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TRANSFORMING THE INVASIVE SUCKERMOUTH CATFISH INTO A GOLDMINE OF OPPORTUNITY

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The invasive suckermouth catfish (*Pterygoplichthys spp.*), commonly known as the pleco, janitor fish, or *ikan bandaraya* is a species native to South America but has become widespread in various water bodies across the globe, including Malaysia. The invasion of suckermouth catfish in Malaysia has caused significant ecological and economic impacts.

These non-native fish have established themselves in various freshwater ecosystems, outcompeting native species for food and habitat. Their burrowing behaviour destabilises riverbanks, leading to increased sedimentation and erosion, which negatively affects water quality and the health of aquatic habitats.

This disruption causes cascading effects on local biodiversity, threatening the survival of indigenous fish species and other aquatic organisms.

Figure 1: Some of the suckermouth catfish removed from the Langat River during a joint program between Komuniti Pemburu Ikan Bandaraya and the Department of Fisheries (photo used with permission from Komuniti Pemburu Ikan Bandaraya Facebook page).

Economically, the suckermouth catfish poses challenges to local fisheries and aquaculture, as they damage fishing gear and consume resources meant for commercial species. The management and control of these invasive fish require substantial resources, diverting attention and funds from other conservation efforts. Efforts to control their population are ongoing (Figure 1), but the ecological and economic consequences of their invasion remain a serious concern. While often seen as a nuisance due to its invasive nature, the suckermouth catfish presents unique opportunities for economic development and job creation. The utilisation of suckermouth catfish in value-added industries presents another significant avenue for job creation.

Various products can be derived from suckermouth catfish, each offering unique economic opportunities. One of the most effective and highly promoted methods to overcome invasion by foreign species is to eat them, as can be seen in the cases of lionfish in the western north Atlantic region, and green crab in Alaska.

Suckermouth catfish flesh is known to be rich in nutrients and can be processed into various food products, such as fillets, fish balls, *satay* (Figure 2), *pekasam* (fermented sour fish), and dried fish snacks. The development of a fish processing industry can generate employment in areas such as food processing, quality control, packaging, and distribution. Moreover, promoting these products in local and international markets can boost sales and create marketing and export-related jobs. One of the main concerns about consuming the suckermouth catfish is the level of contaminants in their flesh, stemming from their habitats, which are usually polluted rivers in urban areas. However, a study conducted on suckermouth catfish caught from the Gombak River by researchers from the Faculty of Pharmacy, Universiti Teknologi MARA Puncak Alam, has revealed that the level of contaminants, such as heavy metals, was below the permissible levels (Table 1) and was heavily influenced by the level of pollution of the river. A study on the health risk assessment is also currently being conducted by a local university to answer questions from the public about the safety of suckermouth catfish consumption. Research and development efforts can also focus on exploring the various potential applications of suckermouth catfish, turning an ecological challenge into an opportunity. Compounds derived from these fish, such as collagen, gelatine, amino acids, and other peptides, possess unique properties that may be suitable for diverse uses in medicinal, agricultural, and industrial fields.

Figure 2: Suckermouth catfish *satay* (photo used with permission from Komuniti Pemburu Ikan Bandaraya Facebook page).

Table 1: Heavy metal content in suckermouth catfish flesh caught from the Gombak River.

Heavy Metals	Content	Permissible Limit for Fish & Fishery Products (Malaysia Food Regulations 1985)
Cadmium (mg/kg)	<0.100	1 – 2
Lead (mg/kg)	<0.100	1 – 2
Methyl mercury (ng/g)	22.4	500 – 1000
Inorganic Arsenic (mg/kg)	<0.05	1

For instance, the collagen and gelatine extracted from suckermouth catfish can be used in the pharmaceutical and cosmetic industries, providing raw materials for wound healing products, anti-aging creams, and other health and beauty applications.

Furthermore, the amino acids and peptides can be investigated for their potential in creating nutraceuticals, dietary supplements, and functional foods that promote health and wellness. In agriculture, these compounds could contribute to developing new types of animal feed, fertilisers (Figure 3), and biopesticides, enhancing crop yields and livestock health while promoting sustainable farming practices. By harnessing the biochemical properties of suckermouth catfish, scientists and researchers can drive innovation, leading to the creation of new products and technologies. This not only addresses the invasive species problem but also stimulates economic growth by creating jobs in scientific research, biotechnology, pharmaceutical, and agricultural manufacturing sectors. The skin of suckermouth catfish, known for its sturdiness and durability, has the potential to be transformed into a high-quality leather that boasts both aesthetic appeal and practical use. This unique leather is an excellent material for producing a variety of goods, such as bags, shoes, belts, and other fashion

Figure 3: Fertiliser solution made from suckermouth catfish (photo used with permission from Komuniti Pemburu Ikan Bandaraya Facebook page).

accessories, offering an eco-friendly alternative to conventional leathers. Establishing leather processing and manufacturing units dedicated to suckermouth catfish leather presents numerous economic benefits. It can generate employment opportunities across various sectors, including processing, design, production, and sales. Additionally, the development of these industries can foster the growth of craftsmanship skills, blending traditional artisanal techniques with modern design principles. By promoting both traditional and contemporary crafts, these initiatives can preserve cultural heritage while encouraging innovation. The increased demand for skilled artisans can lead to the creation of training programs and workshops, further enhancing the skill set of the local workforce.

In conclusion, the invasive suckermouth catfish, often viewed as a problem, can be transformed into a valuable resource for economic development and job creation in Malaysia. Through value-added industries, and research and development, numerous employment opportunities can be generated. By addressing the challenges and ensuring sustainable practices, Malaysia can harness the potential of suckermouth catfish to promote economic growth and improve livelihoods, particularly in rural and underserved areas. This approach not only mitigates the negative impact of this invasive species but also turns it into an asset for the nation's economy, meeting the sustainable development goal 1 and 2 of eradicating poverty and hunger. While the utilisation of suckermouth catfish offers numerous job creation opportunities, it is essential to consider the challenges and potential negative impacts, such as overreliance on a single species that can lead to market saturation and economic instability. Therefore, it is crucial to diversify economic activities and ensure sustainable practices.