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THE ROLE OF NORMS OF BEHAVIOUR IN AFRICAN OUTER SPACE ACTIVITIES

Facilitating the Process
for the Development of an
International Code of Conduct
for Outer Space Activities



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The Role of Norms of Behaviour in African Outer Space Activities¹

Introduction

Over the last few decades, advances in outer space technology have spread to every corner of the world, changing the way that human beings interact and communicate. Space-based services, once the privilege of a select few states, have reached users of every level of economic and social development, including in the Asia–Pacific region, Latin America, and particularly Africa. Attendees of the recent conference of the African Union Ministers in Charge of Communications and Information Technologies recognized the immense value of space-based services for Africa and the many ways that they are being used to support African social, economic, and security development. Africa is one of the fastest growing markets for telecommunications and is now seeking to broaden its access to a wider array of services to benefit weather forecasting, disaster management, peace, and security.² The region has placed high emphasis on integration and utilization of space-based services to further support economic, social, and security development. Indeed, in recent years, African states have demonstrated—through the investment of time, money, and resources—that they are keen to benefit from outer space technologies, as they are a crucial component of ongoing development.

This growing dependency on space assets will, consequently, expose users of space-based services, to a significantly greater degree, to the rising safety and security risks that exist for space assets. Issues such as space debris and interference with satellites pose increasing threats to the integrity of space assets—assets that provide critical services. The space domain is becoming both congested and an environment where power projection and terrestrial instabilities are being expressed. Gaps in existing international law and national policies have left uncertainty as to how these issues will be resolved. But if they are left unaddressed, it will result in a significant reduction of the usefulness of outer space for all.

It is against this backdrop that the international community has sought to find cooperative solutions within multilateral bodies to the risks and threats to activities in outer space. One solution that has generated considerable discussion is the development of norms of behaviour for outer space activities that would act as voluntary “rules of the road” for space, providing actors with an understanding of the acceptable parameters for the conduct of responsible space activities. Such norms would serve to preserve and enhance stability for all actors in outer space, aiming to ensure a stability that has so far allowed all states to take advantage of the huge benefits space services have to offer. For Africa, a successful implementation of key norms of behaviour should result in the assurance of the long-term sustainability of outer space activities and the realization of Africa’s efforts to make outer space services a key component of its long-term development strategies.

Africa’s growing use of outer space as a tool for development

The outer space domain has served to facilitate a number of economic, social, and environmental developments across Africa. Satellites are a cornerstone of mobile telecommunications and Earth observation, two applications that are used by people all over the continent. As a result of end-user technology becoming more widely available, Africa has emerged as the source for some of the highest demand for new space-based services.

Telecommunications throughout Africa

Telecommunications are highly dependent on space-based infrastructure. In Africa, the sector is growing fast and bringing with it economic and social advances. According to statistics from the International Telecommunication Union (ITU), Africa is less integrated than other regions of the world as regards telecommunications. In 2011, the whole of Africa, a continent with over 1 billion inhabitants, had 434 million mobile-cellular subscriptions; by contrast, Europe, a continent with fewer than 750 million inhabitants, had 747 million subscriptions.³ Africa had only 27 million mobile broadband subscribers compared to Europe’s 226 million subscribers. However, the ITU’s statistics also show that Africa’s mobile-cellular subscriptions have grown by nearly 500 per cent in the last six years; Europe’s growth of just over 25 per cent is modest in comparison. In addition, from 2010 to 2011, Africa’s active mobile broadband subscriptions nearly doubled, the highest rate seen in the world during that period. This shows that, while overall usage of telecommunication devices may

1 UNIDIR would like to thank Gabriella Irsten of Reaching Critical Will for her research contribution to this background paper.

2 Working Documents of the Fourth Conference of African Ministers in Charge of Communication and Information Technologies, 2–6 September 2012, Khartoum, the Sudan, para. 119, <http://pages.au.int/sites/default/files/CITMC-4%20Working%20Document-Eng-Final-29082012-MY.pdf>.

3 ITU, “Key global telecom indicators for the world telecommunication service sector”, updated 29 June 2012, www.itu.int/ITU-D/ict/statistics/at_glance/keytelecom.html.

still be comparatively low, African use of mobile technology is well on the rise and the shift away from fixed-line services will increase Africa's dependence on the space-based services that enable mobile networks. This, once again, highlights the growing dependence of Africa on space-supported services.

If such trends continue, Africa will be one of the most important markets for telecommunication development and innovation. Much of this development has been, and will be, driven by satellite services. As said, telecommunication development in Africa will be highly dependent on the safety and integrity of assets in space. African policymakers therefore have increasing equity in the development of instruments intended to ensure stability in the space domain.

Economic development enabled by telecommunications

The growth of financial services in Africa is also being supported by continued access to reliable space-based services. There has been a significant rise in the number of financial transactions being carried out through mobile money transfer services, which provide access to digital banking to millions of cellphone users and is rapidly spreading across the continent. It was reported that Kenyan mobile money transfers nearly equalled the national budget in 2012,⁴ while in Tanzania, mobile transactions jumped from TZS1.9 million in 2010 to TZS48 million in 2012.⁵ Such growth has also been seen in countries such as Botswana, Namibia, Zambia, and Zimbabwe.⁶ As more and more Africans integrate this technology into their daily lives, the reliable service of space assets that enable mobile money transfers will become increasingly critical to the African economy.

Earth observation and remote-sensing for disaster management and sustainable development

Given the extremes of climate and the high incidence of natural disasters in the African continent, space-based imaging services can make a major contribution to improving localized disaster response and resource monitoring and management capabilities. African states have recently been investing in their ability to monitor environmental and climate activity on the continent from outer space in order to better deal with natural disasters. In 2011, Nigeria launched two satellites that last year played a significant role in the management of floods in Africa by providing critical mapping images of Nigeria and surrounding states.⁷ The South African Space Agency has developed a significant Earth observation programme that, with funding from the South African Department of Science and Technology, has led to the establishment of an online catalogue of Earth observation data that can be accessed by the general public.⁸ The Algerian Space Agency, with its two satellite systems focused on Earth observation, is able to obtain high-quality imagery for management of natural disasters as well as land planning, forestry, and so forth.

However, only six African states have so far acquired domestically owned satellites that provide observation data. Other states have sought partnerships and cooperative efforts in order to make access to space services more widely available. In 2006, the United Nations General Assembly approved the establishment of the Platform for Space-Based Information for Disaster Management and Emergency Response, a programme that has provided data for disaster management and has been particularly active in Africa.⁹ The European Union has extended access to the Copernicus Earth observation programme in order to support African environmental policies for sustainable development.¹⁰ The African Resource Management (ARM) satellite constellation, an effort by Algeria, Kenya, Nigeria, and South Africa, is seeking to provide Africans with Earth observation capabilities for resource management applications and to generate indigenous knowledge for the development and transfer of satellite technology.¹¹ Again, these programmes—which are unlocking exceptional resources for policymakers all across Africa—will be highly dependent on the stability in outer space that has permitted development for people across the world.

4 E. Okutoyi, "Mobile money transfers in Kenya close to country's national budget", *Humanipo*, 27 November 2012; and also T. Ogunlesi and S. Busari, "Seven ways mobile phones have changed lives in Africa", *CNN*, 14 September 2012.

5 "Mobile money transactions top TZS1.7tn, Bank of Tanzania reports", *TeleGeography*, 13 December 2012.

6 "Double digit subscriber growth in Southern African mobile markets", *Cellular News*, 3 May 2010.

7 National Space Research and Development Agency of Nigeria, "NASRDA's intervention in flood disaster management", www.nasrda.gov.ng/floodmaps.html.

8 South African National Space Agency, "SANSA Earth observation online catalogue", <http://catalogue.sansa.org.za>; and S. Burger, "Earth observation satellites hold benefits for South Africa", *Engineering News*, 26 October 2012.

9 See United Nations Platform for Space-Based Information for Disaster Management and Emergency Response, www.un-spider.org/?lf=1090&lng=en; and "Space solutions proposed to lessen Africa's vulnerabilities to natural disasters", UN-SPIDER/United Nations Economic Commission for Africa workshop, with support of the government of Austria and in cooperation with Secure World Foundation, Addis Ababa, Ethiopia, 15 July 2010.

10 See www.bragma.eu/home.

11 S. Mostert, "The African Resource Management (ARM) satellite constellation", *African Skies*, no. 12, October 2008.

Space and African security

The dual-use nature of space assets, in particular those dedicated to telecommunications and Earth observation, means that even satellites built and launched for civilian purposes can be used to provide services and data that enhance security capabilities. South Africa, for example, has been using Earth observation satellites to monitor illegal fishing and piracy off its coast.¹² Few African states have openly expressed official plans to develop space capabilities for specific security and defence programmes; such options are prohibitively expensive for most states. However, as technology becomes more widely accessible, as seen in the case of nano-satellites and hosted payloads, an increasing number of states will have the means to develop defence programmes based on space capabilities. A consequence of such reliance is that through the incorporation of space technology into national and regional security strategies, African states will increase their dependency on space assets and therefore the need for the outer space environment to remain stable, conflict-free, and as safe and predictable as possible.

Africa's domestic space-related activities are still developing, but its rate of growth of demand for space services is the world's highest. A call has been launched for a joint African space agency to be established which could aid in increasing access to space for the whole continent by sharing costs and risks for the development of space-based services among states. At its most recent meeting, the African Union information and communications technology (ICT) ministers requested that the African Union Commission implement the recommendations of a feasibility study carried out on a possible African Space Agency and develop a space policy for the continent in collaboration with relevant stakeholders, noting in particular remote-sensing applications and satellite imagery.¹³ If these efforts are to deliver tangible benefits, then African policymakers and strategists will also have to consider the growing risks in outer space, such as space debris and anti-satellite technology, and consider what steps should be taken to protect African endeavours in the future.

Risks to long-term sustainability in outer space

Outer space is fundamentally difficult to operate in. Aside from the physical realities of the environment itself, the limited awareness of the activities of others, and limited capacity to identify threats, man-made or otherwise, are but some of the risks to making sure that humanity can continue to maximize the benefits of space activities in the long term. There are close to one thousand satellites in outer space, operated by over 60 states and entities. Combined with increasingly cheaper solutions for space-based needs—such as nano-satellites and hosted payloads—it is clear that there will be significantly more traffic introduced into orbit in the coming years.

A major threat to satellites is being struck by a piece of space debris. There are currently thousands of pieces of uncontrollable debris in orbit, the result of satellites breaking up and sections of rockets being discarded or disintegrating.¹⁴ Space situational awareness systems are presently tracking more than 21,000 pieces of debris larger than 10cm, and the debris population of pieces between 1cm and 10cm is estimated at 450,000.¹⁵ This does not include the millions of fragments that are too small to track. If even a small piece of debris (say 1cm) collides with a satellite, given the speeds at which it is travelling, it can cause major damage or disable the satellite completely. It is estimated that the amount of space debris in low Earth orbit, the most populated orbit, has increased by 50 per cent in the last five years alone.¹⁶ The rate at which space debris is increasing means that the risk of collision for space assets is proportionally growing.

Along with advances in the field of civil and commercial space-based services, technology has also emerged that could be used to interfere with the functions of a satellite (such as the jamming of a signal)¹⁷ or its physical destruction by the use of kinetic anti-satellite technology (such as a missile).¹⁸ Both of these capabilities are destabilizing, and, should they become prevalent, would greatly reduce the reliability of space-based services. The threat of cyberattacks on satellite systems, as

12 S. Burger, "Earth observation satellites hold benefits for South Africa", *Engineering News*, 26 October 2012.

13 2012 Khartoum Declaration, adopted by the African Union Conference of Ministers in Charge of Communication and Information Technologies, 4th Ordinary Session, Khartoum, the Sudan, 2–6 September 2012, para. 16, http://pages.au.int/sites/default/files/Declaration_Khartoum_CITMC4_Eng_Final_0.pdf.

14 S. Kibe, "Removing space debris: the urgent need to clean up Earth's Orbital environment", Japan Aerospace Exploration Agency, www.jaxa.jp/article/interview/vol67/index_e.html.

15 See <http://orbitaldebris.jsc.nasa.gov/faqs.html#3>.

16 S. Cruddas, "ESA plans to clear up space junk", *SEN*, 3 October 2012.

17 "Satellite interference", Holman Fenwick Willan LLP, 2012, www.hfw.com/__data/assets/pdf_file/0016/18052/HFW-and-ID-Article-Satellite-Interference-A4-4pp-February-2012.pdf.

18 S.A. Kaiser, "Why states should sign the Code of Conduct for Outer Space Activities", in A. Lele (ed.), *Decoding the International Code of Conduct for Outer Space Activities*, 2012, pp. 91–92.

has been examined in a number of international war games, has also become a growing concern, leading many experts to believe that, in future, military activities will be preceded by cyberattack on an enemy's space capabilities.¹⁹

These threats present unique challenges to all actors in outer space. What makes challenges in the space domain particularly onerous is that the actions of any single actor can have significant consequences for the activities of others. Complicating matters further is the fact that international law does not offer much guidance by way of addressing these specific issues, especially within the relatively limited body of outer space law, which has not seen any significant updates in over 30 years. Since then, new issues have arisen which create novel risks to human space activities. There is a need therefore, for all states—whether established, emerging, or future space actors—to engage in multilateral dialogues in order to find a cooperative international solution that will be capable of mitigating these universal hurdles.

The current reality: why norms of behaviour?

The current political and legal frameworks that support space security are not meeting the needs of today's spacefaring and space-reliant communities. As such, space policymakers have been turning to other options, most notably frameworks of norms of behaviour.

Forming the basis for the current space regime are the five United Nations Outer Space Treaties, the last of which was adopted in 1979 and has only 13 parties. These cover the activities of states in the exploration and use of outer space, including the rescue and return of astronauts, the return of space objects, liability for damage caused by space objects, and registration of objects launched into outer space. No explicit steps have been made towards the adoption of any new space treaties within the United Nations since then.²⁰ Similarly, the work of the Conference on Disarmament, the single multilateral disarmament negotiating forum of the international community, has found it difficult to make progress on issues regarding outer space for several years due to an inability to come to a consensus on the priorities for its work programme.²¹

As a result of the lack of progress on legally binding instruments within traditional fora, combined with a sense of urgency on the part of the international community to address stability and sustainability issues in outer space, alternative options are being sought by policymakers to address threats in outer space. It is this drive for progress that has led policymakers to focus on developing non-legally binding solutions that “help establish norms for responsible space-faring nations in the near term ... [while] a space treaty could take many years to negotiate, and decades to enter into force”.²²

So, why norms of behaviour? One of the perceived advantages of the norms of behaviour model is the fact that they do not create binding obligations on states, permitting incremental movement towards solutions to issues that need to be addressed in a timely manner, especially those issues where political obstacles can make the negotiation of formal instruments a long and protracted process.²³ For example, while it has been many years since a formal space law instrument has been adopted, the United Nations General Assembly recently adopted the United Nations Space Debris Mitigation Guidelines, prepared by the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space (COPUOS), in order to make tangible progress on the issue of space debris rather than no progress at all.²⁴ Such small steps can be useful in the maintenance of political momentum on particular issues.

Norms of behaviour are also often seen as being useful because they provide a level of flexibility that is not possible with traditional, highly structured, legally binding treaties.²⁵ As has been seen with norms of behaviour in other domains, such as aerospace and maritime activities, rules of the road can be amended with relative ease as circumstances and needs

19 G. Schulte, “Protecting NATO's advantage in space”, *Transatlantic Current*, May 2012; and M. Kleiman and S. McNeil, “Red lines in outer space”, *The Space Review*, 5 March 2012.

20 S. Aoki, “The function of ‘soft law’ in the development of international space law”, in I. Marboe (ed.), *Soft Law in Outer Space: The Function of Non-Binding Norms in International Space Law*, 2012, p. 57. A commercial space law treaty has recently been adopted, the Protocol to the Convention on International Interests in Mobile Equipment on Matters Specific to Space Assets, adopted in Berlin on 11 March 2012, though it has not yet entered into force.

21 T. Caughley, *Breaking the Ice in the Conference on Disarmament: A Wrap-Up*, UNIDIR, 2011.

22 M. Krepon, “Origins of and rationale for a space code of conduct”, in A. Lele (ed.), *Decoding the International Code of Conduct for Outer Space Activities*, 2012, p. 31.

23 A. Kerrest, “Treaty vs resolution”, in *ibid.*, pp. 85–86.

24 General Assembly, *Report of the Scientific and Technical Subcommittee on its Forty-Fourth Session, Held in Vienna from 12 to 23 February 2007*, UN document A/AC.105/890**, 6 March 2007, para. 99. It is worth noting that, because the Space Debris Mitigation Guidelines are a non-legally binding document, it was never discussed before the COPUOS Legal Subcommittee.

25 C. Brunner and G. Konigsberger, “‘Regulatory Impact Assessment’—a tool to strengthen soft law regulations”, in I. Marboe (ed.), *Soft Law in Outer Space: The Function of Non-Binding Norms in International Space Law*, 2012, p. 90.

change. This allows different frameworks to be tested before more formal agreements are sought, giving the international community an opportunity to gauge the effectiveness of specific approaches. Furthermore, norms of behaviour can be used as a tool for harmonizing national laws and practices, giving states ample room to move towards adherence in accordance with their own economic and technological capacities.²⁶

Characteristics of effective norms

When developing frameworks that will serve as the basis for norms of behaviour, there are certain key characteristics that policymakers should ensure that such norms embody. Some commentators have argued that norms of behaviour are not effective, owing to their lack of enforcement mechanisms.²⁷ Others however, have argued that the continued expansion of human space activities requires the near-term implementation of norms aimed at specific categories of space activities.²⁸ To bring clarity to this debate and to assess potential pitfalls in space security norm development, it is of value to look to the characteristics of a successful set of norms in order to judge their usefulness.

One academic analysis has identified six characteristics that are needed to ensure the effectiveness of norms of behaviour.²⁹

- Norms should be “transparent” and openly state their non-legally binding nature.
- Widespread knowledge and “publicity” should accompany norms so that the relevant actors are given a meaningful opportunity to bring their activities into line within the desired framework.
- “Clarity and precision” are required in the language of norms so that actors will know precisely what is being asked and recommended by the norms.
- Actors must also be able to “rely” that adherence to norms will not result in negative social stigmas associated with the proscribed behaviour.

In addition to these basic characteristics, widespread “involvement” is particularly important to the development process because norms must take into account a wide array of needs and interests in order to produce an instrument that is capable of commanding meaningful support. To achieve this, it is important to involve those actors that will be affected by the norms throughout the consultation and development process. Otherwise, norms run the risk of being out of touch with the key stakeholders whose behaviour they seek to influence.

Finally, “awareness of the necessity for adherence” is, arguably, the most crucial element for widespread adherence and compliance. If stakeholders are aware of the implications of certain actions, such as abandoning an extinct satellite in a highly populated orbit where it is likely to strike another satellite, then it is more likely that actors will self-regulate. This is the ultimate goal of all frameworks and codes: to influence behaviour without formal means of enforcement.

These characteristics are particularly timely as several consultative processes are presently underway for the development of frameworks and norms of behaviour.

Current initiatives of note for the development of a framework of norms of behaviour

At present, there are several initiatives underway in multilateral fora for the development and establishment of norms of behaviour for outer space activities. The first of these is the United Nations Group of Governmental Experts (GGE) on transparency and confidence-building measures in outer space activities, an initiative originating in the United Nations General Assembly First Committee, which “deals with disarmament, global challenges and threats to peace that affect the international community and seeks out solutions to the challenges in the international security regime”.³⁰ The GGE is intended to help improve transparency in space and reduce the risk of misunderstandings and miscommunications between outer space actors.³¹ The GGE will produce a report that will outline recommendations for the strengthening of

26 S. Aoki, “The function of ‘soft law’ in the development of international space law”, in I. Marboe (ed.), *Soft Law in Outer Space: The Function of Non-Binding Norms in International Space Law*, 2012, p. 61.

27 A. Lele, “Space code of conduct: inadequate mechanism”, in A. Lele (ed.), *Decoding the International Code of Conduct for Outer Space Activities*, 2012, p. 6.

28 S. Aoki, “The function of ‘soft law’ in the development of international space law”, in I. Marboe (ed.), *Soft Law in Outer Space: The Function of Non-Binding Norms in International Space Law*, 2012, p. 57.

29 C. Brunner and G. Konigsberger, “Regulatory Impact Assessment—a tool to strengthen soft law regulations”, in I. Marboe (ed.), *Soft Law in Outer Space: The Function of Non-Binding Norms in International Space Law*, 2012, pp. 94–95.

30 See www.un.org/en/ga/first.

31 General Assembly, *Transparency and Confidence-Building Measures in Outer Space Activities*, UN document A/RES/63/68, 12 January 2009.

safety and security in outer space and lay the basis for the development of future frameworks and norms of behaviour for space activities. This work is scheduled to be completed in 2013.

Another initiative being carried out under the auspices of the United Nations is the Working Group of the COPUOS Scientific and Technical Subcommittee on long-term sustainability of space activities.³² The Working Group will make recommendations for measures to ensure safe and sustainable use of space for peaceful purposes. In particular, one of its goals is to produce best practice guidelines, based on current practices and technical considerations, that can apply to all space actors. The Working Group is divided into four subgroups, which cover space utilization, space debris, space weather, and regulatory regimes. The Working Group has been conscious of parallel initiatives being carried out in other fora and has been careful to avoid the duplication of effort. The

Lastly, on 5 June 2012, the European Union announced that it would be launching an ad hoc multilateral diplomatic process to “discuss and negotiate its initiative for an International Code of Conduct for Outer Space Activities”.³³ The purpose of the Code is to “enhance the security, safety and sustainability of all outer space activities”³⁴ by encouraging responsible behaviour in space through the introduction of best-practice guidelines. The European Union plans to hold open-ended consultations where representatives from all United Nations Member States are invited to participate in the development of a code.³⁵ It is intended that the experts at these consultations will present a final version of the code at a diplomatic conference that will be open to all states.³⁶

The European Union has put forward two reasons favouring an ad hoc diplomatic process. First, the European Union does not consider it suitable to “hold substantive multilateral discussions in any existing international fora dealing exclusively with either non-proliferation and disarmament issues”.³⁷ This includes the Conference on Disarmament and the United Nations First Committee. Likewise, because it would address security issues, the code would not fall under the exclusive ambit of COPUOS, which addresses civil space issues. Secondly, the European Union hopes to broaden the participation in this initiative to non-members of these fora and to bring negotiations to a timely conclusion for presentation to the UN General Assembly for endorsement.³⁸ In short, broad participation is being sought for the development of a widely-acceptable code that will be open to all States, an approach consistent with the analysis mentioned above.

Conclusions: Africa and the long-term sustainability of outer space activities

Investment in technology and infrastructure in Africa is booming. The continent’s potential for economic and social growth has been recognized by investors both foreign and domestic, and the role to be played by outer space capabilities has been recognized by many as crucial. The solutions that are being sought by many policymakers in Africa are long term in their nature, and they are encouraging both government and private actors to continue to find ways to make outer space a critical part of policy strategies all across the continent.

As such, the time is now for African engagement in the development of the future space security regime. Multilateral efforts for the development of norms of behaviour for outer space activities are of particular importance to African states because their present efforts will mature in a domain affected by existing threats to stability in outer space. It is, therefore, critical for African states to participate in consultations to develop any type of future regime so as to ensure that any resulting instrument accounts for their particular interests, namely those of emerging space actors.

Also, because African states are poised to emerge as new actors in outer space, they also represent a group whose activities will have an impact on stability in the space domain in the coming years. If norms of behaviour are to be effective, they will require a critical mass of states to adopt them, and the emerging actors in Africa will be an important part of that mass. As efforts to finalize multilateral instruments go forward, outreach efforts should be made to ensure that Africa can take a meaningful position in multilateral consultations.

32 General Assembly, *Report of the Committee on the Peaceful Uses of Outer Space*, UN document A/65/20, (July 2010, para. 152.

33 European Union External Action Service, “The EU launches negotiations on an International Code of Conduct for Outer Space Activities”, http://eeas.europa.eu/non-proliferation-and-disarmament/outer-space-activities/index_en.htm.

34 Article 1.1 of the revised draft International Code of Conduct for Outer Space Activities, www.consilium.europa.eu/media/1696642/12_06_05_coc_space_eu_revised_draft_working__document.pdf.

35 European Union, “EU Statement—United Nations First Committee: Outer Space”, 22 October 2012, paras. 10 and 12, www.eu-un.europa.eu/articles/en/article_12753_en.htm.

36 *Ibid.*, para. 13.

37 *Ibid.*, para. 10.

38 *Ibid.*

No longer the exclusive domain of superpowers, space is now a truly global endeavour. Ensuring a safe, sustainable, and secure environment for African action in, and utilization of, space is essential if national and regional equity is to be protected and the rewards of space services are to be realized for African economic, developmental, and security gains.



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CFSP/2012/05/COC-UNIDIR, carried out with funding by the European Union