TO MEET GLOBAL FOOD SECURITY AND NUTRITION NEEDS, WE MUST INCLUDE AQUATIC FOODS IN OUR AGRICULTURAL PLANS, PROGRAMS AND CLIMATE RESILIENCE ACTIVITIES.

Submission to the Koronivia Joint Work on Agriculture (KJWA)

May 2022

Environmental Defense Fund (EDF) and Stanford Center for Ocean Solutions appreciate the opportunity to present their perspectives on future topics not listed in decision 4/CP.23 and views on the progress of the Koronivia Joint Work on Agriculture (KJWA).

Since 2018, Parties have participated in a series of thematic workshops under the KJWA on a range of topics related to agriculture, with the aim of reporting on the progress and outcomes of their work at COP26. EDF has provided input into these workshops through previous submissions.[1] At COP26, Parties agreed to continue the consideration of the KJWA and to recommend a draft decision for adoption at COP27.

We are writing to request as an urgent matter that the Koronivia process include both wild capture and farmed aquatic food production systems[2] as a future topic for consideration.

This recommendation stems from the fact that aquatic foods are an integral and inseparable part of the food security and climate equation, as demonstrated by the social, biological, and economic evidence that has accumulated over the last several years.[3] In addition, wild fisheries and the ecosystems that support them are under stress the world over, threatening their potential to continue to support food and nutrition needs. In our view, the KJWA process presents the most logical and opportune forum to consider and integrate aquatic foods' role in climate change and the protection of both our food system and planetary health and biodiversity, and to address the climate/aquatic food/agriculture nexus. Here we provide further justification for why aquatic food systems should be taken up by the KJWA:

Fisheries (including aquatic plants) are part of 'Agriculture'

The Constitution (Art.1.para.1.) of the UN Food and Agriculture Organization (FAO) defines "Agriculture" and its derivatives to include fisheries and marine products.[4] The UN FAO has a branch devoted to fisheries and serves as the home for the Committee on Fisheries, the sole global convening body for setting policy for fishery governance and

[1] Environmental Defense Fund submission on Topics 2(b) and 2(c) of Decision 4/CP.23, related to the Koronivia Joint Work on Agriculture, 2019, https://www4.unfccc.int/sites/SubmissionsStaging/Documents/201905021119---EDF%20KJWA%20SBSTA%2050%20SBI%2050%20Submission.pdf; Joint Submission by Conservation International, Environmental Defense Fund, National Wildlife Federation, and The Nature Conservancy on Topic 2(a) of Decision 4/CP.23, related to the Koronivia joint work on agriculture, 2018, https://www4.unfccc.int/sites/SubmissionsStaging/Documents/201811051703---Joint%20Submission%20on%20Topic%202a%20of%20Decision%204CP.23_KJWA.pdf; Joint Submission by Conservation International, Environmental Defense Fund, Woods Hole Research Center, National Wildlife Federation, Forest Trends, and Center for Carbon Removal on matters related to agriculture (Decision 4/CP.23), 2018, https://www4.unfccc.int/sites/SubmissionsStaging/Documents/201804251506---Submission%20on%20agriculture_CCR%20CI%20EDF%20FT%20NWF%20WHRC.pdf

[2] Referring to marine, brackish, and freshwater fisheries and/or farming systems which capture or raise fish, invertebrates, seaweed, and other aquatic species for human consumption.

[3] *See* Bennett, A., Basurto, X., Virdin, J., Lin, X., Betances, S. J., Smith, M. D., Allison, E. H., Best, B. A., Brownell, K. D., Campbell, L. M., Golden, C. D., Havice, E., Hicks, C. C., Jacques, P. J., Kleisner, K., Lindquist, N., Lobo, R., Murray, G. D., Nowlin, M., … Zoubek, S., 2021. Recognize fish as food in policy discourse and development funding. Ambio, 50:981-989; Gephart, J. A., Henriksson, P. J. G., Parker, R. W. R., Shepon, A., Gorospe, K. D., Bergman, K., Eshel, G., Golden, C. D., Halpern, B. S., Hornborg, S., Jonell, M., Metian, M., Mifflin, K., Newton, R., Tyedmers, P., Zhang, W., Ziegler, F., & Troell, M., 2021. Environmental performance of blue foods. Nature, 597(7876), 360–365; Golden, C. D., Koehn, J. Z., Shepon, A., Passarelli, S., Free, C. M., Viana, D. F., Matthey, H., Eurich, J. G., Gephart, J. A., Fluet-Chouinard, E., Nyboer, E. A., Lynch, A. J., Kjellevold, M., Bromage, S., Charlebois, P., Barange, M., Vannuccini, S., Cao, L., Kleisner, K. M., … Thilsted, S. H., 2021. Aquatic foods to nourish nations. Nature, 598(7880), 315–320; Hicks, C. C., Cohen, P. J., Graham, N. A. J., Nash, K. L., Allison, E. H., D'Lima, C., Mills, D. J., Roscher, M., Thilsted, S. H., Thorne-Lyman, A. L., & MacNeil, M. A., 2019. Harnessing global fisheries to tackle micronutrient deficiencies. Nature, 574(7776), 95–98; Tigchelaar, M., Cheung, W.W.L., Mohammed, E.Y., Phillips, M., Payne, H.J., Selig, E.R., Wabnitz, C.C.C., Oyinlola, M.A., Frölicher, T.L., Gephart, J.A, Golden, C.D., Allison, E.H., Bennett, A., Cao, L., Fanzo, J., Halpern, B.S., Lam, V.W.Y., Micheli, F., Naylor, R.L., Sumaila, U.R., Tagliabue, A., Troell, M., 2021. Compound climate risks threaten aquatic food benefits. Nature Food, 2, 673-682.

[4] Food and Agriculture Organization (FAO), 2017. Basic texts of the Food and Agriculture Organization of the United Nations, https://www.fao.org/3/mp046e/mp046e.pdf

management. Koronivia – as it tackles the other elements of the FAO's mandate – should encompass fisheries, as well.

Fisheries are caught up in all aspects of the climate change challenge

As *Boosting Koronivia* - the recent FAO report on the Koronivia process - so well explained, "Agriculture occupies a central position when it comes to climate change. It is both highly vulnerable to the impacts of climate change but also a net contributor to greenhouse gas (GHG) emissions and their increased concentrations in the atmosphere."[5]

Aquatic, or blue foods – fish, shellfish, seaweed and other plants and animals captured or cultivated in freshwater and marine ecosystems – play a central role in food and nutrition security for billions of people. They are the cornerstone of the livelihoods, economies and cultures of many coastal, rural and riparian communities.

And, just like terrestrial agriculture, aquatic foods both are impacted by and exercise impacts upon the climate depending on how they are harvested, and whether they serve as substitutes for other food sources that may have a more (or less) significant carbon footprint.

FAO's own advice on Climate-Smart Agriculture 'on the ground' expressly recognizes that "[t]he agricultural sectors (crops, livestock, forestry, ***fisheries***) [emphasis added] must therefore transform themselves in order to feed a growing global population and provide the basis for economic growth and poverty reduction. This transformation must be accomplished without hindering the natural resource base."[6]

Further:

A. **Many aquatic foods carry a smaller carbon footprint than other animal-based protein sources**.[7] Elevating aquatic foods can therefore be a powerful component of policies and plans seeking to reduce the climate footprint of our global food systems while still ensuring food and nutrition goals are met. In addition, there is a vast diversity of aquatic foods – more than 2,500 different species are eaten globally – and there is quite a bit of variation in terms of emissions produced in catching or growing these species. This means that a focus on aquatic foods provides a diverse array of options for policymakers seeking to reduce food system emissions and build resilience in different cultural contexts.

B. **Wild caught stocks are significantly impacted by climate change**. This has been very well documented, along with the implications for the global food supply, by the FAO and others.[8]

C. **Solutions to the challenges of climate impacts on aquatic foods are available today**. With better climate-resilient management of both wild-caught and aquaculture production we can make significant progress in **meeting the food security needs** of a growing population.[9]

Climate-resilient fishery management can greatly reduce negative impacts; Koronivia should tackle the necessity for enhanced attention to climate-resilient management of aquatic foods and focus attention on the need for investment in good management to ensure climate-resilient outcomes and adequate supply of aquatic foods.

Recent research indicates that the nutritional and health benefits of aquatic foods, taken together with their ecologically light footprint when sustainably cultivated and harvested, make them an absolutely indispensable component of the solution to the global food supply challenge. For example, blue food systems that are often overlooked in policy and dietary studies, like carp farming in China and India, are essential to food security, according to the Blue Food Assessment.[10]

D. **Many of the same marginalized and vulnerable populations at greatest risk of food insecurity due to the impacts of climate change on terrestrial agriculture, for example in Africa and Asia, will also experience significant impacts to critical *aquatic* food sources** as a result of climate change, because tropical regions will see

[5] Food and Agriculture Organization (FAO), 2021. Boosting Koronivia: Understanding the future of the Koronivia Joint Work on Agriculture, https://www.fao.org/3/cb6810en/cb6810en.pdf
[6] Food and Agriculture Organization (FAO), 2014. FAO success stories on climate-smart agriculture, https://www.biopasos.com/biblioteca/64v%20a-i3817e.pdf
[7] Gephart, et al. (2021), *supra* note 3.
[8] Food and Agriculture Organization (FAO), 2018. Impacts of climate change on fisheries and aquaculture: Synthesis of current knowledge, adaptation and mitigation options. FAO Fisheries and Aquaculture Technical Paper No. 627. Rome, FAO. 628 pp.
[9] Christopher Costello, Ling Cao, Stefan Gelcich, Miguel Á. Cisneros-Mata, Christopher M. Free, Halley E. Froehlich, Christopher D. Golden, Gakushi Ishimura, Jason Maier, Ilan Macadam-Somer, Tracey Mangin, Michael C. Melnychuk, Masanori Miyahara, Carryn L. de Moor, Rosamond Naylor, Linda Nøstbakken, Elena Ojea, Erin O'Reilly, Ana M. Parma, Andrew J. Plantinga, Shakuntala H. Thilsted & Jane Lubchenco, 2020. The Future of Food from the Sea, Nature 588: 95–100; Free, C. M., Cabral, R. B., Froehlich, H. E., Battista, W., Ojea, E., O'Reilly, E., Palardy, J. E., García Molinos, J., Siegel, K. J., Arnason, R., Juinio-Meñez, M. A., Fabricius, K., Turley, C., & Gaines, S. D., 2022. Expanding ocean food production under climate change. Nature, 605:490-496.
[10] Gephart, et al. (2021), *supra* note 3.

the greatest losses in productivity and abundance. Moreover, people living in Small Island Developing States, many of whom derive 50% or more of their protein from aquatic foods, are also at heightened risk of food insecurity as a result of the climate change impacts on fisheries.[11] The FAO has labeled seafood the primary source of animal protein in the diets of approximately 1 billion people, mostly in developing countries.[12]

The COVID 19 Pandemic revealed that an important aspect of food system resilience is diversity in food supply. [13] It will thus be critical to consider the full spectrum of both aquatic and terrestrial foods in our efforts to reduce food insecurity.

It is well-documented that the current level of investment in fishery management is not sufficient to protect biodiversity or deliver on the potential of food security or nutrition that well-managed fisheries or aquaculture could yield. A recent assessment by the OECD (which evaluated only ocean investments and did not consider even less well-resourced inland fisheries) determined that less than one percent of current ODA was invested in ocean management.[14]

E. **Freshwater fisheries may be even less well recognized for their importance as food sources**, and their many risks from agricultural practices and from climate change also less well accounted for. The most recent data from FAO reports that inland fisheries (rivers and lakes) account for 12 million tons annually, which is about 13% of global fish harvest. However, because much of the inland fish harvest is unreported,[15] several scientific estimates indicate that inland fisheries may make an even greater contribution to global diets, according to WWF's *Rivers of Food.*[16] By failing to take into account the significance of these fishery food sources in the Koronivia process, we ignore, for example, the fact that the sediment or nutrient pollution from agriculture can affect the two thirds of aquacultured fish, which come from freshwater, and which rely on river systems for water, nutrients, feed or fish eggs.

F. **Seaweed and mangroves**, both nutritious food sources and high value products, not only contribute to the food and nutraceutical supply; they also **provide nursery areas and habitat for numerous aquatic species and thus enhance biodiversity, and they contribute to shoreline stabilization, reducing erosion and limiting the impacts of tidal surges during tsunamis and extreme weather events**. And **shellfish and seaweed aquaculture can add economic and ecological value to the surrounding environment** by removing excess nutrients and enhancing fish production in commercial and recreational fisheries, contributing to broader goals of ecosystem recovery.[17]

Most significant, perhaps, **mangroves and seaweed can act as carbon sinks**, contributing to meeting nations' Nationally Determined Contributions as a triple win even as they contribute to the global food supply. Their myriad benefits to the food supply, the climate and the planet's biodiversity merit far greater attention.[18] Yet, this factor, too, remains un-addressed in the Koronivia process.

Full inclusion of aquatic foods in Koronivia process will insure the best possible outcomes, especially in areas where aquatic and terrestrial food policies overlap, for example, such as the establishment of climate-friendly nutritional standards.

Conclusion: Course correction is possible

Within the global food system discussions initially launched by the UN Food Systems Summit, and within the agricultural discussions launched by the original Koronivia process, policymakers neglected to recognize how *fisheries and aquaculture* are affected by – and able to affect – our food system and our climate, both positively and negatively.

This oversight was recognized and remedied by the UN Food Systems Summit in 2021, as was reflected in the final outcome and the support from the UN Secretary-General, the UN Special Envoy for the Food Summit Agnes Kalibata,

[11] Golden, C. D., Allison, E. H., Cheung, W. W. L., Dey, M. M., Halpern, B. S., McCauley, D. J., Smith, M., Vaitla, B., Zeller, D., & Myers, S. S., 2016. Nutrition: Fall in fish catch threatens human health. Nature, 534 (7607), 317–320; Selig, E. R., Hole, D. G., Allison, E. H., Arkema, K. K., McKinnon, M. C., Chu, J., de Sherbinin, A., Fisher, B., Glew, L., Holland, M. B., Ingram, J. C., Rao, N. S., Russell, R. B., Srebotnjak, T., Teh, L. C. L., Troëng, S., Turner, W. R., & Zvoleff, A., 2019. Mapping global human dependence on marine ecosystems. Conservation Letters, 12(2), e12617.

[12] Organisation for Economic Co-operation and Development (OECD) and Food and Agriculture Organization (FAO), 2019. OECD-FAO Agricultural Outlook 2019-2028. OECD Publishing, Paris/FAO Rome.

[13] Ferguson, C. E., Tuxson, T., Mangubhai, S., Jupiter, S., Govan, H., Bonito, V., Alefaio, S., Anjiga, M., Booth, J., Boslogo, T., Boso, D., Brenier, A., Caginitoba, A., Ciriyawa, A., Fahai'ono, J. B., Fox, M., George, A., Eriksson, H., Hughes, A., … Waide, M., 2022. Local practices and production confer resilience to rural Pacific food systems during the COVID-19 pandemic. Marine Policy, 137, 104954.

[14] Organisation for Economic Co-operation and Development (OECD), 2020. Sustainable Ocean for All: Harnessing the Benefits of Sustainable Ocean Economies for Developing Countries. OECD Publishing, Paris.

[15] Funge-Smith, S., 2018. Review of the state of the world fishery resources: Inland fisheries (FIAF/C942 Rev.3). Food and Agriculture Organization of the United Nations. Rome, Italy.

[16] WWF, Rivers of Food, https://rivers-of-food.panda.org/#intro

[17] Luke T. Barrett, Seth J. Theuerkauf, Julie M. Rose, Heidi K. Alleway, Suzanne B. Bricker, Matt Parker, Daniel R. Petrolia, 2022. Sustainable growth of non-fed aquaculture can generate valuable ecosystem benefits. Ecosystem Services, 53:101396.

[18] Environmental Defense Fund, Blue Carbon, https://www.edf.org/bluecarbon#about-anchor

and the UN Special Envoy for the Ocean Peter Thomson. This also spurred the formation of the Aquatic/Blue Food Coalition at the conclusion of the Summit.

We encourage those responsible for charting the way forward for Koronivia to recognize that this process, too, must make a mid-course correction and provide dedicated opportunities to: 1) recognize the interactions of the terrestrial and aquatic components of the food system, 2) include aquatic food production processes, along with their potentially positive elements to be incentivized, and their negative elements to be disincentivized, and 3) systematically identify and discourage agricultural practices that are harmful to aquatic food production.

We appreciate the KJWA Co-Facilitators' and Parties' consideration of our suggestions, and we look forward to working with you.