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Abbreviations	
CGIAR	Consultative Group on International Agricultural Research
FISH CRP	CGIAR Research Program on Fish Agri-food Systems
FAO	Food and Agricultural Organization of the United Nations
IWMI	International Water Management Institute
JCU	James Cook University
SRA	Small research activity
SIDA	Swedish International Development Cooperation Agency
SSF	small-scale fisheries

1 Acknowledgments

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2 Executive summary

Fish is by far the most important and fastest growing animal-source food, and is a critical contributor to food and nutrition security. Yet, this critical role of fish is poorly represented in global debates about food security and development. There is a limited understanding, particularly amongst those outside of the sector, of the long term contribution the fisheries sector can make to the challenges of malnutrition, poverty alleviation and improved well-being.

Where fisheries do gain recognition the focus tends to be on those parts of the sector that are well accounted for in formal production statistics (i.e., industrial, commercial fisheries) and where gains in production are easily measureable (i.e., aquaculture). The very characteristics that make small-scale fisheries resilient and able to deliver livelihood and food security benefits to millions of people make them difficult to enumerate, account for and govern.

The information deficit that plagues small-scale fisheries (SSF) is also reflected by the challenges that SSF research faces in measuring and accounting for impact. While a number of initiatives have sought to better account for the contribution of small-scale capture fisheries, and the impact of associated research efforts, there remain significant data gaps. The evidence deficit and dispersed nature of existing evidence seriously hinders the ability to maintain a profile of SSF in the food security and nutrition policy arenas. Further, it presents hindrances to the justification and sound design of a convincing research agenda to address some of the challenges. This was highlighted in 2016 when the CGIAR governing bodies and donors approved a consortium research program on fish, yet channelled funds only to aquaculture research.

This SRA has developed some foundational research outputs, proposals and collaborations towards understanding the impact and strengthening the case for continued investment in SSF – including efforts to understand the impacts that have been catalysed or stimulated through investments in SSF research. The objectives of this SRA were to; (1) Synthesise evidence of the impact of SSF for food and nutrition security, livelihoods and climate change adaptation; and (2) Develop a rigorous and high profile case and program for investment in SSF research for development.

This SRA has enabled and directly contributed towards;

- a strengthened and revised research for development program for SSF that has successfully been funded by the CGIAR and new funders such as the Oak Foundation.
- a symposium and associated proceedings of 60 SSF researchers to examine the past and potential role of research in addressing small-scale fisheries concerns
- building a consortium of partners who have drafted a preliminary methodology and secured funding to revisit the 'Hidden Harvest' study that will account for, understand and raise the profile of the vast and diverse nutrition, employment and livelihood contributions of SSF
- the development of two (potentially high profile) research papers that examine nutrition potential of fisheries, particularly small-scale fisheries, and chart an agenda for future impactful research towards nutrition sensitive fisheries
- a draft strategy for a 10 year collaboration between WorldFish and ACIAR – the draft provides a platform from which to details can be discussed and determined collaboratively.

3 Introduction

Fish is by far the most important and fastest growing animal-source food, and is a critical contributor to food and nutrition security (Beveridge et al., 2013). Yet, this critical role of fish is poorly represented in global debates about food security and development (Béné et al., 2015). Although there has been significant growth in aquaculture which is predicted to continue, capture fisheries provide the majority of the fish eaten by people in many developing countries (Béné et al., 2016), and that situation is unlikely to change in the near term. These fish are caught from the wild, in about equal proportion, from inland waters in rivers and wetlands and from coral reefs and estuaries in coastal seas. A strength of these SSF lies in their ability to continue to generate and distribute food and income in contexts where formal markets and supply chains function poorly (Béné et al., 2010). However, the sustainability and equitable distribution of the benefits that these fisheries provide are threatened by environmental degradation and change, increasing competition for resources including from growing commercial sectors and, ultimately, by the low profile that fish, and SSF in particular, hold in food security and development debates and investments.

There is a limited understanding, particularly amongst those outside of the sector, of the long term contribution the fisheries sector can make to the challenges of food security, poverty alleviation and improved well-being. While a number of initiatives have sought to better account for the size and contribution of SSF, there remain massive data gaps that seriously impede the ability to raise the profile of fish in the food security and nutrition policy arenas. The dispersed and seasonal nature of most SSF means that the collection of high resolution catch data is not feasible. While considerable (if controversial) efforts to re-estimate marine fisheries catch are ongoing, the smallest scales of marine fishing, and most subsistence inland fishing activity, remains largely unaccounted for in national and global statistics.

The information deficit that plagues SSF is also reflected by the challenges that SSF research faces in determining an effective focus and delivering impact. SSF are by nature dynamic in time and space, often embedded in diverse livelihoods and harvest mobile, common pool resources – all characteristics offer unique challenges to tracing the impact that investments in research and development have made to date, and can continue to make.

In September 2016, CGIAR governing councils and donors made final determinations on funding for a new round of CGIAR Consortium Research Projects (CRPs). The FISH CRP developed by a coalition led by WorldFish was endorsed for funding, however all consortium funds were channelled for aquaculture research. A flagship dedicated to capture fisheries research ('Flagship 2') was accepted as part of the CRP, but not funded. The councils and donor cited both ideological differences with the proposal proponents, and a lack of evidence to build the case for support. To date, SSF research has failed to present a compelling and evidence-backed case of return on investment. SSF researchers and advocates argue that economic development needs to recognise and better account for the role SSF play in livelihood improvements, nutritional outcomes and adaptive capacity. This proposal sought to build a broader coalition of institutions and synthesise important components of this evidence base and a longer term program of work to address the challenge of sustaining and securing the benefits provided by SSF and refining the role of research in addressing that challenge. The success of this proposal is most substantially evidenced by the success of the multi-agency research program on Small-scale Fisheries.

4 Activities

Objective 1 – Synthesise evidence of the impact of SSF (including the contributions of SSF research) for food and nutrition security, livelihoods and climate change adaptation

1.1 Convene a three-day symposium of partners (e.g., FAO, JCU, IWMI) and WorldFish SSF researchers from Asia, Pacific and Africa to review global case studies that provide examples of impact from SSF research in development.

In September 2017 WorldFish hosted the Resilient SSF Symposium in Penang. It was attended by over 60 researchers from 10 different organization and 12 countries. The Symposium offered an opportunity to WorldFish and partners to critically examine and collate the range of research approaches employed to understand and improve SSF. The symposium set out to: (1) facilitate linkages between SSF researchers—including those with a focus on gender, nutrition and aquaculture; (2) create a synthesis of evidence of the impact of SSF research towards food and nutrition security, livelihoods and equity; and (3) strengthen a SSF research program in terms of research alignment, quality and impact.

The symposium focused on research findings and the role of research around six overarching themes; (1) Tracking and realizing research impact and development impact; (2) Fisheries management and technology; (3) Governance institutions and external drivers of change; (4) Gender and equity; (5) Food and nutrition security; (6) Livelihoods and value chains. Within sessions, researchers illustrated through their presentations the diversity of SSF, the range of geographies and the distinctive systems they are working in, as well as the different ways in which research is used to understand and catalyse development outcomes.

1.2 Analyse and collate global data of the nutritional value of wild-capture fish, particularly those harvested by SSF, in collaboration with JCU, FAO and University of Lancaster.

This has been a substantial, collaborative research effort that has not only amassed a large database (containing 4188 individual nutrient measures, spanning 424 species, caught across 45) but has also conducted two major analytical works. These analyses have taken longer than anticipated but it is expected they will lead to two high impact and high profile research outputs. These outputs are currently in the late stages of preparation and are due to be submitted within the next three months.

1.3 Co-host a working group with FAO to a) review methodologies and b) design a research strategy to fill the global data gap on SSF.

From 27–29 June 2017 FAO, Duke University and WorldFish (with support from this SRA) co-hosted a workshop in Rome to commence an update of the “Hidden Harvests”/”Big Numbers” study led by World Bank, FAO and WorldFish in 2012 – arguably the most comprehensive understanding of SSF globally. Whilst an influential study, the potential value and visibility of the 2012 report (World

Bank/FAO/WorldFish 2012) was ultimately undermined by delays in production of the final report and limited communication following its release.

The 3-day Rome workshop brought together 40 experts from diverse fields associated with SSF with objectives to develop and agree on:

- the scope and main contents of the new study, including type of data (indicators) to be collected and subsector coverage; and
- the methodology for data collection and analyses, including key partners and information sources.

Following on from this workshop, the core team has synthesized outputs into a comprehensive and achievable set of indicators, and is moving towards initiating up to 25 country case-studies and a series of thematic studies to fulfil the project objectives.

The ultimate outcome of the Hidden Harvest II study will be a higher profile recognition of the size and multiple values of SSF in policy, media and public domains, helping to catalyze more coordinated and strategic investments by development agencies, governments, private sector and regional bodies in support of equitable SSF governance.

Objective 2. Develop a rigorous and high profile case and program for investment in SSF research for development

2.1 Build a rigorous and high profile case and program for research and development on fish, focused on SSF, in food systems.

In June 2017 WorldFish led the resubmission of the Flagship 2. Sustaining small-scale fisheries (Appendix 5) an addendum to the FISH: CGIAR Research Program on fish agrifood systems. The submission had benefited from substantial revisions and refinement developed in collaboration with managing partners James Cook University and International Water Management Institute). The resubmission benefited from a more rigorous and compelling presentation of evidence of the proposed pathways to impact. The resubmission was successful and CGIAR granted 40% of the requested funds towards the program.

Parallel efforts to strengthen the SSF program were also successful. For example, a proposal was successfully developed (with Oak Foundation) that supports the communication, monitoring and evaluating and capacity building elements of the SSF program. In the first instance, the project works alongside Hidden Harvest II study to ensure the findings have an influential profile with key audiences.

2.2 Co-host, with ACIAR, a strategic planning workshop to examine theories of change and impact pathways of long-term investments in fisheries research to inform the development of a ten-year strategic plan for collaboration between WorldFish, developing country partners and ACIAR.

The draft 10 year plan (as a discussion document) was submitted to ACIAR in early 2018. The strategy is built on a review of past ACIAR-WorldFish investments, the strategic 10 year plan that ACIAR launched in 2018, the WorldFish strategy, the FISH CRP and a longer term view of WorldFish's contributions towards the Sustainable Development Goals.

Initial feedback has been provided by ACIAR that is being addressed in a revised document that will be submitted by the end of June. During July we will seek feedback in written form and/or through a short (half day) in-person dialogue. The 10 year plan will be finalised for publication by end of July.

5 Outputs

- A peer reviewed, multi-case journal publication on “the food security impacts and shortfalls of research in SSF – a synthesis of developing country cases” has been adjusted to the Proceedings (Appendix 1) – at a later stage a synthesis might appear as a peer reviewed piece.

Cohen, P.J., Huchery, C., Roscher, M. (2017) Resilient Small-scale Fisheries Symposium Proceedings of a workshop held in Penang, Malaysia, 5–7 September 2017. [Web link](#)

- Two potentially high impact paper on nutritional value of SSF is in the final stages of drafting (Appendix 2) and will be submitted within the next three months

Cohen, P.J., Hicks, C.C., Roscher, M.B., D’Lima, C., Graham, N.A.J., Mills, D., Nash, K.L., Thorne-Lyman, A., Thilsted, S.H., Allison, E.H., Rittenschober, D., Charrondierei, U.R., Huchery, C. (in prep) Are all fish are created equal? Accounting for micro-nutrients and macro-trends. Targeting - Proceedings of the National Academy of Science.

Hicks, C.C., Allison, E.H., P.J., C., D’Lima, C., Graham, N.A.J., MacNeil, M.A., Mills, D., Nash, K., Roscher, M., Thilsted, S.H., Thorne-Lyman, A. (in prep) Malnourished in a sea of micronutrients. Targeting – Science.

- A publicly available contributed to the FAO-hosted nutrition database a database containing 4188 individual nutrient measures, spanning 424 species, caught across 45 countries has been produced and will be made publicly available post acceptance of the above article.
- A peer reviewed paper that examines the (necessarily) complementary functions of aquaculture and small-scale wild capture fisheries for food security and economic objectives has been drafted (Appendix 3) and will be submitted during 2018.

Cohen, P.J., Allison, E.H., Andrew, N.L., Cinner, J., Evans, L.S., Fabinyi, M., Garces, L.R., Hall, S.J., Hicks, C.C., Hughes, T.P., Jentoft, S., Mills, D.J., Masu, R., Mbaru, E.K., Ratner, B.D. (in prep) Securing a Just Space for Small-Scale Fisheries.

- A published review of past methodologies employed to understand and quantify participation, food security functions and economic contributions of SSF (Appendix 4)

Basurto, X., Franz, N., Mills, D., Viridin, J., Westlund, L., (2017) Improving our knowledge on small-scale fisheries: data needs and methodologies in: Food and Agriculture Organisation (Ed.). Food and Agriculture Organisation, WorldFish, Duke University, Rome, Italy. [Web link](#)

- A proposal developed to update components of the “Hidden Harvests”

The updates of Hidden Harvest has been included in two proposals that have been submitted and considered to be high probability. These are the Oak Proposal and a proposal to SIDA, with the SIDA contribution to the FISH CRP likely.

- We produced two media outputs directly under this project that deal with the findings and justification for this research on SSF and SSF research impact

[From local to global: How research enables resilient and sustainable small-scale fisheries](#)

[Research as a catalyst for change](#) by Crawford Fund Awardee Kim Hunnman

- A revised proposal for Flagship 2 of the FISH CRP Sustaining Small-scale Fisheries research-in-development program was submitted and successful with support of this SRA. The proposal was strengthened by an evidence backed theory of change about long-term investment in SSF research

WorldFish (2017). FISH: CGIAR Research Program on fish agrifood systems. Addendum: [Flagship 2. Sustaining small-scale fisheries](#). 36pp.

Success in securing funding, through the CGIAR consortium of donors, for Flagship 2 in the order of USD 1M per year until 2022.

Preparation of a USD1.6M (3 year) proposal and indication of interest from Oak Foundation to fund foundational elements including strategic communications, monitoring and evaluation and coalition building for SSF

- A draft 10-year strategy for the ACIAR-WorldFish (Appendix 6) to enhance the impact of fisheries research-in-development has been submitted to ACIAR for consideration and discussion.

WorldFish/ACIAR (2018 – draft for discussion) Strategic plan for the engagement between ACIAR and WorldFish, 2018 – 2027.

6 Conclusions and recommendations

6.1 Conclusions

This SRA has developed foundational research outputs, improved program design and stimulated productive research collaborations. The outcome has been the development and resourcing of a rigorous and high profile program of SSF research for development outcomes. The challenges for sustaining a program on SSF research are substantial, even within the agriculture for development and fisheries sectors – where production gains and simple economic indicators hold greater allure than the more distributed and harder-to-enumerate benefits provided by SSF.

The program on SSF, led by WorldFish will include a series of aligned projects that will continue to build evidence on the values, replacement costs and benefits from investment in SSF research.

6.2 Recommendations

Subsequent to the completion of this project there are three research outputs (Malnourished in a sea of micronutrients; Are all fish created equal? Accounting for micro-nutrients and macro-trends; Securing a Just Space for Small-Scale Fisheries) that require submission – further efforts to ensure these are published will be supported by the now established SSF program led by WorldFish. The Hidden Harvest II research must continue to be a productive collaboration – meeting an ambitious but critical timeline.

We recommend a timeline to develop, finalise and publish the 10 year plan between WorldFish and ACIAR – including our submission of the final draft to ACIAR for comment, a short consultation workshop to arrive at a prioritised action plan and to agree on final steps of publication and communication of the plan.

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7.2 List of publications produced by project

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[From local to global: How research enables resilient and sustainable small-scale fisheries](#)

[Research as a catalyst for change](#)

8 Appendixes

- 8.1 Appendix 1: Resilient Small-scale Fisheries Symposium Proceedings of a workshop held in Penang**
- 8.2 Appendix 2: Are all fish are created equal? Accounting for micro-nutrients and macro-trends**
- 8.3 Appendix 3: Securing a Just Space for Small-Scale Fisheries**
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- 8.6 Appendix 6: Strategic plan for the engagement between ACIAR and WorldFish, 2018 - 2027**