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What is planetary health? Addressing the environment-health nexus in Southeast Asia in the era of the Sustainable Development Goals: opportunities for International Relations scholars

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Abstract

How can environmental conservation policies integrate concerns for the health and well-being of people whose livelihoods rely directly on nature? How to best operationalize science-policy interfaces to improve evidence-based decision-making? This paper raises policy implications deriving from the poor connectivity between human health and environmental conservation, suggesting the emerging field of "planetary health" as a rich field of research for International Relations scholars.

Keywords: planetary health; environment; health; sustainable development goals; Southeast Asia.

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Introduction

In a new, stormier world, where extreme weather events, droughts, climate change, heat waves, flooding, poor air quality, biodiversity loss and humanitarian crises threat human well-being and global peace, resilience — the ability to adapt to disruption and "bounce back" — is everything. The United Nations (UN) 2030 Agenda for Sustainable Development (2030 Agenda) is the most recent and ambitious global development roadmap contributing to resilience building. Concluded in 2015, this universal diplomatic agreement outlines the new 17 Sustainable Development Goals (SDGs), which are supported by 169 targets. Understanding the implications of this new roadmap is necessary for academics and practitioners, considering the importance of realizing the synergetic linkages across all SDGs, if its implementation by 2030 is to be taken seriously.

This paper focuses specifically on the links between environmental change and health to introduce a new theme within International Relations scholars: planetary health. For that, the analysis focuses on examples in Southeast Asia, an emblematic region. During the last decade, rapid economic growth in Asia and the Pacific has significantly contributed to poverty reduction and access to health care, with most countries in the region projected to reach middle-income status by 2020 (Asian Development Bank 2016). However, this progress — measured as the increasing gross production and productivity — has often been at the expense of the most vulnerable people, and has led to widespread environmental degradation (United Nations 2018). For instance, increasing urban air pollution, lack of proper solid waste management, degradation of fresh water resources, soil erosion and contamination, destruction of habitats, and biodiversity loss are among the top unattended consequences of unplanned development, which have costs for cities and rural areas (Fletcher 2008). In its current rhythm, economic development too often trades short-term gains in wealth and comfort for long-term losses in human health and well-being, which ultimately undermines the prospects for long-term economic sustainability and social resilience. These challenges are increasingly exacerbated by natural disasters, aggravated by climate change and related threats that can further disrupt and reverse development investments already made (Desai et al. 2015).

The 2030 Agenda and the Paris Agreement on Climate Change (both adopted in 2015) clearly recognize these challenges and represent an incentive for more holistic development towards a low-carbon economy. However, the SDGs will only be effectively implemented if development is framed and practiced holistically.

In short, the SDGs are a manual for local and national action, as they help to set and measure targets to respect the world's "safe operating boundaries," while aiming to build more equal societies. This paper emphasizes the need to expand the notion of global health beyond the conventional disciplines of medicine or biology, to frame it under a broader spectrum of interlinks. That is the role of planetary health studies. The advancement of such holistic framework is much more dependent on social forces, power and politics, than the lack of scientific evidence of such interlinks. That is why we point out to the growing field of planetary health research, led by the Planetary Health Alliance,[1] with the goal of presetting this evolving area to International Relations practitioners, who are well placed to tackle interdisciplinary problems.

The Alliance is a consortium comprised of academic, nongovernmental, and governmental partners, based at the Harvard University Center for the Environment (HUCE) and the Harvard T.H. Chan School of Public Health. Together they support the growth of planetary health studies across the United States and globally. To date, the absence of professionals from social sciences in general and international relations in particular actively engaged in this community of practice is evident. Yet, these professionals are essential to this endeavor, as they contribute to essential themes, such as global governance, human rights, political economy, security and diplomacy,

[1] More information on an international consortium advancing this notion here: https://planetaryhealthalliance.org

to cite a few. Hence, this paper builds on the notion of planetary health to propose a new angle of research in IR, and also a new narrative for the SDGs.

The SDG 3, in particular, aims to ensure healthy lives and promote well-being for all, at all ages. The most effective way to actually achieve this goal is to pay attention to the relationships across all SDGs, notably those with direct environmental connection. The SDGs highlight the overarching need for global to local efforts to eradicate poverty and build social-ecological resilience, through context-relevant national and regional policies, as well as community-based initiatives that acknowledge the inter-linkages between environmental and public health. Nevertheless, a significant gap still exists between the angles from which health practitioners perceive their role (disconnected from their environment) and the way environmental policies are prescribed (*i.e.,* disconnected from the realities faced by those people who depend directly on the environment for livelihoods, as the history of protected areas demonstrates). Divergent interests and perceived needs, as well as institutional dysfunctions, limit integrated decision-making on health and environmental matters.

To further understand this gap, an essential paradox needs to be addressed. How can one ensure that, for example, modern biomedical science and practice, the same that provided us with health advancements in past decades, take into account the contribution of ecosystems to health and not contribute to their disruption, which in turn degrades our health? How can environmental conservation policies integrate concerns for the health and well-being of people whose livelihoods rely directly on nature? With these questions in mind, this paper analyzes the emerging interdisciplinary field named planetary health, to demonstrate the interdependencies of the environment, and biodiversity in particular, with human health, while proposing new avenues of work for internationalists.

Overall, it shows that the 2030 Agenda represents an opportunity for the adoption of a more cohesive approach to development, suggesting that such diplomatic agenda can be reinvigorated by further strengthening the synergies between environmental and health public policies, notably at the local level. This paper is original for two reasons. First, it addresses a fresh agenda in International Relations through the eyes of both an academic in International Relations and a sustainable development practitioner. Second, it reveals the opportunities for research in the growing and emerging planetary health field.

Health in the Anthropocene: the need for reassessment

The Anthropocene, the most recent geological era, which is human-influenced, is still being debated among geologists in terms of definitions and precise dates. However, it is a turning point, as it provides several strong evidences of human impact on Earth, making the case for a paradigmatic change. This era represents times of uncertainty and unprecedented biophysical change (Rockström et al. 2009). The notion of "planetary boundaries," promoted by the Stockholm Resilient Centre, gained track for encapsulating and facilitating the understanding that the Earth, similar to humans, can also be sick. The ways that our planetary boundaries are being breached are

mainly connected to rapid human population growth, technological development, land use change, energy consumption, and the impacts of a fossil fuel economy since the Industrial Revolution (Lovelock 2014). Profound environmental change related to this new era is not a topic for the future but a present reality. Examples of such evolving reality are related to malnutrition, food insecurity, emerging infectious diseases, and stress-related mental illness (Whitmee et al. 2015). A key paradox facing humanity today is that the Western biomedical model is still perceived as the most advanced when it comes to medical care, and yet it requires a level of consumption that cannot be maintained in a future of ecological constraints (Zywert and Quilley 2017).

Health has no universal definition, but represents a social construct being shaped by political economies, social institutions, and ecosystems. Zywert (2017) captures well the historical background that contextualizes the history of health perceptions when the author recalls that the Cartesian separation of body and mind had a tremendous impact in the modern understanding of the human body. Mechanical and individual actors gained prominence during the dominant physics metaphor, where clinical medicine gained space, paving the way for pharmaceutical and surgical interventions aiming at illnesses of individual bodies. That is how health started being conceptualized as the absence of pathology, and also disconnected from cultural or environmental contexts, opening more space for the biological approach to medical interventions. With social modernization, medicine was impacted by technology and pharmaceutical advances, promoting a rationally designed society, and understanding medical intervention as a moral imperative, which would contribute to the elimination of archaic social structures. Since the Industrial Revolution in Europe, markets became the driving forces of societies, and community reciprocity was left behind (Polanyi 1944). To balance the negative effects of rapid expansion of the market economy, welfare policies, including education and healthcare, were created to redistribute wealth. However, current healthcare is challenging for being complex, tech-dependent, and energy-intensive (Bednarz and Beavis 2012). Forces of capitalism are at the core of health transformations, with market forces determining medical research priorities, trends in professional specialization, and the ongoing medicalization of social problems (Missoni 2015). Briefly put, biomedical health is predominantly based on modern ontologies, which individualizes illness and focuses on postponing death (Gawande 2014).

It must be pointed out that with unstable climatic conditions and social-ecological crises, some of our key assumptions about human health will have to change. Our current society exemplifies changes in mental illness, demonstrating the rise of a public health crisis linked to "modern diseases," such as anxiety, suicide, depression, and personality disorders (Hidaka 2012). Moreover, the high dependence of fossil fuels and the economic growth of our current social institutions is the ultimate challenge for a prosperous and healthy future. The key idea is that, despite the connection between growth and well-being for the last 200 years, the breach of our planetary boundaries suggests the incompatibility of this relationship (Horton et al. 2014).

This paper suggests that the way we conceive health must change. The notion of planetary health is a current and evolving ontology, which makes us rethink the conditions in which human beings will thrive on Earth. Disruptions related to climate change, biodiversity loss and environmental

change are not only ecological changes but are enabling recession, rising energy costs, promoting migration and new diseases, and threatening our food security (Homer-Dixon 2006).

There are reasons to question the effectiveness of exclusive biomedical approaches that neglect social determinants of both human health and environmental degradation (McCoy 2017). Climate change, anti-microbial resistance, ecosystems' collapses, unstable political regimes are all threats that wane modern global health gains. A more critical perspective on the meaning of "success" in global health and development is thus urgently needed.

Resilience is paramount to ensure that complex social-ecological systems can thrive and ensure the health of a fast-growing population. Nevertheless, the increasing commodification of care and massive cuts in welfare policies, coupled with societal changes that reduce caregiving among communities and extended families, add new challenges for resilience-building. In the Anthropocene, human health will benefit from institutions that value health ontologies and reconnect bio-psycho-spiritual aspects of personal health to the social ecological context (Zywert 2017). And yet, the main barrier for such change remains human behavior, mostly neglected in managerial approaches to health and sustainability.

Holling et al. (2002) warn about the incompleteness of many so-called solutions in the sustainability field that, in fact, perpetuate old problems, or create unintended consequences at higher scales. Non-rational drivers of behavior and cultural contexts are often neglected in some of them. In order to ensure a holistic perspective of contemporary health problems, systems thinking the approach that favors an integrative perspective of a problem are needed (Wilcox and Echaubard 2017). Among others, one past relevant attempt to promote this holistic approach is the One Health community, bringing together professionals from an interdisciplinary background to tackle health from a triple perspective: humans', animals' and the environment's (Zinsstag et al. 2015).

Planetary health does not claim to be a complete new movement, but an evolving paradigm. Introduced by Richard Horton and colleagues in 2014, and expanded in a Lancet Commission report in 2015, this emerging field stresses the deep interconnectedness between our nature and human health (Horton et al. 2014; Whitmee et al. 2015). The extent to which planetary health differentiates itself from past, similar fields remains open for further research, but one can already highlight the start of a more critical perspective on consumption and current development models. Intergenerational solidarity, for example, deserves to be addressed. By decimating our natural capital, most of them irreplaceable, present generations are ignoring the needs of future generations, who will most likely face more acute health problems related to resource scarcity, if no alternative models of growth are proposed.

In this sense, the argument that poverty is being reduced deserves further qualification. For instance, even if extreme poverty has been reduced, a shocking 71% of the world's population lives below $10/day, meaning that poverty is not shrinking, as many narratives emphasizing the extreme poverty gains would like us to think (McCoy 2017). Hickel (2017) complements this argument by denouncing the "progress narrative," which erroneously suggests that extreme poverty is no longer a major issue. Most importantly, he underscores that economic growth is only one piece of the

development puzzle. To lift all the population living with up to $5 a day, the global GDP would have to increase 175 times, which is impossible from an environmental perspective. Moreover, climate change and the most pessimistic projections indicate that the planet could heat up by 3.7 °C – 4 °C, which would leave New York and Amsterdam under water, and critically affect global agriculture. Such examples serve to reinforce the views that pure economic growth is actually a ticking bomb.

McCoy (2017) also recalls that there's a huge gap between "what we know and what we do," which favors selective indicators of health improvement and more positive narratives by actors such as the Gates Foundation, the World Bank and the Global Fund that deserves reconsideration. Echoing this paper, this author emphasizes the problem of under-represented disciplines (*i.e.,* economics, international relations, trade, geography, law, earth and social sciences) in the evaluation and study of global health. In this perspective, what is missing is a greater effort to avoid a siloed understanding of structural, social and ecological health determinants. Therefore, this paper calls for greater engagement of social and political sciences in the field of global health and, consequently, planetary health. Above all, sustainability is a matter of ethics within and between generations. When public health policies are designed, one must ask: who benefits?

Where are the gaps? Addressing the health and environment nexus through examples in Southeast Asia

Science is unequivocally providing evidence for several mutually reinforcing pathways through which environmental degradation, or the lack of consideration of environmental factors in decision-making, can lead to public health challenges (WHO et al. 2015). These non-mutually exclusive relationships are, for instance:

Water pollution and contamination

Waterborne diseases, notably diarrheal, cause 1.5 million deaths every year (WHO 2014b). More than half of that burden, or 842 000 deaths per year, are attributable to unsafe water supply and lack of sanitation and hygiene. Additionally, large-scale irrigation development projects for industrial agriculture disturb water flow regimes and flooding patterns, which are associated with the emergence of water-borne diseases (Gayer & Connolly 2005). Leptospirosis is a re-emerging disease caused by pathogenic bacterial spirochetes of the genus Leptospira. Various mammal species, including rodents, are important carriers, although leptospirosis can survive in aquatic and humid environments. According to the World Health Organization (WHO), the global burden of leptospirosis is estimated at 500,000 severe cases occurring worldwide each year, with a growing number of countries reporting leptospirosis outbreaks. Animals and the environment are important factors that determine the transmission ecology of leptospirosis, such as anthropogenic land use, diversity

of animal host species, and human behavior. Climate variability, extreme events, and flooding are also major causes of outbreaks. In 2011, for instance, hundreds of people in Bangkok, Thailand, were deeply affected following rainfall/flood events. Flooding affecting urban and agricultural areas brought inhabitants into contact with contaminated water; domestic animals and rodents were identified as the main potential reservoirs. Ecosystems characterized by lower biodiversity (particularly with fewer wild mammal species), such as intensively cultivated rural areas, but also urban slums, have higher human leptospirosis incidence, which can be explained by the lack of regulation of leptospire-bearing rodent populations (Della Rossa et al. 2016). Degradation of natural resources, biodiversity loss and climate change all may impact leptospirosis transmission, ultimately affecting the poorest populations in tropical developing countries (Derne et al. 2011).

Deforestation and land-use change: drivers of biodiversity loss and new diseases

Besides increasing the likelihood of disasters related to mud slides and floods, deforestation increases the contact between wildlife, domestic animals and humans with greater risk of transmission of infectious diseases (mostly zoonotic) (Patz et al. 2004). This problem usually puts into evidence the weak epidemic mitigation capacity of most countries, and the lack of understanding of the distal social-ecological drivers underlying disease emergence. The 2014 Ebola outbreak is one example of that (Gostin and Friedman 2015). Landscape changes, mosquito and rodent-borne diseases in Thailand are another example of this challenge. A recent study in this country demonstrated how mosquito vector abundance increases as biodiversity degrades. Known disease vectors were found to be least rare in natural forest, becoming increasingly common in fragmented forest, followed by traditional small scale rice farming, to industrial scale farming, where considerably higher numbers of vector species were found (Thongsripong et al. 2013).

Southeast Asia is a region where biodiversity is at high risk due to human activities and unplanned land-use change, which are contributing to the emergence, and re-emergence of infectious diseases at alarming rates (WHO 2016). Biodiversity reduction through altered landscapes in relation to urbanization and agricultural intensification appears linked to major epidemiological changes in human diseases (Wilcox et al. 2007). This includes higher risks and the emergence of novel pathogens resulting from increased contact between wildlife, domesticated animals and humans, as well as re-emergence of known diseases, including malaria, dengue and others.

Intensification of agriculture and its consequences for health

Agriculture intensification, increasing in Asia and the Pacific region, involves focusing on a limited number of crop varieties (monocroping) in order to maximize outputs per land surface

area for profit maximization (*i.e.*, mechanization and homogenization of farming systems facilitate the harvest and the processing of the product). Agriculture intensification is usually implemented over large land areas and tightly dependent upon market demand and demographic pressure. It is also generally associated with a reduction of crop and livestock species and genetic diversity.

The ecological changes generated in intensive agricultural settings are worrying, as cultivated biodiversity and non-domesticated biodiversity in human-dominated landscapes — known to contribute possibly as much as protected areas and unmodified landscapes to global biodiversity — contributes to the health and well-being of the world's poorest people, who rely on resilient agro-systems for their subsistence and income (Hertel and Rosch 2010). Yet, as a recent study of the Greater Mekong Sub-region found, there has been little effort to access the health risks associated with these and the following changes associated with agricultural intensification (Richter et al. 2015). Through simplifying agro-systems, agriculture intensification inherently trades short-term productivity against many ecological regulatory services (*e.g.*, crop genetic diversity reduction in intensive settings is known to increase the risk for disease - *i.e.*, monocroping effect) (King and Lively 2012) that insured resilience of agro-systems against extreme events, and fostered sustainable food security for rural populations. Combined with highly fluctuating crop prices, often driven by commodity trading, these ecological imbalances make rural communities highly vulnerable (Mundt 2002).

Excessive use of agrochemicals, antibiotics and hormones

Reducing crop and livestock species and genetic variability in intensive agriculture contexts, leads to a simplification or disruption of the local ecological functions. A consequent loss of productivity is usually artificially mitigated through the systematic and intensive use of agrochemicals (pesticides, herbicides, fertilizers) in crop production, antibiotic and hormones in livestock operations. Yet, growing research shows that attempts to tame nature to enhance crop productivity erodes the system's resilience and its long-term sustainability. Increased soil and water contamination by agrochemical and antibiotics can have detrimental ecological consequences that further decrease the soils' self-regulatory capacity and fertility (Matson 1997, Wood et al. 2000). For instance, systematic agrochemical use can lead to a dramatic reduction in soil fertility and water retention capacity, to microbial communities' disturbance, as well as the potential for pathogenic bacterial strain to increase in prevalence as a result of these ecological imbalances (Lancaster 2010 and Jones 2013). Environmental contamination with fertilizer can also disrupt ecological regulatory mechanisms occurring in natural communities other than soil microbiota, which can, in some cases, lead to the proliferation of intermediate hosts (*e.g.*, freshwater snails) to human parasites. Alarmingly, increasing use of antibiotics in livestock operations leads to an increasing amount of anti-microbial compounds to be released in our waste systems and soils. This is causing antimicrobial resistance (AMR), including in bacteria of public health significance

(WHO 2014a). AMR can be considered one of the most pressing global issues, and deserves further attention from International Relations scholars.

Over recent decades, there has been a consistent global trend towards intensification of animal production systems, which utilize animals of genetically "improved" breeds in narrowly confined spaces, new formulations of animal feed and an increasing reliance on antimicrobials. Recently, this trend has been occurring mainly in developing countries as a response to economic development and increased demand for animal protein. In the Mekong region (Cambodia, Laos, Thailand, Vietnam), the per capita consumption of animal protein has increased by 45% from 36 to 52 kg between 1990 and 2000. Projections for Thailand and Vietnam indicate a further 62–73% increase between 2000 and 2015 (Knips 2004).

One of the most notable consequences of intensification in this region is the pandemic associated with Highly Pathogenic Avian Influenza (HPAI) (Sub-type H5N1). The now famous 2003-4 outbreak in Southeast Asia ultimately spread to more than 60 countries, resulted in more than 400 human deaths, and millions of poultry being destroyed by culling, or killed by the virus, as well as untold numbers of wildlife. The problem is that the virus continues to circulate endemically throughout Southeast Asia due to the same intensified poultry production practices that originally contributed to its emergence in the first place.

Microbes have no borders. Another way microbial evolution has been outwitting us is the generation of antimicrobial resistance. Although the use of antimicrobials in animal production has brought undisputed benefits (*i.e.,* disease control, increase in productivity), there is growing evidence of the negative impact of farm-associated AMR on human health (Walther et al. 2016). Data on antimicrobial use in animal production in SEA are lacking, but estimates from other countries indicate that they are likely to far exceed the quantities used in human medicine with a predicted use increase ranging from 157% to 205% for Indonesia, Myanmar, and Vietnam. In Vietnam's Mekong Delta, chicken farmers used 5–7 times more antimicrobials than their counterparts in Europe, with 85% for prophylactic use only. Similarly, high levels of antimicrobial use were also reported in aquaculture production in Thailand and Vietnam (Walther et al. 2016).

The impacts of AMR on animal and human health go well beyond the risks of infection with specific resistant zoonotic bacteria. Recently, scientists have begun to elucidate the interactions between antimicrobial use, AMR, the environment, and the resulting impacts on health. These relationships are likely to be dynamic and highly dependent on the specific circumstances (level of antimicrobial use, reservoirs, farming practices, environmental legislation, etc.) of each location (Van Boeckel et al. 2015).

Resilient cities: recovering and preparing for future shocks

Currently, 54% of the world's population lives in urban areas, a proportion that is expected to increase to 66 per cent by 2050. This could add another 2.5 billion people to urban populations

by 2050, with close to 90 per cent of the increase in Asia and Africa (United Nations 2014). Because of high density, economic importance and infrastructure, urban areas are highly vulnerable to climate change and the consequences of natural disasters. While they are responsible for 80% of the world's GDP, cities consume 70% of global energy and natural resources. The New Urban Agenda, a guiding framework adopted in 2016 on the occasion of the UN Habitat III Conference, is a chance for all urban areas to rethink the way cities develop and interact with stakeholders (The New Urban Agenda 2014).

Asian cities have registered record rates of growth when compared to the rest of the world. Urban planning, however, has been weak and, by 2015, there will be 12 megacities (with over 10 million people) in Asia. Noise and air pollution, climate change effects, loss of biodiversity and inequality will all affect the health of citizens living in these areas. Moreover, three out of five top CO2-emitting economies and 11 of the 20 most polluted urban areas in the world are in Asia (Asian Development Bank [n.d.]). This situation is particularly concerning in poor cities, where the lack of infrastructure affects waste disposal and the offer of basic services, including sanitation and water connections. Such areas face acute threats related to flooding and spread of diseases. There is thus great urgency to prioritize cities as hotspots for ecosystem-based adaptation and disaster risk reduction measures aiming to build more resilient urban centers.

Cities do not only represent potential threats but also potential opportunities to increase people's contact to nature and to healthier lifestyles, by mixing environmental management and urban planning. The advantages that regular exposure to nature offers may be greater than the potential risk of zoonotic disease transmission or physical injury while in natural habitats. For instance, spending time in nature has been shown to enhance treatment for mental diseases such as depression, and may be an important trigger for a strengthened relationship between people and nature, which is a necessary element for the consolidation of a global health ethic, and important for the achievement of most SDGs (National Park Service [n.d.]).

Planetary health as an agenda for change

Currently, synergies between health and environmental sectors are insufficient at the local, regional and global levels (Benatar 2016). Internationally, this agenda is nevertheless gaining force, following the growing concern with rapidly spreading environment-related vector-borne diseases, such as Zika, and devastating epidemics, such as the West-Africa Ebola outbreak in 2014, during which socio-cultural and environmental factors have impacted control efforts.

Global health governance structures face dysfunctions that put at risk the implementation of health goals as stated in the SDGs (Fidler 2010). These structures are ill suited to deal with multisectoral issues, and sugar, tobacco and alcohol overconsumption illustrates key challenges. Non-communicable diseases (*i.e.,* cardiovascular and chronic respiratory diseases, cancers, and diabetes) that require more regulation than funding to be controlled were ignored in the

Millennium Development Goals (MDGs). Yet, despite being addressed in the SDGs, governance inconsistencies challenge the implementation of such goals. The main challenges include: democratic deficits, weak accountability mechanisms and poor transparency, institutional inertia, missing institutions and inadequate policy space for health (Ottersen et al. 2014). Together, these factors hinder an effective management of externalities at the international level. The SDGs intensify and enhance complexity of the previous MDGs by 21 to 169 targets along the 17 mega-goals. While it is a positive outcome, this complexity brings considerable challenges in terms of data collection, even for the richest countries (Van de Pas et al. 2017).

A large percentage of new emerging infectious diseases derive from zoonoses. Antimicrobial resistance in human pathogens is another major threat, mostly deriving from the large-scale use of antibiotics in animal husbandry and agriculture. These problems won't be solved without cross-cultural collaboration that manages public health as an interface between human-animal-environment. The WHO promotes this understanding and fosters collaboration among different sectors at national, regional and international levels. For example, in 2015, the World Health Assembly endorsed a global action plan to tackle antimicrobial resistance.[2]

Despite current efforts, international cooperation in health remains testing. For example, the analysis of vertical funds, those combating specific diseases such as HIV/AIDS and malaria, suggests that there are losses in terms of multilateralism promotion and policy consistency. Even with greater financial flows for international organizations and vertical initiatives during the 1986-2010 period, cooperation in the health area have become: disease or issue-specific; controlled by a small group of stakeholders; and funded in a discretionary way instead of promoting long-term commitments (Sridhar and Woods 2013). The result is a narrow conception of health, lack of domestic participation for delivery of assistance, and doubtful legitimacy, given that effectiveness, not process, is the criterion for success evaluations. For Sridhar and Woods, donors — attracted by the model of vertical funds for its measurable outcomes and no long-term commitments — should identify how these funds could address other elements of global health cooperation, particularly those including regulation, monitoring and crisis management (Sridhar and Woods 2013). Following this argument, recipient countries must identify and express more boldly their own health priorities in a context-specific manner. This discussion illustrates the limits of top-down approaches that, often, ignore the priorities and knowledge of local communities (Holling et al. 2002).

The future of global health is being determined by new trends very much dependent on political factors, mainly global power shifts and new crises; humanitarian and related to security (Kickbush 2016). This exemplifies the need for International Relations scholars to further engage with the planetary health research community. To thrive, global health will have to respond and adapt to new realities, while incorporating the new set of guidelines deriving from the 2015 year package: the SDGs (United Nations 2015a), the Paris Agreement on Climate Change (United Nations 2015b), the Addis Ababa Action Agenda (a global framework for financing development

[2] Available at: http://www.who.int/antimicrobial-resistance/publications/global-action-plan/en/

in the post-2015) (United Nations 2015c) and the Sendai Framework for Disaster Risk Reduction 2015-2030 (United Nations 2015d). The so-called post-2015 agenda is set to overcome a model of development excessively driven by exploitation of natural resources with little concern with sustainability and equity.

However, to ensure that this agenda succeeds, there is need for a new conception of health, which cannot be dissociated from planetary boundaries (Lang and Rayner 2015). The reality is that globalization, urbanization, climate change, biodiversity degradation and excessive use of chemicals are all fueling a crisis that threats our existence (Whitmee et al. 2015). In an interconnected world, shocks in one country reverberate across the world (Myers 2015). In summary, this paper draws attention to the social-ecological determinants of health, which goes well beyond the individual, and calls for integrative policies and the inclusion of a broad range of disciplines, especially those related to social sciences.

The potential roles of International Relations scholars in the emerging Planetary Health Community

The post-2015 Agenda reflects changes in the way norms and negotiations evolve at the multilateral level. Several dimensions redefine multilateralism in this era and the context in which health negotiations will take place (Kickbush 2016). First, it will reflect the preferences of a diversified number of actors that need to work together towards common goals. Second, the North-South divide will have to redefine partnerships and "differentiated responsibilities," as historically discussed under multilateral negotiations on climate change. Third, more attention will have to be given to holistic development approaches in which environmental concerns and well-being are valued. Fourth, development aid is losing ground to the benefit of alternative finance investments with more space for private influence. Finally, domestic development must observe the agreed global framework and reflect the SDGs.

It must be stressed that most of the threats in the 21st century are related to the unintended consequences of progress. The AMR threat due to overuse of antibiotics is an emblematic example of the paradox initially presented in this paper, as it relates to a significant progress in medicine. Non-communicable diseases are also deeply connected to unsustainable production and consumption. Therefore, health will no longer be a direct correlation of wealth (Lang and Rayner 2015).

Rising social inequity is worrisome. The number of vulnerable people seems to go way beyond our capacity to deal with them. Refugees, trafficked populations, victims of war, global migrants and populations in fragile states are putting pressure on a deteriorating system. UN peacekeeping, United Nations Human Rights Council and World Food Programme are reaching their limits, and the trends are discouraging. Extreme poverty is 90% located in politically fragile and environmentally vulnerable places, and yet aid to fragile states has stagnated since 2009 (Kickbush 2016).

In the Anthropocene, not surprisingly, the effects of drastic environmental changes will affect the most vulnerable; therefore, politics calls for real democracy, meaning a focus on inequalities and the merge of humanitarian, ecological and conservation issues, combined with justice (Purdy 2015). Bearing in mind that in the contemporary global governance scenario, power asymmetries between actors with conflicting interests shape political determinants of health, durable solutions will only come if side effects that create health inequities are addressed (Ottersen et al. 2014). Decision, policies and actions arising from present global interactions derive from global social norms. While power disparities affecting, for instance, areas of intellectual property, foreign investment treaties, food security, multinationals regulations and conflict are sensitive, they will remain the core in which improvement can be achieved in terms of governance. In this perspective, it is still unclear what kind of governance mechanisms and institutions will be more effective. Besides including a broader range of disciplines in the analysis, the formulation and the implementation of public health policies, there are other elements to be considered when designing "planetary health solutions" and understanding why our current development paradigm is unsustainable.

The imperatives of a circular economy cannot thus be ignored. For instance, microplastics are omnipresent. There's no single place on Earth that is plastic-free. Waste is one of our greatest contemporary challenges. Globally, the world generates about 1.3 billion tons of trash per year, way beyond our capability of recycling or management (Stanislau 2018). The main reason for these mountains of trash in our planet relates to the linear economy, which extracts, produces and disposes, instead of applying the 3R policies: reduce, reuse and recycle. Currently, we use 20 times more plastic than we did 50 years back (Stanislau 2018). While consumer behavior and awareness are key for promoting change, other more systemic barriers remain. With an emphasis on redesigning processes and cycling materials, circular economy promises more sustainable business models, but still fails to fully integrate social dimensions and ethical aspects inherent to the notion of sustainable development (Murray et al. 2017). Kate Raworth, in her book "Doughnut Economics," (2017) also dwells on our planetary limits, calling us all to rethink our economic models, which can no longer be understood as separate from the society and from the environment in which it is embedded. Borrowing the concept of planetary boundaries, the doughnut metaphor is a simple way to suggest that our economies must also consider the needs of our planet for our well-being and prosperity. Climate change, ocean acidification, land conversion, and air pollution are all transforming our planet to the point that we cannot be sure to sustain us in the future. For Raworth (2017), it would be ideal for the economy to remain within the "dough" of the doughnut, a space considered right both for social foundations and ecological ceiling. The key for solving the environmental and health conundrum is finding the right balance between our virtues and vices (Bircher and Kuruvilla 2014). For example, current political agenda, including "ASEAN 2025," could be amended to address identified knowledge, policy and institutional gaps.[3] Some concrete opportunities for IR scholars include engaging in the following areas:

[3] The term "policies" encompasses a variety of mechanisms and arrangements – usually at the national level, but on occasions at a higher,

Strengthening a community of practice

There is an overarching need for the health, climate and biodiversity practitioners to strengthen a "community of practice" with the goal to create and implement integrative policies mindful of sustainable development goals and their impact on global health. The federation of this community of practice and the incorporation of biodiversity and health issues could be fortified and expanded through established global and regional initiatives such as Future Earth's knowledge-actions networks, the Planetary Health Alliance,[4] and the ASEAN Center for Biodiversity and/or the UNEP's Thematic Working Group system (TWGs). The implementation and amendment of existing policy tools and instruments should also be done in alignment with the CBD-UNEP Aichi targets, Nagoya Protocol[5] and the SDGs.

The community of practice overseeing evidence-based research activities and coordinating the science to policy dialogue should have representatives or contact persons in different levels of institutional organization, from and across ministries to local governments, in order to insure an operational connection between policy "inputs" such as evidence and research, dialogue and working papers — and policy outputs (*i.e.,* an updated policy that takes this into account) and "practice" at the local level. This cross-sectoral and cross-institutional workflow would contribute to better evidence building, more consultative processes for policy formulation, improved policy implementation, as well as better monitoring practices.

Going beyond cities: supporting rural resilience as a priority

A major set of issues, such as deforestation, fragmentation of habitats, environmental degradation and AMR, all of which contribute to poor health, are related to unsustainable farming practices and rural people's vulnerability, with limited social and economic choices. Ultimately, this is the result of policies that are not supportive of rural livelihoods, or that reflect the interest of more powerful economic players (*i.e.,* agricultural, pharmaceutical or timber companies). As rural communities are the stewards of much of the biodiversity in Southeast Asia, it is critical to adopt policies that support farmers' rights and local knowledge to foster opportunities in which rural communities can lift themselves out of poverty, while engaging in sustainable farming practices.

Indeed, for a policy to be supportive, farmer groups, cooperatives and other rural peoples' organizations must play a more effective role in policy dialogue, so that policy design can draw on relevant evidence and local experience. This dialogue could be moderated across multiple levels of

regional level or at a lower, state or provincial level – encompassing legislation and regulations, public policy statements and documents, sector plans, strategies and programs; budgets; the high-level rules of government agencies; as well as institutions – the vehicles to implement policies.

[4] Available at: https://planetaryhealthalliance.org

[5] The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity is an international agreement which aims to share the benefits arising from the use of genetic resources in a fair and equitable way. See more at: https://www.cbd.int/abs/

local, national and global policy by the biodiversity and health community of practice referenced above. For example, the International Fund for Agricultural Development (IFAD), through its Agriculture Risk Management (ARM), is an example of an instrument that improves resilience through key institutional components at the national, regional and local policies (IFAD 2016). IFAD's ARM is a proactive way of thinking, preparing farmers to risks related to: weather, natural disasters (biological and environmental), market (logistical and infrastructural, managerial and operational), and public policy (institutional and political). Given the complexity of the risk scenarios, a wide variety of tools have to be combined to reduce, mitigate, and help the farmer and his community cope with risks to which they are exposed, through the market or under government intervention. Such interventions range from adapting specific technologies or farming practices, developing contact farming and warehousing to national disease prevention campaigns, social protection schemes or access to microfinance. For example, intercropping and crop diversification can be one particular ARM option with win-win outcomes, as the farmer can improve soil fertility and preserve the integrity of the environment, while increasing yields and income throughout the year.

Diversification strategies, in particular in relation to genetic resources, local knowledge and resilience, can greatly contribute to strengthening risk mitigation capacity in the context of climate change. This is particularly likely when diversification is combined with access to information on biodiversity and climate, smart agriculture, locally selected seeds and cultivars, green innovations and participatory or community-based natural resource management, as well as the creation of farmers' associations that can absorb market-driven risks, such as price fluctuations.

In this context, the need for transparency and equity concerns is evident. Independent monitoring in the land-use sector is a field where there is room for enhanced synergies with other agendas, notably the one on climate change. Examples include: transparency in data sources, definitions, methodologies and assumptions; increased stakeholders' participation and accountability, complementarity to mandated reporting by countries (de Sy et al. [n.d.]). Moreover, the role of governments is key to enabling a policy environment that incorporates such instruments and supports adaptive risk management at the local level through functioning agricultural market, extension services, information systems, legal framework, social protection, sustainable chemical-less and biodiversity-friendly agriculture subsidies. Internationalists could play a major role during consultative processes for policy implementation.[6]

Promoting environmental literacy - the roles of education and ethics

Ethics involves systematizing, defending, and recommending concepts of appropriate conduct to provide the values and principles that should guide normative actions. Reflecting on these

[6] See the example of the Ibis Rice Project in Cambodia: "A partnership of non-governmental organizations (NGO) and government agencies has made the link between economic development and environmental conservation with the launch of the 'Wildlife-Friendly Ibis Rice Project.' This project provides local communities with an incentive to engage in conservation, by offering farmers a premium price for their rice if they agree to abide conservation agreements that are designed to protect the rare water birds and other species that use the protected areas." https://programs.wcs.org/smpcambodia/About/Ibis-Rice-Project.aspx

aspects, particularly in the context of the SDGs and the post Millennium Ecosystem Assessment (MEA), one can identify several actions that could facilitate the emergence of a global health movement that raises moral concerns and fairness. These actions include the need for educational initiatives implementing "environmental literacy" and "cultural valuation" in school programs, as well as the need to improve the currently used MEA-based Ecosystem Services framework, to go beyond monetary valuation and to become more integrative and ethical in practice. Long-term outputs of educational "environmental literacy" initiatives and the development of a more integrative ecosystem service framework (*e.g.,* operationally accounting for cultural, spiritual or esthetic values) go hand-in-hand, as the former enables and strengthen the moral dimensions possibly lacking in the latter. Together, they would contribute to a more ethical procedure for ecosystem service evaluation, and a more integrated account of the relationships between people and their land (including acknowledging indigenous beliefs and knowledge systems), reflecting the SDGs value of leaving no one behind.

Becoming a knowledge broker

South East Asia simultaneously witnesses massive deforestation, loss of biodiversity and dramatic increase in the use of agricultural chemicals. Farming communities that struggle to transition from traditional livelihoods have little or no knowledge of these impacts, about which neither the government nor commercial sectors (including agrochemical companies) have any incentives to inform them. A general lack of environmental awareness is at the root of this problem, together with power disparities between farmers and chemical industries. Increasing information is necessary but not sufficient to drive change. Some studies alert for opposite effects of excessive environmental information, which leads to despair (Kaplan 2000). Demonstrating the interconnectedness between our natural world and our health is thus a fruitful avenue for communication strategies, as people could start realizing the benefits for their own lives (Schultz 2000).

Effective public policies require good data and effective outreach. This means that integration of multi-disciplinary data into analytical frameworks and models requires stakeholders' engagement from the very beginning, in order to co-design tools for the management of heterogeneous knowledge (*e.g.*, "health GIS," interdisciplinary databases). The abilities of civil servants, researchers and field operators to conduct research and to motivate the communities at risk to participate in the monitoring work should be improved, which could lead to a better understanding of zoonosis' burdens, ecological patterns and cultural, political and socio-economic stakes.[7] However, implementing such multi-sectoral collaboration among agricultural, environmental and health sectors in the current national contexts remains a considerable challenge, because these sectors still work in silos.

[7] See for example the goals of the ComAcross project funded by the European Union related to infectious diseases management based on One Health Approach. http://www.onehealthsea.org/comacross

This gap is also reinforced through the stark divergence between a science domain, characterized by increasing complexity of communicated analytical outputs, and a policy domain, which generally remains propelled towards single metric outcomes (Smajgl and Ward 2013). This divergence calls for the improved management of the science–policy boundary through innovative devices, techniques and institutions capable of fostering the effective transmission of science and technology between and among the communities of scientists, policy makers and other affected interests. It is increasingly accepted that these techniques should rely on a participatory process that uses methodological innovations created for scientific integration (Smajgl and Ward 2013). Participation may be defined as the act of consulting and involving relevant stakeholders in the agenda-setting, decision-making, and policy-forming activities of organizations or institutions responsible for policy development (Rowe and Frewer 2004). Participatory processes can facilitate system learning by different stakeholders and thereby "implant" a foundational consensual understanding, tailored to solving long-term, possibly contested decision arenas.

The Comparison of Participatory Processes (COPP) framework (Hassenforder et al. 2015) is a diagnostic framework used for the description and comparative analysis of participatory processes in science to policy contexts, helping to identify the best steps or methodologies to be implemented in particular settings to enable operational dialogue. This framework has the potential to be sufficiently generic and comprehensive to allow operational science for policy dialogue in issues such as health, biodiversity and the environment. The framework provides several guiding principles that can help design cross-sectoral participatory initiatives for operational science to policy dialogue. These are, for instance: 1) multilevel engagement is more likely to lead to outcomes; 2) specific methods are easily replaceable and the degree of system complexity will erode or compromise the effectiveness of specific methods; and 3) a minimum engagement period of two years, with regular events and local coordination, is more likely to lead to the achievement of project objectives. This framework, based on complexity-focused system sciences, suggest that tools and methodologies are increasingly available to help foster a science to policy dialogue for transdisciplinarity operationalization and sustainability.[8]

Conclusion

The Anthropocene represents a new era in which human health is paradoxically at risk. New emerging and virulent diseases, mental health disorders, non-communicable diseases and disruption of our ecosystems are also disrupting the basis for a healthy life, such as clean air, water and nutritious food. Much of modern medicine relies on an unsustainable economic pathway which puts our future in jeopardy. The 2030 Agenda for Sustainable Development and its SDGs

[8] Transdisciplinary research - a form of integrative research employs a holistic and/or systems and participatory approach, combines knowledge from outside (such as from communities) as well as with academia to address a 'real world' problem with a common goal, creating new knowledge and theory.

are a broad framework guiding development in the next decade. Despite their large scope, they remind us of the urgent need to foster holistic policies at the local, regional and global levels.

This paper reflected on the development pathways of Southeast Asia, identifying opportunities for IR scholars to improve health-environmental synergies to implement the SDGs. In this case, the "ASEAN 2025," the current development vision for the Association of Southeast Asian Nations, should pay closer attention to this agenda and evolve complementarily to the SDGs (United Nations 2018b).

In summary, this discussion served four purposes. First, it innovatively presented the notion of planetary health to a social science community. Second, it warns about the gaps in current public health policies that fail to take into account key perspectives related to ecosystems and ecology, and requested enhanced cooperation between governments, international organizations, non-governmental organizations, academia, private sector and civil society on this specific agenda. Third, it called for a transdisciplinary perspective when addressing human health and provided hints on opportunities for IR scholars, combining solid scholarship with fieldwork that seeks to, theoretically and practically, integrate, for example, the issues of biodiversity conservation, climate change adaptation, and public health through the use of innovative methods. Finally, it suggested several concrete areas in which IR experts could get involved in order to engage with the emerging field of planetary health studies.

The failure to address the environmental-health nexus, also from the angle of internationalists, presents risks of limiting the effectiveness of sustainable development guidelines. Scholars, specially from the global South, would benefit from further research in this area, as they can contribute to the understanding and solutions related to global institutions, power disparities, and normative pluralisms. The planetary health lens is thus a growing opportunity to exercise the skills of scholars already engaged in multidisciplinary studies and therefore well equipped to advance this growing agenda, such as those in international relations. Above all, planetary health is a humble but powerful metaphor that is paving the way for a nascent movement that can improve our relationship with the planet. Such a movement expects to "re-ground" us, so to speak, moving us away from some of the dangerous breaches of Earth's boundaries that so many scientists now envision. Environmental awareness is hence a vigorous tool to improve human health. A simple way to be part of this global movement is to become a knowledge broker and advocate for a healthier planet. Essentially, planetary health is about securing peace, an essential goal of all internationalists.

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