

# Aquaculture Practices in Pompano Production in Zambales, Guimaras, Negros Occidental, and Sarangani, Philippines

Zaireen B. Cleofe, Melissa L. Astillero, Edna Lynn C. Floresca, and Karen Kristine A. Roscom, PFT, PhD

The snubnose pompano (*Trachinotus blochii*), an emerging aquaculture species in the Philippines, is valued for its fast growth, adaptability to varied culture environments, high market demand, and rich Omega-3 content. Despite its potential as a high-value mariculture species, current production faces challenges such as limited fingerling supply, parasitic infestations, and microbial diseases linked to poor water quality.

To support the development of a Philippine National Standard (PNS) on Good Aquaculture Practices (GAqP) for pompano, this study documented the existing practices of seven marine cage farms across Zambales, Guimaras, Negros Occidental, and Sarangani through guided interviews conducted in 2023. Findings showed partial conformance to recommended practices across key areas, including site selection, cage design, stocking density, feeding management, water and soil monitoring, animal health, biosecurity, harvesting, post-harvest handling, and record keeping. While farms generally met basic requirements such as the use of clean water, commercial feeds, and accredited seed sources, significant gaps were observed in monitoring critical parameters, maintaining biosecurity structures, implementing standardized sampling, and keeping complete records. These results highlight the need to strengthen guidelines and farm management practices to support sustainable pompano production and inform the development of the proposed PNS on the Code of GAqP for Pompano.

Considering the number of samples for this study, these findings are exploratory and site-specific, and should be interpreted as indicative rather than nationally representative.



**BACKGROUND**

The snubnose *pompano* (*Trachinotus blochii*, Lacepede), also known as “pompano,” “damis lawin,” or “apahan” is an emerging species for aquaculture in the Philippines (Mamauag et al., 2023). This species has high economic value and broad marketability (Jayakumar et al., 2019; Shi et al., 2023). *Pompano* is one of the topmost candidate species for mariculture, owing to its fast and uniform growth, adaptability to culture environments in ponds and in cages, acceptability to formulated feed, and ability to grow at lower salinity (15-18 parts per thousand [ppt]) (Food and Agriculture Organization [FAO], 2024.; Ranjan et al., 2017; Reyes et al., 2014). *Pompano* has an attractive appearance, firm white and tasty meat, and high market demand globally (FAO, 2024; MPEDA, n.d.; Ranjan et al., 2017; Reyes et al., 2014). *Pompano* contains high levels of Omega-3 fatty acids like eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) in its meat (Jayakumar et al., 2019). It is a promising alternative to grouper, snapper, and other high-value fish species (Baliao et al., 2023; Mamauag et al., 2023).

Despite its promising qualities, *pompano* farms faced challenges such as insufficient fingerlings, sea lice infestation, and microbial diseases often associated with poor water quality (Armada & Dianala, 2023; FAO, 2024; Reyes et al., 2014). The Southeast Asian Fisheries Development Center (SEAFDEC) has been actively conducting research on the snubnose *pompano* since 2007. SEAFDEC highlighted that the culture of *pompano* lacks a national standard. The lack of a national standard may lead to the occurrence of potential risks to food safety, animal health, the environment, and economic losses associated with its culture. For this reason, the SEAFDEC requested the DA-BAFS to develop the Philippine National Standard (PNS) on the Code of Good Aquaculture Practices (GAqP) for *Pompano* in 2020. In response, the DA-BAFS Standards Development Division (SDD) requested the DA-BAFS Standards Research Division (SRD) to collect data on *pompano* farming practices in the first semester of 2023 to support the development of the requested PNS. Hence, the BAFS-SRD conducted this study to identify practices of *pompano* producers in selected producing provinces in the Philippines beginning in the 2nd semester of 2023. Specifically, this study gathered information on aquaculture practices against the following major provisions in the existing PNS on the Code of GAqP (PNS/BAFS 135:2014):

site selection, source of stock, stocking density, feed and feeding, water and soil quality, animal health and management, biosecurity measures, harvesting, post-harvest handling, and transport, and traceability and record keeping. The study employed a guided interview using a survey questionnaire to collect data. A convenience sampling was used for the selection of sampling sites and key informants. Seven respondents participated in the study representing all the seven *pompano* grow out farms in marine cages located in Zambales, Guimaras, Negros Occidental, and Sarangani which are popular producing provinces of *pompano*. The survey responses were analyzed using descriptive statistics with frequency distributions computed for each survey question. Local practices were compared with the requirements contained in the SEAFDEC manual, DA-Bureau of Fisheries and Aquatic Resources (BFAR) Field Guide, and ASEAN and PNS Code of GAqP.

***The absence of a PNS may lead to risks to food safety, animal health, and the environment, and may increase potential economic losses. Recognizing this need, SEAFDEC requested the DA-BAFS to develop a PNS on the Code of GAqP for Pompano in 2020.***

**KEY FINDINGS**

**Site selection**

**Location:** Majority (57%) of the farms were situated within coves. All farms were strategically located away from estuaries and fishing grounds, had convenient access to roads, obtained a license to operate and adhered to zoning ordinance, and had water depth of at least 8-10 m during the lowest low tide. These practices conformed to the site location practices recommended by SEAFDEC and DA-BFAR. However, only 29% had access to accredited hatcheries, while 43% of the farms were in close proximity to residential areas, and 14% were situated near beach resorts and power plants, deviating from recommendations of the DA-BFAR and SEAFDEC. Not all farms completely secure important regulatory

documents (e.g., Environmental Impact Assessment [EIA], Environmental Compliance Certificate [ECC], and farm and vicinity map), as specified in the PNS on Code of GAqP.

**Layout and design:** All farms utilized floating marine cages, and 71% practiced a monoculture system. About 43% of the farms used square cages (e.g., 5m x 5m x 5m, 10m x 10m x 6m, 10m x 10m x 8m, and 20m x 20m x 7m), while another 43% utilized circular cages (e.g., 16-19m diameter and 8m net depth). The DA-BFAR and SEAFDEC had no specific recommendation on the type and shape of cages as long as their size was considered in identifying the stocking density. Most farms (71%) opted for High-Density Polyethylene (HDPE) pipe as *pompano* cage framework, while 29% of the farms used galvanized iron, despite its susceptibility to rust and corrosion. Only 43% of the farms complied with the recommended distance of 3- 5 m between two cages of DA-BFAR. About 14% of farms reported using four mooring devices, each weighing 500-600 kg, in a 16m diameter cage, which falls below DA-BFAR's suggested 14-20 pcs mooring, each weighing 500-700 kg, for cages with 15-20m diameter cages.

**Source of Stock**

Most farms (71%) sourced *pompano* fingerlings locally from accredited sources, such as SEAFDEC in Tigbauan, Iloilo, and private farms in Pangasinan, Quezon, and Sarangani. The remaining 29% of the farms imported *pompano* fingerlings from an accredited hatchery in Taiwan. Seed stocks from accredited hatcheries align with the recommendation of SEAFDEC.



**Stocking Density**

Only 14% of farms with 5x5x5 m cage and stocks of 35 pcs fingerlings/m<sup>3</sup> closely adhered to the recommended stocking density of DA-BFAR. Less than half (42%) of the farms with 10-20m x 10-20m cage framework and stocks of 10-29 fingerlings/m<sup>3</sup> tend to understock when compared to the recommended stocking density of SEAFDEC.

**Feeds and Feeding**

The majority of farms (86%) used commercial feeds. All farms sourced the nutritional requirements of *pompano* from commercially available feeds, divided feed rations from 3-4 portions per day, and were aware of the first in first out (FIFO) rule under the SEAFDEC manual and PNS/BAFS 135:2014 standards, respectively. However, 57% of respondents performed *ad libitum* feeding which the SEAFDEC does not recommend. Only 25% adhered to the requirement of every 30 days sampling period for *pompano*, while none followed the recommended sample size (5% of total stocks) of the SEAFDEC manual. Less than half (43%) of the respondent farms lacked a designated area for feeds which should be present according to PNS/BAFS 135:2014.

**Water and Soil Quality**

All farms monitored temperature and the majority monitored salinity (86%) and dissolved oxygen (71%), adhering to the recommendation of the SEAFDEC. However, only a few farms monitored ammonia nitrogen (29%) and pH (14%). Likewise, none of the farms conducted soil analysis prior to operations, contrary to the recommendation of the DA-BFAR.

**Animal Health and Management**

Majority (72%) of the farms encountered diseases (e.g., fin rot and nocardiosis) and 43% of the farms experienced parasitic infestations (e.g., sea lice and *Benedenia* spp.) due to poor water conditions and low-quality fingerlings. All farms performed freshwater baths and change of nets as a common measure to mitigate disease outbreaks and pest infestation, which are practices approved by SEAFDEC. For those farms that experienced sea lice (29% of farms) added a few concentrations of formalin to the freshwater bath. Majority of the farms (71%) had designated mortality pits, aligning with the requirements of the PNS/BAFS 135:2014.

**Biosecurity Measures**

Eighty-six percent of the farms have bird net protection, while only 43% have hand washing areas, which are requirements of PNS/BAFS 135:2014. However, none of the farms had foot baths, tire baths, and vehicle wash or spray stations.

**Harvesting, Post-harvest Handling, and Transport**

**Harvesting:** Farms harvested *pompano* when they reach an average marketable size of 350-800 g/pc in six months to one year of culture, which closely aligns to the SEAFDEC recommended average marketable size of 330-350g/pc after 4-5 months of culture. All farms harvested *pompano* early in the morning, which is advisable according to Pankyamma et al. (2022). However, 25% performed harvesting in the afternoon, causing potential stress to *pompano*. All farms used chilling tanks during harvest, while ice boxes and styrofoam boxes were used for transport, adhering to the recommendation of the SEAFDEC.

**Post-harvest Handling:** All farms utilized clean and uncontaminated water for harvest, handling, and cleaning. They also used ice from potable water to preserve harvested products, adhering to the requirements of the ASEAN and DA-BAFS standards. Most of the farms (83%) conducted sorting on-site. However, none of the farms have written procedures on cleaning or sanitizing equipment before storage. Only 29% had established protocols for handling the product with consideration to food safety which is required in PNS/BAFS 135:2014. In terms of marketing, all of the farms preferred to sell *pompano* in fresh-chilled form in the local markets (e.g., Navotas, Malabon, Bulacan, Davao, General Santos, and Sarangani),



while 14% reported selling frozen *pompano* in international markets (e.g., United States and the United Arab Emirates). Minority (29%) of the respondents declared that buyers preferred to buy *pompano* in 3-4 pcs/kg or 5 pcs/2 kg.

**Transport:** Most farms (43%) used a closed van to deliver fresh-chilled, frozen, and live *pompano* to the local markets. For live *pompano*, 14% used an aquarium with an aerator, and another 14% used a mixture of water and phenoxyethanol to condition live *pompano* before transport in distant areas. These transport practices are permissible according to DA-BAFS (2014) as long as they are applied in compliance with applicable laws and international guidelines.

**Traceability and Record Keeping**

All farms recorded feed purchases. However, other important farm activities specified by the ASEAN and DA-BAFS standards were not recorded. Eighty-six percent of the farms do not keep and maintain records of farm activities.

***Most farms followed the basic recommended practices for site selection, cage design, and post-harvest handling; however, many fell short in key areas such as stocking density, water and soil monitoring, biosecurity, and record keeping. These gaps particularly in feeding management, disease control, and documentation limit full conformance to the SEAFDEC Aquaculture Operations Manual, the DA-BFAR Aquaculture Guide, and the PNS Code of GAQP.***

**RECOMMENDATIONS/CONCLUSION**

The major recommendations that may be considered by the BAFS-SDD in the development of a PNS on the Code of GAqP for *Pompano*, considering prevalent practices, start with **Site Selection**. The standard should cover location, layout, and design. Specifically, marine cages should be located in **sheltered areas like coves and bays** for protection during adverse weather, and maintain the recommended DA-BFAR distance of **500 m from critical habitats** such as coral reefs and seagrass beds, while also avoiding estuaries to preserve biodiversity. Farms require easy access to roads, aquaculture inputs, reputable hatcheries, and telecommunications. They should be situated away from beach resorts (1 km), residential areas, and power plants to prevent pollution and ensure water quality, requiring necessary permits, compliance with zoning, environmental assessments, and Special Use Agreement on Protected Areas. Crucially, the water depth during the lowest low tide should align with the recommended depth of at least **8-10m**.

For **Layout and Design**, farms may utilize square or circular floating cages made of durable, non-toxic materials like HDPE, bamboo, and steel. The size of cages should influence the stocking density of *pompano*, and steel anchors or prefabricated concrete blocks should be used for stabilization, with the weight depending on cage dimensions. Maintaining a distance of **3-5 m between cages** and **10-20 m between clusters** is advised, and farms may adopt monoculture or polyculture systems.

The **Source of Stock** must be accredited hatcheries to ensure quality. **Stocking density** should adhere to DA-BFAR (25-35 pcs/m<sup>3</sup> in a 10m x 10m x 4m) or SEAFDEC (45 pcs/m<sup>3</sup> in a 10m x 10m x 4m) recommendations to maintain growth, good health, and water quality.

The standard on **Feeds and Feeding** should cover types of feeds, nutrient requirements, feed rations, stock sampling, feeding rate, and feed management. Farms must ensure the regular availability of affordable, quality, preferably slow-sinking feeds suitable for *pompano*, considering the recommended nutritional requirements essential for their high metabolic needs. The feeding schedule of SEAFDEC (i.e., 0800, 1100, 1400, and 1700 for nursery;

0800, 1300, and 1700 for grow-out) is recommended, alongside DA-BFAR's broadcasting and hand feeding methods. **Regular sampling (5% of total stock every 30 days)** is recommended to monitor growth and feed conversion ratio (FCR), utilizing SEAFDEC's feeding rate based on average body weight, while avoiding *ad libitum* feeding. Feeds should be stored in a cool, clean, dry, elevated facility and managed following **FIFO (First In, First Out)** rule to prevent spoilage and contamination.

For **Water and Soil Quality**, farmers should regularly monitor temperature, salinity, dissolved oxygen, ammonia nitrogen, and pH against SEAFDEC parameters to ensure *pompano* health. Soil analysis must also be regularly conducted in compliance with ECC requirements. **Animal Health and Management** standards should include disease and pest control, requiring practices like freshwater baths (5-10 minutes) for infected *pompano*, responsible use of chemicals (e.g., formalin), regular replacement of nets, and removal of biofouling organisms. Training for farm owners and workers on aquatic animal health is also recommended. **Biosecurity measures** such as installing bird nets, foot baths, tire baths, and vehicle wash stations are necessary to prevent the risk of spreading animal-origin diseases.

To maintain quality and safety during **Harvesting, Post-harvest Handling, and Transport**, harvesting must occur during cooler times (early morning/late afternoon) to prevent warm temperature stress. Quality maintenance involves using a chilling tank with pre-chilled seawater and a 1:1 ice-to-fish ratio, followed by packing in Styrofoam boxes with sufficient crushed ice (1:1 ratio) layered between fish rows. Post-harvest facilities must utilize suitable, clean areas, uncontaminated water, and potable ice, requiring established food safety protocols and written cleaning/sanitizing procedures for equipment. For transport, vehicles must be cleaned and sanitized beforehand, a Standard Operating Procedure (SOP) for live aquatic animal transport must be established, and chemicals like phenoxyethanol must be used responsibly. Furthermore, for **Traceability and Record keeping**, farms are required to maintain accurate, detailed, and complete records of all operational activities, which must be accessible and retained for a minimum of two years after harvest.



**Authors:** Zaireen B. Cleofe, Melissa L. Astillero, Edna Lynn C. Floresca, and Karen Kristine A. Roscom, PFT, PhD  
**Technical Content and Layout:** Hanna Alexine R. Ramos  
**Editors:** Mary Grace R. Mandigma, PFT and Katrina M. Maniling

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