

# NATIONWIDE DISSEMINATION OF GET EXCEL TILAPIA IN THE PHILIPPINES

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## Abstract

In the Philippines, tilapia is the second most important food fish for mass domestic consumption next to milkfish. For the last five years, the tilapia industry had increased eminently achieving 36.47% growth from 1997 to 2002. Fisheries commodity road map of 2002 showed that there was tilapia surplus production in Region II, III, IV and XI while the rest of the regions registered deficits. To limit the gap between supply and requirement, and further increase tilapia production, the Department of Agriculture initiated the creation of the flagship project “Nationwide Dissemination of GET EXCEL Tilapia”. This was built upon replacing old tilapia breed available in the country with the latest improved breed of tilapia to bring about targeted incremental production and provide opportunities to participate in global market for value-added products. GET EXCEL Tilapia is a new breed developed by the government by combining improved breed of *Oreochromis niloticus* using within family selection and rotational mating scheme.

The focus of this paper is on the dissemination of GET EXCEL tilapia to local farmers through the established central hatcheries and satellite stations in strategic areas nationwide. The dissemination strategy used in the transfer of tilapia genetic output to the resource-poor farmers is complimented by four components, namely: breeding and production, training, evaluation and distribution with technology demonstration.

## Introduction

Tilapia has grown to be an important food fish for mass domestic consumption in the Philippines. It ranks as the second most important fish culture next to milkfish. In 2002, the country produced 1,338,175 metric tons of aquaculture products consisting of seaweeds (66.9 %), milkfish (17.3 %), tilapia (9.1 %) and shrimps (2.7 %) (BFAR, 2003). The Philippines was ranked the fourth largest producer of tilapia world aquaculture in 1998 by the Food and Agriculture Organization of the United Nations. Asia continues to lead the world on tilapia production with the major producing nations being China, Thailand, Egypt and the Philippines (Guerrero, 2002).

The tilapia industry in the Philippines increased eminently in the last five years. It has achieved a 36.47 % growth from 1997 to 2002 (Table 1). Tilapia production reached 122,417 metric tons (MT), which is 14.6 % higher than the previous year's production of 106,746 MT. This accounted for 3.6 % of the total 3,368,519 MT fisheries production.

In the fisheries commodity road map: 2002, tilapias supply and demand assessment, Regions II, III, IV and XII have surplus production while the rest of the Regions registered deficits (Table 2). These manifest that there is insufficient supply of quality tilapia fry in far-flung areas of the country aside from the issues and constraints on the degradation of quality fingerlings stocks due to inbreeding. To limit the gap between supply and requirement and to further increase tilapia production the Department of Agriculture (DA), initiated the creation of the flagship project entitled "Nationwide Dissemination of GET EXCEL Tilapia". This was built upon the premise that replacing old tilapia breed with the latest improved breed of tilapia will bring about the targeted incremental production and provide opportunities to participate in global market for value-added products. This paper will focus on the dispersal scheme of the new tilapia strain, the GET EXCEL Tilapia developed by the government. The nationwide dissemination is complimented with adequate technology transfer through extension services and training on broodstock management.

The Nationwide Dissemination of GET EXCEL Tilapia is being implemented through the National Institutions, namely: the Bureau of Fisheries and Aquatic Resources (BFAR) through its National Freshwater Fisheries Technology Center (NFFTC), the Central Hatcheries, Provincial/Municipal Hatcheries and Certified/Registered Private Hatcheries.

Table1. Tilapia production from 1997-2000 in metric tons (Source: BFAR 1999, 2000, 2001 2002).

Year	Quantity (MT)	% Increase (Decrease)
2002	122,316	+14.58
2001	106,746	+29.23
2000	82,601	+9.49
1999	75,437	+4.74
1998	72,021	-21.57

Table 2. Supply/production and demand analysis per region for Tilapia (@ 1.5 kcy) (DA-BFAR 2002).

Region	Production (MT)	Requirement (MT)	GAP
CAR	2,414	2,048	(366)
I	3,088	6,301	(3,213)
II	4,305	4,220	85
II	61,936	12,046	49,890
IV	33,286	32,589	697
V	5,055	7,012	(1,957)
VI	568	9,313	(8,745)
VII	123	8,552	(8,429)
VIII	103	5,416	(5,313)
IX	1,175	4,637	(3,462)
X	582	4,121	(3,539)
XI	648	7,784	(7,136)
XII	8,432	3,897	4,535
ARMM	433	3,618	(3,185)
CARAGA	269	3,143	(2,874)
Total	122,417	114,697	7,720

### ***The GET EXCEL 2002***

For the past years, the Bureau of Fisheries and Aquatic Resources-National Freshwater Fisheries Technology Center (BFAR-NFFTC) has been involved in the development of tilapia. Together with the Central Luzon State University-Freshwater Aquaculture Center (CLSU-FAC), Norway Institute of Aquaculture Research (AKVAFORSK), and University of the Philippines Marine Science Institute (UPMSI), it has played a major role as one of the pioneering collaborative national partners in the implementation of GIFT Project or the Genetic Improvement of Farmed Tilapia. This project was coordinated by the International Center for Living Aquatic Resources Management (ICLARM) from 1987 to 1997 with funding from the United Nations Development Programme (UNDP) and the Asian Development Bank (ADB). The result was the development of a synthetic tilapia of African and Asian strain known since then as the GIFT strain. Upon the termination of the project in May 1997, the GIFT Foundation International, Inc. was established to continue selective breeding of the GIFT strain in a self-sustaining basis (Rodriguez, 2003). All the project collaborators were provided access to the GIFT family material technically known as the 8<sup>th</sup> generation GIFT fish.

The BFAR-NFFTC sustained the development of the fast growing fish through the use of genetically improved tilapia available in the country. GET EXCEL 2002 is a product of a selection program combining strain crosses and within-family selection with rotational mating using the four parent lines.

8<sup>th</sup> Generation GIFT strain - developed by crossing the best performing genetic groups from eight diverse Nile tilapia strains and their crosses (Pullin *et al.*, 1991; Eknath, 1993) where combined family selection and within family selection for growth in freshwater has been done.

13<sup>th</sup> Generation FAC Selected Tilapia (FaST) – a product of within family selection (based on body weight) of *O. niloticus* in a rotational mating scheme at Freshwater Aquaculture Center (Abella *et al.*, 1990; Bolivar, 1998). According to Lester *et al.* (1988), this strain is a combination of four *O. niloticus* Philippine strains known as ‘Taiwan’, ‘Thailand’, ‘Israel’ and ‘Singapore’.

Egypt strain – originated from 8 locations in Egypt; namely, Monsour, Manzalla, Timsah Lake, Ismaillia, Abassa, Mariut, Suez Canal and Idku. This was introduced in 1992 through the GIFT Project, implemented by the International Center for Living Aquatic Resources Management.

Kenya strain – progeny of founder stocks collected in 1989 from Lake Turkana. This was introduced in 1989 through the GIFT Project, implemented by ICLARM.

Breeders used as parent line of the Excel tilapia were the selected fish produced through within family selection not included in the GIFT base population.

The new breed of tilapia, have resulted to a superior breed for culture in normal environment giving an advantage of 38.12g in growth and 10% increased in survival than the other improved commercial strains of *O. niloticus*. From this findings, GET EXCEL promises a substantial increase in production and gross revenue for fish farmers. EXCEL implies for **EX**cellent strain that has **C**omparable advantage with other tilapia strain for **E**ntrepreneurial **L**ivelihood projects in support to aquaculture for rural development.

### ***Dissemination strategy of GET-EXCEL 2002***

To deliver better quality and steady supply of tilapia fingerlings, increase tilapia production and ensure that tilapia industry will not revert back to its previous practices that caused species deterioration, a four-fold scheme is implemented.

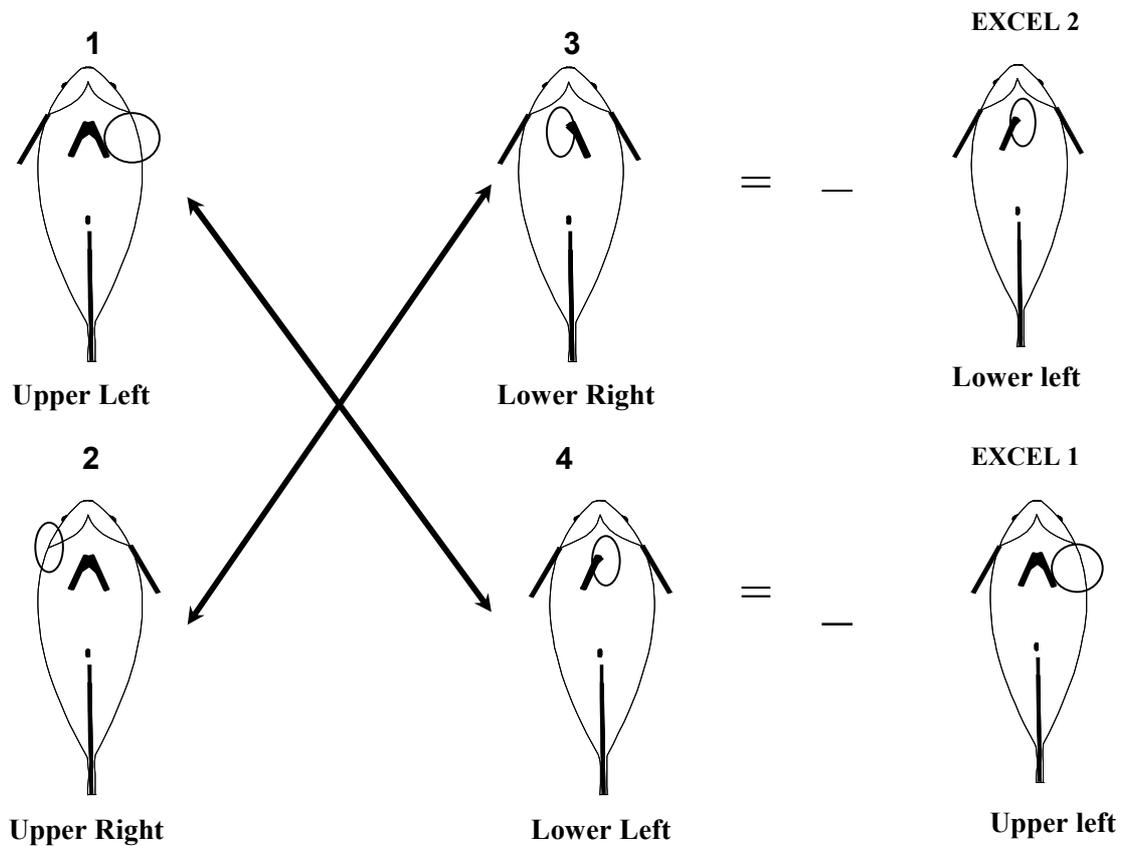
### **Production and breeding**

Continuous genetic improvement of tilapia is being done at NFFTC. Produced selected lines are bred to bring forth four groups of foundation stocks given to the twelve central hatcheries. The foundation stocks are reared separately by group until large enough to be sexed (about 5 g) and fin clipped.

As part of broodstock management, future breeders are fin clipped to serve as the fish permanent identification. Either left or right pectoral or pelvic fin is removed to represent the four groups of fish (Figure 1). Pairing groups 1 to 4 and groups 2 to 3 foundation stocks will result to EXCEL 1 and EXCEL 2, respectively. Produced breeders of EXCEL 1 and 2 by central hatcheries are disseminated to provincial/municipal hatcheries and certified/registered private hatcheries which served as satellite station. GET EXCEL 2002 being disseminated to fishfarmers is produced by mating EXCEL 1 and EXCEL 2. This scheme is very important in maintaining and ensuring the quality of broodstock and fish seed before distribution to central and satellite stations.

### **Training**

Another important component is training. Hatchery managers, technical staff of ROS/Central hatcheries and the registered/certified private hatcheries are required to undergo training on Breeding and Dissemination of GET EXCEL Tilapia with emphasis on Broodstock Management.



Legend:

Upper right = Right pectoral fin  
 Lower right = Right pelvic fin

Upper left = Left pectoral fin  
 Lower left = Left pelvic fin

Figure 1. Fish marking used to identify founder stocks and parent stocks of GET EXCEL 1 & 2.

### Evaluation

Prior to the distribution of Get EXCEL tilapia broodstock an on-site evaluation of all the Central Hatcheries and certified/registered private hatcheries was done. Each of the twelve central hatcheries was launched and the facilities upgraded to conform with the requirement for mass production of tilapia fingerlings. The evaluation team is composed of the Chairman as represented by BFAR Assistant Regional Director and members, namely: BFAR Regional Extension Group, Representative Provincial Fishery Officer. Representative from the private hatcheries and in case applicant is requiring further evaluation, NFFTC representative. Criteria for evaluation is based on: a) technical considerations such as accessibility, sufficient water supply, available facilities, peace and order situation, free from flood, b) experience on tilapia hatchery or equivalent training, c) exclusivity (no other tilapia species should be introduced in the area after 5 months from receiving the GET EXCEL

Broodstocks, d) willingness to adopt new technologies, e) willingness to cooperate with R & D activities of BFAR-NFFTC, and f) will avail broodstock replacement program every 1 1/2 years. Likewise, certified/registered private hatcheries are evaluated by the evaluation team after filing Letter of Intent/Cooperator Application Form (Annex 1).

Release of broodstock commenced after the issuance of registration (Annex 2). Registered/certified private hatcheries are also required to sign on Memorandum of Agreement on GET EXCEL Tilapia Fingerling Production, install sign board in the farm following information in Annex 3, and submit monthly fingerling production report (Annex 4).

Certification of hatcheries as a vital scheme in multiplication and dissemination of improved breed is at present in the process of development. The objective of this scheme is to form a regulatory guidelines involving production-distribution of improved tilapia available in the country. Issuance of certificate will provide assurance to fishfarmers that the fingerlings they buy are of high quality. Certificate of registration will be issued to registered/certified private hatcheries making them qualified to multiply the improved breed of tilapia from the NBC.

### Distribution

The operational structure on the flow of genetic material to grow-out cooperator is presented on Figure 2. The constituents are described below with their immediate functions and responsibilities.

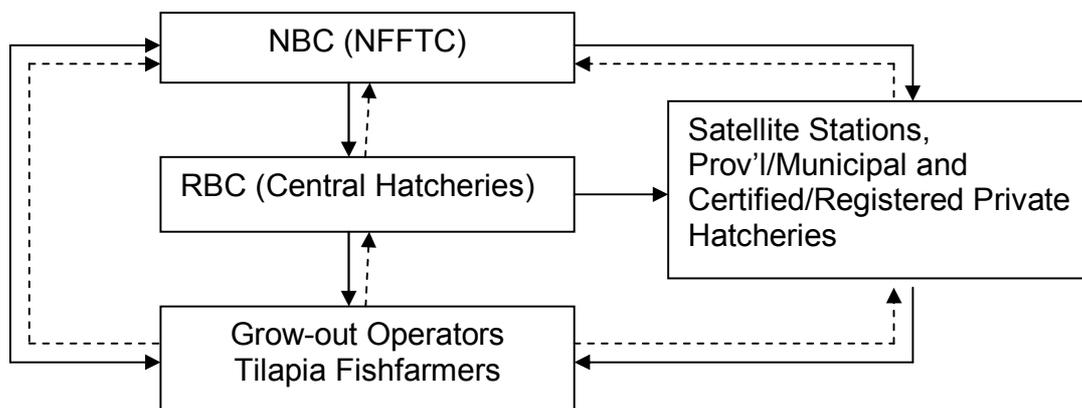


Figure 2. Transfer of Improved Breeds from National Broodstock Center to Multiplier and Grow-out Operators.

### ***National Broodstock Center (NBC)***

The BFAR-NFFTC served as the National Broodstock Center (NBC) for genetic management of tilapia multiplied and disseminated for aquaculture production. It also served

as depository of tilapia species/strains for maintenance of genetic diversity in the country. The Center produces 4 groups of breeders given to central hatcheries and 2 groups of breeders given to the satellite multipliers namely provincial/municipal hatcheries and the certified/registered private hatcheries. Another responsibility of the Center is the distribution and monitoring of test strains to DA Regional Fishfarm. The Center also undertake market assistance/referral to private hatchery operators and assist in the evaluation of Central/Satellite Hatcheries.

**Central hatcheries as Regional Broodstock Center (RBC)**

The Central hatcheries presented in Figure 3 served as Regional Broodstock Center and the main recipients of parent population from the NBC. By applying the recommended broodstock management system the RBC undertakes the mass production of tilapia fingerlings which are sold to certified/registered private hatcheries as their parent stock namely Excel 1 and Excel 2. The RBC also mass produce fingerlings for grow-out operators. To guarantee that fingerlings produced are properly distributed, the RBC is also engage in market assistance/referral to certified/registered private operators. A representative from RBC is involved in the evaluation of proposed hatchery operators/multiplier on their respective regions.

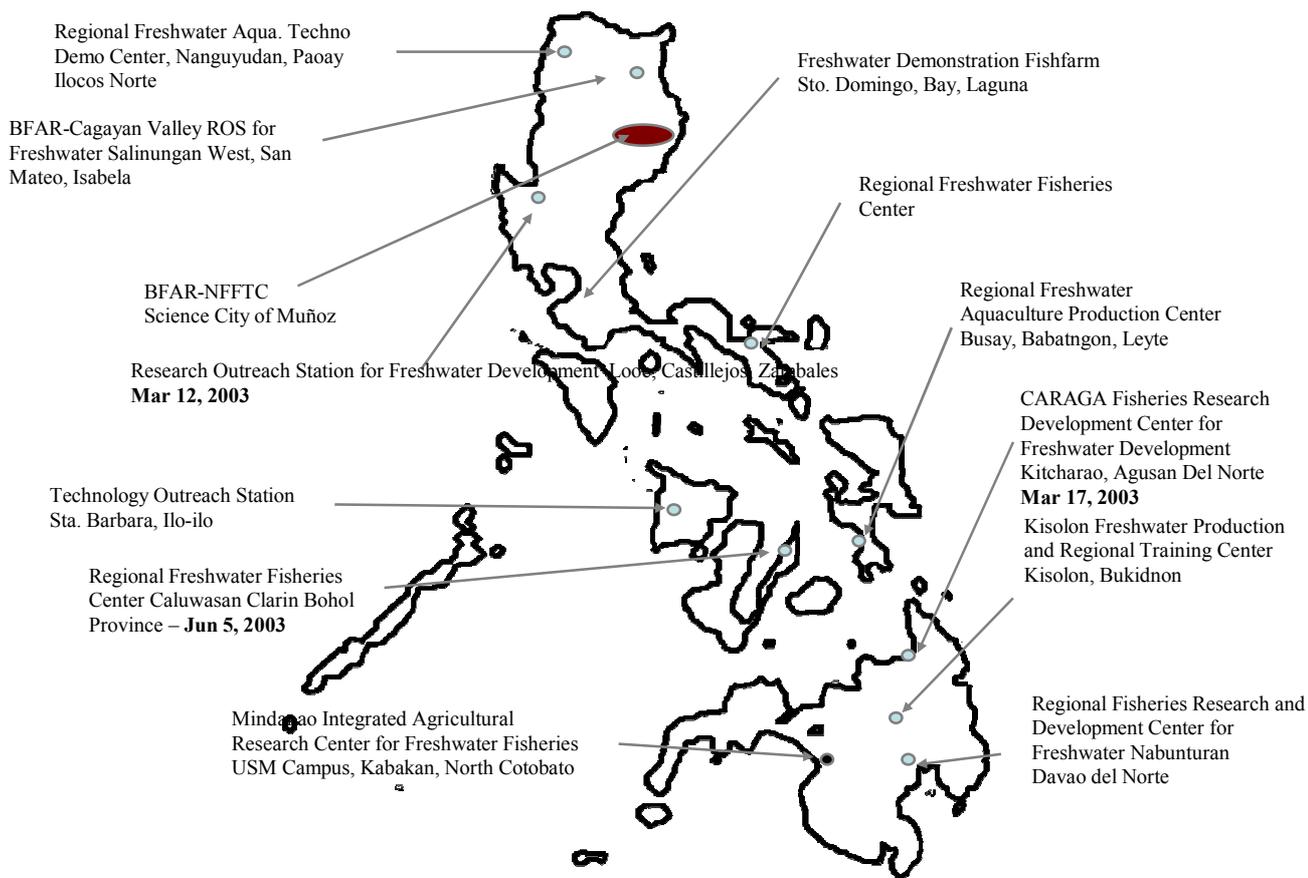


Figure 3. Map of the Philippines showing the locations of the Central Hatcheries of the Department of Agriculture.

## Fishfarmers

The fishfarmers being the recipients of the improved breed of tilapia from the National Broodstock Center, Central Hatcheries and Satellite Stations for growing to marketable size. This component will be an agent in giving feedback to the multiplier stations especially to the National Broodstock Center regarding the performance of the fish developed.

## Technology-Demonstration Project

The most effective method adopted by BFAR-NFFTC Extension group in testing the viability of new technologies on local conditions is demonstration pilot farm (Tayamen, 1988).

As specified in the Fisheries Commodity Road Map for Tilapia (DA-BFAR, 2002), the Philippines has a surplus of 7,720 MT tilapia production and has lost opportunities to participate in global market for value-added production. With the increasing consumer acceptance of tilapia as a substitute for marine white fish in the United States, a growing market for tilapia fillets (fresh, frozen or sundried) as a value-added product has come about. “Frozen and fillet tilapia have a good market in Singapore, Hongkong, and Japan. Unfortunately, the Philippines is not among those which export tilapia to the U.S. The countries that supplied the U.S. market for frozen whole or filleted tilapia are Taiwan, Thailand, Indonesia, Singapore, Costa Rica and Ecuador (Guerrero, 2002). It is in this regard that profitability of culturing tilapia to fillet size was verified using on-station and on-farm trial where two type of culture system are considered: extensive and semi-extensive culture in terms of stocking density. The trials were carried out at BFAR-NFFTC and at the farmer cooperators farm.

The results of four demonstration projects are presented in Table 3. As the table clearly shows, growing tilapia to fillet size can be an alternative market when surplus tilapia production arises. This will also provide tilapia grow-out farmer with gainful income as well as providing opportunities to participate in global market for value-added products.

Table 3. Technology Demonstration. Result of GET EXCEL 2002 in Pond

Cooperator	BFAR-NFFTC	BFAR-NFFTC	Noel Ramirez	Remedios Aquino
Location	Muñoz, Nueva Ecija	Muñoz, Nueva Ecija	Pila, Bataan	San Miguel, Bulacan
Pond Area (ha)	0.06	0.06	0.235	0.1700
Type of Operation (based on stocking density)	Extensive	Extensive	Semi-Intensive	Semi-Intensive
Stocking Rate	2 pcs/m <sup>2</sup>	2 pcs/m <sup>2</sup>	3 pcs/m <sup>2</sup>	3 pcs/m <sup>2</sup>
No. of fingerlings stocked	1,200 pcs	1,200 pcs	7,000 pcs	5,100 pcs
Date stocked	Feb. 17, 2003	Feb. 15, 2003	Sept. 11, 2003	July 17, 2003
Date harvested	Oct. 20, 2003	Oct. 20, 2003	Apr. 10, 2004	Feb. 18, 2004
Amount of feeds consumed	1,318.6 kls	1,741.5 kls	2,558.5 kls	2,419.44 kls
Feed Conversion Ratio (FCR)	1.84	2.45	0.95	1.02
Survival Rate	90%	85%	82.57 %	90.80 %
Expenses (\$)				
Fingerlings	21.57	21.57	18.88	13.75
Labor	17.98	17.98	71.92	26.97
Electricity	-	-	5.84	8.99
Transportation	-	-	29.66	10.79
Chicken manure	-	-	5.61	42.79
Inorganic (16-20-0)	-	-	4.94	22.24
Agrilime	-	-	6.74	-
Marketing Expenses	-	-	227.47	145.11
Feeds	459.87	607.43	873.71	814.35
Total (\$)	499.42	646.98	1,244.77	1,084.99
Output (Quantity)				
Average Body Weight at Harvest (kls)	300 g = 7.44 350 g = 9.38 400 g = 16.39 600 g = 298.94 750 g = 268.59 850 g = 115.11	300 g = 7.37 350 g = 9.28 400 g = 16.23 600 g = 295.96 750 g = 265.91 850 g = 113.96	300 g = 93 350 g = 94 400 g = 1,474 626 g = 1,015	300 g = 72.92 350 g = 9= 545.63 400 g = 1,428 626 g = 312.46
Kilos harvested	715.85	708.71	2,676.45	2,360
Price per kilo (\$)	1.13	1.13	300 g = 1.15 350 g = 1.35 400 g = 1.44 626 g = 1.53	1.02
Gross Income (\$)	814.23	802.74	3,905.00	2418.55
Net Income (\$)	314.81	155.76	2,660.23	1,333.56
Income per square meter (\$)	0.52	0.26	1.13	0.78
Income per month (\$)	39.35	19.47	380.03	190.51
Production cost per kilo (\$)	0.70	0.91	0.46	0.46
If sold as fillet*				
Price per kilo of fillet (\$)	4.49	4.49	4.49	4.49
Kilos fillet	237.67 kls	235.30 kls	846.26 kls	591.75 kls
Whole fish <400g (\$)	19.00	18.56	233.76	633.89
Fillet (\$)	1,067.00	1,056	3,799.70	2,656.98
Gross Income (\$)	1,086.00	1,075.05	4,033.46	3,290.87
Expenses (Fillet)	35.95	35.63	128.23	89.64
Total expenses (fillet + prod'n) (\$)	535.37	682.61	1,373.00	1,174.63
Net Income (\$)	551.58	392.44	2,660.46	2,116.24
Income per square meter (\$)	0.92	0.65	1.13	1.24
Income per month (\$)	68.95	49.05	380.06	302.32

Exchange rate: \$1 = P 55.62

\*with fillet recovery of 34%

## Summary

Nationwide dissemination of GET EXCEL tilapia is expected to replace old tilapia breed with our latest improved breed of tilapia to bring about targeted incremental production and provide opportunities to participate in global market for value-added products. The fish is now disseminated in central hatcheries and satellite station located strategically in different regions of the country using a well structured dissemination strategy.

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### **Implementing Guidelines of the GET EXCEL BFAR Registered/Certified Tilapia Hatchery**

To ensure the supply of high quality GET EXCEL tilapia fingerlings for grow-out operations, the following guidelines shall be followed and be implemented to BFAR Registered/Certified Private Hatcheries.

1. Application or Letter of Intent by the Hatchery Cooperator filed at BFAR-National Freshwater Fisheries Technology Center (NFFTC) shall be endorsed to BFAR Regional Office using form 1 (Annex 1).
2. The hatchery of the applicant will be evaluated by the evaluation team which shall be composed of the following:

Chairman: BFAR Assistant Regional Director  
Members: BFAR Regional Extension Group  
Respective Provincial Fishery Officer of his/her representative  
Representative from the Private hatcheries  
BFAR NFFTC Representative (in case of applicant is requiring further evaluation,  
NFFTC representative shall be requested to join the evaluation team)

#### **Evaluation will be based on the following criteria:**

1. Technical considerations:
  - a. The hatchery should be accessible to any kind of land transportation especially during rainy season for easy monitoring and pick-up of fingerlings.
  - b. The site should have clean and sufficient water supply throughout the year (with back-up deep well pump).
  - c. The following facilities should be available in the farm:
    - nursery ponds
    - breeding ponds
    - condition tanks
    - water supply system
    - hatchery paraphernalia such as seine net, scoop net, oxygen tanks, fish grader, weighing scale, etc.
    - Incubation system (for tanks and hapa-based hatcheries)
  - d. Peace and order situation in the site must be good.
  - e. The farm should be free from flood.
2. The applicant should have at least one (1) year experience in tilapia hatchery or equivalent experience or training.
3. After 5 months from receiving the GET EXCEL tilapia broodstock, no other tilapia species/strain should be introduced/stock in the hatchery area.
4. The applicant should undergo training on the dissemination of GET EXCEL broodstock being conducted by BFAR-NFFTC and willing to adopt new technologies.
5. Release of broodstock should commence after the issuance of certification/ registration (annex 2).
6. The applicant should sign a MOA on GET EXCEL Fingerlings Production. Signboard should be installed in the farm with the following information (Annex 3)
7. The applicant should cooperate in the R & D activities of BFAR-NFFTC.
8. The applicant can be requested to be a techno-demo site for GET EXCEL promotion or information dissemination.
9. The applicant should submit monthly monitoring report (Annex 4)
10. Access to broodstock replacement from BFAR-NFFTC/Regional Central Hatchery is recommended every 1 ½ years. In case of mortality or expansion, hatchery operators can avail of broodstock replacement after an evaluation.

Existing hatcheries who have acquired GET EXCEL tilapia broodstock as of 03 March 2004 without registration/certification will undergo evaluation and must comply with the requirements specified in the guidelines herein stipulated.

## LETTER OF INTENT OF APPLICATION

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 Date
**THE REGIONAL DIRECTOR**
 Bureau of Fisheries and Aquatic Resources  
 Regional Office No. 3
Subject: **REGISTRATION FOR A TILAPIA HATCHERY**

Dear Sir:

I have the honor to apply as a Registered GET EXCEL Tilapia Hatchery Operator of BFAR in pursuant to the provisions of section 57 of RA 8550, known as the Philippine Fisheries Code of 1998.

Hereunder are my pertinent information and present status of the hatchery farm for your perusal.

**A. Operators' Information**
 Name: \_\_\_\_\_ Civil Status: \_\_\_\_\_  
 Residence Address: \_\_\_\_\_  
 Business Address: \_\_\_\_\_  
 Registered Farm Name: \_\_\_\_\_  
 Location of Hatchery: \_\_\_\_\_  
 Telephone No: \_\_\_\_\_
**B. Type of Ownership**

- |                                      |   |   |
|--------------------------------------|---|---|
| <input type="checkbox"/> Owned       | <input type="checkbox"/> Cooperative            | <input type="checkbox"/> Corporation          |
| <input type="checkbox"/> Leased      | <input type="checkbox"/> Local Government       | <input type="checkbox"/> State College/School |
| <input type="checkbox"/> Partnership | <input type="checkbox"/> Others (specify) _____ |   |

**C. Farm distance to nearest road**

	Distance	Accessibility (specify)
<input type="checkbox"/> Barangay	_____	<input type="checkbox"/> Concrete
<input type="checkbox"/> Provincial	_____	<input type="checkbox"/> Asphalt road
<input type="checkbox"/> National	_____	<input type="checkbox"/> Gravel road
		<input type="checkbox"/> Clay

**D. Total Land Area of the Farm**

Pond System	No. of Fishponds/Compartments	Water Area/Pond (sq. m.)
Grow-out	_____	_____
Breeding	_____	_____
Nursery	_____	_____
Rearing	_____	_____
Holding	_____	_____
Reservoir	_____	_____

**E. Types of Hatchery Operation**

- |                                    |   |
|------------------------------------|---|
| <input type="checkbox"/> Pond base | <input type="checkbox"/> Hapa base              |
| <input type="checkbox"/> Tank base | <input type="checkbox"/> Others (specify) _____ |

**F. Drainage**

- |                                  |                               |
|----------------------------------|-------------------------------|
| <input type="checkbox"/> Gravity | <input type="checkbox"/> Pump |
|----------------------------------|-------------------------------|

I am enclosing the development plan and layout of my hatchery for your evaluation.

Anticipating for your usual assistance on this matter.

Very truly yours,

---

 Printed Name and Signature



REPUBLIC OF THE PHILIPPINES  
 Department of Agriculture  
 Bureau of Fisheries and Aquatic Resources  
 NATIONAL FRESHWATER FISHERIES TECHNOLOGY CENTER  
 CLSU Compound, Science City of Muñoz, Nueva Ecija

**GET EXCEL TILAPIA HATCHERY PRODUCTION AND DISPERSAL  
 MONITORING RECORD**

\_\_\_\_\_ (Reference Period)

Name of Hatchery Operator : \_\_\_\_\_  
 Address/Location of Project : \_\_\_\_\_  
 Contact Telephone No.: \_\_\_\_\_

**A. Production ('000 pcs.)**

Type of Hatchery System	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1. Pond based													
~ Mixed sex													
~ Sex reversed													
2. Hapa based													
~ Mixed sex													
~ Sex reversed													
3. Tank based													
~ Mixed sex													
~ Sex reversed													
<b>TOTAL</b>													

**B. Dispersal ('000 pcs.)**

Type of Hatchery System	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1. Pond based													
~ Mixed sex													
~ Sex reversed													
2. Hapa based													
~ Mixed sex													
~ Sex reversed													
3. Tank based													
~ Mixed sex													
~ Sex reversed													
<b>TOTAL</b>													