

ID: W1980950199

TITLE: Does aquaculture add resilience to the global food system?

AUTHOR: ['Max Troell', 'Rosamond L. Naylor', 'Marc Métian', 'M. C. M. Beveridge', 'Peter Tyedmers', 'Carl Folke', 'Kenneth J. Arrow', 'Scott Barrett', 'Anne?Sophie Crépin', 'Paul R. Ehrlich', 'Åsa Gren', 'Nils Kautsky', 'Simon A. Levin', 'Karine Nyborg', 'Henrik Österblom', 'Stephen Polasky', 'Marten Scheffer', 'Brian Walker', 'Tasos Xepapadeas', 'Aart de Zeeuw']

ABSTRACT:

Aquaculture is the fastest growing food sector and continues to expand alongside terrestrial crop and livestock production. Using portfolio theory as a conceptual framework, we explore how current interconnections between the aquaculture, crop, livestock, and fisheries sectors act as an impediment to, or an opportunity for, enhanced resilience in the global food system given increased resource scarcity and climate change. Aquaculture can potentially enhance resilience through improved resource use efficiencies and increased diversification of farmed species, locales of production, and feeding strategies. However, aquaculture's reliance on terrestrial crops and wild fish for feeds, its dependence on freshwater and land for culture sites, and its broad array of environmental impacts diminishes its ability to add resilience. Feeds for livestock and farmed fish that are fed rely largely on the same crops, although the fraction destined for aquaculture is presently small (?4%). As demand for high-value fed aquaculture products grows, competition for these crops will also rise, as will the demand for wild fish as feed inputs. Many of these crops and forage fish are also consumed directly by humans and provide essential nutrition for low-income households. Their rising use in aquafeeds has the potential to increase price levels and volatility, worsening food insecurity among the most vulnerable populations. Although the diversification of global food production systems that includes aquaculture offers promise for enhanced resilience, such promise will not be realized if government policies fail to provide adequate incentives for resource efficiency, equity, and environmental protection.

SOURCE: Proceedings of the National Academy of Sciences of the United States of America

PDF URL: <https://www.pnas.org/content/pnas/111/37/13257.full.pdf>

CITED BY COUNT: 486

PUBLICATION YEAR: 2014

TYPE: article

CONCEPTS: ['Aquaculture', 'Food security', 'Natural resource economics', 'Business', 'Livestock', 'Sustainability', 'Fish stock', 'Diversification (marketing strategy)', 'Agriculture', 'Fishery', 'Biology', 'Ecology', 'Economics', 'Fish <Actinopterygii>', 'Marketing']