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Scaling strategy

Upgrading fisheries science curriculum and training tools for Zambia and the SADC region

*Netsayi Noris Mudege
Kelvin Mashisia Shikuku
Lizzy Muzungaire*

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About WorldFish

WorldFish is an international, not-for-profit research organization that works to reduce hunger and poverty by improving fisheries and aquaculture. It collaborates with numerous international, regional and national partners to deliver transformational impacts to millions of people who depend on fish for food, nutrition and income in the developing world. Headquartered in Penang, Malaysia and with regional offices across Africa, Asia and the Pacific, WorldFish is a member of CGIAR, the world's largest global partnership on agriculture research and innovation for a food secure future.

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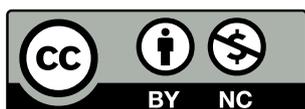
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Contact

WorldFish Communications and Marketing Department, Jalan Batu Maung, Batu Maung, 11960 Bayan Lepas, Penang, Malaysia. Email: worldfishcenter@cgiar.org

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List of acronyms

ASTC	Aquaculture Skills Training Center
AQ TEVET	Aquaculture Technical, Vocational, and Entrepreneurship Training for Improved Private Sector and Smallholder Skills
KFTI	Kasaka Fisheries Training Institute
NRDC	Natural Resources Development College
RUFORUM	Regional Universities Forum for Capacity Building in Agriculture
SADC	Southern African Development Community
STEM	Science, Technology, Engineering and Math
TEVET	Technical Education, Vocational, and Entrepreneurship Training
TEVETA	Technical Education, Vocational and Entrepreneurship Training Authority
UNZA	University of Zambia

Executive summary

Improved performance of aquaculture value chains has been shown to promote economic, social, and environmental development in developing countries. Effective linkages of small and medium scale farmers to profitable value chains and strengthening partnerships between public and private sector are key for realization of such development impacts. Through funding by the Norwegian Agency for Development Cooperation (Norad), WorldFish and partners implemented a project, "Aquaculture Technical, Vocational, and Entrepreneurship Training for Improved Private Sector and Smallholder Skills (AQ TEVET). The project aimed at enhancing the human resource capacity relevant to the private sector and increasing the number of smallholder farmers with adequate knowledge exposure and relevant practical skills for sustainable and inclusive aquaculture growth in Zambia. Following cost-effective achievement of the project's goal and a systematic assessment of the scaling readiness of the innovation package promoted, this paper maps out a scaling strategy for upgrading fisheries science curriculum, training tools and online learning in Zambia and the SADC region. The paper describes the innovation package proposed for scaling, outlines the scaling mechanisms and assesses the scaling readiness of the package. Finally, it describes support mechanisms for scaling and lessons learnt upgrading the curriculum with TEVET institutions in Zambia and how these lessons can inform scaling of the innovations to Universities and other TEVET institutions dealing with fisheries science curriculum in Zambia and the region.

1. The problem

Promoting sustainable growth and development of the aquaculture value chain is a top policy priority for increased incomes, reduced poverty, employment creation, improved livelihoods, and women empowerment in Zambia. Increased participation of small- and medium-scale farmers in the value chain could effectively set Zambia's aquaculture on a sustainable growth path. One promising approach to integrating farmers into profitable aquaculture value chains is through effective Technical Education, Vocational, and Entrepreneurship Training (TEVET) systems. Yet existing TEVET systems face serious capacity gaps and have often failed to generate relevant skills for the private sector. Consequently, linkages between smallholder farmers and the private sector remain weak, further limiting access to inputs and output markets and hindering effective participation in the value chain.

1.1 The Aquaculture Technical, Vocational, and Entrepreneurship Training for Improved Private Sector and Smallholder Skills project

To address the problem, WorldFish partnered with Musika, Blue Planet, and Natural Resources Development College (NRDC) to implement the project, "Aquaculture Technical, Vocational, and Entrepreneurship Training for Improved Private Sector and Smallholder Skills (AQ TEVET)." The project is funded by the Norwegian Agency for Development Cooperation (Norad). The goal is to enhance the human resource capacity relevant to the private sector and increase the number of smallholder farmers with adequate knowledge exposure and relevant practical skills for sustainable and inclusive aquaculture growth in Zambia. The project focuses on two major components to achieve its goal. The first component targets upgrading the fisheries science curriculum and training tools and developing an online training platform and internship program at the NRDC. The second component focuses on enhancing the technical education, vocational and entrepreneurship skills of rural women, men and youth smallholder commercial fish farmers and increasing their linkages to input/output markets and entrepreneurship opportunities via private sector extension support and services delivery.

2. A plan for scaling

This scaling strategy focuses on the first component of AQ TEVET. We define scaling as "the process of expanding, adapting and sustaining successful interventions (policies, programs or projects) in geographic space and over time to reach a greater number of people" (see Cooley and Kohl, 2016 & Cooley & Howard, 2019). Consistent with Gargani and McLean (2017), we recognize that scaling is "a *coordinated effort* to achieve *impacts at optimal scale*, and undertaken if it is both *morally justified* and supported by the *dynamic evaluation of evidence*." Furthermore, we recognize that an integral component of scaling is "systems change aimed at bringing about lasting positive impacts by altering underlying structures and supporting mechanisms" (Woltering et al., 2020). Finally, this strategy focuses on horizontal scaling, that is, realizing larger impacts over greater geographies in ways people value more, and (2) vertical scaling, that is, changing the institutional environment through higher-level influencing.

2.1 The innovation package

The innovation package comprises an *upgraded fisheries science curriculum and training tools* combined with an *online training platform and internship program* at the NRDC. In collaboration with WorldFish, NRDC upgraded its fisheries science curriculum in 2019. The upgraded curriculum includes comprehensive training in aquaculture, entrepreneurship, a component of online learning hosted on the Blue Planet platform, and a revamped and strengthened internship program. The upgraded curriculum was endorsed by the University of Zambia (UNZA) on 10th December 2019, authorizing its implementation in January 2020. Quality was monitored, controlled and enforced by UNZA, which had the authority to underwrite the diploma certificates conferred by NRDC. Short courses are offered at a fee and combine both online and practical sessions at NRDC. Through the funding from Norad, WorldFish also supported the construction of aquaculture skills training centre with ponds and indoor hatcheries to help practical skills development in students.

The process to upgrade the curriculum was rigorous. A research component accompanied the curriculum upgrade program for NRDC in Zambia. Under this component, the public and private sector players were engaged in training needs assessment to identify their needs. The project also interviewed current students and alumni to understand their experiences and what they thought needed to change from their perspective. The curriculum was then developed, considering these needs and new global developments in the fisheries sector. Lecturers were trained on curriculum review, upgrade and design and then developed the new curriculum with oversight from WorldFish and UNZA. After the NRDC upgraded the curriculum, the project engaged public and private sector actors in curriculum validation exercises to upgrade the curriculum to national and regional standards and to meet national, and industry needs along the value chain. UNZA reviewed the curriculum and approved it before it was implemented. After the curriculum was approved, lecturers received capacity building on how to implement the new curriculum. A similar process was followed for the development of the short-courses curriculum.

The upgraded curriculum fills several capacity gaps, including:

1. Ensuring well-trained, practically skilled and competent graduates to meet the private sector's demand.
2. Integrating new local and global developments in aquaculture into the existing curriculum to better serve the sector.
3. Strengthening the entrepreneurial capacity of students to increase employment creation.

The short courses promote continued capacity building and strengthening for practitioners as follows:

1. Improve the skills of professionals employed in both the public and private sector by offering tailor-made refresher courses
2. Improve the skills of smallholder farmers (and other value-chain actors) by offering tailor-made courses to meet their needs.

2.2 Scaling mechanism

Several organizational and technical factors were critical to the success of the innovation at the pilot scale. These include:

1. Buy-in by the Ministry of Agriculture and the Ministry of Fisheries and Livestock. The former is where NRDC belongs and reports to while the latter launched the project.
2. Support from WorldFish to upgrade the curriculum and provide technical support,
3. The willingness of NRDC to change its curriculum and the willingness and ability of the UNZA to authorize implementation of the new curriculum and ensure quality control.
4. The demand for online learning, especially after the suspension of in-person learning for many educational institutions at the peak of the COVID-19 pandemic.
5. The availability of academic staff to deliver the upgraded curriculum,
6. Supportive infrastructure such as the computer lab and the Aquaculture Skills Training Center (ASTC) were set up or constructed through WorldFish's support.
7. Engagement of the private sector in training needs assessments to align curriculum to the needs of the industry.
8. A strong marketing strategy and mass media campaigns to promote the Fisheries Science course and encourage women to enrol.

While it may be possible for some organizations to implement this package at once, we envision a phased-in scaling mechanism for a streamlined scaling process. In the immediate and intermediate-term, the focus will be on scaling the impacts of the upgraded curriculum integrating the three aspects listed in section 3.1. In the long term, curriculum upgrading processes can be implemented with other institutions, including TEVET institutions, the private sector and universities in Zambia and the region.

Scaling by NRDC:

NRDC already has the basic infrastructure to be able to scale its innovation to reach more people.

1. Invest in expanding its facilities, including the computer lab, which currently accommodates 18 students only.
2. Short courses will also be offered at NRDC's physical facilities and via an online platform through distance learning, allowing a greater reach of the program.
3. To target smallholder farmers, some of whom cannot pay the cost but need training, NRDC will market its courses to NGOs working with farmers and sponsor smallholder farmer participation.
4. The NRDC, through its ASTC, should build strong research partnerships with both local and international research and private sector organizations. For example, if the research partners use the ASTC infrastructure:
 - a. Students may gain practical experience at the ASTC or as interns or in the research partner or private sector partner organization.

- b. Collaboration on research with partners hosted at the ASTC will catalyze the acquisition of new knowledge by the Department of Basic Sciences and Fisheries at NRDC to ensure that teaching and curriculum remain innovative and on the cutting edge.

Scaling to other institutions within Zambia and other African countries.

There are two types of educational institutions that can be targeted for scaling efforts, 1) other TEVET institutions and 2) Universities. Additionally, we can scale some components of the skills upgrading program to the private sector.

TEVET Institutions

Scaling to other TEVET institutions within Zambia will be based on training and capacity building linkages between NRDC and other TEVET institutions. However, we observed that some TEVET institutions that offer TEVET are not registered and do not have any external quality assurance systems. Therefore, attempts to improve the quality of graduates from training institutions by upgrading the curriculum should be accompanied by capacity building for these TEVET institutions to affiliate their programs to accredited bodies. The need for capacity building was experienced with Kasaka Fisheries Training Institute (KFTI). Through its engagement on the project, KFTI upgraded the curriculum of its two-year certificate program in Fisheries science. KFTI is currently pursuing accreditation with Technical Education, Vocational and Entrepreneurship Training Authority (TEVETA). It would not have been easy for them to meet the TEVET accreditation criteria without the revised curriculum. Identified scaling partners will start at different levels. Some will need a two-pronged approach focusing on improved curriculum and accreditation and quality control systems. Those that are already accredited may start by upgrading their curriculum. They will then expand to additional dimensions, including the online platform depending on the availability and functioning of the infrastructure.

NRDC is willing and has the organizational capacity to support other TEVET institutions with training. However, in the initial stages of scaling, WorldFish will continue collaborating with NRDC to provide technical backstopping to support the scaling partners. An exchange program between other TEVET institutions and NRDC and creating a multi-stakeholder platform will accelerate knowledge and skills transfer while allowing access to practical sessions at NRDC. As the innovation package scales to other TEVET institutions, TEVETA and Higher Education Authority (HEA) have the organizational capacity to provide quality control for skills/trades schools and higher education institutions, respectively. UNZA, Mulungushi University (MU) and Copperbelt University (CBU) will provide backstopping in terms of quality control at scale.

Scaling curriculum review and upgrading to universities

Despite the African Union's declaration that the Blue Economy is Africa's future, there is little investment in developing the skills to grow the sector. The Association of African Universities identified the need to upgrade the curriculum to ensure African universities deliver skills and professionals required by the labour market (FAO, 2017). However,

universities are underfunded to conduct research needed to upgrade curricula. In addition, tertiary institutions are often geographically isolated and have limited collaboration among themselves, the private sector, government, policymakers and local communities. Building on existing partnerships and experience gained from upgrading the fisheries curriculum for TEVET institutions in Zambia, the curriculum upgrading model could be scaled out to other institutions of higher learning within SADC.

The scaling strategy is focusing on government-owned universities, which are often underfunded. Curriculum upgrading exercises could happen at two levels: 1) at universities in-country and the regional level. For a successful scale-up of curriculum upgrading, exercise universities need to meet the minimum conditions such as high-level support for the exercise, availability, and capacity of staff to engage in curriculum reform and implement the upgraded curriculum. In addition, most universities will need funding to upgrade their infrastructure to meet the demands of the new upgraded curriculum. As a result, a strong fundraising component needs to be part and parcel of a successful scaling put strategy.

The short-term focus will be on upgrading the university curriculum at the level of universities within countries. For this short-term goal, which can take two years to fully accomplish, the following steps are useful:

1. Gain approval from top management on the need for curriculum reform.
2. Conduct rigorous research and needs assessments for the sector. The research will target current students, alumni, public and private sector players, smallholder farmers and NGOs.
3. Learning visits to Northern and Southern institutions to acquaint with new international developments and demands in the sector.
4. Upgrading the curriculum and infrastructure.
5. Upgrading university infrastructure to facilitate meaningful online learning.
6. Training of lecturers to implement their curriculum in gender-responsive ways to promote enrolment of women into Science Technology Engineering & Maths subjects (STEM).

The Chinhoyi University of Technology in Zimbabwe, Mulungushi University in Zambia and Copperbelt University in Zambia have expressed interest in upgrading their fisheries science curriculum (Mudege et al. 2020).

Scaling fisheries science curriculum at a regional level

Scaling fisheries science curriculum at the regional level is a long-term scaling goal. A harmonized fisheries science curriculum at the regional level could benefit students and the region as a whole:

1. It will improve the quality of fisheries and aquaculture expertise in the region.
2. When the curriculum is harmonized, it could pave the way for the region to set up centres of excellence for fisheries and aquaculture. Students would benefit from taking

specialization courses from regional universities with key competencies on specific topics and still get an accredited degree that is recognized across the region.

On several occasions, universities in Southern Africa have expressed a desire to upgrade their fisheries science curriculum and harmonize it across the regions. For example, in conjunction with FAO Sub-Regional Office for Southern Africa, the WorldFish Centre and the Chinhoyi University of Technology, Zimbabwe, co-hosted the 1st SADC Aquaculture Science-Expert Working Group in December 2016 in Zimbabwe. The main objective of the meeting was to develop a strategy that would enable SADC universities to align their aquaculture research and teaching with the SADC Regional Aquaculture Strategy and Action Plan. Jointly with Chinhoyi University, the University of Zimbabwe and private sector players within SADC, WorldFish implemented an Aquaculture Mentorship Scheme. The scheme aimed to improve the practical application of university training to ensure that graduating students have sufficient practical experience to run a fish farm. Through funding from Operation Phakisa (WorldFish-South Africa Partnership), the mentorship scheme successfully hosted the SADC regional aquaculture mentorship program from 5th December to 22nd December 2017, in Kariba, Zimbabwe. Participants came from different countries, including Lesotho, Malawi, Namibia, Zambia and Zimbabwe. Unfortunately, these efforts to harmonize the curriculum have not borne fruit due to a lack of funding and coordination (Mudege et al., 2020).

To harmonize fisheries curriculum upgrading at the regional level is a monumental task.

1. It requires high-level political commitment and agreements at regional levels regarding steps to be taken and harmonized.
2. Engagement of regional bodies such as RUFORUM and the Association of African Universities to lobby for curriculum reform and provide capacity building where needed.
3. Learning visits with other Southern and Northern Universities.
4. Resources to conduct relevant research and engagement with stakeholders to develop a curriculum that aligns with local, regional, and international needs and standards.

Universities should meet the minimum conditions outlined for successfully scaling the upgraded curriculum at local universities before scaling the curriculum upgrading process at the regional level. Due to its role as a neutral and its local and international networks, WorldFish could play a coordination role in this process.

WorldFish could play a coordination role to facilitate curriculum harmonization and upgrading at the regional level.

Scaling the online learning platform

Private sector partners can benefit from scaling the curriculum upgrading process by getting highly skilled staff to join their organization. However, they can also benefit from the BluePlanet online platform. WorldFish and NRDC, since 2017, have been collaborating with BluePlanet, which hosts the world's largest e-learning platform on aquaculture, to develop an e-learning platform on Tilapia for NRDC. This platform is ready to scale to the region and beyond. Private sector actors can easily benefit from this online

platform by enrolling their staff to take refresher courses to be awarded a certificate upon completion. In addition, it is envisaged that the online training platform will be scaled for use by other TEVET institutions and Universities free of charge. While the tilapia platform has already been scaled out to private sector actors in Zambia, Uganda, Kenya, Rwanda, Ivory Coast, and Tanzania, the partnership hope that the platform will reach 10,000 in Africa by 2024.

Today's youth are inclined to engage with such a platform given their engagement with social media and propensity to consult the internet for knowledge-enhancing purposes. Online learning is a major conduit for communicating knowledge and skills by the industry. Also, there is a great scope that online training tools could be developed and translated into vernacular languages in Zambia and Zimbabwe during the later stages of the project. This requires some investment.

2.3 Assessing readiness to scale

We follow a 5-steps process to assess scaling readiness (see the scaling readiness tool by Sartas et al., 2020). These steps include 1) characterization of stakeholders, interventions, innovations, and the scaling context, 2) assessing the scaling readiness of the innovation in its scaling context, 3) identifying the activities and partnerships to overcome bottlenecks as part of scaling strategy, 4) validating the feasibility and acceptability of the scaling strategy, and 5) monitoring, evaluating, and learning about scaling strategy implementation.

The innovation package is relevant and cost-effective. Zambia's Ministry of Fisheries and Livestock perceives the need for the upgraded curriculum as evidenced from the launch of the project activities by the Ministry's Permanent Secretary. Zambia's National Development Plan (2015-2021) estimates that fish production needs to increase by 108,000 metric tons to meet the per capita fish supply of 12kg.

Efforts to upgrade the curriculum are recognized as important in ensuring the required human resources to manage the fisheries sector sustainably. As mentioned before, the Association of African Universities has reiterated the need for curriculum reform for African universities to deliver graduates that need the demands and needs of the labour market. Regional universities and fisheries departments have attempted to meet this challenge but have not yet succeeded due to the lack of funding and coordination.

A study conducted by WorldFish at the beginning of the AQ TEVET project indicated that commercial private sector players had challenges employing fisheries science graduates from NRDC because the graduates lacked adequate practical skills and knowledge in aquaculture. A mid-term independent review of the project found that the upgraded curriculum, tools, and online training platform were consistent with the human resource needs of the private sector. The review further showed that students found the online learning platform helpful. Smallholder fish farmers and small and medium enterprises appreciated the role played by interns in improving extension services delivery. The process of upgrading the curriculum strengthened the capacity of the training officers in the faculty of fisheries science at NRDC and KFTI. The mid-term review report indicated that the intervention was cost-effective.

Several key characteristics of NRDC made the intervention a success. For example, NRDC was already accredited by TEVETA, had a quality control system through the University of Zambia; the senior managers supported the process and were able to allocate land and invest in co-funding for support infrastructure such as a borehole to supply water to the ASTC. Early evidence shows that committed organizations such as KFTI can replicate these factors. However, some organizations, such as KFTI, would first require accreditation from TEVETA.

The AQ TEVET project constructed an aquaculture skills training centre and set up a computer laboratory equipped with computers and a server. The mid-term review showed ownership and commitment by NRDC as critical. For example, NRDC fenced the facilities, sunk a borehole to ensure sustainable water supply, and interns to run their ASTC as a sustainable business. These activities indicate the ability of pilot organizations to maintain the facilities beyond the project's life. However, most scaling partners will likely face similar gaps as NRDC in infrastructure. Therefore, there will be a need for funding and technical support in establishing the facilities at the scaling partner's organizations. The AQ TEVET project also observed that electricity connection to a phase 3 electricity grid was necessary but could take a considerable amount of time.

Through its media campaign strategy, the NRDC boosted the number of women enrolling on the Fisheries Science program. However, lecturers have often stated that female students are not performing as good as male students. The low performance by female students may point to the need to accompany the innovation with research to understand why female students are not performing as well as male students and then design interventions around that.

3. Implementing the scaling plan

Implementing the scaling plan will require strong partnerships among multiple stakeholders. The major challenge relates to investment in infrastructure development. As mentioned, WorldFish played a crucial role in the establishment of the skills training centre at NRDC. Through WorldFish's intervention, UNZA provided technical support towards the upgrading of the NRDC and KFTI curriculum. In addition, two universities in Zambia (Mulungushi University and Copperbelt University) have further expressed interest to partner with WorldFish in providing technical backstopping and quality control during the scaling process. For scaling to other TEVET institutions in the SADC region, a similar arrangement and collaboration with universities and accredited curriculum development centers will be critical. Furthermore, the proper running of operations at the training centres will require a stable electricity power supply. Countries in the SADC region have been experiencing power shortages, and Universities have not been spared. Power shortages necessitate investment in alternative power sources, particularly solar systems.

The AQ TEVET project is ending in 2021. No funds are allocated for scaling by the project. However, initial recipients of the innovation have shown a willingness and ability to continue even after the project. WorldFish will explore the possibility of phase II funding for the project from Norad and other development partners to support the scaling process.

Efforts are currently ongoing to engage with scaling partners in fundraising from developing partners.

There is also the possibility to explore co-funding mechanisms with the scaling partners. As the private sector is a significant stakeholder and beneficiary, demonstrating a clear business case would likely incentivize investment in developing the required infrastructure. The required funds for scaling could be mobilized through public-private sector partnerships. For example, in Zambia, since the government appreciates the beneficial impacts of the innovation in employment creation and management of fisheries resources, in-country scaling partners could lobby the Ministry for Education, Ministry of Agriculture, and Ministry for Fisheries and Livestock to invest in relevant infrastructure.

The curriculum is a government policy document. Changing a government policy document requires effective dialogues and engagement with government stakeholders. Therefore, there is a need for continued policy engagement and collaboration with the government through the Ministries of Agriculture and Ministries of Fisheries and Livestock in Zambia and other scale-up countries. Financial resources will be needed to facilitate continued dialogue until the reform and upgrade process is complete.

Scaling in the region will require establishing new partnerships with regional bodies such as RUFORUM and the Association of African Universities. Through such partnerships, negotiations can be made within the regional landscape for curriculum reform and upgrading and provide capacity building where needed.

4. Monitoring, learning, and dynamic evaluation

WorldFish will maintain a close partnership with the scaling organizations and will continuously evaluate, through its MEL and Impacts Assessment unit, the impacts of the innovation as it scales. This evaluation will assess the partnerships, the beneficiaries, and the unintended impacts. Dynamic evaluation will use a mixed-methods approach combining qualitative and quantitative methods and considering complexities at the systems level as the innovation reaches scale. Where necessary, adjustments will be made informed by the lessons learnt. In addition, WorldFish will encourage scaling partners to hold quarterly stakeholders' reflection meetings to discuss the progress and exchange ideas. The private sector, government, NGOs, and smallholder farmers will also participate in these stakeholder reflection meetings. This type of engagement will further create a multi-stakeholder platform for sustainability. WorldFish will use such platforms to provide feedback to the scaling partners.

5. Conclusion

Scaling an innovation package comprising an upgraded fisheries science curriculum and training tools combined with an online training platform and internship program needs commitment and collaboration from different sectors. First, there is a need for close collaboration between the institutions seeking to upgrade and the bodies set up by the government to offer supervision and quality control. In some instances, colleges and universities may need to invest in infrastructure to support the upgrading process, which may require significant financial investments to set up the infrastructure. An upgrading process also needs to be accompanied by capacity strengthening for faculty members to implement the upgraded curriculum and achieve intended outcomes. Second, an upgraded curriculum needs to respond to the needs of the industry and other stakeholders. To respond to needs, upgrading the curriculum needs to be evidence-based, considering the needs of the private sector, government departments and other users of the products from tertiary institutions. Thus the private sector, relevant government ministries, NGOs, and smallholder farmers, students and alumni need to be consulted to ensure alignment of curriculum with expressed needs. An upgraded curriculum also needs to align with global trends in the sector to ensure that learners get relevant and up to date skills. The lack of resources and commitment can derail curriculum upgrading processes.

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About WorldFish

WorldFish is a nonprofit research and innovation institution that creates, advances and translates scientific research on aquatic food systems into scalable solutions with transformational impact on human well-being and the environment. Our research data, evidence and insights shape better practices, policies and investment decisions for sustainable development in low- and middle-income countries.

We have a global presence across 20 countries in Asia, Africa and the Pacific with 460 staff of 30 nationalities deployed where the greatest sustainable development challenges can be addressed through holistic aquatic food systems solutions.

Our research and innovation work spans climate change, food security and nutrition, sustainable fisheries and aquaculture, the blue economy and ocean governance, One Health, genetics and AgriTech, and it integrates evidence and perspectives on gender, youth and social inclusion. Our approach empowers people for change over the long term: research excellence and engagement with national and international partners are at the heart of our efforts to set new agendas, build capacities and support better decision-making on the critical issues of our times.

WorldFish is part of One CGIAR, the world's largest agricultural innovation network.

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