundary marker number: L Change of direction marker Sheet at scale 1:200,000: **InTillit**

COORDINATES

Ellipsoid: WGS 84

Latitude [DMS] 15° 04' 39,97968"N	Longitude [DMS] 0° 13' 46,37196" W	H _{ellipsoidal} [m]
X [m] 796,044.61	Y [m] 1,668,779.91	H _{orthometric} [m]

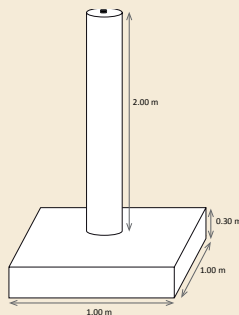
Ellipsoid: CLARKE 1880

Latitude [DMS] 15° 04'42,00044" N	Longitude [DMS] 0° 14' 43,97529" W	H _{ellipsoidal} [m]
X [m] 796,121.62	Y [m] 1,668,695.11	H _{orthometric} [m]

Notes

1. The plane coordinates are defined in the projection:
UTM, Zone 30 North
2. The parameters used to convert between WGS84 and CLARKE 1880 are those determined by the Joint Sub-Commission for Boundary Demarcation, Burkina Faso-Mali in 1990

Sketch (not to scale)



Burkina Faso



Republic of Mali



BURKINA FASO – REPUBLIC OF MALI BORDER

Delineation defined by the Judgement of 22 December 1986 –

General List No. 69 of the International Court of Justice

Type of boundary marker installed at each kilometre along the boundary

IDENTIFICATION SHEET

Boundary marker number: L9 Boundary marker Sheet at scale 1:200,000: Tera

COORDINATES

Ellipsoid: WGS 84

Latitude [DMS] 14° 56' 41,18523" N	Longitude [DMS] 0° 08' 55,54114 E	H _{ellipsoidal} [m]
X [m] 193,360.38	Y [m] 1,654,247.66	H _{orthometric} [m]

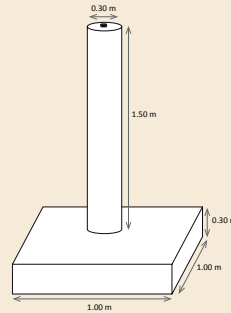
Ellipsoid: CLARKE 1880

Latitude [DMS] 14° 56' 43,18895" N	Longitude [DMS] 0° 08' 58,15210" E	H _{ellipsoidal} [m]
X [m] 193,353.87	Y [m] 1,654,101.27	H _{orthometric} [m]

Notes

1. The plane coordinates are defined in the projection:
UTM, Zone 31 North
2. The parameters used to convert between WGS84 and CLARKE 1880 are those determined by the Joint Sub-Commission for Boundary Demarcation, Burkina Faso-Mali in 1990

Sketch (not to scale)



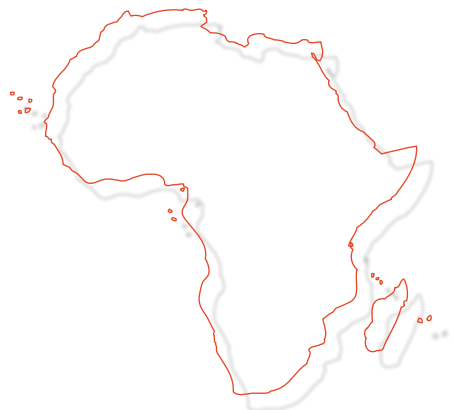
It is important to ensure that boundary mapping is sufficiently precise. The scale of map required depends on the terrain in question and its population density. In certain places, it is useful to incorporate aerial photography or satellite images.

To ensure that the boundary persists, it is necessary to record its coordinates with the highest possible levels of precision, which effectively digitises the boundary. It is important to determine the coordinates of the entire boundary (its natural lines and main, intermediary and densification points) so it can be digitised as, the digital boundary is the best way to ensure longevity and facilitate reproduction.

The demarcation works are approved by means of a final report. This should contain all the data required for UN boundary registration, namely lists of coordinates, boundary marker identification sheets, border crossing point descriptions, maps, and aerial photography or satellite imagery that provides the most precise view possible of the boundary areas.

Information Sources

- ▶ Malian national border policy;
- ▶ Malian national policy for mapping and topography;
- ▶ Malian national policy for geographical information;
- ▶ The detailed record of the Burkina Faso-Mali boundary demarcation process;
- ▶ Spatial geodetic documents covering GPS data.



Chapter 11

Post-Conflict Demarcation of African Boundaries: The Cameroon-Nigeria Experience



Mr. Ali Touré

Former Surveyor General
(Cameroon)

Surveyor Sani M. Isa

Member of National Boundary
Commission (Nigeria)

Introduction

The ruling of 10th October 2002 by the International Court of Justice (ICJ) on the Cameroon-Nigeria boundary case required the two Leaders of Cameroon and Nigeria to acknowledge the importance of their respective obligations under the United Nations Charter. On 15th November 2002, the Secretary-General of the United Nations initiated a meeting between the two presidents where they agreed that a Mixed Commission would be established to consider ways of following up the ICJ ruling and moving the process forward. Under the chairmanship of a special envoy of the Secretary-General and including six members each from Cameroon and Nigeria, the Mixed Commission was mandated to consider all the implications of the decision, including the need to protect the rights of the affected population in both countries. It was entrusted, *inter-alia*, with the task of demarcating the land boundary between the two countries. The Cameroon-Nigeria Mixed Commission (CNMC) held its first meeting on 1st – 2nd December 2002 in Yaoundé, Republic of Cameroon and, among other things, established a ‘Sub-Commission on Demarcation’ that would be responsible for land boundary demarcation.

The Sub-Commission on demarcation consisted of seven members from Cameroon and Nigeria that included legal experts, surveyors and cartographers from both parties and from the United Nations. It was asked to prepare a small-scale map indicating the boundary and consider the nature and characteristics of the maps that need to be prepared for

the demarcation arising from the Court's delimitation. The Delimitation Decision issued by the Court for the land boundary was derived from a series of historical instruments, including: the 1919 Milner-Simon Declaration; the 1929-1930 Thomson-Marchand Declaration of 1929-1930; the 1931 Henderson-Fleuriat Exchange of Notes; the 1946 British Order-in-Council; the Anglo-German agreement of 1913. For the maritime boundary, the Court considered the Anglo-German agreement of 1913; the 1971 Yaoundé Accord and the 1975 Maroua Accord. These instruments provided the base for the work of the Sub-Commission on Demarcation.

The Process

Delimitation

A work programme for the demarcation exercise included the preparation of a small-scale map indicating the boundary based on the Court's delimitation and the above-mentioned historical instruments. At this stage, issues relating to the work programme were identified and agreed upon. First, it was agreed that a small-scale map would be prepared and appended for illustrative purposes. Second, the land boundary between Cameroon and Nigeria would be demarcated in conformity with the 10th October 2002 Judgement of the ICJ. During the demarcation exercise, it was emphasised that villages straddling the boundary and rivers that may have changed their course or disappeared would require special attention. Financing the demarcation exercise would be an enormous task, so it was agreed that although financing of these activities should primarily be undertaken by Cameroon and Nigeria, a United Nations Trust Fund would be established to raise and manage funds for some of the activities. The plans for mapping, delimitation and demarcation were agreed in various meetings of the CNMC.

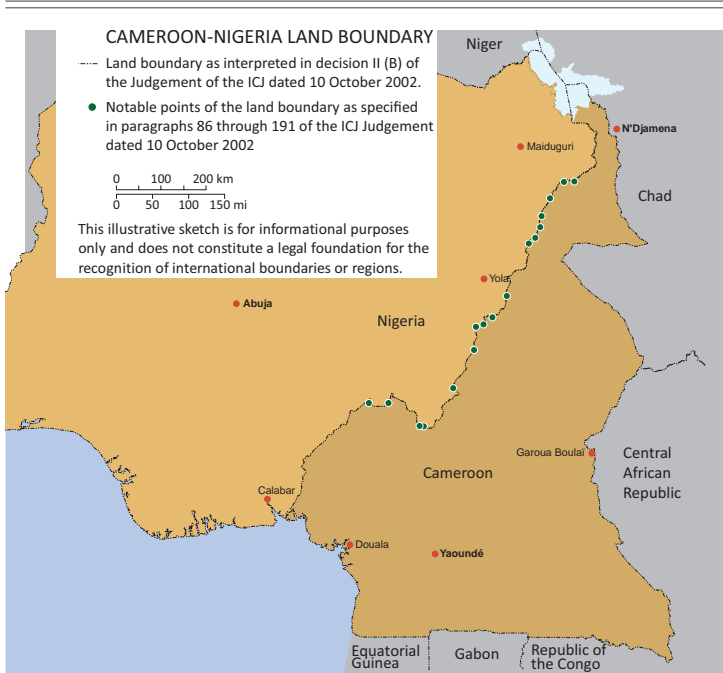


Figure 1 Illustrative sketch of Cameroon-Nigeria Land Boundary based on the 10 October 2002 ICJ Judgement

Map Series Planning

Demarcation was preceded by preparation of a base map series that covered the full length of the land boundary. The parameters and characteristics of the map series are set out as follows:

- (a) Preparation of the base map series:
 - (i) The scale of the base maps was 1:50,000 based on satellite imagery with a resolution of 20 metres or better, with selected areas at a scale of 1:25,000 based on satellite imagery of 2.5 metres or better resolution namely:
 - Limani;
 - Kirawa River;
 - The Kohom River;
 - The watershed from Ngozi to Humsiki (Roumsiki/Kamale/Turu (the Mandara Mountain));
 - From Mount Kuli to Bourha/Maduguva;

- Kotcha (Koja);
- Source of the Tsikakiri River;
- From Pillar 6 to Wamni Budungo;
- Maio Sanche;
- Jimbare and Sapeo;
- Noumberou – Banglang;
- Tipsan;
- Crossing the Mayo Yin;
- The Hambare range area;
- From the Hambare range to the Mburi River (Lip and Yang);
- Bissaula-Tosso;
- The Sama River.

Details of the above sectoral resolution of the Court and its interpretation as unanimously decided by the judges are contained in paragraphs 91, 96, 102, 114, 119, 124, 129, 134, 139, 146, 152, 155, 160, 168, 179, 184 and 189 of the Judgement and as rendered in the attached map (Figure 1) showing the coverage of illustrated sketch maps that accompanied the ICJ Judgement dated 10th October, 2002.

- (i) The base maps were to cover a corridor approximately 60 kilometres wide with 30 kilometres on each side of the border.
- (ii) All map products were bilingual: English and French.
- (iii) Datum is WGS84.
- (iv) Survey work was undertaken by a private contractor selected by and working under the supervision of a Joint Technical Team composed of equal number of members from Cameroon and Nigeria along with United Nations representation.
- (v) The Joint Technical Team determined the field survey requirements pertaining to primary and secondary control points.
- (vi) The Cameroon and Nigeria capitals and the United Nations appointed designated representatives, or focal points. Nigeria designated the National Boundary Commission as its focal point and Cameroon designated the Ministry of Justice as its focal point.
- (vii) Cameroon and Nigeria guaranteed free movement and the safety of the members of the Joint Technical Team and accompanying persons as well as personnel of any private contractor engaged.

- (viii) A private team contractor selected and overseen by the Joint Technical Team produced the base maps with all costs covered by Cameroon and Nigeria and other available external funding sources.
- (ix) The base maps were enhanced with a linear depiction of the land boundary as clarified in accordance with the interpretation or application by the ICJ of particular provisions of the instruments delimiting the boundary.

Demarcation Operation

The overall operation of the Sub-Commission on Demarcation relied on six specified contracts:

- ▶ Contract I: Production of 1:50,000-scale maps of the boundary corridor with 30 kilometres on each side of the boundary;
- ▶ Contract II: Establishment of ground control points (GCP);
- ▶ Contract III: Establishment of 40 geodetic control points;
- ▶ Contract IV: Quality control survey of the established geodetic control points;
- ▶ Contract V: Pillar emplacement;
- ▶ Contract VI: Final survey of boundary pillars.

Priority was given to determining pillar sites. All sectors along the land boundary were demarcated by pillars or represented by coordinates. Work was set to commence in the north and proceed to the south, with the numbers and locations of pillars to be determined in the field. The proposed boundary pillars sites would be added to the enhanced map.

Pillar Installation and Surveying Programme consisted of:

- (a) Evaluation of existing pillars;
- (b) Specification of pillars;
- (c) Construction and emplacement of pillars and related markers;
- (d) Surveying required for the installation of boundary pillars and related markers;
- (e) Maintain one register of particulars related to each pillars.

Final Reporting would involve:

Writing the final report and preparing final maps.

Work Programme for Demarcation

The following specifications were established in order to successfully document the land boundary:

SPOT 5 satellite imagery was used for “Preliminary” mapping of the boundary. A merged product was produced from cloud-free, pan-sharpened, colour SPOT 5 imagery (level 1A) with spatial pixel resolution of 5 x 5 metres. Approximately 130 image maps would be produced at 1:50,000 scale. The mapping covered a strip approximate 30 kilometres wide on each side of the land portion of the boundary between Cameroon and Nigeria. The boundary extends to about 1,800 kilometres.

A single-purpose map was used for the demarcation.

Geodetic datum was comprised of primary and secondary datums with a WGS 84 reference datum.

The cartographic projection used UTM zone 32 and 33 for products at 1:50,000 scale and Lambert projection for products at 1:1,000,000 and 1:500,000 scales.

Field Survey

The preliminary field survey entailed the location of ground control points (GCPs), delineation of boundary on image maps and identification of turning points of the boundary on straight lines.

Identification of existing monuments

IGN Pillars V & II were adopted consisting of bulk or drilled pillars

- ▶ Witness marks accompany each primary pillar;
- ▶ Pointer pillars were used.

Where the boundary follows along roads & rivers:

- ▶ Pillars were placed, one on each side of the course;
- ▶ The boundary follows the median line of the river.

Demarcation Output

The demarcation outputs included adequately emplaced boundary pillars with their associated witness marks and pointer pillars. In addition, the outputs will include the following documentation:

- ▶ Production of a topographic map or image map at a scale of 1:50,000 depicting all boundary pillars and the boundary line;
- ▶ One map covering the boundary at a scale of 1:1,000,000 showing the boundary line and pillar positions and including a list of all pillars coordinates on the map sheet;
- ▶ A register listing geographic and UTM coordinates for all pillars;
- ▶ Documents for each pillar site including a diagramme of the pillar and witness marks, pillar coordinates, a pillar photograph showing pillar identification, witness mark coordinates, bearings and distances to adjacent pillars and distances from pillar to its two pointer pillars;
- ▶ Survey reports for the field survey of GCPs for satellite images, datum survey and, as they are constructed, the survey of boundary pillars. Reports included coordinates for markers, location diagrams and photographs of datum markers, field procedures, and personnel involved, computations and checks;
- ▶ A report by the organisation undertaking the datum computations and survey of the pillars under construction;
- ▶ An independent quality assurance report of the field survey and data processing of the datum surveys and the on-site pillar construction surveys.

Technical Guidelines Used for the Demarcation of the Cameroon-Nigeria Boundary

These technical guidelines were intended to facilitate an orderly, clear, efficient and expeditious survey operation in the field. The field assessment undertaken by the CNMC is aimed at generating the information necessary for the timely implementation of pillar emplacement and survey processes. The identification of individual pillar sites is the ultimate objective of the exercise so that contractors can easily identify them when emplacing the pillars. The general principle is for both sides to collaborate in the field and locate physical boundary features mentioned in the ICJ decision. The survey operations should also provide technical advice concerning survey and mapping issues, including provisional information related to preliminary image maps. This ensures that representation of the ICJ boundary line and approximate position

Survey Procedures and Instructions

Traversing the boundary, the technical team was to follow the ICJ line as closely as possible using the preliminary image maps and GPS equipment to situate the line on ground and to ensure that the boundary conforms to the ICJ Judgement.

Rivers

If the boundary is a river, stream or other existing water feature, the use of preliminary maps would suffice. The boundary constitutes the median line between the banks of the river.

UTM Zone/ Zone UTM			Time/ Temps	Equipment/Équipement
M	M	TYPE		
H	M	No.		

LEFT BANK / RIVE GAUCHE

Point ID/ Point	UTM (EASTING/VERS L'EST)	UTM (NORTHING/VERS LE NORD)
EDGE OF WATER/BORD DE L'EAU (m)		DEPTH/PROFONDEUR (Approx. m)
COMMENTS/OBSERVATIONS		

RIGHT BANK / RIVE DROITE

Point ID/ Point	UTM (EASTING/VERS L'EST)	UTM (NORTHING/VERS LE NORD)
EDGE OF WATER/BORD DE L'EAU (m)		DEPTH/PROFONDEUR (Approx. m)
COMMENTS/OBSERVATIONS		

Team Leader – Republic of Cameroon _____
 Chef d'équipe – République du Cameroun _____

Team Leader – Federal Republic of Nigeria _____
 Chef d'équipe – République Fédérale du Nigeria _____

Representative – United Nations _____
 Représentant – Nations Unies _____

PAGE 2/2

IDENTIFICATION DE L'EMPLACEMENT DES RIVES DE LA RIVIERE
IDENTIFICATION OF THE LOCATION OF RIVER BANKS

Sketch/Croquis

COMMENTS/OBSERVATIONS

Team Leader – Republic of Cameroon _____
 Chef d'équipe – République du Cameroun _____

Team Leader – Federal Republic of Nigeria _____
 Chef d'équipe – République Fédérale du Nigeria _____

Representative – United Nations _____
 Représentant – Nations Unies _____

Figure 3 Cameroon-Nigeria Mixed Commission (CNMC) Joint Technical Committee form for the identification of riverbanks

Marshes

In areas of marshes the boundary was situated in the same way as if it was in a riverbank.

Straight Lines

Where the boundaries consist of long straight lines, clarity is needed to identify the ends and angles in order to determine main and intermediate pillar positions.

Pillars

Specifications

A steel pipe with 250-millimetre outer diameter filled with concrete above a 3-metre deep hole. The steel pipe is fitted with flanges on the inside to ensure that it is fixed firmly to the concrete filling. The depth of the hole will be increased if the individual circumstances of a particular site require greater depth to achieve long term stability and durability. The pipe should have outside diameter of 250 millimetres and a wall thickness of a minimum of 3 millimetres and be made of schedule 40 hot-dip galvanised steel.

A lightweight steel pipe meeting this specification is acceptable. This pipe should extend 1.7 metres height above ground level and be filled with concrete with strength of 30 mega Pascals (30mpa) after 28 days. The concrete is to have a suitable additive to prevent shrinkage. The full length of the hole and pipe above ground is to be strengthened by the use of an internal high tensile deformed metal bars satisfying the requirement of high strength reinforcing bars (RB 20 Yield 219.9 kilograms). This bar is to extend and be grouted by concrete, with strength of 30 mps after 28 days, 3 metres deep in the ground below the pipe, or greater if required for stability and durability.

The pillar centre will be marked with a stainless steel pin, with a 5/8 thread, 125 millimetres long, set 25 millimetres protruding from the concrete block surrounded by a 10-millimetre thick stainless-steel (SS) nut screwed into the top of the pillar and an SS protective cap.

In addition, each pillar is to have 1,500-millimetre square pedestal with a thickness of 400 millimetres reinforced with a steel mesh.

Site Selection

It has to be possible to excavate the pillar sites selected from the boundary delineated on imagery maps to a depth of 3 metres for major

pillars and a depth of 1 metre for intermediate pillars. The selected pillar site was marked with a steel stake painted in bright colours with offsets to any permanent features. Coordinates of the site were recorded using Trimble Pro-XRS GPS equipment. A photograph of the pillar site was taken and diagrams, accompanied by descriptions and sketches of the pillar site in order to illustrate appropriate all-weather roads or helicopter landing sites.

Site Identification

Once on site, the demarcation team:

- ▶ Uploaded the digital provisional boundary coordinate extracted from the preliminary map sheets onto Trimble Pro-XRS GPS equipment;
- ▶ Field traced the provisional boundary line as per the ICJ Decision;
- ▶ Prepared a template for each pillar site to be signed by all parties;
- ▶ Evaluated each pillar site to correspond with the description of the ICJ Judgement;
- ▶ Resolved in the field or reported to the CNMC as referral case each instance where a pillar site was not in conformance with the description in the ICJ Judgement;
- ▶ Identified and recorded turning points that were not pillar sites.

Pillars on Mountain Tops

The conditions and physical nature of mountain tops and suitability for emplacement of pillars was ascertained. In some instances peak itself constituted the pillar position.

Watersheds

The line of watershed is to be identified on ground, noting the significant changes in direction.

Roads

Road conditions, width and major angles will be recorded. Where no road is evident, any evidence that road might have existed in the past be recorded.

Lessons Learnt from the Exercise

The establishment of the CNMC demonstrated the political will of the two countries to demarcate their common boundary as peacefully handed over by the ICJ. The establishment of a Sub-Commission to 'Address Issues Relating to Affected Populations' within the CNMC alongside the Sub-Commission on Demarcation positively assisted the demarcation process and capacity-building mechanisms.

However, UN involvement as a third party proved problematic. With no defined role in the case of dispute between the Parties, the United Nations was unable to prevent or mediate minor disagreements that threatened to prolong the field exercise. In addition, the UN cartographic consultant's *Specifications and Technical Guide* based on "international standards" made the cost of the demarcation exercise prohibitive.

The demarcation of the Cameroon-Nigeria boundary being undertaken through the CNMC under the terms of these technical specifications offers little or no advantage to neighbouring countries, both in terms of cost and time. Both Cameroon and Nigeria came to the understanding that the involvement of the United Nations slowed down the demarcation process because of bureaucratic 'red-tapism' and over-specification to the extent that not all works planned for the period from 2002–2007 were completed. The planned completion of all works on the boundary demarcation by 2010 proved to be a Herculean task, since the field assessment for pillar sites achieved a completion rate of only just 65 per cent by October 2009. The contractors for pillars emplacement had not yet been mobilised, and lost about nine months of work time. From this experience, it is recommended that third-party involvement should be discouraged. Instead, the demarcation of international boundaries across Africa should be conducted through bilateral efforts as much as possible.

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Chapter 12

Demarcation and Maintenance of the International Boundaries of Mozambique



José Elias Mucombo

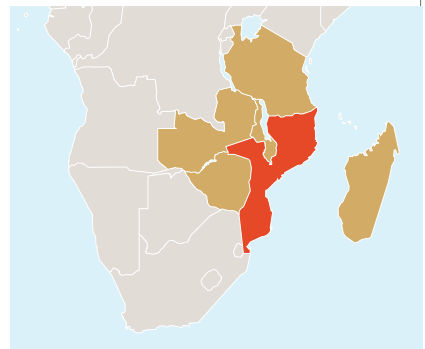
Director of Boundaries

Instituto Nacional do Mar e Fronteiras (IMAF)

Republic of Mozambique

Introduction

Geographically, the Republic of Mozambique is situated between meridians 30° and 42° East, and parallels 11° and 27° South. It lies in the southern part of the African continent extending from the Rovuma River mouth in the north to the Maputo River, “Ponta de Ouro”, in the south covering a total area of 799,380 square kilometres. This area includes 13,000 square kilometres of inland water, mainly comprising Lake Niassa, also known as Lake Malawi. The Indian Ocean bathes the 2,700 kilometres of coastline on the east of Mozambique. Mozambique’s maritime areas overlap with those of Comoros, several of France’s claimed “*îles Éparses*”, Madagascar, South Africa, and Tanzania (Araújo, 1979).



The Republic of Mozambique has land boundaries, in the north, with Tanzania, which largely follow the Rovuma River. In the west, it shares boundaries with five neighbouring countries, including the Republics of Malawi, Zambia, Zimbabwe and South Africa (Transvaal Province), and the Kingdom of Swaziland. In the south, it has boundaries with the Republic of South Africa (Natal Province). Overall, Mozambique has 4,212 kilometres of international boundary, including 2,685 kilometres on land, 1,205 kilometres in rivers, and 322 kilometres on lakes.

INTERNATIONAL BOUNDARIES OF MOZAMBIQUE				
Country	Land Boundary (Km)	River Boundary (Km)	Lake Boundary (Km)	Total (Km)
South Africa	472	24	0	496
Swaziland	106	0	0	106
Zimbabwe	839	295	0	1,134
Zambia	330	76	0	406
Malawi	888	190	322	1,400
Tanzania	50	620	0	670
GROSS TOTAL	2,685 Km	1,205 Km	322 Km	4,212 Km

Mozambique won independence from Portugal, its former coloniser, on June 25th, 1975, through “Frelimo”, originally the Front for the Liberation of Mozambique, which launched its liberation war in 1962. At independence, Mozambique inherited continental boundaries (land, river, and lake) that, like a great number of other African boundaries, were described in words and geographical coordinates in the treaties, agreements and exchange of notes between Portugal, Great Britain and Germany. They were depicted on maps and marked on the ground by physical markers, natural limits, and water courses like boundary pillars, rivers, mountains, watershed lines, etc.

Reaffirmation Process

The process of boundary demarcation was concluded by the early 1950s. Along certain segments this was carried out independently by separate teams, resulting in differences and discrepancies in the final results and requiring both sides to take the mean results. In addition, some of the segments of the boundary lines were not demarcated with pillars or the pillars differentiated in the forms, types and dimensions. At present, natural causes such as large animals, including elephants, disturb the demarcated boundary. In addition, some people are illegally occupying and cultivating lands on either side and are destroying and vandalising pillars with unknown motives.



The term “reaffirmation”, also referred to as recovery or maintenance, is a process that begins with the collection and recovering all treaties, agreements, maps and descriptions of boundaries from colonial era. It requires field revision of the boundaries already delimited and demarcated in the past, and reconfirming their correct locations. Boundaries are made clearer by rebuilding misplaced, missing and/ or displaced pillars, by building intermediate pillars for the purpose of their densification, by clearing the boundary vista, and by sensitising those affected by the boundary to preserve and conserve its markers. Minor adjustments to the boundary lines as well as production of new auxiliary tools (maps, images, etc.) and signing of new treaties and/ or agreements may also be required.

Institutional Framework – Internal

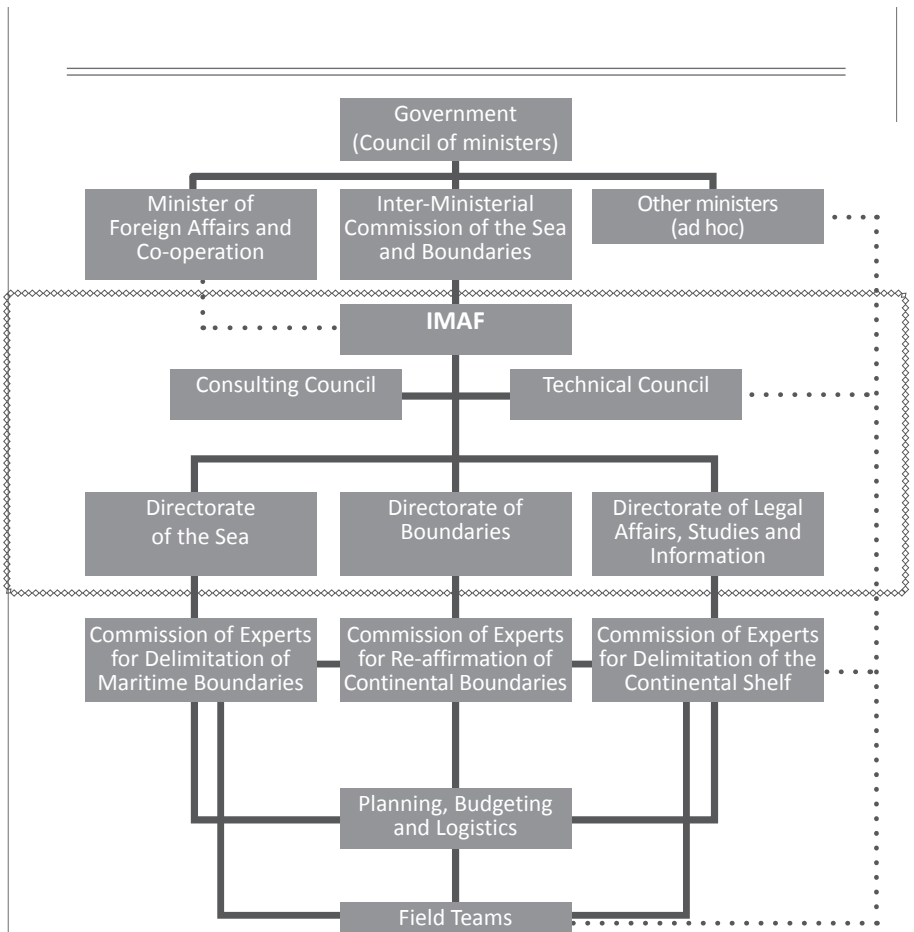
Before 2001, all matters concerning the land boundaries and maritime issues were dealt with by an Inter-Ministerial Commission of the Boundaries (established by Decree 16/97 of 1st July 1997) which ceased its mandate under the Presidential Decree (2/2001 of 3rd July 2001). The latter decree established a new Inter-Ministerial Commission of Maritime and Boundary Affairs as an organ of the Council of Ministers

for the coordination of the multi-sectoral actions of the State on the subjects of the sea and boundaries. Its work is in the sphere of the defence of sovereignty, the strengthening and maintenance of amicable relationships with other countries, in general, and with neighbouring countries, in particular.

Today, the Inter-Ministerial Commission of Maritime and Boundary Affairs is composed of the Prime-Minister who serves as President of the Commission, the Minister for Foreign Affairs and Co-operation as Vice-President and the Ministers of Interior, National Defence, State Administration, Agriculture, Fisheries, Transports and Communications, Mineral Resources, Environmental Action Coordination, and Justice as well as the Minister at the Presidency for Diplomatic Affairs. Depending on the particular cases being dealt with, other ministers may be invited to take part in the meetings of the Commission.

The Presidential Decree entered into being with the Council of Ministers establishing per Decree (18/2001, of 3rd July 2001) the National Institute of Maritime and Boundary Affairs abbreviated to “IMAF” from the Portuguese: *Instituto Nacional do Mar e Fronteiras*. IMAF is the executive and technical coordinating institution of the State on the subjects of maritime and boundary issues. Under the aegis of the Council of Ministers, IMAF is subordinate to the Prime-Minister as the President of Inter-Ministerial Commission of Maritime and Boundary Affairs, and it is monitored by the Minister of the Foreign Affairs and Co-operation. It is a public institution endowed with juridical personality and administrative, financial and patrimonial autonomy. Hence, it is not answerable to any ministry.





Governmental integration of IMAF

Operating under the Presidency of IMAF, the Technical Council is composed of representatives appointed by the Ministers serving as members of the Inter-Ministerial Commission. The Technical Council of IMAF is a consulting and coordinating organ concerning the systems and sectoral actions on the subjects of maritime and boundary affairs with the following responsibilities:

- (a) To assemble and distribute reports of IMAF activities as well as Plan of Activities.
- (b) To coordinate the execution of the systems and sectoral actions on the subjects of the maritime and boundary affairs.

- (c) To provide comment and material about any other important subjects that is placed to it.

IMAF has the following main objectives: (i) to deal with matters regarding the politics of international boundaries of the Republic of Mozambique including the land, river and lake boundaries, the air space, interior waters, territorial waters, the contiguous zone, the continental shelf, the exclusive economic zone and the sea beds covered by the national jurisdiction; and (ii) to propose policies, strategies, plans and priorities on the defined areas of its jurisdiction.

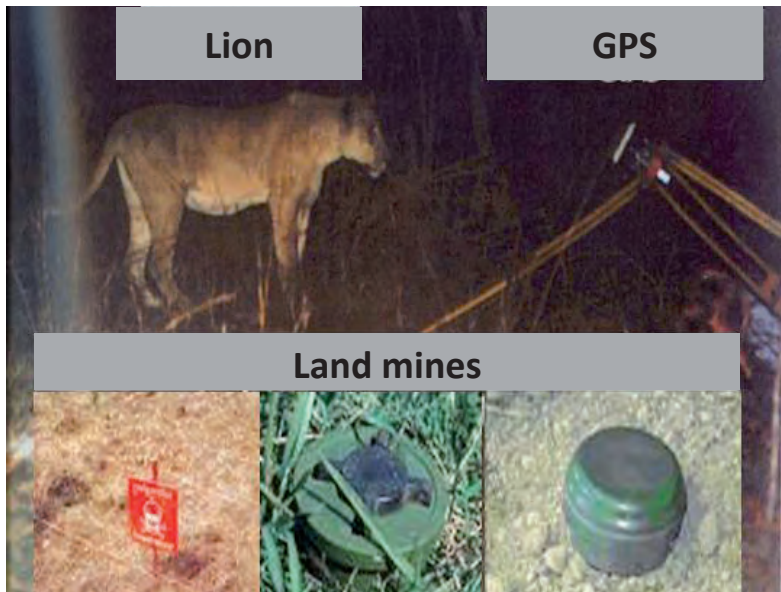
IMAF undertakes the execution and coordination of the activities related to reaffirmation of the continental boundaries, delimitation and demarcation of maritime boundaries and continental shelf limits, as well as execution and administration of the agreements and international conventions concerning the sea and boundaries. It also undertakes technical negotiations with its counterparts on subjects of maritime and boundary affairs in order to accomplish the necessary and appropriate actions to maintain boundaries, particularly including buildings, fences and boundary markers.

The various activities undertaken by IMAF are executed through the three established Commissions of Experts (Reaffirmation of Continental Boundaries, Delimitation of Maritime Boundaries and Delimitation of Continental Shelf). These Commissions are composed of experts from different ministries and/or universities in their individual capacity with the responsibility of carrying out the technical negotiations with their counterparts in neighbouring countries, as well as to carry out the overall technical exercises.

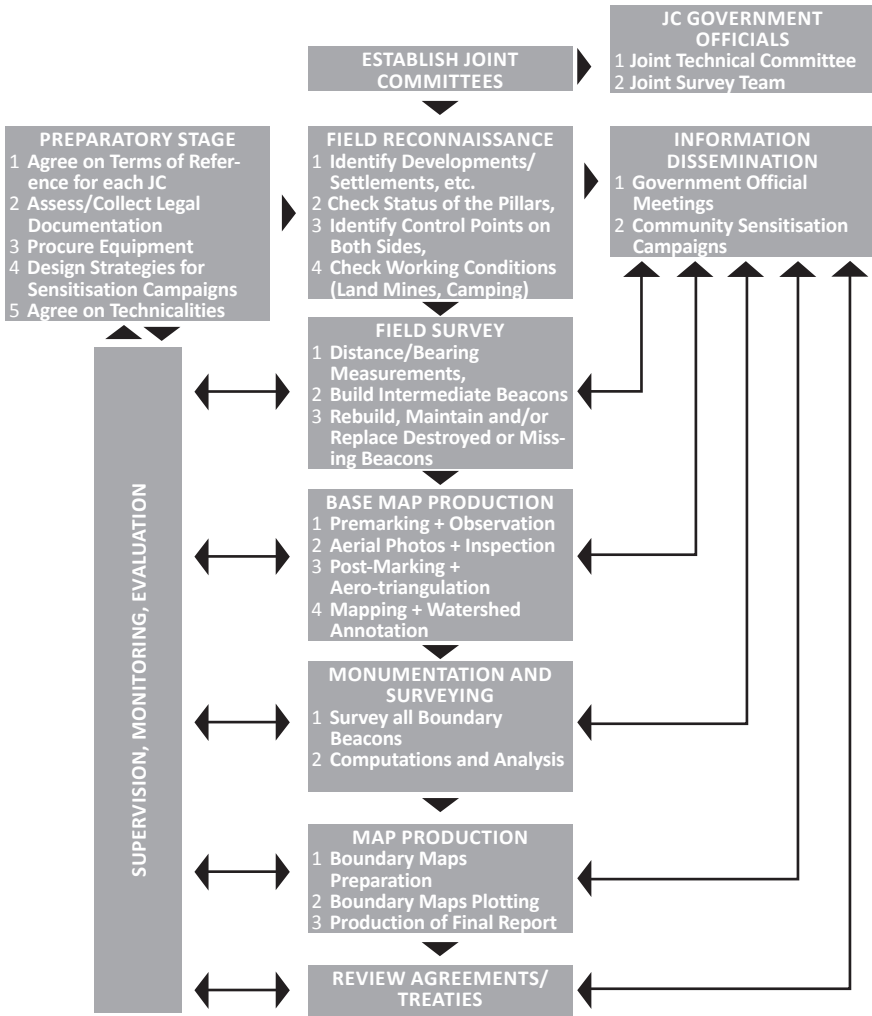
In particular, the Commission of Experts for Reaffirmation of Continental Boundaries (land, rivers, and lake) is composed of geodesists, surveyors, police border force, immigration and customs officers, officials from justice, foreign affairs, public works and habitation, etc. In its operations, the Commission may integrate relevant provincial government officers, relevant district government officers, relevant local authorities, relevant traditional leaders and relevant local communities whose interests may be affected by the exercises. It is important to note that all auxiliary and temporary workers are recruited from the local communities living along the boundaries.

Institutional Framework - Bilateral

According to Resolution 16 of the declaration adopted at the Second Summit of the Organisation of African Unity, held in Cairo in 1964, the boundaries inherited by African States at independence must remain respected. The intangibility principle of African boundaries was reiterated by the African Union on its Inaugural Session, held in Durban in 2002, where the Heads of States and Governments addressed the need to expedite the process of delimitation, demarcation and reaffirmation of African boundaries and stipulated that this exercise would be finalised by 2012.



In view of the *uti possidetis* principle mentioned above, the Republic of Mozambique started the process of reaffirmation, maintenance of boundary pillars and boundary lines with Zimbabwe in early 2002. Today, the exercise has expanded to all six neighbours, namely South Africa, Swaziland, Zambia, Malawi, and Tanzania.



Simplified activity flow diagramme

It should be noted that in almost every case, land mines have been placed along the boundary line areas as result of the struggle for independence and civil wars. This requires the involvement of military personnel to clear the boundary lines of unexploded ordinance. In addition, the presence of wild animals may disturb the normal course of reaffirmation processes (like the lion seen in the picture above, gras-

ing the tripod of the GPS) and imposing other threats to staff in the field. Likewise, it was identified that the presence of armed personnel (Border Guard Force and/or Wildlife Officers) to protect the technical team should be involved in the reaffirmation exercise.

Various stages may be considered for the demarcation or reaffirmation of a boundary. The following simplified flow diagramme of activities may be adopted.

Mozambique has created mechanisms for the reaffirmation of continental boundaries with its neighbours by establishing joint committees with almost every neighbouring country. Over these committees are Joint (bilateral) Permanent Commissions on Defence and Security which view the issues of boundaries in a broad sense within the field of defence and security. Thus, there are three specialised categories of normal bilateral committees concerning boundary matters, namely (1) Joint Committee of Government Officials, (2) Joint Technical Committee, and (3) Joint Survey Team.

- 1 The Joint Committee of Government Officials is responsible for decision making and policy direction. Although varying from one country to another, it is composed mostly of government officials from the Office of the President and Cabinet and the ministries of foreign affairs, agriculture, home affairs, defence, justice, public works, mineral resources, tourism, finance, State administration and local government. Usually, the terms of reference for the joint committee of government officials are to:
 - (a) Provide policy direction on the boundary reaffirmation exercise;
 - (b) Consider recommendations and provide final approval of any proposed joint work plans and budgets;
 - (c) Consider the final draft treaties and make recommendations to both governments for possible adoption; and
 - (d) Keep the Joint Permanent Commission on Defence and Security informed about its recommendations and decisions.

- 2 The Joint Technical Committee for Boundaries is responsible for technical oversight. It is composed of senior technical officials and experts from the ministries of foreign affairs, agriculture, home affairs, defence force, justice, public works, mineral resources, tourism, finance, State administration and local government. Its terms of reference are to:

- (a) Provide technical oversight to the Joint Survey Team;
 - (b) Consider recommendations from the Joint Survey Team and make decisions on technical issues including work plans and budgets;
 - (c) Identify unresolved issues and make recommendations for consideration of the Joint Committee of Government Officials;
 - (d) Mobilise resources for the implementation of the boundary reaffirmation exercise; and
 - (e) Prepare draft treaties for the boundary reaffirmation.
- 3 The Joint Survey Team is responsible for overall technical operations. It normally includes land surveyors, cartographers, hydrographers, hydrologists, wildlife officers, police, defence forces (Explosive Ordinance Disposal Team - EOD) and local authorities. Using the agreed legal and diplomatic instruments on the common boundary, the Joint Survey Team is expected, among other activities, to:
- (a) Survey all existing boundary pillars and monuments to confirm their true positions;
 - (b) Replace all missing, destroyed or displaced pillars and any boundary marks;
 - (c) Determine and physically mark the watershed line;
 - (d) Determine and reference the boundary line along the water bodies incorporating the changes in their course;
 - (e) Recommend the need for intermediate pillars where necessary;
 - (f) Detect and clear all zones of unexploded ordinance along the common boundary;
 - (g) Determine the exact positions of villages, infrastructures, and other forms of development along the common boundary;
 - (h) Communicate, collaborate, and coordinate activities with relevant authorities and other intervening bodies with respect to the developments in the vicinity of the common boundary;
 - (i) Compile and submit progress reports on work done based on the Joint Work Plan and Budget to the respective National Technical Committees on the common boundary and final technical report of observation results and recommendations deriving from its activities;
 - (j) Implement decisions recommended by the Joint Technical Committee;
 - (k) Develop a detailed Joint Project Proposal (work plan, list of equipment, human, technical, financial resources and time frame); and
 - (l) Establish, clear, and maintain the common boundary line.

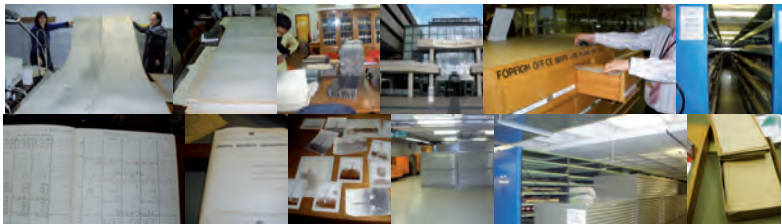
Technical Framework

Search and Collection of as well as Agreement on Legal and Diplomatic Instruments

The first and foremost step in the reaffirmation exercise is searching, identifying, agreeing upon, and collecting all existing boundary treaties, agreements, maps, sketches, and technical reports of demarcation undertaken during the colonial era. Jointly, Mozambique and some of its neighbouring countries have undertaken such exercises in the Portuguese Archives (Scientific Tropical Research Institute, IICT) and the British National Archives and have found all original boundary documentation, namely:

- (a) Legal and diplomatic instruments (treaties, agreements and exchanges of notes);
- (b) Reports and minutes of boundary commissions;
- (c) Demarcation photographs (aerial and terrestrial);
- (d) Field books and manual calculations;
- (e) Maps, plans, sketches and pillar descriptions;
- (f) Official publications on boundaries.

These documents are very crucial for starting any exercise of boundary reaffirmation, especially for those hostile zones prone to vulnerabilities, scarce physical markers and with high probabilities of disagreements and/or conflicts of interest. In the Mozambican experience, this exercise is still on-going due to a lack of funds to undertake the lengthy and tedious search and collection.



Considerations on Survey Control

The national geodetic networks used for boundary demarcations were determined by techniques of terrestrial surveying using “classical geodesy” (up to the 1960s) done by triangulation, based on the measurements of angles and distances. These networks were established independently to serve the purposes of mapping for each particular country. The precise orientation to the geographic North was done by methods of geodetic astronomy. This involved survey instruments such as theodolites and tacheometers, which are no longer used. Today, modern technologies are used including Global Positioning Systems (GPS) and Total Stations.



In order to overcome the difficulties arising from the use of individual national geodetic networks with different reference systems, the decision was made to use WGS 84 for measurements along boundary lines and geodetic points on both sides, then transform the measurements from WGS 84 into the local reference system (in the case of Mozambique, this is Clarke 1886). National geodetic points along the boundary lines in both countries were selected and measured for compatibility check.

Considerations on Criteria for Acceptance of Boundary Pillar Positions

As stated previously, because early measurements of boundary pillars were made separately using different methods and older instruments, such as theodolites and tacheometers, technical specifications were considered and agreed, including the criteria for acceptance of observation errors from the position as recorded in the treaties:

- 1 Any boundary pillar that falls outside of the acceptable observation errors from the position as recorded in the treaty should be reviewed by the two governments taking into consideration various aspects of cost effectiveness.
- 2 Use of existing official topographic maps from both countries (at a scale of 1:250,000, 1:50,000 or larger) taking into account the shortage of resources to acquire new maps for all boundary lines. However, considerations should be taken into account regarding the compatibility among the maps and the fact that, although out-dated, they reflect the real situation at the time of agreement.
- 3 Use of horizontal accuracy of both national geodetic network reference points taking into considerations its differences. Usually an accuracy of ± 5 centimetres for geodetic measurement of boundary pillars is considered normal. This accuracy was considered desirable because of economic aspects as well as the equipment used. It should be noted that boundary pillars may be used by both countries as geodetic points for future use in mapping.
- 4 Use of acceptable tolerance of about ± 15 centimetres from the existing coordinates as normal considering the type of measuring instruments to be used (modern geodetic GPS).

Making the Boundary Visible on the Ground

The main objective of demarcation and/or reaffirmation is to physically determine and mark the precise location of the boundary line by measuring and placing boundary markers such as concrete pillars, stone cairns, etc. on the ground. The process aims to make the boundary line well-known and more clearly visible to those who may be affected on site, mainly the local communities. The reaffirmation process may include rebuilding misplaced, missing and/or displaced pillars, building intermediate pillars (densification), cleaning the boundary vista, and sensitising those affected by the boundary to preserve and conserve its markers, etc.

The visibility of the boundary on the ground depends on various factors, such as:

- 1 Type and form of boundary pillar – there is no universal standard. Consequently, various models have been adopted and used worldwide; however, Mozambique and neighbours have agreed on a standard form and type of pillars.
- 2 Distance between pillars – the distance for placement of boundary pillars will vary from one site to another depending on various considerations.

- 3 Topography of Terrain – the type of terrain may determine the placement of boundary pillars. Hence, hilly terrain may have different considerations compared to flat and clear terrain.
- 4 Developments along boundary lines – considerations for placement of boundary pillars may depend on the developments along and in the vicinity of the boundary line. For instance, a densely populated area, an area with dense infrastructures, and/or an area with dense agricultural activities may require special considerations.
- 5 Possibilities of conflicts – areas prone to conflicts may require the placement of boundary pillars at short distances for intervisibility. Other additional measures may be considered to avoid any grievance between local communities.
- 6 Clearance of vista – the visibility of a boundary line may require the clearance of a ‘vista’ between the pillars, and in certain instances this may require the planting of trees parallel to the boundary line on both sides. Various means for clearing the vista may be used such as manual cutting of trees or use of mechanical means such as a bulldozer.



For example, a boundary passing through a densely-forested area may need prior clearance of vista along the boundary line using all existing and feasible means, either manual or mechanical. The pictures below show two types of vista clearance to make the boundary more visible on the ground (from left to right, top row first). The first picture shows a military engineer clearing any unexploded ordnance; the second and third pictures show the involvement of local communities, military personnel, and border guard forces in clearing the vistas; the fourth picture shows a manual clearing process; the fifth picture shows a cleared boundary vista; and the sixth picture shows the clearing of the vista

along the Canada-USA boundary using a bulldozer. This is often a more efficient means for creating visibility of a boundary, and Mozambique is considering the acquisition of a bulldozer for clearing the vistas along its boundaries.

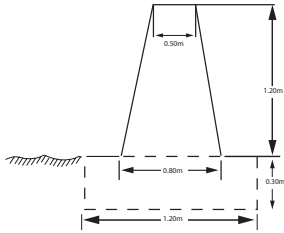
Various types and forms of pillars are being used internationally depending on economic and other factors affecting the boundary lines. Mozambique and its neighbours have agreed to use pillars of the following types and forms:

- (i) Type “A” boundary pillar:
 - (a) Implantation Base of 1.20 metres square and 0.40 metres deep;
 - (b) External Bottom Base of 0.70 metres square;
 - (c) External Height of 1.15 metres and top base of 0.30 metres square.

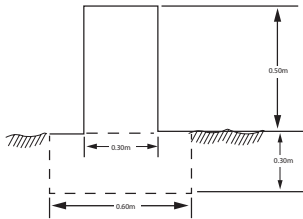
N.B.: To build boundary pillars of type “A” may require three (3) bags of cement of Type I, Class 42.5, 15 metres of iron, sand and stone.

- (ii) Type “B” boundary pillar :
 - (a) Implantation Base of 0.60 metres square and 0.40 metres deep;
 - (b) External Height of 0.50 metres h with a base and top of 0.30 metres square;
 - (c) Build a small pillar (Type “B”) under the three steel rails to show the pillar centre and number on all existing boundary pillars built of steel rails.

- 7 Distances between boundary pillars – various approaches may be adopted, such as the placement of main and intermediate pillars at certain considerable distances that may be agreed according to the specific realities on the ground. Making pillars visible on the ground may be seen from the perspective of intervisibility between pillars, taking into consideration various human factors. Here, issues of distance between them may be of considerable importance. For example, type “A” boundary pillars shall be placed at intervals of 5,000 metres apart, except in densely populated areas where they shall be at 1,000 metres apart. Type “B” boundary pillars shall be placed at intervals of 1,000 metres, except in densely populated areas where they shall be 250 metres apart and 500 metres for less built up areas.



Beacon Type A

Beacon Type B –
Intermediate

Use of Global Positioning System (GPS) Technologies

The Global Positioning System (GPS) is a space-based Global Navigation Satellite System (GNSS) that provides reliable three-dimensional location (latitude, longitude, and altitude) plus the time, to worldwide users on a continuous basis in any weather, day and night, anywhere on or near the Earth. The GPS uses a constellation of between 24 and 32 Medium Earth Orbit satellites that transmit precise microwave signals enabling GPS receivers to determine their location, speed, direction, and time.

The GPS has been used extensively for the survey of an entire boundary area, including the establishment of a geodetic control network and ground control points for mapping. Any country embarking on a demarcation and/or reaffirmation exercise should consider using this technology. With funding from the Federal Foreign Office of Germany, Mozambique and its neighbours have agreed to purchase and use GPS receivers to speed up the exercise of reaffirmation as well as to improve accuracy. A joint training workshop was organised in Lusaka, Zambia, by the equipment vendor, Leica Geosystems (based in Germany), with the participation of technicians from Mozambique, Zambia, Malawi, and Tanzania (see pictures below).



Use of Satellite Imagery

Satellite imagery consists of photographs of the Earth made by means of artificial satellites. Satellite images have many applications in agriculture, geology, forestry, biodiversity conservation, regional planning, education, intelligence and warfare. Images can be in visible colours and in other spectra. There are also elevation maps, usually made by radar imaging, such as LIDAR images (see below). Interpretation and analysis of satellite imagery is conducted using software packages like ERDAS Imagine.

Neighbouring countries involved in demarcation and/or reaffirmation may consider using satellite imagery, depending on the availability of funds. In Mozambique's experience with its neighbours, they have agreed to mobilise resources through their Donor Partners to purchase satellite imagery (IKONOS Geo 3.2m) in order to revise maps of areas showing actual developments.

Use of Geographical Information Systems

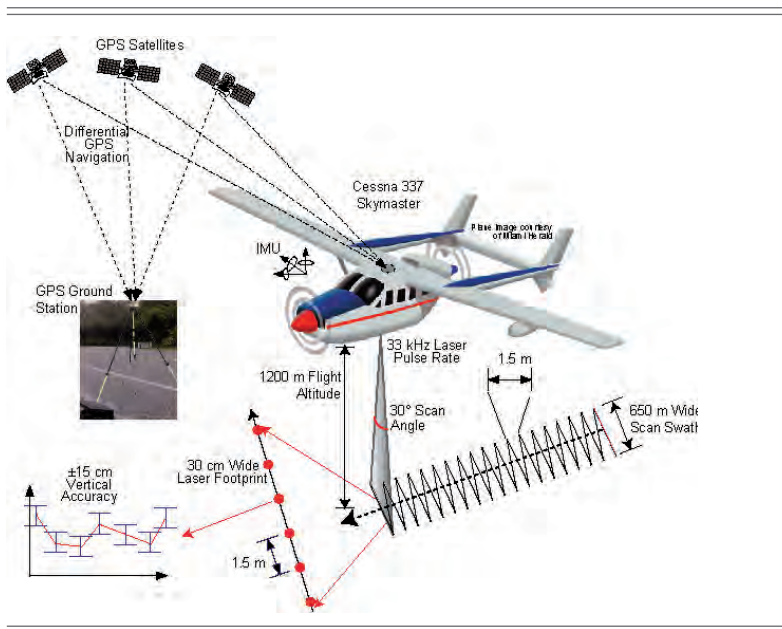
Geographical Information Systems (GIS) refers to a computerised system that deals with spatial data in terms of its collection, storage, management, retrieval, conversion, analysis, modelling, and display/output. It is used as a means for assembling and analysing diverse spatial data. The use of GIS has direct links to areas such as cartography, satellite imagery, surveying, etc. Today, GIS is also considered an important tool in decision-making. It has been applied in many fields, such as cadastral mapping, land use planning, forestry, wildlife management, infrastructure planning, zoning, environmental monitoring, network planning, facility selecting, as well as boundary management. Some of the advanced applications at present involve crime analysis, cross-border cooperation and so on. GIS can integrate and relate any data with a spatial component, regardless of the source of the data.

The extensive use of GIS has brought enormous possibilities for boundary management. The Mozambican experience with its neighbours, Zambia, Malawi, and Tanzania, has shown the relevance of using the GIS within the framework of the African Union Border Programme (AUBP), which is funded by the Federal Foreign Office of Germany. Mozambique is searching and collecting all relevant legal and diplomatic documents to be integrated in a comprehensive boundary GIS database, composed mainly of: treaty maps, coordinates, boundary text description, boundary pillars, topographic maps, satellite imagery, sketches, technical reports of demarcation, photographs of pillars, etc. Different systems are available worldwide but the best known and extensively used are ArcGIS and ERDAS Imagine, combined with the individual customisations.

Use of Aerial Photography and LIDAR Imagery

Aerial photography is the most extensively used source of information for the purpose of demarcation and/or reaffirmation. Mozambique and its neighbours have agreed to mobilise resources through their Donor Partners to Fund Aerial Photographs and/or LIDAR Imagery to revise maps and determine water shade lines where the Boundary Lines were defined as such.

Airborne Light Detection and Ranging (LIDAR) technology [see schematic diagramme for data acquisition]¹⁸⁷ is an active remote sensing technology which allows accurate measurements of topography, vegetation canopy heights, and buildings over large areas. Most modern ALTM systems consist of three basic components: the laser scanner, a kinematic Global Positioning System (GPS), and the Inertial Measurement Unit (IMU). The laser scanner detects the range from the aircraft to the ground by recording the time difference



between laser pulses sent out and reflected back. Many systems allow the recording of multiple returns and the return intensity for each laser pulse. Pulse repetition rates of commercial LIDAR systems range between 5 and 167 kHz. A rotating or oscillating mirror mounted in front of the laser causes the laser to scan back and forth, allowing the coverage of a wide swath beneath the flight path. This oscillation of the scanner mirror, in combination with forward motion of the aircraft, typically results in a zigzag scan pattern beneath the flight path.

¹⁸⁷ Leatherman, S.P. (2009). Special permission for insertion of schematic diagram for data acquisition described by the Florida International University (FIU) International Hurricane Research Centre (IHRC).

A GPS receiver mounted in the aircraft records aircraft positions continuously. A second GPS station situated at a known ground position provides differential corrections for more accurate estimation of the aircraft trajectory. The IMU consists of a set of gyroscopes and accelerometers that continuously measure the roll, pitch, heading and acceleration of the aircraft. After the flight, the aircraft trajectory is then combined with the laser range data, scanner mirror angle, and the IMU measurements to determine the precise horizontal coordinates and vertical elevations of each laser reflection.

Reporting Structure

Reporting and documentation for boundary demarcation is one of the crucial elements. A report of a boundary should contain at least:

- 1 Introductory background;
- 2 Mandate and terms of reference;
- 3 Composition and rules of procedure;
- 4 Meetings and field sessions;
- 5 Participation;
- 6 Organisation of work – boundary definition, technical aspects regarding the surveying, mapping and physical representation;
- 7 Preliminary considerations – including historical background and boundary definition of various delimitation agreements, treaties, etc.
- 8 Mapping:
 - (a) Necessity for new mapping – including the definition of methodologies for new mapping of the boundary area;
 - (b) Field work preparation – including control surveys, definition of datum points to facilitate the production of the maps, control points for definition of primary control network to set out the boundary pillars and photo control points for mapping as well as the aerial photography – specification considerations including scales, pre- and/or post-marking, etc.
 - (c) Mapping of the boundary areas – considerations on need for maps, satellite imagery and/or LIDAR imagery, scale considerations as well as the size and number of map sheets.
- 9 Decision on Demarcation – including parameters for demarcation, segmentation of boundary lines and accessibility to the boundary sites consideration.
- 10 Documentation of Demarcation – including the record of all boundary pillars.

- 11 List of coordinates demarcating boundary – including the pillars, intervisibility of pillars, segmentation of boundary lines, reference systems of the coordinates and ellipsoid associated to it and its elements.
- 12 Annexes – including the list of documents and reports of the Committees, concepts and definitions, rules of procedures and working methods, maps, satellite imagery and processing software.

Concluding remarks

Based on the above experiences, it can be concluded that any exercise of demarcation and/or reaffirmation may be considered as a purely technical undertaking, involving geodesists, surveyors, cartographers, etc. This is a significant difference from the delimitation exercise where the principal players are political advisers, diplomats and international lawyers, with the surveyors, cartographers, and other experts acting in an advisory capacity. Hence, it should be understood that it is the demarcation and/or reaffirmation exercises that provide a permanent record of the boundary and an important component of a database that will serve as the basic infrastructure for managing, maintaining and preserving any international boundary line.

Simultaneously, it could be concluded that the exercise of demarcation and/or reaffirmation can be successful only if conducted by peaceful and patient means of negotiation and with a common technical understanding. The use of the WGS 84 reference system not only avoids problems of connecting boundary points to national geodetic networks, but it also provides an important infrastructure for geographic information systems, which is of primary importance in managing and maintaining international boundaries. Modern technologies such as GIS, satellite imagery, LIDAR, etc., are excellent tools to help undertake the exercise of demarcation and/or reaffirmation, and are almost indispensable in avoiding disputes which may arise due to faulty demarcations undertaken during the colonial era. Therefore, computerised boundary information systems should be established for the purpose of efficient and effective administration and management of the boundaries.

The joint use of GPS measurements and simultaneous adjustments are the best way to establish and/or reaffirm boundary lines within a very acceptable range of accuracy and within reasonable time. If expressed in coordinates, it also ensures the possibility of restoring boundary lines in the future by GPS means, without requiring other aids. Thus, prior

to measurements, the involved parties should agree on GPS methods to be used, as well as the estimated accuracy that is acceptable. All demarcation records should include digital images of the sites and features. They should be meticulously prepared and digitally stored for future reference and boundary restoration.

Technical experts should be involved and, where possible, lead the overall technical negotiations of international boundaries for the purpose of demarcation or reaffirmation in order to provide most reliable information available at the moment. All existing boundary treaties, agreements, reports and minutes, maps, plans, sketches, pillar descriptions and other relevant material should be located, collected and agreed upon jointly to be complemented with the most recently acquired digital data. However, great care should be taken so that all old material is evaluated by experts and the results recorded.

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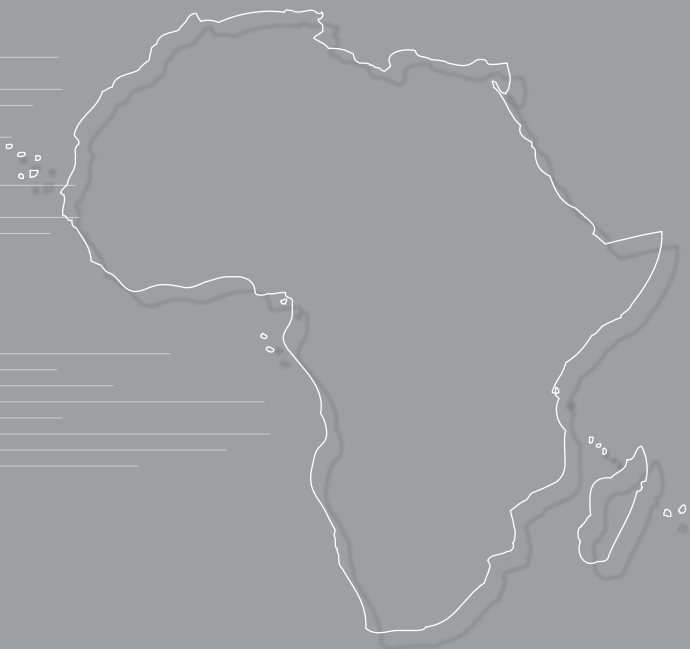
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Section III

Lexicon and Appendices



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Lexicon of Boundary-Making



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A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Accretion. This is the gradual process by which the build-up of sediment and silt adds to the land mass along rivers and on coasts. This will cause the configuration of river-banks to change, and coast-lines to alter. In both cases, median line calculations will be affected. In the case of river boundaries, it is common for the boundary to follow river movements as a result of accretion although those boundaries on river-banks may need to be re-drawn. See also “Avulsion”.

Accuracy. Certain degrees of accuracy must be recognised in all boundary-making activity. Accuracy may be defined as the proximity of a measurement to its true value. This is most strikingly demonstrated in the science of geodesy in which certain constructs have to be taken into account in order to produce a truly accurate measurement of a point on the earth’s surface which can be expressed by coordinates of longitude and latitude. Maps, as two-dimensional representations of a three-dimensional world, can never be said to be truly accurate. They may however provide a useful portrayal of a boundary in a convenient format, always bearing in mind that the older a map is, the less likely it is to be accurate.

Acquiescence. Acquiescence can be an important factor in establishing acceptance by a neighbouring State of the alignment of a boundary.

Administrative acts. These are commonly referred to by the French term effectivités. They are acts carried out by a State exercising its role

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as sovereign over territory. Such acts can constitute important evidence of sovereignty over a territory in dispute. Examples of administrative acts include local government legislation, provision of education, judicial, medical and postal services, payment of taxes, security and policing.

Administrative information. The administrative history of a region may play a vital part in determining the emergence of a boundary. See also “Effectivités” and “*Uti possidetis iuris*”.

Adverse possession. The term used to describe the unchallenged occupation of one State’s territory by another State, taking place over (usually) a considerable number of years. See also “Historical Consolidation” and “Prescription”.

Aerial photography. Aerial photography was used extensively in the twentieth century for the production of maps. The highly technical process of concerting photographs to maps is known as “photogrammetry”. Archives containing the original aerial photography from which maps were made can be a useful source of evidence when resisting or raising challenges to the accuracy of maps as drawn.

Affected populations. When a boundary is drawn, or re-drawn as the result of an agreement or the ruling of a court or tribunal, it is likely that population groups of each State will be affected. Whilst it may not necessarily follow today that an affected population will be forced to assume a new nationality in conformity with the re-drawn boundary, the reality may well be that the affected population migrates back to its own State. In all boundary negotiations it is important that the fate of affected populations is taken into account. This should also influence longer term border management strategies.

Agent. A State bringing a case before the International Court of Justice (ICJ) or the International Tribunal for the Law of the Sea (ITLOS) must appoint an individual to represent it. The agent’s name is given to the Registrar for the purpose of delivering communications. The agent has overall responsibility for the conduct of the case, but he frequently delegates his responsibility of the day-to-day running of the case to a law firm.



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Air space. States exercise sovereignty over the territory that they occupy and the adjoining maritime areas. They also control the air space above them. Control of air space over disputed territory may be an important evidence of sovereignty.

Alignment. Most frequently used in a boundary context to describe the process of ensuring that boundary markers are correctly placed in relation to (a) the instrument describing their position and (b) each other.

Allocation. In certain (generally disputed) boundary situations, it may be necessary to allocate new territory to accommodate an affected population.

Application. A unilateral request by a State to the ICJ or the ITLOS is made by means of an Application. The Court/Tribunal will consider the Application and decide whether or not it has jurisdiction to entertain the dispute. If it decides that it has, the President of the Court/Tribunal will normally summon the parties to a meeting, the main purpose of which will be to set a timetable for the service of pleadings.

Arbitration. Many territorial disputes are resolved by resort to third-party, *ad hoc* arbitration which involves establishing a bespoke tribunal of judges appointed by the disputant States. International instruments frequently envisage arbitration as a means of resolving disputes. Its advantages can include speed and privacy, but seldom the saving of expense. Many States find arbitration processes politically more attractive than references to standing international Courts.

Archives. Archives are generally an essential source of information in any international border dispute since they include official government and administrative records. Much historical information is held by the former colonial powers in their respective archives. The National Archive (formerly the Public Record Office [PRO]) at Kew in London is probably the single most important archive because of the nature and extent of Britain's former empire. It also contains over eight million maps. The French archives are held in Paris at the Quai d'Orsay and in Aix en Provence which houses the French colonial records. The Belgian Foreign Ministry maintains an African Archive alongside its diplomatic

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 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

archive located in Brussels. The Library of Congress in Washington also has important materials, particularly maps.

Archivist. Generally, this is the keeper of an archive. However, the accumulated knowledge of an archivist may be an invaluable asset in directing meaningful research in an archive. In some cases it may be necessary to call upon the evidence of the archivist him/herself in order to establish the existence or, which is usually more difficult, the non-existence of records, maps, or documents.

Armistice line. A line established at a conclusion of hostilities which may be only as temporary as the duration of the armistice period itself. If the armistice becomes a lasting peace, the line thus established may become an accepted and permanent boundary.

Astronomical information. Historically, navigation was undertaken by reference to the stars and the angle of the sun to the horizon at midday. Charts and maps were also produced using the stars and the sun. The unchanging nature of the position of the stars gave rise to the science of the cadastral survey which, for example, enabled the location of plots of land to be plotted with such precision that it is still used in many countries, such as France, in preference to GPS.

Atlases. Parties to international territorial disputes will usually produce atlases of their own. These atlases will contain copies of relevant historical maps, and modern maps created specifically for use in the proceedings. When a dispute is referred to third-party resolution, the parties need to give early consideration to creation of their atlases. A number of expert skills are normally required. Apart from lawyers, historical researchers, cartographers, surveyors, hydrographers (see hydrography) and, nowadays, satellite image specialists (see satellite imagery) are likely to be needed.

Authorisation. It is extremely important when planning to research archive material, which may be held in a variety of locations, to ensure that the correct authorisation is obtained for each location. This may vary from the relatively straightforward process of obtaining a “Reader’s Ticket” to obtaining express permission from the relevant ministry in a foreign State.



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Authority. In a legal context, authority may be actual or ostensible. Actual authority may be taken to be authority which is conferred by the State. Ostensible authority is the holding out of having actual authority to carry out an act, such as signing a Treaty. If that authority turns out not to exist, the entitlement of a party to rely on that authority may depend on the apparent status of the person exercising the authority. Thus, it would not normally be open to a State to deny that a Treaty signed by its President is valid through lack of authority to sign. The other State may rely on the ostensible authority of a President, notwithstanding any lack of authority to sign a Treaty emanating from, for example, the first State's parliament.

Avulsion. Is the abandonment by a river of an old channel and creation of a new channel through some kind of sudden event, such as flooding and/or man-made causes. This will generally be of considerable significance where a boundary is defined by reference to the course of a river and may or may not involve the boundary shifting into the new river channel.

Berlin Conference. In Africa a number of boundaries are often characterised as having first come into existence as a result of the Berlin Africa Conference of 1884-1885. Attended by delegates from France, Germany, Great Britain, Portugal, Spain and several other European States, the Conference saw these European powers agree to crude principles through which they recognised the acquisition of territory in Africa. The reality was that colonial partition after the Conference took various forms. One was a series of agreements between the would-be colonial powers defining 'spheres of influence'. See, for example, the Convention between Great Britain and France for the Delimitation of their respective Possessions to the West of the Niger, and of their respective Possessions and Spheres of Influence to the East of that River, signed at Paris on June 14 1898. The vast majority of African boundaries gained definition through delimitation and demarcation practices that occurred after the Berlin Conference and continued through the twentieth century.

Bilateral Commission. A commission made up of representatives from two neighbouring States. It may be a temporary commission, assem-

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bled to resolve a specific boundary or boundary issue. Or it may be a permanent commission, taking on responsibilities for border management once a boundary is fixed. Bilateral commissions will require a constitutive agreement in order to be most effective. Their mandate will generally emanate from the two States concerned, but, exceptionally, it may be derived from a third party, such as the United Nations. In the latter case, representatives from the third party may also be included in the personnel of the commission.

Border management. This includes several management issues of ongoing concern for both States in the borderland area such as: maintenance of the boundary pillars/marks/tracks; management of transboundary resources such as water, mineral deposits and/or oil and gas; transboundary environmental management for conservation areas; as well as security and access management of cross border movements. These management issues are best addressed through bilateral cooperation and can pave the way for economic development of borderland areas.

Border sensitisation. Communication with local populations about the boundary practices, usually occurs during the demarcation of a new boundary or re-demarcation of a previously defined but unmarked boundary. Sensitisation includes explaining the work of a boundary commission to the local border residents. Since this is usually carried out by a Boundary Commission, it may need to have its mandate extended to cover these important activities.

Borders. Although the word is sometimes used interchangeably with boundary, expressions such as ‘border controls’, ‘border posts’, ‘border crossings’ all denote elements of administrative control on either side of the boundary line.

Boundary Commission. Boundary commissions can either be established jointly (see bilateral commissions) or may be constituted unilaterally as a national body. In either case, boundary commissions may be given statutory responsibility not only for delimiting and demarcating boundaries, but for maintaining and managing them, dealing with affected populations, and resolving internal inter-State disputes. In



federal States, a national boundary commission may be charged with dealing with internal inter-State national boundaries as well as international boundaries. A boundary commission will often be placed under the overall responsibility of the executive office (Presidential, or Vice-presidential).

Boundary movement. Boundaries may be fixed by a demarcation process, for example through the erection of boundary pillars. However, a boundary may be subject to movement as the result of shifting natural features, such as rivers changing course. Such movement will almost certainly require management by, ideally, a boundary commission. Any boundary can be changed or shifted as long as both neighbouring States agree to the change in a treaty or other binding arrangement.

Boundary. The physical limits of a State's geographic, territorial and, usually, national jurisdiction.

Budgets. It is important to establish which government ministry has overall responsibility for boundary budgetary matters and control. Typically, foreign ministries deal with boundary matters but interior ministries and justice ministries may also be involved. Provision must be made for boundary commissions, either temporary or permanent, for such activities as on-going maintenance of boundaries (especially pillars), allocation of affected populations, and, very importantly, for up to date and accurate surveying equipment, as well as on-going cartographic requirements. If there is a permanent boundary commission it will generally have its own budget as a separate government department.

Cairns. Traditional survey marks built of heaped stones (see also 'pillar') called cairns have also been used as boundary markers. Their impermanent nature makes them unsatisfactory as long-term markers, since over time local populations or natural erosion may displace the stones. Remarkably however, many cairns have survived when positioned deep in the bush, although they may take some finding. Properly constituted pillars are a preferable alternative.

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Cairo Resolution. The Assembly of Heads of State and Government meeting in its First Ordinary Session in Cairo in July 1964 adopted Resolution AHG/Res. 16(I). It is fundamental to all modern African boundary-making, as it recognises that ‘the borders of African States, on the day of their independence, constitute a tangible reality,’ whereby the Member States pledged to respect their colonially defined boundaries on achieving independence. Whilst the existing colonial boundaries were thus adopted in principle, it is important to understand that where there were defects in the delimitation of those boundaries, those defects could, and should, be rectified, generally by subsequent boundary commissions. All African States adopted the resolution except Morocco and Somalia. The intention behind the resolution was to avoid potential future conflict.

Chambers. When taking cases to the ICJ or the ITLOS, it is sometimes possible for State-Parties to stipulate that they do not want the entire tribunal to adjudicate their case. The Tribunal itself, or sometimes the State-Parties, may select a limited number of the judges in order to constitute a ‘Chamber’ of the Court. Chambers decided two of the most important boundary cases of recent times, the El Salvador/Honduras case and the Canada/United States Gulf of Maine case.

Colonial powers. In Africa, the main colonial (or imperial) powers, all European, were Belgium, France, Germany, Great Britain, Italy and Portugal (Spain played a lesser role). In a relatively short space of time (generally no more than fifty years after the Berlin Conference) they mounted expeditions, often conducted jointly with their newfound colonial power neighbours, in order to survey the terrain in the border territory. These expeditions produced maps and began the task of working out where a boundary line could run, sometimes in consultation with the local inhabitants. They would then draw up descriptions of these lines, generally by reference to local geographical features, but occasionally using compass bearings. These descriptions were then the subject of diplomatic exchanges and the first boundary treaties were drawn up, gradually replacing the ‘spheres of influence’ agreements. In some cases, further expeditions, including military engineers, were then given the task of marking out the boundary on the ground. This was often the stage at which the original cairns used as temporary

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markers were replaced with boundary pillars. In any subsequent work on these boundaries (consensual or disputed), reference to the original colonial reports, documents and maps stored in archives around Europe and locally in the countries concerned will be an essential aid to understanding the provenance of a boundary line.

Colonies. “Colonies” is a generic term, usually used to describe all the overseas possessions of the colonial powers. In the case of Great Britain however, “Colonies” were divided up into different categories, denoting different administrative relationships with Britain. These relationships may still have significance when ascertaining the precise status of territory and, for example, treaty-making powers under the colonial regime. There are separate entries under each of the entities created by Great Britain, as follows:

Colony – under the administration of the Colonial Office

Dominion – usually under a strong autonomous government (for example: South Africa)

Protectorate – usually under administration of the Foreign Office

Other colonial powers had separate categories to designate colonial holding: it is necessary to look at their respective colonial histories to understand their administrative relationships.

Commissioners. In boundary commissions it is common to appoint ‘commissioners’, or senior members of the commission with responsibility for specific aspects of the commission’s boundary work, such as the ‘Commissioner for International Boundaries’. Two commissioners, one appointed from each side, lead bilateral commissions.

Commissions. See “Boundary Commission” “Bilateral Commission”.

Communities. Generally, this refers to local border communities in the vicinity of a boundary. Their local knowledge, their history, and their sentiments provide an important contribution to any boundary-making exercise.

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Conciliation. Conciliation is an extra-judicial process specifically mentioned in some international instruments, such as Article 33 of the United Nations Charter. The appointment of third-party conciliators or mediators may facilitate the resolution of differences between States on boundary issues by helping to clarify the issues that divide the parties with a view to consensual resolution. Generally, conciliation involves a third-party panel submitting an independent report with recommendations for settlement of the dispute. These are usually accepted as recommendations; however, difficulties often emerge over determining the extent to which a conciliation process will be binding.

Condominium. This is the rare arrangement whereby two or more sovereigns have title over the same area of land; also termed “shared sovereignty”. The creation of a condominium may offer a viable negotiated solution to an intractable boundary dispute.

Confidence building. Where a boundary is disputed, one will very often find an underlying hostility between populations on either side of a perceived boundary. There may also be hostility between the delegations representing each side. It will generally be desirable to try to avoid that hostility reaching a level where trust is lost or where, in the worst cases, armed skirmishes take place. Confidence-building measures such as joint technical meetings between experts as a prelude to negotiations can be extremely effective. Outside the meetings themselves, which may, in appropriate cases, be attended by representatives of the local community, social interaction should be encouraged. The role of confidence building between central and local government, the local population and the experts in each State should also not be overlooked. Typically, this may be a task with which a national boundary commission may be charged.

Constitutive agreement. This is a treaty or other agreement creating a bilateral boundary commission that defines its goals, structure, mandate, technical specifications and dispute resolution mechanisms.

Consultation. An essential part of any boundary-making process, the government ministry or body charged with responsibility for delineating the boundary should hold extensive consultations with its own experts,

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which can include surveyors, lawyers, historians, geographers, hydrographers, who should be fully capable of instructing those charged with negotiating and/or disputing the boundary. Consultation should also take place in the field with local communities comprised of populations likely to be affected by any changes to an existing boundary or the making of a new boundary.

Contours. Contours are the lines drawn on a flat topographic map intended to show terrain elevations within fixed increments of elevation (10 metres, 50 metres, etc.). Contours were once vital to establishing the line of a watershed as they symbolically represent the map terrain like hills, ridges, mountains, valleys, etc. Today, high resolution satellites – or aerial-derived digital elevation data models, sometimes draped with satellite imagery or aerial photos, deployed on geographic information systems (GIS) provide more accurate portrayals of terrain elevations and the identification of watershed and ridges than extracted contour lines.

Convention. Another form of binding international agreement, the term convention is usually in reference to a multilateral treaty.

Coordinates. Most people are familiar with geographical coordinates. In stating coordinates, latitude is generally expressed before longitude in treaties but not in many digital applications like geographic information systems (GIS). Minutes and seconds can also be expressed decimally after degrees. Great care must always be taken with ‘historical’ coordinates whose reference datums are unknown or obscure, and published coordinates may be more notional than precise. Some treaties also include coordinates in the Universal Transverse Mercator coordinate system in tandem with geographical coordinates. Quite apart from the datum question (see datum) it should be borne in mind that, over the centuries, different States have adopted different systems of recording coordinates. Whilst the Greenwich meridian is now universally accepted for most purposes, it was not so long ago that French maps were drawn with the meridian running through Paris.

Costs. Boundary-making is an expensive exercise. The need for proper budgeting is paramount if the exercise is to succeed. Detailed estimates

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of costs in order to arrive at budget figures are highly desirable. Members of a boundary commission may typically be given the responsibility for producing such estimates. The need for accurate costing will become even more acute when dispute resolution processes are invoked.

Custom. Local custom is often an important factor in land boundary disputes. Matters such as local farming patterns, fishing activities, religious observance and rights of passage may all be highly significant.

Customary international law. For many hundreds of years, international law was essentially customary, based exclusively on State practice. Before the advent of treaties and conventions, which sought to embody relevant practices that had grown up over the years, custom tended to determine the applicable international law. Considerable weight is still given to academic works as sources of the law. For many years, these were the most convenient sources in the sense that they assembled the precedents, treaties, practices of States and the other elements that go to make up customary law. International conventions, such as the United Nations Convention on the Law of the Sea (UNCLOS) and the Vienna Convention on Treaties, to a large extent replace the need to refer to customary international law and may be invoked by the ICJ itself as being representative of the law, even though the Court might be considering events which took place before the advent of the conventions.

Datum. Nowadays, when giving a set of co-ordinates in a treaty or demarcation report, the applicable datum is usually specified. This should be mandatory. A horizontal datum positions spatial features over a mathematical model of the earth (normally a spheroid) as closely as possible to the actual earth (the geoid). It therefore defines the coordinate system. Computing survey observations on different datums will produce small but often significant differences in latitude and longitude. From a practical point of view, it is essential that the parties, and indeed tribunals, recognise that, unless the datum is identified, a set of co-ordinates can never be accurately transferred onto the earth's surface, as a consequence of which the demarcation result may differ from what the parties intended by their delimitation. Historically, individual nations might have adopted different datums based on survey reference points but nowadays WGS 84 is commonly used in land and maritime delimitation.

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A vertical datum provides the basis for heights and is usually defined by a series of readings from tide gauges, taken to determine mean sea level.

Declaration. A term sometimes used to announce publicly the reaching of an agreement, which can be multilateral, as in the case of the Cairo Resolution, sometimes characterised as a Declaration, or bilateral, as in the case of the Maroua Declaration made between Cameroon and Nigeria. It may also be used to describe the comments made by States upon ratification of a multilateral treaty that usually absolves the State of some kind of right or responsibility in the treaty. States that accept the jurisdiction of the ICJ are said to make a Declaration under Article 36 of the ICJ Statute.

De facto, de iure. Lawyers commonly use these terms and translated from Latin mean, respectively, ‘of fact’ and ‘of the law’. De facto typically describes a set of facts which exists on the ground, thus, a de facto boundary line is one whose alignment does not necessarily have its provenance in a treaty, but which is observed by the local people and, sometimes, by the States themselves. A de iure line, by contrast, might be used to describe a boundary alignment which has legal “backing” in the form of a binding agreement, such as a treaty, but may have a different alignment on the ground.

Delegation. The term commonly used to describe the representatives of a State at a formal meeting of the parties; the group representatives from one State on a boundary commission; bilateral commissions include only two delegations

Delimitation/Demarcation. These two terms are taken together in order to emphasise their close relationship. They are not, strictly, interchangeable – at least so far as land boundaries are concerned. Delimitation is generally now accepted as being the term applicable to the description of a boundary line while demarcation refers to the physical application of that line on the ground. This is a convenient distinction, but one that has not always been observed and can, even today, lead to argument. Some form of delimitation may precede a demarcation, but after demarcation is completed, often the reports and results are

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then accepted as the delimitation. As far as maritime boundaries are concerned, the term ‘delimitation’ is used almost exclusively. Obviously, demarcation of a maritime boundary is physically difficult when one gets out to sea, though there can be limited demarcation by means such as submerged pillars or buoys.

Densification. This is the practice of increasing the number of pillars or marks along a boundary section to make the line more visible on the ground. Intermediate pillars are often erected between primary or turning point monuments or pillars.

Digital terrain model (DTM). DTM, also known as a digital elevation model (DEM), is a three-dimensional representation of terrain derived either from the digitalisation of existing map contour information or, more significantly, from special satellite or aerial operations collecting digital topographic data such as the U.S. Shuttle Radar Topography Mission (SRTM) collected in 2000 and subsequently compiled and edited.

Digital photogrammetric system. The digitalisation of traditional photogrammetry applied to digital aerial photography and satellite imagery.

Diplomacy. Diplomacy represents the all-important process behind boundary negotiations. Historical archives relating to boundaries are often filled with diplomatic exchanges, which trace the history of the original boundary-making process.

Diplomatic Note. Sometimes referred to simply as a “Note,” these documents issued by foreign ministries can be of great significance as formal evidence of a State’s stance on a particular issue, especially relating to a boundary. In its strongest form, it will be a “Protest Note” (or in French a “*Démarche*”) signifying a State’s disagreement with the action of another State. A Protest Note will be strong evidence of a State’s non-acquiescence to the acquisition of territory by another State, thus preventing the process of historical consolidation from taking place. Diplomatic Notes form an important part of the history of a boundary, and can be crucial pieces of evidence in any dispute resolution process.



Directorate of Overseas Surveys (DOS). The United Kingdom body charged with mapping overseas territory. The DOS existed for a period of 38 years, from 1946 to 1984, when it was disbanded. During that period it produced high quality maps, mostly at a scale of 1:50,000 covering most of Britain's former colonies, and some non-British territory. Its map archive is now held at the Royal Geographical Society in London and the aerial photography archive at the British Empire & Commonwealth Museum in Bristol. The maps themselves seldom designated international boundaries, as it was not part of the surveyors' brief to interpret the instruments that created those boundaries. Such interpretations, carried out by others, will however frequently make use of DOS mapping to show a boundary line for the purposes of negotiation and/or dispute resolution.

Dispute. Ordinarily, one would think that it is relatively easy to know whether or not a dispute exists. ITLOS and ICJ rules, however, both require that a dispute must first exist before the parties can refer the subject matter to the Court/Tribunal. It is not uncommon, in cases where a unilateral application is made, for the defending State to argue, by way of preliminary objection, that no dispute exists which would be suitable for adjudication by the Court/Tribunal.

Dispute resolution. The process by which disagreements between States are resolved; this may include various forms of binding and non-binding mechanisms; see Arbitration, Adjudication, Conciliation, Mediation.

Dominions. This term pertained to British colonial territory that possessed a strong degree of administrative autonomy and was not administered through the Colonial, India or Foreign Offices (for example: Australia, Canada, South Africa).

Effectivités. Effectivité is a French word sometimes translated as 'effectivity'. It is not found in most English dictionaries. The expression is a useful shorthand for describing administrative acts carried out by a State, in exercise of its sovereignty over a piece of territory. Effectivités can constitute important evidence of title to territory.

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Encroachment. The presence in a State of human settlement or settled activity of populations identified with its neighbouring State just across the boundary (see also straddling villages/populations)

Equity. Where lawyers cannot find a written ‘law’ which covers the situation, they tend to resort to ‘equity’. Literally, equity simply means fairness. Equity is used a great deal in public international law precisely because circumstances between individual cases can vary so greatly.

Ethnographers. These scholars study the geographic extent of ethnicity. Their findings may have a bearing on the background to the formation of a boundary, but are seldom definitive in boundary delimitation.

Experts. Generic term used to describe those having expertise in different fields, such as surveying, history, geography, hydrography. It is common for bilateral boundary negotiations to be carried out in the first instance by panels of experts who concentrate on the technical aspects of the negotiations. Such negotiations generally represent the prelude to the negotiations among diplomats, ministers, and political representatives of the two States.

French. The official languages of the ICJ and the ITLOS are English and French. Pleadings may be submitted in either language and hearings are conducted in both languages with simultaneous translation.

Frontiers. Anglophone international lawyers, when talking of boundaries, do not commonly use this word. It nonetheless appears in the titles of a number of boundary cases decided by the ICJ. It tends to be descriptive rather than technical, but is of course used in the context of border controls that may be imposed by States. In English, the term ‘frontier’ usually is used to describe the zone of area on either side of a boundary line.

Geodesic. This refers to a line representing the shortest distance between two points drawn on the earth’s surface (geoid).

Geodesy. Also called geodetics, geodesy is a branch of earth sciences that deals with the measurement and representation of the Earth, in-

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cluding its gravitational field, in a three-dimensional time-varying space. Geodesists also study geodynamic phenomena such as crustal motion, tides, and polar motion. For this, they design global and national control networks, employing space and terrestrial techniques to formulate datums and coordinate systems. In simple terms, geodesy refers to the science of measuring and defining the earth's shape, taking into account the fact that it is not a perfect sphere. The earth is sometimes likened to an orange, with all the irregularities that can be found in the shape of that fruit. It is the irregular bulges and depressions in the outer surface – and here one is not referring to mountains and valleys – that make it necessary to carry out the arithmetical compensations designed to be effected by the datum in order to arrive at accurate coordinates for the particular part of the earth's surface in question.

Geographic Information Systems (GIS). Software systems designed to capture, store, analyse, manage, and present digital data as point, line, polygon, textual (toponymic), symbol, and imagery and scanned map layers synchronised to common geographic locations and features. Components of the system include mapping software and its applications, satellite remote sensing, land surveying, and aerial photography. GIS can be used as an on-site or remote mapping tool that allows users to create interactive searches and permits them to edit maps and produce three-dimensional representations of terrain. Training in the use of GIS is nowadays an important skill for the technical members of boundary commissions.

Geography. Geography underlies every aspect of boundary-making. Factors and features loosely referred to as 'geographic' play important specific roles in boundary-making. The geographical features most commonly used in territorial delimitation are rivers and watersheds.

Geoid. The geoid a mathematical model of the Earth with a surface coincident with the mean ocean surface in equilibrium and at rest. It continues across the continents and ignores land topography.

Geomatics. This new term sometimes applied to the old science of land surveying, whose practitioners are now referred to in technical circles as "geomatic engineers". This reflects the host of new technologies and tools that have become available with the use of satellites and digital

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technology as gathered together in Geographical Information Systems (GIS).

Georeference. This modern term relates to assigning coordinates to locate the physical position of a place or geographical feature on the earth's surface. The term has an expanded meaning that refers to geodetically aligning computer-generated raster or vector aerial or satellite imagery, scanned maps, as well as point, line, and polygon spatial data aligned so that this information can be displayed as synchronous layers in geographical information systems (GIS).

Global Navigation Satellite Systems (GNSS). At the present time, the U.S.-based Global Positioning System (GPS) using a World Geodetic System (1984) (WGS-84) as a universal datum is the most common GNSS in the world. However, China uses the Beidou system, the Russian Federation uses GLONASS, the European Union launched Galileo as alternative GNSS.

Global Positioning Systems (GPS). GPS transformed the technical side of boundary delimitation and demarcation, allowing almost any land feature and maritime area to be expressed as coordinates. The use of co-ordinates alone would not be nearly so effective without navigators, oil companies, and boundary-makers using GPS to the precise whereabouts of boundary points features, both at sea and on land.

Google Earth. Google Earth is a freely available, user-friendly commercial Website that allows users to download and view at various heights and from various angles commercial georeferenced imagery over much of the Earth. The site permits one to overlay the imagery with additional Google-provided data layers like names, three-dimensional elevations, photographic images, roads, boundaries, etc., as well as allows users to draw and annotate new lines and polygons and measure distances and areas. Google Earth imagery varies widely in accuracy and age but provides good basic visualisations and fly-throughs of landscapes which can be utilised as a starting point for the study of a boundary and the physical characteristics of its geographic location.

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Hague, The. A city in the Netherlands, The Hague is the seat of the International Court of Justice (ICJ) and the Permanent Court of Arbitration (PCA). States using the ICJ commonly utilise their diplomatic representation as one of their addresses for service of proceedings and communications with the Registry of the Court, but the agent will usually give an address in his home State as well.

Handheld GPS. An indispensable tool in modern boundary-making, it enables accurate plotting of a boundary line in the field by use of satellite based Geographical Positioning Systems. The handheld GPS has become an essential tool when carrying out demarcation exercises. It has less accuracy, however, than larger systems used for more precise surveys.

Historical consolidation. This term is usually coupled with ‘acquiescence’ in seeking to demonstrate that a boundary has been accepted over a period of years by a neighbouring State without objection or formal protest. It is a method of expressing an acquired right to territory without resorting to prescriptive title (see prescription).

History (regional, national, local). National, regional, and local history forms a vital component in the study of any boundary. Boundary commissions are well advised to include in their number at least one historian well versed in the history of the region through which a boundary runs. Historical background is essential for understanding the context in which a boundary comes into existence. The well-informed historian will be able to direct archive research and play a leading part in the gathering of evidence for use in negotiations and/or dispute resolution.

Human geography. Human geography is a rapidly developing academic discipline that focuses on the spatial dimension of human interaction and activity; sub-disciplines include political geography, economic geography and ethnography.

Hydrocarbons. The presence of oil and gas reserves frequently represents the commercial spur to States in getting on with boundary delimitation, particularly in off-shore maritime areas. The extent of an oilfield will not, generally, of itself, be a deciding factor in boundary

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delimitation but oil licensing practice may well be a factor, as in the Libya-Tunisia maritime boundary case and the Cameroon-Nigeria case.

Hydrology. This scientific field examines the movements of water, both in maritime areas and on lands, including the transfer of water from evaporation through its movement on lands to its behaviour at sea. The skills of the hydrologist are becoming increasingly important in international law, as the world recognises the extreme importance of the value of fresh water. Subterranean reservoirs can of course straddle boundaries in just the same way as oil fields do. Where a boundary is delimited by reference to a river, the evidence of the hydrologist may be vital to establish where, for example, the main channel of a river runs. See, for example, the Botswana/Namibia case.

ICJ. See International Court of Justice.

Intangibility. References are often made at gatherings convened to discuss Africa's boundaries to the 'intangibility' of African boundaries. The 1964 Cairo Resolution (see above) referenced the world 'tangible'. The intention behind the resolution was to adopt the former colonial boundaries in delimiting the territory of Africa's newly-independent States and not to make those boundaries incapable of being put beyond the reach of international law. Defects in the boundaries must be capable of remedy and state practice since 1964 demonstrates that, where necessary, remedial measures have been taken, either consensually, or through third-party dispute resolution.

Interim measures. Interim or provisional measures are a form of relief similar to interlocutory relief obtained in domestic courts. Where a party to proceedings before the ICJ or ITLOS perceives a need for preliminary directions on a point that has an immediate effect on people or property, it may apply on short notice to the Court or Tribunal to make itself available to deal with the question expeditiously. See, for example, the Cameroon-Nigeria case.

International Court of Justice (ICJ). Also referred to as the World Court, the ICJ is the judicial organ of the United Nations. It comprises 15 judges of different nationalities elected by UN Member States. Every effort

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is made to ensure an even political/geographical spread of nationalities, but there will always be a judge from each of the permanent members of the Security Council. Parties who come before the Court sometimes nominate an *ad hoc* judge who will sit with the other judges, taking a full part in the proceedings and bringing the total number of judges up to 17. There is no appeal from the decisions of the Court, although requests for revision can be made if new evidence comes to light (El Salvador-Honduras-Nicaragua) and requests can be made for interpretation (Cameroon-Nigeria). Only two States have flatly refused to recognise the Judgement of the Court – Albania and the United States. The Security Council has the power to enforce Judgements of the Court.

International Tribunal for the Law of the Sea (ITLOS). The Law of the Sea Tribunal was set up under UNCLOS to provide one of several forums, including the ICJ, for resolving issues arising under UNCLOS. It is an independent judicial body whose remit includes established maritime boundary disputes. It is composed of 21 independent members who are elected from different States around the world. ITLOS made its first maritime boundary judgment between Bangladesh and Myanmar in March 2012 (see also jurisdiction).

Intervention. Although the procedures of the ICJ and ITLOS do not provide for multi-party litigation, it is possible for States whose interests may be affected by the outcome of a decision between two other States to apply to intervene in the proceedings, either as a party or as a non-party. If the intervention is as a non-party the decision of the tribunal will not, strictly, be binding on the intervening party. Experience indicates, however, that the decision is likely to be given in a form that does not directly affect the interests or potential claim of the third party. (For example: El Salvador/Honduras – Nicaragua intervening; Libya/Malta – Italy intervening; Cameroon/Nigeria – Equatorial Guinea intervening).

ITLOS. See International Tribunal for the law of the Sea.

Joint Development Zone (JDZ). Where States are unable to reach agreement on boundary delimitation, they may opt for a jointly defined zone in order to facilitate exploitation of natural resources. Such solutions

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are less common on land than at sea, where there are a number of successful examples including the Nigeria-São Tomé and Príncipe maritime JDZ. UNCLOS Articles 74 and 83 call for “provisional arrangements of a practical nature” in maritime areas where States cannot agree on a maritime delimitation and instead of established joint revenue – and resource-sharing arrangements as well as joint development zones.

Jurisdiction. Jurisdiction is crucial to the bringing of disputes before International Tribunals. Both the ICJ and ITLOS operate under a system of voluntary jurisdiction. In the case of the ICJ, jurisdiction can be accepted by States signing declarations that are then lodged with the United Nations. However, such acceptances may be and frequently are subject to exceptions. States that have not signed declarations (sometimes called ‘Optional Clauses’) may agree to bring a particular dispute before the Court by means of Special Agreement (see Special Agreement).

Lakes. Boundaries in lakes, sometimes called lacustrine boundaries, are commonly treated in a similar way to maritime boundary delimitation. Thus, such boundaries will frequently be drawn as straight lines, although they may take into account the presence of islands. There may also be problems when lakes dry out (as is the case with Lake Chad) or when a man-made lake is created along a river boundary (as is the case with Lake Kariba along the Zambia-Zimbabwe boundary), thus obliterating the river’s original median or thalweg boundary.

Lease. There are examples of territory being leased by one State to another, although none exist in Africa. Leases are unusual but not unprecedented, and may be considered as a possible solution to intractable issues relating to the occupation of part of the territory of one State by people from another State.

Licensing. States will frequently designate licence areas for mining or hydrocarbon exploration. This may occur in areas where a boundary is in dispute or is unclear. In these cases, the licensing process may be used by States to give notice, in effect, of a territorial claim and may overlap with licensing of the neighbouring State. Such overlaps can lead to serious tension and may dissuade companies from exploring the resource. It then becomes a matter of priority for the States and oil

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companies to have the boundaries precisely defined. Only once this is done, can proper allocation and development of resources take place.

Limitrophe. Meaning adjacent, neighbouring, bordering or contiguous.

Line. A two-dimensional mathematical construct formed by a series of points that will take on international significance when preceded by the word “boundary”.

Locus. This Latin word for “place” is also used to denote legal capacity.

Loxodrome. A Loxodrome is a straight line joining two points plotted on a Mercator chart.

Maintenance regime. Process established by two neighbouring States to repair or rebuild damaged boundary pillars, densify boundary pillars and clear foliage/bush between boundary pillars to maintain a clear line of sight, or vista. Such a regime usually takes two forms: sectional maintenance – whereby each neighbouring State takes responsibility for a specific boundary section, or joint maintenance – where both States conduct maintenance operations together.

Mandate. The authority given to a bilateral boundary commission by the neighbouring States, usually outlined in a constitutive treaty or agreement.

Mandated territory. Following the First World War, certain former German, Italian, and Ottoman colonies became subject to League of Nations mandates as a ‘sacred trust of civilisation’ administered by other colonial powers, technically on behalf of the League.

Maps. Maps are essential to any boundary delimitation process and will also almost certainly play an important part in subsequent demarcation. Maps are extremely useful when presenting a graphic depiction of a boundary line, either in the course of negotiation, or before a court or tribunal. Maps or graphics are frequently referred to as being ‘for illustrative purposes only’. They are seldom definitive. Historical maps will generally be used as evidence. In many cases they provide

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the best evidence of where people were living at a particular time, the approximate location of settlements and even, on occasion, boundary lines. The best evidential maps are signed copies of maps attached to treaties and, sometimes, original maps, often sketch maps, produced by officials charged with delimiting and demarcating boundaries. However, even these will seldom, in themselves, determine the outcome of a boundary dispute. One very notable exception is the ICJ's Temple of Preah Vihear case between Cambodia and Thailand.

Marks/Markers. These are the physical manifestation of boundary demarcation on the ground. Rock-piled cairns, concrete pillars (sometimes called beacons), and larger monuments are examples of reasonably permanent boundary markers. Less satisfactory are those older treaties that refer for example to trees and property lines as boundary markers. In such cases it is clearly desirable that more permanent markers be established.

Median line. Lake and river boundaries are sometimes defined along the median (or medial) line, which is the line that is at equal distance from the defined shorelines or banks. In the recent Benin-Niger case, the ICJ suggested that if a river boundary section is not specified along a certain feature (for example: thalweg, bank, etc.), then the boundary should follow the median line in non-navigable streams and rivers.

Mediation. States attempting to reach a solution when negotiations break down in the hope of avoiding full litigation sometimes attempt mediation. On occasion, the UN itself will, at the request of the parties, appoint a mediator in an attempt to resolve matters. (This method is currently being used in the disputes between Equatorial Guinea/Gabon, Guatemala/Belize and Guyana/Venezuela).

Memorandum of Understanding (MoU). An agreement between two neighbouring States that is usually less formal than a bilateral treaty. An MoU does not require full ratification like a bilateral treaty and may be agreed only between ministers of neighbouring States. Although indicating the intentions of neighbouring States, an MoU is not as legally binding as a fully ratified treaty.

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Memorial. The technical word for a pleading before the ICJ and UNCLOS in which the claimant's case is set out in full, accompanied by relevant evidence contained in annexes. In special agreement proceedings it used to be common to have a simultaneous exchange of memorials in order to emphasise the non-adversarial nature of the proceedings. In application proceedings, the memorial is followed by the defending State's counter-memorial. If there is a second round of pleadings, the parties will file a reply and a rejoinder.

Meridian. The Greenwich meridian has already been mentioned under co-ordinates, but all lines of longitude are known technically as meridians, and the expression is sometimes used in delimitation to designate a straight-line boundary.

Ministers/Ministerial Council. Lines running vertically around the Earth, intersecting from the north- to south-poles. The distances between meridians decrease, the further one departs north or south from the equator. Meridians are geodesic lines, also called great circles. Ministers are the chiefs of specific ministries or departments within their respective national governments, often forming part of an executive group advising a Head of State (cabinet); a Ministerial Council is an advisory or governing body made up of more than one minister

Nation. A population group that defines itself based on a common cultural identity is often described as a nation. This term is frequently used interchangeably with 'State.' However, while 'nation' is normally used in reference to identity, 'State' is normally used in reference to a defined territorial entity.

Nautical miles. References to miles in maritime delimitation are references to nautical miles. A nautical mile is equivalent to 1.852 kilometres and is abbreviated variously as 'M' or 'nm/NM'. A land mile (16.0934 kilometres) is abbreviated as 'mi'.

Negotiations. Negotiating a boundary is a complex series of discussions, generally requiring input from a variety of experts as well as the appropriate political will, for the purpose of arriving at an agreement to an issue in dispute. As with negotiations in any sphere of human activ-

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ity, detailed preparation and goodwill on both sides will improve the chances of success.

North, magnetic. Treaties often used magnetic bearings to define the direction (azimuth) of straight line boundaries. The earth's north magnetic pole (the point at which the earth's magnetic field points vertically downwards) shifts gradually over time at a predictable rate. It is therefore possible to calculate mathematically where the "magnetic north" will be in a few years' time and where it was at any era in the past. It is important to allow for any change in the direction of magnetic north when magnetic bearings reference line direction in early Treaties.

Note verbale. A note verbale is a communication between states placing on record an exchange of views or, quite often, the formulation of a protest.

Operative parts. In a boundary treaty, a reference is made to the 'business' or 'operative' parts of the delimitation treaty, in which the location of the boundary is agreed.

Opposable. Bilateral treaties are not generally 'opposable' to third parties. Thus, a bilateral boundary treaty between States A and B which may affect State C, for example, by purporting to lay down a line along which the tripoint of the three States must be found - will not necessarily be binding on State C and is therefore not 'opposable' to State C in argument.

Orthophotomaps. These are maps that employ geo-referenced satellite imagery or aerial photos whose features are corrected as if they sat on a common plane rather than their actual elevation on the ground. These maps are then often overlaid with additional geographic information system (GIS) point, line and polygonal geospatial data layers.

'Pacta sunt servanda'. This Latin tag encapsulates what is, for some, an uncomfortable truth. It means that agreements, including treaties, must be honoured.

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Panchromatic (black and white). A panchromatic image is generated from satellite imagery or aerial photography in black, white, and shades of grey often in order to distinguish objects on the ground more clearly than images reproduced in other spectral ranges, including natural colour.

Parallels. Like meridians of longitude, parallels of latitude are also sometimes used to define a straight line boundary. However, parallels are actually arcs on the surface of the Earth and with astronomical instruments were actually quite difficult to survey accurately and with precision. The most famous example is the 49th parallel between the USA and Canada.

Partition. In the case of States, partition may be temporary or permanent. The nature of the partition may give rise to resultant boundary changes of a temporary or permanent nature.

Photogrammetry. This is the technology utilised to convert photographic images or, nowadays, satellite images, into maps. Stereo-photogrammetry enables one to extrapolate three-dimensional coordinates of points to be obtained. These are determined by measurements made in two or more photographic images taken from different positions (known as stereoscopy). Common points are identified on each image and the line of sight is constructed from the camera location to the point on the object. It is the intersection of these lines of sight that determines the three-dimensional location of the point.

Pillars. Pillars (sometimes referred to in non-Anglophone literature as “beacons”) constitute the most commonly used form of boundary marks. Large pillars are sometimes referred to as “monuments” and smaller pillars as “markers”. Nowadays they are usually constructed of steel and concrete, and indicate the course (or alignment) of a boundary line on the ground. No international specifications exist for boundary pillars, although they are normally tapering, square obelisks of between 1-3 metres in height that will include an inscribed number and the names of the neighbouring States.

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Pixels. The word pixel is short for picture element. A pixel is a single point in a digital graphic image and become larger as the resolution of an image diminishes. Graphics monitors or cameras display pictures by dividing the display screen into thousands (or millions) of pixels, arranged in rows and columns. The pixels are so close together that they appear connected. The quality of the picture will depend on the number of pixels in a prescribed square area.

Planimetric map. A planimetric, or line, map shows no relief. Thus contours are not shown to render elevations, as shown on topographic maps. Planimetric maps are often used for urban areas where the focus is on man-made features and other built-up structures.

Plotting. The technical term for marking on a map a series of points which, when joined together, will show a graphic representation of the line of a boundary.

Political will. Support from those of greatest political influence within individual State governments for a specific initiative. The sustained exercise of political will is vitally important for the successful conclusion of boundary negotiations.

Preliminary objections. In an application case, the defending State will frequently object to being brought before the Court. These objections may be expressed formally by means of preliminary objections made after the application is filed or after the memorial is lodged. It used to be the case that the defending State could lodge preliminary objections at any time until the counter-memorial was due to be filed. The Court would then have to receive the claimant's observations on the preliminary objections and possibly allow time for a reply and rejoinder as well as holding a full hearing on the merits of the preliminary objections before the case could proceed. As the result of practice directions recently issued by the ICJ, this process is considerably foreshortened in an effort to minimise the defendant's lodging 'tactical' preliminary objections for the purpose of gaining time.

Prescription. Prescriptive title is acquired through adverse possession over a period of time. Such titles can be acquired in respect of terri-

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tory as well as private property. In international law demonstration of prescriptive acquisition is difficult and problematical. No time periods are set for it.

Prolongation. See continental shelf and geology.

Protectorates. Territories that became Protectorates under the British colonial system did not enjoy the same range of powers as colonies and dominions. Although they were autonomous in the sense that they governed their internal affairs, foreign affairs and defence remained in the hands of Great Britain. Protectorates enjoyed a different relationship with Great Britain, and it is necessary to study the instruments which they came into being to ascertain what that relationship was.

Protest. States commonly send diplomatic notes of protest (or protest notes) when they object to the behaviour of other States, particularly their neighbours in a boundary dispute. The United States keeps a 'global watch' on maritime claims made by other States and issues notes of protest when it considers those claims excessive. A protest note is a means of placing on public record the fact that one State does not accept the action taken by another State. Matters may rest with the issue of the formal note but, of course, in an escalating situation, Protest Notes may be only the beginning of a dispute. Protest notes themselves constitute important evidence of non-acquiescence by the States issuing them.

Protocol. A protocol is another form of treaty, or sometimes an addition to a treaty.

Provisional line. A provisional boundary line can come into existence in a number of different circumstances. It may be drawn in the early stages of boundary delimitation, or it may be a line that comes into existence during hostilities and represents the *de facto* division between two opposing forces. Subsequent events will determine whether a provisional line becomes a fully fledged boundary.

Radar. Radar uses electro-magnetic waves to identify the range, altitude, direction or speed of both moving and fixed objects. The term

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was coined in 1941 as an acronym for Radio Detection And Ranging. Radar works by having a transmitter that emits microwaves or radio waves. When these waves come into contact with an object, they are scattered in all directions. The signal is partly reflected back and a slight change of wavelength, which is amplified through a receiver, gives the radar image. Side-Looking radAR (SLAR) is a high-resolution airborne radar having antennae aimed to the right and left of the flight path. It can provide high-resolution strip maps with photograph-like detail.

Raster. A term used in computer graphics. One format of raster graphics image is known as a bitmap. It is a data structure representing a generally rectangular grid of pixels viewable via a monitor, but other than changing its size, the pixels themselves cannot be manipulated and altered as they can in much more complex vector images used in geographic information systems (GIS).

Ratification. The internal process whereby an individual State government (usually legislature and executive) fully approves of a bilateral or multilateral international agreement, ratification integrates the agreement into a State's domestic legislation and makes the agreement binding on the State.

Reaffirmation. The process by which a boundary line, which has become obscure, either on the ground, or sometimes in the terms of its delimitation, is reconfirmed by a new survey or rebuilding of a pillar. A boundary commission generally carries out this task.

Recovery. When boundaries become obscure on the ground due, for example, to the growth of vegetation, it may be necessary to "recover" the line of the boundary, perhaps between boundary pillars, in order to make clear to the local population where the line runs. Recovery can also mean the digital reconstitution of the correct alignment of a boundary over imagery and digital elevation data using scanned-in historic, official, and modern series maps, treaties, demarcation reports and other authoritative documentation.

Reference ellipsoid (or spheroid). A mathematically-defined surface that approximates to the geoid, used in geodesy. Because of their math-

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ematical basis, reference ellipsoids are used as the surface on which geodetic network computations are performed and point coordinates such as latitude, longitude, and elevation are defined.

Regional organisation. In certain areas there may exist an organisation dedicated to matters within a particular region. An example of this is the Lake Chad Basin Commission. Such bodies may hold regional meetings, attended by representatives of different States, for the purpose of discussing a range of matters, sometimes including boundaries. Minutes of those meetings can be a useful resource when investigating the recent history of a boundary.

Relevant circumstances. See circumstances.

Remote sensing. Strictly defined, remote sensing is the small or large-scale acquisition of information regarding an object (usually territory in the case of boundaries) by the use of recording or real-time sensing devices that are wireless, or not in physical contact with the object. Thus, aircraft and satellites may carry remote sensing devices. Radar is an example of one type of remote sensing in action.

Researchers. When investigating any boundary prior to holding negotiations and/or dispute resolution, it will be desirable to have a team of researchers to carry out investigations, particularly in archives. These archives may be scattered around the world and it will be important to have researchers who understand not only what they are looking for but also how to obtain it. They should be given a specific mandate and authorisation. As noted above, prior authorisation from archives should be sought to allow the researchers to carry out their work.

Responsibility. State responsibility involves action taken by one State in and/or against another State, which, if it causes damage to people and/or property, may result in a claim for reparations. State responsibility claims have been made for unlawful occupation of territory in cases, but they have not generally succeeded.

Return beam vidicon (RBV) cameras. These are the cameras installed on satellites. They can image an entire ground scene instantaneously, thus providing greater cartographic fidelity.

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Rivers. As mentioned above, rivers are often used to form boundaries because they are easy to identify and form a natural division of territory. They are not, however, necessarily a satisfactory form of boundary. Their characteristics can change and they can change course, particularly in areas with seasonal rainfall patterns. A boundary down the centre of the river, giving each riparian State equal access to it, is generally more satisfactory than a boundary down one bank or the other, which at least in theory can preclude inhabitants of one of the neighbouring States from access to the river and is seldom a satisfactory outcome (Guyana/Surinam). Further problems arise when the mouth of a river is used as the starting point for maritime delimitation. Examples are the Rio Grande (Mexico/United States) and the Congo (Angola/Democratic Republic of Congo). If a river boundary is not defined along a bank, the river itself is a shared water resource of the two neighbouring States and requires cooperative management to avoid disputes over a wide range of potential problems such as water quality, allocation, irrigation and access.

Satellite imagery. Satellite imagery has come to play an important part in boundary-making, especially as images of one metre and smaller pixel resolution are now commercially available. Although the cost of each image, or title, may be quite high, it may be less than commissioning aerial photography. Satellite images are useful in showing changes in topography, which may have occurred since the time maps were made. They can also show such features as erosion of coast lines and coastal drift.

Security Council. The Security Council is the ultimate 'enforcer' of Judgements of the ICJ and ITLOS. The Security Council has not so far had to mobilise peace-keeping forces in order to implement Judgements, but there are several instances of Judgements being implemented with UN assistance (Libya/Chad, Cameroon/Nigeria).

Segments/sections. Portions of an international boundary that are of specified lengths. Two or more segments/sections will constitute a boundary.

Source. (1) The source of a river is where it rises. Historically, river sources were sometimes difficult to ascertain, particularly in areas cov-

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ered by thick vegetation. There would therefore often be uncertainty as to whether the lower reaches of a river emanated from the same source as the upper reaches. This is a matter which may require further investigation on the ground, as aerial photography, and even satellite imagery, may not be able to capture the true course of a river. In addition, there is no fixed definition of what constitutes a river source (for example: the point farthest upstream from its mouth, or the point from which the most water is derived). The precise location of the source of a river may be crucially important for determining a particular point on a boundary.

(2) The source of documents used in a boundary dispute may be a critical issue. Whilst opposing States generally accept the provenance of documents without question, cases of forged critical documents are known. It is thus very important to investigate any suspicions that might be held regarding the true source of documents.

Sovereignty. State sovereignty implies the untrammelled title of a State to its territory. The exercise of exclusive jurisdiction over territory is the prerogative of the State, and it is the geographical limit of the right to exercise sovereignty over a particular territory or part of a territory, which lies at the heart of boundary delimitation.

Special Agreement. As mentioned above, this is one of the ways in which States can bring a dispute before the ICJ or ITLOS where one or both of the parties are not signatories to an Optional Clause (see jurisdiction). The parties draw up the terms of reference themselves, setting out the issues that they want the court or tribunal to decide.

Sphere of Influence. This term was popular amongst the colonial powers around the time of the 1884 Berlin Conference. Agreements concerning spheres of influence entered into being after the Conference generally involved a statement of a claim to territory by one party and a corresponding waiver of a claim by the other.

Spheroid. (see Reference ellipsoid)

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States. There are almost 200 States in the world. Every internationally recognised State is now a Member of the United Nations (Switzerland and East Timor joined in 2002). An essential prerequisite of statehood is to have internationally recognised boundaries.

State practice. State practice is often an important element in determining the validity of a boundary. This is so, both in negotiation and before a Tribunal. It can be the practice of the two States themselves or it can be the practice of third-party States in relation to a boundary. It can also be the practice of States generally in respect of certain types of boundary, and it can be the practice of one particular State in respect of its boundaries. Whichever form it takes, the practice is generally manifested in documents such as treaties, declarations or diplomatic correspondence and notes. There may be other records as well, such as journals, archives etc., which evidence the practice of a State with regard to a particular boundary.

State succession. Succession of States may be an issue in boundary delimitation. Modern examples are the Russian Federation and the former Yugoslavia (see *uti possidetis*).

Stereo plotter. A stereo plotter uses stereo photographs to plot map detail and to determine elevations – it has been the primary method to plot contour lines on topographic maps since the 1930's. The stereo plotter requires two photographs that have at least 60 per cent overlap and are corrected for distortion due to the angle of the photo. Modern stereo plotters are large and sophisticated instruments which produce three-dimensional images on computer monitors.

Stereoscope. A stereoscope may be a very simple device which allows a viewer to see a three dimensional image created from two dimensional images. Viewing two images of the same view captured from two proximate angles creates the illusion of depth through a stereoscope. The creation of maps nowadays using digital stereoscopy is much more sophisticated, with industrial three-dimensional scanners being used to view photographs or large swaths of satellite imagery captured with stereo cameras.

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Straddling resources. Dynamic resources such as water and hydrocarbons do not respect boundaries. Gas and oil fields may thus often be found on either side of a boundary line, in which case they will need some agreement between the States and their operators in order to achieve maximum benefit from exploitation of the resource. Typically, entering into a unitisation agreement allows the production of hydrocarbons on an agreed split-share basis. Deposits or seams of solid minerals may also straddle an international boundary and may also require unitisation to facilitate efficient extraction.

Straddling settlements. These are settlements that are divided by a boundary, that is they straddle the boundary with one part of the settlement being in one State and the other in another. Such straddling settlements may need careful management, and careful demarcation of the boundary.

Surveyors. Surveyors have expertise vital to territorial boundary-making from the point of view of both delimitation and demarcation. They assist in analysing cartographic evidence and, in litigation, will frequently themselves address the court or tribunal, though they tend to appear as advocates rather than as expert witnesses. The ICJ often appoints experts to assist it in its deliberations: this practice highlights the importance of the technical input when the Court is attempting to interpret complex maps and geographical concepts. The range of skills that surveyors are now expected to have has led to their being described nowadays in some circles as “geomatic engineers”.

Technical committees. A boundary commission will typically have a technical committee advising on matters such as surveying (geomatic engineering), law and hydrography. It may also be responsible for actual demarcation.

‘Terra nullius’. This Latin expression describes the situation where no title to territory has been established by any recognised State. In the 19th century, this concept was in frequent use. It is, however, probably true to say that, today, there should not, in principle, be any ‘terra nullius’ left on the earth’s surface (apart, perhaps, from volcanic islands which suddenly appear out of the sea).

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Thalweg. Thalweg is a German word meaning “valley path” initially used to describe the channel of a river that is most frequently used for navigation, and thus representing the most equitable division of a fluvial boundary. More commonly, thalweg has come to mean the deepest channel of a river. However, wider rivers, especially in deltas or flood plains, may have multiple channels. In arid areas, where wadis and arroyos on sandy or other soft terrain are subject to massive inundations during the rainy season, their deepest channels will shift from year to year, and then disappear due to wind erosion during the dry season. Determining exactly where the thalweg runs can be a complex exercise in hydrology. This was an important element in the Botswana/Namibia case.

Third party. As mentioned above, third-party States sometimes have a right of intervention in cases where they believe that their interests may be affected by a decision of a tribunal. They are not usually bound by boundary treaties between two other States (see ‘opposable’). Reference is sometimes made to third-party dispute resolution of boundary issues. This means simply that a body or individual independent of the two States is involved in resolving the dispute.

Third-party experts/observers. Individuals appointed from States or organisations other than the two neighbouring States.

Title. Title to territory underlies the whole process of boundary-making. States need to establish the limits of their sovereignty over territory, which in turn necessitates the drawing of boundaries. A State’s title to territory can be acquired in a number of different ways. Reference has been made to treaties, historical consolidation, acquiescence and prescription. Historically, title could also formerly be acquired by conquest.

Topography. Broadly, this is the study of the earth’s surface, its shape and features. Topography may also be concerned with local detail including not only relief but also vegetation and man-made features and, possibly, local history. A topographic map sheet contains contour lines that represent fixed vertical elevations measured incrementally over usually undulating terrain.

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Toponymy. The scientific study of place names, their origins, meanings, use and typology. The origins of place names may be a very useful indicator of the original affiliation of a particular location. This can be a useful pointer to the original sovereignty exercised in an area. Place names, together with boundaries, are the most politically sensitive features on maps, charts, and other geospatial products.

Total stations. A total station is an electronic/optical instrument used in modern surveying. It comprises an electronic theodolite integrated with an electronic distance metre and may include internal electronic data storage facilities to record distances, horizontal angle, and vertical angle measured. Total stations are an indispensable tool in geomatic engineering.

Training. The training of personnel and in particular the use of modern technology ensures technically proficient members of boundary commissions and may reduce the need to retain outside experts.

Treaties. Treaties are, of course, the main means by which States record international agreements. Boundaries are pre-eminently suited to being recorded in treaties signed on behalf of each of the neighbouring States. Such treaties take many forms, but they are always the starting point in researching the history of any boundary. Fortunately, international treaties tend, historically, to be collected together in reference works and can, nowadays, generally be found on the UN website. Once a treaty records a boundary, it can be amended by agreement of the parties. When it comes to interpretation by a tribunal, the judges or arbitrators will make every effort to give the treaty its full force and effect. Attempting to modify a treaty line other than by agreement is an extraordinarily difficult enterprise. The Vienna Convention on the Law of Treaties (1969) is now authoritative on the majority of issues likely to arise on Treaty interpretation.

Tripoint (or Tri-point). The tripoint is the point where three boundaries of neighbouring States or administrative area converge. An international tripoint enters into force as a consequence of the three States signing a treaty or other legal instrument fixing its location by means of a coordinate and the installation of a tripoint monument.

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Trust territory. Chapter XII of the UN Charter established mandated territory that became subject to UN Trusteeship after the Second World War. Article 76 required the administering authority to promote self-government or independence.

Unitisation. This is the term used for one of the methods of dealing with production of a mineral deposit, usually a hydrocarbon field, which straddles an international boundary. It usually involves defining the specific resource field, appointing a single operating contractor and dividing the revenue between the two States. The precise form and working of the unitisation arrangement can be the subject of lengthy and complex discussions, generally involving both States and the companies seeking to exploit the field.

Universal Transverse Mercator (UTM). A coordinate system is a grid-based method of specifying locations on the surface of the Earth that is a practical application of a two-dimensional Cartesian coordinate system. It is used to identify locations on the Earth, but differs from the traditional method of latitude and longitude in several respects. The UTM system is not a single map projection. The system instead employs a series of sixty zones, each of which is 6° of longitude wide and is based on a specifically defined secant transverse Mercator projection.

'*Uti possidetis iuris*'. '*Uti possidetis*', in its abbreviated form, is a Latin term used to describe a form of State succession to title over territory. The term was coined when dealing with the transformation of Spanish colonial possessions in South America into independent States. Essentially, the modern States adopted the old colonial administration boundaries. This process came to be known as '*uti possidetis*'. A similar process took place in Africa, with the adoption of the Cairo resolution in 1964 to accept the old colonial boundaries. Whilst this undoubtedly removed a fertile source of potential dispute, those old boundaries are not, themselves, always free from uncertainty. This is why colonial treaties are of such vital importance in determining boundary issues in Africa. (See especially the Burkina Faso-Mali case before the ICJ as well as subsequent boundary cases: Botswana/Namibia; Cameroon/Nigeria; Eritrea/Ethiopia).

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Validity. When examining title to territory acquired by treaty, it is necessary to examine the validity of the treaty. This relates not only to the possibility that the treaty may have been abrogated, but also to the observance of the terms of the treaty on the ground. Whilst observance may be a factor to be considered, it is not always conclusive of the validity of the treaty.

War. It was formerly possible to acquire title to territory by means of conquest, as mentioned above. However, conquest is no longer accepted as a legal method of acquiring title. Third party dispute resolution is always a preferable option, and one that is usually considerably less costly! Sometimes the boundary delimitation (and demarcation) process will be triggered by a war.

Watersheds. Watersheds are a useful geographical feature along which to run boundaries. They tend to be situated in the same location, although it is sometimes difficult to be sure which ridge forms the watershed. This is particularly so in terrain which is flat or heavily forested. Early boundary makers sometimes got it wrong, thus requiring adjustments to the boundary.

Workshops. Workshops provide useful fora in which to undertake training. There is great value in working through hypothetical examples of boundary situations. The greatest value is in having simulated negotiating sessions with notional opposing delegations. They can also be useful in achieving sensitisation in areas where a boundary is in the process of being altered.

World Court. This is the colloquial name for the ICJ (see International Court of Justice).

Zones. The term can be used to refer to specific areas within lakes or rivers, such as defined fishing zones. See also joint development zone.



Appendix A

Map Accuracy Standards



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Global Map Accuracy Standards

A number of sets of map accuracy standards exist worldwide. These may, however, be put into two main categories.

- (i) The Soviet Union and Eastern Bloc standards; and
- (ii) The North Atlantic Treaty Organisation (NATO) standards.

The latter are more widely used and a brief explanation of them follows.

Customarily, topographic and/or thematic map accuracy standards are divided into two broad categories: horizontal and vertical.

Horizontal Accuracy Standards

NATO specifications for horizontal map accuracy state: “For a map compiled photogrammetrically or through satellite imagery, 90 per cent of all prominent features should lie within:

- 1 ± 0.1 millimetre of their true locations at the publication scale if the latter is 1:20,000 or larger;
- 2 ± 0.3 millimetre of the true locations if the publication scale is smaller than 1:20,000¹⁸⁸ and;
- 3 Any horizontal control to be used for the compilation of such maps must be accurate to within half the specified map tolerance”.

¹⁸⁸In Britain, some mapping organisations use the figure ± 0.4 mm in Europe and ± 0.5 mm in the developing world.

The question arises as to the exact definition of the expression "prominent features". Geomatic engineers, geographers, and other map-users contend that such features should be those directly used as survey or aerial triangulation points. As such, these are classified as: pre-marked features; natural features; and man-made features;

Pre-marked Features

These rectangular-shaped white zinc sheets are laid on the ground before flight and appear strikingly clear on aerial photos or satellite images (Figure B-1). Although, they are usually removed immediately after flight or data acquisition, some mapping agencies prefer to leave them in place for future use.

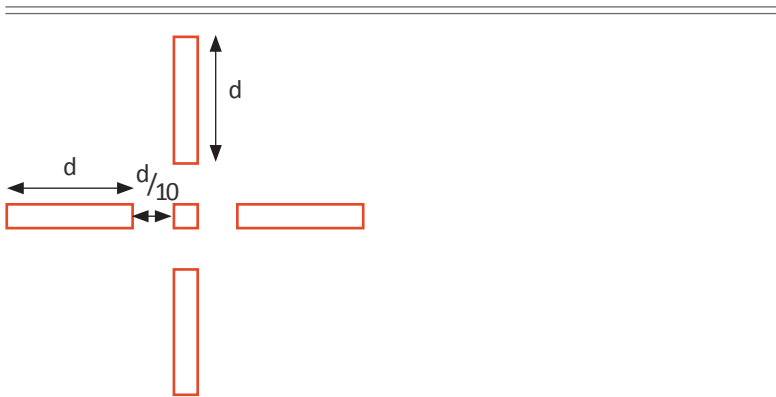


Figure B-1 Prominent White Zinc Sheets

Natural Points

These are the most widely used features for assessing map accuracy. They consist of a variety of naturally-existing objects such as small isolated trees or bushes, intersections of small water courses, isolated rocks, promontories, or cliffs, etc. (Figure B-2).

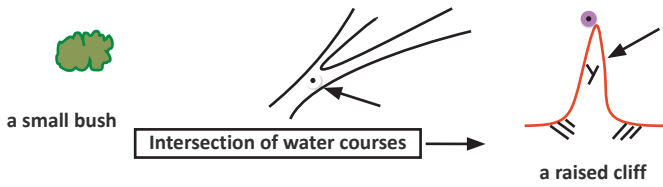


Figure B-2 Natural Features

Man-Made Features

Man-made features are also included among objects used to map accuracy standards and standardly include road intersections, corners of buildings, sharp railroad bends, pylons, and center points on bridges or dams (Figure B-3).

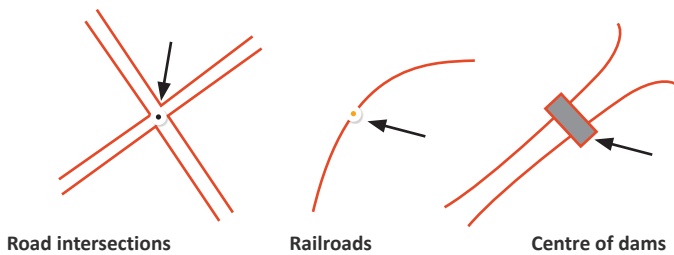


Figure B-3 Man-made Features

Procedures for assessing map accuracy usually involve combining all of these categories. Table B-1 shows the relationship between horizontal map accuracy and map scale derived from NATO specifications. Figure B-4 is a graphical representation of the Table.

Table B-1: Relationship Between Map Scale and Map Accuracy
(per NATO specifications)

Map scale	Map tolerance (metre)	Map type
1:5,000	0.5	large scale
1:10,000	1	large scale
1:25,000	7.5	medium scale
1:50,000	15	medium scale
1:100,000	30	medium /small scale
1:250,000	75	small scale
1:500,000	150	very small scale
1:1,000,000	300	very small scale (thematic)
1:4,000,000	1,200	thematic scale

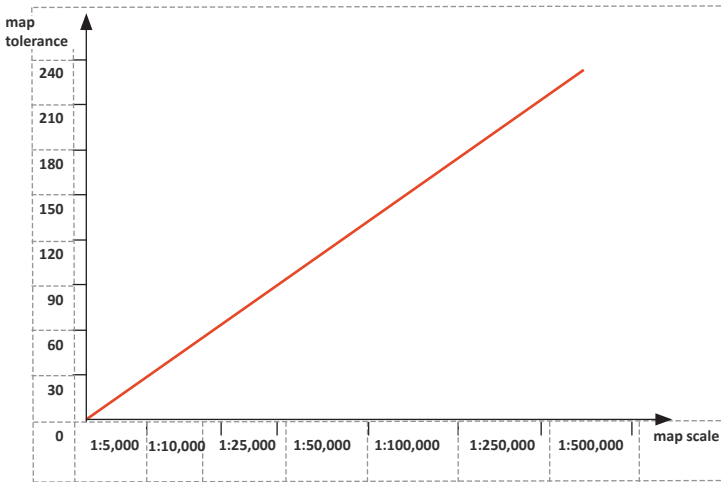


Figure B-4 Relationship Between Map Scale and Map Tolerance (map accuracy in metres) (per NATO specifications).

In the context of geomatics, maps with scales smaller than 1:250,000 (quarter million) are generally referred to as “thematic maps” since

they usually address single topics like States' general boundary maps, vegetation cover maps, tribal maps, road network maps etc.

No accurate metric information can be obtained from such maps. This is an important point to consider in boundary-making.

Vertical Accuracy Standards

If the need arises, particularly in the case of thematic, medium and small-scale maps, the **vertical accuracy** of boundary maps should be appropriately addressed and subsequently checked and evaluated.

NATO specifications for topographic mapping and vertical accuracy standards state that:

- (i) 90 per cent of the elevations of all prominent features must be accurate to \pm one-half contour interval of their true vertical position; and
- (ii) Any ground control to be used for the compilation of such maps must be accurate to within \pm one-fifth of the specified contour interval.

As such, if the contour interval of a map is 5m, then 90 per cent of the elevations of all distinct map elements must be accurate to $\pm 0.5 \times 5 = \pm 2.5$ metre.

A mathematical example better clarifies this condition.

Example: A 1:50,000-scale base map must be compiled to depict a boundary line traversing a certain county. The required map contour interval is 10 metres. Compute the expected horizontal and vertical accuracy of this map if it is to comply with NATO map accuracy standards.

Solution:

Map scale = 1:50'000 < 1:20'000

Therefore map tolerance can be computed as follows:

In the horizontal plane:

1 millimetre on the map \equiv 50'000 millimetres on the ground;
or 50 metres on the ground.

Prominent map features should not be in error by more than ± 0.3 millimetre according to NATO specifications.

$$\therefore \text{Map tolerance} = \delta p = \pm 0.3 \times 50 = \pm 15 \text{ metres.}$$

Any ground control that is to be used for compiling this map must be accurate to $\frac{1}{2}$ map tolerance $\delta p_c \sigma_{pc} = \pm 15/2$ metres = ± 7.5 metres

In the vertical plane:

Since the required contour interval (CI) is 10 metres, therefore, vertical map tolerance

$$= \sigma_h = \pm \frac{1}{2} \times \text{C.I.}$$

$$\therefore \sigma_h = \pm \frac{1}{2} \times 10 \text{ metres} = \pm 5 \text{ metres}$$

Consequently, any vertical control to be used for compiling this map must be accurate to $\pm \frac{1}{5}$ of the contour interval.

$$\therefore \sigma_{hc} = \pm 1/5 = \pm 2.0 \text{ metres}$$

How to Assess the Accuracy of a Map:

It is vitally important to be able to assess recently-produced maps in both the vertical and in the horizontal planes. In order to assess the accuracy of any topographic or GIS map, the following steps are usually followed:

- (i) Select an appropriate number of prominent features on the ground whose coordinates are easily measured on the map (for example: on a geographic information system (GIS), use the cursor over the scanned and registered map). Take advantage of statistical methods by selecting more than 30 such points following basic normal distribution requirements.
- (ii) Positively identify these points on the map and carefully measure their map coordinates with the cursor, or manually scale them off the map if analogue methods are preferred.
- (iii) Repeat the measurements at least ten times and calculate the mean coordinates for each point.
- (iv) Compute grand-pooled root-mean-square error σ_j of your meas-

(ii) $\Delta h < \pm \frac{1}{2}$ contour interval.

then one can say that this map satisfies the NATO map accuracy standards, and can therefore be used for projects that require this level of accuracy.

Note:

Values of “hp” on column 4 for the test points are usually obtained by employing a suitable method of height interpolation as shown in Figure B-5:

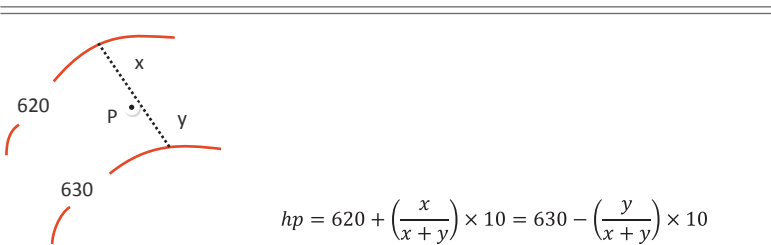


Figure B-5 Height Interpolation

Conclusion

- (i) In line with all other technical products, a map produced for the purpose of boundary-making must satisfy certain pre-determined accuracy standards to be of any value.
- (ii) A number of such standards exist worldwide, the NATO specifications for map accuracy being the most widely used among geomatic engineers, cartographers, geographers and GIS specialists.
- (iii) Fundamentally, the scale at which a boundary map is to be published governs its overall accuracy and consequently its use.
- (iv) Large-scale topographic maps (scale $> 1:20,000$), i.e. those used to depict the terrain of important boundary regions, require stringent accuracy standards; while medium (scale $1:25,000 - 1:50,000$) need less precise survey measurement procedures to produce them.
- (v) Small-scale topographic maps ($1:100,000 - 1:250,000$) are customarily produced from large or medium scale ones or derived from large pixel satellite imagery (for example: Landsat images). Their use in boundary-making is confined to the negotiation and reconnaissance stages, and to situations where high positional accuracy is not of paramount importance (for example: in delineating water sheds or ranges of mountains in the boundary area).
- (vi) Maps published at scales smaller than $1:250,000$ are used only to render the regional setting of the boundary area. Metric information derived from such maps is, understandably, not accurate.

International boundary commissions in African countries should therefore pay attention to the important facts discussed in this report.



Appendix B

Peaceful settlement of international boundary disputes



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Introduction

‘Peaceful dispute settlement’ is enshrined in international law, which also includes standards defining how such pacific agreements should be reached. Crises, however, do not always constitute ‘disputes’ in the strict sense of the word. This chapter examines the principle of peaceful dispute settlement and the means by which disputes are peacefully resolved. To start with, however, it is useful to provide brief definitions of the types of international disputes that pertain to international boundaries.

Definitions of International Disputes

In general terms, an international dispute is ‘a disagreement relating to a point of law or fact, non-compliance, or conflicting legal arguments or interests between two States’¹⁹⁰

International theory and practice generally distinguish between two categories of international dispute:

Category 1:

Political Disputes (those not subject to legal process)

This is where one of the parties demands the change of existing law (for example, the dispute between Germany and Czechoslovakia in 1938 regarding the Sudetenland). According to one commentator, they are disputes ‘in which the conflicting claims of each party cannot be resolved legally’ as ‘they centre on subsequent developments’.

¹⁹⁰ Rousseau, C. (1973), *Droit International Public*, Dalloz (Paris), 7th edition, p. 281.

Category 2:

Legal Disputes (those subject to legal process)

These are disputes where parties disagree about the application or interpretation of existing law. One commentator describes these as conflicts that can be resolved by ‘referring to established rules’.

Article 36, paragraph 2 of the International Court of Justice (ICJ) Statute lists the types of disputes that can be resolved through arbitration and other legal processes as those relating to:

- (a) The interpretation of a treaty;
- (b) Any question of international law;
- (c) The existence of any fact which, if established, would constitute a breach of an international obligation;
- (d) The nature or extent of the reparation to be made for the breach of an international obligation.¹⁹¹

Clearly, international border disputes like those involving delimitation, demarcation, or the allocation of territory fall within the second category given that, by their very nature, they involve problems relating to points a, b and c above and are subject to legal process.

Every category and type of dispute, by its very nature, requires different modes of resolution. Political disputes can only be solved through diplomatic or political processes that seek to accommodate the interests of the disputant parties. Legal disputes relating to borders, on the other hand, are handled through third-party arbitration, adjudication, or other forms of binding legal process on the basis of positive law, should diplomatic or political procedures prove unsuccessful.

The principle of Peaceful Dispute Settlement

States are obliged to seek by appropriate means ‘acceptable and fair’ solutions to disagreements, compliance issues, and conflicts. This principle was incorporated into international law at a time when recourse to war was not prohibited. For this reason, Article 1 of the First Hague Convention of 1907 states: ‘With a view to obviating as far as possible recourse to force in the relations between States, the Contracting Powers agree to use their best efforts to ensure the pacific settlement of

¹⁹¹ *Ibid.*, p. 282.

international differences'. The Covenant of the League of Nations was effectively based on this notion of dispute resolution. Article 2, paragraph 3 of the United Nations Charter, in turn, goes one step further and declares: 'All Members shall settle their international disputes by peaceful means in such a manner that international peace, security and justice are not endangered'.

These texts positively oblige states to seek peaceful solutions to disputes that have brought them into conflict and ensure peace, security and justice, going beyond Article 2, paragraph 4 of the UN Charter that opts simply to 'refrain' from the use of force. According to the Charter, the 'maintenance of international peace' justifies derogations of sovereignty but not where parties preclude recourse to arms and thereby reduce the tensions inherent in dispute resolution.

The Obligation to Settle Disputes and Reserved Powers

The Charter stipulates that 'Nothing contained in the present Charter shall authorise the United Nations to intervene in matters which are essentially within the domestic jurisdiction of any State' (Article 2, paragraph 7). Furthermore, this same Article does not 'require the Members to submit such matters to settlement under the present Charter'.

From this, one may deduce that a State has the right to ignore the general obligation to settle international disputes where matters lie "essentially within domestic jurisdiction" per Article 2. This notion of 'matters [being] essentially within domestic jurisdiction' often becomes confused with a State's 'discretionary powers' or 'reserved powers'. The obligation to settle international disputes is also dependent on the growing range of issues that are presently regulated by international law and must be adapted accordingly.

Disputes involving these types of issues can nevertheless be voluntarily submitted for international settlement by the affected States. States that accept the jurisdiction of the ICJ and the application of Article 36, paragraph 2 of its Statute most often enter reservations based on their right to 'reserved powers'. Yet Article 2, paragraph 7 of the Charter can also be invoked to nullify the jurisdiction of the Court or any other international body.¹⁹²

¹⁹²Thierry, H., Combacau, J., Sur, S. et Ch. Vallée (1981), *Droit International Public*, DOMAT Handbook, published by Montchrestien, Paris, p. 557.

The Free Choice of Means in Dispute Settlement

The principle of peaceful dispute settlement allows all States a free choice of means, as set out in Resolution 2625 (XXV) of the United Nations General Assembly of 1970. The text states that 'International disputes shall be settled on the basis of the sovereign equality of States and in accordance with the principle of free choice of means.'

Indeed, States have a whole range of means at their disposal. These include but are not limited to the options listed in Article 33 of the Charter: 'The parties to any dispute, the continuance of which is likely to endanger the maintenance of international peace and security, shall, first of all, seek a solution by negotiation, enquiry, mediation, conciliation, arbitration, judicial settlement, resort to regional agencies or arrangements, or other peaceful means of their own choice.'

All the above-mentioned procedures are voluntary in the sense that they can only be carried out with the consent of the parties involved. What is more, these different methodologies allow States to agree in advance to process any potential disputes using specific means of dispute settlement. So, when a dispute arises and if it relates to any such prior agreements, the States must then have recourse to these pre-selected methods. That is the purpose of arbitration clauses, arbitration or conciliation treaties, or again the optional clause on compulsory jurisdiction in the ICJ statute.

Furthermore, powers devolved to international organisations in this area imply that collective pressure can be exerted over parties so that they undertake appropriate procedures or that they accept the solutions proposed to them.¹⁹³ In both cases, the principle of free choice is not affected. States can reject agreements that limit their freedom regarding dispute settlement or can restrictively subscribe to such agreements. International bodies can only make recommendations in this area. They cannot make decisions in the same way they can in relation to peacekeeping matters.

¹⁹³ *Ibid.*, p. 558, p. 559.

Means for Peaceful International Dispute Settlement

The three main means for peaceful international dispute settlement are diplomatic, legal, and political means. Political means ensue from powers devolved to international organisations.

The distinction between diplomatic and legal means is based on objective legal information. Diplomatic means in their conventional sense are good offices, mediation, or the follow-up activities of parliamentary diplomacy occurring in international organisations. These are suitable for all types of disputes.¹⁹⁴ Legal means, by contrast, are suitable only where the dispute can be based on a body of pre-existing law and the adjudicating or arbitral body rules on a legally binding settlement reached through due legal process. We will now look very briefly at the definition and/or general characteristics of each of the aforementioned means of international dispute settlement.

Diplomatic Means

This approach promotes agreement between parties and indicates that any decisions reached have not been imposed. It involves diplomatic negotiations, good offices and mediation, inquiry, conciliation, and recourse to the bodies of international organisations.

Non-specialised diplomatic means

Negotiation, good offices, mediation and inquiry are not specifically processes for resolving disputes. They are approaches that can be applied to resolve disputes but can equally be deployed for other ends. They are also weakly regulated in international law.

- (a) **Negotiation** is where two States in conflict seek agreement through discussions/talks between third-party foreign affairs ministers or at side-line meetings at international conferences. The exhaustion of diplomatic negotiations is sometimes specified as a precondition before resort to subsequent higher-level formal dispute settlement through arbitration or the law courts. Finally, the effectiveness of negotiations depends, as a rule, on the spirit in which they are conducted, as well as the state of

¹⁹⁴ *Ibid.*, p. 559.

relations between the opposing parties as well as the third-party negotiator. ¹⁹⁵

- (b) **Good offices** are the friendly actions of a third party, usually operating through diplomatic back channels, who seeks to find common ground between the parties in dispute and attempts to bring about agreement through discreet intervention. Good offices can intervene prior to armed conflict or can equally be deployed in the effort to halt a war in progress.
- (c) **Mediation** is where a third party seeks to bring the two disputant parties together to help them find common ground toward agreement. The difference between mediation and good offices is merely one of degree. The latter are carried out more discreetly, whereas a State operating as ‘mediator’ takes the lead on negotiations and proposes its own solutions to the dispute. Both resort to and decisions issuing from mediation and good offices are optional by nature. Third-party States are never obliged to offer mediation, the States in dispute are perfectly free to decline the offer of mediation at any point, and, unlike arbitration, the mediation outcomes are non-binding and cannot be imposed upon parties.
- (d) **Inquiries** occur usually at the outset of disputes, often ensuing from a crisis, and involve submitting a complaint to investigating commissioners whose mission is to establish the facts of the case. Commissioners do not pronounce on responsibilities in the disputes as these are usually apparent in the documented facts of the case. It is left to the States involved to draw conclusions and settle the agreement using their preferred means.

Conciliation

Conciliation differs from the above because it is a **specialised means** to settle disputes. Being a quasi-legal process – halfway between inquiry and arbitration – it is an activity that precedes arbitration or legal settlement ¹⁹⁶. Generally specified in ‘conciliation’ or ‘conciliation and arbitration’ treaties, conciliation technically takes the form of pre-established ‘conciliation commissions’ that comprise three to five members. The conciliation commission examines the dispute and reports back to the parties with specific propositions for reaching an agreement. The

¹⁹⁵ Rousseau, C. (1973), *Droit international public*, Dalloz (Paris) – 7th edition, p. 283.

¹⁹⁶ Thierry, H., Combacau, J., Sur, S. et Ch. Vallée, *op. cit.*, p. 563.

commission report is in no way binding and has no legal force over parties involved. The commission endeavours to reconcile parties but its role goes no further than that.

Recourse to the Bodies of International Organisations

Most international organisations – including specialised agencies, regional organisations, and the United Nations – are granted specific powers regarding the settlement of disputes.

Specialised agencies

The constituting acts of the World Health Organisation, World Meteorological Organisation and Food and Agriculture Organisation, etc. make provision for disputes regarding a member's execution of obligations to be brought before plenary bodies (general conference, assembly), select committees (council, etc.), or political/executive bodies.

In most cases, however, commissions or panels of experts are assembled to carry out inquiries and conciliation activities. These then propose solutions to the competent body that are, in practice, usually accepted by parties involved. So, though diplomatic in appearance, these procedures tend to assume a quasi-judicial character.

Regional organisations

These types of organisation generally possess the relevant powers to help settle disputes. Two such organisations in the African realm include:

- (a) The **Organisation of African Unity (OAU)** Charter mentions the peaceful settlement of disputes through negotiation, mediation, conciliation, or arbitration (Article 3, paragraph 4) and makes provision for the establishment of a commission for mediation, conciliation, and arbitration (Article 19). The Protocol of 21st July 1964 created a 21-member commission, which was elected by the conference of Heads of State and Government and could be called upon by parties in dispute to act as mediators, conciliators, or arbitrators. This mechanism did not, however, win favour even though mediation provided by African Heads of State was, at the time, commonplace.

Contrary to its predecessor, the **African Union** was happy to write into its 'Constitutive Act' that one of the fundamental principles upon which the Union is based is the 'peaceful resolution of conflicts among Member States of the Union through such appropriate means as may be decided upon by the Assembly' (Article 4, paragraph E). It also makes provision for the creation of a 'Court of Justice'. However, the relevant bodies have not yet adopted the statute, composition, and powers of this organ. Other important related aspects are:

- The principle to respect the borders that existed when African States gained their independence, as defined in the Cairo Resolution AHG/Res. 16(I) of July 1964.
- The principle of negotiated settlement of boundaries and notably the resolution on peace and security adopted by the Council of Ministers in July 1985.
- The Memorandum of Understanding on Security, Stability, Development and Cooperation in Africa, signed in Durban in July 2002.
- The Declaration of the African Union Border Programme and its implementation modalities as adopted by the African Ministers in Charge of Border Issues on 7th July 2007 in Addis Ababa.

- (b) Article 5 of the **Arab League** Charter asserts that if there arises between Member States 'a dispute that does not involve the independence of a State, its sovereignty, or its territorial integrity, and should the two contending parties apply to the Council for the settlement of this dispute, the decision of the Council shall then be effective and obligatory'.

Political bodies of the United Nations

The **General Assembly's** powers in this area are enshrined in Articles 10, 12, and 14 that relate to the 'questions,' 'matters,' 'disputes' or 'situations' as it shall be called on to 'discuss' or about which it can recommend 'measures' (Article 14). No specific arrangements exist, relating to how the Assembly should use its powers for dispute settlement.

The same is not true of the **Security Council**, whose powers in this arena are defined by Chapter VI of the Charter entitled 'Pacific Settlement of Disputes'.¹⁹⁷

¹⁹⁷ Thierry, H., Combacau, J., Sur, S. et Ch. Vallée, *op. cit.*, p. 556.

Article 33 of the United Nations Charter sets out the principle that obliges members to first seek a peaceful settlement of international disputes, but leaves it to Member States to choose their preferred mode of resolution (negotiation, arbitration, resort to regional agencies, etc.).

The Security Council can only act when a dispute endangers the maintenance of international peace and security, and may do so either on its own initiative (Article 34), if requested by any Member (Article 35), or following instruction by the Secretary-General of the UN (Article 99).

The Security Council's intervention in dispute settlement is carried out in a subtly different manner, set out in the Charter:

- When the maintenance of peace is endangered (Charter Chapter VI, Articles 33-38), the Security Council can only make recommendations, either by inviting the parties to settle the dispute by a means of their choosing, by proposing a suitable approach, or by putting forward a solution.
- If the dispute is considered a threat to peace (Chapter VII, Articles 39-51), the Council no longer makes recommendations, but rather gives orders. For example, it can impose provisional measures (ceasefires, the retreat of armed forces, etc.), economic sanctions and, finally, military sanctions.¹⁹⁸

Legal Means

Legal means have commonalities but they also contrast with diplomatic means. They primarily pertain to legal disputes requiring resolution by means of a process that applies the rules and principles consistent with the exercise of justice. Such a process should ensure the equality of parties and result in obligatory authoritative decisions based on the law.

Arbitration

'International arbitration aims to settle disputes between States by Judges of their own choice and on the basis of respect for the law. Recourse to arbitration implies an engagement to submit in good faith to the Award' (Chapter 1 on 'The Pacific Settlement of International Disputes', of Article 37, *The Hague Convention of 18 October 1907*).

¹⁹⁸Rousseau, Ch., *op. cit.*, pp. 296-297.

This definition makes it clear that no material difference exists between arbitration and other methods of legal settlement – like adjudication – that follow ‘the general principles of law’ or operate ‘in accordance with international law’ (Statute of the International Court of Justice, Article 38).

Both States in conflict must willingly concede to participate in third-party dispute settlement by legal means, whether by arbitration or by adjudication. In other words, arbitration and legal settlements only occur strictly contractually and are, therefore, voluntary by nature. The only differences between the two options are in form and structure. An arbitration body is created *ad hoc* with the disputant parties selecting the judges and signing a bilateral treaty to settle a specific, active dispute. Judicial bodies are, by contrast, pre-established; they are not set up directly by litigants themselves but by a multilateral treaty or convention and exist to settle an indeterminate number of disputes.

At present, arbitration is less commonly used to settle international disputes. However, governments continue to show interest in resort to arbitration as a way of resolving key issues. Examples include the delimitation of the Irish Sea continental shelf between France and the United Kingdom (20th June 1977 and 14th March 1978); the Beagle Channel between Argentina and Chile (22nd April 1977); and the delimitation of the land boundary between Eritrea and Ethiopia (2000).

Recourse to arbitration requires the consent of national parties, which can take the form of:

- (a) An agreement (special agreement or ‘compromis’) whereby parties in an active dispute give their consent to undergo arbitration. This agreement defines the dispute, details the nature of the arbitration body, sets the rules by which the body will operate and even the substantive rules to be applied. States, however, retain the option to defer to specific models such as that prescribed by The Hague Convention of 1907.
- (b) An arbitration clause written into a treaty that commits the signatories to handling possible disputes relating to the application or interpretation of said treaty through arbitration.
- (c) An arbitration treaty whose sole objective is to make provision for recourse to arbitration for disputes, or certain categories of disputes that may arise between the signatories.

Benefit is also derived from arbitrators having greater latitude than is accorded to ICJ judges who must comport with the ICJ Statute. In arbitration, contesting parties can specify the rules that apply to the dispute when drawing up their special agreement. However, if no such rules are enumerated in the special agreement, the rules of international law would generally apply common to ICJ adjudication.

Likewise, the arbitrator can be given the function to declare in law as well as in equity or to act as '*amiable compositeur*'. Finally, the arbitration process is regulated solely in accordance with the provisions defined in the agreement. An arbitral award is obligatory between parties and is not binding in any way for third parties. In principle, the award is final except in rare instances where the parties act bilateral to later annul the decision.¹⁹⁹

Legal settlement (adjudication)

Legal settlement, referred to more often as adjudication, involves States settling disputes through a final and binding decision made by permanent international courts. The first such truly international court with the jurisdiction to settle disputes between States was the Permanent Court of International Justice (PCIJ). Article 14 of the Covenant of the League of Nations provided for the creation of the PCIJ, which operated as a separate entity to the league during the period between the two World Wars. Its Statute, which was separate to the League's Covenant, was drafted in 1920 and was approved by the Council and Assembly of the League of Nations that year, coming into force on 1st September 1921.

In the wake of World War II, the resumption of the PCIJ was seen as desirable and a new International Court of Justice was established. This new court is very much the continuation of the PCIJ, being modelled very closely on its predecessor. Its Statute confirms that 'Declarations made under Article 36 of the Statute of the Permanent Court of International Justice and which are still in force shall be deemed [...] to be acceptances of the compulsory jurisdiction of the International Court of Justice [...]' (Statute of the International Court of Justice, Article 36, paragraph 5 and Article 37).

¹⁹⁹Thierry, H., Combacau, J., Sur, S. et Ch. Vallée, *op. cit.*, p. 575.

The ICJ is much more closely linked to the United Nations than its predecessor was to the League of Nations and constitutes one of the principal organs of the United Nations (Article 7 of the Charter). UN members are *ipso facto* signatories of the ICJ Statute, which is annexed and integral to the Charter.²⁰⁰

When an issue is brought before the Court, a party or parties without a judge of their own nationality on the bench may select their own judge *ad hoc* (Article 31 of the Statute). This judge, who does not necessarily need to be of the same nationality as the appointing party, contributes to decision-making on fully equal terms to their colleagues on the bench. This is a vestige of earlier approaches to arbitration in international law.

The Court exercises two different roles. The first is to resolve legal disputes between States or contentious jurisdictions. Its second role is to make advisory rulings at the request of the General Assembly, the Security Council and other authorised organs. Such rulings, however, do not relate to dispute settlement.

In a legal settlement (adjudication), only States have legal standing to appear before the Court. The Court's powers are granted by consent of the litigants and they are exercised in accordance with procedures laid down in the Statute and regulations. The end result of the process is the adoption of final and binding decisions, called court rulings. The consent provided by States, upon which rest the powers of the Court, may be accorded by:

- (a) A special agreement where parties agree to submit their case to court;
- (b) A legal clause written into a treaty, which is analogous to the arbitration clause in arbitration processes;
- (c) A treaty specifically designed to bring about the peaceful settlement of a dispute. In this instance, a litigant State unilaterally refers the case to the Court, but the defendant State must first provide consent for the process to proceed;

An optional clause of compulsory jurisdiction based on Article 36, paragraph 2 of the Statute declares that: 'The State-Parties to the present Statute may at any time declare that they recognise as compulsory *ipso facto* and without special agreement, in relation to any other state

²⁰⁰Thierry, H., Combacau, J., Sur, S. et Ch. Vallée, *op. cit.*, p. 579.

accepting the same obligation, the jurisdiction of the Court in all legal disputes concerning:

- (i) The interpretation of a treaty;
- (ii) Any question of international law;
- (iii) The existence of any fact that, if established, would constitute a breach of an international obligation;
- (iv) The nature or extent of the reparation to be made for the breach of an international obligation.²⁰¹

Jurisdiction is binding when State-Parties involved in a dispute commit to submit the case to the Court. The Court's competence as set out in Article 36, paragraph 2 naturally implies reciprocity, which is grounded in the terms of this Article and, therefore, does not need to be included explicitly in its declarations.

Referrals are made to the Court either by notification of a special agreement or by a unilateral request when a prior commitment to jurisdiction exists. When unilateral requests are made, court regulations require that they must contain, where possible, mention of the provisions with which the applicant seeks to establish the Court's jurisdiction, a precise indication of the subject of the application, and a brief presentation of the facts and motives that justify the application.

A distinction is made between this document for instituting proceedings and the petitions or claims that the parties are putting before the Court and that are recorded in their conclusions. These conclusions outline the framework for legal proceedings thereafter.

With each case, a written part containing written submissions and counter submissions precedes the oral part where pleadings are presented. Most cases submitted to Court invoke discussion of preliminary objections raised by parties concerning either the Court's competence or the admissibility of requests.

Judgements are final and binding and offer the parties no further legal remedy other than a review. Article 94 of the Charter empowers the Security Council to 'decide upon measures to be taken to give effect to the Judgement'. Furthermore, a party can petition the Court for interpretation of a judgement.²⁰¹

²⁰¹Thierry, H., Combacau, J., Sur, S. et Ch. Vallée, *op. cit.*, pp. 579-584.

At present, the two most common legal third-party means of peacefully settling border disputes are adjudication or arbitration. These approaches have been deployed successfully over the last few decades to resolve or defuse many acute border conflicts. Notable examples in Africa include the Libya-Tunisia maritime boundary (1982); Burkina Faso-Mali land boundary (1986); Chad-Libya land boundary (1994); and the Cameroon-Nigeria land and maritime boundary (2002).

The positive role that international law can play greatly depends on the quality of international relations. Relaxed and harmonious relations between States can contribute to the orderly legal proceedings, whether arbitration or adjudication. Indeed, states that maintain sufficiently high levels of mutual understanding are those that can agree to submit their disputes for settlement to a panel of impartial judges.

Conclusion

As a consequence of the adoption of the African Union Border Programme and its incorporation into the Department for Peace and Security, the African Union Commission now plays a crucial role in accordance with the principle of subsidiarity. The Border Programme provides a tool for all AU Member States by lending support and practical advice with regard to the delimitation and demarcation of those African boundaries that have yet to benefit from these vitally important processes.

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Appendix C

Recent Judgements and Awards Concerning International Land Boundary and Territorial Disputes in Africa



International Boundaries Research Unit (IBRU)
Department of Geography
Durham University, United Kingdom

Judgements of the International Court of Justice concerning land boundary ' or sovereignty cases in Africa

1983–1986

Judgement of 22nd December 1986, Case Concerning the Frontier Dispute (Burkina Faso/Republic of Mali), General List No. 69.

<http://www.icj-cij.org/docket/files/69/6447.pdf>

1990–1994

Judgement of 3rd February 1994, Case Concerning the Territorial Dispute (Libyan Arab Jamahiriya/Chad), General List No. 83.

<http://www.icj-cij.org/docket/files/83/6897.pdf>

1994–2002

Judgement of 10th October 2002, Case concerning the Land and Maritime Boundary between Cameroon and Nigeria (Cameroon vs. Nigeria: Equatorial Guinea intervening), General List No. 94.

<http://www.icj-cij.org/docket/files/94/7453.pdf>

1996–1999

Judgement of 13th December 1999, Case Concerning Kasikili/Sedudu Island (Botswana/Namibia), General List No. 98.

<http://www.icj-cij.org/docket/files/98/7577.pdf>

2002–2005

Judgement of 12th July 2005, Case Concerning the Frontier Dispute (Benin/Niger), General List No. 125.

<http://www.icj-cij.org/docket/files/125/8228.pdf>

Arbitral awards concerning land boundary or territorial sovereignty cases in Africa

1986–1988

Award in the Dispute Concerning Certain Boundary Pillars between the Arab Republic of Egypt and the State of Israel (Taba Award), 29th September 1988.

1996–1998

Award of the Arbitral Tribunal in the First Stage – Territorial Sovereignty and Scope of the Dispute (Eritrea/Yemen), 9th October 1998.

<http://www.pca-cpa.org/upload/files/EY%20Phase%20I.PDF>

2000–2002 (2007)

Decision on Delimitation of the Border between Eritrea and Ethiopia, Eritrea-Ethiopia Boundary Commission, 13th April 2002.

http://www.pca-cpa.org/showpage.asp?pag_id=1150

Decision Regarding the ‘Request for Interpretation, Correction and Consultation’ Submitted by the Federal Democratic Republic of Ethiopia, Eritrea-Ethiopia Boundary Commission, 24th June 2002.

http://www.pca-cpa.org/showpage.asp?pag_id=1150



This guidebook, containing contributions from several experts, has been assembled to support the initiatives of the African Union Border Programme (AUBP).

Firstly, the book provides analyses and insights into the historical, political and technical issues concerning boundary delimitation and demarcation in Africa. Secondly, four case studies illustrate recent practices of border delimitation and demarcation across different parts of the African continent (Algeria, Burkina Faso and Mali, Cameroon and Nigeria, Mozambique). The final section features a reference lexicon that explains technical terms used in the book. Moreover, the annex offers documents on mapping standards, options for peaceful settlement of disputes, as well as selected international arbitration sentences and judgements of the International Court of Justice.

Based on the experiences of the authors, any legal, technical or political problem encountered in boundary delimitation and demarcation can be overcome if states are willing to seek equitable and practical solutions.

Even more directly, the very exercise of boundary delimitation and demarcation opens up dialogue between officials in neighbouring states, facilitating more open and comfortable relationships. Approaching boundaries as a shared responsibility rather than as a matter of contestation, builds the foundation for continuous cooperation between neighbouring administrations in all aspects of border management.

With clear boundary definition, eliminating potential disputes, and the bilateral practices of delimitation and demarcation building mutual trust, the primary goal of the AUBP – to enhance borderland development and cross-border cooperation – appears within sight.

ISBN 978-99944-890-8-4



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