POLICY AND GUIDELINES FOR SUSTAINABLE FOOD SECURITY FROM AQUACULTURE PRODUCTION AND AQUATIC ECOSYSTEMS IN THE CAMPUS OF UNIVERSITI MALAYSIA TERENGGANU

A. Background

According to the statistical data from Ministry of Agriculture and Food Industry, MAFI (2022), Malaysian peoples consumed about 46.9 kg of fish per year. Hence, to ensure the food security and sufficiency of the fish resources, aquaculture played a major role in Malaysia which the aquaculture export value can reached about RM3.1 billion. Due to the decreasing of the capture fisheries landing production, aquaculture fields come to meet demand for the fish food resources in the future. However there also major issues in Malaysia in the aquaculture sector such as the fish stock depletion, climate change, diseases outbreak among the cultured fish and on the non-compliance feeding practices by the fish farmer.

Thus, to meet the requirement for the sustainable food aquaculture security, a special task force call Jawatankuasa citra dan kelestarian kampus (JCKK) under Pro Naib Canselor (Strategic and Performance) was assigned to facilitate and propose any sustainable practice that may improve the IU Green metric in the campus from the application of the green aquaculture farming practice such as by implementation of aquaponic system in the fish food production. The UMT community from Institute of Aquaculture Tropical and Fisheries has actively been involved in the aquaponic farming project with the community around Kuala Nerus Terengganu. Through the implementation of this project, sustainable fish food production could be achieved by the community together with the production of vegetables from the aquaponic application. Thus, in order to support this sustainable green fish farming practice, the current policy paper provides a guideline for the implementation of the sustainable green aquafarming practices in the campus and also in the aquaculture activity around UMT.

B. Scope

Sustainable green aquaculture farming for food security especially from the aquaculture and aquatic ecosystem shall be applied to all UMT community including student, faculty and institute staffs, service agency and also to the external parties. The Good aquaculture practices (GAqP) shall follow the principles such as prioritized the elements of food safety, social responsibility, environmental commitments, animal health and welfare, and also should reconsider the occupational health, safety and welfare. In Malaysia we have MyGAP certification where this certification program developed for the crop sector to provide recognition to farms that have implemented Good Agricultural Practices such as application of environmentally friendly concept, maintaining the goodness and safety of workers to produce quality, safe and edible products. The public and university guests are also enforced to this policy upon entering to the UMT campus and during any of university activities.

C. Terminology

myGAP	certification program developed based on Malaysian Standard MS 1784 for the crop sector to provide recognition to farms that have implemented Good Agricultural Practices.

Green aquafarming	green, environmentally friendly farming that involves the carefully cultivated ("farming") of aquatic animals, including fish, crustaceans, mollusks, algae, and other valuable species of plant like lotus or hydroponic plants.
Aquaponic	Aquaponics is a method of producing food where fish are reared in water tanks with plants growing in them. This allows the fish waste to nourish the plants and the plants to filter the water. Building a sustainable system to breed fish and plants in the same system is known as aquaponics.
Sustainability	the capacity to consistently support or maintain a process across time. Sustainability in commercial and policy contexts aims to keep natural or physical resources from running out or any disturbance, so they can be used for a long time.

D. Preparations, Implementation, enforcement and alternatives

I. Preparation: Dissemination of info/Education

Sustainability related committee shall initiate the information, education and communication to UMT community. The campaign shall include the activities to educate the community for the sustainable food security especially from the aquaculture production and from aquatic ecosystem in supporting the sustainable aquaculture food production, implemented the codes of practice such as Malaysian Good Agriculture Practice (myGAP) and Good Aquaculture Practices (GAqP), less or reduce the aquaculture waste and also to promote the green aquaculture farming which is eco-friendly to the environment such as from the aquaponic system application for the sustainable food security and food production around campus.

II. Implementation

Special Task Force committee shall be formed to coordinate the overall campaign, monitor and ensure the enforcement of the policy. The policy cover administrator, institutes, faculties, non-academic staff, service provider, members of public and also other university guest. The campaign material shall include of implementation of the green aquafarming, infographics, social media outlets approved by the University.

III. Enforcement

Written warning and written explanations are required for the first-time offense and further punishment that are deemed suitable by the University administrators for repeated offenders.

IV. Alternatives

1. Promotes green aquafarming activity which eco-friendly to the environment, with implementation of the aquaponic system in the campus.

2. Reduce or less aquaculture waste with replacement of the conventional culture system with the aquaponic or RAS system to recycle and reuse the waste produced from fish/shellfish aquaculture farming.

3. Implementation of the Good Aquaculture Practices (GAqP) and Malaysian Good Aquaculture Practice (myGAP) standards in the fish hatchery culture operations in order to promote safety to the worker, eco-friendly to the environment and good quality of aquaculture production produces from the hatchery in UMT campus.

4. Implementation of green aquafarming technology such as aquaponic system, where this system reduces the disturbance to the ecosystem and environment and the nutrients or fish waste could be used and recycle as the fertilizer to the vegetables cultivated in the system.

E. Relevant committee and their responsibilities

I. **Special task force** shall coordinate the campaign, monitor the implementation and ensure the enforcement of the policy.

II. **Pusat komunikasi korporat (PKK)** shall responsible for dissemination of information, education and communication campaign for sustainable green aquaculture farming or practices in the campus.

III. **UMT staffs** are required to cooperate and help educate and promote the sustainable green aquafarming to the students and fellow colleagues.

IV. **Students, alumni, and UMT guest** shall adhere to the rules and regulations.

V. **Hatchery users - staffs, students and visiting guest (from institute & faculty of aquaculture and fishery)** shall implements the policy in campus - such as follow: reduce or less of aquaculture waste produces that contains high of organic carbon, suspended solid and nitrogenous waste through the implementation of high technology filtration system, RAS or through the application of aquaponic system for the aquaculture sustainable production. In addition, hatchery user (staff, students & visiting guest) also should not dumped any of broken pipe, air tubing, aerotubes, airstones, broken fish tank or fish container and any other aquaculture compartments to the environment or to the aquatic ecosystem that could jeopardize the environment and aquatic ecosystem around the campus in UMT.

VI. **Bahagian Keselamatan** shall enforce the policy by giving the written warning and written explanations for the first-time offense.

G. Recommendations

The committee recommends the following:

1. The application of green aquafarming system in campus for sustainability of foods productions.

2. Use and recycle the unused broken tank/container for aquaponic fish culture tank that can help reduce waste.

3. Application and recycling of the dumped pipe/unused pipe in the AKUATROP hatchery to cultivate hydroponic vegetables in the aquaponic system, where help reduced the waste and recycle.

4. Application of the code of practices Good Aquaculture Practices (GAqP) and Malaysian Good aquaculture practice (myGAP) for the safety of the workers, reduce the impact to the environments, less aquaculture wastes, and also produce quality of fish production which is safe and edible.

5. Reduce or minimize production of aquaculture waste.

H. Policy Enforcement

This policy is effective from March 30, 2024.