CSA CIS Training Report for the Aquaculture Bundle

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CGIAR

AICCRA
Accelerating Impacts of CGIAR Climate Research for Africa

Executive summary

The CSA and CIS training targeted Small to Medium Scale Entrepreneurs offering aquaculture related goods and services and fisheries extension officers. The training was hosted by WorldFish with facilitators from WorldFish and Alliance Bioversity and International Institute of Tropical Agriculture (CIAT). The main focus was on integrated aquaculture agriculture systems under CSA bundle 2 of the AICCRA Zambia project (CSA bundle 2 integrated aquaculture systems) as a climate-smart practice.
The workshop's primary objectives were to:

1. Conduct Climate-Smart Agriculture (CSA) training,
2. Conduct Climate Information Systems (CIS) training
3. Gender Equality and Social Inclusion in climate-smart agriculture and information systems
4. Host a half-day multi-stakeholder dialogue (MSD) for aquaculture.

Fifty-eight participants (34% women) took part in the CIS and CSA training. Facilitators were drawn from WorldFish and CIAT.

CSA Training
The CSA training introduced participants to basic climate change concepts, adaptation and mitigation strategies in the face of climate change risks. It introduced Climate Smart Agriculture, especially climate-smart approaches in aquaculture. Experts from WorldFish introduced learners to integrated aquaculture agriculture systems under the auspices of climate change. The training covered key concepts such as climate, weather, climate change, resilience, mitigation, vulnerability, gender, and the importance of integrated aquaculture agriculture systems. The training included climate change games and role-plays involving decision making on site selection, fish species and integrated aquaculture. These games were used to help participants understand the concepts and make climate-related decisions on fish stocking, site selection, fish species and other crops based on the probability of receiving average rainfall, flood or drought. Results of the games illustrated to participants why access to CIS services and CSA practices was important since farmers without access to these made ill-informed decisions and suffered as a result of climate-related disasters.

By the end of the training, SMEs and extension agents could define and differentiate climate, weather, climate change, adaptation, mitigation, resilience and other terms. The participants appreciated this gameplay because it gave a practical scenario of what they go through and called on the facilitators to carry on with their work of enhancing farmers' access to climate information services and climate-smart agriculture technologies to improve water, food and energy security in the country. Furthermore, participants toured one farm practising integrated aquaculture agriculture systems to expose them to CSA technologies discussed in training.

CIS Training
CIS training introduced climate information concepts and services related to aquaculture and agriculture value chains. The learners were given an opportunity

to understand the value of weather and climate services to fish value chain actors. The session further provided an analaysis of climate change, climate variability and other associated weather and climate behavior. Practical sessions were done and these involved reading weather pattern graphs showing minimum and maximum temperatures, calculating probabilities of various weather events and their relevancy to decision making in agriculture and aquaculture. DACA –a climate advisory tool accessible on google play store for android phones was used as a practical example for accessing and reading climate information for decision making. DACA has various climate advisories such as recommended bean variety for a particular place in any the coming season; probability of exceeding a given growing season length; probability of exceeding a given seasonal rainfall total and many others. At the end of the CIS session, participants could read and interpret climate change or climate variability graphs.

Gender Equality and Social Inclusion

The training also focused on Gender Equality and Social Inclusion (GESI). The facilitators introduced GESI concepts so that SMEs:

1. Understand what GESI is and can distinguish gender and sex,
2. Familiarise with core GESI concepts and
3. Are sensitized to power relations and to the marginalization experienced by different members of society and how this may affect resilience and adaptation to climate change.

Emphasis was placed on SMEs and extension agents to ensure that CSA approaches and access to CIS do not exacerbate or perpetuate gender and other social disparities and instead reduce disparities and empower women, girls, and the disadvantaged groups in society. Group discussions included barriers to GESI. "*I am happy that I have learnt about GESI now; previously I used to think that gender means women fighting for men's rights*" –one of the male SMEs shared his experience and the appreciation of the knowledge acquired during the GESI training. Facilitators encouraged the SMEs to note the barriers identified during the discussions to consider them in the planning and execution of project activities. The GESI component of the training ended with participants embarking on the first step to develop a GESI strategy and implementation work plan for the bundle.

Acknowledgements

We acknowledge the funding from the International Development Association (IDA) of the World Bank to the Accelerating Impact of CGIAR Climate Research for Africa (AICCRA) project.

Project background and workshop objectives by Keagan Kakwasha (See the presentation here)

Participants were introduced to the project and the objectives of the workshop. AICCRA-Zambia aims to improve water, food and energy security through access to knowledge, technologies, and decision-making tools, to strengthen climate resilience in Zambia's agriculture and food systems in the face of a hotter and drier climate. the poroject has three components and these are (i) knowledge generation and sharing effective climate information services (CIS); (ii) partnership for delivery; and (iii) supporting the uptake of CSA innovations through piloting. AICCRA Zambia works with local partners to scale actionable climate information services and climate-smart agriculture technologies which promote gender and social inclusion. Mr. Kakwasha explained that the CSA CIS training targeted accelerator partners aligned to CSA bundle 2 (see figure 1).

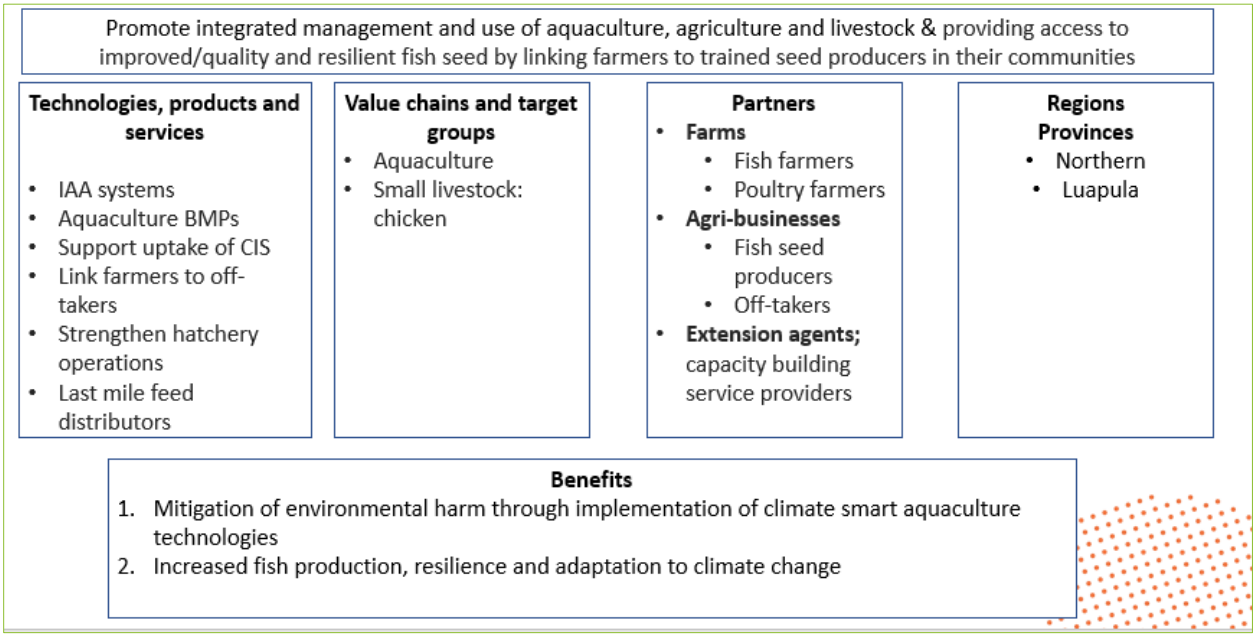


Figure 1: CSA Bundle 2: Integrated Aquaculture Agriculture Systems

The CSA bundle 2 seeks to promote integrated aquaculture agriculture and livestock and providing access to improved/quality and resilient fish seed by linking farmers to trained seed producers in their communities. This CSA bundle will (i) promote the integration of aquaculture with small livestock, particularly dual-purpose (village) chickens; (ii) promote access to improved/quality and resilient fish seed by linking farmers to trained seed producers in their communities; (iii) strengthen existing fish hatchery operations to ensure availability of high-quality seed/fingerlings of local fish species; (iv) strengthen collaboration with feed companies to bring commercial nutritious pond feed closer to farmers; (v) link farmers with off-takers to ensure market access to sell their fish; and (vi) improve farmer access to climate-smart information services through the integration of aquaculture into the agriculture data hub such as iSAT that will be developed in collaboration with the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT).

The CSA Bundle 2 aims to achieve:

- Increase resilience, production and income for smallholder fish farmers, especially among women
- Increase resilience to climate change through adaptation of climate-smart information and use of better management practices
- Reducing environmental footprint through the implementation of sustainable climate-smart aquaculture practices

Others bundles within AICCRA Zambia included: Sustainable financing for off-grid solar irrigation; climate smart seed varieties to address drought; and diversified chicken and goat-legume systems.

Workshop objectives

The main objectives of the workshop were to conduct a CSA CIS training for SMEs, fisheries extension agents and farmers on integrated aquaculture agriculture systems innovations for Integrated Aquaculture Agriculturer Systems bundle of the AICCRA Zambia project. The main objectives included

1. Conduct Climate-Smart Agriculture (CSA) training,
2. Conduct Climate Information Systems (CIS) training
3. Gender Equality and Social Inclusion in climate-smart agriculture and information systems

The workshop was conducted from 25th to 30th April 2022. In addition, the workshop was designed to carry out a multistakeholder dialogue (MSD) space initiated by the project, and this took place on 28th April within the same period of the training. AICCRA Zambia launched an MSD in February 2022 with an objective of sharing ideas on how to scale CSA CIS innovations, and this workshop is one of the many series of workshops planned for the MSD platform.

Expected workshop outputs

1. SMEs working in the aquaculture value and also participating in the AICCRA Accelerator grant are trained on CIS and CSA technologies for scaling to smallholder farmers.

2. Extension Officers in the department of fisheries in Luapula and Northern provinces are introduced to the Accelerator partners under CSA bundle 2, and learn about the technologies that are being scaled out in the region.

3. Producers organizations and farmer cooperatives, SMEs, finance service providers, researchers and many other stakeholders in the aquaculture sector interact, exchange information through sharing experiences on aquaculture opportunities and bottles necks for the growth of the sector through a mult-stakeholder dialogue space.

Introduction to climate change and climate-smart aquaculture (CSA) by Mary Lundeba *(see the presentation here)*

Dr Mary Lundeba facilitated this session. She introduced key climate concepts such as climate change, climate-smart aquaculture (CSA), climate mitigation, adaptation, resilience and weather. Participants discussed the terms and were also engaged in various role plays and games to learn more about these concepts.

Dr. Lundeba gave an overview of climate variability and climate change-related impacts in Zambia, particularly in the Southern province of Zambia, which is experiencing persistent drought and water shortages. She asked participants to reflect on what was happening in their region –Northern and Luapula provinces in terms of rainfall patterns, temperatures and other weather patterns. Participants identified extreme weather events affecting them, such as unpredictable rainfall patterns that sometimes result in fish ponds drying, as observed in the 2018/2019 farming season. The same thing happened in the 2021/2022 farming season. In addition to unpredictable rainfall patterns, the northern region is also prone to extreme floods and low temperatures at the peak of the rain season. These climatic hazards have adversely impacted food and water security, water quality, and livelihoods, especially in rural communities dependent more on aquatic food systems (AFS).

After the presentation, participants were split into groups to discuss and share their experiences on the barriers to climate change resilience among smallholder farmers. The following barriers were listed:

1. Difficult to access climate information
2. Available climate information is not locally relevant or easily useable by farmers. Most information is communicated in English, and it is not simplified to help farmers use it.
3. Lack of access to digital technology was also a major barrier to climate change resilience as most of the climate information is available on smartphones using android applications. The majority of the farmers do not have smartphones and thus can not access information availed through this means.
4. Farmers resist adapting to new practices and instead prefer the way things have always been done. Because of this resistance, farmers take a long time to adapt to new technologies such as new seed varieties, crop diversification and other climate-smart agriculture practices.
5. Efforts to promote resilience to climate change among farmers have been hampered by a lack of access to quality resilient seed/fingerlings; locally available nutritious feeds; poor management of water resources among farmers; and inadequate access to timely weather forecast information to enable farmers to make informed decisions.

Figure 2: Group discussion during the CSA CIS workshop –photo by Agness Chileya

Integrated Aquaculture Agriculture Systems

Dr Mary Lundeba facilitated this session. She explained what integrated aquaculture agriculture entailed and why it was promoted as a climate-smart practice. She emphasized the following:

1. IAAS is a sustainable and resilient innovation to increase food and water security in communities where the majority of the population depends on aquatic foods.
2. IAAS conserves the environment as it uses small amounts of land to produce a variety of aquatic foods, crops and/or livestock whilst increasing investment profitability by generating synergies between farm enterprises (Figure 3).
3. Multiple water and land use make the overall system more stable and resilient than single water and land use.

Figure 3: Integrated aquaculture agriculture systems at Manfred Bwalya's farm in Mansa district of Luapula province –photo by Mercy Sichone and Henry Kanyembo

Role play Activity: Decision making on crops in the face of climate change

Worksop participants were split into groups for a role play on decision making on crops in the face of climate change. The purpose of this role play activity was to demonstrate to learners the impact of poor decision making and use of climate information services to improve resilience in aquaculture. The results of the role-play activity showed that farmers who made decisions without access to CIS made poor farm management decisions and experienced a lot of hunger (with their heads down) in that particular year (See figure 4). Farmers who made decisions based on available climate information remained resilient in the face of adverse weather events. They were able to remain food secure. Some of the decisions made during role play included:

1. Construction of fish ponds in dumbo areas despite being told that there would be floods in that year.
2. Ignoring call for adoption climate resilistance seed varieties including integrated aquaculture practices.
3. Resistance to adoption of climate smart aquaculture technologies.

Workshop participants appreciated this role-playing game because it gave a practical scenario of their real-life farm decisions without adequate climate information making them not improve their fish farming enterprises. Participants called in facilitators to carry on the work of enhancing farmers' access to climate information services and climate-smart agriculture technologies to improve water, food and energy security in the country. Participants agreed that farmers need to:

1. Access to enhanced CIS so that they adapt and adjust fish stocking time in line with prevailing weather conditions.
2. Use solar irrigation technologies to supply water during drought.
3. Explore multiple uses of water from the ponds to increase the efficiency of water;
4. Use animal manure to minimize the use of chemical fertilizers,
5. Practice better management of aquaculture practices to reduce the use of antibiotics and GFG emissions, thereby mitigating the impact of aquaculture on climate change.

Figure 4: In this picture, women bowing their heads to the ground because they lost all their fish from flooding due to poor decision making during pond preparations, stocking and failing to integrate with other value chains. Climate information data were not made available to them hence making wrong decisions.

Gender Equity and Social Inclusion *(see the presentation here)*

This session was facilitated by Lizzy Muzungaire. She introduced GESI concepts so that SMEs

1. Understand what GESI is and can distinguish gender and sex,
2. Familiarise with core GESI concepts and
3. Are sensitized to power relations and to the marginalization experienced by different members of society and how this may affect resilience and adaptation to climate change.

Emphasis was placed on SMEs and extension agents to ensure that CSA approaches and access to CIS do not exacerbate or perpetuate gender and other social disparities and instead reduce disparities and empower women, girls, and the disadvantaged groups in society.

"*I am happy that I have learnt about GESI now; previously I used to think that gender means women fighting for men's rights*" –one of the male SMEs shared his experience and the appreciation of the knowledge acquired during the GESI training.

Participants were put into three sex disaggregated groups and each group was given a question to discuss. In the first question, participants were asked to list integrated agriculture aquaculture (IAA) approaches that would work for men and/or women. Also consider men /women of different ethnic groups in your community, young men /women and women of different or other social differences: What else can be done to increase the responsiveness of the proposed CSA technologies to women or women. Anumber of integrated aquaculture approaches were suggested (Figure 5), and these include fish and chicked, fish and gardens and many others.

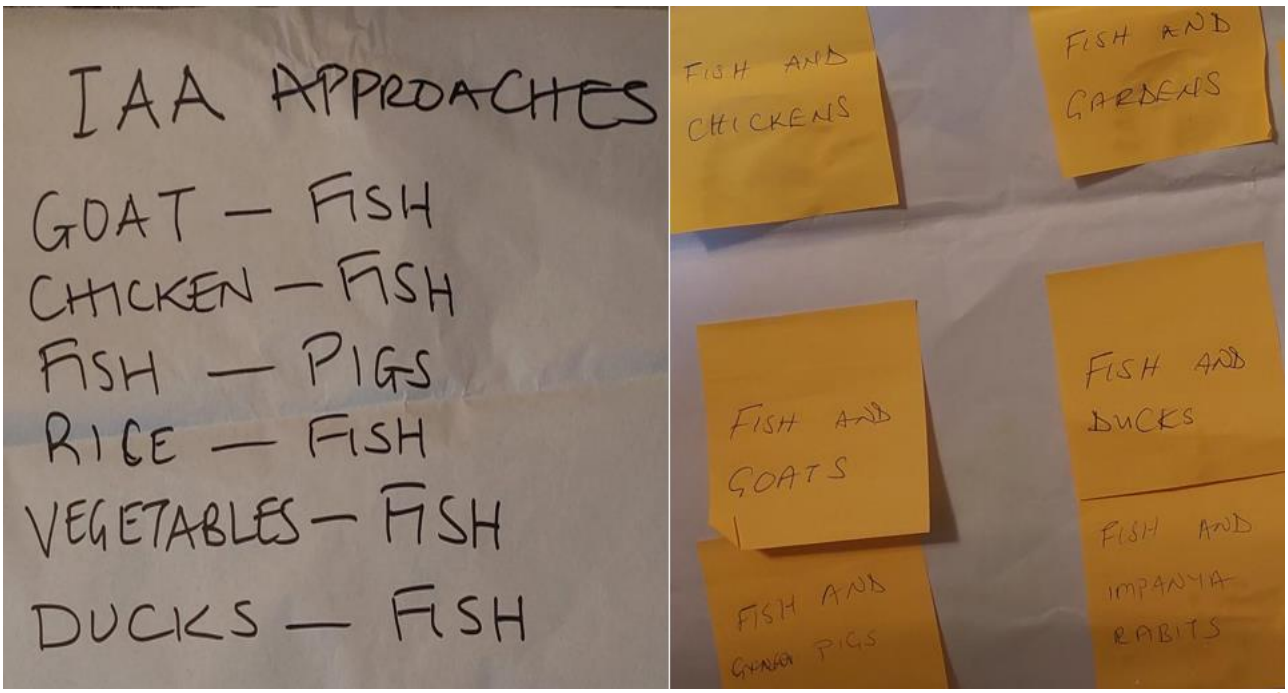


Figure 5: Integrated agriculture aquaculture approaches would work for men / women

The second question was looking potential challenges of barriers could men and women face; and lastly participants were asked to suggest solutions to the proposed challenges of barriers. It was stressed that migrants from relocating to new places had problems with access land as they were asked to pay higher prices compared to local people, and this problem was worse among women as most of them were usually not given land within thein their families (See figure 6). One participants explained that unlike girls, male children, as they grow up were entitled to family land for agriculture within their family land. This problem made it difficult for women to adopt integrated aquaculture. Other challenges included limited access to integrated aquaculture information and financial capacity to invest in integrated agriculture (figure 7).

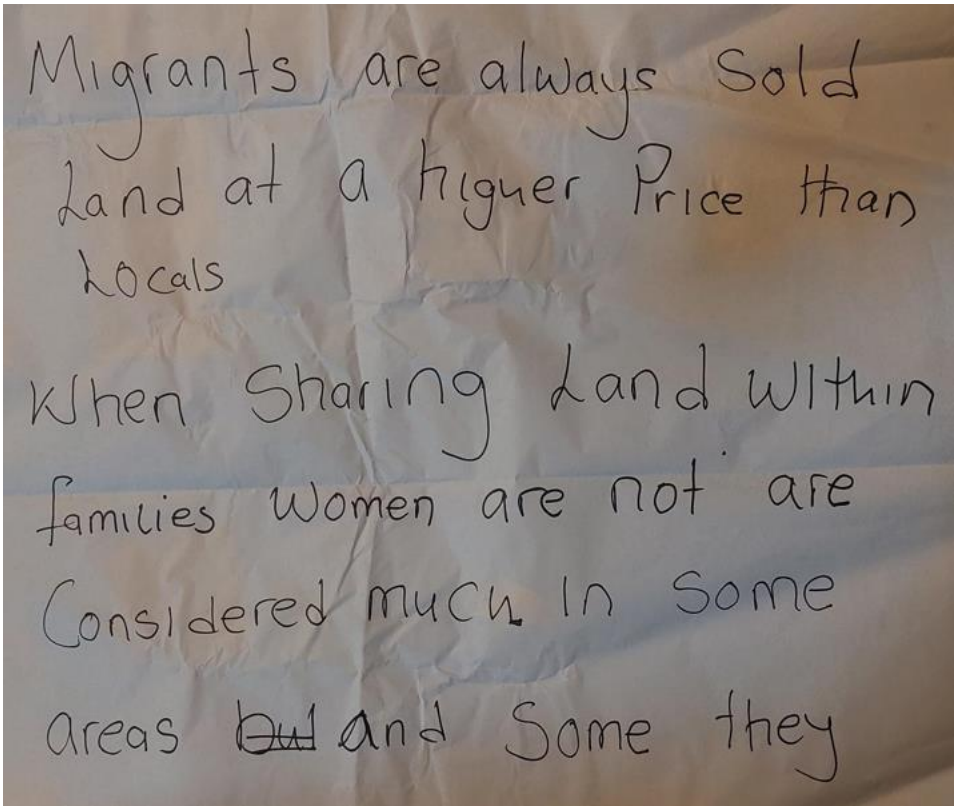


Figure 6: Barriers to adoption of integrated aquaculture practices among women

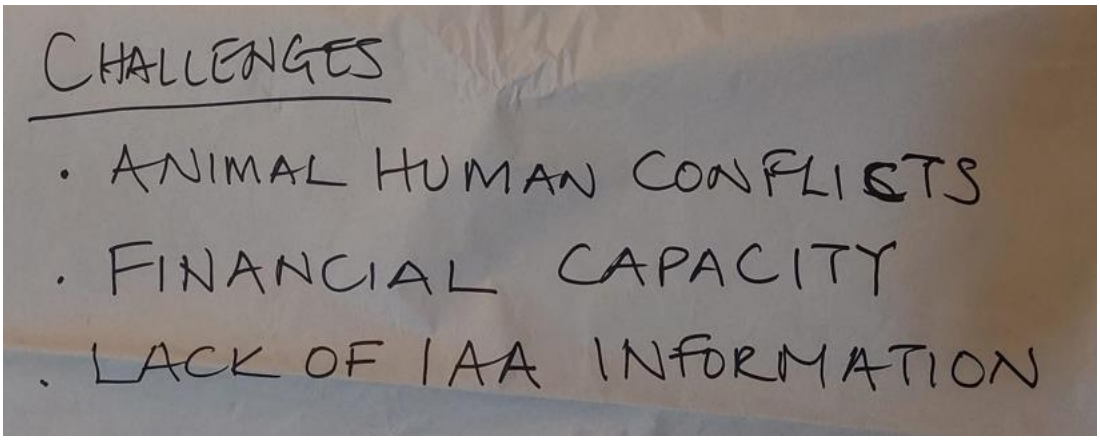
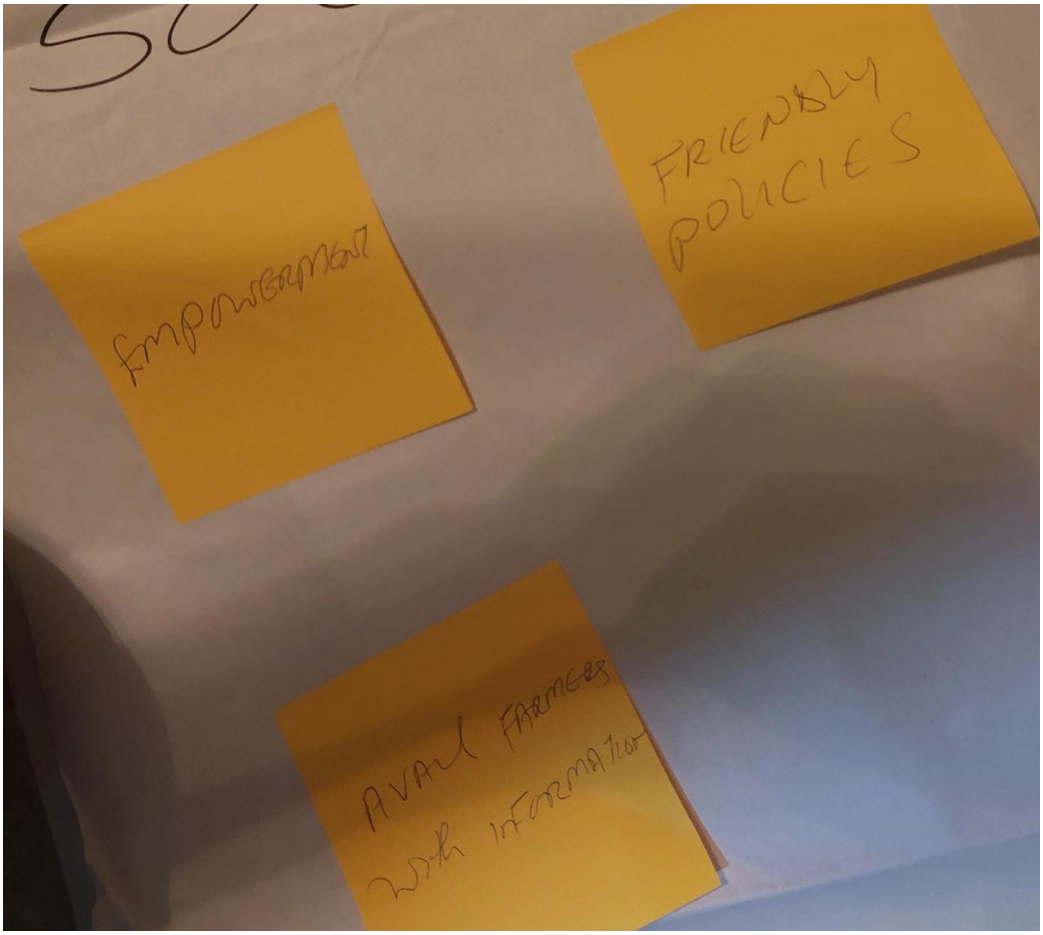


Figure 7: challenges to adoption of integrated aquaculture practices among women

Empowerment of women through cooperatives were one of the suggested solutions to the problems affecting women (Figure 8). Women emphasized that group empowerement would enable them to access land where they can work together and share the cost associated with fish production such as buying feed and fingerlings. Other solutions suggested included disseminating CSA CIS information, and designing of women friendly policies (in consultation with traditional leaders) that deliberately make easy for women to access land.



Activity 1: Gender quiz and relay
The objective of this activity was to ensure that participants had understood the concepts of sex and gender and could clearly distinguish between the two. See Annex 1 and 2 for the activity and how it was implemented. During the gender quiz, majority of the participants did not know how to differentiate between sex roles and gender roles.

***Activity 2: Identifying socially disadvantaged groups in* communities**

Participants were asked to identify socially disadvantaged groups that may need special consideration with climate-smart information and training in the plenary session. The following groups were identified:

1. Women, women
2. Child head households,
3. Widows were the main vulnerable groups identified by the participants during discussions.
4. Landless people

Participants also noted that land distribution and acquisition favored men over women, which affected the ability of women to participate in aquaculture. The traditional authorities allocate land to local people or settlers. A man, by default, is regarded as the owner of the land allocated. In the event of divorce, the land ownership remains with the men and this disadvantage women a lot. Participants

also added that it was easier for a local person to be given land by the traditional leaders than a person outside the community. Persons who want to buy land need to get consent letters from the headman to the chief before getting approvals by the local municipality at district level.

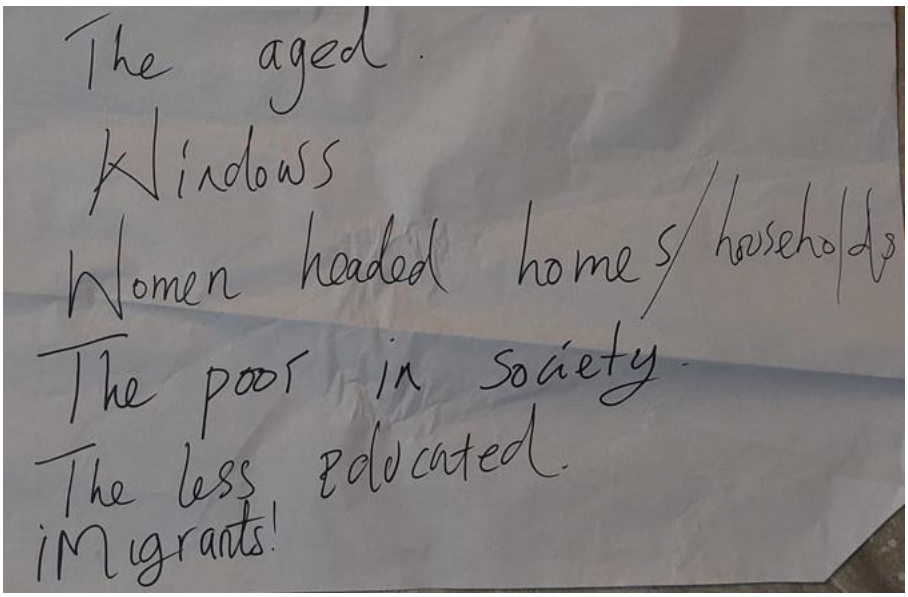


Figure 8: socially disadvantaged groups that may need special consideration with climate-smart information and training

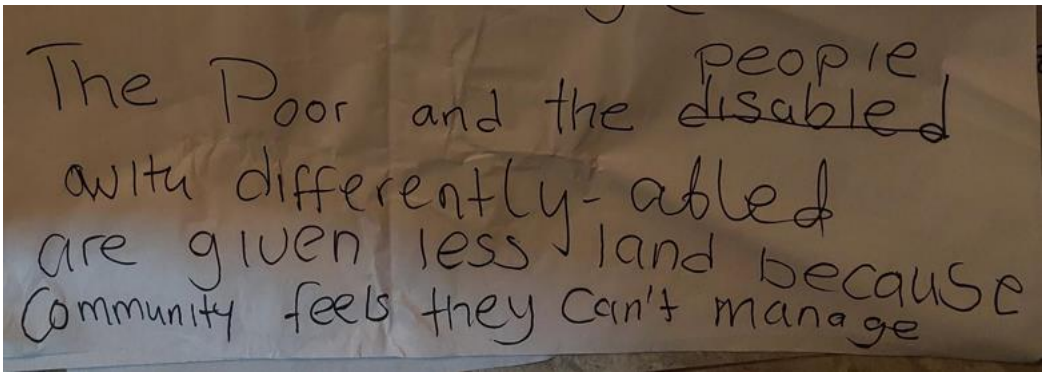


Figure 9: Access to land among vulnerable groups

SMEs were encouraged to identify measures for ensuring that women could benefit from CIS and CSA. SMEs agreed to develop approaches that remove discrimination and structural inequalities in access to CSA technologies and CIS by recognizing that men and women have different roles and needs that should be considered in the planning and execution of project activities. Women in Luapula and Northern provinces depend on wetlands for fish farming. Women who depend on them are negatively affected when wetlands are mismanaged or dry due to climate-related weather variability.

AICCRA Zambia will monitor and report on gender and social inclusion according to the World Bank Gender Tag system. Farmers' yield, income, change in knowledge, decision making disaggregated by sex and age are some of the key indicators the project will use to assess gender and social inclusion among activities led by the CSA CIS bundles.

Climate information services training by Livingstone Byandaga and Desire Kagabo –Alliance Biodiversity and International Center for Tropical Agriculture (CIAT) *(see the presentation here)*

This session was facilitated by Livingstone Byandaga and Desire Kagabo –Alliance Biodiversity and International Center for Tropical Agriculture (CIAT). It introduced participants to key climate terms such as 'weather' and 'climate information services and why they are useful when interpreting and reading climate information reports (Figure 5). The facilitators added that it was important for SMEs and extension officers to fully understand these terms for them to be able to communicate fully with the farmers on the CIS. For example, when someone says 30 millimetres of rainfall –what do you understand with that? "*You should be able to know that 1 millimetre of rainfall is equivalent to 20 litres of water poured in a 1 square meter area. Thereby 30mm of rainfall is 600 litres of water poured together, which means the soil is submerged in water*". He explained.

On the aquaculture side, the trainees were trained on how to make decisions in fishing operations using climate information. Key among these included relating temperature thresholds, floods, water quality management, feeding and fingerling stocking. It was pointed out that each fish species has a minimum water temperature under which it won't feed, and a maximum water temperature over which it can't breathe. For example, the trainees were exposed to the impacts of a temperature above 32^{0}C on a tilapia species (see table 1).

Table 1: An extract from the presentation decribing the relationship between temperature and pond management decisions

Climatic variability	Type of Fish: Tilapia			
Temperature	Threshhold of Temparature	Potential impacts	Climate sensitive management decisions	Management type
	Greater than 32^{0}C	Decreased pH level	Apply disinfectant if needed	Pond water quality management
			Apply lime if pH is <7.5;	
		Decrease in dissolved Oxygen level	Irrigate the pond with fresh water	
			Manage to supply O2 artificially (for example by using aerator)	
		Possibilities to increase the amount of NH3 and H2S gas	Clean the pond by removing sediments...) to remove toxic gases	
		Reduced digestion or less food intake capacity of fish	Reduce or stop feeding temporarily during afternoon	Feeding
			Apply nutritious food having vitamin C supplement during morning time	
		Low survival rate	Avoid fingerling stocking during noon time	Fingerling stocking

Just like the decisions on crops, the decision on fish species depends on minimum and maximum temperatures. By considering the climatology of a particular area, trainees were equipped with skills to make decisions on varieties to stock by basing on Tmin and Tmax thresholds for fish varieties (Figure 10).

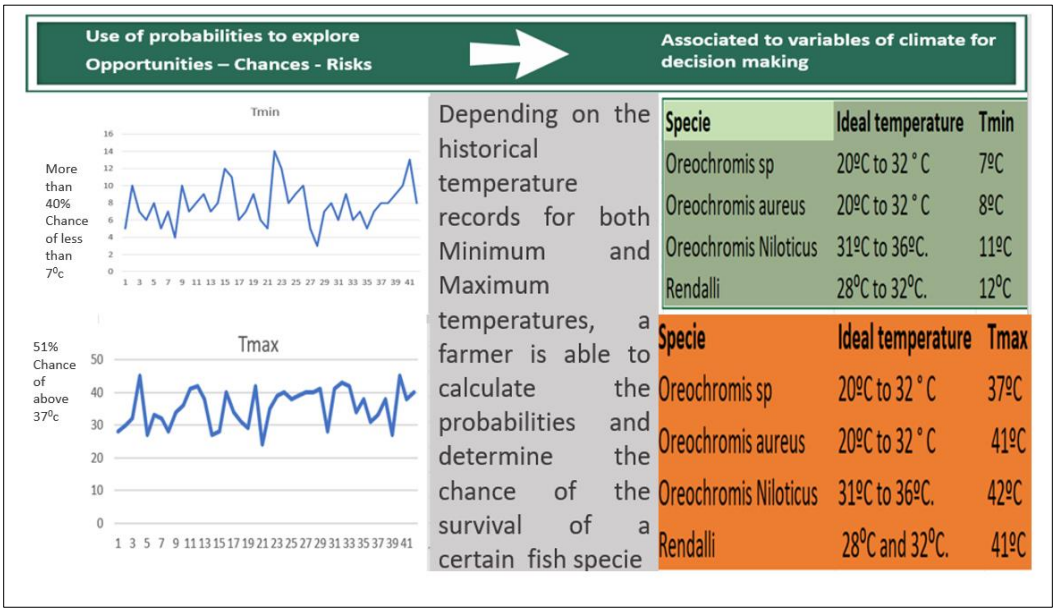


Figure 10: An extract from the presentation that informs breeding decisions

After the discussion on the relationship between temperature and pond management, the learners were introduced to reading weather patterns graphs showing minimum and maximum temperatures, calculating probabilities of exceedance of various weather events (Figure 11). Participants appreciated the usefulness of these graphs in the process of decision making.

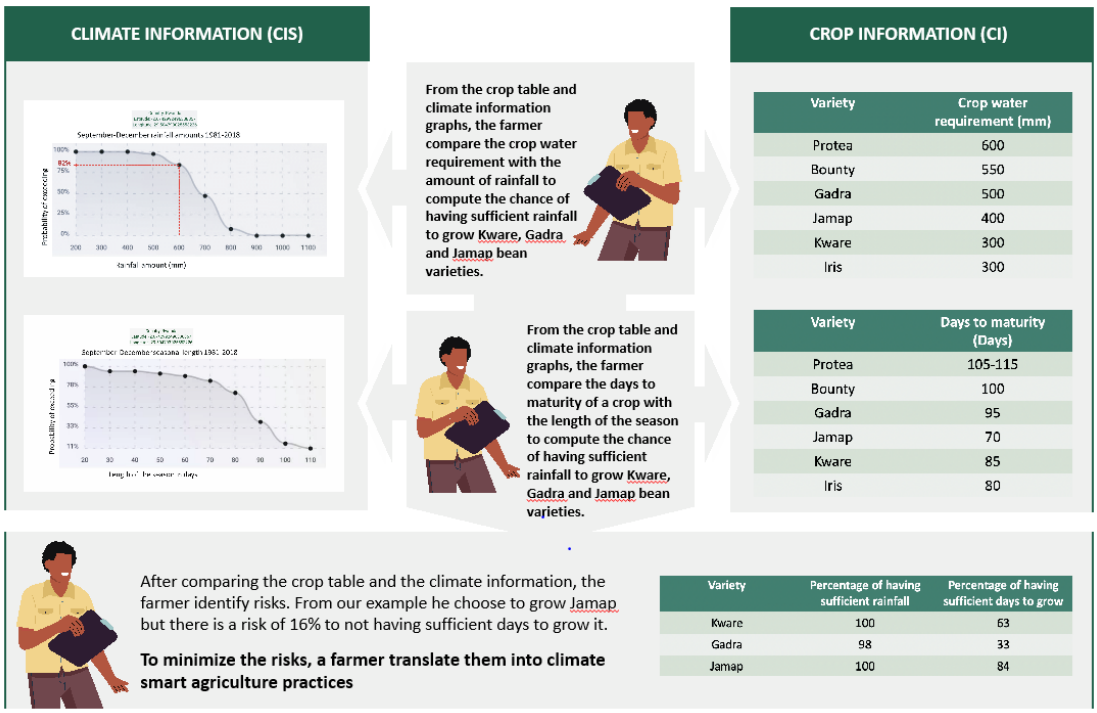


Figure 11: An extract from the presentation describing the relationship between climate information and crop information

Group exercise on application of DACA –a digital agro-climate advisory tool

DACA –a climate advisory tool accessible on the google play store for android phones was used as a practical example for accessing and reading climate information for decision making (Figure 12). It has various climate advisories such as recommended bean variety for the coming season, probability of exceeding a given growing season length, probability of exceeding a given seasonal rainfall total and many others. Participants were trained to read climate variables on time-series graphs.
Participants explored the DACA digital tool before using it in a practical exercise to answer some questions based on their geolocation. The learners found the tool user friendly, and they could read and interpret the results from the graph.

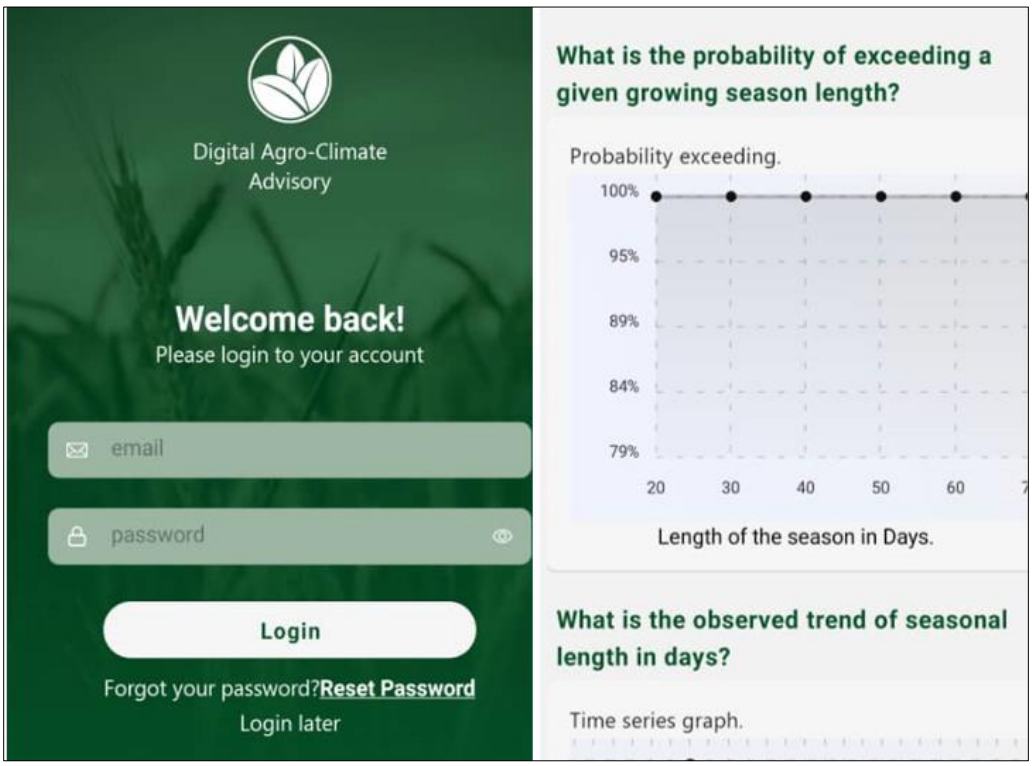


Figure 12: Screenshots from DACA App –an agro-climate advisory developed by CIAT

The SMEs and extension officers discussed that although DACA is currently used on the bean value chain, the agro-advisories generated, such as temperature and total rainfall, could also be useful among aquaculture value chain actors.
In closing, participants raised the following concerns:

1. Agro-climate advisory tools should provide weather forecast information to enable farmers to plan ahead of the farming season;
2. Advisory tools available only on android phones were not accessible to smallholder farmers in rural areas who have no access to smartphones.

SMEs and extension agents who were trained on DACA committed to training at least 20 beneficiaries each in their respective districts on how to use this tool and how to read and interpret graphs

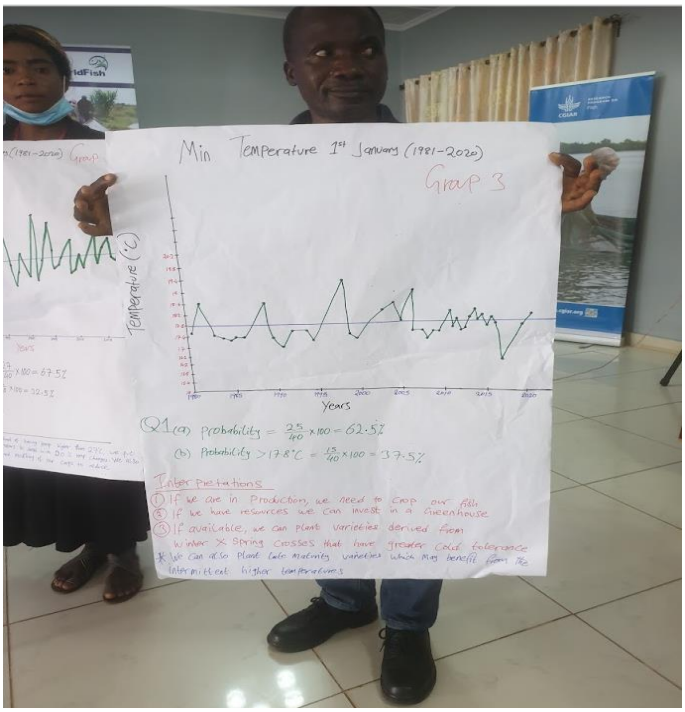


Figure 13: One of the trainees holding a graph they had drawn and the interpretation

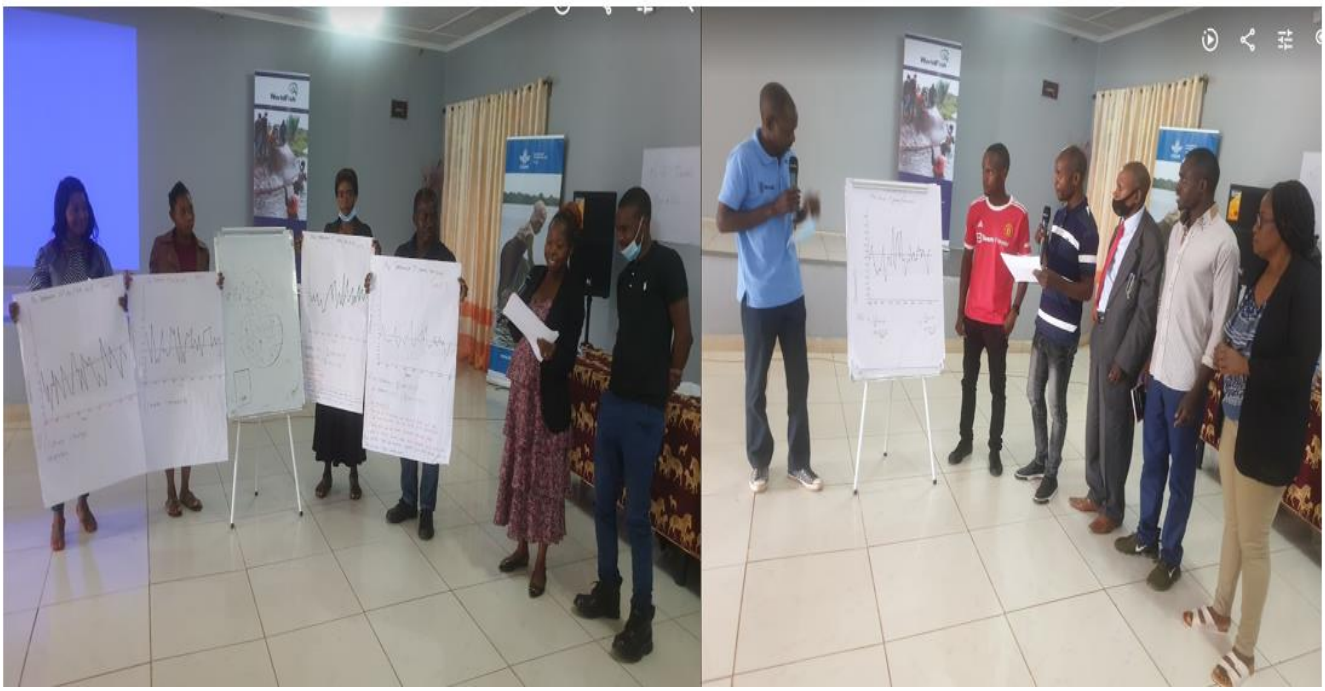


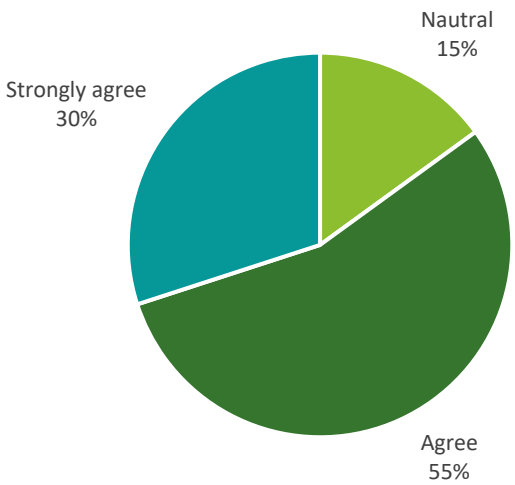
Figure 14: Participants presenting their graphs and interpretation of the data extracted from DACA.

Workshop Evaluation by Keagan Kakwasha

Over 90% of the workshop participants said that the workshop's objectives were clear and that they were the right persons to attend such a workshop. The lessons,

experiences, and ideas shared during the workshop were very useful to the participants and to pass on the lessons to other farmers to have more farmers adopt or use climate-smart agriculture technologies. Generally, participants were happy with the way the training was conducted and rated the content of the training materials as easy to follow (55% agreed, and 30% strongly agreed) (Figure 10).

Figure 10: Content easier to follow



Workshop agenda

AICCRA Zambia CSA-CIS-MSD Workshop: Aquaculture Bundle

25th – 30th April, 2022

Venue: Teja Lodge, Mansa

Agenda

Day 1: 25th April

Time	Activity	Facilitator
08:30-08:50	Registration	Mercy Sichone & Henry Kanyembo
08:50-09:00	National Anthem and Opening Prayer	Eneless and Agness
09:00-09:10	Welcoming remarks	Mary Lundeba
09:10-09:30	Introductions	Lizzy Muzungaire
09:30-09:45	Meeting objectives & project overview - Aquaculture Bundle	Keagan Kakwasha
09:45-10:30	Introduction to climate change/ climate smart aquaculture (CSA) • Barriers to climate change resilience among smallholder fish farmers **(brain storm and present in plenary-3 groups)** • Summarize barriers (Henry)	Mary Lundeba and Lizzy Muzungaire
10:30-11:00	Health Break	Mercy and Agness
11:00-13:00	Introduction to CSA continues • Alignment with national priorities • Expected results Key climate change terms and definitions (Group work)	Mercy Sichone, Henry Kanyembo, Mary Lundeba
13:00-14:00	Lunch break	Mercy and Agness
14:00:16:30	• Climate change adaptation and mitigation • Climate resilience (climate game)-Debrief • Break in 2 groups (NP & LP) **Discuss Climate smart practices to help you adapt to climate change**	Mary Lundeba Mercy Sichone Henry Kanyembo
	End of Day 1	

Day 2: 26th April

Time	Activity	Facilitator
09:00-09:30	Recap of day one	Eneless Kazule/Precious Daka
09:30-10:30	Impact of climate change on aquaculture **(Before the storm game) Debrief** • Discuss impacts & Vulnerability	• Mary Lundeba • Lizzy Muzungaire • Mercy Sichone • Henry Kanyembo
10:30-11:00	Health Break	Mercy and Agness
11:00-13:00	• Climate-smart aquaculture • Climate-smart adaptations & mitigation Integrated aquaculture agriculture (IAA) • What is IAA? • Why practice IAA? • What are the IAA links?	• Mary Lundeba • Lizzy Muzungaire • Mercy Sichone • Henry Kanyembo
13:00-14:00	Lunch Break	Mercy and Agness
14:00-15:00	• How does IAA help adapt and mitigate effects of climate change? • Group work according to provinces and gender **(what are the integration opportunities? And why?)**	Mary Lundeba
15:00-15:30	Health Break	
15:30-16:30	Group work according to provinces and gender **(what are the integration opportunities? And why?) continues** **Presentation in plenary**	Mary Lundeba
	End of day 2	

Day 3: 27th April

Time	Activity	Facilitator
08:30-09:00	Recap of day 2	Mfune Mwendalubi/Susan Chakwira
09:00-10:30	SME plans to reach the set AICCRA project targets Hopeways, Kasakalabwe, ADESK, Eunimos, Triple Blessings, Kasama Arts	Keagan and Lizzy
10:30-11:00	Health Break	Mercy and Agness
11:00-13:00	Gender inclusion in IAA	Netsayi, Mary and Lizzy

	Presentation and games	
13:00-14:00	Lunch Break	Mercy and Agness
14:00-16:00	Visit to Hopeways fish farm • General discussions/observations	Henry Kanyembo
	End of day 3	

Day 4: 28th April

Time	Activity	Facilitator
08:00-08:30	Registration	Mercy Sichone
08:30-09:00	Introductions	Lizzy Muzungaire
09:00-09:30	Mpeni Farm share experience	Mrs. Tembo
09:30-10:00	Aqua-culture development Association Zambia ADAS Share their experience with micro-finance, out grower scheme and marketing & value addition	Nelson Kaluba
10:00-10:30	Tea Break	Mercy and Agness
10:30-11:00	Bench Marking / harvesting estimates; credit worthiness of a smallholder fish farmer	TBA
11:00-11:30	Financial services for small scale fish farmers & SME	NATSAVE
11:30:13:00	Overview of the CIS & CSA and definition of key concepts Reading historical climate information	Livingstone and Desire
13:00-14:00	Lunch break	Mercy and Agness
14:00-15:00	• Expectations from participants Understanding the value of weather and Climate Services to fish value chain actors o Introduce the concept of climate change and variability and other associated weather and climate behaviour o Exploring the relationship between Climate Information Services (CIS) and fish operations	Livingstone and Desire
15:00-15:30	**Health Break**	Mercy and Agness
15:30-16:30	o Participatory dissemination of Digital Agro-Climate Advisory P-DACA	Livingstone and Desire

	End of day 4	

Day 5: 29th April

Time	Activity	Facilitator
09:00-09:30	Recap	Lizzy Muzungaire
09:30-10:30	Understanding the probability of exceedance and time series graphs	Livingstone and Desire
10:00-10:30	Health Break	Mercy and Agness
10:30-13:00	Practical work in groups: Climate Information Services (CIS): Explain how to proceed and working group formation	Livingstone and Desire
13:00-14:00	Lunch break	Mercy and Agness
14:00-15:00	Group work on practical exercises	Livingstone and Desire
15:00-15:30	**Health Break**	Mercy and Agness
15:30-16:30	• Group Presentations • Introduction to the MEL tools • Dissemination Plans among the fish value chain • Evaluation	Livingstone and Desire
	End of day 5	

Day 6: 30th April

Time	Activity	Facilitator
09: 00-12:00	Field visit Manfred Bwalya's farm in Samfya (end of workshop)	Livingstone and Desire
13:00-14:00	Lunch Break	Mercy, Agness
14:00-14:30	Closing remarks	Lizzy Muzungaire
	End of workshop	

About AICCRA

Accelerating Impacts of CGIAR Climate Research for Africa (AICCRA) is a project that helps deliver a climate-smart