Environmental Law: Can it be Applied to Space?*

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* The views expressed in this paper are those of the author and does not represent the position of the agency she belongs to.

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1. The Question

What can we learn from the evolution of environmental law in the context of space security?

→ In terms of Scope; Principles; and Procedures (with a focus on satellite technology)

2. Scope: Evolving Concept of Security

2. Evolving Concept of 'Security'

- National/International Security → Arms Control Regimes: NPT, ABM, SALT, INF, START, CWC, CTBT…
- Human Security (UNDP, *Human Development Report 1994;* Committee on Human Security, *Human Security Now,* 2003)
- Environmental Security (Mathews, *Redefining Security*, Foreign Affairs, 1989); Climate Security (UNSC, 2007).

Actors: State; Purpose: Military

→ Actors: Various; Purpose: Individual well-being

3. Principles: Principles of Environmental Law and Implications to Space Law

3.1 Principles of Environmental Law

- Conventional customary law provides that States have the duty to carry out activities within their territories or in common spaces with regard for the right of other states: *'principles of good neighborliness'* → Stockholm & Rio Declarations

- *Two propositions enjoy significant support* *(Birnie & Boyle, 2001)*:

  States have:

  (i) a duty to prevent, reduce, and control pollution and environmental harm, and

  (ii) a duty to co-operate in mitigating environmental risks and emergencies, through notification, consultation, negotiation and in appropriate cases, environmental impact assessment

3.2 Environmental Information and International Institutions

- The protection of areas of common concern, such as the high seas, ozone layer or global climate, presents a comparable problem to the protection of human rights as *erga omnes*

- Community standing is needed; Collective supervision of global responsibilities by intergovernmental bodies will often be a more effective and realistic remedy than public interest claims and countermeasures by individual states

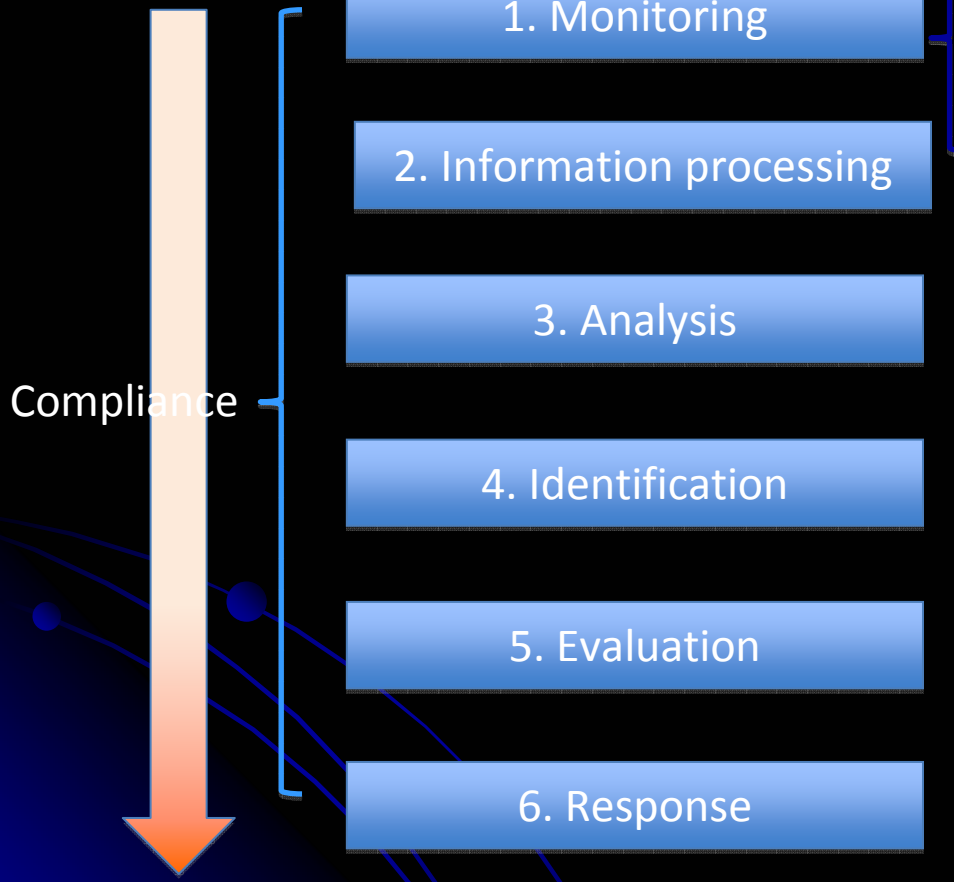
→ The crucial role of **environmental information**, and the functioning of **international institutions**

4. Procedures: From Arms Control Verification to Environmental Monitoring

4.1 Bi-lateral Arms Control Model and the Internationalization of Verification

- National Technical Means of Verification (ABM, 1972)
- NTM Technology: visible light photography, infra-red detection and imaging, radar, image processing, seismology, nuclear explosion detectors, electronic reconnaissance and others, either by satellite, aircraft, or a human inspector or equipment on ground (Krass, 1985)
- Development of NTM → confidence to promote disarmament; need for verification cooperation
- Internationalization of Verification:
  - 1968 NPT ⇒ SIAL
  - 1990 CFE ⇒ EU Satellite Center
  - 1997 CWC ⇒ OPCW

Verification Process



•Surveillance : systematic observation of some place or activity on a continuous or periodic basis.
•Reconnaissance: carried out in the form of missions or ad-hoc activities.

… decision makers and representatives of relevant agencies and political constituencies decide how important this possible violation or pattern of behaviour is.

Based on Krass, Alan, *Verification: How Much is Enough?*, SIPRI, 1985.

4.2 NPT: IAEA Safeguards

- After secretive nuclear development by Iraq in the 1990s, the use of satellite imagery as open source information (commercial satellite imagery) for treaty compliance verification has become a routine requirement in IAEA safeguards system in the NPT regime

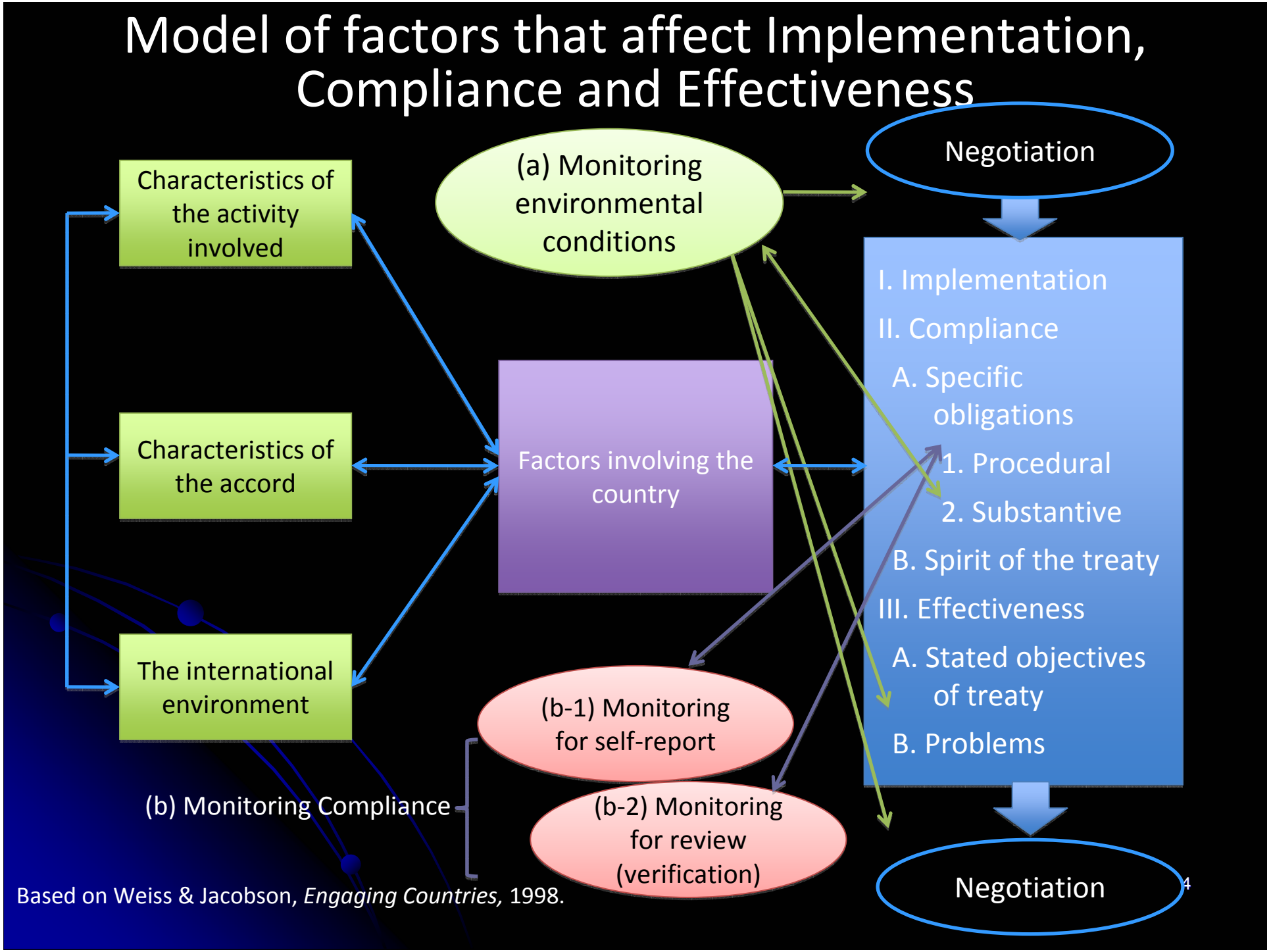
- Proposal of ISMA → IAEA took initiative in gathering data for its own regime objectives

→ Spillover to environmental treaties…

4.3 Environmental Monitoring

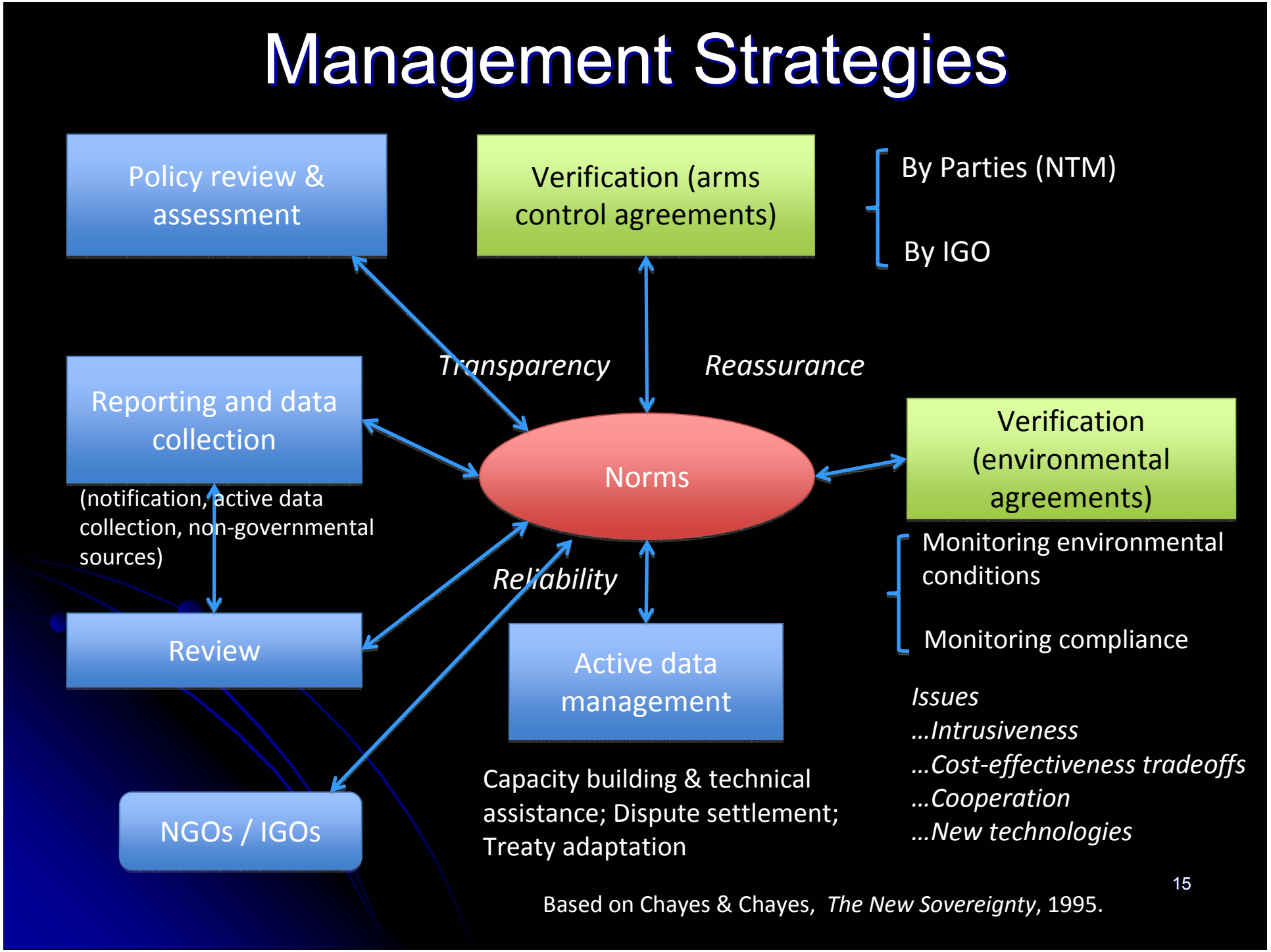
- For the realization of international common interests e.g. environment, human rights and humanitarian affairs, need for transparency through managerial techniques
- 'Monitoring' is a general and central requirement to achieve transparency and assurance
- Two monitoring mechanisms:
  - *Monitoring environmental conditions*
  - *Monitoring compliance*

Model of factors that affect Implementation, Compliance and Effectiveness



Based on Weiss & Jacobson, *Engaging Countries,* 1998.

Management Strategies



Based on Chayes & Chayes, *The New Sovereignty*, 1995.

4.4 Maganerial Model and Satellite Technology

Compliance theory in international environmental law: the Managerialists (Chayes & Chayes, 1995; Weiss & Jocobson, 1998)

- Procedural measures such as information gathering for transparency, reporting, technology and financial support, consultation are more effective than coercive sanctions
- The propensity to comply: through the procedural techniques of the treaty, compliance is facilitated not necessarily based on sanctions
- Focus on the analysis of the managerial procedures: 'Monitoring' is a core

→ Satellite Technology to play a significant role in changing the issues of 'cost' and 'intrusiveness'

4.5 The Role of Satellite Earth Observation in Ozone and Climate Change

- Satellite Earth observation is an integral part of *systematic observation*, as an international obligation (Vienna Convention & UNFCCC)
- Satellite Earth Observation to date does not directly relate to *monitoring compliance*
- The potential is, in future successor missions, to provide validation or verification (e.g. on net GHG source & sink estimations) at global, regional and national levels.

5. Conclusion: Spillover to Space Security

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- The arms control verification model has evolved into the ***management strategies*** of environmental law
- The crucial role of ***environmental information*** and the functioning of ***international institutions***
- A ***spillover of such models*** to the domain of space security is possible; need to identify the best suited institutional model, information flow, monitoring procedures and new technologies to support