ATLANTIC FUTURE

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Patterns of Production and Consumption in the Atlantic Space and Future Environment and Resource Scenarios

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ABSTRACT
The environmental challenges of the Atlantic Space are manifold and mutually reinforcing. This paper examines the dynamics of four key environment and resources issues, looking to the 2020/2025 horizon: climate mitigation and energy transformations; food security; overfishing; and wildlife trafficking and biodiversity loss. Each is global in nature, yet Atlantic actors play influential roles and have shared interests in, and critical resources for, addressing them. Underlying these challenges are regional and global drivers of resource consumption and production. Rising demand for resources to feed growing and wealthier populations is shifting global production and consumption patterns, and in turn, creating heavy environmental strain. Where policy solutions prove insufficient to internalize costs, economic interests will continue to drive unsustainable, and often illegal, resource use and consumption. Nevertheless, despite negative trajectories in many areas, the Atlantic Space offers unique opportunities for concerted action and furthering networks of state and non-state actors to address the environmental challenges of today and of the future through coordinated regional action.

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1. Introduction

This paper identifies four environment and resource issue areas that are particularly relevant to the Atlantic Space, where there exist underlying interdependencies between Atlantic countries, unique production and consumption patterns, or shared opportunities or challenges: climate mitigation and energy transformations, food security, overfishing, and wildlife trafficking and biodiversity loss. The paper analyzes the current situation with a forward looking perspective to predict how certain factors will play out in the upcoming decade. Research examines key structures—e.g., power shifts, soft power and influence, cooperation and conflict, flows, environmental change; actors—e.g., state actors both within and external to the Atlantic Space, non-state actors, regional and international organizations; and tracks of change—e.g., cooperation and competition, North-South dynamics, centrifugal and centripetal forces—that are shaping the Atlantic Space and assesses the likelihood and impact of future outcomes.
The paper draws upon prior work within ATLANTIC FUTURE, including scientific papers and data sets on Atlantic Space environment and resource issues and interviews with Atlantic stakeholders who shared their perceptions of critical challenges and dynamics experienced in the Atlantic.

Our selection of key issues was based on, first, an evaluation of interviewees' identification of important environment and resource issues in the Atlantic Space. Prior research on regional environmental matters and independent evaluation and assessment further contributed to the selection. While there are many relevant environment and resource topics for the Atlantic Space, we identified and selected the four abovementioned issue areas as those having the greatest significance, likelihood, and potential for impact, and which were seen as representative of larger tracks of change. Many of these issues, and others identified, had interlinkages and areas of overlap, which are explored below.

Our analysis frames the issues as a "Problem, Challenge, or Threat" (PCT), examining when and how the issue emerged, how it is relevant to the Atlantic Space, what the issue's current environmental, economic, social, and political impacts are, and what the PCT's current trajectory is. We next identify and assess actors, institutions, and structures of relevance to the PCT in the Atlantic Space. Finally, we assess scenarios on the five- to ten-year horizon (2020 to 2025), considering likelihood of mitigation, requirements for change, and implications for cooperation, conflict, or the emergence of Atlantic communities in the future.

2. Climate Change Mitigation and the Transition of Energy Systems

Climate Change in the Atlantic Space

Climate change is a problem with far-reaching global implications and it is an issue with particular salience for the Atlantic Space. The problem of climate change, and its associated consequences, arguably emerged following the Industrial Revolution that began in Great Britain in the mid-18th century before spreading to continental Europe, and finally to the U.S. just under a century later in the early and mid-19th century. Despite a multitude of international attempts to mitigate the atmospheric and environmental effects of climate change, including the formation of the United Nations

Framework Convention on Climate Change (UNFCCC), its annual Conference of the Parties (COP) that has taken place since 1995, and its Kyoto Protocol, climate change remains a threat for the Atlantic Space and globally. On the one hand, Europe has made considerable strides towards the transition to renewable energy, with Denmark and Germany emerging as global leaders in promoting low-carbon energy sources. Furthermore, the European Union's (EU) 2009 Renewable Energy Directive has set a binding target that 20% of all energy will come from renewable sources by 2020. As of 2013, 15% of the EU's energy demand was already met by renewable sources, and Europe produced 22% of the world's electricity from renewables in 2012 (U.S. EIA 2015). While some European countries are global leaders in renewables, the United States (U.S.) is often perceived as a laggard in renewable energy and is a significant contributor of carbon emissions. The U.S. alone supplied more than 14.5% of all global emissions in 2014 (Statista 2014). The U.S as a whole has made slower, but still significant, progress with renewables making up 9.5% of its energy mix (IEA 2014a). However, the challenge of reducing carbon emissions remains and the U.S. is the second largest contributor to carbon emissions after China. Individual European countries (e.g., Germany) emit a relatively small percentage of atmospheric carbon. However, the success of their efforts on a global scale is highly dependent on global reduction commitments, and, correspondingly, many doubt whether the U.S. and other top emitters can agree to a binding international agreement in which they commit themselves to a concerted effort to transition to sustainable energy systems.

Outlook for Energy Needs and Climate Change in the Atlantic Space

Currently, the countries that occupy the Atlantic Space emit just over 40% of global emissions, with North America producing more than 19%, Europe producing 13%, Latin America producing 4%, and Africa producing around 3.7% of that total respectively in 2012 (U.S. EIA 2015). However, according to the U.S. Energy Information Administration, roughly 61% of the world's net electricity generation from renewables was also produced in the Atlantic in 2012, signaling that a transition is underway (Ibid.). Nonetheless, with renewable, low-carbon energy sources slated to supply only a quarter of the world's energy by 2040, the International Energy Agency (IEA) predicts that the average global temperature will rise a minimum of 3.6° Celsius over the long-term, an estimate well beyond the UNFCCC goal to contain warming below 2° Celsius (IEA 2014a). Immediate action must be taken to hasten the transition to renewables, particularly in emerging economies with large populations and large energy needs, in order to mitigate this temperature increase.

In the future, the issue of energy production and supply could become particularly contentious. The IEA predicts that by 2025 global energy demand is set to grow by approximately 22%, then slowing but continuing to grow to 37% by 2040, relative to energy demand in 2014 (IEA 2014a). Increases in population and spending power will drive energy consumption, with global population anticipated to exceed 8 billion by 2025 and GDP more than doubling by 2035, and with the most growth coming from Asia (BP 2014). In the Atlantic, energy demands are predicted to level off in Europe and North America and to rise in Africa and Latin America. Infrastructure to provide renewable-generated electricity in Africa and Latin America is underdeveloped, and today produces only 2.5% and 16.5% respectively of the world's share of renewable energy production (U.S. EIA 2015). Energy poverty is not only an environmental concern, but is also one of socioeconomic wellbeing and health. Currently, 620 million people in Sub-Saharan Africa lack access to electricity and 730 million rely on solid biomass for cooking, causing air pollution and more than 600,000 premature deaths annually (IEA 2014a).

Global renewable power capacity is projected to more than double by 2025, led by onshore wind, solar photovoltaic (PV), and hydropower generation (IEA 2014b; Frost and Sullivan 2014). Non-OECD markets are expected to account for 70% of new renewable power generation through 2020 (IEA 2014b). Within the OECD, renewables are also expected to continue to grow rapidly, accounting for nearly 80% of new generation from 2013 to 2020 and supported by strong policy support for low carbon energy sources (IEA 2014b; Frost and Sullivan 2014; BP 2014). OECD countries, most of which are in the Atlantic, have shown an annual 3.16% growth rate in renewable electricity generation since 2005 (IEA 2011). While challenges remain in adapting regulatory and economic frameworks and in sustaining clean energy investments in weak economic climates, renewable technologies are becoming increasingly cost-competitive with, or cheaper than, fossil fuel alternatives. Costs have dropped dramatically in recent years due to technological advances and economies of scale and projections show continued reductions (Ibid.). Despite predictions for renewable energy growth, however, renewable power generation is still anticipated to fall short of levels necessary for meeting global climate change objectives (IEA 2014b).

In the fossil fuel sector, Asia Pacific is expected to drive global gas trade, overtaking Europe as the largest importing region in the early 2020s, while North America shifts from being a net importer to a net exporter (BP 2014). Relative shares of coal generation are expected to decline significantly due to new environmental regulations and low natural gas prices, as well as shares of oil. While fossil fuels will still dominate world energy generation in 2025, the fastest growth is anticipated from renewables, overtaking nuclear.

Africa and Latin America have unique challenges looking forward to 2020 and beyond, as energy demand in developing countries in these regions continues to increase. In Africa alone, it is projected that by 2030 carbon emissions will reach levels 40 to 110% higher relative to levels in the year 2000, and that without immediate action to mitigate those levels, permanent damage will be done to some natural systems at high social and economic cost. (UNEP 2007) To address climate change in the Atlantic Space, the transition to renewables and away from fossil fuels and nuclear energy must be furthered in Europe, and particularly in the U.S., as these regions are highly developed and possess the technology and financial capabilities to institute such a change. To implement renewables and promote green economies and infrastructures in Africa and Latin America, action may be needed through multinational corporations, non-governmental and private actors, and development programs to discourage path dependency on fossil fuels in these developing areas. Meanwhile, the IEA (2014) estimates that while energy systems in Sub-Saharan Africa and Latin America are set to quadruple in capacity by 2040, these will largely serve urban areas, leaving a growing rural population of more than 650 million without access to modern energy services.

Some countries in Latin America and Africa have abundant oil and gas resources, although the level of exploitation of those resources varies by country, while in North America, new technologies have opened access to unconventional fossil fuel resources and created an energy “boom” (Isbell 2014). In general, however, future energy needs will be met through a combination of exploiting fossil fuel resources and investing in the development and uptake of renewable energy resources to combat climate change. Countries within the Atlantic Space possess significant solar, hydro, wind, and geothermal potential that could be exploited to help meet energy demands. With technological advancements made by Europe and the U.S., emerging economies in the Southern hemisphere could “leapfrog,” meaning skipping inferior,

less efficient, and more expensive polluting technologies and industries and moving towards renewables. Despite the availability of energy efficient technologies, findings report that today, economic growth patterns in developing countries are not less energy intensive than in the past (van Benthem 2014). In an attempt to better understand why leapfrogging is not straightforwardly implemented in practice, van Benthem offers two explanations. Firstly, industrial production now takes place in developing countries only partially for the purpose of providing for domestic consumption. Instead, most products are exported to the global market to supply wealthy countries. Secondly, energy efficiency gains in some technologies can have the inverse effect of inducing behavioral changes that result in more energy being consumed.

Climate change is closely linked to a myriad of ensuing human and environmental security issues. More frequent natural disasters, decreases in freshwater levels, sea level rise and loss of coastal land due to the melting of large bodies of ice, air pollution, food insecurity, and subsequent health issues will be affected by climate change (see Stefes et al. 2014). Additionally, vulnerable populations, particularly in Africa and Latin America in the Atlantic, will be subject to displacement in the face of food, water, and energy scarcities, as well as natural disasters. Such displacement, due also to conflict over available resources, potentially spurring geopolitical and diplomatic crises. The Intergovernmental Panel on Climate Change (IPCC) estimates that more than 150 million migrants will leave their native countries due to climate change-related conflict by 2050 (Hummitzsch 2009). Empirical research has also shown that temperature increases and subsequent consequences have the potential to halve the EU's annual welfare growth (Ciscar et al. 2010). The costs to mitigate these climate change-related impacts are shouldered by governments and taxpayers and therefore also pose the possibility of spurring both domestic and international economic downturns.

The Role of Actors and Institutions in Mitigating Climate Change

Both state and private actors can substantially further climate change mitigation and contribute to facilitating the transition to renewable energy in both the Northern and Southern hemispheres. Cooperation between national and sub-national authorities within the countries that occupy the Atlantic Space is crucial to promoting renewables and overcoming path dependency on fossil fuels, a scenario that is plausible as evidenced by developments within the EU. The uptake of renewable energies in Europe and the U.S. has in the past depended on government subsidies, which are the domain of federal governments; however, such a transition assumes that governmental ties with oil companies can be severed, or at least weakened, as happened in Germany with the implementation of the feed-in tariff (Laird and Stefes 2009; Stefes 2010). Support for renewables must also be framed in such a way that aligns with both successful governance and international competition. Private actors concerned with implementing renewables, environmental protection, and job creation can help subsidize and further governmental efforts. For example Energy for Opportunity installs sustainable, solar PV electricity-generating infrastructures in West Africa and Power Up Gambia installs PV systems in Gambia to power health and water facilities. Similarly, the Green 10, a group of the largest environmental organizations in Europe, coordinates joint responses to climate-related issues and advises on EU policy.

Intergovernmental and nongovernmental organizations like the World Energy Council, the International Energy Agency, the Inter-American Development Bank in Latin America, and the American Council on Renewable Energy (ACORE) in North and Latin America are instrumental in researching and subsidizing funding for achieving

emissions reductions articulated in international agreements. Additionally, the World Bank, the International Monetary Fund (IMF), and development programs between European countries and African and Latin American countries provide monetary and implementation support in order to construct renewable energy infrastructure and promote green economies at the local and federal level.

International treaties and voluntary agreements also have the ability to drive the energy transition, particularly on an international scale. The UNFCCC and Kyoto Protocol achieved at least moderate success in terms of climate change mitigation, and it remains to be seen if a new, binding international agreement will replace the expiring Protocol (set to expire in 2020) at the 2015 COP in Paris. The Paris COP will be important, especially in light of the U.S-China Climate Change Agreement signed in November 2014, a voluntary agreement between the two nations, the world's top emitters, in which the U.S. pledged to decrease emissions by up to 28% below 2005 levels by 2025 and China agreed to begin reducing net emissions by 2030 (U.S. Office of the Press Secretary 2014).

Atlantic interregional cooperation to promote renewables is also crucial to the energy transition. For example, the Atlantic Council's Global Energy Center promotes cooperation between the EU and the U.S. in order to share technologies and strengthen transatlantic cooperation. The United Nations Africa-EU Energy Partnership aims to build 15,000 MW of hydro, wind, and solar energy capacity and to improve energy efficiency in all sectors, beginning with electricity by 2020 (UN Department of Economic and Social Affairs 2015). Other organizations and initiatives such as the U.S.-Africa Clean Energy Finance Initiative, the German Energy Agency, and ACORE have all forged partnerships between various countries in the Atlantic Space. These various actors and institutions are also vital to overcoming structural obstacles to renewable energy transitions and are necessary to supplement the economic and power imbalances between Africa and Latin America on the one hand, and Europe and North America on the other.

Current climate mitigation measures are insufficient to contain global temperature increase to 2° Celsius. A furthering of the energy transformation to renewables in the Atlantic Space is essential to avoid the environmental and political fallout that would result from global warming. Europe and North America in particular must continue the transition to renewables, and phase out both fossil fuels and nuclear energy. Sustainable infrastructure must be developed in Africa and Latin America. Specific attention must be paid to national and subnational drivers of environmental policy, as support for renewables at the domestic level is crucial for success in terms of international agreements. Although the countries that occupy the Atlantic Space can make strides in terms of combating climate change, an exclusive Atlantic community regarding the issue is not likely or viable, as climate change is a global problem, and other major emitters (e.g., China and India) are not part of the Atlantic Space, and as specific needs may be met through more targeted partnerships.

3. Food Security

Food Security in the Atlantic Space

Food security is a persistent challenge in the Atlantic and will continue to have significant implications for populations within the region. Food security is defined by the Global Food Safety Initiative (GFSI) as "the state in which people at all times have physical, social and economic access to sufficient and nutritious food that meets their dietary needs for a healthy and active life" (The Economist Intelligence Unit 2014).

Despite world food production having increased impressively alongside demographic growth for the last several decades, malnutrition and hunger are persistent problems, with the number of chronically hungry people is over 870 million, about a quarter of which are in Sub-Saharan Africa (World Food Programme 2015). Complicating the malnutrition debate is the fact that the number of severely obese people has also increased, , and is also a problem of malnutrition and poverty. Both hunger and obesity are issues related to a lack of access, particularly by the poor, to nutritious food.

Poverty and the inability to afford healthy, nutritious, and sufficient food has led to the global paradox of "stuffed and starved," where there is an increased frequency of obesity and hunger. Obesity and hunger are global challenges that exist in both developed and developing countries in the North and in the South (Patel 2007; Nestle 2002). This paradox is particularly evident in the Atlantic. Africa is home to over 40% of the world's hungry and famines and food crisis have been most pronounced on this continent (Guinan et al. 2012). Latin American countries in the last decade have made significant strides in eradicating hunger through social and agricultural development programs, though obesity is now increasingly a problem (Reuters 2015). Obesity rates are also on the rise in major food producing and wealthy countries, such as the U.S., and obesity has become a shared challenge faced by developing and developed countries alike.

Atlantic Food Production Systems

The influence of the U.S. and Europe on industrial agricultural production systems and the emergence of Brazil as a major agricultural player make the Atlantic Space particularly interesting in relation to food production and consumption. The U.S. and Europe emerged as major world agricultural producers after World War II through the use of industrialized agriculture systems. Countries in the Southern hemisphere were encouraged to build similar systems of production through development aid and the Green Revolution (Frankel 1971; Freebairn 1995; Lappé et al. 1998), trade policies such as the North America Free Trade Agreement (NAFTA) (Hufbauer and Schout 2005; Fussell 1992), the World Trade Organization (WTO) Agreement on Agriculture (Diaz-Bonilla et al. 2000), and the rise of multi-national agri-food companies (de Schutter 2014; Hubbard 2009; Shattuck and Holt-Giménez 2010). While the overall increases in aggregate production are impressive, the implementation of industrial agricultural systems has arguably come at environmental and social costs. Intensive, industrial agriculture in the U.S. and Europe, along with countries such as Brazil, has resulted in the clearing of land, loss of agricultural diversity, intensification of production, and often concentration of land ownership. The overarching challenge over the next decades in the Atlantic Space is to increase agricultural productivity, particularly in Africa and Latin America, while maintaining and preserving the significant biodiversity that exists in those continents' extensive and undeveloped rainforests, grasslands, and ecosystems.

Atlantic Food Security Actors and Institutions

The continuation and intensification of South-South cooperation in the Atlantic has the potential to act as a counterweight to traditional Northern heavyweights in the global agricultural sector. As part of Brazil's economic and agricultural rise, the country has become increasingly active in providing development aid and economic investment in Africa, particularly in tropical agriculture. Recognizing shared environmental and socioeconomic challenges as well as similar environmental geographies, Brazil and various African nations are engaging in bilateral cooperation, particularly on issues of agricultural production in the face of increased vulnerability to climate change. The

cooperation focuses on socioeconomic issues, such as poverty alleviation, through policy consultation as well as technical assistance and capacity building, particularly in developing hybrid seeds.
Many Southern countries oppose free-trade agreements (FTAs) with the U.S. and Europe particularly as they affect trade in agriculture. FTAs are felt by many developing countries to be unfairly advantageous to the U.S. and Europe and contributing to a North-South divide. For example, NAFTA is perceived to have had a negative impact on Mexico's economy, particularly for agriculture, as cheap, subsidized corn from the U.S. flooded Mexican markets, effectively pricing out domestic producers. There was an attempt to extend NAFTA to other countries in Latin America: In 2005, the Free Trade Area of the Americas (FTAA), planned to include 34 countries, broke down in negotiations over market access, as the U.S. planned to open markets in Latin American countries while maintaining barriers to trade. While negotiations failed on the FTAA, such experiences and cooperation between developing countries for more advantageous trade agreements has helped break down traditional power structures in Western-led financial institutions, organizations, and platforms. Brazil in cooperation with South Africa and India, has taken a lead in representing the interests of developing countries on the international stage, including in the WTO and United Nations (UN), thereby providing a Southern counterweight to traditional U.S. and EU leadership in the sector. Thus, the Atlantic remains an important arena for both cooperation and contention.

Despite high production, the current resource-intensive food production system based on industrialized agriculture is not focused on the production of nutritious food and is thereby affecting food security both on the obesity and hunger fronts. In relation to obesity, corporations, which disproportionally influence food production decisions, have played an instrumental role in determining what types of food are available at low prices and what kinds of crops are grown to facilitate the production of the most economically advantageous foods (e.g., processed foods). On the hunger front, nutritious and diverse crops are often sidelined for more economically lucrative commodity crops, affecting supply and demand dynamics, and making nutritious food disproportionally expensive compared to processed foods.

Industrialized farming in the Atlantic has created significant opportunities for large-scale agribusinesses to heavily invest in agriculture. Most of these agricultural monopolies are based in the U.S. and Europe, reflecting their continued influence in the global agricultural sector. ADM, Bunge, Cargill (U.S.), and Louis Dreyfus (French) are responsible for 75 to 90% of global grain trade. Six firms control 75% of the agrochemicals market, namely U.S.-based Dupont, Monsanto, Syngenta, and Dow and Germany's Bayer and BASF (Lawrence 2011). The emergence of patents placed on modified seeds through the biotech sector strengthens the domination of monopolies in the global food market while having the negative effect of threatening the traditional seed systems of small farmers in developing countries, many of whom reside in Latin America and Africa and make up the majority of the world's poor (de Schutter 2009). Local production is an important piece to meeting global consumption and demand in the Atlantic, as well as internationally (Ahmed 2014).

Grassroots organizations within the Atlantic have formed to combat corporate interests and disparities within the WTO. The outcome of the 2013 WTO meeting in Bali was met with criticism from NGOs such as the German Brot für die Welt and Oxfam in the United Kingdom (Deutsche Welle 2013). Of particular interest, the La Via Campesina is an international peasant's movement which brings together millions of local farmers, indigenous people, agricultural workers, and migrants to promote sustainable small-scale agricultural practices in direct opposition to corporate-based

agricultural practices. The group is present in Africa, Europe, and the Americas as well as in Asia (Organisation 2011). The National Association of Agro-ecology is bringing thousands of Brazilians together to promote agro-ecological or traditional farming practices and this agro-ecology movement is even getting attention from international organizations such as the Food and Agricultural Organization (FAO) of the UN which recently held a symposium on the topic (Ahmed 2014). NGOs are also critical actors in sustainable rural development. For example, a study of six NGOs in Nigeria revealed their prominent role in effectively implementing government programs focused on increasing the efficiency of sustainable development in its rural areas (Enyioko 2012).

Food Security Futures

Food security challenges in the Atlantic Space are magnified by the effects of climate change, which are projected to become more severe in both the short- and long-term. Agriculture is one of the most sensitive sectors to climate change and associated temperature and precipitation variability. For example, approximately 80% of agriculture produced globally benefits or relies to some extent on natural precipitation (USAID 2013). As food production increases in Latin America, resulting land use changes will exacerbate climate change impacts. Rearing livestock and planting soy to feed livestock, a lucrative and emerging industry in Latin America and particularly in Brazil, has implications for deforestation, agricultural biodiversity, land use change, and resource consumption. Increases in soybean production are projected to be a major driver of future land use change in Latin America. Despite increased production, one recent report projects that by 2050, annual agricultural exports from Latin America and the Caribbean could decline by 50 billion USD solely from climate impacts on crop yields (Vergara et al. 2014). Climate change is projected to increase temperatures across Sub-Saharan Africa, destabilizing agricultural production and undermining food production, which is already significantly below average production levels. Sub-Saharan Africa is predicted to be one of the most acutely vulnerable regions to climate change impacts, with estimated agricultural losses of between 3.33 billion USD or the equivalent of 0.2% of regional GDP by 2100 (Calzadilla et al. 2013).

The EU and U.S. agricultural sectors are not exempt from climate change impacts. Europe is projected to experience not only decreasing average annual and seasonal rainfall, but also more extreme weather such as heat waves, storms, floods, and droughts. At the peak of the 2012 droughts, 81% of the U.S. experienced abnormally dry conditions or worse, equating to an estimated 30 billion USD in losses. Climate change magnifies the frequency of droughts, to which the U.S. is historically susceptible (Rippey 2015). In the U.S. as a whole, climate change impacts are mixed. However, its effects on pests, disease, and drought are of particular concern (Adams et al. 1999). Lost revenue in 2014 from the drought in California, which is debatably linked to climate change, was estimated to possibly reach 5 billion USD (Campbell and Durisin 2014).

The Atlantic is going to be a major region for food security issues in the coming century as it is a geographical region that has both major production capabilities and also a space where the “stuffed and starved” or obesity versus hunger paradigm has been most acutely evident. Addressing food insecurity will depend both on producing more food as populations increase, as well as on making sure that the poorest and most vulnerable have access to healthy, nutritious food. In examining the future outlook of the Atlantic Space, it is of particular importance to observe the rise of Latin American countries as global agriculture producers, while African production levels remain significantly below average. Africans themselves remain most acutely affected by extreme hunger.

Intense South-South cooperation on agriculture could bring about significant changes in food production and availability, and has already challenged traditional North-South aid development patterns. The U.S.-born industrial-agricultural-complex has spread globally, yet with the obesity epidemic on the rise, the effects of that system are playing out (i.e., rising health care costs), which could in turn exert pressure for food systems and cultures to change. The U.S. and the EU continue to negotiate shared and diverging interests, on the one hand maintaining dominance in the WTO and on the other clashing during negotiations of the Transatlantic Trade and Investment Partnership (TTIP) section on agriculture and genetically modified crops. Thus, in the realm of agriculture, there are varying interests and motivations among Atlantic players, but there is also potential for greater cooperation within the Atlantic Space to strengthen sustainable agricultural production and consumption, which can reduce the stuffed and starved paradigm and lead to improved food security in the region.

4. Overfishing

Overfishing in the Atlantic Space

According to the FAO, nearly one third of all fish stocks are overexploited, meaning fished at unsustainable levels, and the majority of the remainder are fished at full potential (FAO 2014). Global fish catch peaked in the 1990s, although global fish production continues to grow, thanks to an expansion in aquaculture. Overfishing not only depletes certain fish stocks, but has impacts throughout marine ecosystems, affecting entire biological communities. Furthermore, overfishing threatens human security and well-being. Marine and coastal ecosystems provide important goods and services to Atlantic countries, such as employment, revenues, and nutrition, though levels of dependencies vary within and between countries. More than a sixth of the world's population relies on fish as a primary, if not sole, source of animal protein (UNEP 2006). While both developed and developing countries benefit from fisheries, developing countries face greater risk from illegal fishing and are often more dependent on fisheries as sources of animal protein and for livelihoods (Tedsen et al. 2014).

Overfishing is ultimately a result of competition over common resources, the "tragedy of the commons." However, the factors contributing to this are complex and varied. The introduction of industrialized trawlers and other new technologies such as sonar, trawl nets, and advanced refrigeration following World War II have helped modern, commercial fleets to catch fish at unprecedented rates and to expand to new areas. Within decades, industrial fishing expanded from the Northern Atlantic to the rest of the world, moving further south and into deeper waters. Meanwhile, incomplete data and knowledge of fish stock dynamics has impeded sound management.

The Atlantic was the first of the world's oceans to be overfished. Today, stocks in most major fishing areas within the Atlantic Ocean have been overexploited (UNEP 2006). In the Eastern Central Atlantic, where sardines are the dominant species, 53% of stocks are considered overexploited, with another 43% being fully exploited (Maribus 2013). In the Southwest Atlantic, Argentine hake and anchovy stocks off the coast of Brazil have come under strain, with over 50% of stocks exploited and 41% fully exploited. Catches have decreased in the Northwest, Northeast, Western Central, and Southeast Atlantic (Ibid.).

Two iconic Atlantic fish species with histories of severe overfishing are the cod and Atlantic bluefin tuna. In the early 1990s, North America's formerly abundant Grand Banks fisheries, one of the richest in the world, experienced a severe collapse,

devastating local economies and causing tensions between Canada and countries such as Portugal and Spain over illegal catch. The "Cod Wars" in the Northeast Atlantic in the 1950s and 1970s saw conflict over access to cod stocks in the Northeast Atlantic, particularly between Iceland and Britain, with Britain even sending warships at the peak of the conflict. Atlantic bluefin tuna, which has been severely overfished, has shown signs of recovery, though this prognosis is characterized by significant uncertainty (ICCAT 2014). However, pressure to increase catch limits has nonetheless resulted in increased quotas, perhaps threatening the fragile population increases. The western population of Atlantic bluefin tuna, which spawns in the Gulf of Mexico and feeds primarily off the coast of North America, has faced low stock levels yet rising annual quotas for the past thirty years, and is caught primarily by the U.S., Canada, and Japan (Pew 2014). The larger eastern population of Atlantic bluefin tuna, caught primarily by members of the EU, Japan, and Morocco, has shown even more significant gains in response to the rebuilding measures of the International Commission for the Conservation of Atlantic Tunas (ICCAT), the regional fisheries management organization for Atlantic tunas, turning back towards recovery. However, this is also marked by uncertainty and is perhaps jeopardized by quota increases. Historically, ICCAT catch quotas have been challenged by both developed countries—e.g., Spain, France, Japan, and the U.S.—which seek to retain historically dominant fleets, and developing countries—e.g., Brazil, Morocco, Côte d'Ivoire, and Senegal—seeking to expand fleets (Webster 2009).

The world's fish stocks are under threat not only from overly intensive legal fishing activities, but also from illegal, unreported, and unregulated (IUU) fishing. On the whole, IUU fishing in the Northern Atlantic has decreased in recent years, but continues nevertheless, while port control remains more limited and illegal fishing more prevalent in the Southern Atlantic (Holthus et al. 2012). Illegal and unreported catches have been found to be highest in the Southwest Atlantic and also in the Eastern Central Atlantic, stretching from Morocco down to Angola, where there has been a steady increase in illegal fishing. Off the coast of West Africa, IUU fishing accounts for an estimated 40% of caught fish, the highest in the world (Maribus 2013). Most illegal fishing is carried out in the territorial waters of developing countries.

Atlantic Fisheries Actors and Institutions

State actors play a variety of roles within fisheries management, associated with different rights and obligations, such as flag, coastal, port, and market states. The term "flag state" refers to the state in which a vessel is registered or whose flag it flies (United Nations Convention on the Law of the Sea, art. 91(1)). There are no generally accepted definitions for the terms "coastal state," "port state," or "market state," however these refer to, respectively: the rights, obligations, and jurisdiction of a state within its own maritime zones over foreign vessels; the rights, obligations, and jurisdiction of a state over foreign vessels that are voluntarily in one of its port; and, states which import, export, or have a domestic market for fish or fish products (see Molenaar 2014). Coastal states have exclusive access to marine resources within their jurisdiction, and a particular interest in protecting these, although flag states, too, have economic interests in fish catch and stock sustainability. The practice of using "flags of convenience," whereby companies register ships outside of their home state, helps enable IUU fishing where flag states have less stringent regulations or ineffective vessel controls.

The primary intergovernmental bodies for fisheries at the global level are the UN General Assembly (UNGA) and the FAO. The FAO promotes sustainable fisheries through, *inter alia*, information collection and provision and its Code of Conduct for

Responsible Fisheries, which has been endorsed by around 170 member states. The main international treaties governing fisheries are the UN Law of the Sea Convention (UNCLOS), the "constitution" of the oceans, and the Fish Stocks Agreement, which addresses straddling and highly migratory stocks. Both framework agreements set forth general rights, obligations, and objectives for oceans and fisheries management. Most nations have signed on to UNCLOS, with the conspicuous exception of the U.S., which nonetheless generally follows its principles in practice. On the high seas, ocean beyond coastal states' 200-mile Exclusive Economic Zone (EEZ), fishing is open to all according to UNCLOS and is generally unrestricted apart from participation in fragmented regional regulatory bodies.

The primary work for regulating fisheries takes place at the regional level, where Regional Fishery Bodies (RFBs) aim to conserve, manage, and develop fisheries, with mandates ranging from advisory to legally binding. There are fourteen RFBs overseeing boundary-straddling, highly migratory, or high seas migrating fish stocks in the Atlantic (Holthus et al. 2012). While regional organizations have seen some success in imposing restrictions and rebuilding stocks, they remain ill-equipped, with limited resources to successfully combat IUU fishing and insufficient jurisdiction (The Economist 2014). Meanwhile, political will both in regional organizations and at the national level is weak and fails to reign in fishing lobbies. Importantly, RFBs are not limited to coastal states and include all countries involved in fishing within a given region.

Industrialized commercial fleets and artisanal fishers alike are driven by economic interests in fish sales, especially for high value catch. The former, however, often have formidable political power, through associations, and frequently lobby to raise fishing quotas and continue distortional subsidies. According to a 2013 study, the EU pays 75% of access fees for European vessels to fish in the waters of developing countries in Africa and the South Pacific, allowing industry to rake in greater profits as well as to purchase more efficient, or exploitive, vessels (Pew 2013). NGOs such as the Pew Charitable Trusts, World Wildlife Fund, Oceana, and Greenpeace, for example, provide some counterweight and participate in regional fisheries conferences and negotiations to advocate for sustainability-based practices and catch limits. Addressing the role of consumers in creating demand for fish products, the Marine Stewardship Council (MSC) has established a certification program for sustainable fisheries. In a unique example of regional cooperation, the Sargasso Sea Commission was formed in 2010 as an international partnership between governments, NGOs, and RFBs, leading to a non-binding declaration and framework for voluntary cooperation to protect the biodiverse waters of the Sargasso Sea, in areas beyond national jurisdiction.

Future Fisheries Scenarios

Global consumption of fish has increased dramatically and world population growth is likely to continue to drive demand for fish products (Pitcher and Cheung 2013). As wild fish catch has stagnated or declined since the 1990s, aquaculture has expanded dramatically and helped meet growing demand, growing at a rate of 6.2% per year between 2005 and 2010 and contributing to nearly half of global fish consumption in 2010 (Searchinger et al. 2013). The role of aquaculture has increased over the past 20 years, driven by demand from growing populations in Asia (Maribus 2013). China is the world's dominant leader in aquaculture production and consumes over one third of global fish products each year. Following the EU, China has also had the largest global catch volumes for years now, though there is dispute as to the accuracy and reliability of China's data. Over two thirds of fish exports from developing countries go to developed countries (World Bank 2013).

Over the next five to ten years, wild fish catch is expected to continue to decline, or at least stagnate, as good regional management is overshadowed by short-term profit interests (see e.g., Maribus 2013; Bonini et al. 2011). Most fisheries are already at maximum sustainable exploitation levels, if they are not already overexploited. Further, consumer demand for target species is unabated. To help meet growing demand, particularly from Asia, aquaculture is predicted to continue to grow and to reach equal shares to global fish supply over the next decade or so (World Bank 2013). Under baseline conditions, total fish supply is projected to grow from 154 million tons in 2011 to 186 million tons in 2030 (Ibid.). Per capita fish consumption is projected to decline in Japan, Latin America, Europe, Central Asia, and Sub-Saharan Africa. Were stocks permitted to recover to levels that permit the maximum sustainable yield (MSY), the largest possible catch volume which can be removed from the sea on a long-term basis without reducing the productivity of the stock, wild catch yields would increase above current levels by 2030.

Stock assessments are based on various factors such as annual catch size and quantity of spawning fish, but are challenging to assess in light of limited and patchy data (Maribus 2013). Developing countries face challenges not just in developing institutions and enforcement regimes for fisheries, but in collecting the underlying data to support good governance. While intensive fishing has severely reduced fish biomass in many regions, species may fall below thresholds of “commercial depletion”—i.e., the level below which it is no longer profitable to pursue fisheries in affected regions—before reaching biological extinction levels, and resilience is boosted by the generally high reproductive capacities of fish stocks (Ibid.). Thus, predictions for future fisheries health can range wildly, from total collapse by mid-21st century to opportunities for success (UNEP 2006; Novogratz and Velings 2014). A 2013 meta-analysis of different assessments concluded that while there are limited improvements, such as in the North Atlantic, in North America and Europe, “[s]erious depletions are the norm world-wide, management quality is poor, catch per effort is still declining"(Pitcher and Cheung 2013). Fisheries which are improving tend to be found in developed countries’ waters, where modern stock assessments, high compliance with the FAO’s Code of Conduct for Responsible Fisheries, and high UN Human Development Index scores are present (Ibid.).

While 20th century technology has helped to drive the overexploitation of fisheries, technological advances offer new promise to bringing an end to illegal fishing. New satellite monitoring and “big data” capabilities allow for synthesis of information from a range of sources in order to track fishing (or potentially fishing) vessels monitor suspicious behavior, and track supply chain transport (The Economist 2015). Nonetheless, enforcement capabilities will remain a separate question of resources and political will.

In addition to overfishing, fish stocks face additional anthropogenic threats such as pollution, invasive species, and habitat destruction. Climate change is emerging as a major threat to the oceans, increasing ocean water temperatures and acidification, as well as deoxygenation (Bijma et al. 2013). Already, warming ocean waters are causing shifts in marine species and pole-ward movements of Atlantic species have been observed. Atlantic fisheries are following global trends of moving to deeper waters and to the high seas, as well as from North to South (Montero-Serra 2015; Poloczanska 2013).

Overfishing is a major concern for the entire Atlantic region and, as long as it remains a viable economic opportunity for fishing vessels, will continue to be. To protect fish species and fisheries-based livelihoods, national commitments and cooperation to reduce total allowable catch (TAC) to sustainable levels are needed to allow fish

stocks to recover. Furthermore, advances in monitoring and enforcement must help implement such commitments. Research suggests that rather than relying on one type of fisheries management measure, the most effective solutions will be ecosystem-based, incorporating, e.g., catch limits and expansions of protected areas (see e.g., Pitcher and Young 2013). Other cooperative approaches can include coordinated efforts to ensure compliance by countries which do not participate in regional organizations and improving market traceability, both of which may be boosted by technological advancements. Meanwhile, the sustainability of aquaculture, which will undoubtedly grow to replace wild catch and meet rising demand, will depend on factors such as the volumes of fish meal and fish oil used as feed, as well as land and water use and control of the spread of disease. Restoring and maintaining Atlantic fish stocks will depend on the participation of actors coming from within and outside of the Atlantic region.

5. Wildlife trafficking and biodiversity loss

Wildlife Trafficking and Biodiversity Loss in the Atlantic Space

From an environmental perspective, wildlife trafficking is relevant because it undermines protection of key species and habitats. From a social perspective, it is also relevant in the wider context of organized international crime. There are other critical factors driving biodiversity loss, including monoculture, land conversion, forest lost, habitat destruction, invasive species, and, increasingly, climate change. Many of these are the consequence of the Northern Atlantic lifestyles and corresponding production and consumption patterns.

The illegal trade of wildlife and wildlife products has become a highly lucrative and professionalized criminal activity that is dramatically affecting global biodiversity in source countries, particularly in Latin America and Africa. While the environmental impacts are concentrated in source countries, there are other impacts that influence economic development, good governance, and regional, and even global, security.

In the last decade, illegal wildlife trafficking has become a recognized issue on international agendas, in part because of the value of the illegal trade which is estimated at around 10 billion USD annually and also because of the organized criminal actors involved. Illicit trade in wildlife is now one of the larger trafficking economies alongside drugs, humans, and weapons (Haken 2011). Another reason for its perceived urgency is the fact that several iconic species are at immediate risk of extinction in the wild, should poaching levels continue to accelerate as they have since 2007. In 2014, the U.S. launched its National Strategy for Combating Wildlife Trafficking (USTR 2014) and certain countries in the EU have taken a proactive role in addressing illegal wildlife crime, with, for instance, the UK hosting the international London Conference on combating illegal wildlife trafficking. Despite an increasing level of awareness among civil society and governments, the presence of the international CITES Convention (the Convention on International Trade in Endangered Species of Wild Flora and Fauna), and political commitment by Northern Atlantic countries, illegal wildlife trade continues to accelerate annually, made evident, for instance, by the poaching statistics of some of the more lucrative species such as rhino and elephant (Haken 2011). Wildlife trade, however, encompasses a variety of products including exotic pets, medicinal plants, and animals, and well-known objects such as rhino horns, tiger bones, and ivory. Illegal wildlife trade as recognized by CITES also aims to regulate legal trade of wildlife using quotas, licensing schemes, and other instruments.

Illegal wildlife trade is undeniably a global issue; however, certain patterns of trade, as well as shared interest in fighting environmental crime, exist in the Atlantic Space. Latin America and Africa are both continents endowed with exceptional biodiversity and large swaths of land that have ecological importance and remain largely intact. For this reason, these countries are also the countries sourcing wildlife and wildlife products that are then traded and consumed on the international market. The U.S. and Europe act mainly as transit countries or consumer countries of wildlife products. Both have exhibited political will to end illegal wildlife trade on the basis of both the environmental impacts on source countries and the human security threats it posed, in terms of contributing to global insecurity, conflict, and thwarted economic development in developing countries. Asia is an integral component of the wildlife trafficking challenge, as insatiable demand by Asian consumers significantly propels illegal wildlife trade (Milliken and Shaw 2014; The Atlantic 2013). For example, shark fin is perceived as a sign of wealth and prestige in several Asian countries and increases in Asian incomes have resulted in more consumers that are able to afford luxury wildlife items. Demand also stems from scientifically unfounded perceptions that certain wildlife products can cure a variety of ailments; the most well-known example being that rhino horn, which has been medically proven to be carotene or the same as a human fingernail, can cure cancer (Nowell 2012; The Atlantic 2013).

There is a high level of awareness and concern among U.S. and European citizens on fighting illegal wildlife trade, and U.S. and European governments have exhibited increasing political commitment. There is also a growing awareness among Latin American and African citizens and governments that the illegal wildlife trade threatens economic development and employment opportunities and unsustainably exploits public resources for the benefit of illegal criminal individuals. There is therefore a budding consensus within the Atlantic to work cooperatively to address wildlife crime.

The most direct impacts of the illegal wildlife trade are on ecosystems in source countries, resulting in biodiversity loss and premature extinction of species. Moreover, the loss or decrease in certain species affects the functioning of ecosystems and services they provide. Other socioeconomic impacts include the erosion of good governance and legitimate institutions, perpetuation of conflicts, and even terrorism. Illegal poaching of elephants has been tied to funding Al Qaeda's Al Shabab, Joseph Kony's Lord's Resistance Army, and Sudan's Janjaweed (Lawson and Vines 2014; Agger and Hutson 2013; Horn Portal 2013). These impacts are challenging to quantify, but have been shown to have significant influence on economic and social development (Lawson and Vines 2014).

Recognizing this, the UN World Tourism Organization (UNWTO) conducted a study in 2014 to evaluate the economic importance of wildlife to employment and economic growth in African countries. The study used surveys and gathered information from 31 African governments and 148 European and African tour operators. A total of 93% of the governments surveyed confirmed that poaching is a problem in the protected areas of their countries and 70% of tour operators stated that poaching negatively affects wildlife tourism (UNWTO 2014). Another study by the World Travel and Tourism Centre measured the contribution of the tourism sector to African countries, comparing it against other sectors. They calculated that travel and tourism generated 179 billion USD, or 8.9% of Africa's GDP, in 2013, exceeding total contribution of other sectors such as banking, chemicals, automobiles, higher education, and communication (WTTC 2013). Travel and tourism also contributed 8 million direct jobs and 20 million indirect jobs in 2013, exceeding all other sectors. A third study estimated the touristic value of an elephant over the course of its life compared to that received for its ivory illegally, finding an elephant to be worth 1,607,624.83 USD over

its lifetime compared to 21,000 USD for tusks sold on the black market (Brandford 2014).

Relevant Actors and Institutions

The EU and the U.S. are both on the forefront of international efforts to abate the illegal trade in wildlife. In 2014, the European Parliament adopted an EU Action Plan to fight illegal wildlife crime and in 2015, the U.S. launched its White House strategy against wildlife trafficking. Moreover, U.S. and European NGOs have been instrumental in raising global awareness on the issue and in organizing capacity building workshops among enforcement agencies at the international level. In May 2012, the UK NGO International Fund for Animal Welfare (IFAW) funded INTERPOL's Operation Worthy, a three-month police operation involving 14 countries across Eastern, Southern, and Western Africa (INTERPOL 2013). Before the operation was carried out, IFAW trained over 320 officers from a range of relevant agencies including police, customs, environmental protection agencies, veterinary services, airport security, ministries of tourism, and national prosecuting authorities. INTERPOL reports that Operation Worthy brought forth the arrest of 214 individuals and seized two tons of contraband ivory, 20 kilos of horn, and 30 illegal firearms (Smith and Klaas 2015). Building governmental capacity in source and transit countries is important for adequately enforcing CITES and fighting the illegal trade.

Since the illegal wildlife trade is linked to organized crime, violent non-state actors, and corruption, it has attracted the attention of European and North American military and civilian agencies. Surveillance data and information on trafficking, the types of actors involved, the modalities of how they operate, and value of the trade is therefore available. However, a lot more is known about the activities of traffickers than is used in law enforcement. The transnational nature of wildlife trafficking, combined with the difficulty of adequately enforcing international agreements such as CITES and/or convicting organized criminal actors, remain important challenges to effective enforcement. To date, more cooperation between military and civilian agencies is needed.

Future Outlook for Wildlife Trafficking

The outlook for the illegal wildlife trade in the Atlantic Space varies dramatically depending on the species being exploited, the CITES terms of trade, and the actors involved. However, if current levels of poaching continue for some species that are already experiencing unsustainable levels of exploitation, the result will be their extinction in the wild. In the case of elephants and rhinos, for instance, the rate of poaching in some countries outpaces birth rates. Some studies show that rhinos face extinction as early as 2020 and that the illegal ivory trade could eliminate one fifth of Africa's elephants over the next decade (IUCN 2013; Al Jazeera America 2014). However, it is often the case that the exploitation of iconic species is better recorded and understood than the many species that are being harvested unsustainably, but without public knowledge.

In some countries where the wildlife trade coincides with state instability or conflict, this outlook includes human security threats to local populations, as well as wider regional or global security threats. The illegal wildlife trade in unstable or conflict ridden states poses global security threats, as violent non-state actors or corrupt institutions illegally exploit natural resources to fund illegal activities. The perpetuation of instability and violence has knock-on effects influencing other human security issues, such as migration and poverty. There exists increasing evidence that organized crime syndicates are benefiting from and dictating the illegal trafficking of wildlife. The

presence and perpetuation of black market economies and organized criminal networks poses serious threats to global civil society at large and to legitimate business. The inability thus far to adequately address illegal trafficking of wildlife, but also other goods such as weapons, drugs and humans, makes the challenge of combating organized crime and corruption of utmost importance to the international community, its citizens and its economies.

There is a shared interest to fight illegal wildlife trade in the Atlantic Space. The trafficking of illegal wildlife goods jeopardizes legitimate financial markets, proliferates corruption, and erodes public environmental goods. The Atlantic financial system is complicit in moving and laundering these goods and money. There are significant potential benefits from interregional cooperation, and, conversely, damage to wider interests if wildlife trafficking goes unaddressed.

Strengthening international cooperation, developing norms, and raising awareness, on the one hand, and legal enforcement on the other, are likely to be areas of focus in future decades. The example of Operation Worthy illustrates that new cooperative partnerships between enforcement agencies and NGOs are already starting to take place and new security structures are changing the roles and responsibilities of different actors. In particular, NGOs have become integral providers of evidence in criminal proceedings. The development of technology (e.g., drones) to monitor animals and fight environmental crime also demonstrates the emergence of new and game changing actors.

6. Conclusions

The environmental challenges faced by countries in the Atlantic Space are manifold and mutually reinforcing. For example, deforestation caused by unsustainable food production leads to the decimation of wildlife, which in turn results in even higher prices for illicitly traded wildlife. Deforestation accelerates climate change by destroying critical carbon stocks. Climate change in turn puts additional stress on oceans already facing fisheries overexploitation and threatens agricultural yields. These are just some of the innumerable causal links between the challenges analyzed in this report.
All of these challenges are global in nature. Although these problems are not unique to the Atlantic, they arguably have a pronounced impact in and relation to the region. Despite divergent interests, members of the Atlantic Space are equipped with the resources to address these challenges if state and non-state actors were to pool their resources and strengthen interregional collaboration. Underlying all of these challenges and dynamics are regional and global drivers of resource consumption and production.

The countries of the Atlantic Space emit almost half of all global greenhouse gas emissions. Global warming in turn hits already vulnerable populations in Africa and Latin America especially hard. While the most severe impacts of climate change in the Atlantic Space are anticipated beyond the 2025 horizon, certain impacts may already be experienced, such as changes to temperature and precipitation profiles and agricultural production.

Yet solutions to global warming also lie within the Atlantic Space. At the global level, the UNFCCC and its Kyoto Protocol have shown moderate successes in addressing global warming. European and North American countries have the resources to mitigate climate change and provide the means for climate change adaptation. The EU has already set ambitious targets for the introduction of renewable energy. With

more political will, the U.S. could follow suit, and some states in the U.S. have already taken great strides, such as California and Colorado. EU member states and the U.S. could transfer renewable energy technology and financial resources for investments in renewable energy to the Southern countries of the Atlantic Space.

As Latin American and African countries rapidly develop, they are in the midst of selecting energy systems to feed their future economic development. In a global energy paradigm emphasizing low-carbon economies, renewable energy has clear advantages over centralized systems of energy production that rely on fossil fuels and nuclear fuel. Cooperation between the North and the South, as well as between Europe and the U.S., could facilitate a sustainable energy revolution. Global energy demand is set to increase by over 20% by 2025. Whether this new demand can be met through a transition to clean energy sources remains to be seen. Through 2025, renewable energy technologies are expected to make up the largest share of new generation, particularly in new markets in Asia, Latin America, and Africa, and prices for renewable energy technologies are projected to continue to drop. Nonetheless, fossil fuels are expected to remain dominant in the near future and while clean energy will make significant gains, the levels achieved will not meet those needed to stave off the worse effects of climate change.

Food security is another issue of special relevance for the Atlantic Space as it is home to a significant number of the world's hungry and also of the world's obese. Understandings of food security increasingly consider not only what food is available and affordable, but nutritional aspects as well. Agricultural systems in the U.S. and Europe have played a role in favoring cheap, processed foods and have shaped production and consumption habits worldwide, particularly in Latin America. Recent South-South cooperation has sought to address food security concerns, however, engaging with Northern producers will be crucial to adequately dealing with the stuffed and starved paradox.

As far as fishing is concerned, the Cod Wars of the 20th century provide ample evidence that the Atlantic is a space of common interest with challenges posed by the "tragedy of the commons" dilemma. The primary international regimes that regulate fishing and the relevant agreements and codes of conduct are situated at the global level. Yet much of the particular regulation of fisheries takes place at the regional level, and non-state actors, such as commercial fisheries associations and environmental NGOs, have a strong influence on the development of fisheries policies. Meanwhile, global consumption of fish continues to rise, driven by population and economic growth and new demand for fish products, particularly in Asia. Aquaculture has risen to help meet this demand in the face of stagnating or declining wild fish catch and is predicted to continue to rise.

Finally, the illicit wildlife trade is dense among the four continents of the Atlantic Space, with endangered species from Africa and Latin America supplying a significant trade of which the U.S. and the EU are important transit countries and in some cases consumer countries. Illicit wildlife trade significantly impacts biodiversity, sustainable development, good governance, and regional security in negative ways. Private, and often criminal, actors maintain this trade primarily for economic gain. Yet different cooperative frameworks between governments and NGOs within the Atlantic have developed new structures to deal with the issue. For instance, U.S. and European NGOs are conducting training activities in African countries to train local enforcement officials to detect smuggling. Furthermore, European and U.S. state actors have shown substantial commitment to fight the illicit wildlife trade and provide financial resources to African governments to prosecute poaching. Despite these efforts, the trade in species such as elephant and rhino has continued to increase on an annual

basis and is expected to become more severe, driven by increased spending power and demand for illicit luxury goods, with devastating losses of biodiversity as a result.

Rising demand for resources to feed growing—and wealthier—populations is shifting global production and consumption patterns. World population is expected to increase to over 8 billion people, from approximately 7.2 billion today, by 2025 (UNFPA 2013). Meanwhile, growing economic and purchase power in developing countries is leading consumers to seek out “North Atlantic” resource intensive lifestyles and choices in diet and goods. The increased resource load required to meet these demands puts heavy strains on the environment. Where policy solutions prove insufficient to internalize these costs, economic interests will continue to drive unsustainable, and often illegal, resource use and consumption.

Northern Atlantic industrialized production systems—for energy, food production, fishing, and more—have spread to the Southern Atlantic and around the world, bringing with them environmental and social consequences of intensive resource use. While many environmental challenges can be traced to Northern production and consumption systems, North Atlantic policy solutions can help to meet these challenges. For example, the U.S. developed the world’s first “type” of feed-in tariff policy, while the modern German feed-in tariff was the first of its kind and has influenced the spread of similar policies throughout the world. Technological advancements, many originating in the North, such as renewable energy technologies and satellite tracking systems for illegal fishing, offer new opportunities for tackling environmental challenges. There is hope that by taking up the new technologies of industrialized nations, developing countries can “leapfrog” into a lower-carbon economy and skip the environmentally harmful stages of development that today’s wealthy nations experienced. Yet in other policy arenas, such as agricultural trade and setting fisheries quotas, the North’s influence is frequently seen as more problematic, and South-South cooperation is increasingly offering a counterweight to traditional imbalances.

We also see that the impacts of these environmental challenges reverberate beyond the natural world, impacting human security and well-being. Illicit trade in wildlife is linked to conflict and unstable governance, while food system imbalances and the impacts of illegal fishing on communities lead to nutritional deficits and food insecurity. Meanwhile, the human security impacts of climate change around the Atlantic region are vast and far-reaching. In the end, the full breadth and severity of climate change impacts in the Atlantic Space will be determined by the actions of actors not just in the Atlantic, but around the world, as greenhouse gas emissions must be reduced collectively to mitigate climate change.

The challenges presented in this study are not necessarily limited to the Atlantic Space and are in fact found on a global scale. However, for a variety of reasons, the Atlantic Space offers unique opportunities for concerted action across the four continents through further collaboration between state and non-state actors. First, the challenges are especially severe for countries in the Atlantic Space. Second, despite the severity of the challenges, there are also considerable resources available to address these challenges—mainly in the North, but as the case of Brazil shows, also in the South. Coordinated efforts across the Atlantic to address these challenges have the potential to yield positive results and could further the development of an effective Atlantic community, which has the tools and collaborative will to tackle the pressing environmental challenges of today and the future.

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