ISSUE PAPER ON AQUACULTURE

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I Overview on the Situation of Philippine Aquaculture Sector

1 An overview about aquaculture

Aquaculture is generally defined as farming of aquatic organisms such as fish, shellfish, and aquatic plants[i]. Aquaculture is also defined as farming of fish and other aquatic organisms under controlled conditions.

The environment or ecological habitat determines the kind of specie and type of production system to be adopted in a particular area. At present there are six different aquaculture production systems operating in the Philippines, which include: 1)brackishwater fishponds, 2) freshwater fishponds, 3) marine and freshwater fish cages, 4)marine and freshwater pen culture, 5) seafarming of oyster and mussel, and 6) mariculture of seaweeds. (*Source: BFAR Handouts*)

According to Dr. Jurgenne Primavera, in the Philippines, the dominant aquaculture system is the brackishwater fishponds which totals to 240,000 hectares, while freshwater ponds are only around 15,000 hectares[ii].

Mangrove areas are one of the most severely affected resources converted for aquaculture purposes. From a total of 450,000 – 500,000 hectares in 1918 (*Brown, 1920*), current extent of mangrove forest is barely 117,700 hectares left, 95% of which are second growth. The most rapid decrease in mangrove areas happened between the 1960s and 1970s when the government encouraged the extension of aquaculture development. Between 1978-1988, denudation rate was estimated at 10,700 hectares per annum. (*Source: "Status of Philippine Mangroves: Present and Future Scenario", by Emiliano Ramoran, Senior Technical Staff, CMMO-DENR, in his paper presented to the 3rd Round Table Discussion held at the DENR-PAWB Visitor's Center, Diliman, Quezon City*)

There is a dearth in information to give the total areas currently utilized for aquaculture purposes. What we have are quantitative data on the volume of aquaculture production, based on species and production systems.

The table below presents a general picture on aquaculture production. While the second table shows the figures comparing percentage contribution of major commodity/specie to total aquaculture production in the Philippines for 1992 and 1999.

Table 1 Aquaculture Production in 1999.

Production System	*Production as of 1999* (mt)
brackishwater fishponds	193,209
freshwater fishponds	38,779
marine and freshwater fish cages	31,114
marine and freshwater pen culture	36,097
seafarming of oyster and mussel	No data presented
mariculture of seaweeds	649,796

(Source: BFAR Handouts on Aquaculture for Rural Development, 2002)

Table 2. Percentage contribution of major commodity/specie to total aquaculture production in the Philippines for 1992 and 1999.

Commodity/Specie	**1992**	**1999**
Seaweeds	48%	65.4%
Tiger prawn	10%	3.8%
Milkfish	23%	18%
Tilapia	12%	7.9%
Others	7%	4.9%

These figures were culled from Philippine Fisheries Profile, used by Dr. Lacanilao in his presentation during the first round table discussion.

Based on the figures the first realization was from 1992 – 1999, seaweeds production is the only commodity/specie that earned positive marks in terms of production. This, in a way, demystified the obscured information on what made aquaculture sector produce similar volume to commercial fishing and even surpassed track record of municipal fisheries production.

2 Updates on Government Programs and Policies for Aquaculture

In the review of various government's efforts and support to the aquaculture industry, experts from government agencies, business sector, non-government organizations and the academe, identify the following programs and policy guidelines and related concerns:

- Aquaculture for Rural Development, BFAR's program that promotes 7 components (systems), implemented in selected areas all over the country;
- Tax Incentives to encourage investments in aquaculture production, and Strategies to promote export products from aquaculture, through the Bureau of Investments (BOI), Department of Trade and Investments (DTI);
- Issues and Concerns on Research and Development in Philippine Aquaculture;

The Bureau of Fisheries and Aquatic Resources (BFAR) is implementing the Ginintuang Masaganang Ani and Go Modern Aquaculture (GMA) "for the purpose of developing the aquaculture potential of rural areas in response to attain food security and address poverty nationwide". (*Source: BFAR Handouts*)

Departing from the old production-oriented and technology-based paradigm, BFAR claims its new program shifted from 'aquaculture development' to 'aquaculture for rural development' (ARD) with the following features:

- Community based
- Use of simple, environment-friendly technologies
- Need low capital investment
- Market-focused

The components of this program include:

1. Promotion of rice-shrimp culture, shift from rice-fish to rice-ulang culture (*Macrobrachium rosenbergii* or giant freshwater shrimp);
2. Conversion of 'wastelands' into productive aquaculture areas, target areas that include sand dunes, lahar laiden areas, sunken or flooded areas, marshland and swamp land;
3. Village-level aquarium industry development; a livelihood income generating project to promote ornamental fish production as backyard livelihood activities to fisherfolk;
4. Culture of fish in tanks(FITS) is introduced for urban aquaculture;
5. Fish apartelle or 14 Condo Model, another modern aquaculture technology designed for urban aquaculture; promotes the culture and propagation of local indigenous and exotic species such as hito, ulang, dalag, and tilapia
6. Fish dispersal in communal waters;
7. Establishment of mariculture parks or marine cages patterned after the concept of industrial parks, to be set up in 3 model sites (one in Luzon, one in Visayas and one in Mindanao);
8. Establishment of Seaweed Village Ecozone, priority sites focused on seaweed producing regions;
9. Promotion of saline-tolerant tilapia culture, to augment production of underutilized fishponds.

Despite BFAR's claims that this program is totally different from its previous approach to aquaculture, some feedback and critique raised seem to disagree with this.

Component	Pros	Cons
1. Rice-ulang	Technology is already	- No established market;

	available	- Was launched in Baler, Aurora, which has highly available supply of ulang.
2. Conversion of wastelands		- No clear definition of "wastelands". - Has potential impacts on remaining mangroves & existing land use.
3. Village level aquarium industry development	Potential market; IRA in place.	- No in-depth study to realize potentials of aquarium industry.
4. Culture of fish in tanks		- Capital-intensive, entails entrepreneurial and technical skills.
5. Fish dispersal in communal waters		- No mechanism for preventing dole-out mentality to prevail (among LGUs, fisherfolks); - Most of these are politically motivated dispersal efforts.
6. Mariculture park		- Requires high infrastructure cost shouldered by government; - Pollution issue; - Potential for market glut; - No social preparation for small fisherfolks - Environmental laws sacrificed for expediency sake; - No scientific basis to determine extent of aquaculture production.
7. Seaweeds village eco-zone	Potential for community-based aquaculture production; Low capitalization; Simple culture technology.	- BFAR program lacks support to fisherfolks to benefit from higher production; - Lack processing and marketing support program from government

Generally, these observations present that this program --

- Still caters more to medium and large-scale aquaculture operators;

- Inadequate research and development, e.g. classification of swampland and marshlands as 'wastelands'; cost-effectiveness of converting sand dunes into 'productive aquaculture areas';
- Lacks participation in the process of developing concept;
- Some of its components were clearly borrowed from abroad (e.g. shift to 'aquaculture for rural development', the idea came from NACA and was adopted without due consideration to particular conditions of the Philippine environment)
- Site selection of pilot areas seems to have been politically motivated;
- Legal inconsistencies of ARD with RA 8550 (installation of structure,. issuance of new licenses and permits?)

Policies related to aquaculture include:

- Agriculture-Fisheries Modernization Act or R.A. 8435;
- Fisheries Code or R.A. 8550 and related Fisheries Administrative Orders (FAO);
- FAO 214 (Code of Practice on Aquaculture);
- Joint Administrative Order No. 1, Series of 2000 (DADENR coordination in implementing Fisheries Code);
- Forestry Code or R.A. 715 and related Department Administrative Orders (DAO);
- Environmental Impact Assessment system;
- On Fishpond Lease Agreements;
- Omnibus Investments Code / Investment Priorities Plan;
- Executive Order 133

Feedback on the FAO 214 or Code of Practice on Aquaculture requires some reworking to be done to make it more relevant for sustainable aquaculture. Feedback includes:

- Lacks provisions for regulatory measures, i.e., on marine aquaculture (mariculture), particularly site selection and physical constructions, in the light that there is a push for coastal aquaculture;
- Provisions of the new code do not fit intent of new aquaculture program.
  - Provisions on requirements are applicable to medium to large scale of production, not to small, backyard type of projects.
  - What will stop medium-large scale producers to go into backyard type of projects when the latter succeeds?
- Seems to promote medium and large-scale aquaculture rather than small-scale aquaculture;
- Does not provide a long-term strategy on aquaculture development and only responds to issues raised on aquaculture;
- Lacks provisions for LGUs and does not address issues related to governance;
- The Code needs regulatory policies for its implementation since its adoption is voluntary and has no sanctions to violators.
- Lack consultation with key stakeholders in coming up with FAO 214.

The Agriculture and Fisheries Modernization Act or *AFMA* refers to modernizing aquaculture and fisheries in the context of globalization, which also means development of export-oriented industries, intensive farming and development of fisheries. This is concretized in the Investment Priority Plan (IPP) for 2001 and 2002 by the Bureau of Investments, which states that shrimp farming falls under the category of *mandatory inclusion*. Meaning, this will be promoted by our government aggressively in all regions. However, it has been proven that intensive shrimp farming has social and environmental impacts as in the case of mangrove conversions.

Review on current state policies and programs related to management of coastal and marine resources such as mangroves and local fish species further reveals that –

- Aquaculture continues to have impact on mangroves up to now. No changes yet on this trend.
- There are many laws to protect mangroves but the problems rest on – poor implementation, inconsistent policies, and institutional dilemma among GOs and GAs.
- There are several researches conducted on mangroves but inventory of current state and remaining mangrove areas need much improvement.
- There are several research gaps identified but funds are not easily available, especially for policy-related studies on mangroves.

The government is strongly supporting the development of aquaculture in the Philippines, as exemplified in the above mentioned programs and policies. At the same time, there is apprehension in some segments of the fisheries industry over this enthusiasm after having gone through the negative repercussions of the 1970s Blue Revolution when hundreds of thousands of hectares of mangroves were lost to aquaculture. Added to this are the negative experiences in the collapse of the industry when thousands of hectares of fishponds were affected by shrimp diseases.

This thrust to modernize and promote aquaculture becomes more alarming in the midst of a continuous decline in capture fishing, especially in municipal fisheries, and the degradation of coastal and marine environment.

II Issues and Concerns on Aquaculture

There are several issues advocates for sustainable aquaculture need to contend with, namely, *paradigm, inconsistent policies, ineffective implementation / enforcement of policies and regulatory measures,* and *unity issues among key stakeholders in the industry* on aquaculture.

On Paradigm

The fragmented programs and policies are merely reflections on the existence of various outlook among government agencies and other sectors in the civil society who are directly and indirectly involved in aquaculture and fisheries industry today.

One of these is the orientation slanted towards production, which views development of the aquaculture industry in terms of production. Targets and accomplishments are measured in terms of volume of production regardless of management or production systems used, where these came from, and their impacts on the resource base. Primary concern is to ensure continuing increase in production.

The second prevalent view and source of argument emanates from the perspective of the need to protect the environment, most specially the degraded coastal and marine environment, and communities affected by the push for more aquaculture production. This perspective recognizes the need to involve and provide access of small fisherfolks to engage and benefit from this kind of production, and protect the gains achieved in community-based coastal resource management efforts. This kind of paradigm also advocates for proper valuation of resources especially on mangroves, which at present remains undervalued, and other coastal and marine resources through the adoption of resource rent.

From this perspective, the idea of making aquaculture a development strategy and as an alternative to capture fishing is strongly challenged.

There are important concerns focusing on development of technology, production of export quality products, attention for domestic market and consumers' purchasing capacity, and issues on governance. To address these, close coordination among concerned agencies needs to be done to rationalize respective thrusts and mandates on these concerns in ways that complement rather than contradict each other.

It is important to note here that the Agriculture and Fisheries Modernization Act through the Medium Term Agricultural Development Plan, has identified positive targets biased for commercial and aquaculture sector, with negative targets for municipal fisheries[iii]. The kind of paradigm that influenced these targets in the Medium Term Agricultural Development Program of the Philippine government, remains one of the strategic issues when we talk of issues on development paradigm in aquaculture.

Inconsistent and Fragmented Policies on Aquaculture

There are many existing policies pertaining to aquaculture, but the industry remains unregulated. The inconsistency of government policies and guidelines to regulate aquaculture practices gave operators the chance to take advantage and irresponsibly exploit resources for greater profits, at the expense of present and future users of these resources.

These policies were formulated in a very reactive manner, in attempt to provide answers to issues raised unguided by long-term objectives these policies should serve.

Given the limits of the Code of Practice on Aquaculture, the only remedy done so far is to draft a 'model ordinance', which is still at the pilot stage of implementation in Fisheries Resource Management Program (FRMP) areas.

With so many policies in place, one suggestion is to review how effectively these policies are being implemented before coming up with new proposed policies.

A national framework for sustainable aquaculture is recommended to help define the overall vision and objectives of the aquaculture development, and provide strategic direction in the review, possibly a reorientation of existing policies, and formulation of new ones. Given the context that there are different levels of policy-formulation; this framework has to address policy issues on both national and local levels.

Issues on Enforcement

There is an apparent *weakness in regulating fishponds and aquaculture practices*. There are many incentives provided to investors and operators but there is no punishment imposed on violators, a case of carrot without the stick.

Some attribute this to lack of capability among LGUs to implement policies and regulations, while others say that there is lack of political will on the part of the government to enforce laws. It was keenly observed that there is 'internal violation' within the government itself[iv]. This undermines efforts by some government officials and employees who want to implement policies with good intentions.

Horror stories for mangroves usually involve government officials in the destruction and cutting of mangroves for their own personal advancements. Similar cases also happened in Negros and Quezon. Alleged graft and corruption cases are almost a common occurrence in several areas were big aquaculture projects are operating. Involvement of 'big people' makes it extremely difficult to arrest this kind of problem.

On several occasions, the reason for delay in resolution of issues in aquaculture is the conflict on jurisdiction over foreshore areas between the Department of Environment and Natural Resources (DENR), the Bureau of Lands, and local government units (LGUs). A similar conflict between the Department of Agriculture and DENR on the municipal water use renders the provision for quick reaction team in the Joint Administrative Order a futile provision.

The inability by the government to put its hand on controversial issues such as adoption of resource rent is primarily because of its anxiety over reactions from the 'industry', meaning, the business sector of the aquaculture industry.

Several problems were also identified regarding Fishpond Lease Agreements (FLAs). A general observation as far back as 1987 reveals that titles over government lands are increasing while FLAs are decreasing. This raises more questions on the effectivity of FLAs as a means to regulate aquaculture in the Philippines. Recommendations to address include the need to review the appropriateness of BFAR as the agency tasked with issuance of FLAs, and necessity to consider land use plans in each locality, which is under the jurisdiction of LGUs.

Enforcement activities and program implementation cannot be done without sufficient financial support. The issue on lack of funds to implement initiatives to enforce the law, to conduct more research and development activities, and to implement aquaculture projects is expressed even by respective government agencies tasked to do them.

Financial allocation issues cropped up in the light that government financial support is more on business aquaculture type of projects, i.e. mariculture park, while those projects for the poor do not have funds and would still need to access financial loans for them similar to what the government did for the Fisheries Resource Management Program (FRMP).

Amidst all these, the overarching issues of inconsistent policies and fragmented programs if not effectively addressed would still continue to create problems on enforcement and implementation.

Related concerns for culture management was also raised to change current attitude influenced by the 'culture of politics and the rich' evident here in the Philippines. According to some participants, this paralyzes some government agencies to effectively perform their tasks and mandates.

Unity Issues among Key Stakeholders in Aquaculture

It is a given fact that there are many groups claiming stake in the aquaculture industry. In the face of an increasing population, the clamor for increased production with

increasing profit, advocacy to rehabilitate depleting coastal and marine resources, and worsening poverty in coastal communities, each sector in the industry is striving hard to survive.

Moreover, when we talk of sustainable aquaculture as a whole, this entails unity and coordination among different sectors involved. The business sector engaged in medium to large-scale aquaculture production is looking closely on how government policies can truly help them remove risks to sustain production and increase in profit by reducing cost of production. Foremost in their minds is their need to find ways to continually increase their production, measured in terms of unit productivity.

Government agencies, on the other hand, especially those that have participated in various for a and discussions with NGOs, are now more open to work with different groups in support to the call for 'environment-friendly sustainable aquaculture'.

The biggest challenge now is finding the balance between economic profits and sustainability of resource base. This is also the right time to bring in into the mainstream gains and lessons from community based coastal resource management efforts, and finding concrete alternatives that would benefit marginalized sectors of the industry.

The challenge is even greater for us in the midst of a big threat to self-sufficiency in favor of other things like intensive commercialization of fishing products for foreign consumers and importation of cheap fisheries products for domestic market.

III Recommendations and Alternatives

There are several recommendations presented in various discussions by different stakeholders. these are: Changing Paradigms and Visions for Aquaculture, Systems and Technologies, Policy Advocacy and Effective Regulatory Measures. Although this thematic grouping put focus on specific advocacy themes, they do overlap and interrelate with each other.

Changing Paradigms and Visions for Aquaculture

In international conferences, the prevailing worldview is that 99% of aquaculture is small-scale. There is so much implication if most people believe this to be the truth. The recommendation is to reveal the other side of the picture to challenge this prevailing worldview. A related recommendation holds that research should be conducted to produce reliable information and technology for aquaculture.

Other recommendations in line with changing paradigms include:

- Need for a holistic view and different ways to address issues at different levels;

- Need to "equalize" value of aquaculture and value of destruction done on resource base;
- Need to modify views on aquaculture, we should accept that aquaculture alone cannot cope with the issue on rapid population growth;
- Need to establish direct link between aquaculture and food security;
- Need to presents ideas on other options, which include possible ways to make aquaculture contribute to resource rehabilitation as its long-term role and to answer the question on how to resolve the dilemma between economic benefit/exploitation vs. environmental role of aquaculture.
- Need to incorporate "culture management" since culture is very crucial in enforcement.

Systems and Technologies

There are several recommendations towards development of systems and technology for sustainable aquaculture.

- To develop abandoned areas and efforts to address low productivity of fish ponds
- To focus rehabilitation efforts on idle ponds instead of sand dunes because this costs a lot lesser than developing unproductive areas.
- The need to do research that will produce reliable information and technology for aquaculture.
- To come up with capacity building checklist for NGOs, POs, communities; (a compendium of what you can do and what you need to learn – policies), and efforts to capacitate NGOs, POs, communities, including the government;

An agreement or certain principles were arrived at after a thorough review on the different production systems currently utilized in the country, which include the following:

- There is a need to apply appropriate technologies and systems that would not destroy the environment;
- We should not promote systems we are not yet sure of, and
- We need to develop technologies that will further develop the industry and generate more employment.

Mangroves are seen to be very much compatible with aquaculture. As an alternative, fishponds could be installed in such a way that the mangroves are integrated. Oyster and mussel culture could also be done on mangrove areas. Seaweeds can grow on mangrove water wastes and can produce good income due to its end-product called "agar".

There is a concept paper being developed on mangrove friendly aquaculture that gives preferential treatment to fisherfolk cooperatives in the issuance of FLAs and stewardship agreements with DENR.
In the light that pressure is already there to push for coastal aquaculture, which has implications to existing coastal fisheries, there is also a need for an integrated framework for shrimp and milkfish production.

The following considerations in classifying various aquaculture systems (regulating aquaculture practices) hopes to provide initial guidelines to regulate aquaculture practices:

- Fish meal trap
- Community property rights
- Pollution
- Outsiders vis-à-vis insiders
- Business ownership
- Capitalization
- Mangrove destruction
- Food security (food supply, access, affordability)
- Gender (sensitivity, equality)
- Empowerment (psychosocial, political, economic)
- Profitability

Using the abovelisted criteria, the table below presents a classification of aquaculture systems for development and promotion.

Aquaculture systems for promotion	*Acceptable aquaculture systems*	*Objectionable aquaculture systems*
Small-scale groupers cage culture, provided these are regulated.	Crop rotation / polyculture, e.g. shrimp, fin-fish.	Intensive shrimp farming (ISF) that impact on mangal resources/marine environment and capture fisheries.
Community-based seaweed farming, culture of filter feeders (oysters, mussels, capiz, etc.), provided these are regulated and have support services (e.g. market, credit, processing)	Tilapia, milkfish, carp and other omnivorous species that contribute to food security, provided these are 'regulated'.	Intensive fishpens and fish cage culture with social and environmental impacts.
		Current FLA system (virtual ownership, arbitrary lease fees that do not properly reflect economic, resource rent).

		Arbitrary rent/license fees for other aquaculture projects besides those covered under FLA (e.g. mariculture fish pens and cages)
		Aquaculture practices that go beyond carrying capacity limits, unregulated.
		Large-scale groupers and other carnivorous species that require lots of trash fish.

Policy Advocacy

To guide policy advocacy efforts, the recommendation is that these policies and programs should be *anticipatory* and *proactive*.

Recommendations for policy review are on the following aspects:
1. Reorientation of national policies on fisheries (not just on aquaculture);
2. Harmonize policies between DA-DENR-BFAR. Since this may take some time, in the interim there are several options to look into (legal and meta-legal) and to come up with specific guidelines on what to do with mangrove areas under litigation;
3. A need to re-examine how the government is going to do about implementing modernization of agriculture and fisheries, and investment policies;
4. To review how effectively are existing policies being implemented before coming up with new proposed policies.

Specific policy recommendations were identified on the following aspects:
1. Need for policy to focus on recovery of resource base degraded by construction of aquaculture projects;
2. To develop a licensing system based on resource rent for both capture and aquaculture fisheries;

Another set of recommendations is focused on improving regulations to reduce negative impacts. A corollary recommendation to this is the need to come up with *specie-specific* and *site-specific* proposed standards to regulate aquaculture practices. This recognizes particular characteristics of each specie and respective environment conducive for culture of said species.

In relation to the structure that will handle cases on mangrove management, three recommendations can be considered. One is the establishment of adjudication bodies or special courts (ala-DARAB). Another proposal is to advocate for setting up of "quasi-judicial interagency body". The third recommendation was to opt for administrative remedy than setting up of special bodies/adjudication boards.

Zonation of foreshore areas is another advocacy issue. However, there is a need to be more specific in classifying mangroves whether they are beach forest or mangrove forest. A related suggestion was to exclude mangroves in from being part of the foreshore areas, although it was mentioned that mangroves are already included as part of the foreshore areas under the Land Use Bill.

Given these concerns, the existence of the Land Use Bill is seen as an opportunity to push for policies on foreshore and to clarify who really has jurisdiction over mangroves.

Effective Enforcement and Regulatory Measures

The idea of what constitutes 'regulated aquaculture' is best described with the following features:

- Aquaculture project should be part of Coastal Resource Management (zonation, planning, preferential use rights)
- It does not conflict with others using same resources
- It uses scientific bases or precautionary approaches to determine scale of operation
- There is strict observance of environmental laws, i.e. EIA, and
- Uses 'good' aquaculture practices.

In addition, specific recommendations addressed to BFAR include:

1. BFAR must do more and be proactive to prepare local government units for the task of coastal resource management;
2. Implement more environment-friendly aquaculture development programs;
3. Need for BFAR to have more teeth and stop development operations while it is under application;
4. BFAR should have an inventory for FLA management;
5. Strengthen preferential rights of fisherfolks through promotion of tenurial instruments (CBFMA, silviculture)
6. Strengthen FAMRCs to play active role in regulating, promoting more sustainable aquaculture development.
7. Devolve issuance of Fishpond Lease Agreements(FLAs) from BFAR to marginalized LGUs;
8. Preferential rights/priority to fisherfolk over FLAs issuances;
9. Reversion of FLAs on areas that were formerly mangroves;
10. Repeal selected provisions of FLAs.

- Inventory of FLAs, brackish waterponds; Inventory of existing holders of FLAs;

11. Adoption of rent -based licensing system and issuance of guidelines on this.

For DENR:

1. To speed up the reversion process for unutilized and abandoned lands back to its original mangrove state, it is highly recommended for DENR to take on this responsibility instead going through the usual formation of the tripartite ocular investigation.
2. To reconstitute the National Mangroves Commission and initiate database building on mangroves.
3. For DENR ENRA (resource valuation) program to look into mangroves and come up with corresponding policy recommendations, too, and proper dissemination of info about this program.
4. To actively be involved in capacity building and awareness raising regarding mangrove resources.
5. Issuance of policy on EIA specific to Aquaculture.

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[i] Key Sheets for Sustainable Livelihoods, ODI, DFID.
[ii] See Proceedings on "The Current State of Aquaculture II, a Status Report on Mangroves", 3rd round table discussion held on March 20, 2002.
[iii] See Proceedings on 4th Round Table Discussion held on July 26, 2002.
[iv]