THE BLUE FOOD ASSESSMENT

DISCUSSION PAPER

1. Blue Food Assessment Work Plan

Background & Aims

Blue foods[1] and the waters from which they derive may have an essential role to play in the shift towards a sustainable, healthy food system. The Blue Food Assessment (BFA) aims to conduct a robust, high-impact scientific assessment of how the extraordinary diversity of blue foods affects their contributions to nutrition, their environmental impacts, and their role in local and national economies. It will evaluate the pathways through which various food decisionmakers can effect positive transformation and the tradeoffs among future choices.

[1] With 'blue' or aquatic food we refer to all edible aquatic organisms, including fish, shellfish and algae from marine and freshwater production systems (aquaculture and fisheries).

The BFA will consist of a series of high-profile, peer-reviewed papers published in top-tier journals, and a synthesis report that integrates key findings for decision-makers. The entire body of work will be published in Springer-Nature journals.

The BFA aims to position itself as a key scientific assessment that underpins discussions at a number of high-profile global events and food forums. A pair of upcoming UN conferences provides an unprecedented opportunity to engage public and private sector decision-makers with new perspectives on the development of aquatic foods and their role in the food system. In June 2020, the second UN Ocean Conference will bring together the global ocean community to assess and catalyze progress towards implementation of Sustainable Development Goal 14 ("Life Below Water"). In September or October of 2021, the UN Secretary General will convene the first-ever global Food Systems Summit. Together, these high-level events provide ideal platforms to bring new insights into the debate about the future of food production from the ocean, and to bring a much deeper understanding of aquatic foods into global food dialogues.

BFA Team

Table 1 BFA core partner team

NAME	ORGANIZATION	ROLE
Beatrice Crona	SU/SRC	Co-chair
Roz Naylor	Stanford/FSE	Co-chair
Max Troell	SU/SRC	Scientific and strategic support
Liz Selig	Stanford/COS	Scientific and strategic support
Fio Micheli	Stanford/COS	Scientific and strategic support
Jim Leape	Stanford/COS	Lead on partner, stakeholder, and policy engagement
Malin Jonell	SU/SRC	Scientific, programmatic, and editorial support
Michelle Tigchelaar	Stanford/COS	Scientific, programmatic, and editorial support
Fabrice DeClerck	EAT	Project communication and launch
Maria Westin	EAT	Project communication and launch

Core Partner Team

The core science team of the BFA consists of Stanford University, through the Center for Ocean Solutions (COS) and the Center on Food Security and the Environment (FSE), and the Stockholm Resilience Center (SRC) at Stockholm University. EAT will be a core action partner together with SRC and Stanford in feeding the assessment's findings and recommendations into the agenda and political outcomes of the 2021 UN Food Systems Summit and other relevant forums, through effective engagement and communications with a wide range of stakeholders. Members of the core partner team are listed in Table 1. The core partners will work closely with and draw support from the Friends of Ocean Action, World Economic

Forum, World Resources Institute, the UN Food and Agriculture Organization and the High-Level Panel on a Sustainable Ocean Economy.

Table 2 The BFA Scientific Leadership Team of senior experts and paper leads. Note that these focus areas are suggestions and that experts may well be involved in several papers.

NAME	FOCUS AREAS
Eddie Allison	involved in Econ/Eq, Climate, Transformations
Simon Bush	Transformations
Ling Cao	Environment; involved in Climate
William Cheung	Climate; involved in Scenarios
Jessica Fanzo	Involved in Nutrition, Transformations
Stefan Gelcich	Smallholders; involved in Econ/Eq, Transformations
Jessica Gephart	Econ/Eq
Chris Golden	Nutrition
Ben Halpern	Environment; involved in Transformations
Christina Hicks	Econ/Eq; involved in Nutrition, Smallholders
Avinash Kishore	Demand
David Little	Smallholders; involved in Environment, Econ/Eq
Michael Philips	Involved in Environment, Climate
Marco Springmann	Scenarios
Rashid Sumaila	Demand; involved in Smallholders
Shakuntala Thilsted	Nutrition

Scientific Leadership Team

The BFA Scientific Leadership Team (Table 2) will consist of the core scientific team and approximately sixteen senior scientific experts to lead (or co-lead) the individual work streams and papers that comprise the assessment. This combined scientific team will take ownership of the research areas outlined below and will be intensively engaged in setting a common vision and narrative for the BFA through in-person meetings and sustained digital conversation.

Members of the Scientific Leadership Team were invited for their strong and unique expertise, high standing within and outside of the academic community, geographic representation, and ability to work across disciplines. Together with the BFA core science team from SRC and Stanford, the Scientific Leadership Team carries the responsibility of shaping and authoring the Assessment and the individual papers. Additional co-authors will also be invited to boost competencies where needed, as identified by paper leads. A team of postdocs will contribute analysis and writing. In addition to producing the individual papers, the BFA Core Team and Scientific Leadership Team together will ensure that the assessment

makes up a coherent whole and will synthesize the key findings into a summary report and briefings for decision-makers.

Components of the BFA

Scientific papers

As part of the BFA, we are planning the following series of academic papers:

1. **Setting-the-Scene**
   A Perspective or Comment piece published ahead of the June 2020 UN Ocean Conference that will set out the key goals of the BFA
2. **Three corner-stone review papers** that cover the three key aspects of aquatic foods as they relate to sustainable and equitable food systems:
   a. Nutrition
   b. Environmental impacts
   c. Economics & Equity
3. **Three cross-cutting analytical papers** that analyze how ongoing trends will impact these key aspects:
   a. Climate change
   b. Role of smallholders
   c. Changing demand
4. **Two pathway papers** that analyze what the future contributions of aquatic foods could and can be:
   a. Scenarios for aquatic food futures
   b. Leverage points for food system transformation

Paper Development

As contributing authors develop ideas for the individual BFA papers, we ask that they reflect on the following questions – with the aim of sparking fruitful discussions at the meeting:

1. What is the current state of understanding on the paper topic (nutrition, environmental impact, changing demand, etc.) across all aquatic food domains and their connections with terrestrial systems?
2. What is *not* known but relevant to decision making?
3. In what ways are insights and advancements in this topic relevant to the other BFA papers, and vice versa?
4. What datasets are available or can be collected to support this paper, and how can they be useful to the other BFA papers?

Synthesis Report & BFA Book

The papers outlined above will provide the critical scientific foundation to guide transformation toward a more sustainable global food system that integrates blue food production and consumption. The eight peer-reviewed papers will be the basis for a Summary for Policy-Makers. Developed by the core science partners, EAT and other action partners, in consultation with key stakeholders, this synthesis report will distill the key findings and their implications for decision-makers in the public and private sector. We will also develop briefs crystallizing key messages for specific audiences. With the support of Springer-Nature, the set of individual papers and the synthesis report will be collected in an (online) book.

Timeline

To develop a joint vision for the BFA and promote strong collaboration between papers, we will organize two Scientific Leadership Team meetings. The first, in late January 2020, will serve to get everyone on the same page and to develop strong paper outlines. The second, tentatively planned for April 2021, will bring everyone together to synthesize results and draw out key messages, in conversation with relevant users and stakeholders to ensure salience and relevance. In addition to these large meetings, we have funding available for paper leads to host smaller workshops throughout the year. A rough timeline for the whole project is presented in Table 3.

Table 3 BFA Timeline

January 2020	First BFA Scientific Leadership Team meeting
Spring 2020	Intense work with papers, individual meetings for papers possible
June 2020	June 2-6 UN Ocean Conference Lisbon, launch of the BFC and the "Setting-the-Scene" paper
	June 10-11, Stockholm Food Forum
Fall 2020	Intense work with papers, individual meetings for papers possible. Core team/COS; SRC and EAT) starts working with synthesis report.
Oct-Dec 2020	Submission of papers to Springer-Nature journals
April 2021	Second BFA Scientific Leadership Team meeting, focus on writing the synthesis report
Sep-Oct 2021	UN Food Conference. Launch of the BFA synthesis report.

Staffing & Funding

Funding from the Walton Family Foundation, The Builders Initiative, and MAVA Foundation has been secured that covers half of our two-year budget. This amount will be sufficient to

fund initial meeting and staffing commitments as well as postdoc support for the individual papers. Meanwhile we are engaged in promising conversations on covering the second half of the overall budget.

2. Added Value of the Blue Food Assessment

With the Blue Food Assessment, we have the opportunity to build on a rich body of work on sustainable food systems and the future of food. As we develop the BFA, we want to ensure that it integrates and adds to past and ongoing work. For example, we are working with the National Center for Ecological Analysis and Synthesis, who are working on research related to the environmental impacts of aquatic production systems as well as the sustainability of protein systems. We will build on recent work by the EAT-*Lancet* Commission, for which SRC served as the Scientific Secretariat, and Future Seas, which is exploring various scenarios of future oceans.

We are pursuing a novel and challenging model – developing a set of papers that will each offer the novelty required for publication in a first-tier journal and that will also, collectively, add up to a comprehensive and coherent whole. This section outlines how we see the BFA building on past work; summarizes the scope, goals, and key messages of the most relevant reports of the last couple of years (Appendix A); and provides a larger list of (ongoing) projects and food reports for reference (Appendix B).

What the Blue Food Assessment Can Add

There have been several assessments of the global food system in the last few years, including by the EAT-Lancet Commission, the Food and Land Use Commission (FOLU), and the World Resources Institute (see Appendix A & B). Each of these reports has focused principally on agriculture; those that include aquatic foods have addressed them as a more or less homogeneous food group with globally aggregate impacts and futures. An exception to this is the recently released 'blue paper' on food from the sea of the High-Level Panel for a Sustainable Ocean Economy, which did specifically address the future of seafood, but still presented global aggregates and did not consider freshwater species.

In reality, aquatic foods comprise hundreds of species, derive from a large variety of production systems, and are a highly traded commodity. The Blue Food Assessment will therefore be distinct in the food report landscape by treating the entire sphere of blue foods (fished and farmed; marine and freshwater) in a comprehensive manner. Specifically, the BFA can add depth in the following areas of future of food discussions:

- A deep dive into the nutritional contributions of aquatic foods by species, region, and production type, moving beyond food as calories and protein

- Environmental impact assessment that distinguishes among species and production methods and extends beyond greenhouse gas emissions
- A strong emphasis on the inequalities within the food system, brought about by e.g., trade and climate change
- A comparison of what different blue food futures may look like in terms of nutritional, economic, and sustainability outcomes, disaggregated from the global
- An analysis of what actions and by whom might bring about such futures
- Put aquatic foods, and their connections with terrestrial food systems, more firmly in view of food decision-makers

Combining Novelty & Comprehensiveness

The format of the BFA – a series of high-profile papers, synthesized in a summary report for decision-makers – is also unique in the realm of food reports. It creates several benefits, in that it allows individual papers to strive for academic excellence and get the visibility they deserve, while providing decision-makers with an integrated summary of a multitude of perspectives. However, it also comes with several risks. Individual papers will need to demonstrably add to the existing literature, which already contains excellent and comprehensive work, including by members of the BFA Scientific Leadership Team. On the other hand, perhaps counter to our intuition as researchers, individual papers can't *just* be exciting science or fill specific gaps in the literature. They also need to contribute to a comprehensive and integrated whole. For instance, on the topic of climate change, one might conclude that there is a dearth of knowledge on the climate change impacts on freshwater fisheries and write an important paper addressing that need. While scientifically interesting, this would not meet the needs of the BFA overall. If done well, this publishing model could prove an interesting format for future assessments.

3. A Blue Food Assessment for Impact

The Blue Food Assessment has two goals: (1) to fill and identify important gaps in our understanding of the role of aquatic foods in global food systems now and in the future; and (2) to inform and propel change in the policies and practices that will shape the future of food. This section focuses on this second goal of driving on-the-ground impact. The question of how to make the BFA maximally impactful has two components: i) what can the BFA Scientific Leadership Team do, through writing and assembling the BFA, to ensure it is influential with relevant decision-makers?; ii) and what outreach and impact activities need to follow its release?

Criteria for an Effective Assessment

In order for the Blue Food Assessment to be effective at driving impact, it will need to be:

Comprehensive – We want the Blue Food Assessment to speak to the most salient dimensions of aquatic food environments, and to be relevant across geographic and sectoral contexts. To this end, we have assembled a BFA Scientific Leadership Team whose members have worked in a broad set of disciplines and regions. One goal for the January BFA meeting is to clearly define the boundaries of what the assessment will and will not cover; to assess whether all relevant expertise and experience is represented on the team; and to agree on a strategy for ensuring that the papers constitute a comprehensive assessment.

Coherent – We want the different components of the Blue Food Assessment to make up an internally consistent whole, and to present a clear collective narrative. To this end, we are convening multiple meetings with the BFA Scientific Leadership Team to shape the overall body of work and will synthesize the individual papers in one joint report. Finding our collective messages will be an iterative process. Malin and Michelle will act as BFA 'managing editors' to the individual papers to maintain orientation towards the larger assessment during the writing process.

Credible – We want the Blue Food Assessment to be received as a trustworthy and reliable source of information and insights. To this end, we have assembled a BFA Scientific Leadership Team to author the individual papers and the synthesis report whose members are highly regarded by the scientific community for their expertise and contributions. We will publish the body of work as a series of peer-reviewed papers in esteemed journals in the Springer-Nature portfolio.

Salient – We want the Blue Food Assessment to be relevant to and informed by the reality of users. To this end, we will need to build relationships and create opportunities for engagement with the multitude of actors that shape and depend on aquatic food systems. Some considerations are discussed below.

Legitimate – We want the Blue Food Assessment to respect divergent views and beliefs and be perceived as unbiased and fair. To this end, we need to ensure that we engage the full range of relevant stakeholders in an open and transparent process and be careful to avoid even a perception that some stakeholder groups have undue influence. Some considerations are discussed below.

Visible – We want the Blue Food Assessment to reach as many relevant audiences as possible. To this end, we aim to publish the body of work in journals in the Springer-Nature portfolio; we will work closely with the organizers of the 2021 UN Food Summit to ensure that our work is built into that agenda; we will launch the Assessment at the Summit; we will partner with EAT to develop a media strategy, and work with other

partners, including WEF, WRI, and FAO, to ensure our messages reach a broad set of audiences; and will build relationships with relevant audiences before and after the release.

Audiences & Stakeholders

In putting together the Blue Food Assessment, we are primarily interested in three groups: the academic community working on various aspects of sustainable food systems; people/organizations whose insights can make the BFA and its recommendations relevant and grounded in real experiences (stakeholders); and people/organizations whose role and position allow them to alter the course of food futures via the practices of major elements of the food system (actors). We consider the primary (non-academic) audience of the BFA to be large actors who have the capacity to read and act on an aquatic food report: intergovernmental organizations, national governments, development banks, large supply chain actors (producers, processors, traders, retailers), and public and private funders. However, we acknowledge that the BFA will also need to be informed by the (diverse) perspectives of the millions of smallholders and billions of consumers who critically depend on aquatic foods for livelihood and nutrition and welcome perspectives on how this can be done in a meaningful way.

Stakeholder Engagement

We envision three major pathways for engaging with stakeholders as part of developing the BFA: (1) provide advance insight into what stakeholders see as key gaps in current knowledge and areas where they identify future challenges; (2) ground-truth the key messages of the synthesis report with on-the-ground experiences; and (3) build the basis of a trusted network through which key messages can be distributed and acted on. The BFA Core Team is currently developing avenues of engagement that would fit within the relatively limited timeframe of the BFA (such as workshops and partnership with existing coalitions) and meaningfully balance the diversity of stakeholder perspectives. We welcome the insights of anyone on the Scientific Leadership Team who is interested in participating in this process.

Outputs for Impact

We envision the following products coming out of the Blue Food Assessment:

Peer-reviewed papers – The backbone of the BFA will be the eight (or more) scientific articles which cover the key domains of aquatic food nutrition, equity, and sustainability and which will be peer-reviewed and published in Springer-Nature journals.

Synthesis report – The key messages of the BFA will be synthesized in a 'summary for policymakers'-type report. This report will be authored by the BFA Scientific

Leadership Team, with input from relevant stakeholders to ensure salience. Together, the peer-reviewed papers and the synthesis report will be published as a book.

Policy briefs – As different parts of the BFA will be more or less relevant to different audiences, we will develop short policy briefs for specific organizations and geographies. EAT has previously developed similar materials for the EAT-Lancet Commission report and will be a helpful partner in this.

Presentations & Dialogues – We will use global and regional meetings to present and discuss the messages of the BFA. These include the 2020 UN Ocean Conference, the 2021 UN Food Summit (see below), the Sustainable Development Impact Summit, the Global Nutrition Summit, and upcoming Seafood Expos. We will also consider facilitating smaller group discussions around the findings of the BFA, following the model of or in collaboration with the Food System Dialogues (https://foodsystemsdialogues.org/).

Data products – It may be possible to use the data collected and assembled for the BFA – data on the nutrition, environmental impact, livelihoods, climate vulnerability, and demand and the blue food scenarios they underpin – as the basis for a digital decision support platform in which stakeholders in various contexts and geographies can explore the present-day contribution of aquatic foods and possible blue food futures.

The UN Food Summit

The primary outlet for the BFA will be the UN Food Summit, to be held in September or October of 2021. This event, and the preparatory work preceding it, will provide an unprecedented opportunity to bring aquatic foods into the heart of the global food system agenda. To promote visibility and impact at the Summit, we are working with the World Resources Institute, the World Economic Forum, EAT, and the Food and Agriculture Organization to develop the necessary relationships and identify the most effective and engaging way of presenting scientific messages to high-level audiences.

The Blue Food Coalition

In parallel with the development of the Blue Food Assessment, Stanford, SRC and EAT are working with WEF, WRI, and FAO to develop a 'Blue Food Coalition' that will catalyze science-based action toward healthy and sustainable aquatic food supply chains. The objectives of the Coalition are to champion the BFA at the UN Food Summit and elsewhere, and to mobilize sectoral action on key BFA recommendations.

Appendix A. Summary of Key Food Reports

1. Transforming Food Systems under a Changing Climate (in progress)

Authors	CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS)
Scope	Initiative that brings together leaders in science, business, farming, policy and grassroots organizations to identify pathways for transformation that will steer the food system towards reaching the Sustainable Development Goals. The first phase of the initiative will culminate in a report written by a panel of experts, building on five work packages that are each developed in a commissioned paper: adaptation pathways for farmers, local and global policy approaches, dietary change, technology and innovation, and finance.
Key Messages	The initiative identifies six elements of a transformation: empowering farmer and consumer organizations, women and youth; digitally enabled climate-informed services; climate-resilient and low-emission practices and technologies; innovative finance to leverage public and private sector investments; reshaping supply chains, food retail, marketing and procurement; fostering enabling policies and institutions.
Audience	National governments, intergovernmental and development organizations, financiers
Novelty	One of the few reports that focuses on the 'how' of transformation, not just on the 'why'
Main Gaps	Strong focus on terrestrial production systems, and pathways and realities for the Global South. Does not provide an in-depth exploration of the present-day nutritional, economic, and environmental outcomes of the food system, or the various possible futures food system transformation may or may not incite.
Website	https://www.transformingfoodsystems.com/

2. The Future of Food from the Sea (2019)

Authors	High-Level Panel for a Sustainable Ocean Economy
Scope	The first of a series of 'Blue Papers' that will be released ahead of the 2020 UN Ocean Conference. An earlier report of relevance is titled "The Ocean as a Solution for Climate Change: 5 Opportunities for Action" and explored ocean-based climate mitigation options, including eating fish instead of meat and reducing fuel use in wild-capture fisheries. The HLP report on food from the sea considers the status and future trends of

	food production through fisheries and aquaculture; the opportunities of ocean-based food in achieving SDG 2 (Zero Hunger); and recommendations for how barriers to transition might be overcome.
Key Messages	Looking to the ocean as a source of protein produced using low-carbon methodologies will be critical for food security, nutrition and economic stability, especially in coastal countries where hunger and malnutrition are a challenge. Through smarter management of wild fisheries and the sustainable development of marine aquaculture (mariculture), the ocean could supply over six times more food than it does today, while helping restore the health of ocean ecosystems.
Audience	Intergovernmental organizations, national governments
Novelty	One of few reports to provide in-depth focus on aquatic foods
Main Gaps	Results are presented in global aggregates; nutrition angle is primarily through protein; very strong push for mariculture, which may not be how future pans out; seems optimistic in its estimate of the environmental and equity trade-offs of massive aquaculture expansion?
Website	https://www.oceanpanel.org/future-food-sea

3. Growing Better: Ten Critical Transitions to Transform Food and Land Use (2019)

Authors	Food and Land Use Coalition (FOLU)
Scope	High-level modeling exercise that projects the economic prize, investment requirements, and business opportunities embedded in ten potential pathways to food system transformation. The pathways cover both terrestrial and aquatic food systems. One of the ten transitions is called “A healthy & productive ocean.”
Key Messages	In the aquatic food realm, the report advocates for transitioning to an EAT-Lancet type diet, reforming wild-catch fisheries, and expanding mariculture
Audience	Large corporations, financiers, national and international policy makers
Novelty	Uniquely aims to make the business case for food system transformation
Main Gaps	A useful starting point, but lacks the granularity and depth necessary to implement meaningful policy changes or direct specific investments in sustainable food production. On aquatic foods, it (amongst others) fails to acknowledge the importance of micronutrients in diets, sees ‘fish-as-feed’ as the dominant environmental limitation of aquaculture expansion, and does not mention the role and fate of smallholders in this transition.

Website	https://www.foodandlandusecoalition.org/global-report/

4. Food in the Anthropocene: the EAT-Lancet Commission on Healthy Diets from Sustainable Food Systems (2019)

Authors	EAT-Lancet Commission
Scope	Full scientific review of what constitutes a healthy diet from a sustainable food system, and which actions can support and speed up food system transformation. Identifies on a regional level where present-day diets fall short of the healthy ideal, and to what extent different transformations can move food systems to within the various planetary boundaries.
Key Messages	A diet rich in plant-based foods and with fewer animal source foods confers both improved health and environmental benefits. In diets, staying within the 'safe operating space' requires doubling in the consumption of healthy foods such as fruits, vegetables, legumes and nuts, and a greater than 50% reduction in global consumption of less healthy foods such as added sugars and red meat. In production practices, this requires a combination of substantial shifts toward mostly plant-based dietary patterns, dramatic reductions in food losses and waste, and major improvements in food production practices.
Audience	Consumers, large corporations, national governments, international organizations, academia
Novelty	First assessment to set global scientific targets for the amount and types of food groups necessary for human health as well as the environmental food boundaries that humanity needs to stay within to limit planetary degradation.
Main Gaps	Dietary recommendations around aquatic foods remains broad, and environmental impacts are mostly captured through crop production for feed. Due to the key assumption of a decarbonized society by 2050, fuel use in capture fisheries was not included in the modeling step. Moreover, biodiversity impacts from fisheries or aquaculture operations (except for when related to feed production) were not considered. The report did not dive into regional or country-level details and the nutritional benefits from seafood were not unpacked at a species or species group level.
Website	https://eatforum.org/eat-lancet-commission/

5. Creating a Sustainable Food Future (2019)

Authors	World Resources Institute (WRI)
Scope	Report three great 'gaps' towards achieving a sustainable food future (food production, land area, greenhouse gas mitigation) and offers a 'five-course menu of solutions' consisting of 22 menu items total to meet the food demands of a growing population without increasing emissions, deforestation, or poverty.
Key Messages	The five courses of the menu are: (1) reduce growth in demand for food and agricultural products; (2) increase food production without expanding agricultural land; (3) exploit reduced demand on agricultural land to protect and restore forests, savannas, and peatlands; (4) increase fish supply through improved wild fisheries management and aquaculture; and (5) reduce greenhouse gas emissions from agricultural production. Course 4 can be achieved through improving wild fisheries management and improving productivity and environmental performance of aquaculture.
Audience	International organizations, national governments, private sector
Novelty	Focusing on 'gaps' in report and preceding work provided important new framing and analysis
Main Gaps	No regional analysis; little acknowledgment of the 'who' and 'how' of food system transformation; focus on productivity, land, and greenhouse gas emissions masks other (negative) outcomes of food system
Website	https://wrr-food.wri.org/

6. The Global Food System: An Analysis (2017)

Authors	WWF-Netherlands and Metabolic
Scope	Comprehensive overview of food system practices along supply chain, current trends and emergent behaviors, environmental and humanitarian outcomes, root causes of problems, and challenges for moving towards a sustainable and healthy food system.
Key Messages	The food system is the largest contributor to both environmental and humanitarian impacts; increased population and growing wealth suggest that a doubling of food production may be necessary by 2050; the planetary boundaries and unsustainable resource extraction are hard limits to the food system's further expansion based on past trends; alternative pathways can provide for the needs of our growing population without compromising human or ecological health; we need to address four main challenges in order to transition to a sustainable

	and resilient food system: (1) adaptive and resilient food system, (2) nutritious food for all, (3) within planetary boundaries, (4) supporting livelihoods and wellbeing.
Audience	Not clear
Novelty	Opens the report by presenting a framework of how the food system is structured; discusses the 'root causes' of problems with the food system.
Main Gaps	The report is unclear about what its purpose is, who its intended audience is, and what the key findings or action targets are.
Website	https://www.metabolic.nl/projects/wwf-analysis-global-food-system/

7. Food Systems and Natural Resources (2016)

Authors	Working Group on Food Systems of the International Resource Panel (IRP), hosted by the United Nations Environment Programme (UNEP)
Scope	Food systems approach to natural resource use and environmental impacts of all food related activities, their governance structures, socio-economic outcomes, and the complex interlinkages between all of these.
Key Messages	Resource-smart food systems are needed to achieve sustainable development; taking a food systems approach is important; food security and human health both depend on our natural resource base; current food systems are unsustainable and the pressures on natural resources are expected to increase; options for decoupling food system activities from environmental degradation.
Audience	International organizations, governments, private sector, NGOs
Novelty	Use of food system lens; includes discussion of food system actors and opportunities for transformation.
Main Gaps	Focus on food systems broadly leads to rather general treatment of sub-topics. For example, nutrition is only discussed as the global number of undernourished and obese people; the twelve proposed 'critical shifts' are not quantified or prioritized. Therefore unclear how decision-makers might actually act on this information.
Website	http://wedocs.unep.org/handle/20.500.11822/7592

Appendix B. Ongoing Projects & Additional Food Reports

The list of food reports in Appendix A is by no means exhaustive, and also excludes important work that has been done on sub-topics of the BFA (e.g., the 2019 FAO report on climate change impacts on fisheries and aquaculture). It will be important for each author team to identify the key existing literature and initiatives in their domain and ensure that work is integrated into their effort. Below is a list of the ongoing projects and additional food reports that we are aware of. Members of the BFA Scientific Leadership Team are invited to add things that are missing.

Ongoing projects

- Earth Commission
  https://earthcommission.org/
- Future Seas
  https://www.ices.dk/news-and-events/asc/asc2019/Documents/Peccl%20UTAS_FutureSeas.pdf
- NCEAS projects
  - Environmental Impact and Sustainability of Global Food Systems
    https://www.nceas.ucsb.edu/featured/environmental-impacts-global-food-systems
  - Global Protein Systems Sustainability
- Hidden Harvests
  https://www.worldfishcenter.org/hidden-harvests
- The Future of Protein
  https://futureofprotein.ca/

Additional reports

Sample from a list of food-related reports and articles compiled by Guillermo Castilleja.

- Caron, P., Ferrero y de Loma-Osorio, G., Nabarro, D., et al. Food systems for sustainable development: Proposals for a profound four-part transformation. August 2018. Agronomy for Sustainable Development.
- Food and Agriculture Organization (FAO). The state of food and agriculture: Leveraging food systems for inclusive rural transformation. 2017. FAO.
- Global Panel on Agriculture and Food Systems for Nutrition. 2016. Food systems and diets: Facing the challenges of the 21st century. London, UK.
- IPES-Food, 2017. Unravelling the food-health nexus: Addressing practices, political economy, and power relations to build healthier food systems. October 2017. The Global Alliance for the Future of Food and IPES-Food.

- Ruerd Ruben, J. Verhagen and Christine Plaisier, 2019. The Challenge of Food Systems Research: What Difference Does It Make? Sustainability, 11, 171; doi:10.3390/su11010171
- Task Force of Global Food and Nutrition Security, 2015. All food systems are sustainable. The Secretary-General's High-level task force on Global Food and Nutrition Security. This compendium summarizes the outcome of the work done by the twenty-three High level Task Force of Global Food and Nutrition Security entities, coordinated by the HLTF Coordination Team from October 2014 to October 2015.
- The Economics of Ecosystems and Biodiversity (TEEB), 2018. Measuring what matters in agriculture and food systems: a synthesis of the results and recommendations of TEEB for Agriculture and Food's Scientific and Economic Foundations report. Geneva: UN Environment.
- World Business Council for Sustainable Development (WBCSD) Task Force of Global Food and Nutrition Security. Future of food: A lighthouse for future living, today. June Task Force of Global Food and Nutrition Security. WBCSD.
- World Economic Forum's System Initiative on Shaping the Future of Food Security and Agriculture; Deloitte Consulting LLP, 2017. Shaping the future of global food systems: A scenarios analysis. January 2017. World Economic Forum.