



INITIATIVE ON  
Aquatic Foods

# A report on the Ghana country level inception workshop of the CGIAR Initiative on Aquatic Foods

Jack Pumpuni Frimpong-Manso, Mary Kudom-Agyemang, Everisto Mapedza, Marie-Charlotte Buisson, Ruby Asmah and Lawrence Ahiah

September 22, 2022



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Citation: Jack Pumpuni Frimpong-Manso, Mary Kudom-Agyemang, Everisto Mapedza, Marie-Charlotte Buisson, Ruby Asmah and Lawrence Ahiah. 2022. A report on the Ghana country level inception workshop of the CGIAR Initiative on Aquatic Foods. Workshop Report. Ghana.

### **Authors**

Jack Pumpuni Frimpong-Manso (Former Intern, IWMI, Ghana)  
Mary Ama Kudom-Agyemang (Independent Media Consultant, Ghana)  
Everisto Mapedza (RAqFs Ghana Lead, IWMI, Ghana)  
Marie-Charlotte Buisson (RAqFs Initiative Co-Lead, IWMI, Colombo)  
Ruby Asmah (Principal Research Scientist, CSIR, Ghana)  
Lawrence Ahiah (Director, Fisheries Commission, Ghana)

Cover image, page 5 IWMI; page 16 Curtis Lind/WorldFish; page 20 Nana Kofi Acquah/IWMI.

# Acknowledgements

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This work was undertaken as part of the CGIAR Initiative on Aquatic Foods and funded by CGIAR Trust Fund donors. We would like to thank all funders who support this research through their contributions to the CGIAR Trust Fund: <https://www.cgiar.org/funders/>

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# List of abbreviations

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AGRA	Alliance for a Green Revolution in Africa
CEO	Chief Executive Officer
CGIAR	Consultative Group on International Agricultural Research
CIAT	International Center for Tropical Agriculture
CIFOR	Centre for International Forestry Research
CSIR	Council for Scientific and Industrial Research
DCE	District Chief Executive
ESA	Eastern Southern Africa
EPA	Environmental Protection Agency
FAO	Food and Agriculture Organization of the United Nations
FC	Fisheries Commission, Ghana
GASIP	Ghana Agricultural Sector Investment Programme
GIDA	Ghana Irrigation Development Authority
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
HER +	Harnessing Equality for Resilience in the Agri-Food System
IWMI	International Water Management Institute
KNUST	Kwame Nkrumah University of Science and Technology, Kumasi
LAC	Latin American Caribbean
MASLOC	Microfinance and Small Loans Centre
MCD	Municipal Coordinating Director
MOFAD	Ministry of Food and Aquaculture Development
NDA	Northern Development Authority
NDPF	National Development Project Fund

NGOs	Non-governmental Organizations
PFAG	Peasant Farmers Association of Ghana
RAqFS	CGIAR Initiative on Resilient Aquatic Food Systems
SA	Southern Asia
SAEP	Southeast Asia and the Pacific
SARI	Savannah Agricultural Research Institute of CSIR
SI-MFS	Sustainable Intensification of Mixed Farming Systems
SIP	Savannah Investment Programme
STEPRI	Science Technology Policy Research Institute of CSIR
TAFS-WCA	Transforming Agrifood Systems in West and Central Africa
UCC	University of Cape Coast
UDS	University of Development Studies
UENR	University of Energy and Natural Resources
UG	University of Ghana
USD	United States Dollars
WCA	West and Central Africa
WRC	Water Resources Commission
WRI	Water Research Institute of CSIR

# 1. Introduction

## 1.1. Background and context

Aquatic foods are an essential and growing component of the global food system and provide various benefits; however, these benefits are threatened by multiple stressors such as overharvesting of wild aquatic food stocks and poor governance of aquatic commons. These shocks lead to the marginalization of traditional indigenous fishers, inequalities in supply chains resulting from competing demands for aquatic foods in globalized markets (Farmery et al. 2021), vulnerabilities of coastal and riparian communities and aquatic ecosystems to climate change (Tigchelaar et al. 2021), degradation and destabilization of aquatic ecosystem productivity, biodiversity and carbon-sequestration functions arising from pollution, land-use change, and competition for water, space and resources (Vörösmarty et al. 2010; Cohen et al. 2019). Other stressors include aquatic animal diseases that can destabilize production and antimicrobial resistance (Cabello et al. 2013), supply chains inefficiencies (McMahon, 2022) and disruptions from COVID-19 (Farrell et al. 2020), natural hazards and political and economic instabilities (Gephart et al. 2017; Sievert et al. 2019) and underinvestment in breeding aquatic animals for improved growth, feed conversion efficiency and climate resilience (Lala-Pritchard and Johnstone, 2020; Benzie, Beveridge and Marwaha 2021).

Rapid population growth, urbanization, and increasing incomes are expected to lead to a higher demand for fish and high-value foods, triggering higher fish imports (Ragasa et al. 2022). If aquaculture does not rapidly expand, the supply-demand gap will widen, and per capita, fish consumption will drop if imports cannot fill the gap (Chan et al. 2019). Under a business-as-usual scenario modelling, African aquaculture production will likely be 2.8 million metric tons in 2050; however, it needs to grow by an additional 5.0 million metric tons by 2030 and 10.6 million metric tons by 2050 to reduce dependence on imports—two and four times higher than current rates, respectively (Chan et al. 2019). Invigorating local production and accelerated aquaculture growth could generate 8 million jobs along the value chains in Africa. (Chan et al. 2021).

European countries have the highest aquatic food consumption in the world, with Portugal recording over 36kg per capita; however, African populations consume less with a per capita average of 10kg (Neethling 2022). Aquatic food accounts for 60% of Ghana's national dietary intake of animal protein (Rurangwa et al. 2015; Chan et al. 2021), about four times higher than the global average (Hishamunda et al. 2009). Ghana is an exception in the continent. The current gap between aquatic food demand and supply, which is filled by imports, is about 60% (600,000 tons) of total fish production (Ragasa et al. 2022). Expansion in aquatic food demand, because of rapid population growth, urbanization, increasing incomes, and changing consumer preferences, is expected to continue, and therefore, the supply-demand gap is forecast to widen by 2050 since only marginal increases in fish production can be expected from improved capture fisheries management (Chan et al. 2021). Therefore, Ghana presents an appropriate context for implementing the Consultative Group on International Agricultural Research (CGIAR) Aquatic Food Systems Initiative (AqFS).

The AqFS aims to strengthen the resilience of aquatic food systems to realize their full potential for nature, people and climate by tackling systemic challenges such as data gaps, gendered power asymmetries, water resource mismanagement, limited research investment and missed opportunities for scaling through agricultural innovation systems and address food insecurity by piloting the co-designing and scaling of aquaculture interventions in small water reservoirs for multiple-use purposes (irrigation, aquaculture, livestock, and domestic uses). World Fish and the International Water Management Institute (IWMI) are co-leading the implementation of this new initiative in 11 countries in the six target regions of Central West Asia and North Africa (CWANA), Southern Asia (SA), West and Central Africa (WCA), Southeast Asia and the Pacific (SEAandP), Eastern and Southern Africa (ESA), and Latin America and the Caribbean (LAandC). The beneficiary countries are Bangladesh, Cambodia, Ghana, India, Kenya, Malawi, Myanmar, Nigeria, Solomon Islands, Timor Leste and Zambia.

The three-year project is being implemented through global and regional programs categorized into five major work packages: Work Package 1 AquaData – focused on data and analytical tools supporting Aquatic Food Systems Initiative (AqFS) policies and investments in aquatic food systems; Work Package 2 Aqua+Partners – focused on creating cross-system partnerships to support AqFS actors' inclusion in food system transformations and ocean economy; Work Package 3 – including AqFS in multi-functional water management plan; Work Package 4 AquaGenetics – focused on public-private partnerships to scale delivery of genetically-improved fish varieties; and Work Package 5 AquaLabs – focused on creating platforms to evaluate, scale and accelerate the uptake of existing AqFS innovations.

The Resilient Aquatic Food Systems Initiative will work across multiple geographic locations; however, Work Package 3 (AquaPlans) is specifically targeting Ghana and will look to implement the most effective pathways to scale nutritionally sensitive integrated AqFS as well as how socially inclusive technologies and practices for aquatic foods can be incorporated into water resources projects and plans. Together with users, implementers and scalers, the initiative will co-design integrated packages and investments to upscale and apply a suite of multifunctional water and landscape innovations. These will result in more inclusive, diverse, resilient and sustainable aquatic food production systems.

Work Package 1 (Aqua Data) will also be implemented in Ghana to strengthen data-driven decision-making by examining the data gaps at different scales needed to be filled to understand and transform AqFS and the social, economic and environmental benefits and trade-offs of production and consumption of sustainable aquatic foods in a changing climate.

Partner institutions for the implementation in Ghana include the Ministry of Fisheries and Aquaculture Development, Ministry of Food and Agriculture, Council for Scientific and Industrial Research Water Research Institute (CSIR-WRI), Fisheries Commission and the Ghana Irrigation Development Authority (GIDA).

## 1.2. Problem statement

Fisheries and aquaculture play a significant role in food and financial security (Béné and Heck, 2005; Béné et al. 2015; Akongyuure et al. 2017; Akongyuure, Amisah and Edziyie 2017); however, there is limited empirical evidence of aquaculture significantly affecting poverty directly or indirectly (Toufique and Belton, 2014). In Ghana, capture fisheries and aquaculture do not meet 50% of the fish demand (Obirikorang et al. 2015). The challenges to the development of aquaculture identified for sub-Saharan Africa are feed and seed quality and availability, cost of cage and pond construction, financing and lack of technical acumen (Ridler and Hishamunda, 2001; Halwart and Moehl, 2006; Moehl et al. 2006; Blow and Leonard, 2007; Asmah, 2008), and lack of a market (Halwart and Moehl, 2006; Moehl et al. 2006). A lack of funds, high cost of feed, theft and lack of extension services have also been identified as constraints (Anane-Taabeah et al. 2011).

The co-design process will be informed through the synthesis of existing literature on aquaculture and initial site selection will be informed by remote sensing reservoir and suitability mapping exercises. The other key criteria for site selection will include water quantity and seasonality, water quality, socioeconomics (nutrition, poverty, Gender Equality and Social Inclusion [GESI]), ecosystems, and climate change vulnerability to contribute toward the attainment of Sustainable Development Goals 1 (no poverty), 2 (zero hunger), 3 (good health and well-being), 5 (gender equality), 6 (clean water and sanitation), 13 (climate action) and 14 (life below water).

## 1.3. Aim and specific objectives of the workshop

The aim of the CGIAR Initiative on Aquatic Foods workshop was to bring together relevant stakeholders to collaborate and brainstorm on how to leave a positive footprint in ensuring an abundance of aquatic foods to meet rising population growth, rising demand for aquatic foods, reduce poverty, improve environmental and climate performance and sustain nutrition and food diversity, whilst improving resilience and aquatic agricultural production systems. The specific objectives of the workshop were:



- To introduce the CGIAR Initiative on Aquatic Foods to key stakeholders and partners.
- To start the process of engagement with partners in the co-design of priority research activities to inform and support the development of a sustainable, equitable and healthy aquatic foods sector.

The workshop formally started with introductory remarks and welcome statements by Dr Everisto Mapedza/IWMI and Dr Olufunke Cofie/IWMI. Solidarity statements were delivered by Dr Anthony Yaw Karikari (Deputy Director CSIR, Water Research

Institute) on behalf of the Director of the Institute Prof. Yaw Osei Atweneboana, Paul Bannerman (Deputy Executive Director, Fisheries Commission), Eric Samuel Adu Danquah (Director of Planning, Monitoring, Evaluation and Coordination of Ghana Irrigation Authority) on behalf of the Chief Executive Engineer, Wilson Darkwah. Presentations/lectures were from Dr Kwesi Attah Kraah (Regional and Country Engagement Advisor, CGIAR – Western and Central Africa), Dr Marie-Charlotte Buisson, Initiative Co-lead and WP3 Lead (IWMI). Mavis Hawa Koomson (Minister of Fisheries and Aquaculture Development) delivered the keynote statement and launched the event.



## 2. Project commencement

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### 2.1. Excerpts of introductory remarks by facilitator, Dr Everisto Mapedza of IWMI

Everisto Mapedza, of the project implementing team, appealed to presenters to work within schedule (Annex 1) and participants should listen attentively to get the meaning behind the words that people will voice during the roundtable brainstorming session. Participants should wrestle with ideas, not persons. Although people can see things from different perspectives, a healthy dialogue is indispensable for success.

### 2.2. Welcome statement by IWMI country representative Dr Olufunke Cofie

IWMI is part of the CGIAR system organization—a global research partnership for food, secured future dedicated to reducing poverty, enhancing food and nutritional security and improving natural resources management. IWMI's role in this global partnership is to provide water solutions for sustainable climate-resilient development through clearly defined research for development actions. We are a research institute and not a conventional academic entity, but we bring scientific expertise to bear on development challenges. We bring solutions and we are focused on the outcomes and impacts of bringing solutions to the beneficiaries. We are committed to that and that is why we have brought every one of you to this meeting.

IWMI has been addressing water and land-related issues in Ghana, particularly for the past 20 years, and we recognize that it is important to pay attention to water. As climate change is evolving, we know the atmosphere is warming up, the water cycle is changing and we see more severe and less predictable floods and drought events. We all witnessed the flood events carried in the news. We see the poor water quality, outbreaks of water-borne diseases, and rising sea levels, with more risks, uncertainties and unknowns. In the midst of these, we have to use water for productive activities; we have to use water to produce food; we have to access water to meet our basic needs and we have to use water to rear fish. Water is

very important, and water is life, as people say. Therefore, it is very important that as a CGIAR organization; we pay attention to water challenges and water solutions that help us drive our development agenda in Ghana. As a knowledge institute, IWMI has developed an action framework for climate-resilient water management that builds resilience into decision-making at all levels, and we did this across four main domains:

First, we support infrastructure technology and overall management around technology and water infrastructure. This means we look at where the challenges are and how infrastructure coupled with bundled management solutions can help us maximize available water for food production. An example is a small-scale irrigation. We are working closely with the Ministry of Food and Agriculture, the Ghana Agricultural Sector Investment Programme (GASIP) and the Ghana Irrigation Development Authority (GIDA) at different levels to support small-scale irrigation around infrastructure. We see opportunities here to include fisheries and integrate fish and crops, and even livestock systems to ensure that we diversify food sources and income for our smallholder farmers. This is very important. We recommend climate-smart solutions, bundled with agronomy, water management measures, information services, and market solutions to drive the use of these resources appropriately.

Second, governance and participation. We believe that we cannot do it all alone, we do not have all the solutions and we need everyone. It is not just about technology, it is not just about science, it is not just about indigenous knowledge, and it is not just about people's perceptions and how they want to use their resources. Therefore, governance and participation are very important for us. For instance, we are working together with the Ministry of Food and Agriculture, CSIR Science Technology Policy Research Institute (STEPRI), the University of Ghana, Legon and the University of Development Studies (UDS), to look at social transformation processes in Upper West Region – how are the communities responding to building resilience against climate change and what will it

look like in years to come. With funding from the European Union Commission in Ghana, we are supporting the government of Ghana to come up with scenarios and mechanisms to inform the planning processes at the District Assemblies level. That is one of the solutions we are enacting and contributing to in terms of governance and participation in Ghana.

Third, we believe that knowledge is power, and information and learning are very important. Therefore, we developed capabilities across technology data and policy, we developed tools and decision support instruments to help us make the right decisions to use water. We take advantage of open data, satellite images, with ground truthing to create applications that help people decide in terms of when to use water, how to use water, where, and how to allocate water at the basic level and how farmers can learn to use water at the ground level. Recently, in Zebilla<sup>1</sup>, we introduced a water application tool—a very simple tool, costing only \$10-15, which farmers can use to help them know how to use water during the dry season. We realized that these farmers, while they were using water to irrigate their crops, they think they do not have enough water, so they apply water every 3 or 4 days and they are groaning because they do not have enough water during the dry season. We all know that they have only one production season in the north. But with this tool and from our participatory action research they realized they do not have to apply water every three days, they realized that they have enough water, and the crop will need water every eight days. That saves them a lot of water, a lot of energy and even fuel. So, we use simple tools and decision-support instruments that help not only farmers but also water planners. We also downscale remote sensing images which we use to develop applications that people can use to make water management decisions.

Finally, we also know it is important to look at everything holistically at a systems level. We try to connect the dots, not just one solution. We look at landscape approaches at the system level connecting markets, and private sector engagements with farmers' needs, with community participation to bring holistic solutions to some challenges that we find on the ground. It is more like applying system-level approaches to bring up solutions.

These are some things we are doing, and we are so privileged that we have the opportunity to also launch this project, for which CGIAR has provided seed funding. It is small and strategic, in the sense that we can launch something on integrated systems, and we can leverage existing initiatives of aquaculture for food and jobs and one village and one dam. With our innovations, we are already doing a lot with One District One Factory and Planting for Food and Jobs. We see the Aquaculture for food and jobs initiative as an opportunity to contribute to what the Ministry of Fisheries and Aquaculture Development is doing. With the small seed to start something, I am looking forward to an opportunity where we can leverage this seed and make it bigger. This is going to give us some pilot projects, but we are looking at covering the whole of Ghana with innovations until we have a good fish and nutrition diet on the table of every Ghanaian.

### **2.3. Solidarity statement delivered by Dr Anthony Yaw Karikari, Deputy Director of CSIR Water Research Institute on behalf of the Director of the Institute Prof. Yaw Osei Atweneboana**

The CSRI-WRI's mandate is to research water and other water-related resources. Therefore, this project aligns with the CSRI-WRI because we deal with everything related to water. We also gather information, and data, and create strategies for the socioeconomic development of our country. In our system, we have several divisions, and one of them is the Environmental Chemistry and Sanitation Engineering Division. There, we have a laboratory that deals with water quality-related issues, so if there are any associated problems with it, we will render our services and ensure that we are using quality water for our projects.

We also have an Environmental Biology, Health and Biotechnology Division, Surface Water and Climate Change Division, and a Fishery and Aquaculture Division. So, you understand why we are very much privileged to be part of this project. We also have the Aquaculture Research Development Centre at Akosombo, where we produce fingerlings for fish farmers all over Ghana. We also offer training in aquaculture development which contributes to our research activities and services towards ensuring the availability of abundant food for the population.

The CSIR-WRI is very much excited about being part of this project. We know you are discussing resilient aquatic food systems and this is a complex web of the elements and activities relating to food and water, along with the broader economic, social and natural environment in which they are embedded. We believe the development of an aquatic food system will provide the needed nutritional requirement and support the fishery system that we are establishing in the reservoirs within the One Village One Dam Project, which is an excellent effort by the government of Ghana.

#### **2.4. Solidarity statement by Deputy Executive Director of Fisheries Commission, Paul Bannerman**

The Resilient Aquatic Food Systems project is laudable that will help us bridge the gap between our demand and the supply of fish needs in the country. Ghana's fish deficit in 2020 was around 771, 000 metric tons, of which over 60% of national fish requirements are being acquired via exports. Ghana is endowed with a long coastline and several freshwater bodies within the Volta Basin. Especially in the northern part of the country, where we can use these outlets to increase our food production. But without adequate information and data emanating from our fisheries, we cannot successfully manage and develop new initiatives.

This project involves all stakeholders—I can see a lot of managers, researchers and regulators here at the helm of this project. I believe the future is bright and we will all benefit from it.

We are all aware that aquaculture is the bedrock from which we are trying to overcome the deficiencies in our marine sector. Therefore, we know that this project will help create more jobs, improve food security and enhance the livelihoods of women and youth along the water bodies and the value chain.

The Fisheries Commission, with offices in all 16 regions, will participate fully with its expertise to ensure this project succeeds, resulting in good quality fish on our tables. Not only good quality fish but also good quality water for our livelihoods.

#### **2.5. Solidarity statement delivered by Eric Samuel Adu Danquah, Director of Planning, Monitoring and Coordination of Ghana Irrigation Development Authority (GIDA) on behalf of the Chief Executive Engineer Wilson Darkwah**

This project is aimed at improving the productivity of aquaculture, which is one of the key benefits of stored water irrigation schemes or small dams' irrigation schemes. In the past, some of our irrigation dams were designed and constructed to include fishponds to encourage fish farming as a livelihood venture. A good example is the Kpong Irrigation Scheme, where a private company is producing fingerlings in the fishponds constructed for fish farmers around Volta Lake.

However, we have not taken advantage of such facilities to improve the livelihood of our farmers around our small dams, especially in the north. I believe this intervention is going to reverse this phenomenon and make aquaculture productive to impact the nutritional status of the beneficiary communities and provide a livelihood for the people.

The government, through the Ministry of Special Development Initiatives, implemented the One Village One Dam project to make water for productive uses available at all times in northern Ghana. Over 200 small dams were built under this initiative. The capacity of some of them may not be suitable for this project, because they may dry up in the dry season. For this reason, the Ghana Irrigation Development Authority (GIDA) attempted to construct small irrigation dams to complement the initiative and has completed 10 small dams, constructing eight more and has plans to construct more when funds are available. The capacity of these dams is such that water is always available to support aquaculture, livestock watering, domestic uses and crop production all year round. Drawdown of the water leaves behind depth storage for aquaculture and livestock watering.

This workshop on the CGIAR Resilient Aquatic Food Systems Initiative is for us to understand the concept and share experiences and lessons from our respective fields to make the project a success.

## 3. Thematic presentations

### 3.1. Presentation CGIAR by Dr Kwesi Atta-Krah Regional and Country Engagement Advisor – West and Central Africa (WCA) Initiative

CGIAR is now transitioning into the One CGIAR. CGIAR is a family of international research institutions. There were 15 institutions but now there are 13 of them. They include IWMI, IITA, World Fish, Alliance Biodiversity CIAT, CIP, CIMMYT, IRRI, IFPRI based in Washington DC, ILRI based in Kenya, Africa Rice, ICARDA, ICRISAT and CIFOR-ICRAF.

What the CGIAR effort is all about, given the global challenges we are facing now, is that it is wise for us to find ways to work together as an agricultural outfit to address the global challenges we face. You cannot have fish if you do not have water. Therefore, water is important and even if you have fish, you want to eat it with cassava and you want to eat it with rice. What the CGIAR is trying to show is that, apart from the fact that the challenges are multiplying globally, especially the challenge of climate change, there are all kinds of opportunities if we work together. And that is why in the last two years, we have been working on this reform to create a family that we call “CGIAR.” The One CGIAR is more unified and integrated. In terms of the reform process, it is a dynamic reformulation of the partnerships that we have been working with through the 13 centres. One CGIAR gives us dynamism and we must say CGIAR does not weaken your regional centres. That is a very important point to make. Regional centres, like IWMI, will continue to operate and will be strengthened through the CGIAR. We see all these centres as essential building blocks of what One CGIAR is trying to do.

So why now? Why are we getting into it? Some of the CGIAR centres have been in operation for almost 60 years, while others, like IWMI, are much younger. During that period, there have been many global impacts through the CGIAR centres. As I have said, today we have multiple challenges—the food and nutrition security challenge is much bigger and growing, biodiversity loss and

economic growth through agriculture need to be multiplied and we need to strengthen resilience whether you talking about water systems, given the climate change, and obviously, a climate crisis and we have to do all this in an integrated way. This makes it so important that we work together rather than having different groups act separately.

The CGIAR has recognition from organizations including the United Nations, AGRA and individuals like Bill Gates and their statements affirm the importance of CGIAR. The vision of CGIAR is to have “a world with sustainable and resilient food, land and water systems that deliver diverse, healthy, safe, sufficient and affordable diets, and ensure improved livelihoods and greater social equality, within global and regional environmental boundaries.”

We want women and men working together in charity as we work through this CGIAR. So, we are creating a new organization and the centres are key parts of that. We have consolidated our work into four coherent groups. Three of these four groups developed globally and that is important. What it means is that you pick a particular theme such as “adaptation to climate change,” and this is recognized as a global challenge. Then we say let us develop this program as a global program, so it involves people from all over the world. However, some components of the program will be implemented locally in the countries.

We have identified that in the work that we do, whether it is in the global initiative or within the regionally integrated initiative, we have to target several regions. CGIAR has chosen to work in six regions of the world. And the first one of these regions is CWANA, which is Central West Asia and North Africa. You know our North African brothers are much closer to the countries of central and west Asia, so they have one group. The rest are Southern Asia (SA); West and Central Africa (WCA); South East Asia and the Pacific (SEA and P); Eastern Southern Africa (ESA); and then Latin America Caribbean (LAC).

You will note that Africa is involved in three of the six regions that the CGIAR is working in. The first one is the WCA region where we are based, and then the ESA region and our northern African brothers are linked to the CWANA initiative. So, we have six or three regions that underline the key importance of Africa in CGIAR's work. Now for each region, we have appointed a Regional Director who has oversight over all we do in a specific region. So we have one Focal Person, in the case of WCA, Dr Nteranya Saginga whom I am representing here and who has also been the Director General of the International Institute for Agriculture (IITA) and for each of the regions that I have mentioned, there is a Regional Director. Beyond that, in each country, we have also identified a Focal Person to help coordinate, integrate, facilitate and harmonize. In Ghana, we have selected Dr Olufunke Cofie of IWMI as Ghana's Country Convener. She has a difficult task because foremost, she has her position within IWMI and that workload will not reduce. Additionally, she is taking on the responsibility of being a Focal Person for CGIAR in Ghana, which means, apart from IWMI, she will be involved in all CGIAR operations in Ghana. Therefore, it is a very important role, and we are glad that we have Dr Cofie taking on that responsibility.

I mentioned earlier that we have four major research groups, with three global and one regional, but I did not tell you what these research groups are. The first is Systems Transformation—this is where we look at the broader issues of policy, institutions, etc. because that is a key area. Sometimes the problem we face is not so much biological—It is policy, it is an institution, and it is how the entire system works. So, one of the big initiatives we have falls under the Systems Transformation thematic group.

The second one is the Genetic Innovation thematic group—where we talk about trying to research to improve the quality of livestock, fish, crops, and the breeding work we do, so we bring together technological solutions to varieties and seeds. Whether we are doing it in potatoes, rice, fish or livestock, all that work in that domain falls under this group.

The third research thematic area is the Resilient Agro Food Systems Group—This is where we talk about systems work and bring in resilience. It's

a very important area, and it works at the farm and landscape levels and brings environmental and socio-economic aspects into the research.

Those three are global in the sense that whether you go to the Americas, Asia or come Africa, they will have activities in several of those countries.

Then we have one very special program, which is focused on the six selected regions that I talked about and that is the Regionally Integrated Initiative. For instance, in WCA, we have one initiative, which is focusing on the integration of issues within the WCA region. And there will be links between that and the global initiatives because the global initiatives will have part of the work they are doing within our region.

All the work that we do must result in development. It must result in impact. We are not just talking about publishing results in high-quality journals and things like that, that is important. But the most important things are the impacts—we want to have impacts in five areas. The first is nutrition, health and food security; the second is poverty reduction, livelihood and jobs; the third is gender equality, including youth and social inclusion; the fourth is climate adaptation and mitigation, and finally environmental health and biodiversity. Therefore, these are the five impact areas of the CGIAR. If you are involved in the CGIAR Project, such as the Resilient Aquatic Food Systems, it must be clear which impact area you are going to contribute to. Sometimes you have an initiative that may contribute to two or three impact areas, and that is fine.

Let me also mention that in Ghana, we have several initiatives coming from the three global groups and the Regional Integrated Initiative. They include the Harnessing Equality for Resilience in the Agri-Food System (HER+); Harnessing Digital Technologies for Timely Decision-Making across Food, Water, and Land Systems; Transforming Agrifood Systems in West and Central Africa (TAFS-WCA); and then we have the Resilient Aquatic Foods for Healthy People and Planet (RAqFS), which is the initiative we are launching now. Therefore, as you talk about resilient aquatic foods, you must realize that this is not on its own, it is part of the family of initiatives. So, in the case of Ghana, it is going to be there with all these other initiatives.

Our other initiatives include Excellence in Agronomy; Resilient Cities through Sustainable Urban and Peri-urban Agrifood Systems; and Sustainable Intensification of Mixed Farming Systems (SI-MFS), which will include the livestock element, crops element and others. The Ghana work will also focus on plant health and accelerated breeding to meet Farmers' needs. This is a key part of the genetic innovation that I talked about earlier. We will also have the Enabling Tools, Technology, and Services for Genetic Gains initiative.

Partnerships are going to be key in all these initiatives. The CGIAR, from its inception, has worked with partners and all your organizations have been so vital in every research that the CGIAR has done. I also want to appreciate country governments that have stood with the CGIAR in several domains, including Ghana; we worked with various ministries in trying to achieve impacts, which is also part of the strategic priorities of the country.

Partnerships for research and with farmers and consumers are important. I am happy that we have some groups of NGOs who have been working directly with farmers and consumers. We also must remember the investors who invest in the work that we do. Capacity sharing is a key part of the work that we do across all these domains.

The CGIAR centres are coming together into a single organizational structure to enable us to better manage our resources, our research and our relationships. One CGIAR will enable new capacity dedicated to improving how we engage and align with our regional and national partners. We have refreshed our research strategy and portfolio, which will provide more focus on urgent global and local priorities. The CGIAR will match its partnerships with specific challenges at hand and provide a single point of entry for its partners.

In Ghana, you have multiple CGIAR Centers, but Dr Cofie will be the Focal Person to link with all the work we will do. Ghana is a major country for the CGIAR, as you can see from the 10 or more CGIAR initiatives already happening. In some countries, there might only be two initiatives within the same region. That should not be seen to mean that those countries are not important. You know we have to make strategic decisions and these are just

the first batch of initiatives that we are running. We believe as we move on, we will expand the work in Ghana as well as expand the work in WCA.

### **3.2. Introduction to the Resilient Aquatic Food System Initiative and its objectives in Ghana by Dr Marie-Charlotte Buisson, Initiative Co-Lead and Dr Eddie Allison, WP3 Lead (IWMI)**

Aquatic food is more than fish and is derived from over 3000 species of animals, plants and microorganisms grown in or harvested from water. That is why earlier speakers have stated water is key.

#### **Why do we need an initiative in aquatic foods?**

The first reason we need an initiative in aquatic food is that aquatic foods are a source of nutrition, providing micronutrient-rich foods for over 3.3 billion people around the world. But aquatic food also provides livelihoods and employment opportunities, and interestingly, they also provide livelihoods and employment opportunities for smallholder farmers, women and youth. And that is key for gender and youth employment. Aquatic foods have relatively low carbon footprints as compared to other sectors and have fewer biodiversity impacts. That is also important for our launch.

We know the demand for aquatic foods has been growing and will keep growing in the coming years and we need to act upon it and make sure that we can deliver these foods to the world and to the ones who need these foods. Finally, aquatic foods are also deeply interconnected with the rest of the food systems. Aquatic foods do not exist on their own – aquatic food is within food, water, air and land systems. That is why we need this initiative.

#### **Challenges**

Challenges preventing the resilience of aquatic foods are over-harvesting, especially of wild aquatic food stocks, inequities in supply chains; inequitable aquaculture productivity growth, the growth is happening in some species but not for all, vulnerabilities to climate change, pollution, land use change and competition for water, space and resources in the "blue economy;" and we also know of aquatic animal diseases and antimicrobial

resistance. These are the challenges we are facing and what is happening is these challenges are exacerbating the existing gender and other inequities. Hence the need to tackle these challenges. When we were designing the program and writing the proposal, we thought about why these challenges are persisting.

### **Why do these challenges persist?**

We think that there is an order-of-magnitude of underinvestment in aquatic food systems research and development resulting in a lack of data to inform policy and investment decision-making, which leads to them being under-valued, power asymmetries that marginalize AqFS actors - particularly women - in food systems transformations and the 'blue economy,' aquatic foods and associated livelihoods being overlooked in large-scale water resource management planning, underinvestment in genetic improvement for farmed fish limits productivity, profitability and resource use efficiency gains, and innovations and potential solutions to AqFS challenges remain unscaled. These challenges continue because national agricultural innovation systems do not extend to aquatic foods.

To tackle these five challenges, the program is designed in work packages as follows:

- Work Package 1 AquaData – Data and analytical tools supporting AqFS policies and investments in aquatic food systems;
- Work Package 2 Aqua+Partners – Create cross-system partnerships to support AqFS actors' inclusion in food system transformations and ocean economy;
- Work Package 3 AquaPlans – Including AqFS in the multi-functional water management plan;
- Work Package 4 AquaGenetics – Public-private partnerships to scale delivery of genetically-improved fish varieties; and
- Work Package 5 AquaLabs – Create Platforms to evaluate, scale and accelerate the uptake of existing AqFS innovations

### **Theory of Change**

We also designed a theory of change with the idea that what we deliver fits into several outcomes, benefits and responses to the SDGs. Some of the outcomes and especially the one which is

relevant for Ghana are the gender transformative strategies to enhance integrated food, livelihoods and water use outcomes in multifunctional land and water steps adopted by national partners in Myanmar, Cambodia, Ghana and Zambia.

With this, we want to deliver on the five impact areas. We think we can deliver not only on one impact area but to some extent we can deliver on the five impact areas. The first one is food security, but are we also able to deliver on the other impact area? We are delivering on improving nutrition, health and food security, which is obvious. But we are also delivering on poverty reduction, livelihoods and jobs, gender equality, youth and social inclusion, climate adaptation and mitigation and finally, environmental health and biodiversity. That is our ambition.

To deliver on these five impact areas, we will put in place several innovations. We are co-designing the innovations with our partners and upscaling the innovations on the ground. Some examples of innovations from the different work packages include:

- Work Package 1 AquaData – it is about the aquatic food system sustainability index that will help to track the progress in the multiple dimensions of the aquatic food systems;
- Work Package 2 Aqua+Partners – it is about creating partnerships with news organizations. For example, in the Pacific where we are co-designing the implementation of aquatic food production in small dams;
- Work Package 4 AquaGenetic – we have the improvement for some fish varieties.
- Work Package 5 AquaLabs – we have the multifactor gender and youth-inclusive platform for scaling some of the innovations.

Those are simply some examples of innovations. But in the broader thinking, we think that more innovation can come in across the program.

### **Where will we work?**

This year, we are starting in nine countries and then we will add two more countries later. Not all the work packages are being implemented in all countries. Some of the work packages are being implemented in some countries. As we move on, we hope to have all the work packages in all the



countries. And you will see that some packages are best in the Pacific, in Asia and some in Africa, including Ghana.

One thing which is essential for us and worthy of being mentioned is the partnerships. With this initiative, we want to bring more equitable research partnerships into aquatic foods research. The CGIAR is classifying the partners into demand, innovation, and scaling partners. We want to work across all those partnerships and in doing so; we want to align closely with national, regional and local stakeholders. We want to increase equity in the way we work with partners for the co-production of knowledge, increase innovation, having a pure gender approach in all partnerships and in doing so we hope we will be challenging the systemic injustices, which exist in the research sector and also in the aquatic research sector. It means having in-country partnerships, making sure that we have decision-making, which is an equitable, trans-disciplinary and integrated research and as much as possible governance. The structures that we set up today can revisit and adapt in the coming years to answer to needs.

We are not working in isolation. We hope to have synergies with other initiatives in Ghana and other countries. In Ghana what is essential is our linkage with the West and Central Africa Regional Integrated Initiative.

And finally, we are working on some cross-cutting science topics: gender equity, youth and inclusion; climate change, mitigation and adaptation; and nutrition and health. So those are cross-cutting. We have the five work packages, but we also have these three cross-cutting themes. There are several work packages that we will work on in Ghana.

The first is work package 1 on AquaData. What we see is a lack of robust and clear data on aquatic systems, and this is preventing the realization of the aquatic food system transformation. What the work package aims to do is to look at the existing data and produce new data to support evidence-based decisions. That is the purpose of the work package. In doing that, we also hope to improve the evidence informing the decision and the action by the farmers, the fishers, the private sector and the policymakers.

With Work Package 3 on AquaPlans, the aim is to co-design integrated packages and investment to apply upscale some multifunctional water and landscape innovation with users, implementers and scalars. The purpose is to reduce poverty, improve environmental and climate performance and sustain nutrition and food diversity while improving resilience and aquatic agricultural production systems. This means that Work Package 3 will work around three pathways—one around the provision of data and the tool for evidence-based planning, here that will be mostly about the right decisions to put through for now in Myanmar and Cambodia. The second pathway is aquatic food production in a condition created by water infrastructure. Exactly what we are talking about here in Ghana. The idea is to co-design and implement aquatic food production pilots through small reservoirs or irrigation infrastructure and to do that we will work with the Irrigation Authority, Fisheries Commission, NGOs, local communities, etc. And we will work through stakeholder learning platforms, so the evidence we generate in the pilots can feed into the investment and policy cycle process.

The third pathway is around the governance of the water and the landscape. It is about putting in place the right governance by the local communities so that they are aware of the risk and vulnerability and establishing participatory elaborate development scenarios that will govern resources in the future.

So now let me just zoom in on Ghana. The context is that aquatic foods are essential for food security, are a primary source of animal protein, are a source of micro-nutrients and there is a consumption of about 26kg per capita per annum of fish. It is also essential for livelihoods and is contributing to the national GDP. But as has been said by others, there is also a gap in demand and as a result, about USD 200 million worth of fish is imported annually.

There are already several interventions—there is an efficient system of distribution of feed, seed and other inputs; there are the Aqua systems for Food and Job Programme and we know the extension delivery services are working well. There are some human resource development interventions, from the universities and research institutions to farmers with fish schools, field visits, etc. There is ongoing rehabilitation of the One Village One

Dam initiative, which is essential and then the Fish Disease Containment and Prevention Program. On the whole, we think that there is already a conducive legal framework focusing strongly on livelihood improvement, food and nutrition, and rural development. That is the supportive context in which we are working in Ghana.

In Ghana, we want to engage with partners, which is why we invited you all today to this launch event. We will work with the Council for Scientific and Industrial Research, and with the Fisheries Commission. Beyond them, we also want to work with all of you. And I see this launch event as a first step to the stakeholder platforms where we can come together to continue to look at the alignment of our activities, possibly adapt our activities depending on demand and use the learning that we have for more programs, policy and investment objectives. This is really about building our relationships, building this family so we can work together in the future and what we deliver on a small scale is also useful for a larger-scale project.

Again, Ghana Work Package 3 is about the aquatic work production pilots in small dams, so we are building on work which has been done by you and by different partners, including the One Village One Dam Programme; the participatory economic and policy environment on the existing value chain, especially for feed and input, for example; and previous research on small reservoirs, multiple uses of water and early mapping of water bodies.

With all that background, the idea is to introduce fish production into these small reservoirs. In doing so, we will strengthen food security and poverty reduction in the targeted communities. We also think we will deliver on women and youth empowerment because if we bring that resource and put the resource and production in the hands of women, that will improve their lives. Multiple uses of water also mean multiple beneficiaries; not only men, not only those who are cultivating crops, but also women. With this, pertinent lessons learned and impact assessment results from what the pilot is delivering in terms of nutrition, income generation and employment will be shared with the stakeholder platform to ensure that what we learn is used by the different partners.

### **Where we are?**

Starting with the engagement and discussions with the implementing partners and we are today consulting with you and taking your feedback and that of the group discussions that we will have after the break. We start by generating or completing the database on the small reservoirs. We will undertake site selection field visits to enable us to select sites for the pilots. This will be the starting point in the coming weeks. We are also working on cornerstone activities that will facilitate the building of the pilots for the development of small-scale reservoirs for multiple uses, policy review, literature review and impact assessment design. These are the startup activities after which we can move towards the implementation and hopefully towards the objectives.

## 4. Keynote/launch statement by Minister for Fisheries and Aquaculture Development, Ghana Hon. Mrs Mavis Hawa Koomson

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I am delighted to be part of this inception workshop to launch the Resilient Aquatic Food System Project in Ghana, and I thank the organizers for extending an invitation to me. I have been informed that the program is an initiative established by the Consultative Group on International Agricultural Research, which aims to expand smallholder productivity and increase nutritional outcomes and offer opportunities to benefit from the fish value chain specifically for women and the youth. I am overwhelmed with joy by the information that Ghana is among 11 countries selected globally to benefit from the Program and I am most grateful to CGIAR for including Ghana in the program. Let me use this platform to assure CGIAR that my ministry will ensure that the Program is successful in Ghana.

Distinguished ladies and gentlemen, the government of Ghana has recognized the potential in the aquaculture sub-sector to increase fish production, bridge the gap between fish demand and fish availability, and reduce the importation of fish, thereby saving foreign exchange and creating job opportunities along the aquaculture value chain. Consequently, the Ministry has launched the Aquaculture for Food and Jobs Project to achieve the government's agenda for the aquaculture sub-Sector.

The launching of the Resilient Aquatic Food Systems Program in Ghana has therefore come at an opportune time. It is gratifying to note that in Ghana, the Program proposes the integration of aquatic production into water resources management plans to support the country's production system. This is in line with my Ministry's Medium Term Development Plan and our flagship Aquaculture for Food and Jobs Project currently ongoing across the country.

It is worthy of note that the Program will collaborate with the Fisheries Commission and the Council for Scientific and Industrial Research to co-design innovative packages that allow the integration of aquaculture into small water

infrastructure within the existing framework of One Village One Dam implementation in Ghana. As alluded to earlier, the One Village One Dam Project was an initiative of my former Ministry, and I am happy the initiative will be beneficial to a project under my current Ministry.

It will be good if we increase the number of dams constructed in the One Village One Dam Project. Even though we have constructed 560 and currently 321 are very active, one will ask why. The explanation is that some areas are not conducive to the One Village One Dam. That is why the other dams could not survive. I believe if we still increase the numbers, we will achieve our aims. If we want to stock the One Village One Dam with fingerlings, we need to collaborate with the Northern Development Authority, which has direct oversight responsibility of the One Village One Dam.

Distinguished ladies and gentlemen, the fisheries and aquaculture sector is a very important entry point for promoting development, which is in line with the Sustainable Development Goals. At the global level and the continental level, fisheries and aquaculture are central to the contribution to the African Union's Agenda 2063. At the national level, sustainable management and development of fisheries and aquaculture are in line with the government's development agenda to make good use of the blue economy. I would like to acknowledge the contribution of the government of Germany and Norway through their financial and technical support to the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), the Ministry of Food and Aquaculture Development (MOFAD) and the Fisheries Commission (FC) Aquaculture for Food and Jobs in the Western Region and the Fish for Development Project respectively. Both projects aim to develop aquaculture that contributes to fish production and offers improved livelihoods to people in the catchment area in particular and the country.

I hope the Program will contribute to food and nutritional security and support our national

development agenda. My Ministry will provide strategic directions to ensure that all the aquaculture activities under the Program are aligned with ongoing initiatives. I further expect the Program to introduce innovations to the fish market value chain engagements to ensure that

aquaculture production is well linked with the fisheries value chain. The Ministry of Fish and Aquaculture Development will continue to ensure that fisheries and aquaculture are sustainably managed and developed for the benefit of both present and future generations.



## 5. Group discussions/Plenary session

The group discussions were based on four key areas:

1. Synergies with the project/initiative, activities, policies and investments.
2. What is missing from the presentations?
3. Who else could partner with CGIAR?
4. Opportunities for gender and youth inclusion.

Workshop participants were divided into groups based on areas of similar areas of speciality. The groups were;

- Group 1A – Government Agencies and Development Partners
- Group 1B – Government Sector Groups – District Assemblies
- Group 2 – NGOs and Media
- Group 3 – Research and Academia Institutions

### Group 1A: Government Agencies and Development Partners

#### Question 1: Synergies with the project/initiative

Representatives from FC, EPA, WRC, NDA, FAO and GIDA were present. Each of these organizations has its unique role and mandate (Table 1).

Organization	Mandate
FC	Seeks to promote aquaculture development
EPA	Acquisition of permits and gender
WRC	The acquisition of permits for raw water regulates fresh water and is a major stakeholder in the project.
NDA	Owens 350 viable dams, invests in dam construction in the five northern regions of Ghana; Interested in gender and social protection
FAO	Food and nutrition security, Climate Change resilience, Gender and Social Protection
GIDA	Water governance and Water Users Association regulation LI 22, selection of dams for the project and managing irrigation dams.

**Table 1.** Organizations and their mandates.

#### Question 2: What is missing from the presentations?

Nothing was missing.

#### Question 3: Who could partner with CGIAR?

- World Bank
- Technical support from Developing partners
- Communities
- Traditional Owners/Authorities
- Smallholder farmers

#### Question 4: Opportunities for Gender and Youth Inclusion

Production Stage – capacity building and alternative livelihoods along the aquaculture value chain for the youth and women.

### Group 1B: Government Sector Group – District Assemblies

#### Question 1

##### a. Synergies with the Project/Initiative

Existing wetlands (River Oti: Chereponi and Yunyoo, White Volta tributaries: West Mamprusi, Black Volta - River Sisili Mamprugu Moaduri-overseas)

##### b. Activities

- Fisheries
- Protection of water bodies
- Fish processing

##### c. Policies

- National Medium-Term Development Policy Framework 2022-2025
- Local Economic Development (LED) Policy
- Rural Development Policy
- Rearing for Export and Rural Development
- Aquaculture for Food and Jobs

##### d. Investments

- Pwalugu Multi-purpose Dam – ongoing
- Hydropower
- Irrigation
- Solar power
- Eco-villages
- Re-settlement

### Question 2: What is missing from the presentations?

How to engage the stakeholders including traditional rulers, landowners, fishermen, market women etc.

### Question 3: Who could partner with CGIAR?

- Wildlife Division of the Forestry Commission (with the responsibility of managing wildlife reserves such as national parks, nature reserves etc.)
- Ghana Tourism Authority
- Ghana Investment Promotion Centre
- National Development Authority
- Coastal Development Authority

These institutions provide infrastructure and coordinate policies, transport, facilitation, sensitization and technical advice.

### Question 4: Opportunities for Gender and Youth Inclusion

- Skills training and development
- Fish processing
- Aquaculture
- Boat riding – Recreational purposes
- Employment creation e.g., sales of fish products, the entire aquatic value chain, and Fish farming is the most reliable agricultural activity.

## Group 2: NGOs and Media

### Reflections

The initiative should not focus only on large-scale commercial farmers. The project should encourage women and youth participation.

### Question 1

- a. Synergies with the project/initiative
  - **Oyster Pickers** (Raising and picking oyster supports, nutrition security and employment).
  - **Chamber of Aquaculture** (Fish farming, Data generation: they already collate data on fish).
  - **Peasant Farmers Association of Ghana (PFAG)** (Diversified livelihood: the “project can be an opportunity for smallholder farmers to diversify livelihoods, Research: the project can build on PFAG’s research on the impact of COVID on smallholder farmers).

- **Media** (Reporting on the impact on beneficiaries, Focus on impact reporting).

### b. Investments

- Oyster pickers have associations like Densu Oyster Pickers’ Association (DOPA) and the Development Action Association (DAA) that allow them to secure funds for activities. They also have closed seasons where they carry out alternative livelihood activities.

### Question 2: What is missing from the presentations?

- The success of the project cannot be hinged on the government’s one village - one dam.
- The dams do not hold enough water during the dry season.
- The need to consider well-functioning dams in the project area, e.g. the Community dam in Kazigo Basin in Volta.
- Clams stick to mangroves.
- The project should look at conserving aquatic systems with conservation.
- How to fund the capital investments required for Aquaculture.
- How to mitigate the risk involved (Aquaculture insurance).
- How the dams will be managed

### Question 3: Who could partner with CGIAR?

The project can identify conservation projects such as

- Microfinance and Small Loans Centre (MASLOC) + Gesellschaft für Entstaubungsanlagen (GEA)
- Crop department + aquaculture associations like the Chamber of Aquaculture (COA) + Global Aquaculture Alliance (GAA)
- Academia should get involved
- District + Metropolitan Assemblies

### Question 4: Opportunities for Gender and Youth Inclusion

- Employment.
- Tree planting communities can develop their wood lots around dams.
- Young people in universities could be brought on board by attaching them to community Projects for their thesis/dissertation.
- Community development; reduce rural-urban migration.

### Group 3: Research and Academia Institutions

#### Question 1: Synergies/Activities in our various Institutions

Academic and research institutions in Ghana are engaged in various activities (Table 2); therefore, their experiences can be tapped for the successful implementation of this project/initiative.

#### Question 2: What is missing from the presentations?

- Marketing
- Food safety (wholesomeness of food)
- Inadequate database system

#### Question 3: Who could partner with CGIAR?

- Other academic/research institutions are not present at this launch.
- Involvement of farmers at all stages.
- Farmer Extensive Research linkage

#### Question 4: Opportunities for Gender and Youth Inclusion

- Across the fish-value chain; production, post-harvest and marketing.

Organizations	Activities
KNUST	Fish nutrition (feed formulation and technology) Development of fish feed Research into new Aquaculture species for culture e.g., <i>Heterotis niloticus</i>
CSIR-WRI	Genetic improvement of fish species (fish breeding) Research into how tilapia can grow faster Fingerlings production
UCC	Training Manual for aquaculture (for students and farmers) Feed trials using local materials Water quality monitoring and assessment Breeding (Black-chinned tilapia)
SARI	Soil improvement (compost) Agronomic practices
UDS	Fish Health A freshwater-integrated resilient system Inland water system data
UG	Fish Health
UENR	Impact of climate change on aquaculture Post-harvest fish management Fish production techniques to improve production

**Table 2.** Research and Academic institutions and their roles.

## 6. Outcomes and the way forward

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The CGIAR Initiative on Aquatic Foods Workshop in Ghana brought together diverse expertise (Annex 2) to brainstorm on key issues that need to be examined before the commencement of this project/initiative to ensure successful implementation and significant positive impact for accelerated growth and development. At the end of the workshop,

- Aquatic Food Systems in Ghana were better understood from different perspectives.
- A sense of ownership was generated among attendees.
- Academic and research institutions were present to build the capacity of students to ensure the success of this project/initiative.
- Key commitments from the government, sector ministers and various organizations were established.

Annex 3 provides links to electronic and print media publicity of the launch event.





# Notes

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<sup>1</sup> Zebilla is a town and the capital of Bawku West District, Upper East Region, North Ghana

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# Annex 1. Agenda of the inception workshop

<b>Tuesday, 14 June 2022, 8:30 – 17:00 GMT</b>		
<b>Time</b>	<b>Activity</b>	<b>Person/Organization responsible</b>
08:30- 09:00	Arrival and registration of the participants Tea/Coffee	Ms Zinabu Mohammed (IWMI)
09:00-09:05	Opening Prayer	Session Moderator: Dr Everisto Mapedza (IWMI)
09:05-09:10	Introduction	Moderator
09:10-09:15	Welcome Address	Dr Olufunke Cofie, (IWMI Country Representative)
09:15-09:35	Opening Remarks <ul style="list-style-type: none"> <li>• CSIR</li> <li>• Fisheries Commission</li> <li>• GIDA</li> <li>• MOFA</li> </ul>	Director CSIR-WRI Exec Director, FC Executive Director GIDA Chief Director
09:35-09:50	Presentation on CGIAR	Dr Kwesi Atta-Krah. Regional and Country Engagement Advisor, 1 CG-WCA
09:50-10:10	Introduction of the Resilient Aquatic Food System initiative and its objectives in Ghana	Dr. Marie-Charlotte Buisson, Initiative Co-Lead and WP3 Lead (IWMI).
10:15-10:45	Minister for Fisheries and Aquaculture Development, Hon Mrs Mavis Hawa Koomson Minister's Keynote Address and Official Launch	Chief Director (introduce the Minister)
<b>10:45-11:10</b>	<b>Coffee Break + Group Photo+ Interviews (Media)</b>	
11:10-12:10	Discussion session for participants divided into 4 groups: <ol style="list-style-type: none"> <li>1. Funding/Development partners;</li> <li>2. Government;</li> <li>3. Research;</li> <li>4. NGOs and Media</li> </ol> (Reflect on what they heard and highlight synergies with their own activities/policies/investments).	Session Moderator Dr Ruby Asmah Each group will have a Facilitator and Note Taker.
12:10-12:30	Plenary: Group Report Back (5 Minutes per group)	Moderator
12.30-13:00	<ul style="list-style-type: none"> <li>• Plenary discussion: Take-home messages</li> <li>• Concluding Remarks/Vote of Thanks</li> <li>• Closing Prayer (for main)</li> </ul>	Moderator
<b>13:00-14:05</b>	<b>Lunch Break + (Outstanding Interview slots) Moderator and media</b>	
<b>14:05 – 17:00</b>	Core Team Planning Meeting (CSIR, FC, IWMI) Dr Komlavi Akpoti to present to the team CLOSING of Workshop	Moderator

## Annex 2. Participant list of the inception workshop

Name	Position and Institution
Abass Karim Nyo	Coordinator, Agriculture Northern Development Authority (NDA)
Archisman Mitra	National Researcher, IWMI-Delhi
Charles Teye	Regional Director, FC – North East
Chief Director	Ministry of Fisheries and Aquaculture Development
Chimsi Musbar	MCE, East Mamprusi Municipal Assembly
Daniel Kwabla Gbolosa	Regional Minister's Rep
Dr Anthony Yaw Karikari	Assistant Director CSIR - WRI
Dr Collins Prah Duodu	MAFS, University of Ghana
Dr Everisto Mapedza	Senior Researcher, Social and Institutional Scientist, IWMI- Accra
Dr Francis Kusi	Ag. Director, CSIR – Savana Agric. Research Institute
Dr Komlavi Akpoti	Postdoctoral Fellow, IWMI-Accra
Dr. Kwesi Atta-Krah (IITA)	IITA
Dr. Lawrence Armah Ahiah	Director, Inland Fisheries, FC
Dr Olufunke Cofie	Country Representative – Ghana, Regional Representative, West Africa IWMI
Dr Ruby Asmah	Principal Research Scientist CSIR - WRI
Dr. Daniel Nsoh Akongyuure	Head, Department of Fisheries and Aquatic Resources Management, UDS
Dr. Francis K. Y. Amevenku	Head, Department of Fisheries and Aquaculture, CSIR College of Science and Technology
Edwin K. Akley	CSIR - SAR
Engineer Wilson K. Darkwah	Acting CEO, Ghana Irrigation Development Authority (GIDA), Accra
Eric S. Adu-Dankwa	GIDA
Hayia Zuweiratu Moda Mashiru	DCE, Chereponi
Hon. Arimeyaw Somo Lucky	MCE, West Mamprusi Municipal Assembly
Hon. Abu Adam	DCE, Mamprugu Moagdari
Hon. Hajia Rasheeda Mahama	East Mamprusi Municipal Assembly
Hon. Hajia Zuweiratu Mada Nashiru	DCE, Chereponi District
Hon. Konlan Bitian	DCE, Yunyoo - Nasuan

Name	Position and Institution
Hon. Mrs Mavis Hawa Koomson	Minister, Ministry of Fisheries and Aquaculture Development
Hon. Yidana Zakaria	North-East Regional Minister
Jack Pumpuni Frimpong-Manso	International Research Intern, IWMI
Jacob Adzikah	The Chief Executive Officer, Chamber of Aquaculture
Joseph Kabore Tetteh Ageke	President, National Inland Canoe Fishermen Council
Joseph Louknaan	DCE, Bunkpurugu - Nakpanduri
Mabel Ibidun Quarshie	Aquatic Foods Ltd
Marie-Charlotte Buisson	Research Group Leader, Economics and Impact Assessment, IWMI – Sri Lanka
Mary Ama Kudom-Agyemang	Environmental Communicator/Media Expert
Mathew Cofie Oyih	Director, Aquaculture, FC
Maxwell Twumasi	Head, IT IWMI-Accra
Mr Augustine Otoo	The Executive Director, GIDA Accra
Mrs Jewel Kudjawu	The Executive Director, EPA
Ms Zinabu Mohammed	Administrative Assistant, Receptionist IWMI-Accra
Priscilla B. Gyamfi	WRC
Prof Asiedu Berchie	Head, Department of Fisheries and Water Resources, UENR
Prof Francis Nunoo	Head, Department of Marine and Fisheries Science, UG Board Chair, FC
Prof Joseph Aggrey-Fynn	Head, Department of Fisheries and Aquatic Sciences, UCC
Prof Nelson Agbo	Head, Department of Fisheries and Watershed Management, KNUST
Rahayaru Buwah	NDA
Wuni Seidu Salifu	MCE representative West Mamprusi
Yaa Danso	FAO
Zakaria Fadi	Northern Development Authority

## Annex 3. Media publicity for Resilient Aquatic Food Systems launch

No.	Media house	Assigned reporter/ Camera operator	Status of report	Links to stories
1.	Daily Graphic	Zadok Kwame Gyesei	Published and the link provided	<a href="https://www.graphic.com.gh/news/general-news/invest-in-aquatic-food-system-research-dr-cofie-to-govt.html">https://www.graphic.com.gh/news/general-news/invest-in-aquatic-food-system-research-dr-cofie-to-govt.html</a>
2.	Ghanaian Times	Abigail	The report was published the next day link provided	<a href="https://www.ghanaiantimes.com.gh/resilient-aquatic-food-system-rolled-out-to-enhance-food-security">https://www.ghanaiantimes.com.gh/resilient-aquatic-food-system-rolled-out-to-enhance-food-security</a>
3.	GNA	Albert Ansah	Report published Link provided	<a href="https://www.gna.org.gh/1.21503591">https://www.gna.org.gh/1.21503591</a>
4	Ghenviroment.com	Awudu	Published and the link provided	<a href="https://ghenviroment.com/Fisheries_Oceans/one-village-one-dam-project-to-benefit-from-fisheries-production1655743208">https://ghenviroment.com/Fisheries_Oceans/one-village-one-dam-project-to-benefit-from-fisheries-production1655743208</a>
5	EnviroNews Nigeria	Mary Ama Kudom-Agyemang	Published and the link provided	<a href="https://www.environewsigeria.com/ghana-among-11-countries-to-benefit-from-cgiar-initiative/">https://www.environewsigeria.com/ghana-among-11-countries-to-benefit-from-cgiar-initiative/</a>
6.	GBC Radio	Doreen Ampofo	Item aired at 6 pm after launch and 6 am the next day. Link provided	<a href="https://www.gbcghanaonline.com/uncategorized/boost-fish-production/2022">https://www.gbcghanaonline.com/uncategorized/boost-fish-production/2022</a>
7.	GTV	Esther Aidoo Samuel Oduro Amofa	Item aired on the evening of the day of the launch Link provided	<a href="https://fb.watch/dEFVOI9G6P/">https://fb.watch/dEFVOI9G6P/</a>
8.	Atinka TV	Celestina Damoah	Item aired on the evening of the day of launch. Link to news item provided	<a href="https://www.facebook.com/AtinkaTVGhana/videos/553818333076086/">https://www.facebook.com/AtinkaTVGhana/videos/553818333076086/</a>



Resilient Aquatic Food  
Systems for Healthy  
People and Planet

