LEVERAGING LESSONS FROM THE CLIMATE CHANGE COMMUNITY AND THE FINANCIAL SECTOR TO IMPROVE SPACE DEBRIS REGULATIONS

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ABSTRACT

This article discusses the parallelism between the challenges of addressing the global and societal impacts of (i) climate change and (ii) money laundering and how lessons learnt from addressing those challenges could be leveraged to address the challenges of the space debris community. The article presents a summary of the major historical events for all three challenge areas and discusses the agreements and/or interceding regulations that have resulted and the effects of such regulations on society.

1 INTRODUCTION

We consider three sectors, the terrestrial sector, the space sector, and the financial sector. We define the terrestrial sector as that which deals with the Earth and its environment, in particular its climate. Similarly, we define the space sector as that which deals with outer space and in particular the region within the Earth's sphere of influence. Finally, we define the financial sector as institutions, instruments, and the regulatory framework that provide financial services to its customers.

At first glance these sectors may appear to have nothing in common; however, upon closer examination these three sectors share several commonalities. First, all three are global phenomena that are closely intertwined in our daily lives and thus have significant implications for society. Second, the long term sustainability of each sector depends on the existence of appropriate rules, protocols, and operational procedures to ensure that their respective environments are not adversely affected by overuse and/or abuse. Third, due to their global influence, each of these sectors has some representation at the United Nations (UN). In fact, as will be discussed in subsequent sections of this article, all three sectors have UN activities that are geared towards addressing long term sustainability of the sector.

Current climate change models predict a continuous increase in global temperatures threatening human life and environmental diversity. Similarly, space debris models predict that the 'cascade effect' will be unavoidable if action is not taken. However, there is insufficient data for making confident predictions and certain parties argue that an equilibrium or a peak may be reached in the future and mitigation or removal would be unnecessary. Since the mid-1970s, both the climate change and space debris communities have been working through the United Nations to develop and implement guidelines for appropriate use of their respective environments. However, the constituents of these respective communities are divided broadly into two categories: constituents who accept the predictions of the existing models and are working to mitigate/remediate the associated consequences and constituents who are non-accepting of these model predictions, thus do not see the need for mitigation/remediation strategies. This division appears to be slowing down action on mitigation and/or remediation for both the earth and space environments.

More recently, the financial sector has become an entrant into the global community wherein efforts by some affect all. Specifically, the Financial Action Task Force (FATF) created by the G7 in 1989 initially to combat global drug trade wherein the financial institutions were being misused to launder illicit drug money, and later terrorist financing as this too became a global threat. Since its inception, the FATF has been able to develop and implement anti-money laundering (AML) and counter financing of terrorism (CFT) recommendations that have successfully been adopted into the legal and regulatory framework of over 190 countries to prevent misuse of their financial systems.

This paper is organized as follows: Section 2 provides a brief overview of each sector highlighting relevant events that have occurred; Section 3 discusses activities that have shown promise for long term sustainability of the financial sector; Section 4 provides a summary and suggests how the space sector may leverage some of the lessons learnt.

2 BACKGROUND PRELIMINARIES

2.1 Terrestrial Sector

The United Nations Framework Convention on Climate Change (UNFCCC) was established in May 1992 to acknowledge that changes in the Earth's climate were occurring and that such changes could have adverse effects on mankind. The UNFCCC entered into full force

in March 1994 and currently has 197 parties as members. Precursor activities were the first World Climate Conference which took place in 1979, followed by the second world climate conference in 1990, after which the United Nations decided to launch annual conferences, referred to as the Conference of the Parties (COP), to assess climate negotiations and implementation [1]. Multiple past COPs have been partially successful. The Kyoto Protocol was developed in 1997 in Kyoto, Japan during COP 3. It consisted of a menu of policies for countries to choose from without any enforcement mechanism [1]. In 1998, COP 4 took place in Buenos Aires, Argentina, and was to finalize unresolved issues from Kyoto. Due to major disagreements, it adopted a two-year plan, the Buenos Aires Action Plan, to finalize outstanding details of the Kyoto Protocol, compliance issues, and policies and measures [2]. During COP 4, it was agreed that developed countries were to lead in reducing their greenhouse gas emissions while financially and technologically assisting developing countries. This leadership role was shattered after the withdrawal of the United States from the Kyoto Protocol in 2001, stating that the world economy would collapse if the US were to take action. In 2000, COP 6 took place in Hague, Netherlands. The Hague Climate conference was to wrap up the three years climate negotiations on the implementation of the Kyoto Protocol. The US proposed to count carbon sinks as part of the agreement in order to meet its greenhouse gas reduction targets. This received high criticism from the Europeans, stating that the US should not be allowed to meet its reduction targets without actually cutting its emissions. The unwavering stance of the parties caused the collapse of the conference [3]. The Kyoto Protocol entered into force in 2005 and called on developed countries to jointly reduce their total emissions of six greenhouse gases by 5.2% for the target period 2008-2012. This lead to an internal bargaining between countries: different countries had different emission reduction targets except for Norway, Iceland and Australia who were reluctant to accept anything but targets to increase their emissions by +1%, +10% and +8%, respectively [1]. COP 13 took place in 2007 in Bali, Indonesia. A Bali Action Plan was adopted [1], and focused on creating long-term cooperative actions to be adopted at Copenhagen in 2009: including technology development and transfer to developing countries and financial assistance and investment to support action on mitigation and adaptation. The year 2008 marked the global recession and a reluctance to take action. In 2009, the Copenhagen Accord presented disappointing results, and the parties could not agree [1].

After 18 years from the emergence of the Kyoto Protocol, for the first time ever, 195 countries adopted a universal legally binding climate agreement, at the Paris Climate Conference in 2015 [4]. It was agreed to limit the increase in global average temperatures to well below 2°C and that global emissions need to peak as soon as possible, recognizing that it will take longer for developing countries. This is due to enter into force in 2020. The Paris Conference enclosed the largest gathering of world leaders, which encouraged negotiators to have a more open stance on climate negotiations [5]. After a series of meetings, a draft agreement was proposed, but multiple developed and developing countries had issues with it. One of the most significant issues was over “loss and damage”. The US objected to being required to provide compensation and liability to developing countries in the case of climate-related disasters. China brought up a point that developing countries are less responsible for climate change and therefore should be held less accountable. It was clear that further negotiations were needed in order to reach a compromise, each country was allowed to speak about their concerns. After two days of diplomacy phone calls and a large amount of hard work, all countries wanted an agreement and all made compromises. The US accepted to consider the idea of “loss and damage”. China and India were open to include holding warming to 1.5°C. Other climate related activities pertaining to sustainability are provided in Table 1

Table 1. Chronology of Relevant UFCCC Activities

Year	Particulars of Event
1979	First World Climate Conference
1988	Intergovernmental Panel on Climate Change (IPCC) established
1990	Second World Climate Conference calls for a global treaty on climate change; UN begins discussions on a framework convention
1991	First meeting of the Intergovernmental Negotiating Committee (INC) takes place
1992	UNFCCC text adopted by the INC at the Earth Summit in Rio
1994	UNFCCC entered into full force
1994	First Conference of the Parties (COP 1) in Berlin
1997	Adaptation of Kyoto Protocol at COP 3
2005	Kyoto Protocol entered into force
2007	IPCC’s 4th Assessment Report; climate science enters social consciousness
2012	Doha Amendment to the Kyoto Protocol is adopted
2016	Paris Agreement entered into force in November with signing by 143 of 197 parties

2.2 Space Sector

The United Nations Office for Outer Space Affairs (UNOOSA) is the Secretariat for the Legal Subcommittee of COPUOS, based in Vienna, and established in 1958 [6]. The Outer Space Treaty was created in 1967 and it calls on the peaceful use of Outer Space and deals with outer space issues. The general

assembly expressed the desire of having a separate international instrument that elaborates on the rights and obligations regarding the liability for damage caused by launching objects into outer space. In 1970, it urged COPUOS to reach an early agreement on a draft on liability encompassing measures of compensation to victims and effective procedures for claims [7]. The Convention on International Liability for Damage caused by Space Objects was created in 1972. Space object is defined in article I as "component parts of a space object as well as its launch vehicle and parts thereof", it is unclear whether space debris falls under the component parts of the space object. In fact, one could argue that at the time of this convention the "vastness" of space probably precluded a consideration of space debris and its impact on the space environment and the focus was more on human safety.

Also, the liability convention requires fault in order to determine liability, which is very difficult to prove in space especially with space debris that may be untraceable. An article within the liability convention states that the state causing the damage "shall be liable only if the damage is due to its fault or the fault of persons for whom it is responsible." It defines "damage as "loss of life, personal injury or other impairment of health; or loss of or damage to property of States or of persons, natural or juridical, or property of international intergovernmental organizations." The laws presented in the liability convention protect victims but do not protect the outer space environment.

The Convention on Registration of Objects Launched into Outer Space was adopted in 1975 with the purpose of assisting in the identification of space objects and addressing issues relating to the responsibilities of states parties concerning their space objects [8]. It requires states to register objects launched into space and states that the UN Secretary-General shall be informed "as soon as practicable" after the space launch occurs. There is no set time limit for what is considered as a "practicable" time for notification of launch.

Kessler's 1981 publication was one of the major turning points in discussions of orbital debris and its implications for safe operations in space [9]. The problem of space debris caused the rise of international concerns, which lead the UN to formally address this problem through the 1993 resolution, marking the start of the modern international space debris discussions [10]. Space debris became a formal agenda item in the 1994 session and it was agreed that "consideration of space debris was important and that international cooperation was needed to evolve appropriate and affordable strategies to minimize the potential impact of space debris on future space missions". During the 1995 session, the Scientific and Technical Subcommittee (STS) of COPUOS, considered the space debris issue as a priority [11] and attempted to define the term as "all man-made objects, including their fragments and parts, in Earth orbit or re-entering the dense layers of the atmosphere that are non-functional with no reasonable expectation of their being able to assume or resume their intended functions for which they are or can be authorized." During the 1996 session, STS came up with a system for measuring space debris [12]. It was decided that objects larger than 10 cm in size would be considered "large debris objects" because they can be tracked and are most dangerous to other space objects. It was also identified that debris that is as small as 2 mm in size would threaten spacecraft security. In the 1998 session, the STS formally addressed space debris mitigation and removal measures [13]. Some delegations mentioned that even if removal is not technically or economically feasible currently "the international community should not neglect the efforts to develop adequate technologies to cleanse outer space in the future". A draft on mitigation measures was created to be adopted during the 1999 session.

The Inter-Agency Space Debris Coordination Committee (IADC) started in 1993 as a joint venture of the space agencies from Japan, Russia, and United States to facilitate exchange information on space debris research at each agency. Since then the membership has grown to a total of 13 space agencies organized collectively as a single steering group and four working groups. Working Group 1 focuses on measurement techniques for existing and future capabilities; Working Group 2 focuses on the characterization and modelling of the environment about Earth; Working Group 3 focuses on technologies and methodologies for shielding /protecting space assets; and Working Group 4 focuses on mitigation strategies. [14]

In 2007, COPUOS provided the UN General Assembly with nonbinding guidelines for space debris mitigation [12]. It stated that implementation of debris mitigation measures is considered a necessary step, and called on member states to voluntary take measures to ensure that guidelines are implemented. The seven mitigation guidelines are the following:

- Limit debris released during normal operation,
- Minimize the potential break-ups during operational phases
- Limit the probability of accidental collisions in orbit,
- Avoid intentional destruction and other harmful activities
- Minimize potential for post-mission break-ups resulting from stored energy,
- Limit the long term presence of spacecraft and launch vehicle orbital stages in the low-Earth orbit region after the end of their mission, and
- Limit the long-term interference of spacecraft and launch vehicle orbital stages with the geosynchronous Earth Orbit region after the end of their mission."

The 2015 COPUOS report aims to develop new legally binding outer space rules for both developed and developing nations [14]. It states that mitigation and removal measures must take into account the historical responsibilities. Emerging spacefaring nations will not be obliged to share the costs of space debris removal. It also states that spacefaring nations should assist other nations with emerging space programs in implementing space debris mitigation measures. A summary of relevant space sector activities are summarized Table 2.

Table 2. Chronology of Relevant Space Debris Activities

Year	Particulars of Event
1959	UN COPUOS established
1967	UN Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies
1972	UN Convention on International Liability for Damage Caused by Space Objects
1976	UN Convention on Registration of Objects Launched into Outer Space
1981	Don Kessler published "Sources of Orbital Debris & the Projected Environment for Future Spacecraft" in *J. of Spacecraft*
1993	IADC formed by Japan, Russia, and US space agencies
1995	NASA issues first mitigation guidelines
2001	ISO Orbital Debris Co-Ordination Working Group established to develop standard procedures and practices for implementing IADC, COPUOS, and ITU guidelines
2002	Formal adaptation of IADC's *Space Debris Mitigation Guidelines*
2007	• IADC updates mitigation guidelines • UNCOPUOS endorses *Space Debris Mitigation Guidelines*

2.3 Financial Sector

It has been 27 years since the formation of the Financial Action Task Force (FATF), a task force created by the G7 in 1989 to find a solution to the rapidly growing global drug trade at that time. Its creation was the result of the recognition by the G7 ministers of the "urgent need for decisive, multinational action to tackle the global problem of money laundering and other abuses of the financial system" [3] and came on the heels of the first international convention to criminalize money laundering, the United Nations Convention Against Illicit Traffic in Narcotic Drugs and Psychotropic Substances (1988). This type of international intervention to fighting drug trafficking was first undertaken back in 1961 with the passage of the United Nations Single Convention on Narcotic Drugs (amended by the 1972 Protocol). By the latter part of the 1980s, organized criminal networks had a firm grip on drug production and distribution systems. It was then that the international community grasped the ease with which drug money traversed geographic borders and realized that the most effective way to tackle the problem was to attack the economic base of the traffickers and criminal networks.

At the time of its establishment in 1989, the FATF was mandated to focus on the prevention of the use of the banking system and other financial institutions for the purpose of laundering the proceeds of the drug trade and other criminal activities. The task force took less than one year to complete its analysis and issue its report which was published in April 1990 as the first set of global standards to detect and prevent money laundering – known as the Forty Recommendations.

The Forty Recommendations are not legally binding in international law, so each countries acceptance and introduction of these standards was really the influence of soft law[1]. The use of international soft law instruments to address money laundering began in December 1988 with the Basle Statement of Principles [17]. "The crown jewel of soft law, however, is the set of forty recommendations issued by the Financial Action Task Force on money laundering (FATF) in 1990. … It was a deliberate choice not to cast the recommendations into the mould of a treaty … to allow [for their] flexible adaptation." [18] Prior to the FATF 40, most countries had no national legal or regulatory provisions requiring the detection, deterrence or punishment of money laundering. FATF's success in setting out measures to protect the integrity of the international financial system led to its mandate being expanded to the threats to global financial systems posed by the financing of terrorism following the 9/11 attacks. In this regard, the FATF issued nine (9) Special Recommendations related to terrorist financing.

By 2005, FATF's role in the setting of international standards to combat money-laundering and terrorist financing was affirmed by the United Nations in UN Security Council Resolution 1617 (2005) which

> "strongly urge[d] all Member States to implement the comprehensive, international standards embodied in the FATF Forty Recommendations on money laundering and the Nine Special Recommendations on terrorist financing." [19]

[1] Soft law is defined by the Organisation for Economic and Co-operative Development as "Co-operation based on instruments that are not legally binding, or whose binding force is somewhat "weaker" than that of traditional law, such as codes of conduct, guidelines, roadmaps, peer reviews."

The chronological sequence of FATF's milestones demonstrates its development are shown in Table 3.

Table 3. Chronology of Relevant FATF Activities

Year	Particulars of Event
1990	First set of Forty Recommendations on money laundering was issued
1996	The 40 Recommendations were revised and a series of Interpretative Notes issued to clarify the application of the Recommendations
2000	The first list of Non-Compliant Countries and Territories (NCCT) was published (15 countries)
2001	• The 9 Special Recommendations on terrorist financing were issued • Second list of NCCT countries published (8 countries)
2003	Significant amendments were made to the scope of the Recommendations, expanded to include designated non-financial businesses and professionals (DNFBP) in the customer due diligence (CDD) requirements
2005	Addressed threat posed by cash couriers and measures to detect physical cross-border transportation of cash and bearer monetary instruments introduced
2006	The last country on the NCCT list was de-listed
2012	Latest revision of the FATF Recommendations which merged the money laundering and terrorist financing recommendations and addressed proliferation of weapons of mass destruction

But the establishment of standards, strong as they are, would not enable this global network comprising nearly 200 countries to achieve the levels of compliance they demonstrate. Behind the FATF Recommendations is a mechanism, recognized and accepted by the FATF members and associate members, the FATF-style regional bodies (FSRBs), to be the major enforcement apparatus for the standards. As FATF itself declares,

> "The strength of the FATF lies in its ability to assess how well a country has implemented the FATF Recommendations, and how effective a country's measures are in reaching the ultimate goal of detecting, preventing and punishing abuse of the financial system." [20]

The measuring tool is the Mutual Evaluation process, a peer review system by which countries are assessed on their level of implementation of the FATF Recommendations. An important and necessary aspect of implementation is the presence of "the necessary political will to bring about national legislative and regulatory reform." [21] Executive Secretary of FATF, David Lewis' statement in his speech at the 50th Meeting of MONEYVAL in April 2016 addressed this point:

> "FATF today consists of 37 members, 9 regional bodies, 198 jurisdictions, and works in close partnership with the UN and Egmont Group of Financial Intelligence Units. This makes us more inclusive than the UN, with all 198 jurisdictions having committed to implement the FATF standards and to being assessed by their peers using the FATF methodology." [22]

Decisions are made by consensus at the FATF Plenary which meets three (3) times per year. Country representatives to the FATF Plenary are at the ministerial or senior government official level.

The work of FATF is carried out through a number of working groups with expertise centered on specific areas of FATF's mandate.

2.4 Similarities and Differences of Sectors

As presented above, all three sectors have some traceability to UN activities which is summarized in Figure 1. Also shown in Figure 1 are organizations which have been influential in the evolution of each sector. The sectors have been categorized into two groups, Group A and Group B. The two sectors in Group A have the distinction that there has not been universal acknowledgement by their constituents of the existence of a problem that can have devastating effects on the long-term sustainability of their respective sector, hence, developing mitigation and/or remediation strategies has been difficult. The sector in Group B has universal acknowledgement of the existence of such a problem and thus has been able to develop, implement, and revise remediation strategies. We hypothesize that one reason for this lack of universal acceptance by the respective constituents of the sectors in Group A may be attributed to an "observability" difficulty. By this we mean that the time constants associated with changes in these sectors are extremely long (on the order of decades) and thus it is difficult to gauge the impact of input actions into the system. This is further complicated by fact that the input actions have cumulative rather than impulsive effects on the system, thus requiring significant observational times. Even if there is acknowledgement of the existence of a problem, additional challenges exist within Group A sectors in terms of "developed" and "developing" nations – here we used "developed" to imply developed nations in the context of terrestrial (climate) discussions and space-faring nations in the context of space (debris) discussions. A common plea from developing countries is that they are being held accountable for the problems created by the developed nations.

Another significant difference between Group A and Group B is in enforcement. On the one hand, there are no

real mechanisms for implementation of mitigation strategies for the terrestrial and space sectors in Group A. While some constituent members of these sectors may be good stewards of their respective environments, it requires only a few rogue constituent members to adversely impact the environment. On the other hand, mechanisms exist for implementation of mitigation strategies in Group B since there is universal acknowledgement of the existence of a problem. In fact, within Group B mitigation strategies have been developed, implemented/enforced, and modified to best address the sector's needs.

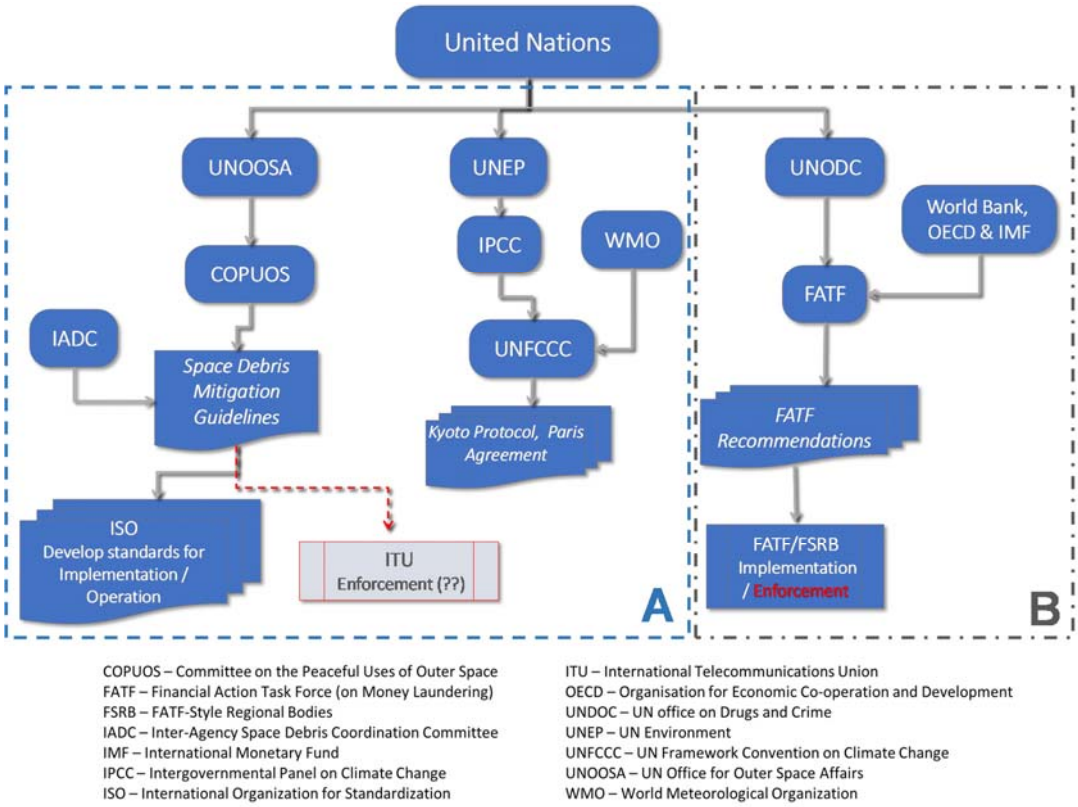

Figure 1. UN Activities related to Sectors

Table 4. Sector Grouping by Categorization

	Group A	**Group B**
Sectors	• Terrestrial • Space	• Financial
Existence of problem acknowledged	• No, not universally acknowledged	• Yes, universally acknowledged
Status	• Acknowledgement of problem needed • Enforcement mechanisms needed • Consequences to deter violations needed	• Implementation and feedback mechanism in place • Effects of actions are observable, thus impact of modifications can be assessed • Consequences to deter violations
Long-term sustainability	Ad hoc strategies in place for addressing needs	Pro-active measures in place to address current and emerging needs

3 FINANCIAL SECTOR SUCCESSFUL IMPLEMENTATION STRATEGIES

3.1 FATF Monitoring Implementation of the Recommendations

Building on experience garnered over 25 years of implementation of the recommendations, today's mutual evaluations consists of two components:

1. Technical Compliance – "a list of criteria which represent those elements that should be present in order to demonstrate full compliance with the mandatory elements of the Recommendations" [23]; and
2. Effectiveness - "the extent to which financial systems and economies mitigate the risks and threats of money laundering and financing of terrorism and proliferation. … FATF assesses effectiveness primarily on the basis of *eleven Immediate Outcomes*" [23] (eleven key goals which an effective AML/CFT system should achieve).

The evaluation is conducted by representatives from other member countries within the FATF or FSRB to which the country belongs. The Working Group on Evaluations and Implementation (WGEI) has responsibility for this area.

The mutual evaluation methodology also includes a follow up process to address weaknesses identified during the review whereby countries periodically submit progress reports on their efforts to mitigate the issues in areas rated weak until the area is considered satisfactory.

3.1.1 Engaging High Risk and Non-Cooperative Jurisdictions

At the April 2009 G-20 Summit in London, the G-20 leaders called on FATF to "revise and reinvigorate the review process for assessing compliance by jurisdictions with AML/CFT standards." [24] Where a country has not sufficiently implemented the recommendations, the country will be deemed high risk and the measures designed to deal with high risk and non-cooperative jurisdictions will be engaged. The implications of being so designated include public identification and public statements issuing "clear warnings about countries with strategic risks due to inadequate AML/CFT measures. …These statements put pressure on the countries to address the deficiencies. Failing to do so, can have a negative impact on their position in the global economy." [25] FATF, or the FSRBs, then works with the countries named to obtain the political commitment and to move towards effective implementation of AML/CFT measures. The International Co-operation Review Group (ICRG) is tasked with this aspect of FATF's work.

3.1.2 Identifying and Responding to Emerging Threats

Criminal organizations will always seek to launder the proceeds of their criminal conduct to give them the appearance of legitimacy. So, as financial systems tighten to exclude the methods used to launder criminal proceeds, new methods are developed. The Working Group on Typologies (WGTP) seeks to identify and analyse these emerging threats and disseminate its findings in periodic typology publications.

Another committee, the Working Group on Terrorist Financing and Money Laundering (WGTM) concentrates on responding to new and emerging threats, revising standards and developing guidance. "The FATF remains alert to the evolving terrorist risks and trends. The Emerging Terrorist Financing Risks report published in October 2015 identifies threats and vulnerabilities posed by foreign terrorist fighters, fundraising through social media, new payment products and services, and the exploitation of natural resources." [26]

The Global Network Coordination Group provides capacity building support to the work of the FSRBs to advance global implementation of the Recommendations.

Can the successes of the FATF in combatting the global threat to the international financial systems posed by money laundering and terrorist financing be used as a model for addressing other global issues?

4 SUMMARY & RECOMMENDATIONS

Successfully addressing the long-term sustainability of these sectors requires the acknowledgment of the need for appropriate mitigation/remediation strategies and then the development, implementation, and enforcement of such strategies. While the sectors in Group A are making progress toward universally acknowledging the need for long-term sustainability strategies, they should look to the financial sector in Group B and leverage the lessons they have learnt in addressing their long-term sustainability. Of course, the first step is to acknowledge the need for sustainability strategies, but once this has been accomplished, then the challenge is to develop, implement, enforce, and update the strategy. As demonstrated by the financial sector through the activities of the FATF and FSRBs, the last two steps, *enforce* and *update*, are vitally important steps in the process. Without mechanisms for enforcement only some constituent members of the sector will adhere to the strategy. Additionally, mechanisms for continued improvements must be employed in order to keep the strategy and its implementation/enforcement efforts relevant to the current state of the sector.

As postulated at the end of Section 3 in this manuscript, can the space sector adopt some of the lessons learnt from

the financial sector in developing its long-term sustainability strategy? While there may still some debate about the severity of the space debris problem, there has been some acknowledgement of the existence of the problem. While the acknowledgment may not be universal, as outlined in Section 2 of this manuscript, mitigation guidelines have been proposed by the IADC, adapted by the UN COPUOS and implementation standards are being developed by ISO. Thus, the space sector has had some success in addressing the first steps of the long-term sustainability process (i.e., acknowledge the need, develop a strategy, implement the strategy), the key steps of enforcing and updating of the strategy are non-existent.

The enforcement of the long-term sustainability strategy requires that appropriate enforcement mechanisms exists. Figure 2 shows several of the organizations with key roles in the long-term sustainability of the space sector. Since all spacecraft currently require a radio frequency for its operations, then could the ITU to be the logical organization for enforcement of the space sector's long-term sustainability strategy?

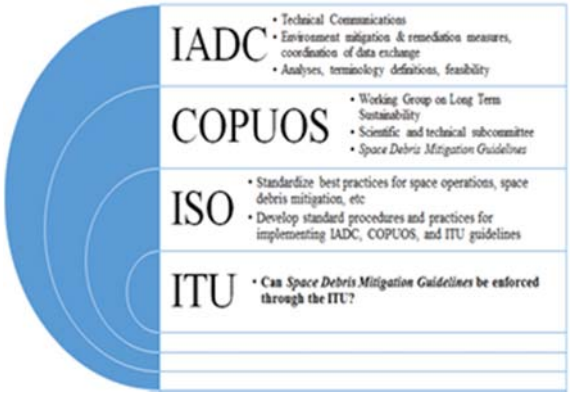

Figure 2. Possible implementation strategy for space debris mitigation guidelines

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