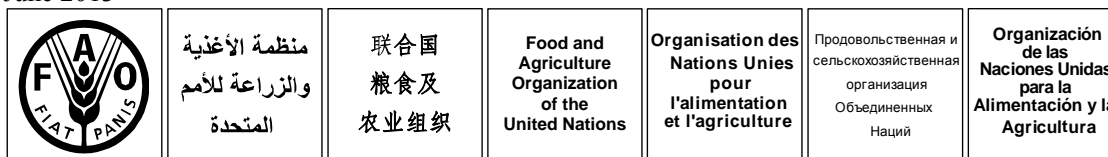


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COMMITTEE ON FISHERIES

SUB-COMMITTEE ON AQUACULTURE

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STRENGTHENING INTERNATIONAL COOPERATION FOR ACCELERATING SUSTAINABLE AQUACULTURE DEVELOPMENT

Executive Summary

This paper seeks to set the scene for the exchange of information and experience on international cooperation in aquaculture. It contends that improving international cooperation in the sector is crucial if the latter is to continue growing so as to enable the world to meet the increasing global demand for safe and quality fish as well as other aquatic foods. The paper outlines some of the recent progress achieved in international cooperation in aquaculture, discusses its potential benefits and reviews some of the main vehicles used whilst exploring ways for strengthening such cooperation. In addition to training and capacity building, international cooperation in aquaculture has enhanced technology transfer and diffusion, amongst countries. Such cooperation has also led to harmonized regional aquaculture development strategies in some places. As a result of the improved cooperation, aquaculture productivity has increased, food security and nutrition have been enhanced and both employment creation and income generation have been promoted along the value chain.

Major international conferences together with the FAO COFI Sub-Committee on Aquaculture, the network of FAO regional fishery bodies, as well as bilateral and tripartite cooperation arrangements and regional networking constitute the principal platforms to advance this cooperation. International cooperation could be further advocated through the forging of strategic partnerships, expansion of bilateral and South-South cooperation arrangements, the increase of direct foreign investment in the sector, encouragement of joint ventures, the promotion of greater use of consortiums in aquaculture and ensuring sustainability of existing networks.

The Sub-Committee is invited to:

- 1) Review this paper and share national and regional experiences in aquaculture cooperation;
- 2) Explore and share additional ways of enhancing international cooperation in aquaculture in general;
- 3) Reflect and advise on the means of addressing the recurrent issue of funding of Regional Aquaculture networks, which affects their sustainability; and
- 4) Advise the Secretariat on the way forward on the issue of improving international cooperation in aquaculture.

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Introduction and rationale:

1. With about 62.7 million tonnes of fish produced globally in 2011 and an average annual growth rate of 6.1 percent in the last decade, aquaculture expansion continues to outweigh that of the other food-producing industries.
2. This growth varies across regions, within regions, and across countries¹. It also occurs in the context of an increasing world population and a stagnating global capture fisheries production, at best².
3. In the event that this trend in demographics and capture fisheries production was to remain the same, the scenario would imply that aquaculture production would have to continue growing in order for the world to meet its increasing demand for safe and quality fish and other aquatic foods.
4. Maintaining the momentum of aquaculture development is a challenge on several accounts. There is a mounting number and severity of risks from adverse processes of nature. The scarcity of land, water, financial and other essential productive resources needed to grow fish and other aquatic products remain on the rise. As these resources become scarcer, competition for their acquisition grows stiffer. Differences in skills and technologies across nations and regions continue to grow wider³.
5. On a positive note, however, such challenges for individual nations and regions can constitute opportunities for the world as a whole to boost aquaculture production.
6. Through, inter-alia, research, education and information exchange, the international community can boost sustainable aquaculture development and defy the negative effects of climate change and natural disasters on aquaculture; an issue of common interest. Physical, human, financial and other resources, and skills and technologies, which, in addition to policies, may explain the bulk of the uneven cross-country and cross-regional development of aquaculture, can be “traded” amongst nations and between regions⁴. Information can be rapidly, and easily, disseminated across national and regional boundaries. The resulting increase in the production of fish and other aquatic products in each country and region entails greater availability of such products globally to feed humanity and ensures a better-off world.

¹For example, in 2011, Asia produced around 55.5 million tonnes of fish or 88.5 percent of the world production. Within Asia, three countries alone accounted for 82.9 percent of this share (China: 69.5 percent; India: 8.2 percent and Viet Nam: 5.1 percent). In Africa, which produced about 1.4 million tonnes or 2.2 percent of the global total, Egypt (with 70.6 percent), Nigeria (with 15.8 percent) and Uganda (with 6.1 percent) represented 92.5 percent of this region’s production. Aquaculture production in the Americas (4.7 percent of the world’s total) was also dominated by three countries (Chile: 32.5 percent; Brazil: 21.4 percent; the United States of America: 13.5 percent), accounting for 67.4 percent of the region’s total. A similar situation occurred in Europe which produced 2.7 million tons or 4.3 percent of the world’s total, and where about 61.6 percent of this production came from Norway (42.5 percent), the Spain (10.1 percent) and France (8.4 percent). (Adapted from FAO Statistics and Information Service of the Fisheries and Aquaculture Department. 2013. Aquaculture production 1950-2011. FISHSTAT Plus - Universal software for fishery statistical time series [online or CD-ROM]. Food and Agriculture Organization of the United Nations. Available at: <http://www.fao.org/fishery/statistics/software/fishstat/en>).

² FAO Fisheries and Aquaculture Department. 2011. *World aquaculture 2010*. FAO Fisheries and Aquaculture Department. Technical Paper. No. 500/1. Rome, FAO. 105 pp.

³ Although aquaculture operations are conducted within a single country’s territorial waters and are, therefore perceived by some to be a national issue, many countries are contending with the same issues. This implies that many of the problems facing aquaculture are international and can be best solved with the help of broader international cooperation.

⁴ Regions and nations with more resources but less efficient skills and knowledge can easily access more innovative and groundbreaking technologies from elsewhere. Technologically advanced regions and nations endowed with less physical resources can access other regions and nations’ resources, through, for example, joint ventures or any other kind of partnerships.

7. Through information and experience sharing, nations and regions can strengthen their capacity to implement the Code of Conduct for Responsible Fisheries (CCRF) in its articles related to aquaculture, thus ensuring the sustainability of the sector development and its benefits to society.
8. In either of these scenarios, the key is for the international community to come closer and work together in a more harmonious and concerted manner. Getting closer and working in harmony requires stronger international ties and enhanced international cooperation.
9. The purpose of this paper is to share some of the recent progress made in international cooperation in aquaculture and a number of the major lessons that these years of experience can offer. Its aim is also to set the scene for the exchange of national and regional experiences in this meeting and to explore ways and means of enhancing this cooperation for further advancement of the sector.
10. International cooperation in aquaculture may be global, inter-or intra-regional in scope. At the regional level, such cooperation occurs amongst both neighbouring and distant countries.

Major milestones in promoting international cooperation in aquaculture

11. Globally, the United Nations system has played an important and unique role in international cooperation in relation to the management of natural resources, including those relevant to aquaculture.
12. The system has facilitated a series of key meetings on various aquaculture topics and a range of aquaculture-related international organizations and programmes⁵. In most cases, FAO has played a catalytic role. Some major examples are outlined below.
13. In 1976, FAO organised the «*Technical Conference on Aquaculture*» in Kyoto, Japan. This Conference was the first to draw attention to the potential economic importance of aquaculture and to call for international cooperation for its promotion.
14. The Conference explored a variety of opportunities for aquaculture development (including technology, science, networking as well as human capacity and institutional strengthening) and formulated a “World Strategy for the Development of Aquaculture”; also known as “*Kyoto Strategy*”⁶.
15. The *Kyoto Strategy* included the establishment of regional networks of aquaculture centres in the world’s less prosperous regions.
16. The aim of these centres was to develop and test aquaculture technologies, train staff, and prepare and disseminate information. The centres would subsequently become intergovernmental organizations⁷. Two firm examples in this respect are NACA (the Network of Aquaculture Centres in Asia-Pacific) and the Network of Aquaculture in the Americas (NAA).
17. Since the early 1980s, the *Kyoto Strategy* led to a significant increase in technical and financial assistance from the international donor community through national and regional aquaculture projects worldwide. A worldwide network of Regional Aquaculture Centres coordinated by the FAO/UNDP’s⁸ Aquaculture Development and Coordination Programme (ADCP) implemented projects formulated in the framework of this Strategy⁹.
18. The *Strategy* also contributed to strengthening human capacity in aquaculture and enabled the transformation of aquaculture from a mostly traditional subsistence-oriented to a science-based vibrant economic activity in many developing countries. Furthermore, it prompted technical cooperation

⁵ Other international organizations, donors, institutions and cooperatives as well as countries themselves have also fostered international cooperation.

⁶ 1984 World Conference on Fisheries endorsed this Strategy.

⁷ FAO. 1976. *Report of the FAO Technical Conference on Aquaculture. Kyoto, Japan, 26 May–2 June 1976*. FAO Fisheries Report, No. 188. Rome. 93 pp.

⁸ United Nations Development Programme.

⁹ See for example: Tacon, A.G.J.; Collins, J.; Allan, J. (comps.) *FAO field project reports on aquaculture: indexed bibliography, 1966 -1995*. FAO Fisheries Circular. No. 931. Rome, FAO. 1997. 192pp.

amongst developing countries to expand aquaculture and establish a framework for regional cooperation in the sector.

19. A second illustration of the FAO's role in promoting and supporting international cooperation in aquaculture is the organization of the 2000 "*Conference on Aquaculture in the Third Millennium*" in Bangkok, Thailand¹⁰.

20. The *Bangkok Declaration and Strategy* adopted at this Conference articulated 17 strategic elements and re-emphasized the importance of international cooperation for aquaculture development. Recognizing that strengthened regional and inter-regional cooperation should increase the efficiency and effectiveness of aquaculture development efforts, the Bangkok Declaration and Strategy stressed that improving cooperation amongst stakeholders at national, regional and inter-regional levels is pivotal for the further development of aquaculture.

21. The establishment of the FAO "COFI¹¹ *Sub-Committee on Aquaculture*" in Rome, Italy in 2001 is a third strong example of the international community's commitment to promote international cooperation in aquaculture.

22. Upon COFI's recommendation, the FAO Council established the COFI Sub-Committee on Aquaculture as an inter-governmental mechanism for information exchange, discussion and consensus building on emerging issues in aquaculture, among various parties interested in the sector.

23. The Sub-Committee has so far held seven sessions (including the current one). These meetings have proven useful to FAO Member countries in seeking solutions to emerging issues of common interest in the sector¹².

24. The most recent milestone illustrating FAO's role in promoting international cooperation is the organization¹³ of the 2010 "*Global Conference on Aquaculture 2010, farming the waters for food and people*" held in Phuket, Thailand.

25. The *Phuket Conference* reviewed the status and trends in aquaculture development, evaluated the progress made in the implementation of the 2000 Bangkok Declaration and Strategy, discussed emerging issues relevant to aquaculture development, assessed opportunities for future aquaculture development, built consensus on advancing aquaculture as a global, sustainable and competitive food production sector and adopted the "*Phuket Consensus*".

26. The *Phuket Consensus* reaffirmed participants' commitment to implement the 2000 Bangkok Declaration and Strategy and highlighted the need for public-private partnerships and cooperation at national, regional, inter-regional and international levels in the continued implementation of the Bangkok Strategy.

27. These various Declarations and Consensus statements made at the global level have been useful in calling policy makers' attention to the social and economic importance of aquaculture and the need for concerted and cooperative efforts in addressing issues of the sector. They have also successfully guided aquaculture development and management during the past thirty-six years¹⁴.

28. Experts and policy makers have also adopted several agreements and made declaratory statements at the regional level. These agreements and statements too stressed the importance of international cooperation in aquaculture development.

¹⁰ In collaboration with NACA (the Network of Aquaculture Centres in Asia-Pacific).

¹¹ Committee on Fisheries.

¹² See <http://www.fao.org/cofi/aq/en/>

¹³ With NACA and the Royal Thai Department of Fisheries.

¹⁴ When the World Strategy on Aquaculture Development was adopted at the FAO Kyoto Conference on Aquaculture about 36 years ago, the best estimate of global production from farming of aquatic organisms was less than four million tons; compared to more than 60 million today.

29. An example of such is the collaboration between FAO, WorldFish and the New Partnership for Africa's Development (NEPAD), which organized the “*Fish for All Summit*” in Abuja, Nigeria in 2005. Heads of states and governments and other high-ranking government officials from across the Continent attended this event and adopted the “*Abuja Declaration on Sustainable Fisheries and Aquaculture in Africa*”.

30. Amongst other things, the *Declaration* vows to *support* regional cooperation in fisheries and aquaculture, *implement* the provisions of the FAO Code of Conduct for Responsible Fisheries, *empower* fishing and fish farming communities, civil society and stakeholders, *ensure* that fisheries and aquaculture is adequately reflected in the national and regional economic policies, strategies, plans and investment portfolios and *foster* small, medium and large-scale aquaculture production in a sustainable and environment-friendly manner.

31. Five years later in 2010, African Ministers for Fisheries and Aquaculture held their first conference (CAMFA) in Banjul, the Gambia. The Conference recommended that the African Union (AU) put in place a mechanism for a broad-based participatory continental policy dialogue and fisheries management and support Member States to strengthen policy coherence in national fisheries and aquaculture sector within the framework of the Comprehensive African Agriculture Development Programme (CAADP)¹⁵. These recommendations were endorsed by the 18th Ordinary Session of the African Union Heads of State in 2011.

32. A second example is the “Colombo Declaration”. In July 2011, FAO and NACA organized the first Asia Regional Ministerial Meeting on Aquaculture for Food Security, Nutrition and Economic Development in Colombo, Sri Lanka.

33. This high-level ministerial event, which was attended by delegations from seventeen countries in the region and in which the keynote address was delivered by His Excellency Mahinda Rajapaksa, the President of Sri Lanka, discussed regional cooperation in improving the contribution of aquaculture to food security, nutrition and economic development in the region and concluded with the “*Colombo Declaration*”.

34. The *Colombo Declaration* is a political commitment to regional cooperation in aquaculture development for food security, nutrition and economic development. It provides a policy framework for Asian governments to collaborate in pursuing these common goals, to share experiences and build on each other's strengths for the benefit of all.¹⁶

35. There are other examples of such declarations and statements in other regions. It would be too onerous to discuss them in this paper. Exploring some of the lessons learned from these and global-level agreements and declaratory statements is deemed more important. They could be useful to countries as they thrive to enhance international cooperation for the benefit of aquaculture.

Some lessons learned: potential benefits and main vehicles of international cooperation in aquaculture

A. Some lessons learned: Potential benefits

36. International cooperation in aquaculture has led to several benefits. On a broader developmental perspective, it has resulted in, for example, enhanced technology transfer and diffusion.

37. Experts define **technology transfer** as the “transmission of systematic knowledge for the manufacture of a product, the application of a process, or the rendering of a service.”

¹⁵ The Ministers had noted that the absence of policy coherence in the fisheries and aquaculture sector across the continent made it difficult for the sector to address its challenges in a comprehensive manner and to contribute effectively to economic growth and social benefits whilst continuing to provide food, livelihoods and employments in many countries.

¹⁶ http://library.enaca.org/emerging_issues/colombo_declaration/colombo-declaration-2011.pdf

38. In addition to transfer, **technology diffusion** implies “the ability of the technology-receiving system to learn from the acquired technology and develop its own”. Diffusion results in building the recipients’ capacity not only to use the technology acquired, but also to improve on it¹⁷.
39. Some of the most commonly encountered critical issues around technology transfer and diffusion are the lack of capacity of recipients and the inequality of capacities amongst recipients to access, apply and improve or adapt the technology. Inequalities can occur between countries and pockets of economic areas within a country such as coastal versus highlands. They can also occur between socio-economic groups such as large- versus small-scale farmers, rich versus poor farmers, or those with production resources and those without.
40. Evidence from Asian aquaculture and elsewhere has indicated that technical cooperation can facilitate the efficient transfer and diffusion of technology amongst countries and build the capacity needed for those that are less able to acquire or absorb it.
41. The same evidence further demonstrated that the pooling and sharing of national resources increased the regional capacity and, therefore, the individual national capacities, to absorb and utilise technologies. Technical cooperation amongst countries within the region made the transfer and dissemination of technology quasi equitable. Access to the pooled resources by every country enabled the countries in the region to utilise and often improve on the technology acquired¹⁸.
42. International cooperation in aquaculture has led to national and regional **capacity building** in several places in Africa, Asia and Latin America in terms of training of national personnel and the upgrading of national and regional facilities. The training of national personnel and improvements of national and regional facilities created multiplier effects for various development programmes and ensured the smooth and effective implementation of assistance programmes. With them, also came a wider dissemination of results and assurance of follow-up activities within governments; the odds of the continuity of project-initiated activities increased.
43. There are many instances where international cooperation has enhanced national **governments’ commitments to aquaculture**. An example is the Asia-Pacific countries with NACA. Where national governments were strongly committed to the development of the sector countries have often agreed upon *harmonised regional strategies* for aquaculture development. These strategies, which reflected their common priorities, guided and focused on various development initiatives. At the national and local levels, these initiatives were adapted, refined and diffused through the national Research and Development (R&D) system and up taken into national policies and programmes. The result has been more fish produced, more jobs created and more income generated along the value chain of the sector.
44. International cooperation can also lead to **stronger farmer groups and industry organizations**. In many instances, the generally weak or strained governmental national extension services hampered a more effective diffusion of technologies. Where this situation occurred, farmers often formed associations through which they developed complementary or alternative approaches. The subsequent industry-focused and farmer-oriented R & D programmes¹⁹ raised the relevance and lowered the cost of the technology transfer and utilization as well as the management of the sector.
45. In many developing countries, the shortcomings in governments’ efforts to address poor and small farmers’ concerns provided opportunities for civil society organizations to take a more active role in rural development programmes. Through approaches such as farmer field schools and farmer-

¹⁷ V. Konde. 2006. “Africa in the global flows of technology: an overview”. African Technology Development Forum (ATDF) Journal Volume 3, Issue 1. March 2006. www.atdforum.org.

¹⁸ Bueno, P. Towards an Aquaculture Network for Africa (ANAF) Inter Governmental Organization (IGO): Small Steps for the Final Leap. Discussion paper. Fourth Annual Meeting of the Aquaculture Network for Africa Entebbe, Uganda, 4–6 Dec 2012.

¹⁹ Such as farming systems research and extension, partnerships between public and private sector, and the voluntary management schemes adopted by farmers associations (that included adoption of Codes of Practices and Better Management Practices).

to-farmer field visits and events such as fish day, a number of **non-governmental organizations (NGOs)** have provided useful assistance for aquaculture development. NGO-Government alliances tend to serve rural development objectives in an effective manner. International cooperation enabled the NGOs' intervention in the sector and enhanced these NGO-Government alliances.

B. some lessons learned: main vehicles

46. FAO, its Member countries and other development partners have used a variety of approaches and mechanisms to promote international cooperation in aquaculture. Globally, they include mainly the *organization of major international conferences*, and the establishment and meetings of the COFI Sub-Committee on Aquaculture. Regionally, through *its network of regional fishery bodies (RFBs)* such as CIFAA²⁰ for Africa, APFIC²¹ for the Asia and Pacific, COPESCAL²² for Latin America and the Caribbean, RECOFI²³ for Middle-East, which address aquaculture issues, FAO Member countries also have opportunities to interact and share experiences.

47. Other mechanisms include:

- *Sub-committees within regional fishery bodies* to address sub-regional, trans-boundary issues;
- *Working Parties* made up of selected Member countries to study and report on thematic issues of a recurring nature;
- *Ad hoc working groups* consisting of selected members countries' representatives to examine and report on specific matters or challenging problems pertaining to aquaculture; and
- *Technical consultations* composed of senior government officers as well as other stakeholders to review and agree on issues with potential political implications, etc.
- *Intergovernmental organizations (IGOs)*, which, to varying degrees, play an important role in aquaculture development. Examples include, NACA, OSPESCA and APEC²⁴.

48. **Bilateral and tripartite** arrangements have also been a useful mechanism for international cooperation in aquaculture. **Bilateral cooperation** occurs between two countries without FAO's intervention. **Tripartite cooperation** is essentially a three-dimensional arrangement with one country as the cooperator (donor), the other as the host (recipient) and an international organization (in this case, FAO) as the facilitator.

49. Tripartite cooperation usually occurs in the framework of the FAO Technical Cooperation amongst Developing Countries (TCDC) or the **South-South Cooperation Programme**. The donor country provides expertise and/or funding. The recipient country makes an in-kind or financial contribution towards the implementation of the programme. In addition to facilitating the process, FAO has often provided some additional operational funding and/or technical expertise, generally through technical cooperation (TCP) funding.

50. **Networking** has also been an important vehicle for inter- and intra-regional cooperation. Some of the common types of networks are information exchange networks, training networks, service networks, scientific consultation networks and collaborative research networks.

51. **Information exchange networks** are generally concerned with organizing and facilitating the exchange of ideas, methodologies, results, data and other information through various mechanisms. **Training networks** involve the joint development and exchange of training materials and the conduct of joint training events. **Service networks** are involved with the exchange of materials and information to improve services, operations supervision, training and research. With **scientific consultation networks**, participating institutions or individuals focus on common priority research areas, implement the research independently but hold regular meetings and use other means to

²⁰ Committee for Inland Fisheries and Aquaculture of Africa.

²¹ Asia-Pacific Fishery Commission.

²² Commission for Inland Fisheries and Aquaculture of Latin America and the Caribbean.

²³ Regional Commission for Fisheries.

²⁴Details can be found at their home pages at: <http://www.sica.int/ospesca/> for OSPESCA -Organización del Sector Pesquero y Acuícola de Centroamerica (Organization of Fishing and Aquaculture in Central America) and <http://www.apec.org/home/groups/> for APEC (Asia-Pacific Economic Cooperation).

exchange information on research. **Collaborative research networks** involve joint inter-country planning, implementing and monitoring of research regarding problems of mutual concern to countries within a region or sub-region.

52. Aquaculture networks established with FAO's assistance have tended to be all-embracing. They embody all of these functions in the five types of networks, albeit in a progressive manner. Some of them can provide useful lessons from which the international community can learn in its efforts to strengthen international cooperation for advancement of aquaculture.

The Aquaculture Network for Africa (ANAF)

53. In Sub-Saharan Africa, the Kyoto Conference resulted in the establishment of the *African Regional Aquaculture Centre (ARAC)* established in Nigeria in 1980 under FAO's guidance and with financial assistance from a number of development partners. Covering 18 African countries, ARAC trained 131 senior aquaculture scientists. Due to *financial* and other factors, ARAC ceased to exist as a regional centre in 1989²⁵.

54. In 2008, CIFA²⁶'s 15th Session meeting in Lusaka, Zambia, established the *Aquaculture Network for Africa (ANAF)*, which modelled on NACA. ANAF aims to address the many common infrastructure, technological, policy, institutional, human capacity research, and information gathering and dissemination problems in Member countries.

55. So far, ANAF's sole achievement has been limited dissemination, through its website, of technical and other information (including its costs and benefits). Accomplishment of the network's objectives is hampered by inadequate political will on the part of governments and the consequent lack of financial contributions by governments..

The Network of Aquaculture of the Americas (NAA)

56. In 1978 the Latin American Regional Aquaculture Centre (CERLA) was established. However due to insufficient funding it was subsequently dismantled in 1986. Subsequently, in 2009, FAO Member countries in Latin America agreed to create the *Network of Aquaculture of the Americas (NAA)*²⁷, which was formally endorsed in Managua, Nicaragua in 2012²⁸, as an intergovernmental body. NAA's mission is to contribute to the sustainable and equitable development of aquaculture through regional cooperation of the countries of the American continent, focusing on the social, economic, scientific, technological and environmental aspects.

57. It is too early to assess NAAs' achievements. Many activities undertaken since 2010 and the proposed comprehensive programme for the coming years predict a successful future for NAA. However, it is worth noting that NAA's existence depends much on the strong leadership, logistical and financial support from one of the Member countries. While financial support is important to jump-start this or any other network, national governments' political and continuous financial commitments are equally or more important for the network's sustainability.

58. FAO's Regional Office for Latin America and the Caribbean also helped countries create several technical cooperation networks fully or partially involved in aquaculture. Some of these include:

- The Commission for Inland Fisheries of Latin America (COPESCAL) created in 1976;
- The *Latin American Aquaculture Association (ALA)* created in 1977. ALA is not very active in cooperative actions in the region due to *budgetary problems*.

²⁵ ARAC still operates, at a lesser extent, as a national centre.

²⁶ Committee for Inland Fisheries and Aquaculture of Africa.

²⁷ Report of the meeting on the reactivation of the initiative to create an aquaculture network of the Americas. Guayaquil, Ecuador, 10-12 June 2009. FAO Fisheries and Aquaculture Report No. 931
<http://www.fao.org/docrep/012/i1561b/i1561b00.htm>

²⁸ NAA website <http://www.racua.org/>

- The Latin American Organization for Fisheries Development (OLDEPESCA) created in 1985;
- The *Technical Cooperation Network for Aquaculture and Fisheries* established in 1986 with 16 participating countries. *Financial difficulties* led to the discontinuation of this network;
- The *Regional Network of Aquaculture Institutions and Centres of Latin America* established in 1986 with funding from the International Development Research Centre of Canada (IDRC), and which *ceased to function* because of *insufficient financial resources* and inadequate cooperation among its participating institutions once IDRC pulled out;
- The Centre for Marketing, Information and Advisory Services for Fisheries Products in Latin America (INFOPECSA), established in San José, Costa Rica, in February 1994;
- The Latin American Network of Women in Fisheries (LANWF) founded in 2000.

The Network of Aquaculture Centres in Asia-Pacific (NACA)

59. NACA was established in August 1980 through a regional project signed on 7 June 1979 by 11 participating governments, funded by the UNDP and implemented by FAO under ADCP^{29,30} with its office located at Thailand's National Inland Fisheries Institute in Bangkok. The project ended on 31 December 1989 with a fully-fledged independent intergovernmental organization capable of assuming regional responsibilities.

60. To achieve its objectives³¹, NACA focuses its activities on capacity building, collaborative research and development, development of information and communication networks, support to policy development and institutional capacities, aquatic animal health and disease management, and genetics and biodiversity.

61. NACA funds its activities through contributions from Members, and the development and implementation of projects throughout the region in partnership with its Member governments, banks and donor foundations, development agencies, universities and a range of non-governmental organizations and farmers^{32,33,34}. The Network has also been successful in promoting regional and intra-regional cooperation in Africa, Latin America and the Caribbean, and solid collaboration has been founded with some developed countries in Europe.

62. With the network's true intergovernmental governance structure, this intra- and inter-regional cooperation along with the robust efforts by national governments to develop the sector was critical to NACA's success in contributing to the remarkable increase in aquaculture productivity, growth and population's prosperity and well-being in most countries of the region^{35,36,37}. In particular, the

²⁹ Aquaculture Development and Coordination Programme.

³⁰ Project RAS/76/003,

³¹ Of increasing production of "fish" and rural income and employment, diversifying rural farm production, and enhancing foreign exchange earnings and savings in the Asia-Pacific region.

³² FAO/RAP, 2003. *Report of the regional donor consultation on the role of aquaculture and living aquatic resources: priorities for support and networking*. FAO Regional Office Asia and the Pacific, Bangkok Thailand. RAP Publication No. 2003/04, 90 p.

³³ NACA website. Available at <http://www.enaca.org/modules/cms/start.php?start_id=1&seite=about-naca>

³⁴ NACA's achievements also hinge on Member government's central policy to promote regional self-reliance through technical cooperation, the principle that "The stronger members shall help the others", and Member governments' conviction that aquaculture can contribute to poverty alleviation, human development and social empowerment if experiences and knowledge are shared amongst countries in the region. It also followed strong national institutions that brought about linkages and fostered cooperation, strong membership (NACAA Member countries encompass most of the people of Asia and the Pacific), and exclusive focus on aquaculture development through regional cooperation. Strong ownership of the Network by the participating governments (ensures sustainability), generation and sharing of aquaculture development models and useful lessons by many members, inclusiveness of the processes, assisting Member countries in achieving their national development goals (set by themselves; not imposed on them) were also important. Privileging the bottom-up approach (consultations), experience in designing and delivering effective R&D programmes (through the diversity of expertise and competence of its partners), and endorsement by FAO (increased the confidence of other agencies in the Network) were equally important.

³⁵ NACAA Member countries account for about 86 percent of the reported global aquaculture fish production.

structure allows for efficient resource mobilization and use. For example, at NACA's request, FAO or any other agency or donor can provide assistance to NACA's 18 member countries through one project. This also facilitates the implementation of the project.

The Network of Aquaculture Centres in Central Eastern Europe (NACEE)

63. NACEE was created in November 2004 during the "First Meeting of NACEE Directors" held in Szarvas, Hungary. In 2006, NACEE obtained a Liaison status from FAO. On 26 January 2011, it officially registered as a non-profit organization in Hungary.

64. Currently, NACEE consists of 29 institutions and individuals from nine countries³⁸. Its primary mandate is to enable the R&D sphere in Central-Eastern Europe to be an integral part of the European Research Area.

65. To achieve its objective, NACEE regularly organizes workshops, symposia and meetings on a wide variety of topics affecting European and global aquaculture. The Network has also established strong working relationships with a number of organizations and institutions such as FAO, IUCN, EIFAC and NACA. Additionally, NACEE has undertaken several concrete tasks that have contributed to enhancing its effectiveness and efficiency³⁹.

Conclusions: Challenges and opportunities for enhancing international cooperation in aquaculture

66. This paper has recalled that aquaculture development will face multiple challenges over the coming decades be it nationally, regionally or globally.

67. Satisfactory responses to most of these challenges will require concerted, often collective and coordinated actions from the international community; such responses will entail international cooperation. Isolated national approaches might deny countries that persist in following such pathways, as well as others, opportunities to benefit from the globalization of aquaculture including enhanced technology transfer and diffusion, capacity building, stronger government commitments, harmonized regional aquaculture development strategies, strong farmer groups and industry organizations, and safe aquaculture products for consumers. Development approaches de-linked from regional and international programmes might also deny the sector the opportunity for a better growth

³⁶ It is important to re-emphasize that these outcomes are not attributable to NACA alone. NACA is an important, but not the only player in Asian aquaculture. INFOFISH, SEAFDEC (Southeast Asian Fisheries Development Centre), the Bay of Bengal IGO, the Mekong River Commission (MRC), the South Asian Association for Regional Cooperation (SAARC), the Association of South East Asian Nations (ASEAN) and the Asia Pacific Economic Cooperation (APEC) are some of the other major players in the Asian aquaculture.

³⁷ FAO/RAP, 2003. *Report of the regional donor consultation on the role of aquaculture and living aquatic resources: priorities for support and networking*. FAO Regional Office Asia and the Pacific, Bangkok Thailand. RAP Publication No. 2003/04, 90 p.

Cai, J., Jolly, C., Hishamunda, N., Ridler, N., Ligeon, C. & Leung, P. 2012. «Review on aquaculture's contribution to socio-economic development: enabling policies, legal framework and partnership for improved benefits». In R.P. Subasinghe, J.R. Arthur, D.M. Bartley, S.S. De Silva, M. Halwart, N. Hishamunda, C.V. Mohan & P. Sorgeloos, eds. *Farming the Waters for People and Food*. Proceedings of the Global Conference on Aquaculture 2010, Phuket, Thailand. 22–25 September 2010. pp. 265–302. FAO, Rome and NACA, Bangkok.

³⁸ Belarus, Czech Republic, Hungary, Latvia, Lithuania, Moldova, Poland, Russian Federation, Ukraine.

³⁹ Some of these are:

- Information exchange among members (within the region);
- Exchanging scientists;
- Conducting joint research and training programmes;
- Better involvement of CEE institutions in European-level aquaculture development programmes;
- Improvement of partnerships between science and practice, with special regard to small- and medium-scale enterprises and Producers Associations;
- Capacity enhancement for CEE institutions in preparing and running regional aquaculture development projects.

and impede it from making a stronger contribution to rendering the world a better place to live in through the enhancement of food security and nutrition, employment creation and income generation.

68. As evidenced by declarations made at various international conferences as well as by recent developments in this area, most countries recognise that international cooperation in aquaculture is important. Whilst good progress has been made, many countries have yet to establish specific programmes and institutional arrangements to translate the provisions of these declarations into concrete actions, or to enhance existing ones, where necessary; many opportunities for enhancing international cooperation remain at best poorly explored.

69. Some of these opportunities include:

a) Enhancement of public-private partnerships

70. The current trends of global social transformations, demographics, climate change and natural disasters have placed food security, poverty reduction and economic growth at the forefront of global debate. At the same time, however, in many places, the trend in the world economic crisis has already resulted in decreasing public funding for agriculture, including aquaculture. This situation illustrates the need for policy makers and development agencies to seek new strategic partnerships to ensure that aquaculture continues to grow. **Public-private partnerships (PPPs)** could be one of them.

71. By bringing together partners from the public and private sectors with different but complementary strengths, skills, knowledge and levels of financial resources to partake in aquaculture production, PPPs would enable a more international exchange of technologies, expertise and information. They would also remove the isolation of national research and other institutions whilst allowing partners to mobilise investments, develop innovative solutions, attain efficiency gains along the value chain and reduce risks. Such arrangements have become important because, in many situations, single organizations acting in isolation, be they private or public, may not be able to create an enabling environment, assemble the necessary resources, capabilities and knowledge to generate and diffuse innovations that would contribute to significant productivity increase in the sector⁴⁰.

72. In spite of their potential to push aquaculture forward, limited examples where these partnerships have “significantly” contributed to increasing national and regional food security, reducing poverty and enhancing economic growth through aquaculture are documented. This situation could be an indication that the much-needed private sector resources in aquaculture are still so little that they do not bear on the sector’s development challenges as yet. There is the need to enhance PPPs if resources are to be mobilized in a meaningful manner and benefit aquaculture.

73. Potential partakers in these partnerships could include governments, community groups, farmers, private associations, investment promotion bodies, sector development promoters and funding agencies⁴¹. Inclusive PPPs will ensure transparency, equity and, hence, increase the odds of aquaculture sustainability.

74. FAO is currently in the process of developing a multi-donor partnership programme, aiming at assisting member countries and the civil society in making future aquaculture growth sustainable. This programme – Global Aquaculture Advancement Programme (GAAP) – will create opportunities for effective collaboration for donors, interested civil society, academia, investors, development partners and the private sector in assisting countries to make future aquaculture growth sustainable. GAAP complements the FAO’s enhanced decentralization programme, reflects the new strategic objectives of the organization and also strengthens the TCDC and south-south cooperation concepts and mechanisms.

⁴⁰ World Bank. 2012. Agricultural Innovation Systems: an Investment Sourcebook.

⁴¹ World Bank. 2012. Agricultural Innovation Systems: an Investment Sourcebook.

b) Promoting Consortiums

75. Individuals, governments, organizations or any combination of these could associate with aquaculture consortiums with the objective of participating in a common programme or pooling their resources in achieving a common goal.

76. Given their members' ability to 'speak with one voice' to stakeholders, policymakers and financiers, consortiums retain the capacity to convey effectively their message and secure more resources. Members can also share these resources, including financial, human and others, and jointly plan and implement activities. The sharing of productive resources and co-implementation of jointly planned activities could, ultimately, result in more services provided and more fish and aquaculture products generated more effectively and efficiently. In particular, sharing human resources could provide opportunities for staff to develop new skills.

77. An example is the Consortium on Shrimp Culture and the Environment amongst FAO, NACA, the United Nations Environment Programme (UNEP), the World Bank (WB) and the World Wildlife Fund (WWF). This consortium developed international principles for responsible shrimp farming. The latter provide the basis upon which stakeholders can collaborate for a more sustainable development of the shrimp industry⁴².

c) Expanding Bilateral Cooperation through South-South Cooperation

78. A number of FAO Members countries and various development partners have used bilateral cooperation to promote aquaculture. This mechanism has proven useful and effective.

79. South-South cooperation arrangements, also known as "Technical Cooperation amongst Developing Countries –TCDC", were often used as a vehicle for the implementation of these arrangements. In Africa for example, through the South-South cooperation, Egyptian and Nigerian experts have shared their experiences with several countries. Nigeria and Madagascar have improved on their aquaculture rice-based systems by using experts from China and Viet Nam, respectively. Chinese and Vietnamese experts often intervene in African countries' aquaculture through South-South cooperation agreements. Between 2000 and 2010, twenty sub-Saharan African countries hosted 1,228 experts from other countries. FAO has been the effective link between the donor and recipient countries in these agreements.

80. In other cases, bilateral cooperation occurred between the donor and host countries without FAO's intervention. Aquaculture experts from Brazil, European countries and European Union – to name a few - often provide support to African or Latin American countries' aquaculture through "country-to-country" bilateral cooperation agreements.

81. Either form of bilateral cooperation has been useful, but bilateral cooperation through the South-South cooperation has proven particularly effective in pushing aquaculture forward in developing countries over the last decade. For example, inter alia, experts from donor countries trained local technicians, worked with farmers in the field and diverse educational and research institutions in recipient countries. This cooperation spurred technological innovations and better management practices in some areas, and some public institutions became more effective. Innovations also diffused faster due to the participation of users which increased the odds that the results would be useful to farmers and other stakeholders. Experts from donor countries themselves acquired new experiences. Enhancing bilateral cooperation through South-South cooperation where it already exists and expanding it elsewhere would accelerate the growth of the sector.

d) Improving Multilateral Cooperation

82. A situation where more than two countries are involved in cooperation to advance aquaculture could be more effective than one in which two, a donor and a recipient, act alone. With more partners, additional resources could be mobilized for a single project and with more resources available, many countries could get assistance from one single project. The result would be efficiency. The burden

⁴² FAO, NACA, UNEP, WB and WWF. 2006. International Principles for Responsible Shrimp Farming.

inherent to the project implementation would spread amongst the participating parties, subsequently the likelihood of project failure could be reduced. For example, unlike bilateral cooperation situations, a multilateral project would not necessarily collapse in case a partner pulls out.

83. In spite of these benefits, however, multilateral cooperation in aquaculture has not been as vibrant as one would have hoped.

84. Some of the possible reasons for this slow progress may be technical. A multilateral project is generally more complicated to plan and implement than a bilateral one; there are more specific objectives and expectations to reconcile and take along, more risks of disagreements and misunderstanding, more potential discord or incompatibility among the partners, and in general, more interdependence and thus more mutual trust to be invested and sustained. Moreover, because each partner is responsible for their own financiers, the entire project has to respect multiple sets of often divergent conditions imposed by them and be accounted for in various ways, often with conflicting deadlines. Coming to terms with divergent attitudes, routines and action modes can become quite demanding on all participants⁴³.

85. Other reasons could include the reluctance by some countries to move away from the familiar bilateral cooperation including for political and other interests⁴⁴, and the unwillingness to widely and freely share nationally generated information, experiences and technologies, perhaps for economic reasons and pride. In recipient countries, the lack of dedicated leadership and adequate financial resources to forge international cooperation in the sector and the weak capacity to effectively monitor the implementation of cooperation arrangements and ensure sustainability of the resulting projects may be other reasons.

86. Multilateral projects are a recent phenomenon in international cultural cooperations, traditionally driven on a bilateral logic. They should be encouraged in aquaculture. FAO's mounting experience in planning and managing multi-partner projects could be useful in this regard.

e) Enhancement of cooperation aiming at increasing direct foreign investment in the sector

87. Direct foreign investments (DFIs) are one of the main driving forces and constitute defining elements of the modern world economy, an important vehicle for technology transfer and diffusion.

88. By providing economies with investment financial resources, new technologies, better management techniques and access to international markets, DFIs stimulate economic growth and development. In aquaculture, they have contributed to the introduction of new technologies and farming techniques that enabled the increase in farm productivity in many countries. Examples include shrimp farming in Ecuador and Mozambique, and salmon farming in Chile.

89. Yet, in spite of these attributes, foreign investment in aquaculture, particularly in new technologies, remains small in many developing countries including Africa. There, aquaculture development has relied largely on local entrepreneurs with inadequate financial resources and limited access to loans, rather than on foreign investors with sufficient funds.

90. One of the ways of attracting foreign investments in aquaculture could be to set up friendly fiscal policies for aquaculture production-oriented- and high-tech aquaculture -related foreign enterprises. Such policies could include, for example, low or the exemption of public land leasing fees where applicable, tax holidays or exemption from import duties to foreign investors in aquaculture, and tax holidays on enterprise incomes. Other policies could be for countries to ease limits to foreign ownership of natural-resources-based industries. Some of these policies have been successfully used to boost aquaculture development in many places worldwide⁴⁵.

⁴³ <http://www.seas.se/is-there-much-difference-between-bilateral-and-multilateral-cooperation/>

⁴⁴ Historical, political and economic ties between countries seem to be important ingredients in bilateral cooperation.

⁴⁵ Hishamunda, N.; P.B. Bueno; N. Ridler; W.G. Yap. 2011. Analysis of Aquaculture Development in Southeast Asia. A policy perspective. FAO Fisheries and Aquaculture Technical Paper. No 509. Pp.79. Rome, Italy.

f) Encouraging Joint ventures in aquaculture

91. The cost of starting new aquaculture projects can be high; this is often the limiting factor when establishing aquaculture farms, especially in developing countries. Joint ventures can be a good way of overcoming this problem and realizing the otherwise difficult projects; they allow parties to come together to take on one project and share the burden of the project costs, not only in terms of money, but also in-kind.

92. While they could be especially beneficial to large projects and major corporations whose ambition is to diversify, joint ventures can ensure the success of small- and medium-scale aquaculture projects by forging them a competitive edge.

g) Ensuring sustainability of existing networks

93. The 1976 Kyoto Conference stimulated the creation of a number of aquaculture networks in Africa, Asia-Pacific and the Americas. Evidence shows that many of these networks played an important role in pushing aquaculture forward. However, evidence also shows that their success was often short-lived; prospering when there was external financial support and fading away in the absence of the latter. The most common response to such a situation has been for countries to demand and create new networks.

94. Whilst the creation of new networks may be an attractive idea in the short run, it may not be a sustainable solution to the often-recurrent funding problem of these networks. There are already indications of impending serious funding problems for some of the newly created networks, which could threaten their very existence.

95. In Africa, five years after its creation, ANAF still does not have a secretariat or a premise of its own; its financing is external and ad hoc⁴⁶. In the Americas, NAA derives funding from Members' contributions. However, NAA's financial and logistical existence hinges, in many respects, on the generosity of the host country of the Secretariat, which provided funding for the first two years.

96. On the contrary, since the first meeting in 2000, Members of the *Network of Latin American Women of the Fishery Sector* (LANWF) has found it difficult to meet due to financial constraints.

97. A network is a partnership of persons or institutions who work in close cooperation towards specific goals with a *sharing of costs, benefits, results and outcomes* of their interactions whilst preserving their personal and institutional autonomy⁴⁷. Perhaps, abiding by principles contained in this definition could contribute to enhancing the financial status.

⁴⁶ Currently, this support comes from a regional NEPAD (New Partnership for Africa's Development) -FAO Fish Programme (NFFP) funded by Sida (Swedish International Development Agency).

⁴⁷ Hariri G. «The role of networks in the field of agricultural training and research». In: Dupuy B. (comp.), Dupuy B. (collab.). *Equilibre alimentaire, agriculture et environnement en Méditerranée*. Montpellier : CIHEAM, 1994. p. 121–131 (Options Méditerranéennes: Série A. Séminaires Méditerranéens; n. 24)