

# **The Law Governing the Acquisition and Use of Earth Observation Data in South Africa: A Need for Legal Harmonisation**

Adv. Phetole Sekhula

Councillor, South African Council For Space Affairs, advppsekhula@gmail.com

## **Abstract**

*The law on acquisition and use of earth observation data in South Africa is scattered through various pieces of legislation residing in different user entities. The primary pieces of legislation governing earth observation, The South African Spatial Data Infrastructure Act of 2003 provides for the institutional framework to enhance the acquisition, integration, distribution and use of spatial data, including satellite-derived data while the South African Space Affairs Act of 1993 establishes a regulatory framework for use of outer space, which satellite earth observation is a great component. There is also the South African National Space Agency Act of 2008, which authorises the South African National Space Agency (SANSA) to acquire and utilise satellite remote sensing data.*

*It is of great concern that these various pieces of legislation confer authority on various entities to acquire, integrate, enhance and disseminate earth observation data. There is a great risks of duplication of effort leading to increased costs for the users of earth observation data and an unnecessary drain on the national fiscus since the majority of these entities are either State-owned and/or funded by the Treasury.*

*It is therefore necessary to analyse these pieces of legislation, observe the overlaps, if any, and suggest an integration legal approach to harmonise earth observation data laws at a national level.*

## **1. Introduction**

Earth observations can be generally be considered to be the sum total of observed characteristics and data regarding the earth atmosphere, land surface, the marine environment as well as water resources. This data is collected by a variety of technical methods including aerial surveillance and satellite platforms. The technical process regarding observing, recording and classifying objects on earth is commonly referred to as remote sensing (Lyall & Larsen, 2009).

The present discussion is skewed towards satellite remote sensing because of its pervasive nature and the legal implications it has on the present unfolding regulatory environment in South Africa and the world at large. Satellites do not respect physical boundaries and political considerations as they orbit the earth and gather data of object they see in their footprint, hence, the need for clear rules of engagement with respect to function (Diedericks-Verschoor, 2008; Reynolds & Merges,

1997). Thus remote sensing applications now permeate daily life and work and services range from agricultural use, environmental mapping and management, disaster management, meteorology, land use monitoring, urban planning, and geodetic to security and judicial processes (GEOSS, 2001).

In South Africa, earth observation is the axis around which the National Space Programme revolves. The National Earth Observation Program (NEOP) is an important component of the National Space Programme (NSP) implemented by the South African National Space Agency (SANSA) through a plan to progressively develop, launch and operate earth observation satellite for purposes of resource management, environmental management, disaster management, planning and decision-making as well as research and development in earth observation (SANSA, 2010). As an active member of GEOSS and associated international efforts to develop responsive mechanisms to address national needs using space technologies, South Africa has developed institutional frameworks to harness earth observation applications, products and services. The launch of the National Earth Observation and Space Secretariat (NEOSS) is a culmination of efforts to address “the need for coordinating the collection, assimilation, and dissemination of Earth observation data so that they can be fully utilized to support policy, decision-making, economic growth and sustainable development” (Pandor, 2010).

At the technical level, SANSA has developed the Earth Observation Data Centre for receiving, processing and disseminating earth observation data. There is also the National Imagery Acquisition Programme run by the Chief Directorate: National Geo-spatial Information (NGI), a component of the Department of Rural Development and Land Reform charged with implementing the requirements under the Spatial Data Infrastructure Act 54 of 2003 which has as its primary objectives the provision for determining standards to facilitate the sharing of spatial data. Although conceived as primarily in situ data, the NGI is now utilizing space-derived data in the discharge of its functions as a host of the South Africa Data Infrastructure (SASDI).

South Africa has launched two earth observations satellites into orbit. SunSat was a micro satellite developed at the University of Stellenbosch Engineering Department and launched in 1999. It lasted for two years. Sumbandilasat was manufactured by a local company, SunSpace Systems and launched in 2003. It provided valuable experience in the manufacture of small satellites and provided spectacular images before being damaged and rendered non-functional by sun storm.. The two small satellites provided an impetus to South Africa as a space exploring nation. They also demonstrated the capabilities of the local industry to enter into the foray of the space business. This is the experiential base from which to launch the envisaged National Space Programme which primarily advocates that the country to develop a niche in the small satellite manufacturing market (SANSA, 2011). Recently, South Africa has participated in the African Resource Management Constellation (ARMC) which is an initiative between four African countries. This initiative envisages Algeria, Kenya, Nigeria and South Africa contributing satellites to a constellation that will be collectively pooled to provide space-derived data for use by the countries concerned. As a

member of the African Resource Management Constellation, South Africa has an obligation to contribute satellites to the constellation.

The use and exploration of outer space is guided by norms and rules derived from the general principles of international law and those developed out of the unique experience in the space environment (Christol, 1991). Hence, South Africa's foray into outer space must be exercised with due regard and in conformity with established *corpus lex spatialis*. To that end, South Africa enacted the Space Affairs Act 84 of 1993, amended in 1995 which establishes the need for space policy and the functions for the South African Council for Space Affairs ("SACSA") to assist the Minister of trade and Industry in establishing a regulatory framework for space activities.

More recently the South African National Space Agency Act of 2008 has been enacted to establish SANSA as an implementing agent for the NSP.. As previously stated, the Spatial Data Infrastructure Act (SDI) regulates spatial data and its dissemination. There are various pieces of legislation related to astronomy and orbit/spectrum use which are outside the ambit of present consideration such as the Electronic Communications Act 36 of 2005 and the Astronomy Geographic Advantage Act 21 of 2007.

These three pieces of legislation are administered by three Departments respectively, *viz*, the Department of Trade and Industry (DTI) administers the Space Affairs Act, SANSA is under the political authority of the Department of Science and Technology (DST), while the SDI is administered by Department of Rural Development and Land Reform. There is apparent confusion from a user perspective, wastage from duplication of efforts and the resultant compromise in standards and service delivery emanating from overlapping legislative mandates relating to Earth observation data in South Africa. The legal and administrative implications of these overlapping authorities create disharmony in the acquisition and distribution of earth observation data.

## **2. Earth Observation Legal Framework**

### **2.1 The International Outer Space Regulatory Regime**

Earth observation, as it relates to satellite remote sensing, is a space activity governed by international space law. Due to its transnational character, earth observation has been central to the implementation of international cooperative mechanisms in the use of outer space, if not the major catalyst for such international coordination and cooperation. This is reflected in the plethora of intergovernmental organisations active in the earth observation arena as well as the policy and legal framework governing the use of remote sensing data. The majority of these international cooperative efforts manifest in the environmental and disaster management milieu, including, but not limited to, the World Meteorological Organisation (WMO), UN-SPIDER; International Strategy for Disaster Reduction (ISDR), etc. GEO is perhaps a more elaborate examples of such international cooperation (Lyall & Larsen, 2009).

The over-arching legal framework for earth observation, the United Nations Principles On Remote Sensing, is a reflection of the need to coordinate the use of remote sensing on international basis (UNTS, 1986). The 1986 UN Principles provide a basis for international law on the acquisition, dissemination and use of remote sensed data. While there is a trend towards a more restrictive interpretation of the Principles based on diverse national concerns, the efficacy and influence of the Remote Principles is acknowledged internationally. Yet, remote sensing from outer space, as both space and an earth-based activity, is governed by both general principles of international law as well as domestic law. In some instances, space-faring nations have enacted specific remote sensing laws, while some have only policies guiding the use of remote sensing data, and still more countries with neither laws nor policies on remote sensing (Gabrynowicz, 2008).

## **2.2 Jurisdiction, Control and Supervision in Outer Space**

International space law developed rapidly as soon as the first man-made capsule orbited the earth in late 1957. Sputnik orbited the earth and was soon followed by a manned spacecraft carrying USSR cosmonaut Yuri Gagarin, giving impetus to the need for rules of conduct in the exploration and use of outer space. The United Nation was seized with the duty to develop set of rules to ensure an orderly use and utilisation of outer space. The 1963 Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space laid the foundation for the development of principles of international space law and was thus converted into a Treaty some few years later (Christol,1991).

The 1967 Outer Space Treaty has reached a state of international acceptability such that the Principles enshrined therein are universally accepted as constituting international customary law (Lyall & Larsen, 2009). There are thirteen Principles which impose affirmative duties on States to conduct their exploration and use of outer space in consonance with international law, including the Charter of the United Nations.

## **2.3 Freedom of Use of Outer Space**

Outer space is a province of all mankind and must be explored and used “for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development...” (Christol,1991). All States are free to explore and use outer space without discrimination, on a basis of equality in conformity with international law. The freedom of scientific investigation in outer space is underpinned by the need for the States to facilitate and encourage international cooperation (Christol, 1991). Appropriation of outer space, including the Moon and other celestial bodies, by claims of State sovereignty, by means of use of occupation or any other is prohibited. (Lyall & Larsen, 2009).

## **2.4 Responsibility in Outer Space Activities**

The 1967 Outer Space Treaty imposes an obligation on State Parties to bear responsibility for activities in outer space carried by nationals of that State. Article VI provides that the State Parties:

*shall bear international responsibility for national activities in outer space, including the Moon and other celestial bodies, whether such activities are carried on by governmental or by non-governmental entities, and for assuring that national activities are carried out in conformity with the provisions set forth in this Treaty.*

Article VI further requires State Parties to authorise and continually supervise activities of non-governmental entities in outer space. Thus, Article VI provides the legal basis for States to provide mechanisms that ensure the national under their respective jurisdiction and control conduct outer space activities with proper authorisations. Any entity that conducts activities in outer space ought to do so under authority of an appropriate State in order to address anomalies that may arise given the perilous environment of outer space. Issues of liability arising from damage resulting from outer space activities can be addressed in that regard.

## **2.5 Jurisdiction and Control in Outer Space**

Jurisdiction relates to the ability of a State to exercise legal authority based on territoriality or *in personam* rationale. Article VIII of the 1967 Outer Space Treaty provides that jurisdiction and control over space objects launched into outer space resides with the State on whose registry the space object is located. Jurisdiction and control extends to the personnel in outer space. Moreover, “ownership of objects launched into outer space, including objects landed or constructed on a celestial body, and their component parts, is not affected by their presence in outer space or on a celestial body...” Such ownership is not affected by the return of the space object to earth and if found beyond the limits of the State of registry, it must be returned to the latter where sufficient proof of identifying data is furnished.

## **2.6 Remote Sensing Law: International Dimensions**

The legal framework governing remote sensing is fraught with obfuscations given the genesis of remote sensing application (Lyll & Larsen, 2009). The dual use of remote sensing technology raises sensitive national security concerns justifying resistance to comprehensive legally binding international instruments (Reynolds & Merges, 1997). Yet, the practical benefits of remote sensing, including, but not limited to, data from places not accessible by conventional means such as steep mountainous areas, the Arctic regions, conflict-ridden and fire-ravaged, including the deep seas, coupled with the ability of satellites to revisit sites of interest regularly, provide a motive force for the development of policies and legal rules to ensure wider access and use of earth observation data (Lyll & Larsen, 2009).

The widespread use of remote sensing data raised concerns and arguments culminating in the adoption of the 1986 UN Principles on Remote Sensing. Remote sensing applications such locating deposits of new mineral and oil resources, effective environmental management, crop management, forestry and urban sprawl management were now pervasive. However, less resourced countries felt

slighted due to lack of access to data about their own countries when such data was widely available on the open market.

The UN Principles reflect the need to make remote sensing data promptly available on a non-discriminatory and reasonable cost basis. The Principles reflect and is an elaboration of the basic tenets of international space law enshrined in the 1967 Outer Space Treaty. Fifteen Principles express the need to strengthen international cooperation in the field of remote sensing. States are required to conduct remote sensing activities “for the benefit and in the interest of all countries, irrespective of their degree of economic or scientific development” based on “the principle of freedom of exploration and use of outer space on the basis of equality” (Lyall & Larsen, 2009). Principle IV seems to equivocates because it continues “these activities shall be conducted on the basis of respect for the principle of full and permanent sovereignty of all States and peoples over their own wealth and natural resources, with due regard to the rights and interests, in accordance with international law, of other States and entities under their jurisdiction”.

The Principles identify three categories of data and each category is treated uniquely. Principle I provides that there is “primary data” which is “raw data that are acquired by remote sensors...are transmitted or delivered to the ground from space by telemetry in the form of electromagnetic signals, by photographic film, magnetic tape or any other means”. Processed data means “products resulting from the processing of the primary data, needed to make such data usable” while “analysed information” means the “information resulting from the interpretation of processed data, inputs of data and knowledge from other sources”.

Remote sensing activities mean the operation of remote sensing systems, primary data collection and storage stations, and activities in processing, interpreting and disseminating the processed data”. The definition of remote sensing activities includes activities that take place on earth, even after the data is downloaded to the receiving ground stations. Therefore, Principle XIV reiterates the need for authorisation and continued supervision of remote sensing activities as stipulated in Article VI of the 1967 Outer Space Treaty.

## **2.7 Access To Data**

The most contentious provision of the 1986 UN Principles relates to access to remote sensing data. Principle XII provides that:

*As soon as the primary data and the processed data concerning the territory under its jurisdiction are produced, the sensed State shall have access to them on a non-discriminatory basis and on reasonable cost terms. The sensed State shall also have access to the available analysed information concerning the territory under its jurisdiction in the possession of any State participating in remote sensing activities on the same basis and terms, taking into account the needs and interests of the developing countries.*

There has been considerable debate on the extent and scope of this Principle (Jakhu, 2003). The meaning of non-discriminatory and reasonable cost terms has generated a lot of consternation in those quarters that argue for free access to data, especially as it concerns their territories. Yet, there has been changes and upheavals in the manner in which Sensing States make remote sensing data available. The genesis of discontentment is reflected in Article IV which declares seemingly contradictory legal postulations, *i.e.* freedom of use on the basis of equality and claim of sovereignty over resources located in one's country.

The logic of that latter argument is necessarily that one must question the rationale for paying for what is essentially one's property (Christol, 1991). The argument petered down to exhortation that a sensed State is entitled to "priority rights" to satellite-derived data concerning its territory. In the end, the practicalities required a compromise in the form of Principle XII where the sensed State will be given preference to acquired data at reasonable cost terms.

## **2.8 UN Principles Not Binding Law**

The 1986 UN Principles on Remote Sensing do not have the status of a binding treaty and are only persuasive in substance (Diedericks-Vershoor, 2008). Despite their non-binding character, the 1986 UN Principles have informed and lay the basis for much policy and law in those States that engage in remote sensing activities since today many States offer remote sensing data at cost or free (Gabrynowicz, 2008). Recently, however, there has emerged a trend towards a restrictive approach and interpretation of non-discriminatory access principle. Thus remote sensed data is available for commercial exploitation by a country other than the sensed State and/or stringent restrictions are imposed on *who* gets the data ostensibly on national security concerns. Yet the impact of the 1986 UN Principles is demonstrated by a plethora of efforts and international institutions geared towards making remote sensed data widely available at minimum cost.

The Recommendations of UNISPACE III to implement a space-based global natural disaster manager system resulted in the establishment of UN-SPIDER which provide universal access to all types of space-based information to support and facilitate capacity-building in the universal application of space-based data; the Disaster Charter is an inter-agency agreement which puts together national space agencies with responsibility for remote sensing and international space system operators who make their systems available to assist when disaster strikes. The Group On Earth Observation (GEO) was established to carry out the GEOSS Ten year Implementation Plan, while the Committee on Earth Observations (CEOS) plans to coordinate earth observation program and ensure maximum utilization of earth observation data. CEOS established a Data Democracy program which aims to increase data dissemination capabilities in developing countries.

## **2.9 GEOSS Data Principles**

GEO present a formidable effort to address wide access to earth observation data. When more than eighty countries and sixty-plus international organisations find common ground on the data access principles, hope is engendered that the universal spread and access to remote sensing is possible. The GEO plan is to develop a system of systems to realise the vision of a "future wherein

decisions and actions for the benefit of humankind are informed by coordinated, comprehensive and sustained Earth observation and information.”

The GEO Ten Year Implementation Plan boldly asserts that “the societal benefits of Earth observations cannot be achieved without Data sharing”. The GEOSS Data Principles, with respect to the core sharing of data, provide that firstly, there shall be full and open exchange of data, recognising the relevant instruments and national policies and laws, secondly, data must be made available with Minimum time delay and at minimum cost, and thirdly, all shared data and products must be free of charge or at no more than the cost of reproduction (GEOSS, 2010).

The achievement of these principles by all members of GEO will set the standards for full access and wide dissemination of EO data. The impact of such full and open exchange principle is bound to reverberate in national legal systems and produce changes in existing laws and policies on access to Earth observation data.

### **3 Legal Overlaps in Domestic Earth Observation Regulatory Framework**

#### **3.1 Authorisation and Supervision of Space Activities**

South Africa has enacted a general domestic space law to regulate national space activities. The Space Affairs Act seeks to “manage and control certain space affairs in South Africa”. While couched in general terms, the Space Affairs Act seeks to regulate the participation of all entities, both private and state involved in outer space-related activities, thus providing for conformity with the requirements of international space law as regards States’ international responsibility in outer space and, specifically the requirements contained in Article VI of the Outer Space Treaty on authorisation and supervision of national space activities.

South Africa is a signatory to the 1967 Outer Space Treaty as well as the three other space treaties, *viz*, Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (“The Rescue Agreement”). Recently, South Africa deposited the Instruments of Ratification for both the Convention on International Liability for Damage Caused by Space Objects (“Liability Convention”), and the Convention on Registration of Objects Launched into Outer Space (“Registration Convention”).

The South African Space Affairs Act does not expressly incorporate the international conventions and treaties to which it has acceded to. This is so because section 231 of the Constitution of the Republic provides for a legal process to incorporate international agreements into domestic law. In essence, the process involves that international agreements be subjected to a parliamentary process and approval by both Houses of Parliament and a Presidential proclamation in the Government Gazette, unless such agreements are of administrative or technical nature. Such a process has not been followed. Yet the Republic is bound by these treaties at an international level by virtue of being Signatory thereto.

### **3.2 Space Activities Under the Act**

The Space Affairs Act defines space activities as “the activities directly contributing to the launching of spacecraft and the operation of such craft in outer space”. In addition, there is “space-related activities” defined as “all activities supporting, or sharing mutual technologies with, space activities”. This definition is inclusive of all activities relating to or closely connected to remote sensing activities. The question that arises presently is whether earth observation is a “national space activity” specified in the Act. The anomaly arises because earth observation includes distinct processes that are space-based and those activities occurring on earth. The launching and operation of an earth observation satellite is an activity that falls within the outer space activity subject to international space law while the acquisition of such data on earth and distribution thereof may not be a “national space activity” within the context of the Space Affairs Act. There is therefore a need legal clarification on this issue.

The Space Affairs Act further provides that the Minister responsible for the Act may develop a general policy to be followed with a view to “meeting all the international commitments and responsibilities of the Republic in respect of the peaceful utilization of outer space, in order to be recognized as a responsible and trustworthy user of outer space”. To that end, a South African Council for Space Affairs (SACSA) is established to implement the space policy and “on behalf of the State take care of the interests, responsibilities and obligations of the Republic regarding its space and space-related activities in compliance with international obligations, treaties and agreements entered into or ratified by the Government of the Republic”.

Under the Space Affairs Act, all launching activities, including operation of spacecraft in outer space, can only be undertaken under the authority of a license issued by the SACSA pursuant to section 11. The license is required specifically for *launch activities* undertaken from the territory of South Africa or by South African legal entities elsewhere. Any other space activity which entails either South Africa’s international obligations or affect other national interests and is undertaken by juridical persons or such persons participate in such space activities, must be licensed. The Act also applies where liability for private space activities attaches for launches of space objects from South African territory. The Act mandates SACSA to license and regulate space activities. Under these specified conditions. It is not clear whether this mandate extends to downstream “services” such as the acquisition and distribution of earth observation data. Furthermore, the SANSA Act provides that SANSA has an objective, the acquisition and dissemination of such data.

In pursuance of its mandate, Space Council has thus far licensed two launches of earth observations satellites, Sunsat and Sumbandilasat. The licensing of these satellites was done under the general legal framework of the Act as there is no licensing framework in the form of regulations in place yet. Since the licenses were granted to the DST, issues and problems associated with private space enterprises were absent, thus allowing for a relatively easy regulatory approval.

### **3.3 Licensing Requirements Under the Space Affairs Act**

Section 11 of the Space Affairs Act provides for the conditions precedent for the issuance of a license. The Space Council may determine the conditions for a particular licensing, taking into account the following factors:

- (a) The minimum safety standards as determined by Council;
- (b) The national interests of the Republic; and
- (c) The international obligations and responsibilities of the Republic.

The narrow interpretation of the licensing provisions seems to confine SACSA to licensing launches and operation of space craft. There is no indication presently whether the SACSA will engage on regulating earth observation data as such given the earth-based nature of earth observation data, especially given the general mandate provided to SANSA in the earth observation arena.

### **3.4 The Role of the National Space Agency**

A national space agency was established in 2009 to harness the space activities of the various State agencies. The South African National Space Agency Act provides for the establishment of a South African National Space Agency. Section 5 provides the objectives of SANSA, which are, *inter alia*, is “to acquire, assimilate and disseminate space satellite imagery for any organ of state”. SANSA is empowered to enter into agreements with governments, administrations and person. SANSA does conclude bilateral agreements and individual contracts to acquire Earth Observation data. SANSA is under the political direction of the Ministry of Science and Technology.

The Earth Observation Data Centre (EODC) is a unit of SANSA, which has defined role to, *inter alia*, the provision of satellite data and value added products to support government, to provide satellite data to support research and development and human capital development in Earth Observation related science, and *to provide satellite data for national and international benefit* (Manga, 2012). SANSA therefore has positioned itself as a reseller of satellite imagery to a wider range of client-base. The SANSA Act provides that satellite imagery acquired by SANSA is meant only for organs of state.

### **3.5 The National Imagery Acquisition Programme**

The National Imagery Acquisition Programme seeks to acquire aerial and other remotely-sensed imagery for purposes of establishing and maintaining a national control survey system. This is done under the aegis of the Chief Directorate: National Geo-Spatial Information (NGI), a unit of the Department of Rural Development and Land Reform. The Land Survey Act 8 of 1997 empowers the Chief Director: Surveys and Mapping “to take charge of and preserve the records of all geodetic and topographic surveys, maps and aerial photography or other remotely sensed imagery.” Presently, NGI is, active in space weather using TrigNet defined as “ionospheric mapping of variation of annual Total Electron Count (TEC) over South Africa”. This is done from a network of GNSS base stations spread across the country (Parker, 2012).

NGI is also responsible for the implementation of the South African Spatial Data Infrastructure (SASDI), “a national technical, institutional and policy framework to facilitate the capture, management, integration, distribution and use of spatial information through the cooperation among organs of state” (Parker, 2012). The Spatial Infrastructure Data Act provides, as its objectives, for the capture of spatial data through cooperation among organs of state, promote the effective management, maintenance, sharing and use of spatial information.

The Spatial Data Infrastructure Act further seeks to create an environment which facilitates coordination and cooperation among the various entities involved in spatial information. The Act also seeks to eliminate duplication in the capturing of spatial information and the promotion of universal access to such information. The Minister determines the fees, costs and price payable for spatial information and grant exemptions where necessary as well as prescribes by way of regulation measures for the sharing and integration of spatial information. All this activity falls under the Ministry of Land Affairs. The effectiveness of this legislation has not been objectively quantified from available information, but is it noteworthy that the implementation of this legislation has been transferred to the NGI ( Parker, 2012).

#### **4 Disharmony in Earth Observation Legal Framework**

An analyses of the various earth observation strategies and entities participation in such demonstrates the antithesis created by the various laws enacted to regulate earth observation in general and satellite remote sensing in particular. Firstly, the Space Affairs Act, read in conjunction with relevant international space law instruments, there is no specific reference to satellite remote sensing in the Act. The Act provides for broad and general policies contained in international treaties and obligations that South Africa must adhere to. The regulatory thrust adopted by SACSA concentrates on licensing launches and operation of space craft which include earth observation satellites. But there is no clear pronouncement on whether earth observation data emanating from those licensed satellites is subject to domestic regulation.

Secondly, the Spatial Infrastructure Data Act does not encompass satellite derived data as such, yet at a practical level the relevant entity responsible for its implementation is aggressively using satellite data in discharging its functions. Thirdly, the SANSA Act provided for the acquisition and dissemination of satellite data to government agencies, but in practice there is no limitation nor legal restrictions for SANSA to commercialise such data, as it is presently doing.

Flowing from the analyses above, is apparent that countervailing policies demand an evaluation of the practical effect technological advances and institutional rationalization prevailing on the South African earth observation environment.

##### **4.1 Need For Legal Harmonisation**

The current legal framework governing the South African earth observation environment is unsustainable. There is a great deal of operational uncertainty because of lack of clarity on the

extent of applicable law, viz. the Space Affairs Act, the Spatial Data Infrastructure Act and the SANSA Act. The South African earth observation legal disharmony is not unique when compared to other countries engaged in remote sensing activities.

In general, a global comparative analysis reveals the following:

- (a) Few countries have formal law on Earth observation/remote sensing;
- (b) There are policies which are not always transparent;
- (c) There is a growing trend to narrowly construe the 1986 UN Principles in that data provision is subject to approval and decisions to disseminate are now based on the resolution of the imagery.

Many countries deny the provision of remote sensing data based on national security reasons. Yet there is now more government-owned space segment moving towards free access (Gabrynowicz, 2008).

#### **4.2 Recommendations for Legal Reform**

There is an urgent need to address the lacunae that exist in earth observation law and regulation in South Africa. Some practical steps towards harmonisation include, but not limited to:

- (a) Examine the apparent duplication between the activities and continuing rationale for the existence of the NEOP and NGI and how the two can be harmonised. Such parallel existence, given the convergence of remote sensing capabilities, perpetuated the duplication of efforts and increases costs of earth observation data, products and services;
- (b) Evaluate the extent of the legal effect of the three pieces of legislation and how they seek to remote sensing, from the launch and operation of earth observation satellites up to the acquisition, processing and distribution of remote sensing and earth observation imagery;
- (c) Provide harmonised standards for users and service providers in earth observation data, products and services;
- (d) Provide clear rules of liability and recourse to adjudicative tribunals.

### **5 Conclusion**

South Africa has established an international reputation as a responsible and responsive space-faring nation complying with international space law in conducting space activities. The space policy emphasises the need to develop and maintain a robust set of space capabilities while the NSP 2030 provides a roadmap for achieving that objectives. The country's regulatory mechanisms are however, lagging behind technological advances as the space programs is implemented. The lack of clear legal and regulatory frameworks has led to a duplication of efforts which may be catastrophic unless reined in.

There is, however, light at the end of the tunnel. The study undertaken leading to the possible review of the space affairs act bodes well for efforts to harmonise the policy and legal environments governing earth observation in South Africa. The Review should closely examine the need to specific earth observation law to determine the requirements for earth observation satellites technical standards, ownership and national security concerns, South Africa's international obligations under relevant international agreements, conditions for accessing satellite data, and exemptions, if any.

The 1986 UN Principles on Remote Sensing should be a guiding framework in this regard. Consideration should be given to GEOSS data sharing principles impact on the development of data sharing framework now and in the future. The roles of private and state-owned entities in the distribution and commercialisation of earth observation data must be clearly delineated in consonance with national policies.

In the end, a clearly defined entry point for the reception, processing and dissemination of remote sensing data can only improve the efforts of Government to ensure universal access to remote sensing for all and sundry.

## **6 References**

- Christol, Q.C, 1991, *Space Law: Past, Present and Future*, Kluwer, New York, United States.
- Diedericks-Vershoor, I.H.Ph 2008, *An Introduction to Space Law*, Wolters Kluwer, Amsterdam, Netherlands.
- Gabrynowicz, JI, 2008, *The Land Remote Sensing Laws and Policies of National Governments: A Global Survey*, University of Mississippi, Mississippi, United States, viewed on 10 June 2011, <<http://www.olemiss.org>>
- GEOSS, 2010, *Overview: The Group On Earth Observation 10 Year Implementation Plan*, Geneva, Switzerland, viewed 12 June 2012, <http://www.geo.org>.
- Ito, 2003, *Improvement to the Legal Regime for the Effective Use of Satellite Remote Sensing data for Disaster Management and Protection of the Environment*, Journal of Space Law, pp. 45-56.
- Jakhu, R, 2003, *International Law Governing the Acquisition and Dissemination of Satellite Imagery*, (2003) Journal of Space Law, vol 34 pp. 65-91;
- Lyall, F & Larsen, P.B 2009, *Space Law Treatise*, Ashgate, London, United Kingdom.
- Mangara, P, 2012, *Earth Observation Data Centre*, 1<sup>st</sup> SA-GEO Symposium, 12 September 2012, Cape Town.
- Pandor, GNM, 2010, *Developing the South African National Space Programme*, Watch This Space, Pretoria, Issue 1, pp.1.
- Parker, A 2012, *Earth Observation Data at NGI*, 1<sup>st</sup> SA-GEO Symposium, Cape Town, 12 September 2012.
- Reynolds, G.H & Merges, R.P, 1997, *Outer Space: Problems of Law and Policy*, Westview, San Fransisco, United States.
- SANSA, 2012, *The NEOP Data Centre*, Pretoria, viewed 10 September 2012, <http://www.sansa.org>.