Ghana and Submission to CLCS under Article 76 of LOSC 1982

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GHANA’S EXTENDED CONTINENTAL SHELF AND SUBMISSION TO THE COMMISSION ON THE LIMITS OF THE CONTINENTAL SHELF UNDER ARTICLE 76 OF THE LAW OF THE SEA CONVENTION 1982

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Abstract

Although Ghana’s extended Continental Shelf (CS) would appear to be modest compared to some other broad shelf States, including those in Africa such as Angola, Madagascar, Mauritius, Morocco, Namibia and South Africa, studies have shown that Ghana has the potential to have a CS beyond 200 nautical miles. This article therefore seeks to examine the submission of Ghana in respect of its extended CS submission to the Commission on the Limits of the Continental Shelf (CLCS) in relation to its obligation under Article 76 of the Law of the Sea Convention (LOSC) 1982.

Keywords: Ghana; Extended Continental Shelf; Law of the Sea Convention; Commission on the Limits of the Continental Shelf.

1. Introduction

Since the first submission in 2001 by the Russian Federation to the Commission on the Limits of the Continental Shelf (CLCS) in respect of the Continental Shelf (CS) beyond 200 nautical miles,¹ a number of States have also made submissions in line

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¹ The Russian Federation made its submission to the CLCS on 20 December 2001. The CLCS is set up under Annex II of LOSC to consider submissions of coastal State with extended CS, to make recommendations in respect of such submissions and the outer limits of the extended CS established on
with their obligation under Article 76 of the Law of the Sea Convention (LOSC) 1982. One of such States is Ghana, a coastal State located in the west coast of Africa on the Gulf of Guinea, which became an independent State in 1957 and has the honour of being one of the few African States represented at all the three United Nations Conferences on the Law of the Sea. It was one of the Eighty-Six States represented at the first United Nations Conference on the Law of the Sea (UNCLOS I), that carved out the Four Geneva Conventions, with its representative being a member of the Fourth Committee of the Conference, which examined issues related to the Continental Shelf. In spite of this, Ghana did not become Party to any of the Geneva Conventions, including the Convention on the Continental Shelf, which enunciated the depth of 200 metres and the rather vague “exploitability” test in determining the Continental Shelf of a State. Again, Ghana was represented at the second United Nations Conference on the Law of the Sea (UNCLOS II), which failed to produce any new Conventions and did not settle certain outstanding controversial issues, such as the breadth of the territorial sea and fishing zones.

At the third United Nations Conference on the Law of the Sea (UNCLOS III), Ghana was again represented. At this Conference, its initial position was that the concept of the CS should be abandoned in favour of a 200 nautical mile Exclusive Economic Zone (EEZ), a new concept, which emerged during the Conference. However, it subsequently adjusted its position to support the concept of the CS, so long as it ran parallel with that of the EEZ. Further, it supported putting in place an equitable system of revenue sharing between the International Community and Broad Shelf States of resources in respect of the CS beyond 200 nautical miles (M). The following excerpt taken from the UNCLOS III Official Records of the 20th meeting held on 30 July 1974 gives an indication of the position of Ghana at this crucial Conference:

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the basis of such recommendations is regarded as “final and binding”. See Art.76 (8) of LOSC – Members of CLCS.

2 For up to date information on submissions so far see http://www.un.org/Depts/los/clcs_new/clcs_home.htm

3 Ghana (prior to independence known as the Gold Coast) gained independence from British colonisers on 6 March 1957. It celebrated its 50th anniversary this year. At the time of the independence of Ghana there were only seven other independent African States, namely Egypt (then known as the United Arab Republic), Ethiopia, Liberia, Libya, Morocco, the Sudan and Tunisia.

4 UNCLOS I took place from February 24 to April 27 1958, See American Journal of International Law 1958; 52:830-867. Mr R.A. Quashie (Ghana) was the Vice-Chairman of the Fourth Committee. At the UNCLOS I the following Conventions were adopted: Convention on Territorial Sea and Contiguous Zone; Convention on the Continental Shelf; Convention on Fishing and Conservation of the Living Resources of the High Seas and the Convention on the High Seas. There was also an Optional Protocol of Signature concerning the Compulsory Settlement of Disputes.

5 See United Nations Treaty Collection, http://untreaty.un.org/English/access.asp Art. 1 of the Continental Shelf Convention states: “For the purpose of these articles, the term “continental shelf” is used as referring (a) to the seabed and subsoil of the submarine areas adjacent to the coast but outside the area of the territorial sea, to a depth of 200 metres or, beyond that limit, to where the depth of the superadjacent waters admits of the exploitation of the natural resources of the said areas …”.


7 This appears to have been in line with the position of the Organisation of African Unity(OAU) in its 1974 Declaration on the Issues of the Law of the Sea, UNCLOS III, Official Records, Vol.III, pp.63-65. The Declaration only dealt with the EEZ but did not mention the CS because it was felt that the two concepts were mutually exclusive. For the original position of Ghana, see UNCLOS III, Official Records, Vol. II, p.165, paras.62-65.
Along with other developing nations, Ghana supported the concept of the economic zone which would ensure precise definition of limits and equitable sharing and proper control of the resources of the marine environment while safeguarding the economic interests of coastal States... His delegation shared the opinion of the Austrian delegation that there was no need to maintain the concept of the Continental Shelf if the Conference decided to establish an economic zone beyond the territorial sea. It was the view of his delegation that the concept of the economic zone and the continental shelf were mutually exclusive. The Declaration of the Organisation of African Unity had not mentioned the concept of the continental shelf and his delegation found it difficult to appreciate the paradoxical position of States which supported both concepts...However, international law could only impel, and since there was no means of compelling those States to relinquish their hold on those areas outside the proposed 200-mile limit, his delegation would support any proposal aimed at the establishment of an equitable system of revenue sharing to ensure that the international community obtained some benefit from the exploitation of what would otherwise have fallen within the international zone.”

The two concepts of EEZ and CS, including a possibility of an extended CS beyond 200 nautical miles up to a defined limit, were eventually taken on board by the Law of the Sea Convention (LOSC) 1982, which was the result of a package deal involving trade offs and compromise. In the manner of trade offs and compromise of the UNCLOS III, a system requiring broad shelf States to make annual payments or contributions in kind to the international community through the International Seabed Authority (ISA) at a specified rate in respect of production at the CS beyond 200 nautical miles after the first five years of exploitation, was also included in the LOSC as a concession for allowing such extension of the CS. Ghana eventually became a Party to the LOSC on 7 June 1983, not too long after the Convention was adopted.

Although, Ghana’s extended CS would appear to be modest compared to some other broad shelf States, including those in Africa such as Angola, Madagascar, Mauritius,
Morocco, Namibia and South Africa, a study by Prescott indicates that Ghana is one of the States with CS beyond 200 nautical miles. In addition, Kwiatkowska has identified Ghana as one of such broad shelf States. This article therefore seeks to examine the submission of Ghana in respect of its extended CS submission to the Commission on the Limits of the Continental Shelf (CLCS) in relation to its obligation under Article 76 of the Law of the Sea Convention (LOSC) 1982.

2. Article 76 of LOSC

The LOSC states that the continental shelf of a coastal State is the seabed and subsoil that extends beyond the territorial sea throughout the natural prolongation of its land territory to the outer edge of its continental margin or in cases of States that do not have a broad continental shelf, to a distance of 200 nautical miles from the baselines from which the breadth of the territorial sea is measured. This provision acknowledges the natural configuration of the continental shelf of broad shelf States may go beyond 200 nautical miles. However, the LOSC limits such broad shelves to a maximum of 350 nautical miles from the baselines or 100 nautical miles from the 2,500-metre isobath. It provides two technical, complicated methods for establishing the outer limits of such extended CS known as the Irish or Gardiner formula (1% sediment thickness option) or the Hedberg formula (FOS + 60 nautical miles). These formulae may be used simultaneously by a State with extended CS in respect of different portions of its extended CS in order to enhance its chances of extension. The final outer limits of the extended CS beyond 200 nautical miles from the baseline is to be measured by straight lines not exceeding sixty nautical miles in length connecting all the fixed points.

Further, the LOSC provides for a technical body, the CLCS, to consider submissions by coastal States with extended CS and make recommendations in respect of such

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13 Ghana is said to potentially have an extended CS of about 25,943 Sq. Km. Other African States with potentially extended CS with the area in Sq. km are: Angola (251,305), Congo(Republic of)(14,652), Equatorial Guinea(15,566), Gabon(136,752), Gambia(10,662), Guinea(27,897), Guinea Bissau(38,359), Kenya(20,782), Madagascar(2,087,434), Mauritania(53,312), Mauritius(321,039), Morocco(824,562), Mozambique(123,258), Namibia(1,111,735), Nigeria(103,772), Senegal(106,630), Seychelles(321,039), Sierra Leone(31,030), Somalia(242,679), South Africa(184,863), Tanzania(55,681), Togo(15,566) and Democratic Republic of Congo(formerly Zaire)(13,431). See Parsons, L, “Evaluation of the Non-living Resources of the Continental Shelf Beyond the 200 mile limit of the World’s Margins” in Minerals other than Polymetallic Nodules of the International Seabed Area, Proceedings of the International Seabed Authority’s Workshop, Kingston, Jamaica, June 26-30, 2000(ISA/04/01), Jamaica: International Seabed Authority; 2000: 667 at 736.


15 See Kwiatkowska, B, “Commentary: Some Remarks on Africa, With Particular Reference to the State Practice of Ghana,” in Mensah, T, (ed.), Ocean Governance: Strategies and Approaches for the 21st Century. Honolulu: The Law of the Sea Institute, University of Hawaii; 1996: 511 at 520. A United Nations Press Release estimated that there are between 30 and 60 Broad Shelf States, though it admitted that the actual number would only be determined as the submissions are examined by the CLCS and the States satisfy the criteria under Article 76.

16 Art 76(1)

17 Art. 76(5) and (6). However, the 350 nautical miles limit does not apply to submarine elevations that are natural components of the Continental Margin such as plateaux, rises, caps, banks and spurs.

18 Art.76 (4) (a) (i) and (ii) respectively.

19 Art.76(7)
submissions. The outer limits established by the coastal State based on such recommendations shall be final and binding.\textsuperscript{20} Thereafter, the chart and other relevant information permanently describing the outer limits are required to be deposited with the Secretary-General of the United Nations, who is to give such information due publicity.\textsuperscript{21}

3. Relevant Domestic Legislation relating to the Ghanaian Continental Shelf

The interest of the Ghanaian State in its extended CS, just like any other coastal State, is based on its potential to have commercially exploitable natural resources. From all indication, its extended CS is potentially endowed with oil and gas resources, which may be commercially exploitable.\textsuperscript{22} Domestic legislation related to the CS has therefore been enacted.

3.1. The Constitution of Ghana

The Constitution of Ghana provides that minerals found in the land territory and offshore zones within national jurisdiction, such as the CS are the property of The Republic of Ghana and shall be vested in the President on behalf of and in trust for the people of Ghana.\textsuperscript{23} Consequently, the government has a responsibility to harness and take steps to ensure that all mineral resources within Ghanaian land and maritime territory, including the extended CS, are exploited for the benefit of the people of Ghana. The Constitution further provides that Parliament may by law provide for the delimitation of various maritime zones including the CS.\textsuperscript{24} The current legislation dealing with the Ghanaian maritime zones, the Maritime Zones (Delimitation) Law was enacted in 1986 and is deemed to have been enacted by Parliament pursuant to the provisions of the Constitution, which came into force in 1992.

3.2. The Maritime Zones (Delimitation) Law

Under the Maritime Zones (Delimitation) Law, the CS of Ghana is defined as comprising: “... the sea-bed and subsoil of the submarine areas that extend beyond the territorial sea throughout the natural prolongation of its land territory to a distance of two hundred nautical miles from the baselines from which the breadth of the territorial sea is measured.” This legislation limits the Ghanaian CS to a distance of 200 nautical miles. Although an extended CS is not referred to in this legislation, as previously mentioned, Ghana has been identified as one of the States with an

\textsuperscript{20} Art.76 (8) and on CLCS See n.1 above.
\textsuperscript{21} Art.76(9)
\textsuperscript{22} Parsons estimates that potentially about 8 billion barrels of oil equivalent may be derived from the Ghanaian extended CS. Parsons, op.cit. (See note 13 above).
\textsuperscript{23} S.257 (6) of the 1992 Constitution of Ghana says: “Every mineral in its natural state in, under or upon any land in Ghana, rivers, streams, water courses throughout Ghana, the exclusive economic zone and any area covered by the territorial sea or continental shelf is the property of the Republic of Ghana and shall be vested in the President on behalf of, and in trust for the people of Ghana.” See also S.1 of the Minerals and Mining Law 1986, (P.N.D.C.L 153). See Art.77 (1) of LOSC, which says that a Coastal State has sovereign rights over its CS for the purpose of exploring and exploiting its natural resources.
\textsuperscript{24} S.4 (2) states: “Parliament may by law provide for the delimitation of the territorial sea, the contiguous zone, the exclusive economic zone and the continental shelf of Ghana.”
extended CS.\textsuperscript{25} Under the LOSC the rights of a Coastal State to the CS is not dependent on occupation or any express proclamation.\textsuperscript{26} Therefore, though an extended CS is not specifically mentioned under its domestic legislation, Ghana is still entitled under international law to its extended CS and has sovereign rights to explore and exploit the resources therein. Nonetheless, the Ghana Government is currently taking steps to get Parliament to review and update its maritime zones legislation to make it compatible with the provision of the LOSC dealing with extended CS. It is suggested that a suitable model that could serve as a guide is the Seychelles Maritime Zones Act No.2 of 1999, which defines the CS of Seychelles as follows:

“(1) … the seabed and subsoil of the submarine areas that extend beyond the limit of the territorial waters throughout the natural prolongation of the land territory …

(a) to the outer edge of the continental shelf; or

(b) to a distance of two hundred nautical miles from the baseline where the outer edge of the continental shelf does not extend up to that distance.

(2) For the purposes of subsection (1), wherever the continental margin extends beyond 200 nautical miles from the nearest point on the baselines, the outer limits shall be established and delineated with due regard to the requirements and limitations of international law”\textsuperscript{27}

4. Ghana National Continental Shelf Delineation Project (GNCSDP)

In August 2006, the Ghanaian Minister of Lands, Forestry and Mines, set up a National Continental Shelf Advisory Committee (NCSAC) to make recommendations in respect of the delineation of the outer limits of the CS beyond 200 nautical miles. The Committee, with membership drawn from a variety of stakeholders, including the academia, research institutions and maritime agencies,\textsuperscript{28} was given the following terms of reference: to provide an update in respect of work done up to the time of establishing the Committee with regard to the outer limit of the CS; to demonstrate by maps and drawings the CS up to 200 nautical miles; to illustrate by way of maps and drawings the possibility of extending the CS beyond 200 nautical miles; to examine delimitation issues with neighbouring States vis-à-vis the extended CS and to draw up a road map to ensure that submission in respect of the extended CS was made to the CLCS within the deadline.\textsuperscript{29} The NCSAC in its road map divided the process into four phases. Phase 1(the planning phase) involving, amongst other things, the setting up of the GNCSDP with the political responsibility for the delineation of the extended CS, including defining the project structure, identifying and co-ordinating the different government agencies and departments to be involved in the project.

\textsuperscript{25} See n.14 above.
\textsuperscript{26} Art.77 (3).
\textsuperscript{27} Section 11.
\textsuperscript{28} See the Report of the Continental Shelf Project Advisory Committee(on file with the authors). The Committee consisted of representatives from the Survey Department, the Environmental Protection Agency, Ghana Maritime Authority, Ghana National Petroleum Corporation, Kwame Nkrumah University of Science and Technology, Ministry of Justice and the Ministry of Lands, Forestry and Mines.
\textsuperscript{29} Ibid.
appointing the body for the technical aspects and establishing appropriate sources of funding. Phase 2 (the desktop study phase) involving the commissioning of the desktop study, collating all available data from within and outside Ghana, report to and consideration of the desktop study by the government. Phase 3 (the preparation phase), involving the commissioning of work, necessary fieldwork to fill in any gaps, data processing and preparation of relevant submission documents. Finally, phase 4 (the actual submission process phase), involving the selection and preparation of the delegation that would appear before the CLCS and the actual submission of the report and relevant documents and data to the United Nations Secretary-General.  

Based on the recommendation of the NCSAC, the GNCSDP was established on 30 August 2007 to prepare Ghana’s submission to the CLCS in respect of its extended CS. Three standing Committees, namely a Ministerial Oversight Committee (MOC), a Steering Committee (SC) and a Technical Core Group (TCG), were established.

The MOC was made up of government Ministers from the Ministry of Lands, Forestry & Mines; Ministry of Energy; Ministry of Foreign Affairs, Regional Integration & NEPAD (New Partnership for Africa Development); Ministry of Justice & Attorney General’s Department; Ministry of Finance & Economic Planning and Ministry of National Security, as well as a representative of the President of the Republic of Ghana. The SC and the TCG were made up of representatives from the Geological Survey Department; Survey Department, Ghana National Petroleum Corporation (GNPC); Ministry of Justice & Attorney General’s Department; Ministry of Lands, Forestry & Mines; Ministry of Foreign Affairs, Regional Integration & NEPAD; Ministry of Finance & Economic Planning; Regional Maritime University, Kwame Nkrumah University of Science & Technology (KNUST) and the University of Ghana, Legon.

The work of the MOC was to serve as a direct link between the SC and the Government. In addition, it exercised supervisory role and ensured that the objectives and deadlines set for the project were met. The SC acted as an interface between the MOC and the TCG and also examined the modus operandi of the TCG. The TCG included six (6) geoscientists mainly tasked with evaluating and preparing the submission in accordance with the scientific and technical guidelines of the CLCS.

5. Deadline for Ghana’s submission to CLCS

As indicated previously Ghana became a Party to LOSC on 7 June 1983. Ordinarily, its submission in respect of its extended CS should have been due within ten years of the entry into force of the Convention on 16 November 1994, i.e. on 16 November 2004. However, due to the decision taken by the States Parties to the Law of the Sea Convention (SPLOS) in 2001 the commencement period for States, such as Ghana, which became Parties to LOSC prior to 13 May 1999 (when the CLCS adopted its Scientific and Technical guidelines), was fixed at the 13 May 1999. Consequently,

30 Ibid.
31 CLCS/11 of 13 May 1999
32 Art.4 of Annex II of LOSC
the submission of Ghana was due on 13 May 2009. Meanwhile, Ghana made its submission to the CLCS on 28 April 2009. Even though, it was able to meet this deadline it alluded in its executive summary to the challenges it faced in doing so due to the cost, complexities and technicalities involved in preparing its submission. This challenge is not peculiar to Ghana, but similarly is faced by other developing States. As far back as 2004, the Law Ministers and Attorneys General of Small Commonwealth jurisdictions expressed concerns over their ability to meet the ten-year deadline due to the complexities and expenses involved in preparing the submissions. In addition, the African Union (AU) in a recent decision, while encouraging member States to seek to meet the deadline for submission had also called for its members to adopt a common position at the General Assembly for an extension by another 10 years of the May 2009 deadline, which applied to a number of broad-shelf African States. Even more recently, by a communication dated 12 May 2009, Nauru, a small island State in the Pacific, notified the United Nations Secretary-General of “its present inability owed to its current lack of the required capacity and resources to fulfil the legal requirements under article 76 of the Convention.”

Although the ten-year deadline appears to be an obligation resting on States Parties the LOSC does not state any legal consequence for a failure to comply. It has been argued that since the entitlement of a coastal State to its CS is not dependent on occupation, actual or notional, nor express proclamation, a State with an extended shelf does not forfeit such CS due to its inability to meet the deadline. Besides, it has been pointed out that the CLCS does not have the competence to determine a States’ entitlement to its extended CS and therefore cannot in anyway forfeit a coastal State’s extended CS if it fails to meet the deadline. Nonetheless, due to Article 300 of

35 Other African States such as Mauritius and Seychelles, South Africa, Kenya, Nigeria, Cote d’voire and Namibia have also made submissions. See note 2 above.
36 See Para. 1.6 of Ghana’s Executive Summary. See also Chris Carleton, “Article 76 of the UN Convention on the Law of the Sea – Implementation Problems from the Technical Perspective”, (2006) 21(3) The International Journal of Marine and Coastal Law, p.287 at 288 and 306. In SPLOS/INF/20 of 16 January 2008, Ghana is said due to its difficulties in meeting the deadline of May 2009 to have requested its deadline to be deferred to May 2010. This request was actually not an official position of the Government, which was determined to meet the deadline.
39 Para.8 of SPLOS/INF/22 of 22 May 2009
40 Arts.76(1) and 77(3) of LOSC
41 Oude Elferink, A.G. The Continental Shelf of Antarctica: Implications of the Requirement to Make a Submission to the CLCS under Article 76 of the LOS Convention. International Journal of Marine and Coastal Law 2002; 17: 485 at 497-498. See for instance, Nauru which in a communication dated 12 May 2009 stated its inability due to a lack of finance and capacity to currently fulfill its article 76 obligation, but insisted that this “should not prejudice Nauru’s inherent right as an equal and sovereign member of the International community, a coastal State, and especially as a small island developing State, to assess a potential claim on an extended continental shelf at a future point in time.” Para.8 of SPLOS/INF/22
LOSCL, the compliance with the deadline is an obligation that States Parties must in
good faith seek to achieve in order to maintain the integrity of the Convention.\textsuperscript{42} However, it is posited that a State Party unable to make the submissions within the
deadline, not through deliberate omission, but rather because of circumstances beyond
its control, such as the lack of financial resources and technological capability, would
not be regarded as a breach of its obligation to comply in good faith. When such a
State Party is able to surmount such difficult circumstances it must take diligent and
reasonable steps to ensure that it makes its submissions without undue delay even
after the deadline. Anyhow, the latter argument would appear to be a moot point in
view of the recent decision of the SPLOS.\textsuperscript{43} The SPLOS in an attempt to arrive at a
pragmatic solution to the issue of the inability of certain developing States to meet the
deadline, recently decided that a coastal State may satisfy the time period ( referred to
in article 4 of annex II and the earlier SPLOS decision in 2001) by submitting to the
Secretary-General preliminary information indicative of its extended continental shelf,
along with a description of the status of preparation and the intended date of making
the actual submission.\textsuperscript{44} Pending the receipt of the actual submission the SPLOS
decision, however, makes it clear that the CLCS shall not consider such preliminary
information.\textsuperscript{45} So far, 44 preliminary information, including 23 from African States,
have been submitted.\textsuperscript{46} The SPLOS decision does not give an indication of any legal
consequence if these States fail to make their actual submissions on the intended date
they have proposed. Perhaps, it is arguable that so long as these States take reasonable
and diligent steps, within the constraints of their financial and technological
capabilities, all that may be expected is that the actual submissions should thereafter
be made as soon as practicable. To avoid a situation whereby there is uncertainty in
the demarcation of the seabed beyond national jurisdiction, the common heritage of
mankind, it behoves the international community to take active and creative steps to
assist and encourage these States to make submissions within their proposed actual
submission date.

6. Maritime Boundary Delimitation with Neighbouring States

Ghana shares maritime space with Cote d’Ivore to the West and Togo, Benin and
Nigeria to the East, with which it has unresolved maritime delimitation issues.\textsuperscript{47} There

\textsuperscript{42} Art.300 of LOSC and Art.26 of the Vienna Convention on the Law of Treaties, 1969. See
International Law Association, Toronto Conference(2006), 2\textsuperscript{nd} Report of the Committee on Legal
Issues of the Outer Continental Shelf, at 19-20; Oude Elferink, A.G. Ibid and Egede, E. Submission of
Brazil and Article 76 of the Law of the Sea Convention(LOSC) 1982. The International Journal of
Marine and Coastal Law 2006; 21:33 at 36
\textsuperscript{43} SPLOS/183 of 24 June 2008
\textsuperscript{44} Para 1(a)
\textsuperscript{45} Para 1(b), Ibid
\textsuperscript{46} http://www.un.org/Depts/los/clcs_new/commission_preliminary.htm Angola, Benin, Togo,
Cameroon, Cape Verde, Comoros, Congo, Democratic Republic of the Congo, Equatorial Guinea,
Gabon, Gambia, Guinea, Guinea-Bissau, Mauritania, Mauritius(has already made a joint partial
submission with Seychelles), Mozambique, Sao Tome and Principe, Senegal, Seychelles(See about on
Mauritius), Sierra Leone, Somalia, Togo and United Republic of Tanzania.
\textsuperscript{47} All the neighbouring States are all parties to the LOSC. Benin (16 October 1997); Cote d’Ivoire (26
March 1984); Nigeria (14 August 1986) and Togo (16 April 1985). See Prescott, J.R.V., Maritime
Political Boundaries of the World. London: Methuen & Co. Ltd; 1985: at 322, for maritime boundaries
in the east Atlantic Ocean. See Ezigbo, O. “Nigeria’s Map is Out-Dated”, This day Nigerian
Newspaper, 14 September 2007, where it was reported that Nigeria has successfully concluded
are ongoing discussions with Cote d’Ivoire and Nigeria with a view to signing maritime boundary treaties with them. On the other hand, the boundaries relating to Togo and Benin are yet to be considered since these States, as at the date of writing this article, are yet to respond to notes verbale sent on this issue to them by the Ghanaian government.

What however is not clear at this point is if the delimitation questions with the neighbouring States would apply in respect of the extended CS. It is pertinent to point out that delimitation of the EEZ and CS should be effected by an agreement based on international law in order to achieve an equitable solution. If the States are unable to reach an agreement within a reasonable period they may resort to the dispute settlement procedure provided under the LOSC. Pending such agreement the States may enter into “provisional arrangements of a practical nature”, including the joint development of the disputed areas. Such provisional arrangements should, of course, not to jeopardize or hamper the reaching of an agreement by the States concerned. It is also without prejudice to the final delimitation.

In the case of unresolved maritime boundary issues in respect of areas in the outer limits of the CS, the LOSC makes it clear that the provisions requiring submissions by broad shelf States to the CLCS are “without prejudice to the question of delimitation of the Continental Shelf between States with opposite or adjacent coasts.” Annex II of the LOSC emphasises that the actions of the CLCS shall not prejudice matters related to the delimitation of boundaries between States with opposite or adjacent coasts. In its Rules of Procedure the CLCS has elaborated on how it would deal with submissions in respect of disputes in the delimitation of the CS between opposite or adjacent States or other cases of unresolved land or maritime disputes. The Rules make it clear that the competence with regard to such disputes rests with the States involved, consequently, in cases where a land or maritime dispute exists the CLCS would not consider a submission by any of the disputing States except with the prior consent of all the disputing States. In cases where there is prior consent of all States concerned in the disputes the recommendations in respect of such submission shall be without prejudice to the position of the States involved. A State making submission in respect of areas of its CS subject to disputes with neighbouring States may make a partial submission, excluding the disputed areas, or make a joint submission with the

demarcations of her land and maritime boundaries with all her neighbours, except Ghana.


48 Arts. 74(1) and 83(1)
49 Arts. 74(2) and 83(2). See also Part XV of LOSC
51 Art. 74(3) and 83(3)
54 See Ibid, Annex I Arts.1 and 5
The possibility of a joint submission with the neighbouring States to the CLCS was considered by Ghana but it was felt it would involve a considerable negotiating effort to persuade the other States to participate in such joint submission. Although, there is precedence to show that such joint submissions are practicable, the differential status of submission preparations of neighbouring States made a joint submission impracticable in this case. Consequently, Ghana chose to make a sole submission. However, Ghana and all its neighbouring States, all ECOWAS member States, consented to a “no objection note” to the submissions to the CLCS. This note is, of course, without prejudice to the eventual delimitation of the maritime boundaries of these States. 

7. Technical Preparations for Submission to CLCS

7.1. Desktop Study (DTS)

The delineation of the outer limits of the continental shelf of any coastal State beyond 200 nautical miles and the subsequent preparation of a submission involves not only legal and diplomatic aspects, such as negotiating boundary Agreements with neighbouring States, but also complex scientific preparation work, involving putting together relevant marine scientific data and information. The preliminary stage, normally involves scanning and desktop study.

The Geological Survey of Denmark and Greenland (GEUS) carried out the preliminary assessment of data and metadata necessary for the DTS of the Ghana continental shelf project, in consultation with NCSAC, in March 2007, using mainly seismic data supplied by the Ghana National Petroleum Company (GNPC). The seismic, which was scanned in Kingdom Suite, revealed that the foot of the slope (FOS) could only be located in selected areas, thus identifying some data gaps (Figure 1).

The GNCSP later received a report prepared by the New Partnership for African Development (NEPAD) sponsored African Shelf Project, initiated by Senegal and the Council for Geoscience of South Africa (CGS)[the NEPAD African Shelf Partnership Report] which used Caris Lots and public domain datasets. This report included an earlier report on preliminary continental shelf assessment of coastal African States by Dr. S. Perritt in which Ghana was quoted as having the potential to an Extended Legal Continental Shelf of the order of 1,440 km² based on the 1% sediment thickness formula. The former report, which considered the area of relevance from Sierra Leone to Gabon, assumed normal baselines from the World Vector Shoreline 2 (WVS2) database except for Gabon where straight baselines were applied. The public domain data employed in this report were mainly Digital Chart of the World (DCW), World Vector Shoreline 2 (WVS2), Global Gridded 2-minute Digital Relief (ETOPO-2) and

See Ibid, Arts.3 and 4.  
56 Report of NCSDP  
58 Paras.5.0 and 5.2 of Executive Summary.  
59 This section is an updated version of a presentation by Lawrence Apaalse at the Make a Spatial Connection @ Caris 2008, 12th International User Group Conference & Educational Sessions, September 22-26, 2008, Bath, United Kingdom.
the National Geophysical Data Center (NGDC) gridded sediment thickness datasets. It is essential to mention that no in-house proprietary data were included in this assessment, giving rise to the belief that the extension area could be improved with the inclusion of these datasets. The NEPAD African Shelf Partnership Report also conclusively recommended the Gardiner Line and the 350 nautical miles limit as the optimal formula and constraint lines respectively for Ghana.60

![SEISMIC DATABASE](image)

**Figure 1:** Proprietary data available in GNPC showing seismic coverage of the entire coast. The white ovals are areas where the FOS could be located as mapped by GEUS & NCSAC, March 2007.

The GNCSDP considered the preliminary assessment contained in the NEPAD African Shelf Partnership Report and based on this, one Robert van de Poll was contracted to carry out the DTS, in consultation with the GNCSDP, under the following scope of work:

- To define the Territorial Sea Baseline (Normal Baseline) by generating base points from UK Hydrographic Nautical Charts, Russian Nautical Charts, recently acquired 0.5 m resolution Orthophotos of the entire coastline of Ghana and direct Field Observations;

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60 See the NEPAD African Shelf Partnership Report: 1-20(on file with the authors). Dr Perritt, S., Preliminary Assessment of Coastal African States with regard to possible Extended EEZ claims according to UNCLOS Article 76 (Report No. 2003-0233) is contained in Appendix B of the NEPAD African Shelf Partnership Report at 28-30
To delineate hypothetical adjacent boundaries between Ghana and Cote d’Ivoire, Togo, Benin and Nigeria;

To measure the 200 nautical mile limit and the 350 M constraint line from the baseline;

To locate the FOS at the maximum change in gradient at the base of the slope;

To choose the points where the sediment thickness is 1% of the distance to the FOS;

To determine the approximate extension area;

To recommend any extra data needs for the preparation of the submission to the CLCS

7.2. Territorial Sea Baseline (TSB)

To proceed with the desktop study, a base map of the area (Figure 2) had to be generated. The 2006 National Geospatial Agency (NGA) WVS2 dataset was used to mimic the coastline at an approximate scale of 1:75000 and an accuracy of ±100 m. This new NGA WVS2 dataset was collected from present-day LANDSAT TM7 Satellite Imagery (14.25 m resolution, accuracy ±50 m, September 2003).

It must be pointed out that published base points of coastal States in the study area were not available. However, Cote d’Ivoire has legislation for the use of both straight and normal baselines while Benin, Nigeria and Togo have legislation for the use of normal baselines as the TSB. For this reason, ‘hypothetical’ base points and baselines were produced for respective adjacent coasts by digitizing the straight and normal baselines in Caris Lots with the help of nautical charts, satellite imagery and orthophotos.

Strenuous efforts were made to generate base points for the Ghana TSB. Initially, two United Kingdom Hydrographic Office Nautical Charts Nos.1383 and 1384, published on July 11, 2004 and May 12, 2005 respectively, were used. They are both regional Nautical Charts in 1:350,000 scale, showing generalized coastline with some isolated low water line information (Figure 3). No datum was supplied for these charts and notes on the charts themselves question their accuracy. Therefore, a resort was made to three larger scale Russian Nautical Charts (Chart 3500 in 1:150000, Chart 35001 in 1:150,000 and Chart 35005 in 1:50000). Recently acquired 111 0.5 m resolution orthophotos were also supplied by the Survey Department of Ghana to improve the quality of the base points.

In the final analysis, 335 base points were computed as geographic coordinates in WGS84 Datum and have been edited to be submitted to the United Nations for publication. In addition, it is to be used in adjacent maritime boundary delimitation with neighbouring coastal States.

Out of the 335 base points, 28 were collected from the Russian Nautical Charts (see Figure 4 for examples). The remaining 307 were collected from the Orthophotos, examples of which are shown in figures 5 &6.

61 See Egede, op.cit.:164-172(See note 11 above)
62 Art.16 of LOSC.
Figure 2: Base Map of study area showing World Vector Shoreline 2 coastline.

Figure 3: Example of the UKHO Nautical Charts showing the coastline at Cape Three points.
Figure 4: Russian Nautical Charts (1:150000) of the coastline of Ghana showing low water elevations and two base points.

Figure 5: Examples of the 0.5-meter high-resolution Orthophotos showing interpreted normal baseline running East-West and 2 base points (dots on the line).
Figure 6: Examples of the 0.5-meter high-resolution Orthophotos showing interpreted normal baselines (zig zag line) and 3 base points (black dots). In this figure, numerous offshore low water elevations (rocks and reefs) can clearly be seen.

It is important to point out that since maritime boundary treaty lines (bi- or multilateral agreements) for neighbouring States were not available the United Nations’ best practices for Law of the Sea methodologies were followed and a “hypothetical” set of Geographic Coordinates were generated in Caris Lots as the base points. This baseline information was then used to produce “hypothetical” maritime boundaries between Ghana and her neighbours using the Equidistance Method (Figure 7).
7.3. The Outer Limits of the Continental Shelf beyond 200 M

As already stated, the formula for the determination of the outer limit of the continental shelf of Ghana beyond 200 M was the 1% sediment thickness line (which depends on the FOS) and the 350 nautical miles constraint line. Article 76 paragraph 4(b) of the LOSC states: “... in the absence of evidence to the contrary, the foot of the continental slope shall be determined as the point of maximum change in the gradient at its base...”.

Therefore, sediment thickness analysis of the sub-surface to determine the 1% sediment thickness points relative to the Foot of the Slope (FOS) was carried out. The bathymetric echo-sounding information compiled in the determination of the FOS was primarily collected from the GEODAS database of the National Geophysical Data Centre (NDGC) (Figure 8). Selected bathymetric profiles were assembled across the

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63 See Art. 76(4)(a)(i) and (5) of LOSC
The FOS profile line was drawn in the Caris Lots software. Each profile line was analyzed using the underlying Raster bathymetric data sources (ETOPO2, and GEBCO1) and the GEODAS ship tracks. In all, 65 lines were chosen from four different GEODAS databases to cover the entire continental margin and the abyssal plain. The Douglas-Peucker filter from the Caris Lots software’s ‘Foot of the Slope Tool’ that applies a linear approximation of bathymetric profiles was applied to identify the FOS markers.
As stated earlier, seismic data available in GNPC showed that some of these lines could well be used to locate the FOS positions in some areas.\textsuperscript{64}

7.4. The 1\% sediment thickness Formula Line (Gardiner Line)

The Caris Lots software was used to calculate the sediment thickness position at each point along the FOS profiles and 1\% sediment thickness points were determined. The individual 1\% sediment point markers were then connected together to form the 1\% sediment thickness line commonly referred to as the Gardiner Line (Figure 9).

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{gardiner_formula_line.png}
\caption{The Gardiner Formula lines(black triangles on white lines) showing SED Profile lines (closely spaced north-south dipping white lines) and the individual FOS markers (white and black circles at the start of these lines). The black circles are from the coarse-gridded, while the white ones are from the fine-gridded, sediment models respectively. (Credit Robert Van de Poll, Fugro Pelagos Inc)}
\end{figure}

The individual 1\% sediment markers (black triangles on the white lines) are the individual results of the 1\% sediment positions. In this DTS, two individual sediment models were used and these two models produced different results. The inner row of 1\% sediment thickness came from the analysis of the Fine Sediment Raster Model; the outer row of 1\% sediment points came from the second sediment - Coarse Raster Model. The striking thing was that while the fine sediment model suggested that Ghana’ extended CS potential lies only to the east, the coarse sediment set was more

\textsuperscript{64} Unfortunately, these data cannot be incorporated into this study due to some confidentiality issues regarding the use of these data in concessions owned by multinational exploration companies.
ambitious. The latter provided Ghana with a much larger area running from east to west in the entire deepwater. It must be pointed out however that these analyses were for demonstration only as the gridded data models often show a departure from real seismic data and therefore were not good enough for the preparation of the final submission.

7.5. Establishment of the 350 Nautical Miles Limit

As already stated, the constraint line was computed for only the 350 M as this portion of the Eastern Equatorial Atlantic has a rather narrow continental shelf and a very steep continental slope. The 2,500 meter isobath is very close to shore, and in no location of the study area did it protrude seaward of the 350 M (Figure 10).

Figure 10: This figure illustrates the positions of the 2,500 m isobath, the 2,500 m + 100 M constraint line, the 200 mile limit and the 350 M constraint.
7.6. Delimitation of the Potential Extension area

Based on the analyses of the two sediment datasets discussed above, two sets of results were computed. The Fine Sediment Datasets showed that Ghana’s extended continental shelf was only to the eastern portion of the study area with an approximate area of 6,148 km² (See Figure 11).

Figure 11: Results of the Fine Sediment Dataset showing the continental shelf extension area of approximately 6,148 km² (dark filled polygon).

The second set of results was produced from the Coarse Sediment Datasets, which shows an UNCLOS Article 76 extension covering the entire offshore beyond the 200 M of approximately 40,504 km² (See Figure 12).
7.7. Survey Planning

It has been noted that several East-West prominent linear Fracture Zones are present and very well documented in this transform margin setting. This is critical from an analysis point of view and for planning purposes. If these linear trends are seen to “pop through” the sediments on the seabed, the continuity of the sediment plume seaward of the FOS, as required by CLCS, cannot be established.

Due to these uncertainties, a multi-variate approach to seismic data planning was adopted. Two seismic survey plans have been suggested. Plan A consists of 10 proposed lines spaced 50 M apart with a total of 4,189 km. Survey plan B consists of 20 proposed lines, spaced at 30 M with a total of 6,529 km. These plans were contingent on the continuity of sediments and were designed such that the survey could be called off after a minimum of 3,777 km. These plans were then run by Karl Hinz,\(^{65}\) (courtesy the Commonwealth Secretariat) who felt that only three seismic lines, each 300 km long, from the Ghanaian slope into the eastern potential extension.

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\(^{65}\) He was a member of the CLCS from 1998-2002
area and a maximum of three tie-lines, each about 110 km long, i.e. a total of about 1,250 km, are sufficient. However, the GNCSDP, desirous to maximize territorial gains, advised the government to tender for a minimum of 2000 km that would allow for an additional strike line to test the western corridor of our basin. In line with this, several quotes were obtained from different seismic companies and evaluated. Finally, 1948 km of 2D seismic was acquired, including 3 lines to the east and west (see Figure 13).

![Figure 13: Final seismic outline for the Ghana UNCLOS Project](image)

8. Submission of Ghana to CLCS

On the 28th of April 2009, about two weeks before the expiration of its deadline set for 13 May 2009, Ghana became the 26th State to make its submissions in respect of its outer CS to the CLCS under Article 76 of LOSC. In line with the CLCS Rules of Procedure and the Scientific Guidelines, the submission consisted of three parts, namely the executive summary, a main body and the supporting scientific and technical data. The executive summary, which is the only part of the three part documentation published on the United Nations website based on requirements of confidentiality, includes two maps, depicting the Ghanaian outer CS on its Eastern

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66 These companies include SeaBird Exploration, TGS-NORCE, GEMS, & WaveField, Fugro Oceaneisimica S.p.a
Extended Continental Shelf Region and the Western Extended Continental Shelf Region (Figure 14). The former encloses an outer CS of 9,387.8 sq km, while the latter encloses a more modest area of 4,741.8 sq km. The latter figure was revised to 6,445.0 sq km as a result of the inclusion of new seismic data acquired in the west and presented as addendum to the main submission. In delineating the outer limits of the CS beyond 200 M, Ghana relied on the Irish or Gardiner formula (i.e. the 1% of the Sediment Thickness option) and its outer limits for the relevant areas were constrained by the 350 M line.  

Figure 14: Maps submitted to the CLCS indicating the location of Ghana’s Extended Continental Shelf Regions.

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68 Para.3.1 of the Executive Summary
9. Conclusion.

The journey of Ghana to fulfil its international obligations in respect of its extended CS under the LOSC has been a complex and long haul one. In spite of the technical and financial challenges, Ghana was able to make its submission prior to its deadline, a clear indication of its determination to comply in good faith with its obligation under the LOSC. While this is no mean achievement, the journey is by no means over as the CLCS still has to rummage through the long list of prior submissions before it eventually considers and makes recommendations in respect of the Ghanaian submission. Nonetheless, this submission, along with that of other States, including other African States, is undoubtedly a giant step towards the proper demarcation of the outer limits of the CS of all coastal States so that the scope of the seabed and subsoil beyond national jurisdiction (the Area), the common heritage of mankind, may be determined with certainty.

\[69\] Art.76(8) of LOSC