Aquaculture interventions improve the production value, income, total expenditure, and food consumption of beneficiaries. There is insufficient evidence to assess the effectiveness of aquaculture programmes on other nutrition and women’s empowerment measures.

What is this review about?
Aquaculture is the farming of aquatic animals and plants in inland and coastal areas. The steady increase in the international production and consumption of fish has encouraged investment in aquaculture as an option for development. While aquaculture is promoted as a pro-poor activity with the potential to stimulate the economy, increase the consumption of nutritious food, and drive gender equality, there is still limited rigorous evidence regarding its impact.

We defined “aquaculture interventions” as any project, programme or policy aiming to provide new and/or improved activities at any stage of the aquaculture value chain. No further restrictions were defined a priori for identifying relevant interventions.

The review assessed whether aquaculture interventions increase the productivity, income, nutrition and women’s empowerment of individuals in low- and middle-income countries. We also aimed to identify barriers and facilitators that could affect the effectiveness of these interventions, and the cost-effectiveness of such programmes.

What studies are included?
The review includes studies with an experimental or quasi-experimental design that estimate the effect of aquaculture interventions on relevant outcomes.

We identified 21 studies covering 13 aquaculture programmes in low-income and lower-middle-income countries, with the majority focusing on Bangladesh. We did not identify relevant studies implemented in middle-income countries.

What are the main findings of this review?
Do aquaculture interventions increase the productivity, income, nutrition and empowerment of individuals? There is a small increase in the production value, income, total expenditure and food consumption of participants as a result of their involvement in aquaculture interventions.
These findings should be interpreted with caution given the substantial heterogeneity and potential for risk of bias in the included studies. There is not enough evidence available to synthesise other nutrition outcomes – such as anthropometrics, food security, or quality of diets – or women’s empowerment measures. Moreover, there is insufficient data to assess spillover effects, or if the effect of aquaculture interventions differs by gender.

What are the potential barriers and facilitating factors that affect the effectiveness of aquaculture interventions? First, barriers affecting programme set up are low funding, participants not being able to choose the intervention package, unclear roles of partners, and project plans that were never implemented. Second, we find barriers and facilitators affecting the participation of beneficiaries, including social and cultural norms, the level of income generated from aquaculture activities, programme delivery aspects, and access to natural capital. Third, we identify factors affecting the level of productive activities, involving access to inputs and funding, general economy settings, and infrastructure and environmental issues.

What is the cost-effectiveness of aquaculture interventions? There is insufficient data to make full comparisons across programmes. For interventions in Bangladesh, the maximum yearly cost per household is US$300, while the maximum benefits are US$900. The lowest cost for reaching a household is US$19 per annum.

What do the findings of this review mean? The results of the review suggest that, while several aquaculture programmes can be identified, there is a paucity of rigorous evidence assessing their effectiveness. This opens an opportunity for the aquaculture programming sector to align investments with evaluation frameworks that inform what works, for whom, and why.

Future research could emphasise three areas to continue building quality evidence:

1. establish ways to evaluate the effect of aquaculture interventions on intermediate and main nutrition outcomes and women’s empowerment measures;
2. promote reporting standards to reflect that relevant studies are free from confounding issues; and
3. encourage the collection and publication of cost data to allow for cost-effectiveness analyses across the sector.