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THE CIBIRU FISH SEED CENTER CONTRIBUTION IN LOCAL FISH AID DISTRIBUTION IN BANDUNG, WEST JAVA INDONESIA

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ABSTRACT

This field activity was conducted from May to July 2023 at the technical services unit Cibiru Fish Seed Center (Cibiru FSC), located in Pasir Biru Village, Cibiru District, Bandung City. The primary aim of this activity is to gain insights into consumption fish cultivation activities and the community-oriented role of the Cibiru FSC. The methodology involves active participation in the FSC's activities, field observations, discussions with field supervisors, and consultations with experts at Cibiru FSC. "Nirwana" tilapia spawning was conducted semi-naturally, employing 3 nets of 4x4 m *hapa* nets in Pond D Cibiru FSC, which spans 30x30 m. Each *hapa* net accommodates 100 fish, comprising 25 males and 75 females, with a male-to-female parent ratio of 1:3. Water quality assessments indicate favorable conditions at the Cibiru Fish Seed Center, with a pH level of 8.05, a temperature of 28°C, and dissolved oxygen at 7.8, meeting the prerequisites for optimal tilapia cultivation. The Cibiru FSC plays a pivotal role as both a producer and distributor of fish seeds and fish broodstock, particularly tilapia. Consequently, the FSC engages in distributing fish seeds to various groups, including farmers, without charge. The notable aspect of Cibiru FSC is its commitment to providing fish seeds and distribution services at no cost to the recipients, showcasing its dedication to supporting local fish farming initiatives.

KEYWORDS:

Cibiru, fish seed center, hatchery, Nirwana tilapia, spawning, water quality.

INTRODUCTION

Indonesia, primarily an agricultural nation, relies on its agricultural sector to sustain a majority of its population. However, the availability of agricultural land for farmers is progressively diminishing (Moniaga, 2011). The geographical layout of Indonesia, an archipelagic country, features two-thirds of its territory as marine waters, encompassing coastal seas, open seas, bays, and straits, with a coastline stretching 95,181 km and a vast water area totalling 5.8 million km². This geographical richness translates into abundant marine and fish resources.

As an archipelagic and maritime nation, Indonesia possesses extensive oceans with considerable potential in the marine and fisheries sector, which could significantly contribute to the welfare of local communities (Adinugroho, 2017). The wealth of natural resources, including marine and fisheries resources, serves as a vital asset for economic development (Tajerin and Satrawidjadja, 2017). Recognizing its historical maritime legacy, Indonesia has the opportunity to harness the ocean to propel national prosperity, particularly through the fisheries sector. To effectively manage fisheries, comprehensive rules and laws are imperative, aligning with Indonesia's commitment to being a rule-of-law country. The designated authority for fisheries administration is the Ministry of Maritime Affairs and Fisheries. The legal framework for fisheries management is established by Law no. 31 of 2004, reaffirmed and improved in Law no. 45 of 2009.

Fisheries management, as dictated by law, connects three inseparable dimensions: (1) the dimension of fisheries resources and their ecosystem; (2) the dimension of utilizing fisheries resources for socio-economic interests; and (3) the dimension of fisheries policy itself (Charles, 2001). Regional governments play a crucial role in managing fisheries resources to ensure benefits and equity in socio-economic development. However, there is a need for an integrated approach to managing fisheries resources within the constraints of limited land area, involving the local community as economic actors in the fisheries sector.

The collaborative effort for fisheries management extends to both government agencies and the community. Active community involvement allows for valuable input and solutions, particularly concerning cultivation and fisheries activities. Infrastructure development, integral to fisheries activities, is largely the responsibility of various stakeholders, predominantly the government, tasked with providing essential public goods. However, the continuous increase in infrastructure needs is met with challenges, primarily constrained by limited government budgets in developing fisheries infrastructure in Indonesia. This budgetary constraint remains a significant hurdle in optimizing the management of fisheries resources.

Cooperation is an inherent aspect of community interaction, yet the effective management and utilization of fisheries resources often wane, giving way to heightened competition between communities. This mutual competition for exploiting fish resources has led to the failure of fisheries management, evident in resource depletion and ensuing poverty. Nevertheless, the interactions between communities can be reframed as a potential that, if harnessed, could formulate an efficient mechanism for managing fisheries resources. The conflicting desires within society are a natural societal characteristic, emphasizing the imperative need to develop mechanisms for fisheries resource management capable of mitigating conflicts. Such mechanisms should empower communities to determine their own approaches to fisheries resource management, aligning with their self-defined objectives.

The objective of this activity is to comprehensively understand the pivotal role of the Cibiru Fish Seed Center (FSC). This agency serves as a crucial supplier, distributor, and community facilitator in the fisheries sector, particularly for recipients of fish seed assistance within the Bandung City area, West Java, Indonesia. In fulfilling its primary responsibilities, the Fish Seed Center serves a pivotal role in the fisheries sector. It involves preparing operational and technical plans along with guidelines for executing fish hatcheries. This encompasses the entire spectrum of fish hatchery operations, from spawning and nursery practices to monitoring seed quality. The UPTD Fish Seed Center is also tasked with the upkeep of facilities and infrastructure, providing training to enhance fish hatchery skills, managing administrative functions, and overseeing supervision, control, evaluation, and reporting processes.

The objective of this activity is to determine the significance of the Cibiru Fish Seed Center as an organization that serves the fishing industry as a supplier, distributor, or community supporter, particularly for those who receive aid with fish seeds, particularly in the Bandung City region. Also, through this activity, the objective is to discern the role and impact of institutions like the center on people's lives, especially those benefiting from fish aid. Additionally, we aim to understand the techniques involved in field fish cultivation, covering aspects from pond preparation and hatching to seed development and harvesting. Furthermore, this activity seeks to elucidate the essential role played by BBI in freely distributing fish to the community within the city of Bandung.

MATERIALS AND METHOD

Throughout this operation, various instruments were employed to facilitate the tasks at hand. This encompassed the utilization of *hapa* nets designed specifically for tilapia spawning, water pumps dedicated to drawing water from ponds, distribution pipes for efficient water drainage, and nozzles designed for precise water spraying. Additionally, sophisticated apparatus was incorporated, such as Lutron DO-5510 brand DO meters, which were pivotal in accurately measuring dissolved oxygen in water. The pH levels of the water were meticulously gauged using Lutron brand pH-207 pH meters, possessing accuracy level of 0.03. Other essential implements included a thermometer for monitoring water temperature, a digital scale ensuring precision to 0.1g for weighing both food and fish biomass, a scoop for the retrieval of fish and distribution of feed, a ruler for measuring fish length, and a bucket serving as a container for food. Concurrently, the materials used in this activity comprised Tilapia Fish Seeds and commercial feed in the form of Hiprovite 781 and Hiprovite PSP.

Data Collection Method

According to Suryabrata (2011), the descriptive method is employed to depict conditions or events in a specific area. Utilizing this approach goes beyond merely collecting and retrieving data; it encompasses in-depth analysis and discussion. The objective is to offer a comprehensive, systematic, genuine, and valid portrayal of the facts and characteristics of the area's population.For this initiative, data collection involved two types: primary and secondary data. Primary data was acquired through observations, active participation in FSC Cibiru activities, and interviews with key sources, including the community set to receive fish seeds and field supervisors like Mr. Ato, Mr. Yayan, and Mr. Darwin. Secondary data was sourced from literature in the FPIK library, journals, and previous research. Field observations were conducted by closely monitoring daily FSC activities, engaging in active discussions with the DPL about relevant aspects, and actively participating in the operations.

Observation, as described by Arikunto (2002), involves focusing attention on an object using the senses, including sight, smell, hearing, touch, and taste. In this context, observations were made of various Nirwana Tilapia seed production activities at Cibiru FSC, covering pond preparation,

irrigation, broodstock handling, spawning, pest and disease control, harvesting, distribution, and other related processes.Sugioyono (2010) defines participatory observation as a method where researchers follow and engage in people's activities, listening to what they say and understanding their practices. Active participation in Tilapia fish hatchery activities at the Cibiru Fish Seed Center involved direct involvement in pond preparation, cleaning, net installation, broodstock selection, spawning and seeding procedures, larval harvesting, feeding management, pest and disease control, and effective Tilapia fish marketing.Secondary data, often referred to as available data (Hasan, 2002), is information collected by researchers from existing sources. This data is typically obtained from libraries, reports of previous researchers, and trusted sources such as the UPT BBI institution. Secondary data in this Field Work Practice is gathered through reports in the FPIK Library, research reports, journal references on the internet, and insights from the local community. This secondary data serves to complement and strengthen the primary data obtained during fieldwork related to the Tilapia fish hatchery business.

Activity Procedure

The various stages of work carried out in this activity consist of:

a. Parent Maintenance: Acquiring good-quality parents is crucial in hatchery operations. Good fish seeds result from well-maintained parents, making parent maintenance a crucial aspect of the breeding process.
b. Media Preparation: Media preparation is the initial and mandatory stage before initiating the cultivation process. The necessary media include those for parent maintenance, spawning, and nursery. Media preparation involves drying, processing pond base soil, fertilization, and filling the pond with water.
c. Parent Selection: Parent selection is conducted to obtain quality, mature gonad-bearing male and female parents. Separation is carried out to prevent unwanted spawning processes between male and female parents.
d. Spawning: The spawning process for Nile tilapia parents includes activities such as preparing spawning media, dispersing parents, installing spawning nets, and separating parents after spawning.
e. Implementation Procedure
    - Feeding is performed once a day at 09:00 and 15:00 Western Indonesian Time, provided ad satiation or until the fish are satiated.
    - Water quality parameter measurements (temperature, pH, and dissolved oxygen) are conducted in the morning using the methods outlined in Table 1.

Table 1. Water Quality Parameters

Parameter	Unit	Instrument	Source
Physics:			
Temperature	°C	Thermometer	SNI 06-6989.23 2005
Chemistry:			
pH	-	pH-meter	SNI 06-0689. 11-2004
Dissolved Oxygen	mg/L	DO-meter	SNI 06-2425-1991

- Growth calculation through the observed sample comparison is conducted at the end of the research.

Observed Parameters and Data Analysis

The observed parameters include water quality and fish growth, encompassing weight and length. The data analysis method used is descriptive. Descriptive analysis is a method that illustrates the condition or occurrences in a specific area. In this descriptive method, data collection extends beyond the mere gathering of information; it includes the analysis and discussion of the data (Ritonga *et al.*, 2022).Data analysis is performed by comparing the sampled data of 1-month-old Nile tilapia seeds with 3-month-old Nile tilapia seeds. Furthermore, data analysis is conducted using a literature study method obtained from various literature sources. The specific growth rate (SGR) of fish is calculated using the formula (Asmawi, 1983):

$$SGR = \frac{Ln\ W_t - Ln\ W_O}{t}\ x\ 100\%$$

Information:

SGR = Specific growth rate (%),

Ln W_t = Natural logarithm of the total weight of test fish at the end of cultivation (g),

Ln W_o = Natural logarithm of the total weight of test fish at the beginning of cultivation (g),

t = Cultivation time.

RESULTS AND DISCUSSION

Media Preparation

Tilapia broodstock are accommodated in four holding ponds measuring 30x30, specifically in pools A, B, C, D, and a 10m catchment pond for tilapia broodstock during breeding activities.

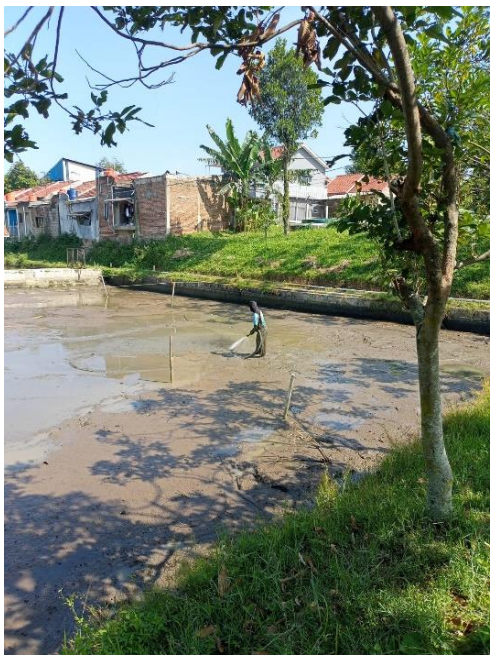

***Figure 1*. Cleaning mud and dirt in the tilapia holding pond**

One essential stage of media preparation involves cleaning the mud at the pond's bottom, as shown in Figure 1. This cleaning process employs a hose and a high-pressure water pump to spray mud, making the task more efficient and reducing cleaning time. After refilling the pond and making

it ready for use, three nets (Figure 2) measuring 4x4 m are installed in Pool A BBI Cibiru, which has dimensions of 30x30 m. Each *hapa* net is stocked with 100 individuals, comprising 25 males and 75 females. Tilapia spawning is conducted with a male-to-female parent ratio of 1:3. Subsequently, the tilapia seeds produced undergo a nursery and rearing phase outside the *hapa* net.

***Figure 2*. Process of installing nets for tilapia broodstock**

Parent Fish Care

Proper supervision of Nirvana tilapia broodstock is crucial, as this care precedes the spawning stage. Missing any essential steps can lead to a decrease in quality during the broodstock spawning. Key considerations include feeding management and pond water quality.To facilitate parent selection and prevent natural or undesirable spawning, male and female tilapia broodstock are kept separately in different nets but in the same pond, specifically in pond D. This is in line with Ramadhan's (2018) recommendation that broodstock rearing involves selection, maturation of gonads for spawning readiness, and the separation of male and female broodstock to avoid mass spawning.The feed provided to broodstock was the Hiprovite 781 Brand with a feed size of 3mm, presented in floating pellets. The feed's nutrient content is detailed in Table 2 below.

Table 2. Nutrient Content of Parent Feed (Hiprovite 781)

Nutrient	Content (%)
Protein	31-33
Fat	4-6
Fiber	3-5
Moisture	9-10

Feed plays an essential role in aquaculture businesses. Approximately 60-70% of the total production costs in cultivation businesses are attributed to feed. Hence, quality feed enhances feed efficiency and expedites fish growth factors (Harahap *et al.*, 2019).

Figure 3. **Parent feeding process**

Male and female broodstock are kept separately, and feeding occurs twice a day (Figure 3) – in the morning at 08:30 West Indonesia Time and in the afternoon at 15:00 West Indonesia Time. The feed provided to broodstock goldfish is the Hiprovite 781 Brand with a feed size of 3 mm, presented as floating pellets.

Preparation of Spawning Media

The container for broodstock spawning is a 4x4 m *hapa* net situated in a concrete pond measuring 30m x 30m x 1.5m with a water depth of 50 cm. The preparation involves meticulously cleaning the pond bottom from mud, utilizing a water pump to efficiently remove adhered dirt, and eliminating pests like clams and water snails. After draining the pond, water is replenished, and a 4x4 meter net is installed. The utilization of nets or *hapa* during spawning (as illustrated in Figure 4) aims to streamline egg harvesting and attachment.

Figure 4. **Spawning net**

Preparation of Spawning and Nursery Ponds

The nursery pond, a concrete structure measuring 30m x 30m x 1.5m, has a pre-installed net as a spawning medium. In FSC, fish larvae remain in the spawning pond due to the large net size, allowing tilapia larvae to hatch and exit naturally. Preparing the nursery pond involves cleaning,

drying to eliminate bacteria and pathogens, inspecting water channels for leaks, liming the pond at 50 g/m², and finally, filling it with water. Fertilization follows, using organic fertilizer at a rate of 500 g/m². According to Hasibuan *et al.* (2021), pond drying can be accomplished in 5-7 days. Cracks on the pond's surface indicate sufficient air aeration to decompose organic matter, purging the pond of potential pathogens. Additionally, this process releases trapped toxic gases at the pond's bottom.

Selection of Parent Fish

Before spawning, rigorous parent selection aims to secure high-productivity parents with desirable morphological traits. High productivity includes robust growth and survival rates in various cultivation environments. Broodstock selection ensures the chosen fish possess mature gonads and are ready to spawn (refer to Figure 5). Essential criteria include sexual maturity, where males produce sperm and females produce mature eggs, and bodily maturity, indicating they are physically prepared to be productive parents. Meticulous parent selection significantly influences the quality and quantity of larvae produced during spawning.

Figure 5. **Nirwana Tilapia Parent Selection Process**

Spawning Technique

The Cibiru Fish Seed Center employs Nirwana Tilapia III strain, a hybrid resulting from the Gift Tilapia and GET Tilapia from the Philippines, developed at the Wanayasa Freshwater Fish Seed Development Center (BPBIAT), Purwakarta. This strain display rapid growth, reaching a weight of 1 kilogram within 6 months, and distinctive features such as a larger body, smaller head, and thicker flesh. Its FCR (Feed Convention Rate) can reach 1:1.4 (Decree of the Minister of Maritime Affairs and Fisheries Number 28/2016; Judantari *et al.*, 2008).

Tilapia spawning occurs semi-naturally by installing three nets of 4x4 m *hapa* nets in Pond D Cibiru FSC (30x30 m). Each *hapa* net accommodates 100 fish (25 males, 75 females) at a male-to-female parent ratio of 1:3. Following spawning, the tilapia seeds undergo nursery and rearing phases outside the hapa net. The spawning process involves males spraying sperm on the eggs released by females, after which fertilized eggs are taken into the female's oral cavity for nurture.

Tilapia fish eggs exhibit a diameter of 2.8 mm and come in gray or yellow hues. Notably, they possess a non-sticky nature, rendering the use of a *kakaban* unnecessary during the spawning process. The incubation of these eggs in the female's oral cavity spans 4-5 days. Upon hatching, the eggs give rise to larvae measuring 4-5 mm, and the female diligently cares for them until they reach 11 days old, measuring 8 mm. Subsequently, at the age of 12 days, the larvae congregate in groups in shallow water or along the pool's periphery (Amri and Khairuman, 2003).

Fish Seed Feeding

The nourishment of tilapia fry follows a routine, with a feed containing 40% protein administered twice daily at 09:00 WIT and 15:00 WIT. The feeding quantity amounts to 3% of the biomass. The even distribution of feed throughout the pond ensures uniform growth of all tilapia seeds. The preferred feed for tilapia fry is "HI-PRO-VITE," provided in 5 kg sacks (refer to Figure 6).

Figure 6. **Powdered Tilapia Fish Seed Feed**

The nutritional needs of fish are crucial for their growth and survival from the larval stage to adulthood. Tilapia, being omnivorous, consumes zooplankton during the larval stage. Additionally, tilapia larvae feed on algae or moss adhering to objects in their habitat. Once mature, tilapia can be introduced to additional foods like pellets.Tilapia, being omnivores, exhibit versatility in consuming both animal and plant-based food, making them highly suitable for cultivation. During the larval stage, the preferred diet includes zooplankton such as *Rotifera* sp., *Moina* sp., or *Daphnia* sp. Additionally, they feed on algae or moss attached to their living environment. Tilapia also demonstrates a penchant for aquatic plants in cultivation ponds. Once considered mature, they can be fed various supplementary foods, such as pellets (Khairuman and Khairul Amri, 2003).

In the Field Work Activities conducted at FSC Cibiru, tilapia were fed with commercial Hiprovite 781 feed for adult tilapia and Hiprovite PSP (refer to Figure 6), with nutritional contents as listed in Table 3. Feeding was administered ad satiation, providing the fish with as much food as possible.

Table 3. Nutrient Content of "Hi-Pro-vite" Seed Feed

Nutrient	Content (%)
Protein	Min. 40
Calcium	Min-max. 1.2-2.0
Phosphor	Min-max. 1-2
Lysine	Min. 2.4
Methionine and Cystine	Min. 1.2

Sampling

Sampling involved 1-2 month old and 3-month-old tilapia fish from the D FSC Cibiru pond. The data from fish sampling results are presented in Table 4 below.

Table 4. Data on measurements of length and weight of tilapia fish

Parameters	Treatments	
	FSC Sampling	Standard (Muhajir & Agustini 2018)
Initial length (mm)	4.6	5
Final length (mm)	7.6	-
Initial weight (g)	3.3	5
Final weight (g)	10.5	6.2
SGR (%)	12.85	4.28

The examination of standard FSC Cibiru sampling, as conducted by Muhajir and Agustini in 2018, revealed notable variations in the growth of tilapia fish under different conditions. The initial measurements for 1-month-old tilapia fish indicated an average length of 4.6 cm and an average weight of 3.3 grams. In contrast, 3-month-old tilapia fish exhibited an average weight of 10.5 grams and an average length of 7.6 cm. These findings led to a specific growth rate (SGR) of 12.85% for tilapia raised at the Cibiru Fish Seed Center, highlighting significant growth compared to the control treatment in the research by Muhajir and Agustini (2018).

The assimilation of protein from the feed involves digestion and hydrolyzation into free amino acids, subsequently absorbed by the intestinal tissue and distributed through the bloodstream to tissues and organs (NRC 1993). The nutritional elements in the feed are absorbed to construct tissue and flesh in fish, facilitating the growth process. Feed type and quality play a pivotal role in the speed of fish growth, alongside dosage factors, and favorable environmental conditions contribute to achieving the desired fish growth rate (Khairuman and Amri, 2003).

Water Quality

Optimal water quality is vital for the optimal growth of fish, as poor conditions can lead to stress and increased susceptibility to diseases. According to Tirta and Riski (2002), the ideal water quality for rearing tilapia fry includes oxygen content exceeding 4 mg/L, carbon dioxide below 5 mg/L, a pH range of 5-9, and a temperature between 25°C and 30°C. Toxic compounds, particularly ammonia, should be within the range of 0.1-0.5 mg/L. Measurements in the tilapia rearing pond at theCibiru Fish Seed Center (presented in Table 5) align with these standards, meeting the requirements for effective tilapia cultivation.

Table 5. Water Quality Measurement Data in Tilapia Fish Rearing Ponds

Standard	Result	Parameters (NSA 2009)
Temperature (°C)	28	25-30
pH	8.05	6.5-8.5
DO(mg/L)	7.8	> 5

Based on the SNI 6141:2009 standard, the water quality parameters, including pH, temperature, and dissolved oxygen, at the Cibiru Fish Seed Center meet the prerequisites for successful tilapia cultivation.

Nirvana Tilapia Pests and Diseases

Tilapia generally exhibit resistance to diseases, but their susceptibility can be influenced by the fish's body condition, environmental factors, and pathogens. Monitoring the fish's body condition is crucial to prevent diseases. Pests like snails and snail eggs can disrupt tilapia fry raising, affecting the growth rate. Diseases like Aeromonas sp. can manifest as reduced appetite, passive movement, and darkening of the fish's body color. Poor water quality is a contributing factor, necessitating careful attention to pond water quality. Treatment for diseased fish involves water changes, protein-containing food, and antibiotics. Infected fish are isolated from healthy ones, and medication is administered by sprinkling it into the pool waters as per packaging instructions. The periodic application of medication over seven days ensures the fish's recovery. Disease control involves maintaining good water circulation, providing protein-containing feed and antibiotics, and removing dead fish from the pond surface.

(A) (B)

Figure 7. **Disease Control:**(A) Vitamins, (B) Fish Vaccines

The application of vitamins and vaccines (Figure 7) to Nirwana tilapia seeds serves the purpose of ensuring optimal bodily processes and proactively preventing diseases that could affect the Nirwana tilapia seeds. Two primary categories of diseases pose a threat to fish: parasitic diseases caused by microorganisms such as viruses, fungi, bacteria, protozoa, and nematodes, and non-parasitic diseases resulting from unfavorable water conditions and poor feed quality.Throughout the hatchery activities, no fish were found to be afflicted by pests or diseases. Ensuring good pond preparation, regular water quality measurements, appropriate feed, and correct dosages are crucial considerations to maintain fish health.

Packing Process

Prior to the packing activity, necessary tools and materials, including a *hapa* for holding the seeds, a 20 kg oxygen gas cylinder, a ladle, a scoop, a large bucket, plastic bags for packing, vitamins, and rubber bands for binding, must be prepared. The water used to fill the reservoir comes from the inlet. Fish seeds, particularly those measuring 2-3 fingers, are placed in a special net for ease of distribution.The packing process involves using plastic bags measuring 40 x 60 cm with a 10-liter capacity (Figure 8). Seeds are packaged with a ratio of 2:1 between air and water volume, ensuring 1/3 of the bag is filled with water and 2/3 with oxygen. Clean water is crucial as a living medium to minimize seed mortality during transit. Seeds are typically transported by motorbike, and individuals requiring larger quantities are recommended to use private vehicles like a pick-up.

Figure 8. **Process of Handing Over Fish Seeds and Packaging Fish**

Data on Distribution of Fish Aid Recipients

May Recipients of Fish Assistance

In May 2023, the Cibiru Fish Seed Center provided fish assistance to various community groups, as listed in Table 6. The assistance primarily consisted of Nirwana Tilapia fish seeds, emphasizing the community's strong preference for tilapia seeds over goldfish or catfish.

Table 6. List of Fish Aid Recipients in May 2023

Date	Aid Recipient Group Name	Subdistrict	District	Aid Type	Amount
04 May 2023	Buruan Sae Kopo	Kopo	Bojongloa Kaler	Ornamental fish	500
22 May 2023	Buruan Sae RW 02	Sarijadi	Sukajadi	Nirwana Tilapia Fish Seeds	100
22 May 2023	BuruanSae Cempaka Indah Hunting Group	Ciumbuleuit	Cidadap	Nirwana Tilapia Fish Seeds	100
22 May 2023	Astana Anyar Sector Police	Nyengseret	Astana Anyar	Nirwana Tilapia Fish Seeds	50
				Red Tilapia Fish Seeds	50
26 May 2023	BuruanSae Orchid	Cihaurgeulis	Cibeunying Kaler	Nirwana Tilapia Fish Seeds	100
		TOTAL			900

The data illustrates that in May 2023, the FSC assisted five different groups, providing a total of 900 fish seeds. The community's high interest in tilapia seeds compared to goldfish or catfish is evident, and the FSC actively supplies seeds in varying quantities based on community needs and relevant approvals.

List of June Fish Assistance Recipients

Below is a comprehensive list of community groups that received fish assistance from the Cibiru Fish Seed Center in June 2023, as detailed in Table 7.

Table 7. List of Fish Aid Recipients in June 2023

Date	Aid Recipient Group Name	Subdistrict	District	Aid Type	Amount
06 June 2023	Buruan Sae Manglayang Valley	Cisurupan	Cibiru	Nirwana Tilapia Fish Seeds	600
06 June 2023	Buruan Sae Motekar	Cipamokolan	Rancasari	Nirwana Tilapia Fish Seeds	200
06 June 2023	Gadjah Putih	Arjuna	Cicendo	Nirwana Tilapia prospective parents	300
08 June 2023	Kebon Kangkung Village	Kebon Kangkung	Kiara Condong	Nirwana Tilapia Fish Seeds	100
08 June 2023	SMP Negeri 8 Bandung City	Cigending	Ujung Berung	Ornamental Fish	500
12 June 2023	Buruan Sae	Dago	Coblong	Nirwana Tilapia Fish Seeds	200
13 June 2023	Buruan Sae	Sukabungah	Sukajadi	Nirwana Tilapia Fish Seeds	100
16 June 2023		Hegarmanah	Cidadap	Nirwana Tilapia Fish Seeds	100
20 June 2023		Sukamiskin	Arcamanik	Red Tilapia prospective parents	100
				Nirwana Tilapia prospective parents	100
22 June 2023	RW 07	Sukapada	Cibeunying Kidul	Nirwana Tilapia prospective parents	300
25 June 2023	People's Festival saung Udjo	Pasirlayung	Cibeunying Kidul	Ornamental Fish Seeds	200
26 June 2023	Affordable Food Movement DKPP Bandung City	Husein S.N	Cicendo	Ornamental Fish Seeds	300
				Nirwana Tilapia Fish Seeds	200
27 June 2023	Sein Farm	Pasanggrahan	Ujung Berung	Nirwana Tilapia prospective parents	250
TOTAL					3550

The detailed data above indicates a substantial distribution effort by the FSC in June 2023. The FSC demonstrated exceptional efficiency in providing fish seed assistance to community groups and agencies, serving up to three groups a day. Notably, FSC donated 500 ornamental fish to SMP Negeri 8 Bandung City during one such event, and contributed 500 tilapia seeds to the Cheap Food Movement organized by the Bandung City DKPP. The total number of fish provided in June reached 3,550, highlighting the remarkable trust placed in FSC by the community and agencies for fish seed and prospective fish parent requirements.

List of Fish Assistance Recipients for July

Below is the list of community groups that received fish assistance from the Cibiru Fish Seed Center in July 2023, as presented in Table 8.

Table 8. List of Fish Aid Recipients in July 2023

Date	Aid Recipient Group Name	Subdistrict	District	Aid Type	Amount
5 July 2023	Buruan Sae Jitu	Braga	Sumur Bandung	Nirwana Tilapia Fish Seeds	100
				Red Tilapia Fish Seeds	100
6 July 2023		Pasir Biru	Cibiru	Nirwana Tilapia Fish Seeds	200
7 July 2023	Bandung City Witness Forum			Nirwana Tilapia Fish Seeds	200
TOTAL					600

The data for July reveals that, until mid-July, there were fewer groups taking fish at the FSC. However, despite the lower frequency, the FSC contributed significantly, providing a total of 600 fish seeds. The collective data from the past three months underscores the impactful role of FSC in supporting community groups seeking fish assistance, whether for cultivation businesses or hobbies. The evident reliance on FSC for fish seeds positively influences the welfare of these community groups.

Conclusion

The fieldwork activity conducted at the Cibiru Fish Seed Center reveals several key findings. Nirvana tilapia spawning, executed semi-naturally, involves the installation of three *hapa* nets measuring 4x4 m in Pond D at FSC Cibiru, covering an area of 30x30 m. Each net accommodates 100 individuals, comprising 25 males and 75 females, maintaining a male-to-female ratio of 1:3. Post-spawning, tilapia seeds undergo nursery and rearing phases outside the hapa net. Measurements indicate that 1-month-old tilapia fish exhibit an average length of 4.6 cm and a weight of 3.3 grams, while 3-month-old tilapia display an average weight of 10.5 g and a length of 7.6 cm. The specific growth rate value for tilapia at the Cibiru Fish Seed Center stands at 12.86%.Water quality observations reveal a pH parameter of 8.05, a temperature of 28°C, and dissolved oxygen levels at 7.8, demonstrating that the Cibiru Fish Seed Center complies with optimal conditions for tilapia cultivation. The implementation of tilapia rearing activities at the Technical Implementation Unit of the Cibiru Fish Seed Center has been commendable, with observed water quality meeting the necessary conditions for the well-being of tilapia fish.A recommendation for the Cibiru Fish Seed Center is to consider separate treatments for tilapia of different ages. This approach would enable tailored cultivation treatments, potentially leading to more significant fish growth. Furthermore,

expanding the establishment of Fish Seed Centers, especially larger centers that encompass all aspects of fisheries without fees, similar to FSC Cibiru, is a crucial suggestion for governmental consideration. Such an initiative has the potential to significantly benefit local communities by providing comprehensive support for fisheries development.

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