



REPUBLIC OF ZAMBIA

MINISTRY OF FISHERIES
AND LIVESTOCK



REPUBLIC OF ZAMBIA

MINISTRY OF FINANCE
AND NATIONAL PLANNING



**ZAMBIA
STATISTICS
AGENCY**
"Quality Statistics for Development"



2023 AQUACULTURE SURVEY

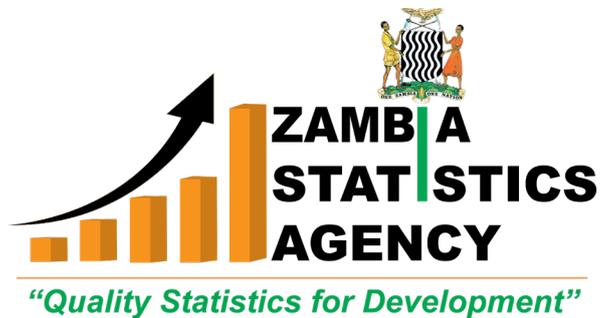
SUMMARY REPORT





REPUBLIC OF ZAMBIA

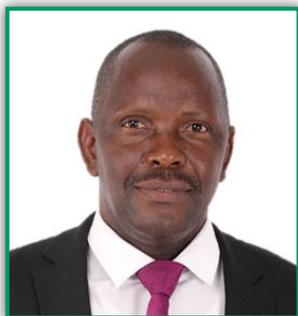
MINISTRY OF FISHERIES AND LIVESTOCK



2023 AQUACULTURE SURVEY SUMMARY REPORT



FOREWORD



The Government of the Republic of Zambia has prioritized the fisheries and livestock subsectors as key drivers in the socio-economic transformation agenda of the country. The Government also places emphasis on evidence-based planning, monitoring and evaluation as a basis for implementing programmes being undertaken across all sectors and also as a way of measuring their impact. In order to achieve this, high-quality statistics are necessary. Aquaculture statistics are, therefore, crucial in revealing sector performance against set targets as well as assessing the contribution of the subsector to the National Gross Domestic Product (GDP).

Up-to-date and accurate aquaculture statistics also assist the country in accurately reporting and providing evidence-based information on key programmes such as the Malabo Declaration and the Sustainable Development Goals (SDGs), Vision 2030, National Development Plans and the National Agricultural Implementation Plan (NAIP) the, among others.

Furthermore, quality statistics are needed to demonstrate the importance and relevance of the aquaculture sector with respect to employment creation, incomes and livelihoods of households.

Therefore, we sincerely hope that the results of the 2023 Aquaculture Survey will be used to measure the performance of the aquaculture subsector and its contribution to the economy as well as a tool for determining future policy actions. We are confident that the results of this survey will assist policy-makers in making informed decisions, allocating resources and justifying investments in the subsector.

Hon. Makozi Chikote, MP
**MINISTER OF FISHERIES AND
LIVESTOCK**

Hon. Dr. Situmbeko Musokotwane, MP
**MINISTER OF FINANCE AND NATIONAL
PLANNING**

October, 2023



ACKNOWLEDGEMENTS



The 2023 Aquaculture Survey was conducted in April 2023 in cognizance of the importance of robust and rigorous statistics critical for informed decision and policy formulation. Since the 2017/2018 Livestock and Aquaculture Census, there has never been nationwide aquaculture data collection and consequently hence the country has relied on a non-robust administrative data sources that often do not accurately reflect what is obtaining on the ground.

The success of the 2023 Aquaculture Survey was attributed to the availability of funds and technical support. Therefore, we would like to express our sincere gratitude to all institutions that provided such assistance.

The Government of the Republic of Zambia is profoundly grateful for the funds provided by the European Union (EU) through the Zambia Aquaculture Project (ZAP) and the African Development Bank (AfDB) project, Zambia Aquaculture Enterprise Development Project (ZAEDP). ZAP supported the entire survey process from frame and instruments development through to report writing stages and printing of the final report. ZAEDP provided funds for the development of the survey instruments. Sincere appreciation also goes to the Indaba Agricultural Policy Research Institute (IAPRI) for its technical guidance which assisted in shaping and fine-tuning the 2023 Aquaculture Survey instruments. The institution's involvement was also critical during the data processing and analysis stages.

Finally, gratitude is extended to all the technical and support staff at both the Ministry of Fisheries and Livestock (MFL) and the Zambia Statistics Agency (ZamStats), the Provincial Administrators, and the Enumerators for their effort and dedication to the whole survey process. It is our sincere hope that the statistics contained herein will contribute to improving decision-making and policy formulation in the aquaculture sub-sector.

Eng. Himba Cheelo (Ms.)
PERMANENT SECRETARY
MINISTRY OF FISHERIES AND LIVESTOCK

Danies K. Chisenda
PERMANENT SECRETARY
MINISTRY OF FINANCE AND NATIONAL PLANNING

October, 2023

STATISTICIAN GENERAL'S STATEMENT



The Zambia Statistics Agency was established under the Statistics Act No. 13 of 2018. The main focus of the Act is to develop an integrated National Statistical System, provide mechanisms for coordination, collection, management and dissemination of statistics, as well as promote the use of statistical data and information at all levels. By the same Act, the Zambia Statistics Agency is the sole designated entity responsible for the publication of official statistics. The Agency is also required to provide for the production and compilation of official statistics in a transparent and impartial manner.

It is against this background that I am pleased that the Ministry of Fisheries and Livestock collaborated with the Agency in conducting the 2023 Aquaculture Survey.

The 2023 Aquaculture Survey used a sound methodology and internationally accepted fundamental principles for the production of official statistics. It was designed to provide aquaculture estimates at national, provincial as well as rural and urban levels. It collected information on demographic characteristics of fish farming households, table-size fish production and productivity, fingerling production, fish feed production, access to loans, credit and grants as well as challenges faced by both households and establishments.

I hope the results contained in this report and the dataset will find use among policymakers, programme managers, researchers and other data users for the development of the aquaculture industry and the entire country. The 2023 Aquaculture Survey datasets and any specialized tabulations can be made available to users upon request.



Mulenga J. J. Musepa
STATISTICIAN-GENERAL
ZAMBIA STATISTICS AGENCY

October, 2023



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ACRONYMS AND ABBREVIATIONS

8NDP	Eighth National Development Plan
AfDB	African Development Bank
CATSP	Comprehensive Agriculture Transformation Support Programme
EA	Enumeration Area
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
GDP	Gross Domestic Product
MFL	Ministry of Fisheries and Livestock
MT	Metric tonnes
NAIP	National Agriculture Investment Plan
NGOs	Non-Governmental Organizations
PACRA	Patents and Companies Registration Agency
PSU	Primary Sampling Unit
SGDs	Sustainable Development Goals
ZABS	Zambia Bureau of Standards
ZAEDP	Zambia Aquaculture Enterprise Development Project
ZamStats	Zambia Statistics Agency
ZAP	Zambia Aquaculture Project
ZRA	Zambia Revenue Authority





CHAPTER 1: BACKGROUND

1.1 Introduction

According to the FAO, aquaculture production has continued to rapidly increase globally in recent years with a 2.7% growth reported in 2020. Zambia is among the leading fish-farming countries in Africa and number one in Southern Africa (FAO 2028). The aquaculture industry has exponentially (MFL 2021) grown in the last two decades owing to the country's successive supportive policy frameworks which include the National Aquaculture Strategy (2005), National Aquaculture Development Plan (2010), the first and second National Agriculture Policy, National Agriculture Investment Plan (2014), National Development Plans and Vision 2030. These frameworks have provided policy direction and created an enabling environment that continues to attract investments into the aquaculture industry, both local and foreign. Most large aquaculture investments have been established in the Zambezi Basin due to its favorable climate for aquaculture and the availability of market and water for both land-based aquaculture operations. The small-scale fish farmers are mainly concentrated in the northern region; Northern, Luapula, Muchinga, Copperbelt and Northwestern provinces.

Despite this rapid growth, there has not been a parallel robust information available to measure the performance of the aquaculture subsector and demonstrate its contribution to the national economy. The only nationwide aquaculture assessment that has so far been undertaken is the 2017/18 Livestock and Aquaculture Survey. Since then, the country has been relying on extrapolations from administrative data sources which are usually outdated and not reliable.

Therefore, the 2023 Aquaculture Survey was the first of its kind in Zambia and is envisioned to provide comprehensive and updated statistics on aquaculture. The survey provides

baseline data on performance indicators for the key policy frameworks such as the Comprehensive Agricultural Transformation Support Programme (CATSP) and Eight National Development Plan (8NDP) as they contribute towards the country's long-term aspirations stipulated in the Vision 2030. The survey will also be critical in demonstrating the subsector's contribution to the GDP.

1.2 Objectives of the 2023 Aquaculture Survey

The overall objective of the survey was to collect updated, reliable and credible aquaculture statistics to guide policy formulation, cooperating partners' support and private sector decisions regarding investments and the development of the Aquaculture sub-sector. The specific objectives were:

- To generate statistics which are critical in analyzing and assessing the sector's performance and contribution to the National Gross Domestic Product among others;
- To collect data from the aquaculture sub-sector that will form a benchmark upon which future surveys will be based;
- To show the importance of fish farming with respect to employment, livelihoods, and resilience capacity of the nation and firms engaged in aquaculture production;
- To determine the characteristics and distribution of fish farming households;
- To understand the fish farming management practices being used by households and establishments;



- To understand the fish marketing aspects at both household and establishment levels;
- To understand the extent to which fish biosecurity measures and climate-smart aquaculture are being practiced by both fish farming households and establishments;
- To understand access to funds for aquaculture at both household and establishment levels;
- To understand the fish post-harvest practices being used by households and establishments;
- To determine the quantity and distribution aspects of fish feed in the country;
- To determine the major challenges affecting fish farming in Zambia;
- To determine the aquaculture production contribution to the annual fisheries production.



CHAPTER 2: CHARACTERISTICS OF FISH FARMING HOUSEHOLDS

This chapter highlights the demographic characteristics of household heads engaged in aquaculture as at 31st December, 2022. The main demographic characteristics discussed under this section include sex, age, education level and marital status for the fish farming households.

2.1 Distribution of fish farming households

Table 2.1 and Figure 2.1 shows that a total of 19,697 households were engaged in fish farming as at 31st December 2022. Among

the provinces, Northern Province had the highest number of fish farming households at 5,690 followed by Muchinga Province at 3,075, Southern Province had the lowest number of fish farming households at 515.

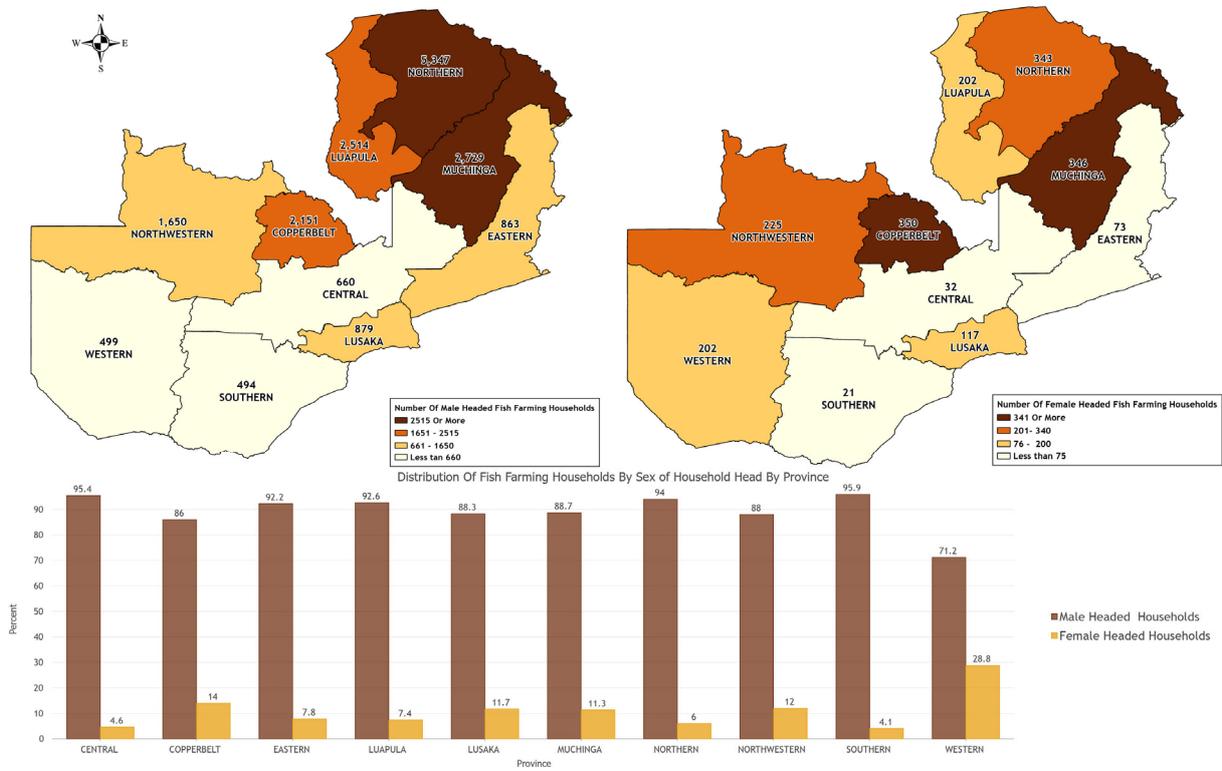
Southern Province recorded the highest percentage of Male-headed households at 95.9% while Western recorded the lowest at 71.2%. On the other hand, Western recorded the highest percentage of female-headed households at 28.8% and Southern Province was the lowest percentage at 4.1%.

TABLE 2.1 DISTRIBUTION OF FISH FARMING HOUSEHOLDS BY SEX OF HOUSEHOLD HEAD AND PROVINCE

Province	Sex of household heads				Total fish farming households	
	Male		Female			
	Number	Percent	Number	Percent	Number	Percent
Central	660	95.4	32	4.6	692	100.0
Copperbelt	2,151	86	350	14.0	2,501	100.0
Eastern	863	92.2	73	7.8	936	100.0
Luapula	2,514	92.6	202	7.4	2,716	100.0
Lusaka	879	88.3	117	11.7	996	100.0
Muchinga	2,729	88.7	346	11.3	3,075	100.0
Northern	5,347	94.0	343	6.0	5,690	100.0
Northwestern	1,650	88.0	225	12.0	1,875	100.0
Southern	494	95.9	21	4.1	515	100.0
Western	499	71.2	202	28.8	701	100.0
Zambia	17,786	90.3	1,911	9.7	19,697	100.0



FIGURE 2.1: DISTRIBUTION OF FISH FARMING HOUSEHOLDS BY SEX OF HOUSEHOLD HEAD AND PROVINCE



2.2 Distribution of Households engaged in Fish Farming by Rural and Urban areas

Table 2.2 shows the distribution of households engaged in fish farming in rural and urban areas. A total of 14,358 households were based in the rural area, which accounted for 72.9% of the total fish farming households while the remaining 27.1% were urban-based.

At the provincial level, Northern had the highest percentage of rural fish farming households at 93.0% while Copperbelt recorded the lowest at 11.2%. Conversely, Copperbelt Province recorded the highest percentage of urban fish farming households at 88.8% while Northern Province was the lowest at 7.2%.

TABLE 2.2 DISTRIBUTION OF HOUSEHOLDS ENGAGED IN FISH FARMING BY RURAL AND URBAN AREAS BY PROVINCE

Province	Region				Total	
	Rural		Urban		Number	Percent
	Number	Percent	Number	Percent		
Central	510	73.7	182	26.3	100	692
Copperbelt	279	11.2	2,222	88.8	100	2,501
Eastern	668	71.4	269	28.7	100	936
Luapula	2,286	84.2	430	15.8	100	2,716
Lusaka	292	29.4	704	70.6	100	996
Muchinga	2,545	82.8	530	17.2	100	3,075
Northern	5,292	93	398	7	100	5,690
Northwestern	1,641	87.5	235	12.5	100	1,875
Southern	309	60	206	40	100	515
Western	536	76.5	165	23.5	100	701
Zambia	14,358	72.9	5,339	27.1	100	19,697



2.3 Distribution of Fish Farming Households by Sex of Household Head

Table 2.3 shows the distribution of fish farming households by sex of household head and age group. The majority were 35 years and older (77.57%) while youth-headed households (15-34 years) accounted for 22.38% of the total fish farming household heads.

The most common age group among the male-headed households was 35 years and older accounting for 77.2% followed by those between 15 and 34 years at 22.7%. Among the female-headed household heads, the age group 35 and older was still the majority at 80.8%.

TABLE 2.3 DISTRIBUTION OF FISH FARMING HOUSEHOLDS BY SEX OF HEADS OF HOUSEHOLDS AND AGE CATEGORY

Age Group	Distribution of household heads by sex				Total	
	Male		Female			
	Number	Percent	Number	Percent	Number	Percent
Less than 15 years old	10	0.1	0	0	10	0.05
15 to 34 years old	4,043	22.7	366	19.2	4,409	22.38
35 years and older	13,735	77.2	1543	80.8	15,278	77.57
Total	17,788	100	1,909	100	19,697	100

2.4 Household heads by the highest Level of Education

Table 2.4 shows the distribution of fish farming household heads by highest level of education completed by province. Out of the 19,697 heads of fish farming households, the majority of them

attained primary education (30.1%) followed by junior secondary at 23.6% while 1.3% had never been to school.

TABLE 2.4: HOUSEHOLD HEADS BY HIGHEST LEVEL OF EDUCATION

Province	Total households	Percentage distribution of household heads by highest level of education attained								
		None	Primary	Junior secondary	Senior secondary	A- level	College/ Under-graduate	Certificate/ Diploma	Bachelor's degree	Master's degree and beyond
Central	692	0	26.1	18.5	24.5	0	0	17	4.6	9.2
Copperbelt	2,501	0	6.5	15	29	0	3.7	29	7.5	9.4
Eastern	936	1.7	35.9	14.5	27.5	0	3.2	12.4	4.8	0
Luapula	2,716	1.8	36.3	24.1	24.2	0	0.2	7	4.1	2.3
Lusaka	996	2.9	10.3	11.8	8.8	0	2.9	25	17.7	20.6
Muchinga	3,075	0.7	29.8	35	26.4	0	0.4	4.6	2.4	0.7
Northern	5,690	1.1	45.2	30.9	17.4	0.2	0.9	3.4	0.9	0
Northwestern	1,875	2.6	23.4	24.9	31.3	0	4.7	8.8	3.7	0.5
Southern	515	5.2	21.4	13.4	26.6	0	2.7	18.6	9.3	2.7
Western	701	0	17.4	28.4	32.7	0	5.9	11.3	3.9	0.4
Zambia	19,697	1.3	30.1	25.3	23.6	0.1	1.8	10.5	4.2	3.1



CHAPTER 3: FISH FARMING MANAGEMENT

This chapter highlights fish farming management aspects such as source of water used for fish farming, the source and cost of inputs used by households and establishments in aquaculture production, the proportion of households that received extension services and the type of information received.

3.1 Source of Water used in Fish Production

Table 3.1 indicates that the main source of water for fish farming was streams/ rivers used by 57.2% of the households. Swamps/dambos/ wetlands and boreholes were the next common water source accounting for 17.3% and 10.6% of the households, respectively.

TABLE 3.1: PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY MAIN WATER SUPPLY BY PROVINCE

Province	Total households		Percentage distribution of households by source of water for fish farming							
	Number	Percent	Stream/river	Spring	Lake	Dam/reservoir	Swamp/dambo/wetlands	Borehole	Water utility company	Other specify
Central	692	100	38.4	4.6	0	1.6	10.7	41.6	0	3
Copperbelt	2,501	100	41.1	11.2	0	1.9	22.4	16.8	4.7	1.9
Eastern	936	100	12.8	9.3	0	3.2	45	17.5	1.5	10.8
Luapula	2,716	100	60.1	21.2	0	0.9	16.9	0.4	0	0.2
Lusaka	996	100	20.6	2.9	0	1.5	1.5	69.2	1.5	2.9
Muchinga	3,075	100	70.3	3.5	0	5.6	17.1	3.2	0	0.4
Northern	5,690	100	65.3	6.8	0.5	6.4	19	0.7	0	1.3
Northwestern	1,875	100	87	5.2	0	1.5	4.7	0.5	0.5	0.5
Southern	515	100	21.4	1.4	1.4	10.7	4.1	54.6	5.4	1.4
Western	701	100	56.5	7.8	0	0.4	23	11.7	0.4	0
Zambia	19,697	100	57.2	8.4	0.2	3.8	17.3	10.6	0.9	1.5

3.2 Proportion of Households accessing Extension Services

Table 3.2 shows that out of a total 19,697 fish farming households, 12,958 representing 65.8% received extension services. Among provinces, Western recorded the highest percentage

at 96.0% followed by Lusaka (80.9%) and Copperbelt (76.6%) while Muchinga reported the lowest at 48.2%.

TABLE 3.2: DISTRIBUTION OF HOUSEHOLDS THAT RECEIVED EXTENSION SERVICES BY PROVINCE

Province	Total households	Households that received extension services	
		Number	Percent
Central	692	500	72.3
Copperbelt	2,501	1,916	76.6
Eastern	936	714	76.3
Luapula	2,716	2,061	75.9
Lusaka	996	806	80.9
Muchinga	3,075	1,482	48.2
Northern	5,690	3,243	57.0
Northwestern	1,875	1,171	62.5
Southern	515	391	75.9
Western	701	673	96.0
Zambia	19,697	12,958	65.8



3.3 Types of Fish Farming Information received by Households

Table 3.3 shows the number of households by province that accessed information on fish farming (fish inputs, fish production, fish marketing as well as credit, microfinance or savings information). Fish production was

the most received type of information (11,406 households) followed by fish inputs and fish marketing at 6,845 and 2,659 respectively. Credit, micro-finance or savings information was the least at 1,654 households.

TABLE 3.3: HOUSEHOLDS THAT ACCESSED VARIOUS TYPES OF FISH FARMING INFORMATION BY PROVINCE

Province	Distribution of households by type of information received							
	Fish input		Fish production		Fish marketing		Credit, micro-finance, or savings information	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Central	192	2.8	447	3.9	117	4.4	53	3.2
Copperbelt	1,100	16.1	1,799	15.8	492	18.5	351	21.2
Eastern	520	7.6	671	5.9	212	8	137	8.3
Luapula	1,138	16.6	1,994	17.5	520	19.6	300	18.2
Lusaka	439	6.4	689	6	161	6.1	117	7.1
Muchinga	762	11.1	966	8.5	43	1.6	311	18.8
Northern	1,151	16.8	2,829	24.8	515	19.4	81	4.9
Northwestern	770	11.2	1,015	8.9	254	9.6	147	8.9
Southern	261	3.8	371	3.3	69	2.6	7	0.4
Western	513	7.5	625	5.5	276	10.4	151	9.1
Zambia	6,845	100	11,406	100	2,659	100	1,654	100



CHAPTER 4: FISH PRODUCTION AND PRODUCTIVITY

This chapter covers fish production and productivity of households and establishments engaged in fish farming between 1st January 2022 and 31st December 2022. It highlights information on the total number of active fish farming facilities by type managed by households and establishments, the area and volume occupied by the facilities and the number of production cycles. Further, fish species produced, stocking density and yields by facility type and province are reported under this chapter.

4.1 Types of Fish produced by Households and Establishments

Table 4.1 shows the distribution of households and establishments by type of fish (table-size, fingerlings or table-size and fingerlings) they produced. It is worth noting that establishments that were involved in feed production but were not engaged in fish production are not included in the analysis under this chapter.

At the household level, table-size fish producers were prominent accounting for 91.6% followed by those producing a combination of table-size and fingerling at 6.4% and the least were fingerling producers at 2.0%. Under establishments, the majority (87.1%) produced table-size fish, followed by table-size and fingerlings producers at 12.7%. The lowest were fingerling producers only at 0.1%.

TABLE 4.1 NUMBER AND PERCENTAGE OF HOUSEHOLDS AND ESTABLISHMENTS BY TYPE OF FISH PRODUCED

Type of Fish	Households		Establishments		Total	
	Number	Percent	Number	Percent	Number	Percent
Table-Size	18,034	91.6	1,176	87.1	19,210	91.3
Fingerlings	399	2.0	2	0.1	401	1.9
Table-Size and fingerling	1,264	6.4	172	12.7	1,436	6.8
Zambia	19,697	100.0	1,350	100	21,047	100.0

4.2 Fish farming facilities by type managed by households and Establishments

The types of fish farming facilities that were used for fish production by both households and establishments were ponds, cages, tanks, raceways, pens and dams. A total of 61,968 ponds were reported to have been managed by both households and establishments out of which Northern Province recorded the highest

at 18,801 followed by Luapula Province with 11,079 while Southern Province accounted for the lowest at 1,166. Cages totaled 919 out of which Southern Province reported the highest at 550 followed by Copperbelt Province and Northern Province with 144 and 45, respectively (See Table 4.2).



TABLE 4.2: DISTRIBUTION OF FISH FARMING FACILITIES USED BY HOUSEHOLDS AND ESTABLISHMENTS BY PROVINCE

Province	Number of facilities for households						Number of facilities for establishments						Total number of facilities					
	Ponds	Cages	Tanks	Raceways	Pens	Dams	Ponds	Cages	Tanks	Raceways	Pens	Dams	Ponds	Cages	Tanks	Raceways	Pens	Dams
Central	1,447	21	21	-	-	-	438	12	10	0	0	0	1,885	33	31	-	-	-
Copperbelt	6,310	-	117	-	23	-	2,208	144	32	21	10	1	8,518	144	149	21	33	1
Eastern	1,832	-	7	-	-	-	231	0	11	0	0	5	2,063	-	18	-	-	5
Luapula	10,720	-	6	-	6	-	359	38	0	0	0	2	11,079	38	6	-	6	2
Lusaka	1,715	-	29	-	-	-	1,283	0	31	0	0	4	2,998	-	60	-	-	4
Muchinga	7,266	-	32	-	-	-	770	15	23	0	0	0	8,036	15	55	-	-	-
Northern	17,769	10	41	20	20	-	1,032	35	44	13	0	0	18,801	45	85	33	20	-
North-western	4,886	68	-	20	-	-	706	2	0	36	0	0	5,592	70	-	56	-	-
Southern	878	7	-	-	21	-	288	543	10	12	4	1	1,166	550	10	12	25	1
Western	974	14	-	-	-	-	856	10	74	0	0	0	1,830	24	74	-	-	-
Zambia	53,797	120	253	40	70	-	8,171	799	235	82	14	13	61,968	919	488	122	84	13

4.3 Size of Fish Farming facilities managed by Households and Establishments

Table 4.3 shows that 41,561 fish farming facilities were stocked out of a total 54,280 that were managed by households while at establishment level, all 8,663 facilities were stocked.

Further, the total stocked area for fish ponds from both households and establishments was 19,597,323 square metres and the volume for cages was 657,977 cubic metres.

TABLE 4.3 FISH FARMING FACILITIES MANAGED BY HOUSEHOLDS AND ESTABLISHMENTS

Fish farming facility	Households				Establishments		Total stocked facilities (Households and Establishments)	
	Total facilities		Stocked facilities		Stocked facilities		Number	Area/ Volume (m2/ m3)
	Number	Area/ Volume (m2/ m3)	Number	Area/ Volume (m2/ m3)	Number	Area/ Volume (m2/ m3)		
Ponds	53,797	17,399,204	41,192	13,561,387	7,573	6,035,936	48,765	19,597,323
Cages	120	9,350	78	3,821	799	654,156	877	657,977
Tanks	253	547,192	225	546,276	161	3,747	386	550,023
Raceways	40	15,864	20	11,910	82	7,288	102	19,198
Pens	70	17,613	46	12,587	14	53,500	60	66,087
Dams	0	0	0	0	34	252,425	34	252,425
Totals	54,280		41,561		8,663		50,224	

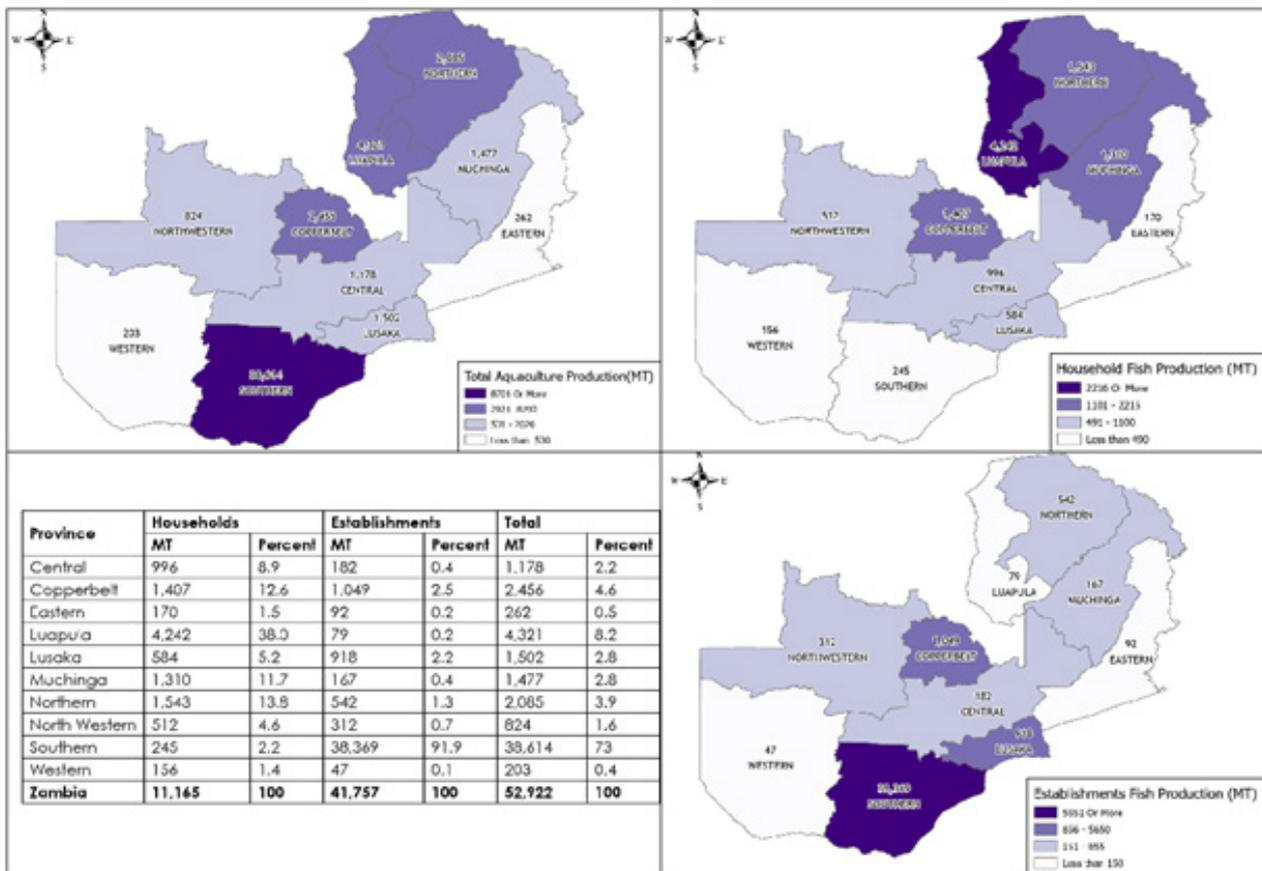
4.4 Fish Production by Households and Establishments by Province

Figure 4.1 shows fish production by both households and establishments was 52,922 metric tonnes out of which establishments contributed 41,757 metric tonnes while households contributed 11,165 metric tonnes. At the household level, Luapula Province reported the highest fish production of 4,242 metric tonnes (38.0%) followed by Northern Province at 1,543 metric tonnes representing 13.8%.

Southern Province was highest at the establishment level recording 38,614 metric tonnes (91.9%) of fish production, followed by Copperbelt and Lusaka at 1,049 metric tonnes (2.5%) and 918 metric tonnes (2.2%), respectively.



FIGURE 4.1: FISH PRODUCTION BY HOUSEHOLDS AND ESTABLISHMENTS BY PROVINCE



4.5 Fish Production by Households and Establishments by Species

The major cultured fish species in Zambia recorded were breams (Three-spotted tilapia, Green-headed tilapia, Red-breasted tilapia, Nile tilapia and Tanganyika bream), Common carp fish and Catfish. At the household level, Red-breasted tilapia accounted for the highest percentage of fish produced at 27.2%, followed

by Mixed species and Green-headed tilapia at 25.6% and 23.9% respectively.

Under establishments, Nile tilapia (94.6%) constituted the largest percentage, followed by Red-breasted tilapia (1.9%) and Green-headed tilapia at 1.7%.

TABLE 4.5 FISH PRODUCTION BY HOUSEHOLDS AND ESTABLISHMENTS BY SPECIES

Fish Species	Households		Establishments		Total	
	Metric Tonnes	Percent	Metric Tonnes	Percent	Metric Tonnes	Percent
Three-spotted tilapia	1,787	16	676	1.6	2,463	4.7
Green-headed tilapia	2,671	23.9	724	1.7	3,395	6.4
Red-breasted tilapia	3,036	27.2	811	1.9	3,847	7.3
Nile tilapia	761	6.8	39,486	94.6	40,247	76.1
Carp fish	15	0.1	2	0.00005	17	0.03
Catfish	27	0.2	23	0.1	50	0.09
Tanganyika bream	20	0.2	17	0.04	37	0.07
Mixed species	2,848	25.6	18	0.04	2,866	5.4
Total	11,165	100	41,757	100	52,922	100



4.6 Number of Production Cycles per Year for Households

The majority of fish farming facilities under households were used for one (1) production cycle (73.3%) followed by those that never harvested their facilities (21.1%). Eastern

Province recorded the highest percentage of facilities that had two (2) production cycles at 11.0% (See Table 4.6).

TABLE 4.6: PERCENTAGE DISTRIBUTION OF NUMBER OF PRODUCTION CYCLES BY HOUSEHOLDS BY PROVINCE

Province	Total facilities		Percentage distribution of the number of harvests per facility				
	Number	Percent	0 cycle	1 cycle	2 cycles	3 cycles	4 cycles
Central	1,171	100.0	22.7	69.1	7.3	0.9	0.0
Copperbelt	4,019	100.0	23.3	69.7	7.0	0.0	0.0
Eastern	1,495	100.0	37.3	50.3	11.0	1.5	0.0
Luapula	8,629	100.0	12.7	84.7	2.5	0.1	0.0
Lusaka	1,376	100.0	4.3	85.1	10.6	0.0	0.0
Muchinga	5,295	100.0	25.7	69.8	4.1	0.4	0.0
Northern	14,234	100.0	24.3	71.9	3.6	0.2	0.0
Northwestern	3,862	100.0	16.7	71.4	9.9	1.8	0.3
Southern	749	100.0	23.0	67.8	9.2	0.0	0.0
Western	753	100.0	28.3	61.0	9.4	0.9	0.4
Zambia	41,583	100.0	21.1	73.3	5.1	0.4	0.0

4.7 Fish Stocking Density for Households and Establishments

Table 4.7 shows the average stocking density (number of fish per meter square or meter cubic) for households and establishments. Under households, the national average fish stocking density for cages was 43.1 per meter square and 4.1 per meter square for ponds. Meanwhile, establishments reported a fish stocking density of 90.6 per meter cubic and 7.9 per square meter for cages and ponds, respectively.

Among provinces, Northwestern recorded the highest fish stocking density for cages by households at 76.1 per meter cubic and Western was highest under ponds at 8.0 per square meter. The highest fish stocking density for cages under establishments was recorded in Southern Province (228.0 per meter cubic) and Lusaka was highest under ponds at 9.5 per meter square.

TABLE 4.7: AVERAGE FISH STOCKING DENSITY FOR HOUSEHOLDS AND ESTABLISHMENTS

Province	Households		Establishments	
	Cages (number of fish/m ³)	Ponds (number of fish/m ²)	Cages (number of fish/m ³)	Ponds (number of fish/m ²)
	Central	10	4.7	24.4
Copperbelt	-	3.3	31.6	9.5
Eastern	-	3.8	-	4.7
Luapula	-	3.2	81	3.4
Lusaka	-	3.9	-	9.5
Muchinga	-	3.8	68.1	8.1
Northern	-	1.1	43.6	3.2
North Western	76.1	4.4	179.2	8
Southern	-	4.9	228	7.5
Western	-	8	69.1	7
Zambia	43.1	4.1	90.6	7.9



4.8. Average Fish Yields for Households and Establishments

The national average fish yield for cages under households was 18.6 kg/m³/year and 7.0 tonnes/ha/year from ponds. Under establishments, fish yield for cages was 46.6 kg/m³/year while ponds recorded 15.0 tonnes/ha/year

Cage fish farming under households was only reported in Northwestern and Central Provinces with the earlier reporting the highest yields at 20.3 kg/m³/year. Meanwhile, the highest yield from ponds was recorded in Northern Province

at 12.5 tonnes/ha/year followed by Southern (10.2) and the lowest was Luapula at 3.4.

Under establishments, Southern Province reported the highest fish yields from cages at 68.7 kg/m³/year followed by Luapula and Copperbelt at 47.4 and 23.3 respectively. Copperbelt Province recorded the highest fish yields from ponds at 24.9 tonnes/ha/year followed by Southern Province (18.6) and Western (15.5) [See Table 4.8].

TABLE 4.8: AVERAGE FISH YIELDS FOR HOUSEHOLDS AND ESTABLISHMENTS

Province	Households		Establishments	
	Cages (kg/m ³ /year)	Ponds (tonnes/ha/year)	Cages (kg/m ³ /year)	Ponds (tonnes/ha/year)
Central	17.0	8.1	6.5	5.8
Copperbelt	-	8.4	23.3	24.9
Eastern	-	6.2	-	-
Luapula	-	3.4	47.4	2.0
Lusaka	-	6.5		11.0
Muchinga	-	6.7	9.3	1.5
Northern	-	12.5	2.0	2.8
North Western	20.3	3.8	-	8.0
Southern		10.2	68.7	18.6
Western	-	4.5	1.0	15.5
Zambia	18.6	7.0	46.6	15.0



CHAPTER 5: FINGERLING PRODUCTION

This chapter covers information on fingerling production by households and establishments between 1st January and 31st December, 2022. Specifically, the number of breeding facilities managed by households, number of fingerlings produced and sold by households and establishments, type of fingerlings produced by households, and the number of establishments producing fingerlings in the country are discussed in this chapter.

5.1 Number of Fish Breeding Facilities Managed by Households and Establishments by Province

Table 5.1 shows that the total number of fish breeding facilities managed by both households and establishments countrywide was 1,781. Under households, Northern Province recorded the highest percentage at 45.6%, followed by Muchinga at 16.6% while the lowest was Western Province (0.4%). Similarly, at the establishment level, Northern Province had the highest percentage at 21.4% while Eastern Province had the lowest percentage at 2.9%.

TABLE 5.1: DISTRIBUTION OF FISH BREEDING FACILITIES MANAGED BY HOUSEHOLDS AND PROVINCE

Province	Managed by households		Managed by establishments		Total	
	Number	Percent	Number	Percent	Number	Percent
Central	21	1.3	12	11.7	33	1.9
Copperbelt	47	2.8	18	17.5	65	3.6
Eastern	129	7.7	3	2.9	132	7.4
Luapula	251	15	6	5.8	257	14.4
Lusaka	44	2.6	8	7.8	52	2.9
Muchinga	279	16.6	10	9.7	289	16.2
Northern	765	45.6	22	21.4	787	44.2
Northwestern	108	6.4	11	10.7	119	6.7
Southern	27	1.6	9	8.7	36	2.0
Western	7	0.4	4	3.9	11	0.6
Zambia	1,678	100	103	100	1,781	100.0

5.2 Fingerling Production by Species

A total of 228,119,775 fingerlings were produced by both households and establishments. The households produced a total of 4,647,527 fingerlings of which Three-spotted tilapia accounted for the highest number, representing 69.6% of the total while Tanganyika bream accounted for the lowest number, representing 0.1%. Other species (mixed species/crossbreeds) accounted for 13.2% (see Table 5.2).

Under establishments, a total of 223,472,248 fingerlings were produced. Nile tilapia accounted for the highest number of fingerlings produced at 91.1% followed by Green-headed tilapia (4.0%) while Common Carp fish accounted for the lowest percentage at 0.01%.



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TABLE 5.2: DISTRIBUTION OF FINGERLINGS BY SPECIES

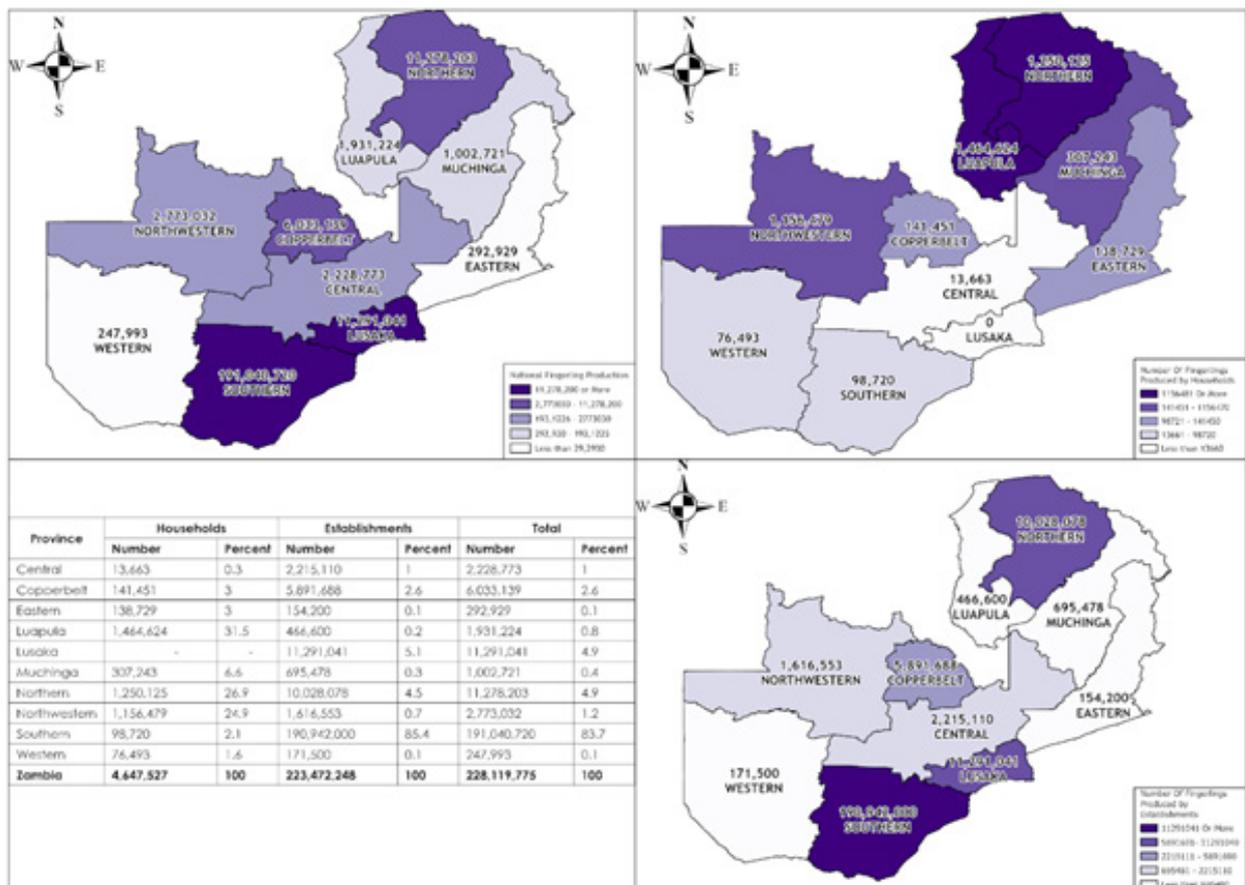
Type of Species	Households		Establishments		Total	
	Number	Percent	Number	Percent	Number	Percent
Three-spotted tilapia	3,233,824	69.6	7,523,516	3.4	10,757,340	4.7
Green-headed tilapia	340,748	7.3	9,000,059	4	9,340,807	4.1
Red-breasted tilapia	350,408	7.5	749,298	0.3	1,099,706	0.5
Nile tilapia	61,735	1.3	203,604,441	91.1	203,666,176	89.3
Common Carp fish	29,480	0.6	12,500	0.01	41,980	0
Catfish	14,942	0.3	890,934	0.4	905,876	0.4
Tanganyika Bream	4,657	0.1	1,691,500	0.8	1,696,157	0.7
Other (Mixed Species/Cross-breeds)	611,732	13.2	-	-	611,732	0.3
Zambia	4,647,527	100	223,472,248	100	228,119,775	100

5.3 Fingerling Production by Province

Overall, Southern Province recorded the highest number of fingerlings produced by both

households and establishments representing 83.7% of the total. Eastern and Western provinces accounted for the lowest with 0.1% each.

FIGURE 5.1: DISTRIBUTION OF FINGERLINGS PRODUCED BY PROVINCE





5.4 Type of Fingerlings produced by Households

Table 5.4 shows the distribution of type of fingerlings produced by households. Of the total 4,647,527 fingerlings produced countrywide, 4,405,255 were of mixed sex and 242,272 were sex-reversed.

Luapula Province produced the highest number of sex-reversed fingerlings accounting for 63.1% while Copperbelt Province produced the lowest number accounting for 0.6% of the total. For mixed sex fingerlings, Luapula Province still produced the highest number accounting for 29.8% and Central Province produced the lowest number accounting for 0.1% of the total.

TABLE 5.4: DISTRIBUTION OF TYPE OF FINGERLINGS PRODUCED BY HOUSEHOLDS BY PROVINCE

Province	Type of fingerlings produced by households				Total	
	Sex reversed		Mixed sex			
	Number	Percent	Number	Percent	Number	Percent
Central	9,626	4	4,037	0.1	13,663	0.3
Copperbelt	1,406	0.6	140,045	3.2	141,451	3
Eastern	5,365	2.2	133,364	3	138,729	3
Luapula	152,757	63.1	1,311,867	29.8	1,464,624	31.5
Lusaka	-	-	-	-	-	-
Muchinga	6,443	2.7	300,801	6.8	307,243	6.6
Northern	31,950	13.2	1,218,174	27.7	1,250,125	26.9
Northwestern	23,415	9.7	1,133,065	25.7	1,156,479	24.9
Southern	-	-	98,720	2.2	98,720	2.1
Western	11,310	4.7	65,183	1.5	76,493	1.6
Zambia	242,272	100	4,405,255	100	4,647,527	100



CHAPTER 6: FISH FEED PRODUCTION

This chapter gives a summary of fish feed production status in Zambia between 1st January 2022 and 31st December, 2022. It includes the number of establishments involved in fish feed production and the quantities and types of fish feed produced.

6.1 Number of establishments producing fish feed

A total of 44 establishments were recorded to have been involved in fish feed production categorized as commercial complete (feed

produced by an established feed manufacturing company with ingredients that are well-balanced and labelled) and non-commercial (on-farm formulated). Northern Province had the highest number of feed-producing establishments (13) while Luapula was the least with only one (1). Out of the total of 44 fish-feed producing establishments, nine (9) were producing commercial complete feeds and 35 produced non-commercial on-farm feeds. Among provinces, Lusaka had the highest number of commercial complete fish feed producers four (4) (See Table 6.1).

TABLE 6.1: NUMBER OF ESTABLISHMENTS PRODUCING FISH FEED BY PROVINCE

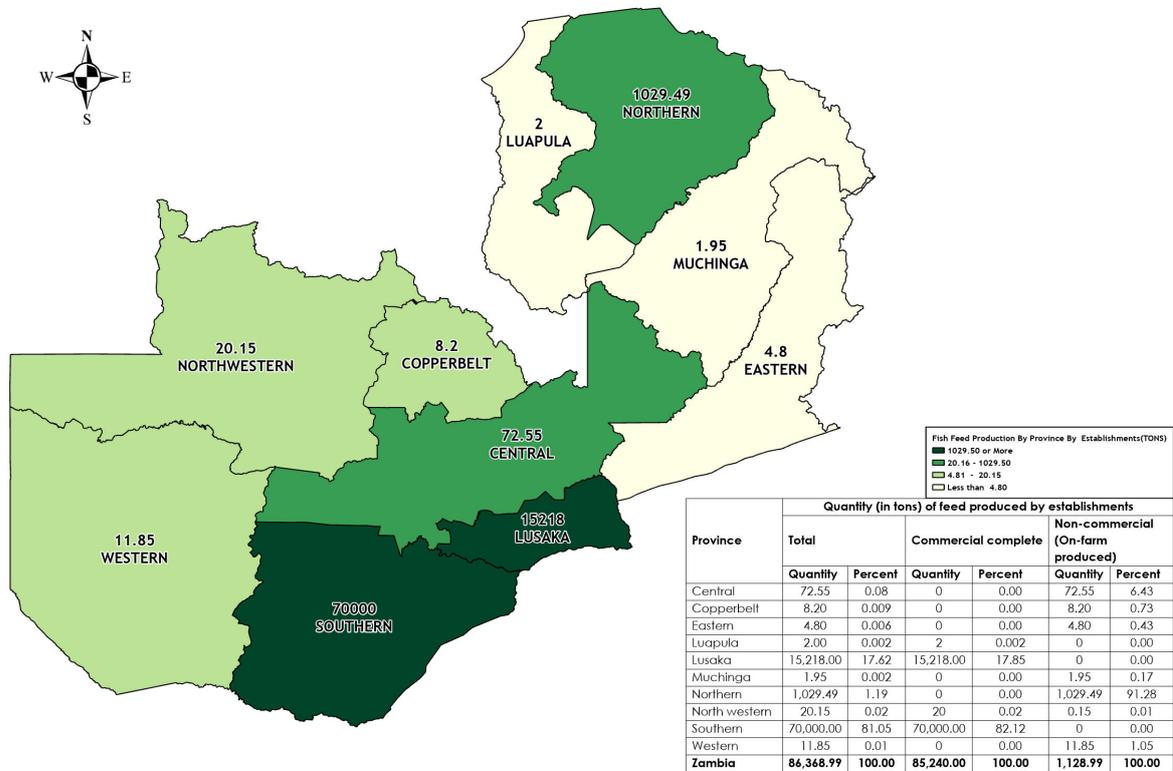
Province	Establishments producing fish feed		Non-commercial (On-farm produced)
	Total	Commercial complete	
	Number	Number	Number
Central	3	0	3
Copperbelt	3	0	3
Eastern	7	0	7
Luapula	1	1	0
Lusaka	4	4	1
Muchinga	5	1	4
Northern	13	0	12
North-western	2	1	1
Southern	2	2	0
Western	4	0	4
Zambia	44	9	35

6.2 Quantity of Fish Feed Produced by Establishments

A total of 86,368.99 metric tons of different types of fish feeds were produced by the 44 establishments from January to December 2022. Southern Province recorded the highest production of 70,000 metric tons accounting for 81.05% of the total feed produced while Muchinga recorded the least quantity of 1.95

metric tons accounting for 0.02%. Much of the feed produced was commercial complete (85,240 metric tons) at 98.70% of the total feed produced while non-commercial on-farm formulated feed was 1,127.83 metric tons at 1.30 % of the total fish feed produced (See Figure 6.1).

FIGURE 6.1: QUANTITY OF FISH FEED PRODUCED BY ESTABLISHMENTS AND PROVINCE





CHAPTER 7: FISH MARKETING

This chapter highlights the information on households and establishments that reported to have engaged in fish marketing from 1st January to 31st December 2022. The cost of fish farming inputs, fingerlings and fish produced, their prices, and marketing aspects are discussed under this chapter.

7.1 Distribution of Fish Sales at Households by Province

Table 7.1 shows that out of the total 19,697 households, 7,619 (38.7%) sold their fish. Among the provinces, Western reported the highest percentage at 53.2% followed by Muchinga and Central at 48.1% and 46.1% respectively. The lowest was Lusaka at 11.7%.

TABLE 7.1: PERCENTAGE DISTRIBUTION OF HOUSEHOLDS THAT SOLD THEIR FISH BY PROVINCE

Province	Total Households		Households that reported to have sold their fish	
	Number		Number	Percent
Central	692		319	46.1
Copperbelt	2,501		1,028	41.1
Eastern	936		400	42.7
Luapula	2,716		855	31.5
Lusaka	996		117	11.7
Muchinga	3,075		1,480	48.1
Northern	5,690		2,271	39.9
North-western	1,875		596	31.8
Southern	515		179	34.8
Western	701		373	53.2
Zambia	19,697		7,619	38.7

7.2 Place of Fish Sales by Households

Figure 7.1 shows places where fish was sold. The majority of households sold their fish on-

farm (49.7%) followed by those that sold within their districts but not on their farms at 47.3%. Households that sold their fish outside their district were lowest at 3.0%.

FIGURE 7.1: PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY PLACES OF FISH SALES

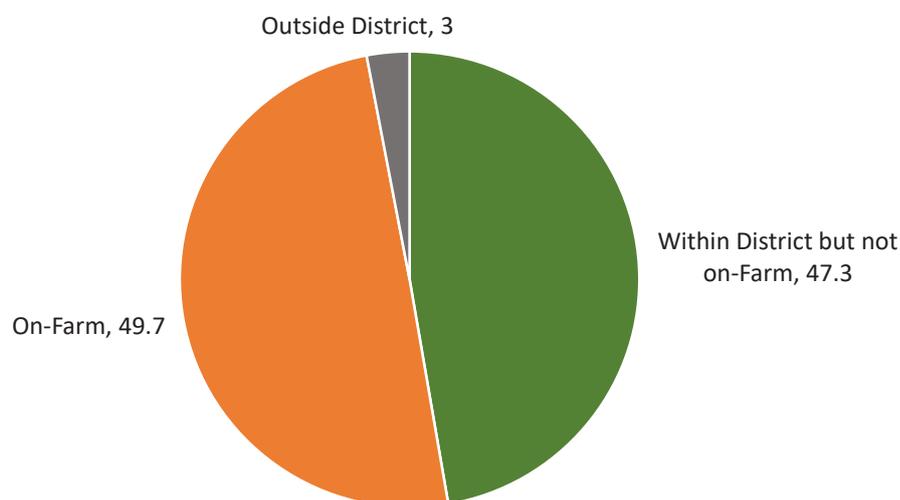




Table 7.2 shows that among provinces, Northern (57.4%) had the highest percentage of households that sold their fish on-farm followed by Northwestern with 56.4% while Muchinga had the lowest with 35.9%.

In terms of households that sold their fish within the district but not on-farm, Eastern Province reported the highest percentage at 60.4% followed by Muchinga (60.0%) while Lusaka was lowest at 30.4%. Meanwhile, Lusaka (23.2%) recorded the highest percentage of households that sold fish outside their districts.

TABLE 7.2: PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY PLACES OF FISH SALES BY PROVINCE

Province	Percentage distribution of households by places where they sold fish			Total
	On-farm	Within the District but not on-farm	Outside District	
	Percent	Percent	Percent	Percent
Central	51	46.8	2.2	100
Copperbelt	53.4	44.4	2.2	100
Eastern	39.6	60.4	0	100
Luapula	45.2	52.1	2.6	100
Lusaka	46.5	30.4	23.2	100
Muchinga	35.9	60	4	100
Northern	57.4	42.1	0.4	100
North-western	56.4	43	0.6	100
Southern	50	39.7	10.3	100
Western	54.8	44.4	0.8	100
Zambia	49.7	47.3	3	100



CHAPTER 8: BIOSECURITY MEASURES, FISH DISEASE AND CLIMATE SMART AQUACULTURE

This chapter highlights the information on biosecurity practices, challenges, diseases, level of awareness and implementation of biosecurity measures in fish farming between 1st January to 31st December, 2022 for both households and establishments. Biosecurity measures are essential for preventing and controlling the spread of diseases in fish farming.

8.1 Proportion of Households and Establishments practicing Biosecurity Measures

Table 8.1 and Figure 8.1 show that out of a total of 19,697 households, 10,035 (50.9%)

practiced biosecurity measures. At provincial level, Lusaka (91.2%) had more households that adopted biosecurity practices, followed by Western (84.9%) while Luapula had the lowest at 11.0%.

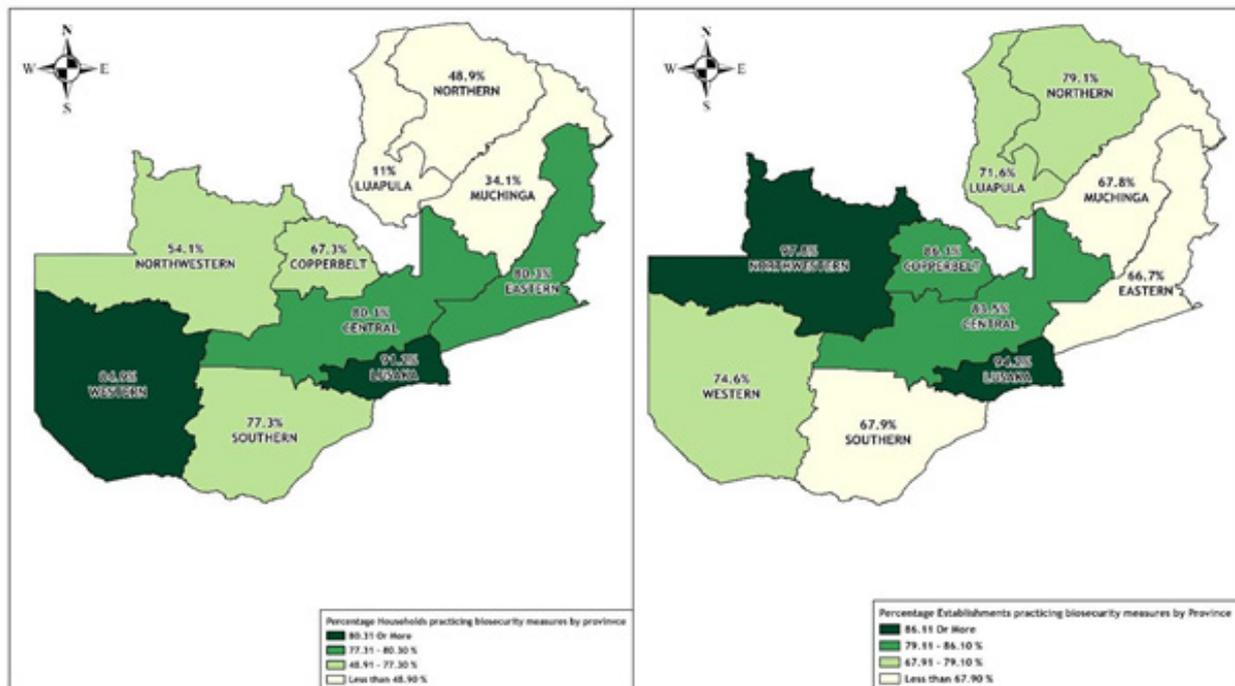
As for establishments, out of a total of 1,674 establishments (fish and fish feed producers), 1,388 (82.9%) practiced biosecurity. At the provincial level, Northwestern (97.8%) had more establishments that adopted biosecurity practices, followed by Lusaka (94.2%) while Eastern reported the lowest at 66.7%.

TABLE 8.1: PERCENTAGE DISTRIBUTION OF HOUSEHOLDS AND ESTABLISHMENTS PRACTICING BIOSECURITY MEASURES BY PROVINCE

Province	Total households	Households practicing biosecurity measures		Total Establishments	Establishments practicing biosecurity measures	
		Number	Percent		Number	Percent
Central	692	554	80.1	127	106	83.5
Copperbelt	2,501	1,683	67.3	546	470	86.1
Eastern	936	752	80.3	90	60	66.7
Luapula	2,716	300	11	81	58	71.6
Lusaka	996	908	91.2	346	326	94.2
Muchinga	3,075	1,050	34.1	87	59	67.8
Northern	5,690	2,780	48.9	172	136	79.1
North-western	1,875	1015	54.1	46	45	97.8
Southern	515	398	77.3	109	74	67.9
Western	701	595	84.9	71	53	74.6
Zambia	19,697	10,035	50.9	1,674	1,388	82.9



FIGURE 8.1: PERCENTAGE DISTRIBUTION OF HOUSEHOLDS AND ESTABLISHMENTS PRACTICING BIOSECURITY MEASURES BY PROVINCE



8.2 Types of Biosecurity Measures Practiced by Households and Establishments

Figure 8.2 shows the most common forms of biosecurity measures practiced by households. These included wastewater disposal (55.4%),

restricted access to the facility (46.7%), waste disposal (43.1%) and fencing (37.5%).

FIGURE 8.2 PERCENTAGE DISTRIBUTION OF BIOSECURITY MEASURES PRACTICED BY HOUSEHOLDS

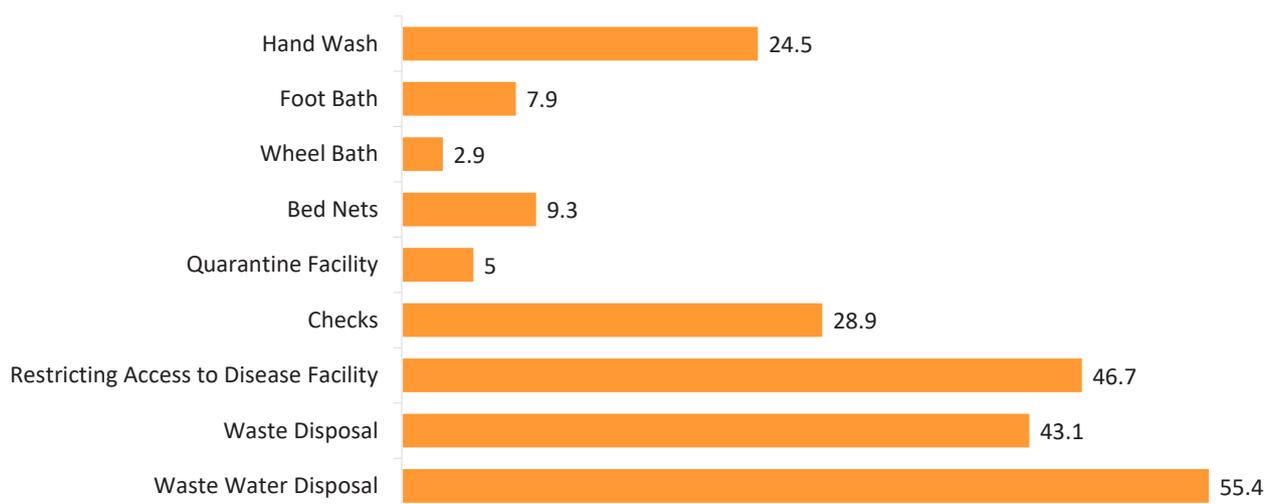
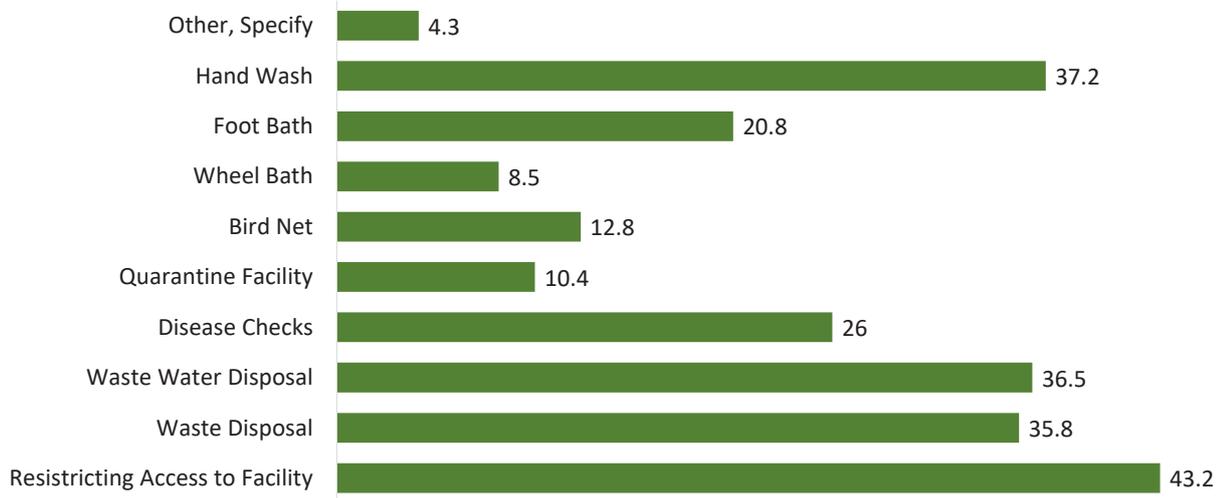




Figure 8.2 shows the most common forms of biosecurity measures practiced by establishments. These included fencing

(45.7%), restricting access to facility (43.2%), hand wash (37.2%) and waste water disposal (36.5%).

FIGURE 8.2 PERCENTAGE DISTRIBUTION OF BIOSECURITY MEASURES PRACTICED BY ESTABLISHMENTS





CHAPTER 9: ACCESS TO LOANS, CREDIT AND GRANTS

This chapter presents information on the number of households and establishments that accessed loans, credits and grants between 1st January and 31st December, 2022. It highlights the sources, total and average loan amounts accessed by both households and establishments.

9.1. Number of Households and Establishments that accessed Loans, Credit and Grants

Table 9.1 and Figure 9.1 show the total number of households and establishments that accessed loans, credit and grants. A total of 1,835

households and 137 establishments accessed loans, credit and grants. North-western had the highest number of households accessing loans with 284 while Southern Province had the lowest with 34. Northern Province had the highest number of households that accessed the credits with 53. Eastern (127) recorded the highest number of households that accessed grants.

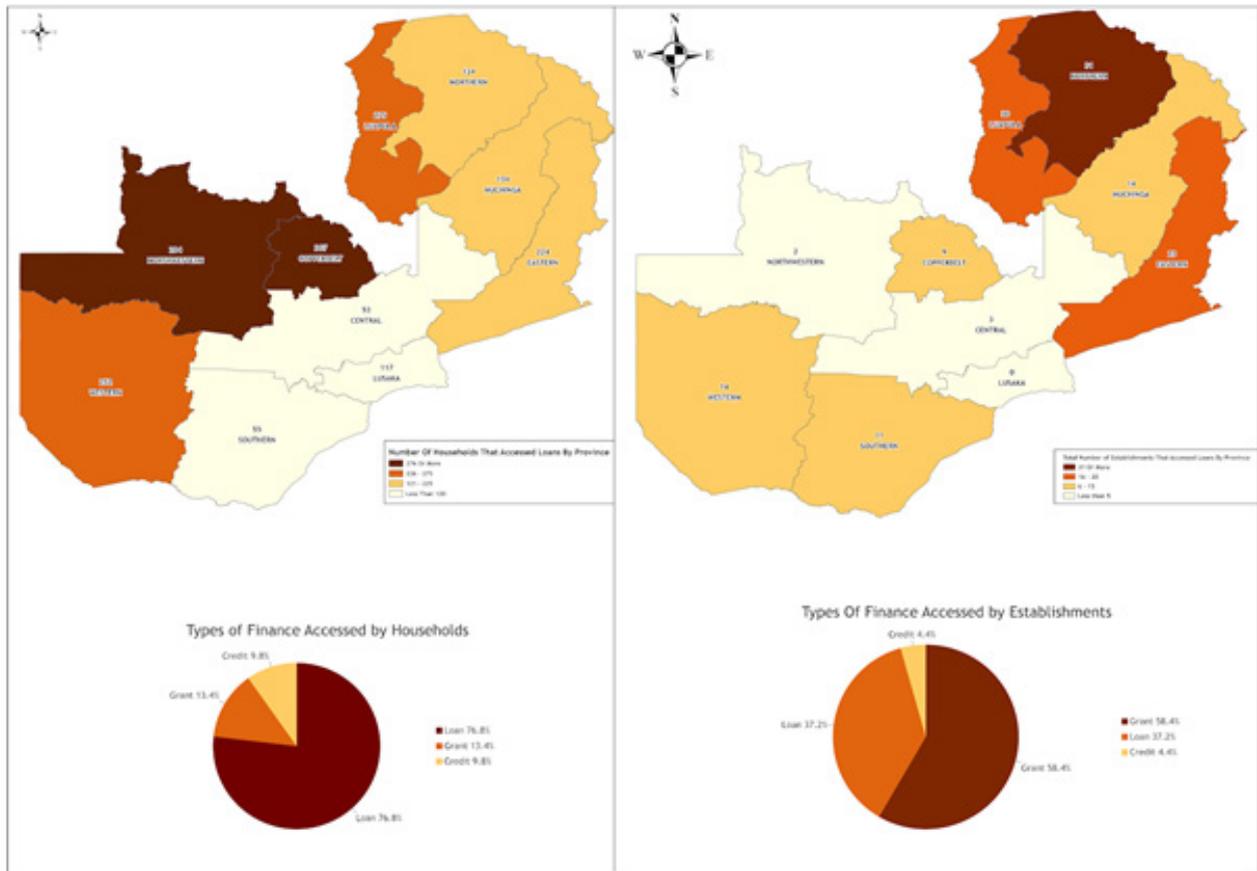
At the establishment level, Northern Province recorded the highest number (18) of establishments that accessed loans, while Luapula Province had the highest number (23) of establishments that accessed grants.

TABLE 9.1: NUMBER OF HOUSEHOLDS AND ESTABLISHMENTS THAT ACCESSED LOANS, CREDIT AND GRANTS BY PROVINCE

Province	Number of Households				Number of Establishments			
	Total	Loan	Credit	Grant	Total	Loan	Credit	Grant
Central	53	53	0	0	3	2	0	1
Copperbelt	307	257	50	0	9	8	0	1
Eastern	224	72	25	127	23	6	0	17
Luapula	275	220	21	34	30	5	2	23
Lusaka	117	117	0	0	0	0	0	0
Muchinga	134	110	14	10	14	1	0	13
Northern	134	81	53	0	31	18	1	12
North-western	284	284	0	0	2	1	0	1
Southern	55	34	0	21	11	9	0	2
Western	252	182	17	53	14	1	3	10
Zambia	1,835	1,410	180	245	137	51	6	80



FIGURE 9.1: NUMBER OF HOUSEHOLDS AND ESTABLISHMENTS THAT ACCESSED LOANS, CREDIT AND GRANTS BY PROVINCE



9.2 Sources of Loans, Credit and Grants accessed by Households and Establishments.

Table 9.2 shows sources of loans, credit, and grants for fish farming households and establishments. The major source of finance for fish farming under households was loans while establishments mainly accessed grants. Out of 1,410 fish farming households that accessed loans, 1,183 sourced loans through

government-run programs. In terms of credit, the majority of households sourced from friends (82) out of the total 180. Under grants, 191 out of 245 households received from government-run programs. At the establishment level, 37 and 58 accessed loans and grants respectively through government-run programs.

TABLE 9.2: DISTRIBUTION OF HOUSEHOLDS AND ESTABLISHMENTS BY SOURCE OF FINANCE

Source of Finance	Number of Households			Number of Establishment		
	Loan	Credit	Grants	Loan	Credit	Grants
Government-run program	1,183	14	191	37	1	58
Commercial bank	34	29	0	6	0	0
Bank farmers/ union/cooperative	13	0	0	4	0	3
Microcredit/Community credit scheme	101	32	0	0	1	0
NGOs/ Faith-Based/ Church	43	3	38	3	0	19
Friends	16	82	16	1	4	0
Kaloba	20	20	0	0	0	0
Zambia	1,410	180	245	51	6	80



9.3. Loans, Credit and Grants Households Sourced

Table 9.3 shows the average value of loans, credit and grants by each source of finance obtained by the fish farming households. The government-run programme provided the highest average loan, credit and grant amounts at 105,899.04 ZMW, 76,667.56 ZMW, and 35,197.27 ZMW, respectively.

Non-Governmental organizations (NGOs)/ Faith-Based/ Church provided the second-highest average amounts for loans (43,292.45 ZMW), credit (50,000 ZMW) and grants (19,024.39 ZMW).

TABLE 9.3 AVERAGE AMOUNT OF LOANS, CREDIT AND GRANTS OBTAINED BY HOUSEHOLDS

Source of Finance	Loan		Credit		Grant	
	Number of households	Average amount obtained by households (ZMW)	Number of households	Average amount obtained by households (ZMW)	Number of households	Average amount obtained by households (ZMW)
Government-run program	1,183	105,899.04	15	76,667.56	191	35,197.27
Commercial bank	34	21,797.93	30	13,956.48	0	-
Farmers union/ cooperative	13	2,115.27	0	-	0	-
Microcredit/ Community credit scheme	101	14,875.22	33	22,922.34	0	-
NGO/Faith-Based/ Church	43	43,292.46	3	50,000.00	38	19,024.39
Friends	16	7,781.36	85	2,437.87	14	1,147.39
Kaloba	20	11,757.07	20	1,009.45	0	-
Zambia	1,410	29,645.48	186	27,832.28	243	18,456.35



CHAPTER 10: FISH FARMING EMPLOYMENT

This chapter presents a summary of employees that were directly engaged by fish farming households and establishments segregated by sex, province, type of employment and fish farming activities as at 31st December 2022. The main fish farming activities highlighted in this section include facility construction, table-size fish production, fingerling production, harvesting, processing, marketing, administration, transportation, and security.

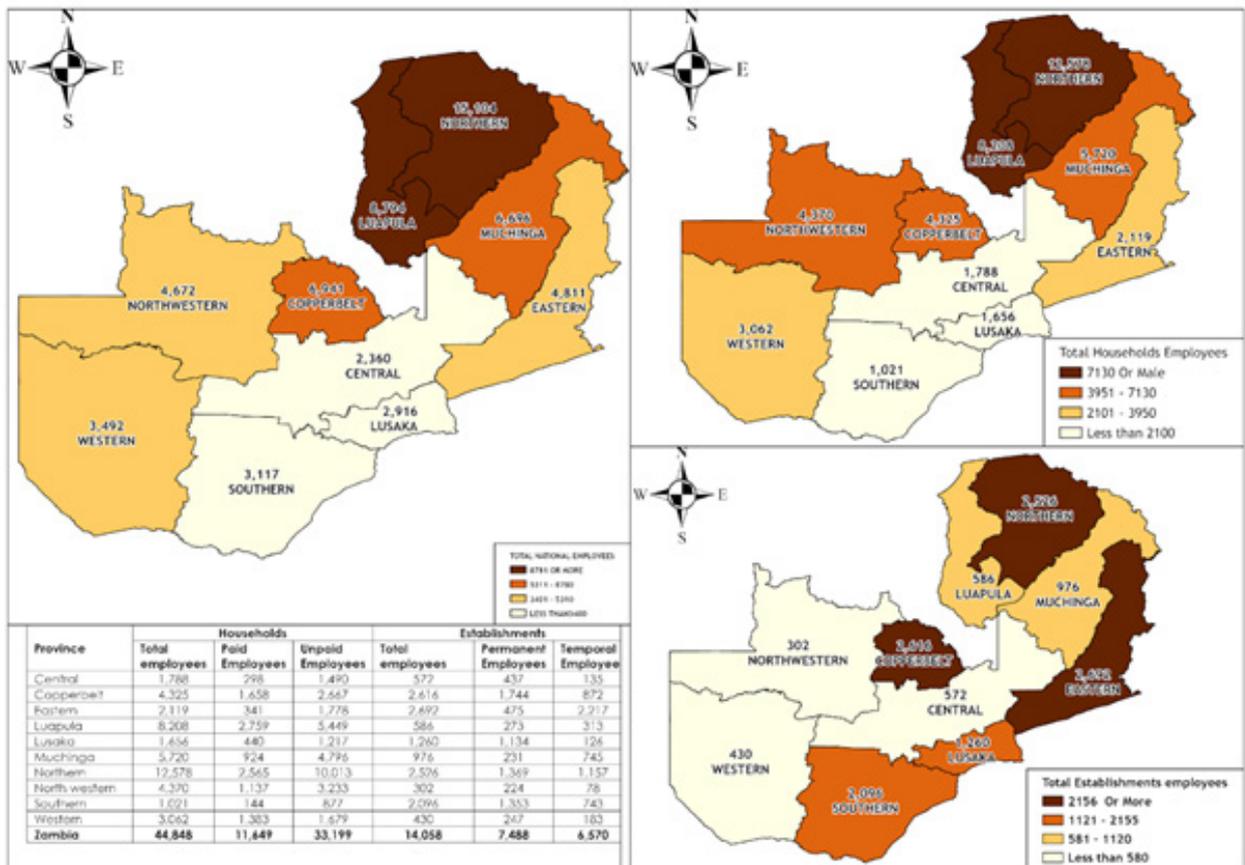
10.1 Number of Employees engaged by Fish Farming Households and Establishments

Figure 10.1 shows that a total of 58,906 were employed in the aquaculture subsector. The majority were contributed by households (44,848 employees) and the remaining 14,058 by the establishments.

Under households, Luapula Province recorded the highest number of paid employees at 2,759, followed by Northern Province with 2,565, while Southern Province had the lowest number of paid employees at 144. In terms of unpaid employees, Northern Province ranked the highest with 10,013, followed by Luapula Province with 5,449 and Southern Province had the lowest at 877.

As for establishments, Copperbelt Province had the highest number of permanent employees seconded by Northern Province with 1,369, while North-western Province recorded the lowest number of permanent employees at 224. For temporal employees, Eastern Province had the highest number at 2,217 followed by Northern Province with 1,157, and North-Western Province was the lowest at 78.

FIGURE 10.1: DISTRIBUTION OF EMPLOYEES ENGAGED BY FISH FARMING HOUSEHOLDS AND ESTABLISHMENTS BY TYPE OF EMPLOYMENT BY PROVINCE





10.2 Employees engaged by Fish Farming Households and Establishments by Sex and Fish Farming Activity

Table 10.1 shows the number of employees engaged by fish farming households and establishments to undertake various fish farming activities as at 31st December 2022 across the country. At the household level, facility construction had the highest number for both male and female paid employees, recording 19,566 for males and 1,501 for females. Similarly, table-size fish production had the highest number for both male and female unpaid employees at 17,202 and 10,793 respectively.

At the establishment level, for permanent employees, the highest number of male employees was in administration, transportation, and security, at 784. On the other hand, facility construction had the highest number of female permanent employees at 454. In the case of temporary employees, facility construction had the highest number for both males and females at 1,319 and 549, respectively.

TABLE 10.2 DISTRIBUTION OF EMPLOYEES BY FISH FARMING ACTIVITY AND GENDER

Fish farming activity	Total workers engaged	Households					Establishments				
		Number of paid Employees		Number of unpaid Employees		Total employees Households	Number of permanent Employees		Number of temporal Employees		Total employees Establishments
		Male	Female	Male	Female		Male	Female	Male	Female	
Facility Construction	41,819	19,566	1,501	12,858	4,973	38,898	1,828	577	2,184	684	5,274
Table size fish Production	37,556	6,551	941	17,202	10,793	35,488	1,657	332	772	482	3,244
Fingerling Production	7,078	930	108	3,609	1,827	6,474	392	139	204	39	774
Harvesting	32,823	7,613	1,418	14,080	7,845	30,956	417	187	840	423	1,867
Processing	5,669	685	88	2,331	2,046	5,150	190	118	129	98	535
Marketing	14,947	1,836	556	6,912	4,958	14,263	367	170	190	117	844
Transportation, Security, Administration	25,224	5,682	1,364	10,361	6,432	23,839	3,110	624	1,264	262	5,259



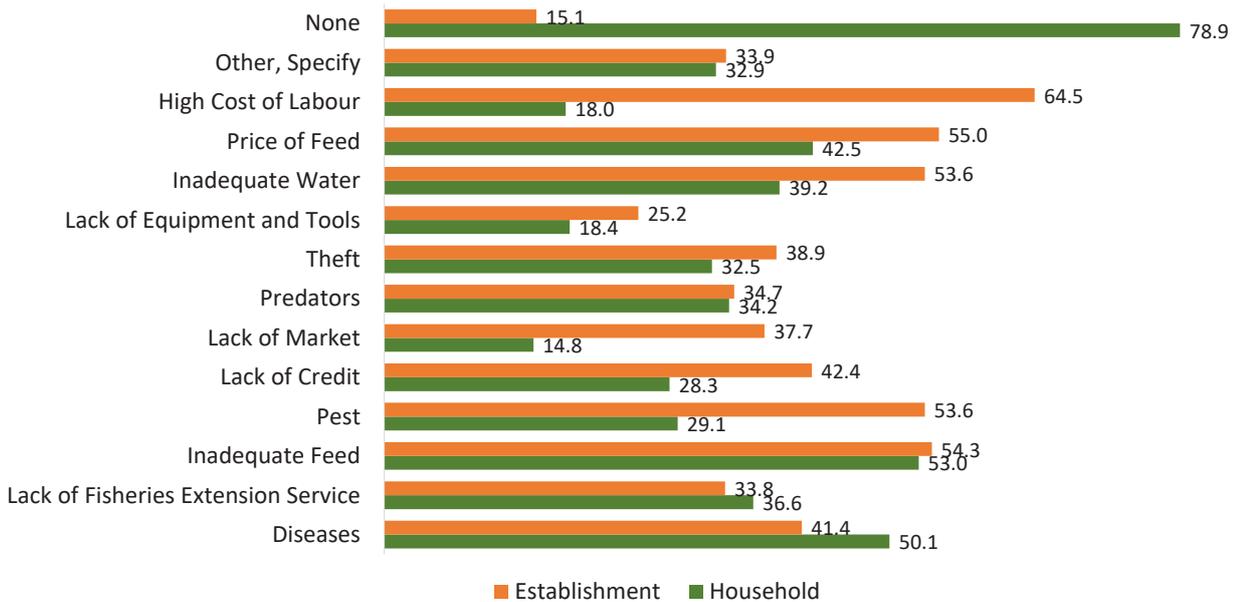
CHAPTER 11: CHALLENGES IN FISH PRODUCTION

This chapter highlights the most severe challenges faced by households and establishments involved in fish farming between 1st January and 31st December, 2022.

11.1 Major Challenges Faced by Households and Establishments in Fish Farming

Figure 11.1 shows the major challenges faced by households and establishments in fish farming under the most severe category. At the household level, inadequate feed (53.0%) was the major challenge followed by diseases (50.1%) and the price of feed at 42.5%. Under establishments, the high cost of labour (64.5%) was the major challenge followed by price of feed (55.0%) and inadequate feed at 54.3%.

FIGURE 11.1 MOST SEVERE CHALLENGES FACED BY HOUSEHOLDS AND ESTABLISHMENTS IN FISH FARMING





LIST OF KEY PERSONS INVOLVED IN THE ANALYSIS AND REPORT WRITING

Main authors

Mweemba Chijoka
Principal Statistician
Ministry of Fisheries and Livestock

Chirambo Zyangani
Chief Aquaculture Officer
Ministry of Fisheries and Livestock

Other authors

Mavis Sialumuno
Senior Fisheries Culturist
Ministry of Fisheries and Livestock

Nkandu Kabibwa
Principal Statistician
Zambia Statistics Agency

Christine Chiluba
Economist
Ministry of Fisheries and Livestock

Linda Mwaangwa
Fisheries Research Officer
Ministry of Fisheries and Livestock

Edwin Kikamba
Principal Aquaculture Research Officer
Ministry of Fisheries and Livestock

Dennis Bwalya
Statistician
Zambia Statistics Agency

Loziwe Chilufya
ZAP Project Manager
Ministry of Fisheries and Livestock

Evans Langeni
Statistician
Zambia Statistics Agency

Boniface Nyika
Senior Fisheries Research Officer
Ministry of Fisheries and Livestock

Mutale Mulenga
Senior Aquaculture Research Officer
Ministry of Fisheries and Livestock

Ketrix Silika
Intern
Ministry of Fisheries and Livestock

Mwaluba Banda
Intern
Ministry of Fisheries and Livestock

Data analysts

Masiliso Sooka
Principal Statistician
Zambia Statistics Agency

Herold Musonda
Senior Statistician
Zambia Statistics Agency

Dr. Mary Lubungu
Research Fellow,
Indaba Agricultural Policy Research Institute

Report editors

Succeed Mubanga
Director – Policy, Planning and Information
Ministry of Fisheries and Livestock

Shadreck Mungalaba
Director – Fisheries and Livestock Marketing
Department
Ministry of Fisheries and Livestock

Mbamwai Mbewe
Acting Director – Department of Fisheries
Ministry of Fisheries and Livestock



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Brivine Sikapande
Assistant Director – Policy, Planning and Information
Department
Ministry of Fisheries and Livestock

Patrick Mwendalubi Chuni
Assistant Director – Agriculture and Environment
Division
Zambia Statistics Agency

Mr. Lumbwe Kalumba
Deputy Director – Aquaculture Branch
Ministry of Fisheries and Livestock

Anthony Nkole
Desktop Publishing Officer
Zambia Statistics Agency

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MINISTRY OF FISHERIES AND LIVESTOCK, MULUNGUSHI HOUSE
P.O. BOX 50060, LUSAKA, ZAMBIA.