



Planetary Security
INITIATIVE



WAGENINGEN
UNIVERSITY & RESEARCH

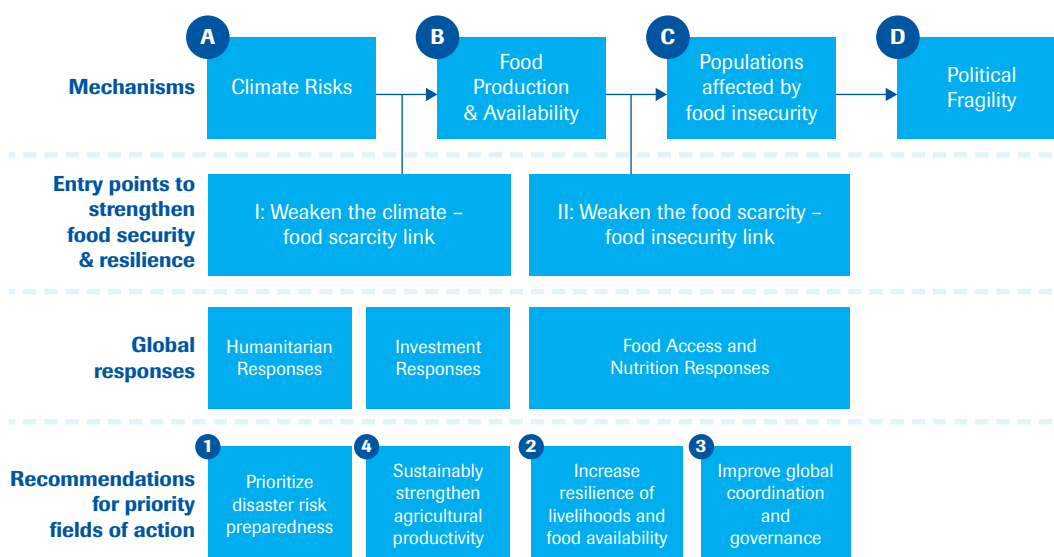
APRIL 2017

Food security

Strengthening resilience to climate-fragility risks

Violent conflict and global environmental changes endanger the progress that many countries, with the support of the international community, have made in improving food security. Access to sufficient and healthy food is crucial to human security and welfare. It also has important repercussions for societal, state and international security. Whereas the exact role of food insecurity in driving unrest and other forms of conflict remains contested, the stunted development and risks of disaster and displacement – as well as the impacts of food insecurity on governments' legitimacy – constitute plausible security risks that a preventive foreign policy needs to address. Alleviating these risks requires intensified efforts to improve access, availability, stability and utilization of food and to shift towards managing risks rather than exclusive reliance on post-hoc responses to disasters and crises.

Ensuring global food security will entail using fewer natural resources to produce both more and better quality food while increasing environmental sustainability. This challenge is compounded by the need to address the geographic and social distribution of food security threats. The international community can play a role in helping to get the balance between inevitable trade-offs right – between location-specific needs and overall investment efficiency, mitigation and adaptation requirements for agriculture, and many more. It can do so by engendering a global environment that supports the case for focusing climate policy and climate finance instruments on the strengthening of the resilience of the poor, by stimulating the development and dissemination of climate smart food security technologies, by engaging vulnerable countries in political dialogues on appropriate adaptation strategies, and by strengthening regional and global cooperation for coordinated risk management. Above all, the international community can contribute by improving its record on what is arguably the most important responsibility: rolling back violent conflict and state fragility and ensuring peace and international security.



Introduction

Huge productivity improvements in agriculture in recent decades suggest that our planet can feed everyone, even a global population of over 9 billion people (as is expected by 2050). The fact that the Millennium Development Goals’ target to halve the proportion of hungry people was nearly achieved during the period of 2000–2015 underlines this positive trend. Yet progress has been unevenly distributed and almost 800 million people still suffer from chronic hunger.¹ This large-scale suffering is particularly pervasive in fragile states, with huge long-term consequences for the human and societal security of those affected.

This policy brief focuses on (A) the risks related to climate change and how these may negatively affect (B) food availability and price volatility, resulting in (C) significant populations affected by food insecurity, and the knock-on effects leading to (D) political fragility. This brief does not imply that other secular trends, both environmental and social, do not matter for food security; nor does it imply that some effects of climate change may not also benefit food production.

In focusing on one particular chain of causal links, it abstracts from complex interconnected processes, notably the way in which protracted crises massively contribute to hunger. Instead of describing all these interconnections, the policy brief maps out specific risks that foreign policy-makers need to be aware of, with a focus on alleviating the risk vectors between climate change and the different dimensions of food security, such as food prices/availability (I: A → B), and on to people coping with food insecurity (II: B → C). Broadly speaking, strategies to address risks in category I focus on disaster risk reduction and sustainable increases in agricultural productivity whereas strategies for category II risks focus on livelihood improvements and more efficient and robust global cooperation.

Challenges for food security resulting from climate change

Climate change risks significantly disrupting the production of and access to food, resulting in negative effects on global food security.² Yet most scenarios lead to the conclusion that global food supply

1 Fan, S. 2016. Food policy in 2015–2016: Reshaping the Global Food System for Sustainable Development, in: *Global Food Policy Report 2016*, Washington, DC, International Food Policy Research Institute (IFPRI).

2 Krishnamurthy, P.K., et al. 2014. Climate impacts on food security and nutrition. A review of existing knowledge, Devon, Met Office and World Food Programme.

can be adequate for the decades to come, and this holds true even under worrying emission scenarios.³

However, there is little room for complacency as predictions of continued progress are to a significant extent simply a function of the investments that need to be undertaken now to ensure greater resilience, productivity and sustainability. Moreover, adequate global supply is a necessary, but not a sufficient condition for food security at local levels. Although the precise effects of climate change are subject to uncertainty, tropical latitudes appear most affected.⁴ This implies that the worst effects are expected in regions that already suffer disproportionately from food insecurity, where a large share of the poor are concentrated, and where demographic pressures are strongest. This geographical distribution will likely be more problematic for human and international security than climate change's impact on net global food production.

Climate change is predicted to intensify the number and scale of extreme weather events. Increasing international linkages, notably food trade, have helped to build resilience against local and national shocks. Yet they also carry systemic risks. In 2007/08 and 2010/11, relatively small weather-related production shocks, coupled with low stocks and damaging export bans, led to food price spikes of more than 100%.⁵ Thus, global food security is not only about increasing agricultural productivity and sustainability but also about reducing volatility and increasing resilience to shocks.

3 Nelson, G.C. et al. 2014. Climate change effects on agriculture: economic responses to biophysical shocks, *Proceedings of the National Academy of Sciences of the United States of America*. 111 (9), 3274–3279.

4 Krishnamurthy et al., op. cit.

5 Bailey, R., et al. 2015. Extreme Weather and the Resilience of the Global Food System. Synthesis Report from the UK-US Taskforce on Extreme Weather and the Resilience of the Global Food System, UK, The Global Food Security programme.

Global responses

Global efforts to improve food security fall into three broad categories that will structure our discussion:

- (1) **Humanitarian efforts to fight hunger:** coordinated under the aegis of the global Food Security Cluster (gFSC), which is co-led by the World Food Programme (WFP) and the UN Food and Agriculture Organization (FAO). This category includes work to improve predictions of volatility in supply and prices, nutritional support in times of crises and emergency livelihood protection.
- (2) **Efforts to improve access to food and nutrition:** This comprises multiple levers at the local, national and international level (see below), with the FAO serving as a facilitator.
- (3) **Efforts to improve agricultural productivity:** while conserving the natural environment and improving social well-being. Many international research efforts are clustered around CGIAR, a consortium of (currently) 15 International Agricultural Research Centres that have helped improve crop genetics and spread good practices. In addition to the FAO, many international financial institutions (IFIs) support programmes that straddle efforts to improve agricultural productivity, market infrastructure, and access to food, with the International Fund for Agricultural Development (IFAD) specifically dedicated to fighting rural poverty.

Beyond the UN lead organizations on food governance highlighted above, many other national and international governmental and non-governmental organizations play important roles. The rise in food prices in the early 2000s and the food price shocks of 2008 and 2010 greatly increased the salience of global food security. The G20 and the G7/8 both started significant new initiatives. The G20's 2011 'Action Plan on Food Price Volatility and Agriculture' comprises a large set of initiatives, both in terms of improving monitoring and of reacting to food insecurity, e.g. by setting up the Agricultural Market Information System (AMIS) to strengthen transparency and coordination in international food markets.

The G8's 2009 'L'Aquila Food Security Initiative' mobilized more than \$22 billion for food security investments over a three-year period. Both the G7/8 and the G20 reinforced the role of existing international food (security) institutions such as the FAO, the WFP and the Committee on World Food Security (CFS). Food security also plays an important role across many of the 17 Sustainable Development Goals (SDGs, with goal 2 specifically dedicated to zero hunger). All major food policy organizations are emphasizing the need for mainstreaming climate change into food security policies.

Despite progress however, the international community continues to face severe challenges across all three food policy areas that will be analysed below.

(1) Humanitarian Response: Famine and immediate crises

Full famines are nowadays largely limited to conflict areas, with four countries – Nigeria, Somalia, South Sudan and Yemen – facing this risk as we write in early 2017.⁶ The humanitarian system is creaking under the strains it is presently experiencing: with more than 65 million people forcibly displaced, serious underfunding is leaving large numbers of displaced people underserved.⁷ Food assistance needs are not limited to conflict areas, as Southern and Eastern Africa in particular reeling from recent droughts. The Famine Early Warning System (FEWS NET) expects some 70 million people to need emergency food assistance in 2017.

(See graphic below for the geographical distribution of food assistance needs).⁸ Although early-warning systems on impending humanitarian crises have improved, they have not consistently led to quick and decisive action. As a recent report on the (non-)response to the 2011 famine in Somalia argued, risk reduction and early response efforts do not keep pace with improvements in warning.⁹ This is all the more troubling given that we can expect that climate change will, *ceteris paribus*, lead to more frequent shocks threatening national and regional food security.

Beyond conflict, natural hazards such as droughts are crucial drivers of food crises, and global environmental change will enhance their intensity. Indeed, while global markets are an important influence, local environmental events have been found to more frequently impact local food prices in many developing countries.¹⁰ Yet, climate change will not only increase natural hazards. Through its impacts on competition over natural resources and governmental legitimacy, it also threatens to contribute to a greater number, frequency and intensity of conflicts.¹¹ Given our difficulties in coping with the current level of crisis, and our knowledge that climate change effects will intensify in the foreseeable future, this means that prevention and disaster risk reduction need to become far stronger to ease the pressure on domestic, regional and international relief capacities. Yet as last year's report by the High-Level Panel on Humanitarian Financing notes, investment in Disaster Risk Reduction (DRR)

6 FEWS NET, Global Alert. Emergency food assistance needs unprecedented as Famine threatens four countries, January 25, 2017, <http://www.fews.net/global/alert/january-25-2017> (accessed April 2017).

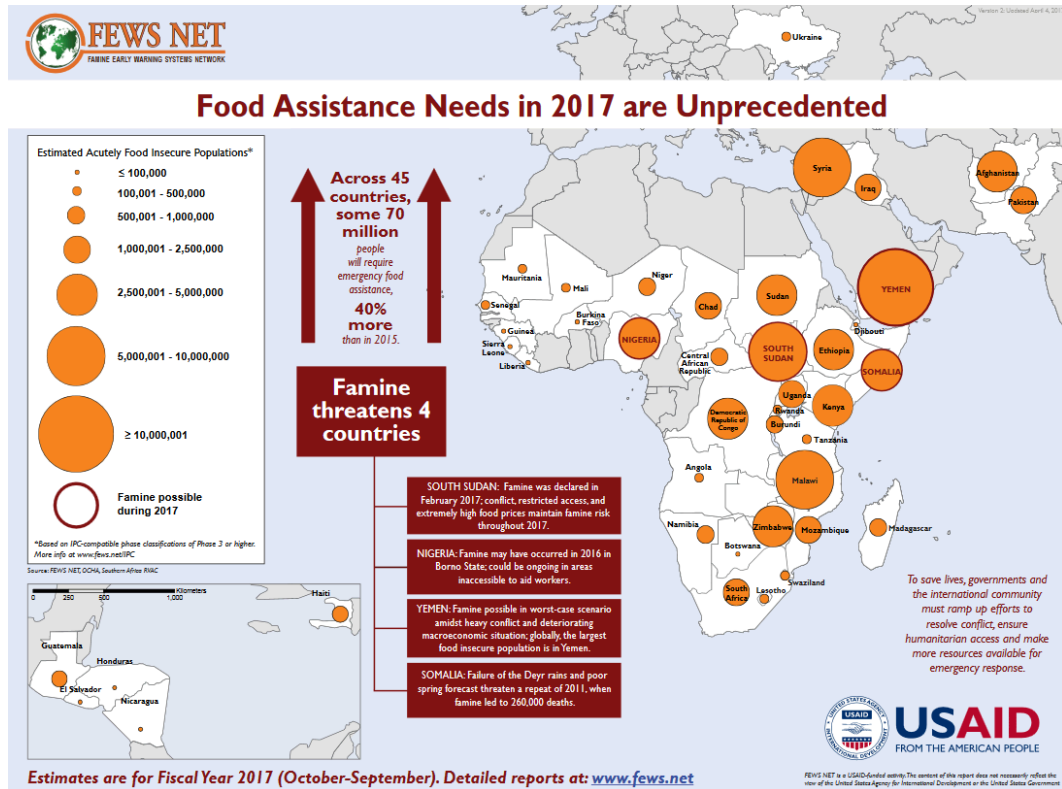
7 UNHCR. 2016. Global Trends. Forced Displacement in 2015, <http://www.unhcr.org/news/latest/2016/6/5763b65a4/global-forced-displacement-hits-record-high.html> (accessed January 2017 2016); The International Crisis Group. 2016. <https://www.crisisgroup.org/global/global-refugee-crisis-statement-board-trustees-international-crisis-group> (accessed November 2016).

8 FEWS NET, op. cit.

9 Bailey, R., et al. 2013. *Managing Famine Risk. Linking Early Warning to Early Action*, London, Chatham House.

10 Brown, M. E. Kshirsagar, V. (2015): Weather and international price shocks on food prices in the developing world. In: *Global Environmental Change* 35, S. 31–40.

11 Rüttinger, L. et al. 2015. *A New Climate for Peace. Taking Action on Climate and Fragility Risks*, Berlin/London/Washington,DC/Paris: adelphi, International Alert, Woodrow Wilson Center for Scholars, European Institute for Security Studies.



Source: reproduction courtesy of FEWS NET, OCHA, Southern Africa RVAC. FEWS NET 2017, http://www.fews.net/sites/default/files/Food_assistance_needs_2017v2.pdf (accessed April 2017).

and preparedness is “far too low”, noting that “12 out of a group of 23 low-income countries received less than \$10 million for DRR over 20 years while receiving \$5.6 billion in disaster response”.¹²

The gaping difference displays a bias towards short-term action that foreign policy needs to counter. Even within the framework of disaster response, there are needs and incentives for strengthening early action: according to conservative estimates, timely procurement of food in response to the (predictable and predicted) 2015/2016 El Nino event could have saved between \$127 and \$271 million in Ethiopia alone

– or fed up to 3 million people for 9 months, in many cases avoiding consequences that last for a lifetime.¹³

(2) Food availability and access

Most hunger is a function of persistent poverty. Climate change will add pressure on agricultural livelihoods, in particular through its expected impacts on regions already trapped in poverty as well as environmentally induced food price shocks that cause additional hunger and poverty elsewhere around the globe.¹⁴

12 The High-Level Panel on Humanitarian Financing. 2016. Too important to fail – addressing the humanitarian financing gap, <http://www.un.org/news/WEB-1521765-E-OCHA-Report-on-Humanitarian-Financing.pdf> (accessed November 2016), p. 6.

13 Singh, R., et al. 2016. Reality of Resilience : perspectives of the 2015-2016 drought in Ethiopia, http://reliefweb.int/sites/reliefweb.int/files/resources/51332_resilienceintelethiopiaipaperweb.pdf (accessed January 2017), p. 22.

14 For an analysis of the mechanisms, see e.g. ‘Global food price shocks’ on the ECC Factbook, <https://library.ecc-platform.org/conflicts/global-food-price-shocks>

Access to food is primarily about the distribution of purchasing power, and about institutions that enable the efficient distribution of food, from infrastructure to trade and functioning markets. Depending on a household's or community's specific context (including whether it is a net food buyer or seller), improving food access and nutrition often requires mixing demand-side measures (especially social protection safety nets, food for work and employment programmes) to raise incomes and supply-side measures (increasing agricultural productivity through better seeds and production methods as well as sustainable access to natural resources). Beyond agricultural production, entry points include improvements in food chains and access to markets, including capitalizing on the extensive opportunities to reduce food waste before it reaches consumers. Better physical (transport, storage) and regulatory (secure tenure rights, functioning cross-border markets) infrastructure can help to reduce the level and volatility of food prices.

Ensuring access to food and nutrition is a policy realm where national governments have a primary role. However, the international community can provide crucial support by facilitating learning, providing financial support for the necessary investments, and seeking to strengthen coordination on crisis prevention, management and recovery. The crisis of 2007/2008 had triggered numerous export bans by major crop producers, increasing global price volatility and in effect passing the burden of adjustment on to major importing countries. Although the precise impact of food insecurity on the "Arab Spring" remains contested, these events and their consequences underline the risks of food insecurity for global stability.¹⁵ Such risks call for better global coordination, e.g., through developing contingency plans with pre-agreed response protocols, coordinated

management of reserves and rules to limit export bans or similarly damaging interventions.¹⁶ Livelihood improvements thus need to be complemented by a supportive governance structure that facilitates risk management through international markets and transfers and a coordinated response to significant shortages.

(3) Agricultural productivity

The challenge of improving agricultural productivity is two-pronged: the first consists in closing the 'yield gap' between what is already feasible and what many farmers, particularly in developing countries, actually realize. The FAO emphasizes the need for faster adoption of a host of good practices such as better crop varieties and soil management and urges the removal of policy barriers that prevent their widespread adoption: from regressive input subsidies to limited access to information, finance and safety nets.¹⁷ The second challenge concerns innovation for extending the productivity frontier in terms of increasing yields and decreasing harvest volatility, and for doing so sustainably. This combination is known as the "save and grow" approach.¹⁸ Both challenges necessitate investments and setting the right incentives for farmers to adopt innovation.

Considerable synergies exist between adaptation through agricultural intensification (increasing output per land) and climate change mitigation.¹⁹ Lobell et al. estimate that a cumulative investment until 2050 of \$225 billion in agricultural research and development would not only offset the negative impacts of climate change (i.e. allow adaptation), but also reduce greenhouse gas emissions at \$15/tCO₂e, making investment into agricultural R&D a potentially very cost-effective climate

15 See Hendrix, C. 2016. When Hunger Strikes: How Food Security Abroad Matters for National Security at Home, Chicago, The Chicago Council on Global Affairs ; ECC Factbook, <https://factbook.ecc-platform.org/conflicts/food-price-volatility-and-fragility-mena-region>

16 Bailey et al. 2015, op. cit.

17 FAO. 2016. The State of Food and Agriculture. Climate Change, Agriculture and Food Security, Rome, Food and Agriculture Organization.

18 See, for example, <http://www.fao.org/ag/save-and-grow/> for a range of publications.

19 Lobell, D., et al. 2013. Climate mitigation as adaptation: the case of agricultural investments, *Environmental Research Letters* 8.

mitigation and adaptation measure.²⁰ While there are great uncertainties, this estimate establishes agricultural research and development as a plausible entry point for considerable synergies between climate change mitigation and adaptation that would simultaneously increase food security. Policy-makers will still need to weigh difficult trade-offs because the greatest mitigation potentials do not coincide with the greatest adaptation benefits and conflict prevention potential will not perfectly align with sustainable food security benefits, but climate mitigation co-benefits constitute an additional argument for strengthening food security through sustainable agricultural intensification.

Conclusion & recommendations

The expected consequences of climate change, especially increases in temperature and changes in the hydrological cycle, are likely to have significant impacts on agricultural and fishery potential and risk undermining food security through their impacts on livelihoods, infrastructure and, ultimately, political stability. The global food policy architecture is evolving to reflect the interrelated challenges of short- and long-term access to food under the conditions of environmental change that exacerbates existing vulnerabilities. However, it needs to do better.

Even if primary responsibility lies with national governments, the international community has a residual responsibility – and, if rejecting that responsibility, will have to cope with the consequences of inaction such as large-scale suffering and potential destabilization. Preventing food insecurity from turning into an issue of international peace and security is hence not only about altruism, but enlightened self-interest. Moreover, many actions related to research and governance are far more efficient if undertaken collectively.

As a consequence, and building on the three policy fields discussed above, this brief suggests four priority fields of action for the international community (two for food availability and access, the broadest category). Neither of these is entirely new nor has progress eluded us – witness the sharp reduction, over the last decades, of the percentage of people facing acute food insecurity. Nor, however, has progress been sufficient to match the international community's ambition of 'zero hunger'. Action is most urgent in the humanitarian domain where the world faces unprecedented needs this year (and where we still have to see whether the international community has learned rather than only identified the lessons of the 2011 famine when the humanitarian system mobilized only far too late and several hundred thousand people died in the Horn of Africa), but early action needs to be accompanied by structural measures that can in the future bring down the recurrence and scale of such emergency needs.

1) **From disaster management to disaster risk preparedness:**

The response to acute hunger needs to improve, shifting from insufficient donor assistance addressing the short-term consequences of conflict and disasters to a more forward-looking system that saves money and lives by strengthening disaster risk reduction and preparedness. This includes the need to strengthen appropriate early action in response to warnings of impending food insecurity. One possibility for aligning bureaucratic and political incentives with the need for quick action might be to explore ways of 'automating' commitments, based on (weather, harvest, violence etc.) forecasts and/or thresholds, such that donors would have to stop responses to early warnings rather than start a process of action and internal persuasion. Similar tools are already being pioneered with respect to climate insurance, e.g. in the framework of the African Risk Capacity, but not yet with respect to political risks to food security or the political incentives that donors face in acting to reduce famine risk rather than responding to its occurrence and the resulting publicity.

²⁰ Ibid.

- 2) **Resilience of livelihoods and food availability:** Structurally improving access to food is ultimately a question of improving and diversifying livelihoods. In particular, opportunities in rural areas need to be strengthened to enable access to crucial infrastructure such as markets for subsistence agriculture. Global governance can support that process by seeking to make sure that policies on trade, investments, development and climate change strengthen the resilience of smallholders and the urban poor. Ensuring that climate policy instruments support their livelihoods is not just a question of climate justice, but an investment in global stability. Donors should consider establishing dedicated funding windows in climate finance for adaptation in marginal regions and least developed countries (such as they exist in other areas of development finance) to help to create incentives for such investments.
- 3) **Improving global coordination and governance:** A combination of sufficient global food availability but increased local and regional volatility in supply and prices implies that food security under climate change will be much more difficult to achieve under conditions of national self-sufficiency. This calls for a greater role for trade, but developed countries should ensure that they do not undermine their development policies by embracing agricultural export policies that intermittently flood (and thereby destroy) nascent national markets with subsidized agricultural products, as is still occurring. Strengthened regional and global cooperation could serve as a form of re-insurance against the destabilizing effects of climate change risks. Governments around the world, especially the most influential as assembled in the G20 framework, should work to better predict and manage supply and price volatility, improve the resilience of import-dependent developing countries, and develop contingency plans for coordinated global risk management.
- 4) **Strengthening agricultural productivity:** Agriculture has long suffered from underinvestment, particularly in the regions that are food-insecure today. Closing the yield gap is a key challenge, but doing so must avoid or at least compensate for undermining livelihoods as well as negative impacts on ecosystems and natural resources and needs to harness synergies with and between climate change adaptation and mitigation. Trade-offs will be inevitable, but the international community can and should facilitate progress by supporting risk insurance instruments and vulnerability assessments, by helping finance the necessary investments into research and innovation, as well as by supporting better policy and institutional frameworks that facilitate the widespread adoption of innovation and good practices.

All four fields of action are crucial for improving global food policy. Shifting towards earlier action that seeks to manage risks by improving resilience is a notion that the international community has in principle embraced, even if implementation is difficult. Yet food insecurity is often a symptom or consequence of other issues, notably violent conflict. Many of these conflicts are 'forgotten'. The international community seems to have largely given up on SDGs in conflict settings, amounting to large-scale accommodation of suffering. Helping to attenuate and resolve these conflicts and trying to facilitate development in conflict settings is thus an overarching and urgent challenge – and a core responsibility of foreign policy. Embracing this responsibility will generate significant co-benefits for global food security.


About the Planetary Security Initiative

The Planetary Security Initiative aims to help increase awareness, to deepen knowledge, and to develop and promote policies and good practice guidance to help governments, the private sector and international institutions better secure peace and cooperation in times of climate change and global environmental challenges. The Initiative was launched by the Netherlands Ministry of Foreign Affairs in 2015 and is currently operated by a consortium of leading think tanks headed by the Clingendael Institute.

Follow us on social media

 @PlanSecu

 The Planetary Security Initiative

 The Planetary Security Initiative

E-mail: psi@clingendael.nl

Website: www.planetarysecurityinitiative.org

About the authors

Benjamin Pohl is Senior Project Manager at adelphi.

Johannes Ackva is Project Manager at adelphi.

Ruurd Ruben is Professor and Coordinator of Research Program on Food & Nutrition Security at Wageningen University & Research.