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**Challenges and Opportunities to**

**Promote Responsible Aquaculture in Asia – Pacific Region**

Extended Abstract of NACA Presentation at the

**Regional Seminar on Aquaculture for**

**Program Officers of Norwegian Embassies & Fisheries Advisors of NORAD**

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*Abstract*

*Our presentation will begin with an overview of aquaculture production – global and in the Asia – Pacific region, with emphasis on the unique characteristics of the extant Asian aquaculture system: diversity of species, diversity of farming systems, the present trends and most importantly the people and the small scale entrepreneurs who are responsible for the region’s impressive contribution to the food security, nutrition and livelihoods. The focus of discussions will be on the track record of aquaculture in Asia in terms of its responsiveness to a number of issues related to the “image” and sustainability of aquaculture including, productivity, environment, biodiversity, use of resources, food safety, balancing of socio-economic benefits, small-scale vis-à-vis large scale industrial aquaculture; and adoption of animal welfare measures. It will also focus on how the sector as a whole is expected to sustain in the next few decades against the backdrop of stagnating food fish production from capture fisheries, population growth and the targets established under the auspices of the Millennium Development Goals. We have highlighted some priority intervention areas for due consideration by NORAD and the Norwegian Embassies in the region.*

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**Global Scenario**: The global capture fisheries production has stabilized at about 90 million metric tonnes (MMT) with estimated value US$217.5 billion in 2010. Global aquaculture production, on the other hand, has continued to grow, albeit more slowly than in the 1980s and 1990s. In 2010, the world aquaculture production attained an all-time high at 60 MMT (excluding aquatic plants and non-food products), with an estimated total value of US$119 billion. The share of total fishery production exported in the form of various food and feed items increased from 25 percent in 1976 to about 38 percent in 2010. World trade in fish and fishery products grew significantly also in value terms, rising from US$8 billion (1976) to US$102 billion (2010). The key drivers for increase in world trade of fish and fishery products include; sustained demand, trade liberalization policies, globalization of food systems and technological innovations. On the livelihood front, fisheries and aquaculture provided livelihoods and income for an estimated 54.8 million people engaged in the primary sector of fish production in 2010. Apart from the primary production sector, fisheries and aquaculture provide numerous jobs in ancillary activities. All of this employment, together with dependents, is estimated to support the livelihoods of 660–820 million people, or about 10–12 percent of the world’s population. World per capita food fish supply increased from an average of 9.9 kg in the 1960s to an estimated 18.6 kg in 2010. Fish accounts for about 16.6 percent of the world population’s intake of animal protein and 6.5 percent of all protein consumed. Globally, fish provides about 3.0 billion people with almost 20 percent of their intake of animal protein, and 4.3 billion people with about 15 percent of such protein.

**Asia Pacific Scenario**: Asia Pacific is the top aquaculture region in the world. In 2010, almost 90% of world aquaculture production came from the region. China is the mainstay in the region. Without China, Asia-Pacific only contributes around 30% of the world aquaculture production (and value). Asia-Pacific as a region produced 53.1 MMT of aquaculture products (excluding aquatic plants) showing a 6.5% annual growth over decade 2000-2010 and contributing to 89% of global aquaculture production. Total value of aquaculture products from the region was $95.2 billion showing 10.6% annual growth over decade 2000-2010 and contributing to 80 % of the global total. During 2000-2010, Asia Pacific witnessed an average growth of 6.7% per year but with significant variations at the country levels.

**Highlights from Asia Pacific**: Eight of the top 10 producers are from the Asia Pacific region. They are China, India, Vietnam, Indonesia, Bangladesh, Thailand, Myanmar and Philippines. Freshwater finfish requiring lower cost feed inputs dominate freshwater finfish production (carps) accounting for 95% of the production at 30 MMT in 2010. In recent years there has been a rapid growth of high value freshwater finfish such as snakehead, eel species, mandarin fish and largemouth black bass. Catfish has been the fastest growing species group with 2.8 million tonnes in 2010 witnessing a rapid growth during 2000 – 2010, 28 % per year. Tilapia, dominated by Nile tilapia is emerging as an important commodity with 2.4 MMT (unit value $ 1.49/kg) in 2010 and 4 countries (China, Indonesia, Philippines & Thailand) are leading in its production. Of the various cultured commodities, crustaceans are the most valuable species group. The total production in 2010 has reached 5.1 MMT. Very interestingly the exotic white-leg shrimp dominates production with 2.2 million tonnes in 2010. Other important species (in the top 20 aquaculture species in the region) include Giant tiger prawn, Chinese mitten crab and Red swamp crawfish. The growth of marine and brackishwater finfish has been rather slow (3% per year 2009-2010) with a production of 2.5 million tonnes worth $ 7.9 billion in 2010. Major producers include China, Indonesia, Philippines, Japan, Viet Nam, RO Korea & Bangladesh. Diverse species of carnivorous fish contribute 1.6 million tonnes worth $ 6.7 billion ($ 4.09/kg) while Herbivorous & omnivorous fish species like milkfish contribute about 800 000 tonnes worth $ 1.3 billion ($ 1.53/kg). The top 10 species produced around the world include grass carp, silver carp, common carp, Nile tilapia, big head carp, crucian carp, Atlantic salmon, rohu and pangasius. During the past decade, three species have become super performers. These include Catla (20 % per year), White-leg shrimp (99 % per year) and pangas catfishes (29% per year).

**Issue of small scale**: Asian aquaculture is characterized by small-scale family operated farms that are typically less than one hectare in area. Small scale farming in Asia is very important and is a major contributor to production in many countries and therefore major contributor to global fish supplies. This sector is a major source of income and employment for rural communities and critical for rural development, employment and poverty reduction. The small-scale nature of the sector poses special challenges in confronting emerging issues such as globalization, the evolving international trade and maintaining environmental integrity. Aquaculture in Asia Pacific is characterized by huge diversity. Large numbers of species (over 250) are cultured in several types of culture systems (ponds, cages, tanks, rice-fish systems) at different levels of operation (traditional, extensive, semi-intensive, intensive, and super-intensive). On the issue of small versus large scale aquaculture there is no statistics on relative importance. Small-scale farmers dominate Asia-Pacific aquaculture by number but large-scale farms are likely to contribute most to total national production. In terms of support, both sectors need support since there are limits on land and water resources so need to intensify. In addition, small-scale farming households are driven by need to increase household income so sustainable aquaculture for income generation is becoming more important rather than subsistence as in past donor projects.

**Key Challenges**: There are several challenges that need to be addressed to promote responsible and sustainable aquaculture in the region. According to the European Commission report “The World in 2025. Rising Asia and Socio-ecological transition (2009)” the World population will be 9 billion with 2/3 of it in Asia, more than 50% of population will be in cities, Asia will contribute to more than 30% of global GDP, there will be large rising middle class, Asia will become the main destination for location of business R&D and all this will be putting tremendous pressure on the already scarce natural resources. The root problem is going to be food security: the challenge of feeding 9 billion people. The challenge will be three-fold; (a) meet demand for food from rapidly increasing and more affluent population (b) do so in environmentally and socially sustainable ways and (c) ensure that world’s poorest people do not go hungry. The main challenges for Asian aquaculture include: sustainably intensifying aquaculture with declining natural resources in the more developed and lesser developed countries of Asia, to improve livelihoods along the entire value chain, to contribute towards national food security in Asia and to export an increasing amount of food to the rest of the world.

**Intervention Opportunities**: To meet these challenges, interventions developed based on science and socio-economic considerations and supported by national and international institutions will be urgently required to be applied. Some of the specific challenges to responsible and sustainable aquaculture and intervention opportunities are summarized in the following table.

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| **Challenges** | **Intervention Opportunities** |
| Environment integrity | * National legislation and policies
* EIA, BMPs, Certification
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| Food safety | * Responsible use of approved drugs and chemicals
* BMPs, compliance to Codex, certification
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| Over intensification | * Promoting sustainable intensification
* Use of aquaculture planning and management tools
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| Use of Alien species | * Responsible use of alien species
* Regional study on *P.vannamei*
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| Mangrove clearance | * National legislation
* Supporting compliance to public/private certification
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| Effluent discharge | * Supporting BMPs, compliance to national/international requirements
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| Excessive use of fish meal and oil | * Regional studies on strategies to reduce dependence
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| Disease emergence and spread | * Regional biosecurity programs with focus on risk analysis, surveillance and contingency planning
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| Market access and aquaculture certification | * Small farmer inclusive certification programs
* Benchmarking and equivalence of public and private certification programs
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| Empowering small farmers | * Development and promotion of BMP implementation through farmer groups/cluster management
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| Seed and brood stock quality | * Regional domestication programs for key species
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| Wild seed and wild broodstock | * Hatchery and broodstock management programs
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| Climate change | * Vulnerability assessments, mitigation strategies
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**Support required**: Technical, financial and advisory support is required to address the above challenges and apply the interventions. Such support should primarily fall under 4 broad categories. **1. Support least developed countries in Asia Pacific** (Bangladesh, Cambodia, Lao PDR, Myanmar and Nepal). Fisheries and aquaculture is important in all the above LDC and they need a major push and priority support. **2. Support aquaculture for poverty alleviation**. Previous donor support for small-scale aquaculture (SSA) was mainly for subsistence but farmers seek increased income. Thus SSA needs to provide a significant source of income and be a small and medium enterprise (SME). Considerable poverty alleviation is possible through large-scale aquaculture through employment (large-scale farms, value chain development e.g. input supply, processing and marketing). **3. Support aquaculture to diversify livelihoods of small farmers and fishers**. Aquaculture is the best entry point for poor farmers and fishers to farm fish mainly because of its relatively low cost, minimal risk and aquaculture forms the first step on ladder of intensification i.e. to gain experience and confidence before intensifying. **4. Support south-south cooperation**. Within Asia-Pacific region between more developed to least developed countries by assessing ‘what has worked where’ in more developed countries (a) and ‘where there is a need for similar systems’ in less developed countries (b) transfer from (a) and adapt to local physical and socio-economic conditions in (b). Similar cooperation between Asia-Pacific region and sub-Saharan Africa has great potential

**To conclude**, NACA recognizes the commitment of Norway to support needy governments in Asia Pacific through its donor programs, embassies, national institutions and private sector. NACA with its track record and vast network of regional resources looks forward to partnering and collaborating with Norway to support needy governments in the region in their efforts to promote responsible and sustainable aquaculture.