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Sharing Our Ecospace

Sharing Our Ecospace

Rede

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door

Joyeeta Gupta

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1. Sharing an interconnected world in the Anthropocene

The hare and the tortoise

The fable of the hare and the tortoise is about a race. The hare runs fast. The tortoise is slow. The hare challenges the tortoise to a race. The tortoise accepts. The overconfident hare takes a nap during the course of the race. He is sure that he will win. The tortoise moves steadily and ultimately she wins the race, as the hare is caught napping on the job!

International Development Studies focuses on how development and peace, inequality (gender, income, access, spatial, trade, investment, etc.) and poverty are produced, reproduced and challenged over time. It has evolved every decade using different approaches to understanding, analysing and addressing this problem (Baud, 2004; Meier, 2001; Thorbecke, 2006; Easterly, 2007; Gupta and Thompson, 2010).

However, we now live in the geological age of the *Anthropocene* (as identified by Paul Crutzen and others). We have exhausted more than 40% of the oil resources; transformed 50% of the land, mangroves and wetlands; used 50% of the available freshwater; overexploited 22% of the fisheries; pumped the atmosphere with greenhouse gases and moved en masse to cities. This is caused by the *Great Acceleration* in our population, production, consumption, urbanization and trade patterns (Steffen et al., 2004). ‘The Earth is now in the midst of its sixth great extinction event’ (Steffen et al., 2004). We are increasingly crossing planetary boundaries (Rockström et al., 2009) and unsustainably using 1.5 times the Earth annually (WWF, 2012: 38).

Our human wealth (stocks) and income (flows) come from the use of these finite resources (see 2.2, 2.3) and ecosystem services (see 2.4), without which life itself would not be possible, let alone economic activity. Resource trade was at USD 5 trillion in 2012 (Lee et al. 2012) and our ecosystem services have an estimated value of about USD 33 trillion a year at a time when global GNP was at USD 18 trillion (Costanza et al., 2007). Hurricane Sandy cost the US, USD 100 billion, floods in China in 2012 USD 14 billion (UNU-IHDP, 2014).

Resource and development politics, which hark back to Kautilya’s Arthashastra (2nd century BC), conquests and colonization, are now returning with a vengeance in the face of dwindling resources and growing demand (Lee et al., 2012). The ecosystem service knowledge adds a new dimension. Our shrinking ecospace (see 2, 3.1) and related politics has a critical role to play in determining who develops (see 3.3), where (see 3.2), when (see 3.3) and how (see 3.4, 3.5); how inequality and impoverishment will be dealt with (see 3.6) and how this will affect peace.

We thus live in an interconnected world. On World Environment Day, it is appropriate to reflect on how we share our earth! My PhD thesis on climate change (Gupta, 1997) began stating:

‘There are either enough natural resources for everyone to use,¹ or there are not.² If the perception is that there are enough resources for everyone and these resources are accessible to all, then there is no problem. If, however, the perception is that there are not enough resources for everyone, or there are enough resources but not accessible to all, there is a serious problem. This can be solved through technology development and discovery; or through addressing the issue of what is ‘enough’³ and how available resources should be shared.⁴ Alternatively, it can be dealt with by substituting the word ‘everyone’ by ‘some’.⁵

Fifteen years later I am still preoccupied with how we share our resources.

Although there is probably enough for everyone’s greed in the solar system, I limit my inaugural speech to the Earth and the coming decades. If there are limits to our resources, this implies new challenges to global development governance. There are four options to deal with scarcity – the neo-liberal approach, the hegemonic approach, polycentric governance, and the sustainable development intergovernmental and multi-level governance approach (see 3.1). I argue in favour of the sustainable development approach and submit that evolutionary processes will lead global society to gradually learn to share!

2. Shrinking Ecospace

2.1 Introduction

Since the 1970s we know that we live on an Endangered Planet (Falk, 1971) and that we have ‘Only One Earth’ (Ward and Dubos, 1972). We have a *shrinking ecospace* (environmental utilization space, building on Opschoor, 2009) as some resources have absolute limits or use limits (see 2.2), some resources are fixed but demand increases (see 2.3), and for unlimited ecosystem services for a growing population we have to limit our use of other resources and sinks (see 2.4).

2.2 *Some abiotic resources have absolute or use limits in human time-scales*

Some abiotic resources (i.e. metals, strategic minerals and rare earths, energy sources, and chemicals like phosphorous) have absolute limits in human timescales. Although there are reserves, such reserve data cannot guarantee supplies, and often the reserves are of low quality or only accessible at high economic and social cost.

Global metals (e.g. iron ore, zinc, bauxite, copper, aluminium) consumption is rising rapidly. Zinc, lead, copper and nickel are increasingly only available as low grade metals. By 2030, there may be a 50% supply gap and heavy rare earths may face a supply shortage until 2020 (Lee et al., 2012) and even beyond. Nitrogen and phosphorous, critical for agriculture also face shortages. The information on phosphorous availability is highly contested (Edixhoven, Gupta and Savigne, 2014) and reveals the politics of science of mineral reporting. The reserves are concentrated in Morocco and Western Sahara, and the US and China control most of the phosphorous production. This could pose challenges to countries who want to raise agricultural production. Many such resources are exhaustible; currently geographically concentrated in terms of demand, supply, and processing hubs; are subject to supply disruptions, price volatility, and labour trouble (Lee et al., 2012); extracted while disrupting local life, rights and environments (Oxfam America, nd); and long-term international extraction contracts lead to national policy freezing (see Box 1). Price and supply volatilities affect marginalized poor countries, who are often also plagued by the 'resource curse', civil war, the rise of rebels and militias. It is less the physical scarcity aspect than the political and economic dimensions of scarcity and the trade-offs between individual resource scarcities that is important (PBLa, 2011).

There is a different problem in relation to fossil fuels. Currently oil production from conventional gas fields is declining and concentrated in six OPEC countries. It may be supplemented by Canadian oil sands, American shale oil, Arctic offshore production and new producers such as Ghana and Uganda (Lee et al., 2012). However, if we wish to address climate change and ensure that average global temperatures do not rise by more than 2°C in relation to the pre-industrial era, we cannot burn the remaining 80% of the fossil fuels (*stranded resources*), much of which is located in the developing world and will thus have an impact on their ability to earn (Carbon Tracker, 2014: 2).

Box 1. PhD – Foreign direct investment in developing countries as a solution and problem for sustainable development

The Expropriation of Environmental Governance: Protecting Foreign Investors at the Expense of Public Policy, Kyla Tienhaara (Canadian), PhD/VU/Gupta's NWO-VIDI, PhD 2008, Presently at Australian National University.

Using an international relations and law approach, Tienhaara focuses on how with the rise of neo-liberalism, thousands of investment agreements protect the interest of private investors (in mining, water and forests) and their contracts at the cost of public policy development ('policy freezing') in developing countries leading to the expropriation of environmental and social governance to inappropriate institutions.

2.3 Limited resources and rising demand implies shrinking ecospace per capita

We have limited land and freshwater. Meeting global food needs by 2050 will require an additional 60% of cropland and a 70% increase in meat and dairy production (IIASA, 2013/2014). The competing uses of land to meet food, fuel and urban needs pushes agriculture onto marginal soils and deforested lands. Global water demand is rising rapidly to meet growing demographic and consumption needs and 50% of the world's population will be living in water stressed areas by 2050 (EC, 2013).

Future expectations show a rising demand against a fixed resource base. A European Commission appointed expert group (of which I was a member) debated on the world in 2050 based on foresight studies, expert judgement and scenario development. The world of 2050 will have 9 billion people with persistent but changing inequality patterns. Environmental stress will drive competition for control over water, food, seeds, energy sources (including biofuels), land and minerals in a changing and less hospitable climate. These changes will imply a reduced supply per capita especially in the context of the impacts of climate change on the hydrological system (EC, 2012).

2.4 Unlimited ecosystem services but only if sustainably managed

Although we have a limited Earth with finite land, water and minerals (at least in human timespans), its capacity to provide us with ecosystem services is infinite, but *only* if we manage it sustainably (Chopra et al., 2005). Let me explain.

Our ecosystems have their own existence value and some cultures see them as divine. They also provide us with *supporting* services which include the way the system cycles nutrients; helps in soil formation – an extremely important

element in agriculture, but soils also store some 4000 Bt of Carbon (Lal, 2010) and clean water (Falkenmark and Rockstrom, 2006); *provisioning* services – food, fodder, fresh water, wood and fibre, fuel and many others; *regulating* services which regulates the climate, floods, keeps disease under control, and purifies water; and *cultural* services – a home to live in, aesthetic pleasure, spiritual support and recreational pleasure. The *miscellaneous services* include natural borders for countries and regions, shipping routes, and inspiration for our technologies!

The hare and the tortoise revisited – 2: Development and environment

Development (the hare) is on a run-away process. But natural resources and the ecosystem services (the tortoise) are limited. If development runs like the hare, and ignores environmental limits, the environment will win the race and leave the hare behind.

Extraction and pollution either exhaust the quantity or affect the quality of our finite resources, or affect ecosystems and impair their ability to provide the ecosystem services which are vital for our well-being – namely our (i) personal safety, resource access, and low exposure to disasters; (ii) basic material for the good life (livelihoods, food, water, shelter, clothing and other goods); (iii) health; (iv) good social relations, all of which are essential to (v) have peace, freedom of choice and action, and to participate effectively in society (Chopra et al., 2005).

An ecosystem framework is more complex in scale (glocal) and also in breadth of issues (e.g. the cultural, supporting and regulating services) than the traditional environmental approach; second, it requires a socio-ecological systemic rather than an instrumental governance approach; third, maintaining ecosystem services is a global public good, while environmental challenges are global public bads; the difference in framing leads to different reasons for, and articulations of, policy formulation; however, fourth, global public goods and bads face boundary challenges – i.e. where can one draw the boundaries for each ecosystem problem and how does that relates to jurisdiction; and finally unlike an environmental approach, in an ecosystem approach, humans are both part of the ecosystem as well as actors outside the system given that in the Anthropocene we humans have a major impact on our environment (Gupta, forthcoming a).

3. Governance challenges

3.1 *The sharing our earth problem*

Thus, the challenge of the Earth in the Anthropocene is the problem of the triple shrinking *ecospace* on a per capita basis in a world of growing population and demand, because:

- a. the resource shrinks (e.g. scarce minerals), and/or
- b. the sink shrinks (e.g. the permissible greenhouse gas emissions into the atmosphere shrinks which has implications for stranded resources, the right to grow and who bears responsibility for climate impacts), and/or
- c. the resource stays constant but our demand increases (e.g. fixed land and fresh water, but food demand multiplies).

This shrinking *ecospace* will threaten development and peace. It has three dimensions:

- The *ecosystem* dimension implies that if we want a continuation of ecosystem services and resources we need to take cognizance of the shrinking or absolute limits of *ecospace* (resource, sinks, and growing demand) and develop *ecosystemic standards* and define *ecospace* using e.g. new sciences including ICT technologies (EC, 2012). This calls for global steering. However, those with vested interests will not want global standards!
- The *economic* dimensions refer to the direct and indirect link between spatial and temporal economic development with *ecospace*. Business-as-usual development abuses *ecospace*, even though it is often the cheapest option in the short-term leading many to want to externalize their impacts on *ecospace*. Historic transition patterns in relation to demography, development, household pollution, urban pollution, forests and greenhouse gas transitions show that control over global pollutants cannot be left to autonomous processes (UNDP, 2011; Gupta, 2014). Markets cannot deal with public goods requiring strong steering governance (Kaul et al., 2003; Went, 2010; WRR, 2010; PBL, 2011b; AIV, 2013; UNDP, 1999; UNIDO, 2008). For long-term economic development, states will have to accept ecosystemic standards that shape or limit their development aspirations (see 3.4). The *green economy* approach tries to take the relationship between the environment and the economy into account (UNEP, 2010; see 3.6). However, convincing countries and peoples to redefine development paths is not easy.
- The social dimensions refer to how the triple *ecospace* problem will affect societies. It will lead to less trust, cutthroat competition, poor policies and

compound existing peace problems (Lee et al., 2012). It will lead to implicit marginalization and exclusion to explicit stress between peoples and countries. Indigenous peoples and local communities are losing their traditional rights to land and water as mining, agriculture or urbanization make demands on their lands (Misiedjan and Gupta, 2014). Artisanal fisher folk are losing their fishing rights as large-scale trawlers supported by national law, bilateral fishing agreements, and/or the military, fish in their waters. Laotian farmers's water rights may have been transferred to new private dam authorities (Merme et al., 2014). Foreign mines are often protected at the cost of environmental and social issues (see Box 1). At best these lead to paper conflicts of legal pluralism (Von Benda-Beckman, 2001; Bavinck et al., 2014.) resolvable through negotiation and free and prior informed consent, at worst to bloody situations over land as in Indonesia. Farmers are losing their ability to reuse seeds as genetic modification and vertically integrated markets push them into an 'adverse inclusion model' (see Box 2). Least developed countries (Gupta, forthcoming b) and small island developing countries and poor people globally will face the full brunt of climate change impacts without themselves having significantly contributed to the problem. The *inclusive development* approach tries to take these kinds of issues into account (see 3.6). However, convincing powerful actors to take inequality into account will be challenging.

Box 2. PhD – Polycentric governance and adverse inclusion: The case of biofuels

The Politics of Biofuel Governance and Sustainability, Mairon Bastos Lima (Brazilian), PhD/VU 2014, co-supervisor – H. Aiking, presently at Wageningen University. Using international relations and environmental theories, Bastos Lima argues that the global rise in biofuel production to meet rising energy needs and the challenge of climate change through polycentric green economy governance that avoids equitable, democratic and legitimate policymaking leads to adverse inclusion of poor farmers exacerbating social and political inequities and causing environmental problems.

This brings me to the question: Why and how should we share shrinking eco-space (see also why we should be inclusive, 3.6)? First, the shrinking sink has three interlinked implications: (a) Where this concerns the ecosystem service of maintaining the common atmosphere/hydrosphere/climate/ozone layer, these are shared by all. These issues are global public goods for economists, or issues of common concern/or shared heritage for policymakers and lawyers. No one on earth can be excluded from such services such as a stable climate and ozone layer (non-excludable), and the use by one does not imply

less available for others (non-rival). (b) Protecting these sinks implies e.g. reducing greenhouse gas emissions. Such reduction may have implications for economic growth patterns. Thus this raises the issue of how can emission allowances be distributed among countries and peoples? Will developed countries (and/or rich people) reduce their emissions to make space for developing countries (and/ or poor people) to increase their emissions (see 3.3)? Who can use their unused (stranded) resources in the future (see 2.2, 3.4). (c) Furthermore, if countries or actors e.g. do not agree to reduce their emissions, can the no harm principle be used to impose liability on them? After all their actions cause climate change which may have negative impacts on others? This means that those who cause harm (global public bads e.g. climate change, ozone depletion, water pollution) should be held responsible/accountable/liable under the no harm principle especially as the humans affected have a 'right' to life and a healthy environment.

Second, where the resource is limited but demand increases, this might call for redistributing allocation and revisiting existing rights in order to ensure that there is enough for all. In the water world, this is often referred to as hydrosolidarity.

Third, when it comes to shrinking abiotic resources such as phosphorous that are absolutely essential for food production, monopolizing these resources through long-term extraction contracts or production capacities to the exclusion of others, is not just immoral, but illegal as it will affect the right to life. This is also relevant to the whole discussion of patents on seeds which take free and renewable seed supply out of nature's hands and into the hands of companies. Furthermore, where strategic metals and minerals are concerned, perhaps the sharing argument is weaker; but at least we need to face questions such as is 'first-come, first-served' a legitimate principle in the 21st century and how do we deal with late-comers to development? Not only that, the extraction of these resources has significant social impacts through the erosion of local traditional (informal) rights to resources.

Sharing does not imply equality; it calls for equitable governance. It calls for understanding how to ensure (i) *access* (minimum rights for all) and (ii) *allocation* (distribution and redistribution) of the remaining ecospace *rights*, *responsibilities* and (social and environmental) *risks* and burdens among peoples and countries including the impacts of climate change (Gupta and Lebel, 2010). It focuses on the critical issue of who allocates! The principles of sharing will differ from case to case. It should also be noted that these sharing issues are nested in larger sharing issues.

The shrinking ecospace problem evokes four key policy options:

- Neo-liberal market approach: This allocates ecospace and related rights, responsibilities and risks through pricing, markets and privatization. The rich buy land, water, minerals, and sinks (through the purchase of emission credits) often through ignoring existing local traditional claims to rights and national claims to the right to develop, and externalizing ecological and social impacts. The rich countries (through emissions trading), companies and people monopolize the ecospace; channel much of their transactions through offshore tax havens; and avoid access and redistributive issues.
- Neo-realist, hegemonic approach: This allocates, by default in an anarchic global system, the shrinking ecospace and related rights, responsibilities and risks on the basis of binding bi-and plurilateral treaties (or other less legal means) to secure continued access to resources for individual countries and uses (absolute territorial) sovereignty to protect national resources and securitization arguments to control access to resources at home and abroad (see 3.4). Increasingly, policy studies are recommending bilateral agreements with countries that can supply strategic metals and minerals as a way to guarantee the security of access for individual countries (PBL 2011a, Hague Centre for Strategic Studies 2011). Hegemonic and securitized approaches may or may not be interested in the ecospace issue (cf. Deudney, 1990; Le Prestre, 1993; Conca, 1994; Buzan et al., 1998; Balzacq, 2005), but they prioritize their own access over distributive issues. The powerful countries can thus monopolize ecospace and poorer states will struggle with the challenge of stranded resources (the oil/gas/hydroelectric potential and forest lands that they may not use), the right to develop and environmental impacts.
- Polycentric governance: This allocates the shrinking ecospace related rights, responsibilities and risks through laissez faire governance as it is generally opposed to hierarchy and centralization and sees that each actor has a role to play and most actors (communities, industry, governments, NGOs) will try to find solutions. Polycentric ad hoc approaches may address localized ecospace issues within community settings, but even though they mobilize and empower all (Ostrom, 2010), they cannot deal with externalities and are not able to adopt ecocentric standards, or deal with ecospace sharing *between* polycentric governance systems. Current ad hoc responses in an increasingly neo-liberal, polycentric world are increasingly leading to inappropriate policy responses (Lee et al., 2012). Polycentric governance tries to empower all in decision-making, but has its own power politics and its effect is uneven on the poor and the environment (see Box 2).

- Global sustainable development governance: This can potentially define ecocentric standards and deal with ecospace related rights, responsibilities, and risk issues based on certain principles through an effective intergovernmental and multi-level governance system that discourages free-riding, promotes accountability and liability systems and includes all countries and peoples (see 4.1). *Strong* sustainable development governance (which does not allow trade-offs between the economy, society and the environment) addresses the ecosystem challenges, the right to develop and stranded resources of countries and inequality. This empowers all in decision-making and in terms of impact.

I argue that sustainable development, intergovernmental and multi-level governance is most suitable because, market, hegemonic and polycentric discourses cannot individually or jointly deal with ecospace issues such as adopting ecocentric standards and defining ecospace; nor can they deal with access (minimum rights of access) and allocation (rights, responsibilities and risks). Sustainable development governance can deal with these issues because it can build on the array of intergovernmental tools available for developing ecocentric standards and for guiding human behaviour (see section 4 and 5). Within such a framework there is room for polycentric and market approaches.

I now elaborate on five hypotheses that shape the governance for sharing ecospace.

3.2 *Globalization glocalizes problems, requiring glocal analysis*

First, rapid globalization has made almost all problems global to local (glocal) in nature. Climate change is obviously glocal. But even deforestation (Gupta et al., 2013a), water (Gupta et al., 2013b; Gupta and Pahl Wostl, 2013), and persistent world-wide poverty and inequality are glocal problems, because:

- their drivers (discourses and institutional arrangements) operate at glocal levels;
- their impacts spill over to other levels directly (i.e. local water pollution causes downstream health problems) and indirectly (i.e. when one dam is not a problem, but dam congestion worldwide affect fish populations, ecosystems and livelihoods);
- natural, economic and investment systems are glocal systems; and
- as learning is cumulative, glocal science and technology can analyze and solve problems.

This brings me to the politics of scale. Even when a problem is clearly glocal, actors may scale up a problem for positive and negative reasons:

- to increase systemic understanding: thus accounting for externalities and establishing global thresholds;
- to enhance the effectiveness of governance: through including all actors and states, to attain the common good;
- to promote domestic interests via avoiding domestic measures till others do so or to put pressure on others, and
- to promote extra-territorial interests: to gain influence over another country's resources (Gupta, 2008).

Arguments to scale down (used also by neo-liberals, hegemons, and polycentrists) include better physical and social contextual knowledge, designing tailor-made solutions using local institutions, sovereignty, avoiding international liability, and promoting extra-territorial interests through hegemonic or fuzzy governance approaches (see Box 2).

I would argue that ecospace problems and solutions are glocal even if actors and states may scale them up or down and requires *scalar analysis*. This calls for (a) expanding multi-level governance into a glocal governance analysis, (b) thus going beyond the scalar boundaries of individual disciplines (e.g. local: anthropology, sociology, micro economics; national: political science, law; international: international law/relations). International development studies has always focused both on issues within developing countries, but also on critical relational issues between North and South. It thus provides better disciplinary scope for studying the glocal challenges of sharing ecospace. (c) Such glocal scalar analysis combines time (catch-up and late-comer theories), administrative (multi-level governance), actor/sector (state, NGO, business, small and medium sized enterprises, civil society, disadvantaged groups including the informal economy, capital markets, and the illegal economy which is 20% of the global economy and interacts seamlessly with the legal economy within vertical production systems where some parts are legal and some not, and through money laundering especially in offshore tax havens (Weaver, 2014)) and spatial (territorial dynamics) scales. (d) It explores and diagnoses the glocal nature of the ecospace sharing problem. It explains and predicts why countries and actors may or may not wish to scale up or down a problem and what they may choose instead. It analyses how scalar discourses, strategies (including the politics of science and scalar shopping), arrangements and instruments influence and shape social transformations. It has policy relevance and can explain which institutional arrangements and

instruments are likely to work in which combinations and at which (sets of) level(s) and how they need to be co-designed (Gupta, 2014b).

Box 3. PhD – Linking global climate policy to micro-scale industries in India

Global Solutions Meeting Local Needs: Climate Change Policy Instruments for Diffusion on Cleaner Technologies in the Small-Scale Industries in India, Preeti Soni (Indian), PhD/VU/NUFFIC financed, PhD 2007 (supervisor P. Vellinga and H. Opschoor). Presently at UNDP, New Delhi. Using an economic, environmental and international relations approach, Soni focuses on the lack of attention paid to the micro industry in climate policy arguing that while the global and national level can set the policy guidelines, ecological sustainability has to be achieved also at the local level and this calls for multi-level policies that take the small and micro-scale sector and local livelihoods into account.

3.3 Changing world, but persistent problems, requiring relational analysis

Second, although geopolitics and geo-development patterns are changing, persistent problems will require North-South and rich-poor sensitive relational analysis.

It is clear that who is ‘North’ and who is ‘South’ is changing. The centre of gravity of economic and political activity will shift to Asia with its demographic size, and production and consumption capacity⁶ even though 71% of the global population with less than USD 1 per day will live there (EC, 2012).

However, these changes do not justify the call to dismantle and discredit the North-South distinction. Arguments against a North-South approach are that such classification is vague and analytically useless (Toye, 1988; Sebenius, 1993; Harris, 1986); does not reflect the changing income realities (see World Bank data); is irrelevant 50 years after the end of colonization (Toye, 1988); polarises relationships (Benedick, 1993; Andresen and Wettestad, 1992); and with the decline of the state, such an approach is history.

However, North-South remains functional as (i) it divides the world into two groups with vastly different problems (demographic, governance, economic, social) even if there are countries in the margin that could better belong to the other group (Gupta, 2007, p. 449-472); (ii) past N-S relations have a long shadow into the future (e.g. in terms of trust and relationships); and the shadow of the legacy of colonization feeds an ‘us versus them’ belief in the North (Minovitz, 1993; Ramphal, 1983, p. 17-23) which is reinforced by the ‘west-centric’ approach (Diez, 2005) that frames the ‘rest’ as inferior needing civilizing (Said, 1979), or as an existential threat justifying military force (Buzan et al., 1998), or as adopting ‘poor governance’ approaches and being cor-

rupt; China reacts by trying to develop its own distinct development (state led modernisation) and development aid (non-interfering, non-conditional, leading to no new debt crises – Zhang, 2011, p. 209-225) philosophy. (iv) There is an expectation that patterns of North-South exclusion are continuously institutionalized and reproduced since colonial times by powerful developed countries (Third World Approaches to International Law (TWAAIL); ICLR, 2008; Chimni, 2006), disenfranchising poorer countries (Green (ed.), 2006), so that there is a continuing need to call for global justice (French (ed.), 2010), (v) especially in the context of the new ecospace sharing crises which will actually sharpen North-South and rich-poor differentials because of the contentious sharing issues (translated into who can develop where, who can deforest where, who can use stranded resources where, who can subsidise farmers, the shift of virtual jobs, the production versus consumption debate, who will pay for adaptation; who will bear the brunt of residual risk os sinking small island states, etc.) particularly when these challenges are resolved through neo-liberal and hegemonic strategies (Gupta, 2014a); and (iii) there remains a clear if changing South of very poor countries (Gupta, 2012).

The hare and the tortoise revisited 3: North and South

The North-South story line hoped that the South would ‘catch-up’ with the North! But the North paradoxically resents the South catching up. This resentment becomes worse with the realization of the shrinking ecospace: the more one gets – the less there is for the other. Only those actors that learn how to develop within a limited ecospace will win! The US has not realized that; has China?

There are also regional examples of ‘North-South’ issues. While Egypt clings on to its legal rights to the Nile as claimed under British rule, the upstream countries have been trying to claim greater access but with little success. Ethiopia’s unilateral decision to build a new millennium dam is stressing this relationship (Sanchez and Gupta, 2011). China’s increasing use of international rivers challenges existing treaties between downstream countries (e.g. Lower Mekong countries, India, Pakistan, Nepal, and Bangladesh; Salman and Uprety, 2002). Countries (e.g. India and Sri Lanka) also struggle over fish with the navy not always at a distance. These sharing problems are often being resolved through a recourse to sovereignty and securitization (see 3.4)!

Similarly, the issue of who is rich and who is poor is changing. However, (i) the 85 richest people have the same income as the bottom 3 billion. 50% of global wealth is in the hands of 1% of the population (OXFAM, 2013; Credit Suisse, 2013). The 1.3 billion poor people who live on less than USD 1 a day and the 2.47 billion living on less than USD 2 per day are mostly in Middle

Income Countries (Sumner, 2010) and income inequality is increasing in cities; (ii) the youth (Ortiz and Cummins, 2012), older and unemployed people will become more vulnerable adding to existing gender and racial inequalities (EC, 2012)! While there is increasing optimism about economic growth in Asia and Africa (Chandy and Gertz, 2011), this may not reduce poverty and enhance wellbeing (Ravallion, 2011; Stiglitz et al., 2009), nor is it clear if such growth is sustainable as there are limits to local resources. The rich-poor problem is not passé; the rich (i) support neo-liberal approaches and markets, promote deregulation and strongly influence policymaking in their own favour (Oxfam 2013) in order to, inter alia, pre-empt legitimate, democratic governance processes on ecocentric standards, and ecospace sharing through access and allocation rules, (ii) evade taxes: “over 50% of international bank lending, approximately 33% of foreign direct investment and 50% of global trade is routed on paper via OTH [offshore tax havens]” (Weaver, 2014: 3, citing Christiansen, 2011) often in collusion with developed country governments (Weaver, 2014), which could have been used for redistributive purposes; (iii) monopolize resources and sinks (through emission credits); (iv) further impoverish the poor (in collusion with their governments) by eroding the traditional rights of the poor of access to lands, water and fish through large-scale land, water and fish grabbing; and (v) cause climate impacts which may further exacerbate existing poverty.

These changing yet persistent geo-development patterns calls for a critical, constructive, glocal, relational approach. This implies (a) understanding how glocal paradigms and institutions are used to control people, shape sharing politics and perpetuate inequalities; and how and whether this might change through changing geopolitics; (b) not just a focus on the poor/South but also on the rich/North (their capital markets, flows, operations) and the relations between them; (c) using also Southern epistemological approaches such as TWAIL; (d) analysing how past relations and their shadows and future expectations will shape ecospace sharing; such shadows are solid when they refer to the infrastructural and technological lock-in of societies, but others are more ephemeral but no less real in terms of social and political lock-in; (e) understanding how changing geopolitics and Asia as both the centre of power and poverty in the 21st century will affect the development prospects of others; (f) understanding how empowering the poor, weak, and marginalized at glocal level (from LDCs to indigenous peoples) would help in addressing ecospace challenges in a world growing to 9 billion people; and (g) assessing how redistributive mechanisms can be funded not just by new and innovative funding mechanisms but also by closing offshore tax havens.

3.4 Ecospace-limits shape anthropocentric development ambitions: Sustainability, not securitization

Third, since ecospace limits will need to shape anthropocentric ambitions, this has implications for our development goals, definitions and patterns, and whether sustainability or securitization control this process. This raises the questions of who can develop, how, and what form of development is acceptable?

Since the end of World War II developing countries have argued in favour of the new international economic order to ensure global fairness and the right to develop (Garcia Amador, 1990; Chowdhury et al., 1992; Gupta, 2010). The latter was adopted in 1986 by the UN General Assembly (UNGA, 1986). Whether this is a right of states or individuals to develop is contested (Piron, 2002; Adam, 2006; Kirchmeier, 2006). However, not all countries and individuals can continue to develop in the same manner as the ecospace is limited.

Take climate change (Gupta, 2014a). To address the climate problem, we need to stabilize concentrations of greenhouse gases. This implies a limit to the amount of greenhouse gases that we can emit into the atmosphere and every year this limit decreases. This can be depicted as a shrinking cake/ecospace. It is this shrinking cake that has to be shared between North and South, (rich and poor). As the cake shrinks to non-existence in 2032 (UNDP, 2007), the sharing problem gets worse – it was thus much easier in 1990 to have addressed the problem, and it will get tougher as we get closer to 2032! While in 1992, it was agreed that the North would reduce its own emissions thereby making space for the right to develop of the developing countries, this social contract was affected by the US-UK collusion in making the developed countries' reduction target vague in the 1992 treaty; the US non-ratification of the 1997 Kyoto Protocol; the withdrawal of Canada, Russia, Japan and New Zealand from the 2012-2020 phase of the post-Kyoto agreement and the current resentment that the South is growing! The breakdown of this social contract has badly affected South-North trust. Why should the South take action; there is no guarantee that the US ever will? Alas this is also a suicidal argument! The way the small island states and the Least Developed Countries have been ignored in this process demonstrates effectively that the North-South problem is still alive, if changing.

The limits of the Earth's ecospace has sharpened thus the North-South debate, but also the rich-poor debate on the right to develop, as one group's development may come at the cost of the other group's aspirations and rights.

This has led to the rise of the Hydra of securitization. At global level natural scientists talk of planetary boundaries and global security using a statistical

and scientific approach (Rockström et al., 2009). At local level, scholars talk of food, energy and water security using a human security approach (UNDP, 1994; UNEP, 2009). Some argue that the use of 'security' enlarges the scope of traditional state-centered security because environmental challenges ignore national boundaries (Dabelko and Dabelko, 1995, Lipschutz and Holdren, 1990; Ullman, 1983) and prioritizes these issues. Others argue that resource shortage will lead to war (e.g. the water war hypothesis; Annan, 2001; Gleick, 1993; Kaplan, 1994; Schwartz and Randall, 2003; and the hydro hegemony hypothesis). Securitization of sustainability issues is taking place through linguistic, visual, institutional and infrastructural framing approaches (Fischendler and Nathan, forthcoming).

However, I would argue that this is naïve and empowers states to securitize ecospace as they did energy in past decades and resources during colonization. This will allow upgrading an issue into a high politics issue justifying the back-up use of weapons and the suspension of the rule of law; it enlarges the scope of (shrinking) military activity (Colijn et al., 2013; Novelli and Lopes Cardozo, 2008; Gupta et al., forthcoming c). The military/security industry and scholarship is reinventing itself to also safeguard the economy and prosperity through promoting peace and safety in maritime waters; stability and security in failed or fragile states; promote Defence, Diplomacy and Development; and promote human rights where people's access to water, food and a safe environment is threatened (Colijn et al., 2013). In recent decades there is also a rise in the use of private security guards to manage natural resources, protect wealthy people, cope with civil conflict (Lee et al., 2012) and illegal gangs that control (and sometimes support) the poor. I believe that instead of the security jargon prioritizing sustainability and safety issues on the global agenda, it hijacks the sustainability agenda into a securitization discourse. Defense, private security organizations and illegal gangs are both anticipating and creating the fear of 'conflict' *also* in terms of 'ecospace related conflict' which can only be resolved through a security apparatus. Securitization exacerbates the sustainability debate as hard power implies (i) the suspension of the rule of law, (ii) cannot address marginalization, exclusion and vulnerability challenges, and (iii) cannot resolve the 'sharing' debate and will be counter-productive (Deudney, 1990; Le Prestre, 1993; Conca, 1994; Buzan et al., 1998; Balzacq, 2005). This strengthens the state's military role without strengthening its role in intergovernmental cooperation. Furthermore, there is nothing inevitable about resources leading to conflict – e.g. the hydrosolidarity hypothesis has more support in historical documentation (Dellapenna, 2002; Kalpakian, 2004; Wolf, 1998) than the water wars hypothesis.

3.5 Fragmented polycentric governance inevitable, but not sufficient: Good government, rule of law, and global constitution needed

Fourth, fragmented governance is inevitable but not sufficient to address eco-space issues and its sharing, calling for a global constitution and rule of law.

Fragmented governance is inevitable at glocal level because (a) ecospace issues (environmental and developmental) are so closely interlinked and intertwined with each other at glocal level, are characterised by complexity, uncertainty, surprise and unexpected feedback effects that it is very difficult to make comprehensive approaches, not least because of the challenge of free riders and vested interests. (b) Furthermore, fragmentation is also inevitable because of the shift from hierarchic, centralized government to non-hierarchic, diffuse governance in a network society (CGG, 1995, Arts and van Tatenhove, 2005; Van Gunsteren, 1976; Castells, 1996) supported by neo-liberals, neo-realists and polycentrists/deeper democracy movements. (c) Such fragmentation is not random but deliberately benefits the powerful and issue-specific interests leading to fragile compromises where the conflict of interest is high (Koskenniemi, 2009). The use of language to present 'neutral' choices that obscure politics (Koskenniemi, 2009) or to 'securitize' the debate in an innocent endeavour to widen the ambit of security mandates (Fischendler and Nathan, forthcoming) will compromise the ability to achieve good governance at glocal level (cf. Box 4). (d) Such fragmentation also results from the reduced regulatory and fiscal powers of all states globally (Weaver, 2014).

Box 4. PHD – Fragmented governance

The Fragmentation of Global Climate Governance, Harro van Asselt (Dutch), PhD/VU/2013 (cum-laude) (other promotor: F. Biermann), presently at Stockholm Environment Institute. Using a law and international relations approach, Van Asselt argues that the global climate change regime is fragmented and interacts with other regimes. He concludes that as the distinction between hard and soft law is becoming blurred in perception and implementation, there is need for combining traditional treaty interpretation rules with new accountable and legitimate coordination mechanisms (which is not easy) to complement existing autonomous institutional interaction, but that there are no clearly identifiable and objective standards against which such interaction can be judged.

Fragmented governance cannot address the issue of ecosystem limits and eco-space sharing issues. This is because while the awareness of the relationship between resources and development calls for greater constructive (and not securitized) state engagement than before (Hurrell, 1994), the rich and power-

ful promote deregulation in favour of the private sector, the merger of public and private governance, confusion between public and private participation, self-regulation, and tax havens (Oxfam, 2014; Weaver, 2014). Such fragmented governance leads to incoherence. This incoherence in the context of declining North-South trust feeds the fear that international processes may reproduce and institutionalize global inequities through fragmented governance in climate change (Limon, 2009) as well as in other ecospace issues (cf. Chimni, 2006; Okafor, 2008; Rajagopal, 2006; Sornarajah, 2001).

Box 5. PhD – Global water discourses and national implementation challenges

Investigating institutional arrangements for integrated water resource management in developing countries: The Case of White Volta Basin, Ghana, Joseph Boateng Agyenim (Ghanian), PhD/VU/NUFFIC financed, 2011; presently at Cape Coast University. Using a policy analysis approach, Agyenim argues that while the dominant approach is to adopt integrated water resource management (IWRM), the implementation of such a concept requires strong government and governance institutions. However, historical path dependency and limited resources leads to a messy reconfiguration that neither addresses the challenges of the poor nor the environment.

This incoherence has led to the rise of concepts such as integration (e.g. see Box 5), coherence, coordination (UN, EU, national policy; Schubert and Gupta, 2013), mainstreaming (Gupta and van der Grijp, 2010) and the nexus approach (Gupta et al., 2013c) as ways to promote synchronized policies. However, such efforts cannot resolve the underlying conflict of paradigms (see 3.6), nor can they rewrite the historical processes that have led to the adoption of different policies in different sectors at multiple levels of governance leading to plural rule systems.

This is why I would argue in favour of the rule of law and constitutions at both national and international level. Such elements are fundamental to all stable states; why not then at the global level? This would not just be procedural rule of law but also substantive rule of law, promote global equity and inclusive development (see 3.6) (Craig, 1997; Tamanaha, 2004; Kwaka, 1994) and balance the effect of power politics. Global rule of law is needed as (i) the scale of ecospace sharing problems are multiplying in the Anthropocene; (ii) we have no parallel situation ('no analogue state' – Steffen et al., 2004) from which to learn; (iii) markets, hegemonic and polycentric governance cannot resolve these; (iv) since globalization and transnationalization has brought people together globally; (v) the rise of new powers and new ways of doing business calls for collective debate on principles of global governance; (vi) there are too many leaks in the global system such as with respect to the

more or less unregulated global capital market, and (vi) since we need transformative policy and have arrived at a constitutional moment in history (Biermann et al., 2012a/b). Koskenniemi (2009: 17) argues that ‘I totally approve of the political move to re-define the managerial world of international institutions through constitutional or administrative vocabularies – not because of the intrinsic worth of those vocabularies, however, but for the critical challenge they pose to today’s culture of a-political expert rule, and perhaps for the appeal of the (Kantian) perfectibility that they set up as a regulative goal for human institutions [footnotes deleted].’

Constitutionalization and a bill of rights for the 21st century would include systemic principles for sharing our earth and make space for the adoption of ecosystemic goals and standards that would define our ecospace (see 4.1); the UN adoption of the global sustainable development goals expected in 2015 could be a second step towards creating such a global framework (following the adoption of the Millennium Development Goals). A bill of rights would create the rules of interaction within which markets, hegemony, polycentric governance, capital flows, informal activities and illegal activities operate and are controlled.

This is not easy as there is also power politics in drawing up such a constitution and implementing it (Koskenniemi, 2009). This is not a short-term challenge. It calls for articulating the idea, its necessity and challenges; and for support from states (EU and G77 and China currently support this) and global social movements (which are now emerging), and the right moment. As the globe moves from first order (improving routines), through second order (improving assumptions, reforming) to third order (epistemic, transformative) learning to deal with ecospace sharing in the Anthropocene, I believe constitutionalization will become necessary.

3.6 Competing discourses unavoidable, but prioritize inclusive governance

Finally, a global constitution does not solve the problem of competing development discourses nor challenges dominant discourses. It can however help to provide some principles within which these discourses operate. These principles include how issues of access and allocation of shrinking ecospace can be dealt with. These principles can draw on the emerging theory of inclusive development which focuses on the bottom billions and the causes and processes of inequality.

The competing discourses that shape our world view (Hajer, 1995) can be illustrated on a triangular map of sustainable development which has eco-

conomic, social and ecological aspects (see Box 6). Sustainable development has evolved from a development discourse focused on gross domestic product and macroeconomic stability in the 1970s, to human development, wellbeing and sustainable society in the 1980s (Brown, 1981) to sustainable development (WCED, 1987) in the 1990s. Although vague and open to interpretation, sustainable development embodies the inspiring (Lafferty, 1996) process and goal of a world of continuous development for all. While adopted as the key goal in many national and international policy documents, and institutionalized in the current UN efforts at identifying sustainable development goals (Sachs, 2012; Sanwal, 2012) – it faces fierce competition from the background dominance of neo-liberalism and its focus on economic growth and free market politics which emphasize the economic aspect of sustainable development. This has led to *weak* sustainability allowing trade-offs in favour of economic goals. Since then the sustainable development community has split into two sub-discourses – the green economy and inclusive development.

Box 6. Sustainable development and water

International Law, Sustainable Development and Water Management, Antoinette Hilderling (Dutch), PhD/VU, 2004 (Promoters: P. Vellinga and N. Schrijver).

Using a law and sustainable development approach, Hilderling argues in favour of the concept of development of water as linking the ecological and development aspects of sustainable development, the concept of life support by water as linking the ecological and social aspects of water, and the sustainable use of water as linking the social and ecological aspects of water.

The green economy takes a technocratic, market-oriented and instrumental approach to promote growth within environmental boundaries (UNEP, 2010). Its scope ranges from an incremental approach of internalizing externalities through limited pricing approaches to a structural systemic approach (including dematerialization and decarbonisation) (UN Secretary General, 2010). In its incremental incarnation it has parallels with ecological modernization (Adams and Jeanrenaud, 2008; Foster, 2012; Buttel, 2000; Baker, 2007; Pataki, 2009; Mol, 2002; Jänicke, 2008); in its structural incarnation it has parallels with industrial transformation (Olsthoorn and Wiezorek, 2006; Vellinga et al., 2008, p. 321-344). However, these discourses focus on growth and do not question the existing distribution of power and resulting social inequality (Brand, 2012) and do not always take ecological limits into account (Barbier, 2009/2011).

In contrast, inclusive development is a social justice concept in line with human rights, well-being (not welfare) and livelihood approaches. It is justified because of (a) the normative considerations of minimizing human indig-

nities (Rauniyar and Kanbur, 2010a/b) and maximizing empowerment of the poor (Sachs, 2004), (b) the legal considerations of recognizing human rights including the right to life; (c) the economic considerations of enhancing economic growth and development while ensuring material, relational and subjective wellbeing (Pouw and McGregor, 2014); (d) the human survival considerations of ensuring access to basic resources including safety, and educational or training opportunities for engaging in legal means of income generation; (e) the social considerations of inequality and poverty compounding other inequalities (gender, racial, etc.), (f) the political considerations of enhancing democratic participation in policymaking and in turn providing well-being gains to all, and (g) the relational considerations of seeing poverty emerge as a result of the total economic and political system (Mosse, 2010). Such inclusive development may also empower people to make conscious decisions with respect to family planning.

Inclusive development has three strands: inclusive *growth* focuses on the notion of including people in GNP generation and use, inclusive *wealth* focuses on the stocks, not flows, of social, economic and natural wealth; and inclusive development focuses on wellbeing (Sen, 1999; Dasgupta, 1993).

Box 7. PhD – Inclusive governance in water: the potential of stakeholder participation

Stakeholder participation in Water Resources Management: The Case of Densu Basin in Ghana, Nana Amma Anokye (Ghanian), PhD/VU/2013 presently at Cape Coast University. Using a policy analysis and water management approach, Anokye assesses how Ghana's Densu Basin water governance can become more inclusive. Stakeholder participation can enhance good governance, democracy and sustainable development. Anokye concludes that while the rules for enabling stakeholder participation are in place, the actual implementation tends to be tokenistic. Effective participatory approaches need to build on the available financial resources and human capacity and, where possible, inclusive governance should aim to both educate and empower local people."

Inclusive *development* (i) focuses on the excluded in society (the poor, vulnerable, disadvantaged, women, elderly, indigenous people, the illegal aliens, refugees) (Rodríguez-Pose and Tijmstra, 2007; Rauniyar and Kanbur, 2010; Chatterjee, 2005; Jiang, 2011; Huang and Quibria, 2013); (ii) through examining marginalized and informal sectors and areas especially in the rural and peri-urban areas – the non-agricultural informal sector ranges from 78% in Africa, through 57% in Latin America and the Caribbean, to 45-85% in Asia (Weaver, 2014); (iii) provides equal opportunity for participation (Sachs, 2004; Lawson, 2010; see Box 7); (iv) using both modern knowledge and edu-

cation (Conceição et al., 2001) as well as local and indigenous knowledge (Tikare et al., 2002; Fritz et al., 2009; Borel-Saladin and Turok, 2013; Bonal, 2007); (v) provides infrastructure and amenities (Sachs, 2004; Lawson, 2010; Rodríguez-Pose and Tijmstra, 2007); (vi) that is context relevant (Borel-Saladi and Turok, 2013; Fritz et al., 2009); (vii) builds capacity and encourages action research (see Box 8) to ensure that the marginalized can avail of these opportunities and amenities; (viii) recognizes traditional rights; (ix) stimulates the self-help options of the poorest (Chambers, 1988); and (x) actively engages in promoting adaptation, adaptive capacity and resilience for poorer peoples (and countries). (xi) It thus requires a critical relational approach that examines and reorganizes existing power relations in society (Cook, 2006) that are institutionalized in economic/financial (banking and tax system – and especially how substantial parts of international bank lending, foreign direct investment and global trade avoid taxes through tax havens and hence their responsibility in redistribution of resources), political (the disproportionate role and methods of influence of the rich on policy processes), social (reducing access of the poor to education and health facilities), and environmental systems (pollution impacts are more concentrated in poor areas). Piketty's influential 2014 book shows that if capital has a higher rate of return than labour, the rich will become richer through inherited wealth.

Inclusive development requires us to think about different development models that tackle distributional issues. The market, driven by its profit motive, is unable to deal with inclusive development alone; state intervention is a must to change the system and ensure the conditions for inclusive development. Inclusive development has its policy tool box (see 4.1).

Box 8. PhD – Action research to empower micro-industries to adopt cleaner technologies and thus protect their livelihoods

Micro and Small Industries, Water and Developing Countries: A Challenge for Sustainability in Colombia, Monica Sanz (Colombian), PhD/UVA-UNESCO-IHE/forthcoming (co-promoters: Maarten Siebel and Rhodante Ahlers).

Using cleaner production, negotiation and SME theories, Sanz focuses on the excluded and marginalized community of leather tanners who are often closed down by the legal system as they pollute too much, leaving them with few survival opportunities. Sanz demonstrates that with persistent action research, legal rules can be changed, livelihoods improved and the environment protected.

4. A Research Agenda: A Systemic Problem Requires Systemic Solutions

4.1 *Ecospace is a systems problem requiring systemic solutions*

The ecospace sharing problem is a systemic problem requiring systemic, not symptomatic solutions, within which level-related, fragmented governance and instruments can be applied. Let us take the climate change problem. It can be addressed at the symptomatic level of emissions and sinks; but only if it is addressed at the level of production, distribution and consumption patterns and underlying paradigms can it be managed enduringly.

Systemic solutions are defined as solutions that focus on the system as opposed to parts of the system. In innovation science it is defined as ‘tools that focus on the level of the innovation system instead of focusing on specific parts of innovation systems and support processes that play a crucial role in the management of innovation processes’ (Kuhlman, 2004).

In Section 3, I argued that Governance for sharing our ecospace calls for scalar analysis of glocal problems (see 3.2); critical and constructive relational analysis of changing but persistent North-South and rich-poor problems (see 3.3); sustainability not securitization framing to deal with ecospace and the right to develop (see 3.4); a global constitution and rule of law within which other governance processes operate (see 3.5); and inclusive development as a way to counter the dominant neo-liberal, hegemonic frames (see 3.6).

Such analysis leads to the formulation of systemic instruments. These include:

- Systemic Goals: The adoption of systemic sustainable development goals as are currently being negotiated at UN level should be based on ecosystemic standards and criteria for inclusive development. Sub-goals, targets and indicators may focus on specific issues (Young et al., 2014, including Gupta).
- Systemic regulatory instruments include:
 - a. Constitutions and the rule of law at national through to global level that takes the systemic challenges into account. The possible bill of rights (basic and advanced), responsibilities and risks would include: (i) political, social, economic and environmental human rights; (ii) the right to development and what it means and who it applies to (late-comers and/or first-comers); (iii) principles for global cooperation as emerging from the 1992 UN Rio Declaration on Environment and Development including, in particular, the principle of sovereignty being subject to not causing harm to others (which should counter

absolute territorial sovereignty and securitization approaches), the principle of equity (as further elaborated by the equity principles in the UN Watercourses Convention of 1997, the ILA Berlin Rules of 2004 and the common but differentiated responsibilities and respective capabilities principle under the Climate Change and Biodiversity Conventions), liability and compensation, and participation (as further elaborated in the 1998 Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters); and the principles from the Paris Declaration on Aid Effectiveness (2005) and the subsequent declarations of Accra (2008) and Busan (2011); (iv) Principles for business including the UN Guiding Principles on Business and Human Rights (Ruggie Principles), the Extractive Industries Transparency Initiative and the Equator Principles for sustainable project funding; and (v) the adoption of *obligations erga omnes* (obligations owed to the international 'community', Simma, 1994) in view of the recognition of planetary and social boundaries, irrespective of participation in international treaties.

- b. Peer review/ voluntary sustainable development reporting: The UN High-Level Political Forum for Sustainable Development established at the Rio+ 20 Conference in 2012 is expected to set up a review process to monitor the effectiveness of the Sustainable Development Goals. Peer reviews or voluntary reporting mechanisms are being considered inspired by the Universal Periodic Review of the Human Rights Council and the African Peer Review Mechanism.
- c. Investing in good government especially in developing countries is necessary for creating the arena for good governance domestically and participating effectively in intergovernmental cooperation. Good government has a good balance of power between the legislative, executive and judiciary; can provide the role of regulator, tax collector, and redistributive agent through the provision of civic amenities and public infrastructure (health, education, transport, water and sanitation, security, electricity and safety net schemes to all); and is accountable, transparent, effective, equitable, responsive, and resilient, itself respects the rule of law and can provide an effective framework for other actors to play their role. Transparency and accountability must be such that the role of lobbying by rich and powerful communities (Oxfam, 2013) should be revealed by the state and more efforts to proactively support political participation by the poor should be promoted.

- d. Investing in ways to strengthen global governance by ensuring that actors at all levels of governance can influence the system. While decentralization (Shortall, 2008) played a key role in shifting power, it did not always shift resources and capacity and often resulted in abdication of responsibility, especially in developing countries.
- e. Strategic environmental assessments applied to policies could be expanded into a *strategic environmental and inclusive development assessment* and could become a useful sustainable development assessment instrument of the future;
- f. Substantive and monitored environment and social impact assessments that are applied more at project level;
- g. Spatial planning tools that take ecospace (including inclusive development) considerations into account;
- h. Rules for systemic innovation for sustainable development;
- i. Global abolishment of tax havens, if not tax holidays, to generate resources for ecospace sharing;
- j. Public-private contracts and private contracts with an impact on ecospace (resources and sinks) and ecospace sharing (access and allocation) should increasingly be made transparent and open to scrutiny by civic society.
- k. The recognition (and not expropriation of) local and traditional property rights, even if such rights cannot be indefinitely extended into the future because of ecospace limits.
- l. Legal remedies for violating human rights and the environment.
- Economic and financial instruments like:
 - a. Payment for ecosystem services which could also be expanded to include payment for unpaid human services;
 - b. Polluter pays principle and systematic rules for internalizing costs;
 - c. Systemic subsidies for dematerialization and decarbonization;
 - d. Systemic subsidies for investment in social institutions (Singh, 2012), to enable access to basic goods and services and affordable micro-credit opportunities to support livelihoods and micro and medium sized enterprises, food for work schemes and other such job creation opportunities.
 - e. Progressive taxes on income and all commercial transactions (Piketty, 2014 argues for a 80% tax on those who earn annually more than USD 500,000 in the US)
- Suasive and research instruments could include:

- a. Public education from primary school through to life-long learning of the systemic nature of the problem, including gender issues and demographic aspects;
 - b. Promoting concepts such as human rights, well-being, livelihoods approaches, closing substance cycles, life cycle analysis, the circular economy, dematerialization, decarbonization, and industrial transformation; smart family, smart city, smart regions, smart watershed, smart nations and smart globe;
 - c. An expanded glocal, economic, social, ecological, political and legal value chain analysis to inform understanding of how and where value chain problems can be addressed;
 - d. Promoting the combination of modern (including geographical information systems and big data) and traditional knowledge systems to enable a better understanding of ecospace, ecospace sharing, and peace issues.
 - e. Labelling instruments that combine social and ecological aspects in such a manner that they can influence policy processes.
 - f. Participatory action research to change relations in order to address ecosystem and social goals.
- Management instruments could include:
 - a. Corporate social responsibility, responsible supply chain management, scrutinized by civil society;
 - b. Community based resource management;
 - c. Watershed management, but both within the context of a multi-level system of management.
 - Technological approaches include access to and adaptation of cleaner production technologies for the micro and small scale producers, to the provision of better open access seeds to enhance the resilience of local people.

Such an approach focuses on understanding systemic causality, the performance of systemic approaches and instruments and individual tools, and the co-redesign of these approaches based on an analysis of the performance of these approaches.

4.2 Ecospace sharing research agenda

The following ecospace sharing research agenda is partially being addressed by colleagues (*), post-docs (**), PhD candidates (***) and MSc students (****).

4.2.1 Governance for ecospace sharing

- How do different theories of governance relate to and compare with each other in analysing ecospace sharing issues?* What is the role of government and intergovernmental cooperation in ecosystem sharing governance?
- How can differing principles of sharing be designed for different issue areas? How can they be made compatible with each other? How can such principles be co-designed with key social actors?
- What is the role, capacity and limits of democratic and landscape governance at local (including urban,* rural* and the urban-rural interface*) to national to global level in dealing with systemic sustainability challenges?
- How can scalar and relational analysis be used as a diagnostic and predictive tool for analysing the drivers, processes and impacts of global transformations and their consequences for different actors, genders, institutions, networks and resources? What are the various theories of transition (forest, environment Kuznets curve) and how do these influence development patterns?
- How are new patterns of demographic growth, migration, production, consumption, distribution, and travel being produced, reproduced and contested at city/village to global level and how consistent is this with social, economic and ecological justice?
- How can a study of urban-regional-global metabolism, the relationship between micro interactions and macro patterns in complex urban environments help to understand how societies are transforming over time?* How do these transformations affect inclusive development and ecosystem services?

4.2.2 Globalization and Glocalization: Systemic understanding, analysis and prediction

- How can we understand and analyze ecospace sharing challenges at multiple levels of governance (local, rural, urban, urban-rural interface, local, national, local-national interface, etc.)? How does the politics of scale influence this understanding?
- How can critical, constructive, scalar (spatial, temporal, actor, etc.), multi- and trans-disciplinary and relational analysis be used to diagnose, analyse, and co-design the governance required for ecospace sharing and inclusive development?**** (forests)
- What is the role, capacity and limits of different governance actors (policy entrepreneurs, NGOs, communities, private sector actors, civil society, social movements) in contributing to governance for ecospace sharing?

ing? How do they differ from context to context and project to project?
*** (forests)

- How are governance decisions taken on small to large-scale infrastructural projects and the built environment and how do these projects then shape and limit the possibility for democratic decision making? How do these effects change over time in urban and other areas? How do these infrastructural projects affect and are affected by resources from the hinterland and beyond?

4.2.3 Changing world, but persistent problems

- Using a critical relational and inclusive development lens, can we still justify a focus on the changing South in the 21st century and what does this focus imply? How are Southern epistemological, structural, and societal contexts structurally different from that of the North?
- What does the systemic challenge of ecospace sharing imply for analyzing evolving North-South and rich-poor relations?
- How do global paradigms shape and reinforce ideas within the changing geo-development context?
- What are changing patterns, paradigms, goals, and implications of South-South and North-South cooperation in terms of investment, trade and development assistance? What are the implications of a shift in the global economy and concentration of global poverty to Asia for global relations?
- How can capacity building efforts be assessed to identify context relevant best practices?
- Given the poor level of governance in many post-conflict countries and least developed countries and that these governance trends will exacerbate the development and climate adaptation challenges faced by these countries, how can investment in long-term education contribute structurally to promote peace and sustainability?*

4.2.4 Ecosystemic standards shape development ambitions: sustainability and not securitization

- How will ecosystemic standards affect our individual and collective development ambitions? How can criteria for who can develop and under what circumstances be identified, and who has the authority to decide on this issue?
- What are the changing development paradigms in the emerging economies of the South (e.g. Brazil)?* Why do different countries choose different paradigms: Philippines – inclusive development, China – green economy and South Africa – sustainable development? ****

- How can we empirically assess and analyze the political tendency to revert to securitization and (absolute territorial) sovereignty arguments? What are the implications for sharing ecospace?
- How can we empirically assess and analyze the rise of private security and what are its implications for society?*,***
- Using a critical, scalar, relational approach, how are climate change related rights, responsibilities and risks to be divided among countries and peoples if the climate change problem is to be kept within limits and the human wellbeing of people world-wide is to be enhanced? How should the governance of scarce resources such as ground water***, transboundary water resources**,*** and minerals such as phosphorous*** and rare metals be organized?
- If such governance requires that some developing countries may not use specific resources (the challenge of stranded resources) how can they be compensated for the foregone development opportunities?****
- How can one critically assess the public and private securitization debate?

4.2.5 Fragmented governance inevitable, constitution necessary

- Why is there fragmented and plural governance in different ecospace sharing issue areas?* What leads to more consensus in some areas of governance as opposed to other areas?
- What are the theoretical and practical definitions and interpretations of mechanisms to deal with fragmentation such as coherence, coordination, integration, mainstreaming and nexus approaches and how do these compare with each other in addressing ecospace sharing issues?****
- What are the key elements of a global constitution for the 21st century? To what extent will such a constitution run the risk of institutionalizing rules in favour of the rich and powerful? How can such a constitution make room for plural approaches? What are the prospects for constitutionalization and the rule of law?

4.2.6 Competing discourses unavoidable: Inclusive governance needed to prioritize the most vulnerable

- What discourses are consistent with Sharing our Earth and under what circumstance?
- What are the key substantive, procedural and spatial elements of a critical, relational theory of inclusive development*,**** and how does it relate to human rights theory, social justice, wellbeing, livelihoods and participation research? Can such a theory provide a counter-balance to the dominant neo-liberal approach?

- Using a critical, scalar, relational approach, how is access to resources (water/sanitation services,^{***} fish,^{***} land,^{*} forests,^{***} energy) including to the political system governed at multiple levels of governance and how do they shape, and are shaped by, wellbeing and development? What are the drivers, patterns, trade-offs and options for equitable and sustainable use of resources, and how can we ensure sustainable access to food,^{*} water,^{*} land, clean air, energy and materials for current and future populations to promote human wellbeing[?]? Are there differential access aspects and effects in different kinds of countries, within countries, in urban and rural areas? What does a legal pluralist analysis of such governance reveal?^{***}
- How can adaptation to climate change, adaptive capacity and resilience be implemented in different parts of the world?^{***} How can disaster management and relief systems be mainstreamed in policy processes and make better use of social, economic, technological and ecological capital?^{***}

4.2.7 Systemic instruments for transitions and transformation to a sustainable world

- How can we ensure that these sustainable development goals meet the criteria of inclusive development, the needs of the present and future generations?^{****} What is the role of the global Sustainable Development Goals (SDGs) in such a transition? How can such SDGs also reflect Southern philosophies and epistemologies?^{***}
- How can the existing systemic instruments be analyzed, assessed and improved? What new systemic instruments can be developed?
- What are the trends in education, knowledge and technology governance? How is contestation on education, knowledge and technology to be dealt with in addressing ecospace sharing issues? What is the role of education, (formal and non-formal) knowledge, and technology in promoting peacebuilding^{*} and transformations towards inclusive and sustainable development in society?
- What is the role of negotiation in diffusing emerging disputes?^{****}
- What is the role of spatial knowledge management in urban, rural, and national transitions to an inclusive and /or sustainable society?^{*}

Sharing Our Earth is a systemic challenge. It calls for a transformative not incremental governance system. As the world gradually moves towards third order transformational learning, such issues will play a stronger role on the

global agenda. This research programme aims to collect the evidentiary basis for influencing that agenda.

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Thank you for your attention. I have spoken.

Notes

1. The Bariloche report (Herrera et al., 1978) assumes that natural resources will not be exhausted in the coming century and that pollution can be addressed through technology development. It was written as a reaction to the Meadows book. Prof. Julian Simon (1981) argues in *The Ultimate Resource* that more people means more knowledge, and that the new knowledge will help to address the new problems. The perceived scarcity of natural resources will be more than compensated by new technological and other discoveries.
2. Malthus (1994 edition) argues that the exponential (geometric) growth of population will surpass the arithmetic growth of food and that there should be moral restraint to reduce the growth of population. Meadows (1972) argues in his 'Limits to growth' book, on the basis of a mathematical model, that there are no unlimited opportunities for growth. The two limiting factors will be exhaustion of natural resources and the pollution of our environment.
3. René Dumont (1975) argues in 'Utopia or else ...' that if the people and their pets in the rich countries ate less, there would be more available for those in the poor countries.
4. WCED (1987) argues in favour of global partnership.
5. This can be done via lifeboat ethics or social Darwinism. Garrett Hardin (1974: 38-40) argues that if the world can be seen as a sea in which there are rich people in boats and poor people trying to get on to those boats, the dilemma is that if the poor get onto the boat the boat will sink and everyone will drown. In order to survive in the boat, it may be a harsh necessity to use lifeboat ethics. Social Darwinists believe that capitalists should be allowed to compete freely in the marketplace. They extend Darwin's theory of evolution into a theory of social evolution. Competition is seen as a process in which each succeeding generation is more evolved than the last because those least fit to survive do not succeed in surviving and procreating.
6. Already more than 40% of mobile phones and 35% of cars are sold in Asia.

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