ENGLISH

Final Report

Seminar for Promotion of Sustainable Development of Fisheries in Indonesia

March 16 - 19, 2004, Aryaduta Hotel, Jakarta, Indonesia

Organized by:

International Cooperative Alliance (ICA)

The International Cooperative Fisheries Organization (ICFO)

Induk Koperasi Perikanan Indonesia (IKPI)

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FOREWORD

INDUK KOPERASI PERIKANAN INDONESIA (IKPI)

(NATIONAL FEDERATION OF INDONESIAN FISHERS' COOPERATIVE SOCIETIES)

In the effort to give contribution to the development of inland fisheries industries and to enhance at once the promotion on fisheries product consumption in Indonesia, Induk Koperasi Perikanan Indonesia (IKPI) in cooperation with the *International Co-operative Fisheries Organization of the International Cooperatives Alliance* (ICFO/ICA) organized a seminar, with the theme "Promotion of Sustainable Development of Fisheries in Indonesia" with special emphasis on promotion of domestic fish consumption and development of local fishing industry, which was held at Aryaduta Hotel Jakarta, on16 to19 March, 2004.

This is the 3rd Seminar organized by IKPI which is financed by ICFO/ICA. This Seminar is hoped to be able to give contribution to the development of management system on fisheries product quality, the increase of fish consumption through the promotion of domestic market, and the sustainable development of fisheries in Indonesia.

In this Seminar we have tried to put forward various articles/science studies as well as popular articles and other information dealing with the theme of the Seminar which were put forward in the form of lecture texts by 5 (five) resource persons from abroad (Japan and Canada) and 5 (five) resource persons from Indonesia.

Through this opportunity we express herewith our gratitude to :

1. ICFO/ICA for their great attention toward the implementation of this Seminar;
2. Mr. H. Alimarwan Hanan, Minister of Co-operatives and SME, of the RI. for his keynote speech in the Opening Ceremony and for the facilities given to us;
3. Mr. Prof. Rokhmin Dahuri, Minister of Maritime and Fisheries of the RI. for his readiness to give a special lecture in this Seminar;
4. The resource persons from abroad as well as from internal for the delivery of their lecture texts;
5. The Moderators for their guidance of the discussion in this Seminar; and
6. The supporting bodies, viz : PT. Bank Bukopin, PT. Garuda Indonesia, PT. Arteria Daya Mulia (PT. ARIDA), PT. Indoneptune Net Manufacturing Company, Asosiasi Tuna Indonesia (ASTUIN), Nalendra Group and PT. Pusaka Bahari for their support so that this Seminar could be implemented successfully.

Finally we do hope that this Seminar could give the useful contribution for all of us, especially for the development of Fisheries.

Jakarta, April 2004

INDUK KOPERASI PERIKANAN INDONESIA

Wibisono Wiyono
President

FORE WORD

INDONESIAN FISHERIES SOCIETY

Masyarakat Perikanan Nusantara (MPN) / The Indonesian Fisheries Society express congratulation toward the successful of the Induk Koperasi Perikanan Indonesia (IKPI) in organizing the "Seminar for Promotion of Sustainable Development of Fisheries in Indonesia".

The Seminar was followed by about 80 participants and put forward 10 experts on fisheries and public health from Canada, Japan and Indonesia and high-ranking officials from the Ministry of Cooperatives and SME and from the Ministry of Maritime and Fisheries as Lecturers. In the above Seminar had been discussed and compiled the related formulation with several aspects on the sustainable fisheries development covering environment and economic aspect, and the enhancement of consumption of the national fisheries products.

The development as mentioned above needs the existence of exact strategy. The result of the Seminar could become one of the materials for the concept of "Grand Strategy" which for the time being is in the process of compiling by a certain Team of Experts of MPN and the high-ranking officials of The Ministry of Maritime and Fisheries.

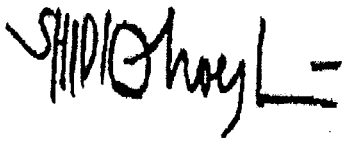
The further hope of MPN is the materialization of the conclusion of the result of Seminar on the field. It is hoped that the result of the Seminar will be affected toward the enhance of cooperative's role, the usefulness of small and medium enterprises including the fisheries sector and stimulate the development of aquaculture and the excellent and the added value of fisheries product.

MPN also hopes that the cooperation, which had been pioneered by IKPI with its partnership in Japan, with ICFO of the ICA (ICFO/ICA), could be going continuously in order the fisheries cooperatives in Indonesia obtain the benefit and would be highly regarded in the international cooperative's arena.

Jakarta, April 2004

Masyarakat Perikanan Nusantara (MPN)

(Indonesian Fisheries Society)



Shidiq Moeslim

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PART I
IMPLEMENTATION OF THE SEMINAR

IMPLEMENTATION OF THE SEMINAR

1. The Objective and the Theme of the Seminar

The objective of the seminar is to contribute to the development of fisheries as local industry of Indonesia and to contribute to the promotion of domestic fish consumptions to support it, and the theme of the seminar is as follows : "ICA/ICFO/IKPI Seminar for Promotion of Sustainable Development of Fisheries in Indonesia" with special emphasis on promotion of domestic fish consumption and development of local fishing industry.

2. Financial Support

The Seminar is financed by the International Co-operative Fisheries Organization (ICFO) of the International Co-operative Alliance (ICA).

3. Host Organization

The host organization of the Seminar is as follows :

Name of Organization	: Induk Koperasi Perikanan Indonesia (IKPI) = National Federation of Indonesia Fishermen's Co-operative Societies
Address	: Jalan Ir. H. Juanda No. 2 Jakarta 10120, Indonesia
Telephone	: (62-021) 345 – 1118
Fax	: (62-021) 380 – 6177
E-mail	: ikpi@indosat.net.id or masay@endoramail.com
Representative	: Mr. Wibisono Wiyono President

4. The Agenda of the seminar

The seminar was organized into 4 (four) activities, which were :

a. Opening Ceremony

b. The Seminar was held in the form of :

- Lectures;
- Discussion, Question and Answer;

c. Closing Ceremony;

d. Study Visit to complete the Seminar.

5. Date and Venue

The activities of the seminar were held from 16 (Tue.) to 19 (Fri.) March, 2004, at:

(1). Auditorium of Ministry of Co-operatives and SME , RI
Jalan H.R. Rasuna Said Kav. 3-5 (Lt. 2)
Jakarta, Indonesia

(2). ARYA DUTA HOTEL, JAKARTA
Jalan Prapatan 44 – 48, Jakarta 10110, Indonesia
Phone : (62-021) 231 – 1234
Fax : (62-021) 380 – 9900

On March 19th, 2004, the Study Visit was organized and made a trip to Fish Market and Fish Processing Center at Muara Angke, North Jakarta.

6. Participants

The participants consisted of :

a. Representatives of Members of IKPI, Secondary/Provincial level as well as Primary Level;

b. Supervisors of IKPI;

c. Representatives of the related Universities;

d. Students of the related Universities;

e. Representatives of the related private enterprises;

f. Representatives of the related Government Offices, Central as well as Local; and

g. Representatives of the NGOs.

7. Paper Presenter/Lecturer

Paper presenter/lecturer consisted of 10 (ten) persons :

5 (five) persons from Indonesia :

1. Professor Tridoyo Kusumastanto, Professor Bogor Agricultural University, Faculty of Fisheries and Maritime Technology, with the theme : Dietary Life of Indonesian People with Special Reference to Present State of Fish Consumption and Problems.

2. Mrs. Winie Trilaksani, MSc, Bogor Agricultural University, Faculty of Fisheries and Maritime Technology, with the theme : Present State and the Problems of Fishery Products Quality Controls Systems in Indonesia.

3. Mr. Husni Manggabarani, Director General Capture Fisheries, Ministry of Maritime and Fisheries, with the theme : Present State of Indonesia Capture Fisheries and Perspectives for the Development.

4. Dr. Fatuchri Sukadi, Director General of Aqua Culture, Ministry of Maritime and Fisheries, with the theme : Present State of Aqua Culture and Perspectives for the Development.

5. Mr. Gellwynn Yusuf, from the Indonesia Fishery Schollar Association, with the theme : The Role of Fish Consumption in Supporting National Food Security

5 (five) persons from Abroad :

1. Mr. Kuniyuki Miyahara, Managing Director JF Zengyoren Japan, with the theme : Resource Management and Trade of Fishery Products.

2. Mr. Richard Clayton, Adjunct Professor Carleton University, Ottawa, Canada, with the theme : Sustainable Development of Fisheries.

3. Mr. Kaoru Kurosawa, JICA expert on Fisheries Planning (Japan's Fishery Agency Official).

4. Mrs. Dr. Taneko Suzuki, Visiting Professor of Kokusai Gakuin Saitama Junior College, Japan, with the theme : Nutritional Characteristics of Fishery Product).

5. Mr. Dr. Yukio Yamori, Professor Emeritus Kyoto University and Director WHO Collaborating Center for Research on Primary Prevention of Cardiovascular Diseases, with the theme : Our Dietary Life and Health.

8. The Moderator

The Seminar was guided by 9 (nine) moderators as follows :

1. Mr. Wibisono Wiyono
2. Mr. Muhammad Taufiq
3. Mr. Hardadi Lukito
4. Mr. R.P. Poernomo
5. Mr. Anwar Pulukadang
6. Mr. Riyantho Chadhiri
7. Mr. Fuad Choliq
8. Mr. David K. Wiranata
9. Mrs. Mita Wahyuni

9. Papers of the Seminar

The materials of the Seminar were prepared in two languages, Indonesian and English, which contained about 4.000 – 5.000 words (including figures and tables) typed in quarto size paper.

10. Languages

The principal using language of the Seminar is Bahasa Indonesia. Other languages were translated and interpreted into Bahasa Indonesia.

11. Final Report of the Seminar

The Final Report/the outcome of the Seminar and the Study Visit will be arranged by the OC both in Indonesian language and English language, 100 copies and 50 copies respectively.

Of those, 20 copies of Indonesian language and 40 copies of English language must be sent to the Secretariat of ICFO in Japan.

The rest will be sent to the Government/Counceling Institutions and to all of the participants of the Seminar.

PART II
OPENING CEREMONY

SPEECH BY THE PRESIDENT OF I.K.P.I.

In the OPENING CEREMONY OF the ICA/ICFO/IKPI SEMINAR
FOR "PROMOTION OF SUSTAINABLE DEVELOPMENT
OF FISHERIES IN INDONESIA"

at the Auditorium of the Ministry of Cooperative and SME
March 16, 2004

By : **Wibisono Wiyono**

Mr. Alimarwan Hanan, the Minister of Cooperative and Small & Medium Enterprises.

Mr. Rokhmin Dahuri, the Minister of Marine Affairs and Fisheries.

Mr. Takeo Kaminaga, First Secretary Embassy of Japan, in this occasion representing the Ambassador of Japan.

The Delegation of ICFO,

The Lecturers and Moderators of the Seminar,

The Participants of the Seminar especially to the members of IKPI,

Distinguish guests, ladies and gentlemen

Assalamu'alaikum Wr. WB

Properous greeting and good morning.

Let us, in this nice morning, we pray together, Praise be to God Almighty, that now we are in a good health condition, so that we are able together in the opening ceremony of the "ICA/ICFO/IKPI Seminar for Promotion of the Sustainable Development of Fisheries ini Indonesia".

H.E. the Ministers, ladies and gentlemen.

Before we extend our reports on the organizing of the seminar, please allow us to express our gratitude, firstly to H.E. Mr. Alimarwan Hanan the Minister of Cooperative and Small & Medium Enterprises on the opportunity given to us to use this -just finished renovated- place for the purpose of the seminar. Secondly, to H.E. Professor. Rokhmin Dahuri the Minister of Marine Affairs and Fisheries toward his "order" to us to invite more participants from many institutions background, including central government and the provincial, and the related NGOs. And for that purpose, we are open to cooperate with several parties for fungding supports.

H.E. the Ministers, and the audiences.

Furthermore, we also express our gratitude to the ICFO which had been given the opportunity to IKPI as the organizer of this seminar. We are also grateful to the foreign lecturers who had made use of their valuable time to come to Jakarta, giving their contribution in this seminar. And also to the Indonesian lecturers, we are feeling proud toward their readiness to accept our request to give their contribution in this seminar. And also to our moderators whose tasks are very important as a LIBERO in the implementation of the seminar.

H.E. the Ministers, and the audiences.

Then, allow us to inform you that this seminar is participated by about 100 persons coming from:

1. Puskud Mina (Center of Fisheries Cooperative, secondary level), member of IKPI.
2. KUD Mina (Fisheries Cooperative, primary level).
3. Enterpreneurs and national fisheries enterprises.

4. Central Government Instances.
5. Provincial government Instances.
6. Non Government Organizations
7. University faculty and students.

And in this opening ceremony are attended by around 150 persons whom are going directly to hear the keynote speech from H.E. Mr. Alimarwan Hanan and will obtain provisions from H.E. Professor. Rokhmin Dahuri in this special and very important speech.

The hole programs of the seminar will be implemented from this morning March 16th, 2004 at this Auditorium and will be continued until March 18th, 2004 at Aryaduta Hotel, and on March 19th, 2004 will be continued by study visit to Muara Angke Fish Market, Jakarta.

H.E. the Minister and the audience, we would like to report and to introduce the lecturers as well as the moderators who will be participated in this seminar.

1. Mr. Kuniyuki Miyahara, Managing Director JF Zengyoren Japan, with the theme : Resource Management and Trade of Fishery Products.
2. Mr. Richard Clayton, Adjunct Professor Carleton University, Ottawa, Canada, with the theme : Sustainable Development of Fisheries.
3. Mr. Kaoru Kurosawa, JICA expert on Fisheries Planning (Japan's Fishery Agency Official).
4. Mrs. Dr. Taneko Suzuki, Visiting Professor of Kokusai Gakuin Saitama Junior College, Japan, with the theme : Nutritional Characteristics of Fishery Product).
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10. Mr. Gellwynn Yusuf, from the Indonesia Fishery Schollar Association, with the theme : The Role of Fish Consumption in Supporting National Food Security.

As to the moderators are as follows :

1. Dr. Muhammad Taufiq
2. Mr. R.P. Poernomo
3. Mr. David K. Wiranata
4. Mrs. Harini Nalendra
5. Mr. Anwar Pulukadang
6. Mr. Maman A. Rahman, MSc
7. Dr. Fuad Choliq

H.E. the Ministers and the audiences.

Those are all of our report on the ICA/ICFO/IKPI Seminar for Promotion of sustainable Development of Fisheries in Indonesia. Please accept our apology, incase there are any lacks and constraints in organizing this seminar.

To H.E. Mr. Alimarwan Hanan, the Minister of Cooperatives and S.M.E we would like you to open officially this seminar.

To H.E. Professor. Rokhmin Dahuri, once again we would like to express our gratitude for your readiness to give special lecture as the first lecture of the seminar.

We would like also to express our gratitude to Bank BUKOPIN, Garuda Indonesia and Aryaduta Hotel, for their supports, so that this Seminar could be implemented smoothly.

Before we finish this report, though it is late, we would like herewith to express happy birthday to H.E. Mr. Alimarwan Hanan for his having birthday on March 12th, 2004 with the hope that God would bless him for his long live, and his healthynes, so that he could together with H.E. Professor Rokhmin Dahuri as the Ministers to enhance the wellfare of the fishers and fish culturers through speeding up the development of fisheries in Indonesia and to clarify the fisheries cooperatives/KUDs Mina as the agent of changing. Amin.

We finish this report with the hope that this Seminar will give useful contribution for all of us.

Thank you very much.

Wassalamualaikum Wr. Wb.

SPEECH BY THE CHAIRMAN OF ICFO

In the OPENING CEREMONY OF the ICA/ICFO/IKPI SEMINAR

FOR "PROMOTION OF SUSTAINABLE DEVELOPMENT OF FISHERIES IN INDONESIA"

at the Auditorium of the Ministry of Cooperative and SME
March 16, 2004

By : **Mr. Shoji UEMURA**

First of all, I would like to ask your kind understanding that the chairman of ICFO Mr. Uemura has an urgent business in Japan, and can not be present here today.

The chairman asked me to deliver his speech to you on behalf of the International Co-operative Fisheries Organization of the International Co-operative Alliance.

Let me read out his speech.

Professor Rokhmin Dahuri, Minister of Marine Affairs and Fisheries,

Mr. Alimarwan Hanan, Minister of Co-operation and Small & Medium Enterprises,

Mr. Takeo Kaminaga, first Secretary, Embassy of Japan

Mr. Wibisono Wiyono, President of IKPI.

Distinguished guests,

Participant, Lecturer,

Bard of Directors of IKPI,

Ladies and Gentlemen.

It is a great pleasure for me to address this opening ceremony.

ICFO has organized a seminar for leadership development of fisheries co-operative in Indonesia two times before : first time in November, 1989, and second time in Cirebon in March, 1997. Therefore the seminar today is the third seminar of ICFO in Indonesia.

The funds for the seminar have been contributed by the government of Japan to ICA, for which I would like to express my thanks.

In the previous two seminar, active discussions were held on improvement measures concerning management of fisheries co-operatives as well as on development of fisheries in Indonesia and so forth, and recommendations were prepared.

I believe that a lot of efforts have been made by IKPI and its member organization after these previous seminar in order to develop the business of fishing in Indonesia, for which I would like to pay my highest respect.

Fishing Industry is a risky business. It is liable to affect the industry by the changes of nature like climate and weather as well as of environment.

Nevertheless, I believe that our wisdom gained through experiences would be able to overcome such difficulties.

Recourse management is one of such wisdom.

However, it is not enough.

Market, Market, Market.

Whether or not we have a reliable and dependable market to do business with is one of the keys to solution of the business of fisheries.

This is same in other business too.

It is from this standpoint that ICFO has planned this third seminar in Indonesia.

If I say our point first, the key is development of domestic market.

It is a matter of course that foreign market is important as well. However, what will it happen if such foreign market fails?

Unless we have a firm, dependable domestic market, it is doomed to failure.

The current negotiations concerning market access of fishery products at the WTO has a lot to do with our business in this sense.

We fishers have to co-operate together in order to protect our interest. For this purpose, I would like to work with you.

Bird flu and mad cow disease are threatening the would.

We have to learn from this a lesson. We should not think this as a good chance to make money, but rather as a warning that we should be caring for better business practice and environment.

During the seminar, I do hope that you find many useful information and clues for improvement of you business.

The 21st century is said to be the era of Asia.

In order to prove this to be true, and to show that we can, we have to make every effort in each of our sector.

Lastly, I would like to extend my heart-felt gratitude to Mr. Wibisono Woyono, President of IKPI, Mr. Mohammad Taufiq, deputy minister of the Ministry of Co-operatives and Small & Medium Enterprises, and many other who have cooperated to prepare for the seminar.

I hope every success of the seminar.

Thank you very much

Represented by

Mr. Masaaki SATO

Secretary ICFO

[redacted]

Leadership and training are two key factors in any development. From this standpoint, I hope that the exchange of views and information during the session of the seminar will lead to greater dynamism and prosperity of fisheries, and ultimately to sustainable fisheries development which is the theme of the seminar.

Lastly, I sincerely hope that this seminar will create a fruitful and positive effect on the ever-growing Indonesian fisheries.

I hope every success of the seminar.

Thank you very much.

Keynote Speech

by

Alimarwan Hanan

The Minister of Co-operatives and Small/Medium Enterprises

At the Opening Ceremony of the ICA/ICFO/IKPI Seminar
"For Promotion of Sustainable Development of Fisheries in Indonesia"

In the name of Allah, the Beneficent, the Merciful.

Assalamu'alaikum Warahmatullahi Wabarakatuh.

The Minister of Marine Affairs and Fisheries.

The Representative of Japan Embassy in Indonesia.

Mr. Kuniyuki MIYAHARA, Managing Director JF.ZENGYOREN, Japan.

Mr. Rick CLAYTON, Adjunct Professor Carleton University, Ottawa, Canada.

Mr. Kaoru KUROSAWA, JICA Expert, Jakarta.

Ms. Dr. Taneko SUZUKI, Visiting Professor Kokusai Gakuin Gaitama Junior College, Japan.

Mr. Dr. Yukio YAMORI, Professor Emeritus Kyoto University and Director WHO.

Distinguished speakers from Bogor Agricultural Institute, Ministry of Marine Affairs & Fisheries and Indonesia Fisheries Scholars Association (ISPIKANI).

Distinguished representatives of Central and Provincial Governments, Mass Organizations, NGOs, Universities/Students.

Our beloved Board of Directors of Induk Koperasi Perikanan Indonesia (IKPI), B.o.D. of the Provincial Federation of Fisheries Co-operatives, B.o.D. of KUDs Mina/Fisheries Co-operatives.

First of all, Praise is to God, the Almighty, who gives the opportunity to me in this Seminar on Sustainable Development of Fisheries Co-operatives in Indonesia, initiated by IKPI in collaboration with ICFO/ICA.

Furthermore we express herewith our welcome to Mr. Miyahara, Mr. Clayton, Mr. Kurosawa, Mrs. Suzuki and Mr. Yamori with our hope that the resent Jakarta condition during the General Election Campaign will still bring about feeling safe and may be able to enjoy the above atmosphere.

It is an honor and happiness for me personally, to give speech for the bonds of friendship with all of you so that with this relationship there are many matters to be developed and to be contributed for the progress, the benefit and the welfare of the fisher's communities in general and for the KUDs Mina/Fisheries Co-operatives in particular.

Dear audiences.

The seminar with the emphasis to the promotion on fish consumption and the development of the domestic fisheries industries formulates a meeting arena of International quality is hoped to be able to contribute toward the developments of the local fisheries industries as well as to increase fish consumption in Indonesia where the fishers' organization such as IKPI is very concerned and responsible to bring the above intention into reality.

As a part of the International communities, Indonesia should of course interact in every aspect including the world trading which had been agreed in the GATT/WTO agreement, where the last goal to be reached through the GATT/WTO agreement is to increase the standard of living of the world communities by way of increasing the volume of world trading where the circles are to increase the production in the framework of broadening the employment's opportunities.

In the implementation there should be culminated in the increasing of the exploitation of natural resources on a large scale. If these matters could happen, the happening potency of the common tragedy as had been reminded by Gerald Hardine in his book "The Tragedy of Common" said that:

When the Natural Resources were still in abundance, and the individual intelligence and skill (HR) were still limited, the individual greed to maximalize the profit for the individual interest would not be influencing each other negatively.

But, when the HR were more and more limited, and the individual intelegence and skill were more and more high, the every individual greed to maximalize the individual profit will become a dangerous threat for them selves, for the communities and for the environment, until the process of poisoning each others, polluting each others and damaging each others which will become a source of "common tragedy" would happen.

The only way to avoid the tragedy is cooperating each other's.

From the above analysis, it could be said that in the era of more and more intensify global competition, the co-operatives have just the great opportunity to be growing and developing. The dabble characteristics and ethical values which served as the bases for the principle of co-operative as an identity characteristic is just going to make the co-operative as an economy alternative in the future which is needed to clearly overcome the problems, to be faced together by the world communities. The growth of collective awareness to establish the co-operation to overcome problems of un-employments, social imbalances, and environment damages, social health and safeness will become a fertile field for the growth and the developments of co-operatives in the future.

Dear audiences.

Furthermore the matters in question is how the fishers and the fisheries co-operatives attitude to prepare them selves in anticipating the globalization flow which day by day its bellows are felt.

To answer the above question we need to see the order of fishers communities' livelihoods from various dement ions.

Firstly, since formerly the Indonesian fishers had been well known as a community who own a maritime spirit, though their formal educational level are not so high.

To recognize the natural potency (sea) are usually done based on their hereditary experience so that in moving their fishing ground sometimes were not as easy as moving the activities in land area. For that purpose the incessantly innovation followed by the elucidation with examples are very needed and apparently it had been proved that it could help the development of the operational area of the fishers in Indonesia.

The second dimension and it needs to be spotlighted is the fishers individually as well as aggregating in the organization such as Fisheries Co-operative are colored by the following various limitedness:

1. Limitedness in capital.
2. Limitedness in infestation abilities.

3. Limitedness in market facing abilities.
4. Limitedness in mastering the technology.

It could be understood that as a consequence of the limitedness in their own capital as well as obtained from outside (credit) have an impact on the weakness of their means of fishing, and in turn they will earn low production and they have no ability in setting aside their earnings for saving to support their infestation. So that it is an impossible thing if they rely only on the individual ability of the fishers to be able to enhance the exploitation of fisheries resources.

Dear audiences.

Parallel with the above matters the group rapprochements in the circle of fishers world formulates the alternative that could answer the problems of limitedness experienced by the individual fishers and to anticipate at once the friction which could be possible to emerge later.

In the history of fishers matters in Indonesia the tradition of mutual co-operation in doing business had been taken place long time ago in the form of Fisheries Co-operative, which formerly was known as Sea Fisheries Co-operative, and now develop become Fisheries Cooperative/KUD Mina.

The record shows that at present there are about 672 Fisheries Co-operatives/KUDs Mina with their several secondary PUSKUDs Mina/Federation of Fisheries Co-operatives in the Provincial level as well as in the regency/city level and the Induk Koperasi Perikanan Indonesia (IKPI) in the national level.

Through the fishers business group rapprochements in the form of Fisheries Co-operative it had been proved that they played a role in two main matters:

1. Giving services toward the needs of fishers.
2. Increasing the "bargaining position" of the fishers to face the market, the production input market as well as the fishers' products market.

In other word the co-operative activities for the fishers had been able to increase the efficiency which at the beginning it was very difficult to approach individually. The togetherness in the form of co-operative organization, endeavoring to provide the need of their means for going to the sea such as oil basic commodities, ice, fishing gears etc and the togetherness in marketing their products will help the fishers to decrease the expenses appear if it is carried out individually. The role of co-operative as mentioned above creates the efficiency of fishers group network, it is caused by the co-operative have the members spreading out in a certain areas, which were developing the membership network. This membership networks an asset to facilitate the distribution input as well as the products marketing. As already known that in various businesses, the network formulates a pillar of successful.

Dear audiences.

Along with the progress level, which had been reached, the ability of the fishers and the fish farmers together with their co-operatives were also getting increased. So the public policy should be started to begin involving many more fishers at every process of fisheries development activities. As and successful example is that the local government had entrusted the fisheries co-operatives to manage the fish auction place. Every fish auction place managed by the co-operative with their members control through the mechanism on the distribution of retribution system apparently had a very clear impact toward the increasing of welfare of the fishers and fish farmers and toward the original income of the region.

The province of Central Java which consistently applies the valid regulation with giving the trust toward PUSKUD Mina in managing the fish auction places had showed the clearly evidence that the co-operatives together with the fishers and fish farmers have had the ability that more and more getting better. If the above trust is also expanded to the other regions and in the fields of the directly related activities with their interests such as in providing vessels, building fishing ports etc by involving them, and it would be ensured to obtain the better income. By way of giving the bigger trust to the fishers and fish farmers at every development process formulates an evidence of the government's acknowledgment toward the successful of the government, which had been implemented. On the contrary the more afraid to give trust to the fishers and fish farmers the more lower the level of trust of the government toward the successful of the development which had been reached.

Dear audiences.

To anticipate the free trade, which is colored with the more and more critical competition, one of the keys needed is efficiency. With the efficiency step will be able to push the increase of productivity and the increase of quality of products at free market. So that it becomes optimistic that if the efficiency emerged by the fisheries co-operatives as mentioned above, that is an undoubtedly effort for the development of fishers communities at present as well as in the future. The existence of Fisheries Co-operative as an institute that support the ability of the fishers will be able to enter the era of globalization with its various impacts.

As an anticipation of the globalization impact where at behind the capitalism economic system gotten a free ride, so that there is a strategy policy which could be taken by the government, among others: **To create a local superiority**. One of the models that had been succeeded in developing the local resources until they own the superiority in facing the global competition is as what had been carried out by Hiramatsu Morihiko, when he was a Governor of Oita, Japan, through the "One Village One Product Movement".

This movement had been modified by the Indonesian government became Small and Medium Enterprises (SME) Central Program. This matter is actually carrying out integrated endeavor systematically to develop local economic superiority based on the potential of the natural resources and human resources, including the culture aspect. With those above bases one commodity (product) developed systematically and integrated until it owns the superiority as a global product. This movement is not meant that the village (region) is allowed to develop one superior commodity only, but it could develop two or more local superior commodities. So is the one commodity could be developed by one or more villages (regions), which owns a basis to develop the said commodity (product)?

Dear audiences.

This Central Program involves the communities and business world in the framework of increasing and supporting the competition power of local product. Guidance program on SME with the central system supported by services on non financial business development through Business Development Services (BDS) as accompanist, consultant, to access all business interests of Co-operatives and SMEs, including in it market access, capital, production, technology and increasing the HR skill and managerial ability.

Besides that, strengthened by financial services through the Saving and Credit co-operative/co-operative of Saving and Credit Business as well as other financial institution existing in the Central and the facility on guaranty program. The policy with capital support and with the program on first capital and commensurability through the

said above co-operative which is allocated for SMEs in Central, as an answer toward the very difficult for SMEs to access the capital sources through the Banks. At present since 2001-2003 had been grown 107 Centrals of Capture Fisheries/Fish Cultures and 34 Centrals of Fish Processing.

Nevertheless the all above facilities should not be seen as technical only, but they must be put in the position as an aspiration growth stimulant and the community's initiative as a concrete measure on the development of territory autonomy.

Dear audiences.

Lastly, that the globalization which are overwhelming several countries, implicates toward the whole lines of the livelihood of the communities. So that it needs preparations and appropriate strategy to equalize it, including to increase the skill and the knowledge of HR in managing the SMEs and to enhance the competition power of the SMEs products which have had the comparative competition power. The co-operative is hoped to be one of the alternative choices in facing the liberalization in the economic sector.

To support the above mentioned matters, the government takes the strategy by way of enhancing the affectivities, policies, enhancing access toward the market, information and capital and increasing the quality of the HRs by involving the participation of the communities in developing the SMEs as a consequence of the reality of usefulness.

I do hope that what I had expressed to this seminar could be benefit toward the progress of the nations, especially to the development of Fisheries Co-operatives.

Peace is with you and God's blessings.

Minister of Co-operatives and Small/Medium Enterprises

Alimarwan Hanan

MENTERI KELAUTAN DAN PERIKANAN RI

THE POLICY ON DEVELOPMENT OF MARITIME AND FISHERIES IN THE FRAMEWORK OF DEVELOPING THE COOPERATIVES AND SME

Put forward in the "ICA/ICFO/IKPI Seminar for Promotion of Sustainable Development of Fisheries in Indonesia" March 16, 2004 in Jakarta

By:
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Minister of Maritime and Fisheries

MINISTER OF MARITIME AND FISHERIES
JAKARTA, 2004

I. BACKGROUND

- Economy crisis whipped Indonesia since medio 1997, in the last 3 year, in a macro scale the economy had been recovered.
- Nevertheless, the economy micro (real sector) is still listless, so that the unemployment is still high (± 38 million people) and the number of poor people is still big (± 40 million people). Besides that, the competitive ability of the Indonesian product and service is more and more decreasing.
- So that, it needs revitalization in several economy activities and creating a high competitive ability of the new economic growth resources and absorbing considerable man powers.
- In this case the maritime and fisheries constitute one of the prime mover sectors to recover the nation's economy.
- Most of the fisheries business are still in small and medium scale, so that they need endeavors to make these groups of business useful, until they will be more welfare (they could minimally fulfil their basic necessities).

THE BASIC AND THE URGENT MATTERS OF WHICH INDONESIA HAS TO CARRY OUT

ECONOMIC FIELD :

- Stimulating various sectors (activities) of economy which are able to provide big opportunities for employment and giving prosperity.
- Creating "*Competitive advantages*" based on "*Comparative advantages*" (Natural resources) owned by the Indonesian nation through the application of IPTEK (Science and Technology) and Professional Management.
- The Macro Economy policy in order conducive to the extensively grow of real economic activities and the creation of social equity proportionally.

COMPETITIVE ADVANTAGES/THE ECONOMIC GROWTH RESOURCES OF THE INDONESIAN NATION

Resource-based industries **based on the competitive ability of IPTEK and Professional Management, Justice and Environment insight :**

1. **Maritime Affairs and Fisheries**
2. **Tourism**
3. **Agriculture, Plantation, Horticulture and Animal Husbandry**
4. **Forestry**
5. **Energy and Mineral Resources**

II. THE MAIN REASON
THE MARITIME AND FISHERIES SECTOR AS A PRIME MOVER OF THE NATIONAL DEVELOPMENT

1. Physically the sea constitute a dominant factor with the huge and variously economic potency
   - ¾ of the Indonesian territory are in the form of sea (5,8 million km^2)
   - > 17.500 island (the bigest archipelago country)
   - 81.000 km of a longest tropic coastal line or the second longest (after Canada) in the world.
   - The extent of Indonesian territories :
     - Western end (Sabang) – East (Merauke) = London – Bagdad
     - North End (Satal isl.) – Selatan (Rote isl.) = Germany – Algiers
2. The more and more increase of the world popuiation and the awareness about the healthier fish nutrient, making intelligent and making strong, the demand of Maritime and Fisheries products will be more and more increasing.

THE MAIN REASON

continued...

3. The maritime industry creates high "*backward and forward – linkage industries*"
4. Most of the maritime resources are "*renewable resources*" → the basic of sustainable economic development.
5. Most of the activities of Maritime and Fisheries are found at the coastal area and small islands, so that it could help problems on urbanization and "*brain drain* ".
6. With the control and the law enforcement of sovereignty at the sea → defence and security and the sovereignty of of the territory would be guaranteed
7. Social – Culturally, returning back to focus to sea,it means "*reinventions*" of the Indonesia supremacy in the past
8. "*Bench marking*" with other countries

SEVERAL ADVANCED AND PROSPEROUS COUNTRIES/NATIONS ARE CAUSED BY THEIR FISHERIES AND MARITIME SECTOR :

1. ICELAND
   - ≈ GNP/Capita = US$ 26.000
   - ≈ GNP/Capita USA = US$ 24.000
   - ≈ GNP/Capita Indonesia = US$ 400
   - ≈ 70% of goods and export services are in the form of fisheries products
   - ≈ 65% GDP are coming from the fisheries sector
2. NORWEGIA
   - ≈ GNP/Capita = US$ 30.000/year
   - ≈ The contribution of fisheries sector toward the GDP = 25%
   - ≈ The contribution of oil & natural gas sector toward the GDP = 40%
   - ≈ Export of Salmon fish = US$ 2 billion/year

continued...

3. CHINA

- ≈ The waters broadness 503 thousand km^2 or 8,8 % of the Indonesian waters broadness
- ≈ The total fisheries productions 41 million tons
- ≈ The sea fish catches produce 15 million tons
- ≈ The mariculture produce 11 million tons
- ≈ The sea fresh water fish cultures produce 15 million tons
- ≈ The portion of fish cultures, inland as well as sea reached 60% of the total production
- ≈ The productions value of fisheries reached US $ 34 billion

continued...

4. THAILAND

- ≈ The length of coastal line = 2.600 km
- ≈ The broadness of shrimp ponds = 80.000 hectare
- ≈ The production of shrimps in year 2000 = 300.000 tons vs. Indonesia (120.000 tons)
- ≈ The fisheries export value = US $ 4,2 billion vs Indonesia (US $ 1,76 billion) (1998)

5. PHILIPINES

- ≈ The number of islands = 7.200
- ≈ The sea weed export value in 1998 = US $ 700 million vs. Indonesia (US $ 45 million)
- ≈ 60% of the *raw materials* of sea weed are imported from Indonesia (Trubus, December 1999)

The comparison of the maritime economic contribution from various countries

No.	Name of Country	The length of coastal area (km)	Maritime sector contribution toward GDP	
			(%)	Value (US $)
1.	South Korea	2.713	37	147 Billion (1992)
2.	Rep.People of China	32.000	48,4	1 17.350 illion (1999)
3.	Indonesia	81.000	20	28 Billion (1988)
4.	Japan	34.386	54	21.400 Billion (1992)

Source : Dutton and Hotta (1996) and Xin (1999)

III. THE POTENCY OF MARITIME ECONOMIC DEVELOPMENT (AT THE COASTAL AND SEA AREA) BASED ON THE KIND OF NATURAL RESOURCES

A. *RENEWABLE RESOURCES*
- Fish and other biotics
- Mangrove forest
- Etc.
- Coral reefs
- Small islands

B. *NON-RENEWABLE RESOURCES*
- Oil and Natural Gas
- Raw material of mine and other minerals

C. MARITIME ENERGY
- Waves
- OTEC (*Ocean Thermal Energy Conversion*)
- Rise and fall of tides
- Wind

D. *ENVIRONMENTAL SERVICES*
- Transportation and Communication Media
- Beauty of Nature
- Climate Control
- Cesspool absorbent

THE POTENCY OF MARITIME ECONOMIC DEVELOPMENT IN ACCORDANCE WITH THE ACTIVITIES SECTOR

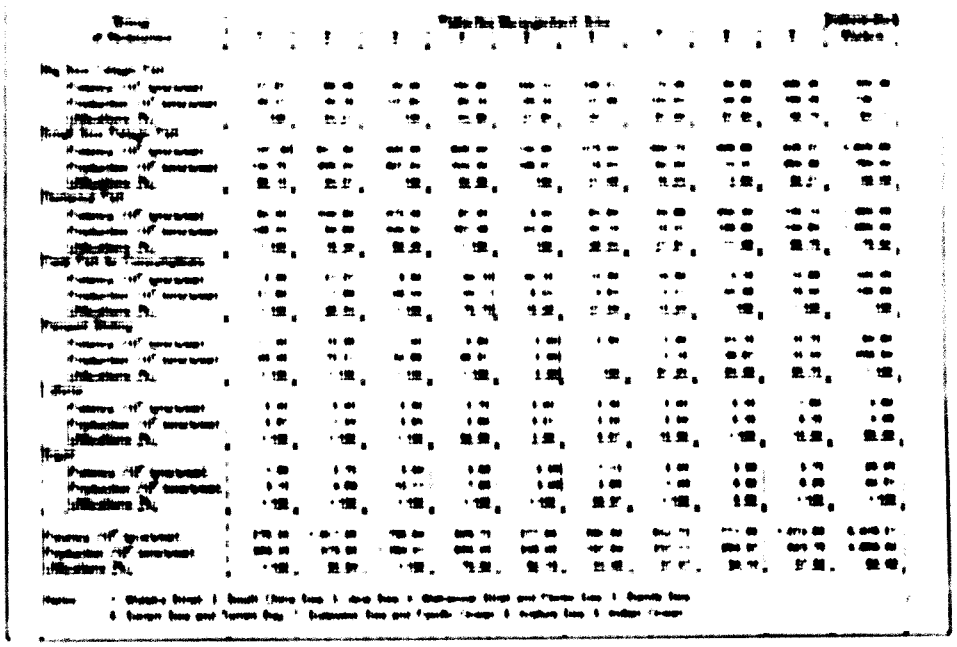
1. Culture Fisheries
2. Capture Fisheries
3. Fisheries Product Processing Industry
4. Biotechnology Industry
5. Maritime and Coastal Tourism
6. Mining and Energy
7. Sea Communication
8. Maritime industry : dock yard, boat engines, fishing gears, sea and coastal building, etc.
9. Coastal forest (mangrove)
10. Small Islands
11. Valuable articles

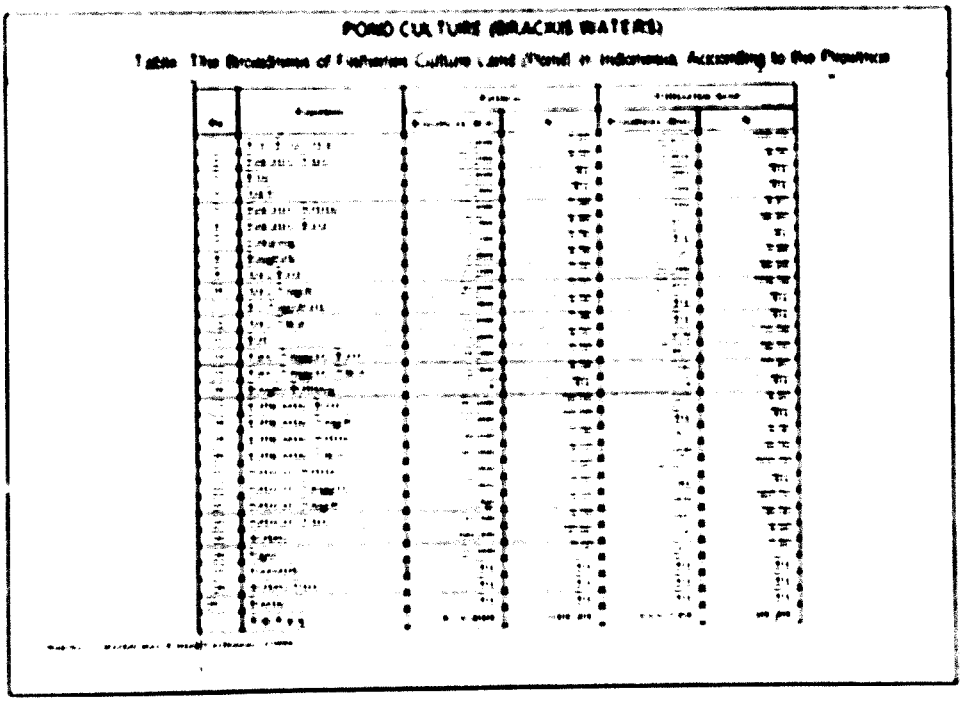
THE DOMAIN OF EKONOMY OF THE MINISTRY OF MARITIME AND FISHERIES

1. Culture Fisheries
2. Capture Fisheries
3. Fisheries Produce Processing Industry
4. Maritime/Waters Biotechnology Industry
5. Utilizations of deep sea water
6. Small Islands
7. Valuable Articles
8. Sea Sand
9. National Sea Park and Other Sea Conservation area (in cooperation with the Ministry of Forestry)
10. Salt Industry (in cooperation with the Ministry of Industrial and Trade Affairs)

CAPTURE FISHERIES AT SEA

- Maximum Sustainable Yields (MSY) = 6,4 million tons/year
- Catching quantity allowable = 5,12 million tons/year (80% MSY)
- The present total catch = 4 million tons (2001)
- Opportunity = ± 1,12-2,4 million tons/year




POND CULTURE (BRACKISH WATERS)

THE ECONOMIC POTENCY OF SHRIMP POND BUSINESS

- If the 500.000 ha could be carried on, with the average productivity 2 ton/ha/year
- The national shrimp productions = 1.000.000 ton/year
- The national shrimp export value = 1.000.000 ton/year x US $ 8/kg
  = US $ 8 billion/year.

Notes :

1. Thailand, with coastal line 2.600 km, the production of pond shrimps = 340.000 ton/year
2. The total production of Indonesian pond shrimps = 120.000 ton (year 2000)

Table. The broadness potency of mariculture waters

No	Province	Acreage Potency (ha)
1	NAD	203.350
2	North Sumatera	734.000
3	West Sumatera	128
4	Bengkulu	203.000
5	South Sumatera	2.785.300
6	Riau	1.595
7	Jambi	30
8	Lampung	596.800
9	DKI Jakarta	26.400
10	West Java	743.700
11	Central Java	677.700
12	D.I. Yogyakarta	18.800
13	East Java	640.500
14	Bali	39.200

No	Province	Acreage Potency (ha)
15	West Nusa Tenggara Timur	152.800
16	East Nusa Tenggara Timur	37.500
17	North Sulewesi	143.400
18	South Sulawesi	600.500
19	Central Sulawesi	18.400
20	South is Sulawesi	230.000
21	West Kalimantan	15.520
22	East Kalimantan	6.350
23	Central Kalimantan	3.708.500
24	South Kalimantan	1.962.505
25	Maluku	1.044.100
26	Papua	9.938.100
	TOTAL	***24.528.178***

Source : Directorate General of Culture Fisheries Ministry of Maritime and Fisheries (2002)

MARICULTURE

- Coastal line = 81.000 km
- There are many cove waters and small islands relatively calm and clear.
- Possessing the spread out of coral reef (85.000 km2) the largest in the world.
- The potency of mariculture commodities :
  - Barramundi
  - Groupers
  - Cupped oysters and Blood cockles
  - Sea cucumbers
  - Tiram Mutiara dan Abalone
  - Seaweed
  - Sea horse

- From the potency of the mariculture acreage, the productions potency ± 46,73 million ton/year (Puslitbangkan, 1998)
- Until the year 2000 the productions realization = 0.5 million ton (very low!!!)

THE POTENCY OF AQUA CAPTURE FISHERIES

- Based on the access, inland waters is grouped into two : (1). Public waters, and (2). Culture waters.
- Public waters is an open access of the inland waters for examples : river, swamp, lake, and reservoir.
- The largeness of Indonesian public waters = 13,7 million ha (Sarnita, et.al., 1993) with the MSY = 900.000 ton/year (Djajadiredja, et.al., 1982)
- The utilizations level = 400.000 ton (45%) in year 2001
- Malaysia (453.570 ha); Philipines (262.426 ha); and Thailand (4.474.690 ha) (Baluyut, 1983)

THE POTENCY OF AQUA CAPTURE FISHERIES

1. **Public Waters**
   - Lake,
   - Reservoir,
   - River and
   - Swamp.

   Broadness : 13, 7 million/ha
   Potency : 900.000 tons/year
   Value : US $ 1billion
2. **Fresh Water Pond**
   - Irrigation Channel: 3.755.904 ha
   - Waters Area : 375.800 ha

   Production : 805.700 ton/year
3. **Minapadi (Paddy field)**
   - Irrigation Channel: 1.760.827 ha
   - Broadness of land: 880.500 ha

   Production : 233.400 ton/year

   Value : US $ 5,19 billion

Total of Economic Value : US $ 6,19 billion/year

MARITIME BIOTECHNOLOGY

a. Natural Products Extraction (*Bioactive substances*) from sea biotic for industries of : food and beverages, pharmacy and cosmetic.

b. Genetic Engineering

c. Bioremediation of environment pollution

   ≈ Philippines' sea weeds export value = US$ 700 million in 1998 (Terubus, December 1999). Indonesia in the same year only US$ 45 million.

   ≈ 60% of raw materials of sea weeds for Philippines sea weeds industry are imported from Indonesia.

   ≈ USA's export value for maritime biotechnology products = US$ 4 billion in 1996 (World Bank and Sida, 1997)

   ≈ Export value of bioremediation of England in 1996 = ± US$ 2 billion (ODA, 1997)

Table. General Estimation of Economic Value of Fisheries Resources Potency

Commodity	Potency Everlasting (1000 ton)	Value Estimation (US$ million)
Perikanan Tangkap di Laut	5.006	15.101
Inland openwater capture	356	1.068
Marineculture	46.700	46.700
Brackish water pond fisheries	1.000	10.000
Aqua culture fisheries	1.039	5.195
Maritime biotechnology potency *)	-	4.000
Total + Biotechnology	-	82.064

IV. MARKET OPPORTUNITY OF FISHERIES COMMODITIES AND WATERS' BIOTECHNOLOGY PRODUCTS

MARKET OPPORTUNITY OF EXPORT

Keep on increased :

- ✓ The world population increased
- ✓ Human awareness toward fish nutrient/*sea food* for healt, intelligent and strength.
- ✓ The more and more expanding of the pharmaceutical industry, cosmetic and food and beverages which mostly of their raw materials are made from waters biotic.
- ✓ Anti shrimp dumping by US toward Thailand, RPC, India, Vietnam, Ecuador and Brazil.

The distinations of export of Indonesian fisheries products and its volume percentage :

- ✓ Japan (40 %)
- ✓ USA (15 %)
- ✓ Europe & the other countries (20 %)
- ✓ Rep. People of China (10 %)
- ✓ Hongkong (5 %)
- ✓ Singapore (5 %)
- ✓ Other countries (5 %)

DOMESTIC MARKET OPPORTUNITY

1. Fisheries Products :
   - ✓ The provider of foodstuff of animal protein
   - ✓ The raw material of fish flour processing industry
2. Total Indonesian Population (2002):
   ± 220 million people
3. Consumption per capita (2002) :
   22 kg/capita
4. Total consumption level (2002) :
   4,8 million ton

V. PORTRAIT OF THE PAST MARITIME DEVELOPMENT

- **The economic contribution relatively still small.**
- **The springing up of practices of *illegal fishing* and *illegal sea sand mining.***
- **Part of the area and maritime resources experience serious environmental damage.**
- **The big part of fisheries and coastal communities are still poor, only 25% of them are wealthy and prosperous (*dualistic economy*).**

VI. THE OBSTACLES AND PROBLEMS

1. The lowness of the nation awareness concerning the important meaning and the strategic value of the maritime resources toward the national economic development (the nation prosperity) since the era of colonization up to the era of New Order.
2. The attention, the knowledge(insight) and control and application of the maritime science and technology are still low too.
3. The internal problem of the maritime field : HR is relatively low, infrastructure and the facility of development is limited and the community's backwardness.

BUDGET OF THE DEVELOPMENT OF MARITIME AND FISHERIES IN THE YEAR 1999 – 2004 (MILLION RUPIAH)

Details	1999	2000	2001	2002	2003	2004*)	Increase (% /thn)
Development	70,000	763,570	647,952	984,961	1,496,812	1,901,297	28.96
- Pure Rupiah	70,000	96,961	498,700	700,000	1,310,000	1,360,000	133.41
- PHLN		666,609	149,252	284,961	186,812	235,827	1,28
- DAK		.....	.....	.....	.....	305,470	
Rutin		16,390	81,250	113,620	105,640	119,692	110.46
Total	70,000	779,960	729,202	1,098,581	1,602,452	2,020,989	29.03

*) Planned

Notes : During PJP I till medio PJP II total bank credit alocated for fisheries business was only about 0,02% from the total credit.

THE COMPARISON OF THE FISHERIES PORT CONDITION IN JAPAN, THAILAND, AND INDONESIA

1. Japan
   - Coastal line : 34.000 km
   - Total of ports : 3.000 buah
   - Ratio : 1 ports/ 11 km coastal length
2. Thailand
   - Coastal line : 2.600 km
   - Total of ports : 52 buah
   - Ratio : 1 ports / 50 km coastal length
3. Indonesia
   - Coastal line : 81.000 km
   - Total of ports : 18 buah (5 PPS and 13 PPN)
   - Ratio : 1 ports /4.500 km coastal length

THE STRUCTURE OF FISHING VESSELS, 1999-2002

In : Unit

DETAILS	1999	2000	2001 *)	2002 **)	Increase (%)
NON MOTORIZED VESSELS	241.517	230.867	228.730	225.890	-2,19
VESSELS/MOTORIZED	214.413	218.691	221.600	225.440	1,69
- OUTBOARD MOTOR	124.043	121.022	122.027	123.170	-0,22
- MOTORIZED VESSEL	90.370	97.669	99.573	102.270	4,24
= < 5 GT	57.768	65.897	66.680	67.720	5,61
= 5-10 GT	18.850	19.460	19.570	19.570	1,47
= 10-20 GT	6.792	5.599	5.810	5.810	-3,22
= 20-30 GT	3.439	2.974	3.340	3.340	0,56
= 30-50 GT	1.516	1.543	781	1.140	-0,55
= 50-100 GT	1.038	1.129	1.602	2.030	25,79
= 100-200 GT	756	741	1.295	1.680	34,17
= >200 GT	211	326	495	520	37,13
TOTAL	455.930	449.558	450.330	451.330	-0,33

Notes :
**) Provisional Figure **) Estimate Figure*
Motorized Vessel 30 GT up = 1,2% of the whole Fisheries Fleets

4. Makro economic policy (***political economy***) not conducive yet:
   a. **The limitedness of capital and investation sources.**
   b. **The certainty of low.**
   c. **The safety in business.**
   d. **Tax and other quotations.**
   e. **Manpowers matters relatively less productive but there are many demands (demonstration).**
   f. **Most of the enterpreneurs are still having the quality as "*rent seeker*" (profit hunter and less pay attention toward the nation progress)**
   g. **Euphoria on Territorial Autonomy**
   h. **Unfair Globalization (*free trade*) inflicted a lost upon the developing country.**
   i. **The "*sectoral leakage*" and "*regional Leakage*" occurred from the sectors and regions of coastal and sea to the other sectors and region.**

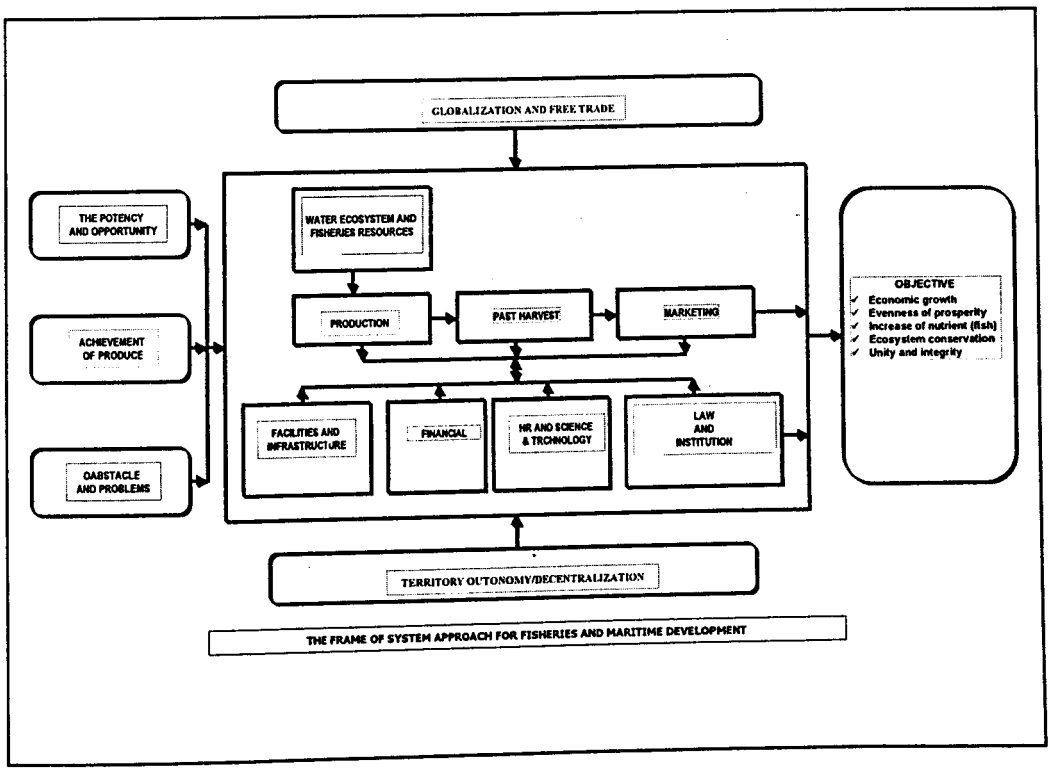
VII. VISION, MISSION AND STRATEGY OF MARITIME AND FISHERIES DEVELOPMENT

VISION ON MARITIME AND FISHERIES DEVELOPMENT

The Maritime and Fisheries resource as a progress and prosperity resource of the Indonesian Nation, justly and sustainable

MISSION ON MARITIME AND FISHERIES DEVELOPMENT

1. The increase of welfare of the fishers communities fish culturers and other Maritime's Communities (*social equity*)
2. The increase of role of fisheries and maritime sectors as an economic growth resource (*economic growth*)
3. The maintenance and the increase of support capacity and the environtment quality of fresh water, coastal area, small island and sea (*environmental sustainability*)
4. The increase of the nation intelligence and health through the increase of fish consumption
5. The increase of maritime role as a nation integrationist and the increase of the maritime culture of Indonesian nations



VIII. WORKING PROGRAM OF MARITIME AND FISHERIES SECTORS

1) MAKING EFFICIENT USE OF FISHERS COMMUNITIES, FISH CULTURERS AND OTHER COASTAL COMMUNITIES
2) INCREASING THE ECONOMIC GROWTH OF MARITIME AND FISHERIES SECTORS
3) REHABILITATION AND CONSERVATION OF MARITIME AND FISHERIES RESOURCES AND ITS ECOSYSTEM
4) INCREASING THE MARITIME ROLE AS THE NATION INTERGRITY AND MARITIME CULTURE
5) DEVELOPING THE TECHNOLOGY AND INFORMATION SYSTEM
6) DEVELOPING OF HR AND STRENGTHEN THE INSTITUTION
7) HARMONIZATION OF MANAGING THE MARITIME AND FISHERIES RESOURCES IN CONNECTION WITH TERRITORY A`UTONOMY
8) DEVELOPING OF REGIONAL AND INTERNATIONAL COOPERATION

THE STRATEGY OF THE DEVELOPMENT OF MARITIME AND FISHERIES SECTORS

1. **Science and Technology Base**
   - Conventional (modern) ST.
   - Traditional Knowledge and Wisdom
2. **Conservation Base**
3. **Integrated Approach**
   - Production – Processing – Marketing
   - Intersectoral
4. **Community Base (based UKM)**
5. **A close cooperation between government and stakeholders**

IX. THE MAIN ACTIVITIES OF MARITIME AND FISHERIES DEVELOPMENT IN 2000-2004

1. Stabilization and Harmonization of the institution
2. Stabilization and Harmonization of Law System
3. Optimalization of Capture Fisheries Development Sustainably
4. Optimalization of Culture Fisheries Development Sustainably
5. Strengthen and developing of Fisheries Produce Processing Industry
6. Developing of Maritime and Fisheries Biotechnology Industry
7. The strengthen and the development of fisheries Product Marketing
8. The sustainably development of small islands and based on community
9. Making efficient use of non-biological resources and Maritime Environment service
10. Space restructuring environment damage control and Maritime Fisheries resources conservation

IX. THE MAIN ACTIVITY OF MARITIME AND FISHERIES DEVELOPMENT 2000-2004

11. Supervising and Law enforcement
12. Strengthen and Development of Science and technology
13. Strengthen and Development of H.R
14. Strengthen and Development of Information System
15. Regional and International Cooperation
16. Superiority and integrated activities
17. GERBANG MINA BAHARI (National Movement on the development of Maritime and Fisheries)

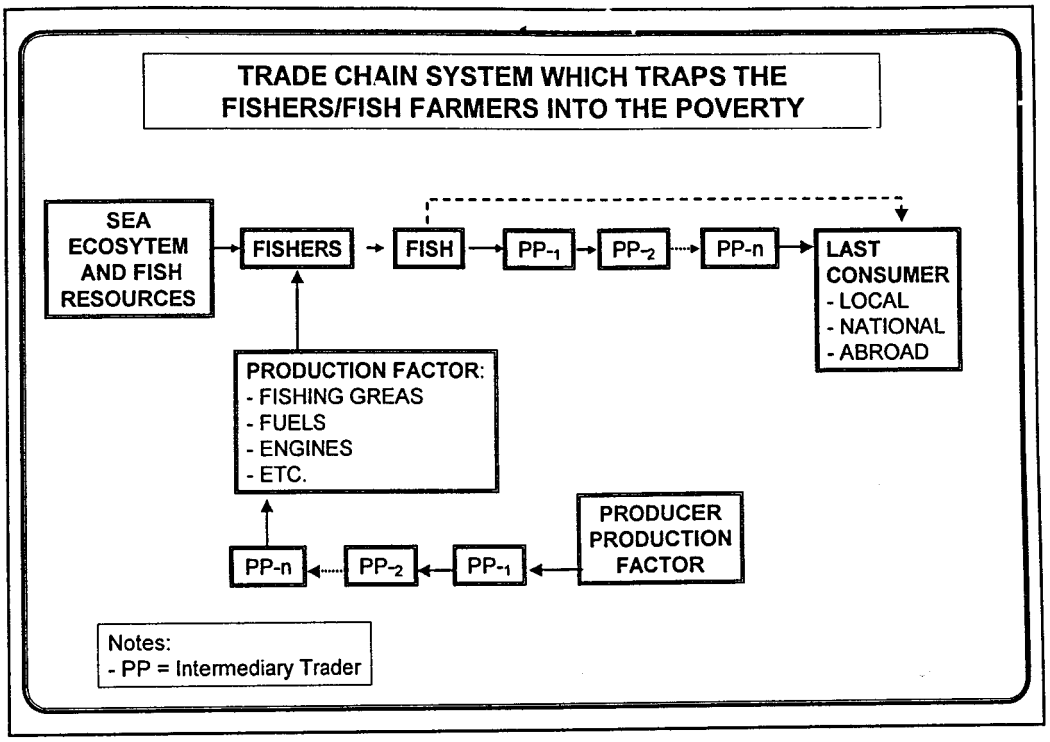
3. Optimalization of Sustainably Development of Capture Fisheries

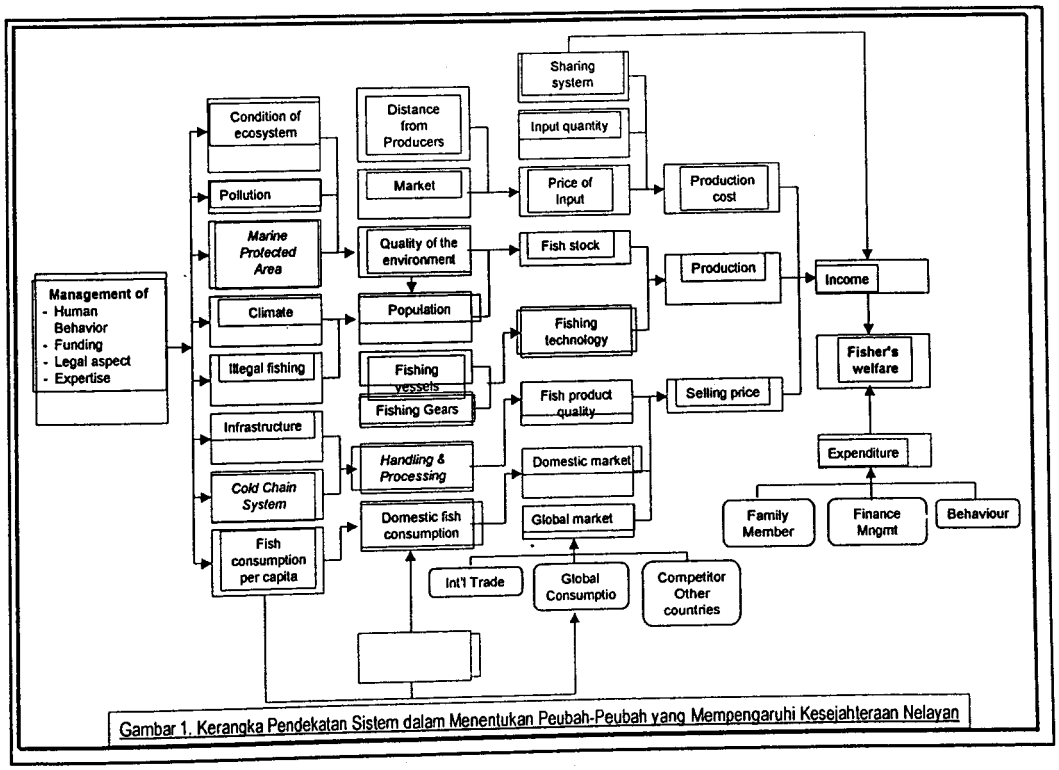
1. Issue and Problems

1. Most of the poverty (65%) are fishers
2. *Illegal, Unregulated and Unreported* (IUU) *Fishing Practices*
3. *Over fishing* at several *fishing grounds* for several fish stocks and *under fishing* at other *fishing grounds* for other fish stocks
4. The damage and/or the decrease of the broadness of coastal and sea ecosystem area (especially mangrove, estuaria, daydream field and coral reef) caused by pollution, *destructive fishing practices* (explosive material, poison etc), and convention becomes "*man-made ecosystem*"
5. The marginal position of the fishers in "Trade Chain" at the time purchasing production input (boat, boat engine, fishing gears, food stuff, and other logistic necessities) relatively expensive. On the contrary, at the time selling fishing produce, far cheaper than the market price (at the last consumer) and in general occurred "*market glut*".
6. Small opportunity of fishing produce of the fishers :

   Indonesia = 6,4 million ton/year = 4 kg
   4 million fishers ? = day

   Malaysia = 1,2 million ton/year = 330 kg
   = 30,000 fishers = day
7. The existence of fish at a certain *fishing ground* has the quality of seasonal and sea condition (wave, wind etc) causing the fishers go for fishing only about 3-9 months per year?
8. Sharecropping system between vessel's crew and vessel's owner is not equitable yet?
9. Fishers settlement has not existed yet in the space restructuring of region as well as in the *coastal cities* such as DKI, Surabaya, Makassar, Medan, and Manado.
10. The productive economic asset (capital, technology, management, infrastructure, information, etc) has not or very little been present together with the fishers community and coastal area.





Gambar 1. Kerangka Pendekatan Sistem dalam Menentukan Peubah-Peubah yang Mempengaruhi Kesejahteraan Nelayan

2. Policy and Program

1. To optimalize fishery resource fit to MSY in every *fishing ground* (fishing rate ≤ 80% MSY).
   a. Relocate fishers from "*overfishing*" area into "*underfishing*" area; aquaculture (marine, brackishwater and freshwater); off farm business and trading; supporting industry e.g. dockyard, fishing gears factory and fishing engines.
   b. Modernize fishing vessels via fisheries cooperative, partnership system and private. It is hoped in 2007? There is no more "*licensing system*" for foreign fishers.
   c. Revitalize and develop fishing infrastructure.
2. To eliminate IUU *fishing practices* and other illegal fees through creating fisheries law, coastal area law and marine law; MCS, special court for fisheries, etc.
3. To eliminate *destructive fishing practices* through "*public awareness*" program, *sustainable alternative livelihood*, and law enforcement. COREMAP, MCRMP, are also included.
4. To develop fisheries cooperatives which are able to supply production input with good quality and competitive price; to process and market fish catch production of fishers with considerable price.

5. Location options: Fishing ports in Belawan, Bungus, Padang Bay/Bengkulu, Fisheries cooperative Fajar Sidik/ Belanakan, Dadap, Gebang Mekar, Fishing ports in Pekalongan, Cilacap, Juwana/Pati, Lamongan, and Paotere/Makasar
6. To empower fishers and coastal community by improving performance and synergizing programs e.g. PEMP, KUB (Koperasi Usaha Bersama), MCRMP, COREMAP, etc. with focus on 3 efforts/development:
   a. Business : availability of productive assets such as: Kredit Mina Mandiri, Swamitra Mina, BPR Nelayan & Pesisir, Kredit SUP, SPDN/SPBM nelayan, etc; and other alternatives of businesses in hardship season.
   b. Human resource : Education, training and monitoring to increase entrepreneurship, family finance management, etc.
   c. Natural Re-sources : Housing and its facility in accordance with conservation, pollution management etc.
7. To develop and repair infrastructure of fishing ports and fish landing facility.
8. To execute some program: OPTIKAPI (Optimalize fish catching efforts), OPTILANPI (Optimalize fish auction system), OPTIHANKAN (Optimalize fish processing system), OPTISARKAN (Optimalize fish market system).

ESTIMATION OF OPTIMAL NUMBER OF FISHERS IN COASTAL/MARINE AREAS IN INDONESIA

No.	Coastal/Marine Areas	FO	Fe
1	Malaka Strait	99.579	224.766
2	South China sea	361.191	144.454
3	Java sea	246.872	530.360
4	Makassar strait and Flores sea	244.265	383.048
5	Banda sea	66.902	55.772
6	Seram-Tomini sea	171.843	135.255
7	Sulawesi and Pasifik sea	173.910	142.828
8	Arafuru sea	152.669	63.345
9	Hindia sea	444.935	375.213
		1.962.166	**2.055.041**

IO = The optimal Income of Fisherman (Rp/Family)
FO = The optimal number of fisherman (TPR/IO)
Fe = The existing number of Fisherman
MSYi = Potential Yield of SDI i
Hi = Price of SDI i

$$Fo = \frac{\sum_{I=1}^{n} MSYi \times Hi}{Io}$$

4. Optimal Sustainable Development of Aquaculture Fisheries

1. Issue and Problems

1. Policy on the increasing of aquaculture production in 2006 of 4 million ton.
2. The decreasing of shrimp ponds productivity caused by bacteria and viruses, water pollution, social characters of fish farmers etc. since 1992.
3. Threatening of fail production of fish farmers in shrimp pond caused by viruses vaname and rostris.
4. High cost production of aquaculture (low efficiency) due to high price of the shrimp food; poor management of the fish farmers in 5 (five) fields: (1) Breeding technique, (2) Shrimp food and nutrition, (3) Fish viruses, (4) Water and soil treatment, and (5) pond engineering.
5. Mari culture is still in infant stage. Reflected from the low production of 0.6 million ton in 2002, compared to the potential production of 46.7 million ton/year.
6. Lack of species to be cultured, it is estimated only 20 species: (1) grouper, (2) snapper, (3) baronang, (4) kerang hijau, (5) kerang mutiara, (6) sea weed, (7) milk fish, (8) rajungan, (9) crab, (10) Tiger shrimp, (11) vaname shrimp, (12) rostris shrimp, (13) artemia, (14) golden fish, (15) nila, (16) cat fish, (17) gourame; from thousands of species in Indonesia.

7. Revitalization of shrimp pond business via nucleus plasma partnership system, once had been successful in many region such as in Karawang, Lampung, Jawai West Kalimantan, Waworada Bima West Nusatenggara.
8. There are many constraints of aquaculture facility (irigation-drainage, hatchery, etc.).
9. Strong influence from international market and importers to Indonesia to implement *sustainable/responsible aquaculture practices*, such as eco labeling, antibiotic, mangrove (*green belt*), etc.

2. Policy and Program

1. Revitalize aquaculture damaged locations and regions such as in Aceh, north coast of Java and coastal region in south Sulawesi.
   a. Option-1:
      - To implement non intensive technology for tiger shrimp culture and the estimated production is around 200 kg – 1.000 kg/ha/year.
      - To change the species from shrimp into other fishes such as milkfish, gobia, polyculture and others.

b. Option-2:
   - To decrease the aquaculture area which is fit to the environment.
   - Redesign and re-lay out, develop green-belt area.
   - To implement sustainable aquaculture practices into non-intensive technology, semi-intensive, and intensive (*close-system*/recirculation) by implementing post farming aquaculture professionally.
2. To create new shrimp ponds (extensification), for tiger shrimp and vaname.

   By implementing Option-2 number-1:
3. To increase the performance of main species aquaculture such as shrimp, sea-weed, grouper, milkfish, pearl) via INBUDKAN (Intensification, Aquaculture) , Integrated Rural Aquaculture, Fisheries-Based Aquaculture, etc.
4. Diversification, aquaculture business in fresh water and brackish water.
5. To develop Mari culture.
6. To strengthen and develop fish food industry.

7. To develop integrated sea-weed industry.
8. Culture-base Fisheries
9. Integrated Aquaculture

5. To strengthen Fish Processing Industry

1. Issue and Problems

1. Trend of unfair free trade via tariff barrier and non tariff barrier
2. Market access to export fish products is limited and not powerful.
3. Domestic market of fish products does not develop well (22 kg fish consumption per capita per year)
4. Marketing and distributing infrastructure of fish products still lack behind, under sanitation and hygienic standard.
5. Under capacity and collapse many of fish processing industry due to shortage of fish raw material and other causes.

2. Policy and Program

1. Revitalize fish canning industry, fish mill, cold storage, etc, in order to be more efficient and more competitive ability.
2. Product development and diversification .
3. To develop and operate hygienic markets
4. To supply transportation means of fishery products from producer location into consumer (market) such as air-conditioned box vehicle, air and sea transportation
5. To campaign and socialize fish consumption efforts.
6. To finalize the development and operation of exotic fish raiser.
7. To establish the Board of commodities, such as : shrimp, tuna, sea-weeds, fish mill and pearls.
8. To strengthen and develop fish products export

FISHERY DEVELOPMENT PROGRAM THROUGH THE ROLE OF FISHERIES COOPERATIVE

1. PEMP (Economic empowerment of coastal community)
2. Capital availability
   - ❖ Kredit Mina Mandiri (Bank Mandiri)
   - ❖ Swamitra Mina (Bank Bukopin, Ministry of Coops and SMEs)
   - ❖ BPR Nelayan dan Pesisir (PNM)
   - ❖ To utilize a part of profit of state-owned companies
   - ❖ Investment development of SMEs in Fisheries sector through cooperation with the Ministry of Coops and SMEs in order to utilize Government Bonds (3,1 thousand billions Rupiahs)
3. KUB (Kelompok Usaha Bersama) Perikanan Tangkap
4. INBUDKAN (Intensification of aquaculture) : shrimp, milkfish, grouper, sea-weeds etc.
5. To establish fuel stations for fishing vessels in 1260 locations.

continued...

FISHERY DEVELOPMENT PROGRAM THROUGH THE ROLE OF FISHERIES COOPERATIVE

6. To build corporate culture in fishers and fish farmers businesses.
7. To develop fisheries cooperatives which are able to supply production input with good quality and competitive price; to process and market fish catch production of fishers with considerable price.
8. To develop and improve facility in fisher community, cooperate with ministry of Kimpraswil and other donors
9. To develop fisheries facility: fishing ports, irrigation, drainage, training center, schools, etc.

NUMBERS OF COASTAL AND SMALL ISLAND COMMUNITY ECONOMIC EMPOWERING ACTIVITY

YEAR	NUMBER			
	CITY/REGION	VILLAGE	KMP	MEMBER
2000	26	117	526	3.210
2001	125	543	2.330	25.609
2002	90	615	2.422	22.411
2003	126	504 *)	3.249 *)	24.559 *)
2004	159	**)	**)	**)

Keterangan :
*) temporary figures
**) Not yet executed activity
KMP = Group of recipient

COASTAL COMMUNITY ECONOMIC EMPOWERING (PEMP)

Group of Recipient of PEMP:

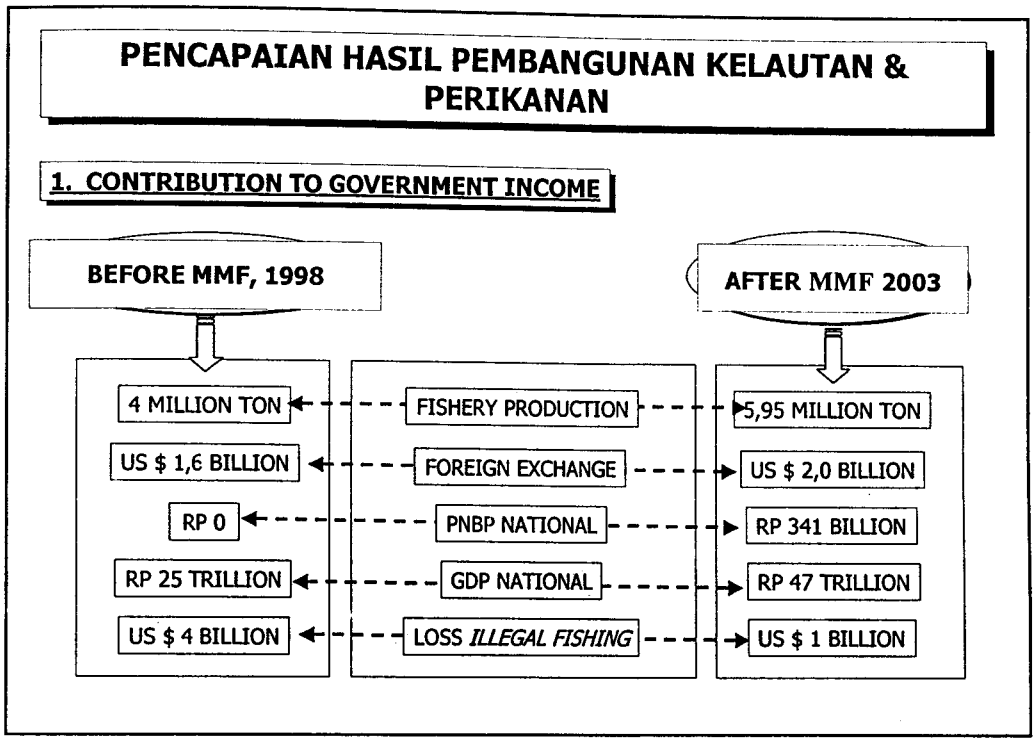
a. Fishers with outboard engine vessel max power of 15 PK
b. Fishers without engine in the vessels
c. Workers in fishing vessels
d. Small scale fish traders and Female Fishers
e. Small scale of fish processed producers
f. Small scale fish farmers
g. Small scale operators of fisheries supporting business.

RECAPITULATION OF PEMP DATA IN 2002

No.	Location	KMP Income (Rp)			Remark
		Before PEMP	After PEMP	Increase (%)	
1	Kota Sibolga	1,500,000	1,650,000	10.00	March 03
2	Nias	325,000	450,000	38.46	April 03
3	Pesisir Selatan	350,000	550,000	57.14	April 03
4	Agam	687,500	837,500	21.82	April 03
5	Bangka	867,500	1,792,500	106.63	April 03
6	Sukabumi	485,000	715,000	47.42	April 03
7	Karawang	2,152,000	2,562,500	19.08	April 03
8	Serang	53,650	54,000	0.65	April 03
9	Kendal	165,000	210,000	27.27	April 03
10	Gunung Kidul	560,000	660,000	17.86	March 03
11	Tuban	887,500	1,267,500	42.82	April 03
12	Pasuruan	591,700	700,000	18.30	April 03
13	Situbondo	437,500	443,750	1.43	May 03
14	Klungkung	540,000	808,000	49.63	April 03
15	Buleleng	400,000	700,000	75.00	March 03
16	Lombok Barat	200,000	350,000	75.00	April 03
17	Bima	563,750	10,030,750	1679.29	April 03
18	Kota Samarinda	1,130,000	1,400,000	23.89	April 03
19	Jeneponto	433,300	666,600	53.84	April 03
20	Majene	113,170	155,270	37.20	May 03
21	Selayar	110,585	180,170	62.92	April 03
Total		**12,553,155**	**26,183,540**	**108.58**	

X. RESULT OF MARINE AND FISHERY DEVELOPMENT 2000-2003

1. Gross Domestic Product Sub Sector of Fishery
2. Development of Fisheries Production
3. Development of Export and Trade Balance of Fishery Products
4. Development of Fishers and Fish Farmers
5. Development of Fishing vessels.
6. Development of Aquaculture area.
7. Development of Fish Consumption.
8. Non-tax Government Income (PNBP) from (Fishery).
9. Rescue Government Deficit
10. Fisher and Coastal Community Income



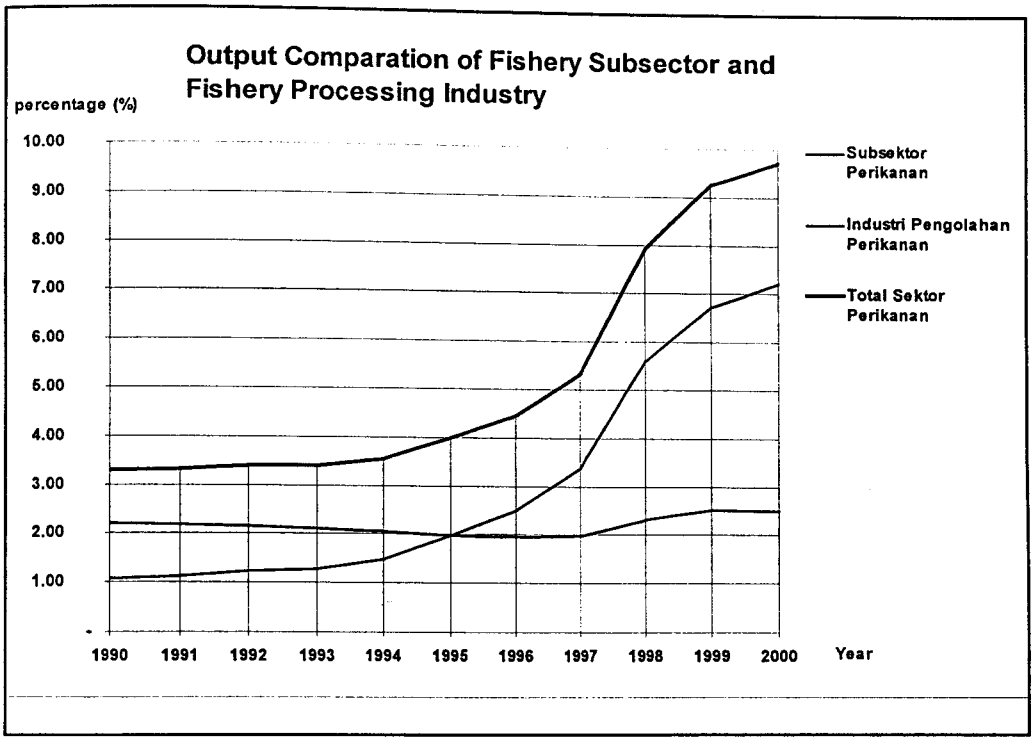
GDP OF FISHERY AND NATIONAL GDP, 1999 - 2002

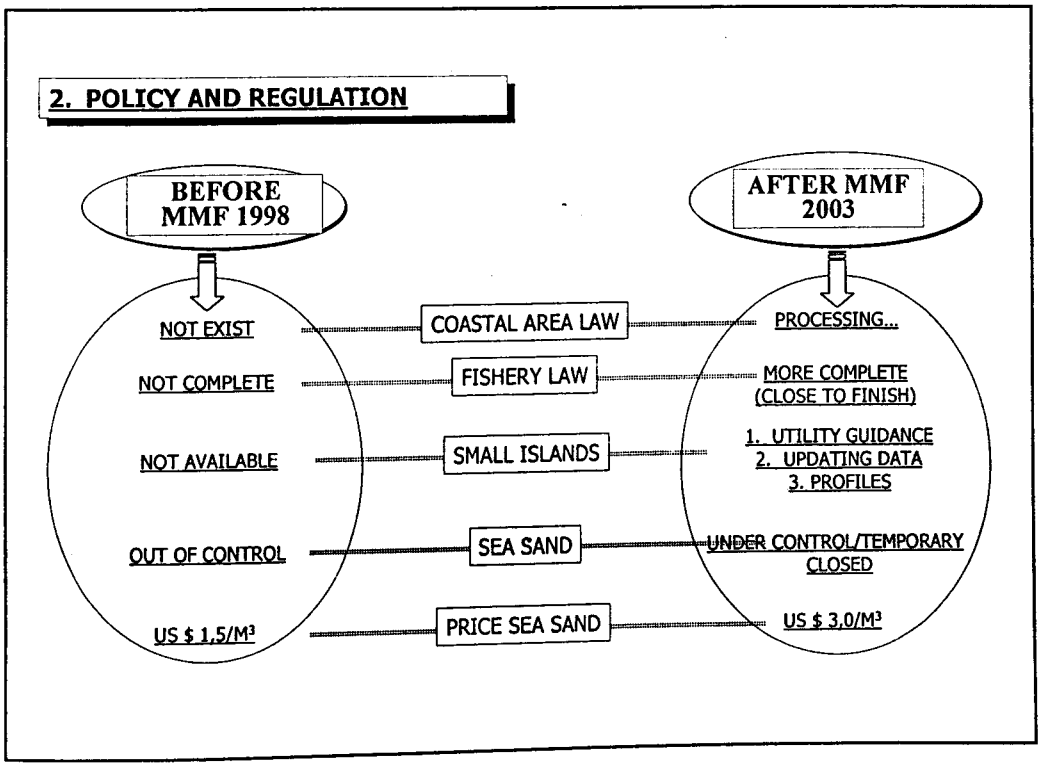
Unit : Rp billion

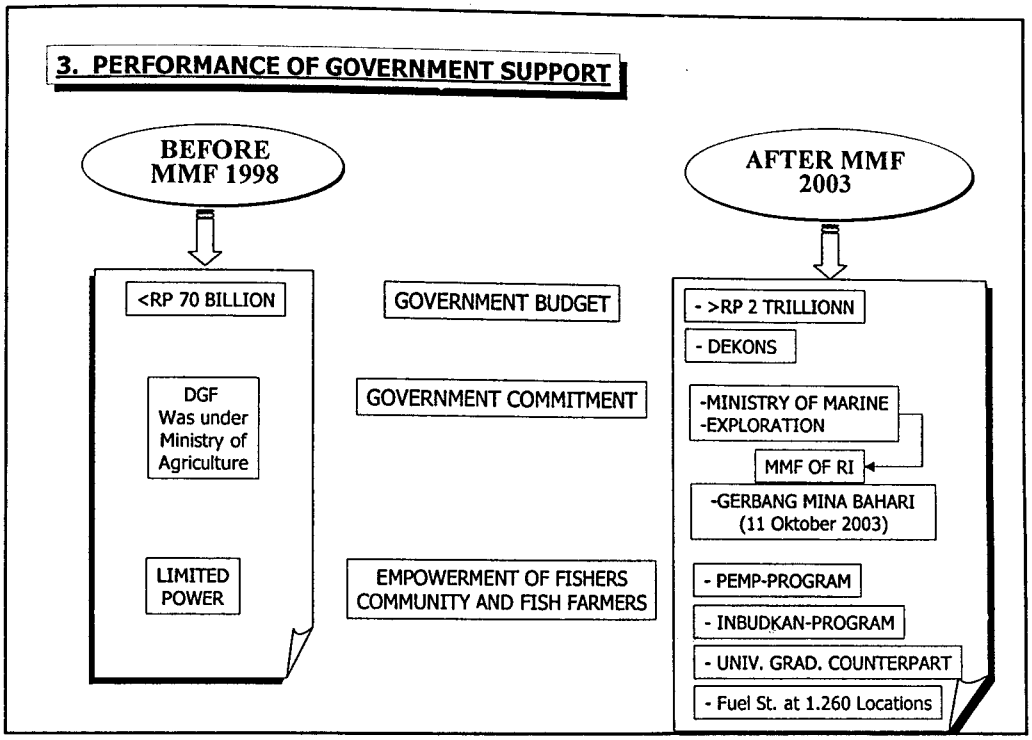
Item	1999	2000	2001	2002 *)	2003 **)	Increase (%) 1999-2002
FISHERY	**25.932,80**	**29.509,70**	**36.654,80**	**46.610,30**	**11.890,70**	**21,72**
ANIMAL HUSB.	23.761,20	27.034,60	30.438,20	34.808,90	9.066,50	13,58
PERKEBUNAN	35.966,50	33.744,70	37.491,20	41.919,50	7,257,90	5,58
TAN. PANGAN	116.222.50	112.661,20	126.065,20	141.137,40	44.591,30	6,39
FORESTRY	13.803,80	14.947,80	15.648,30	16.848,90	4.826,80	6,88
NATIONAL GDP	1.099.731,60	1.264.918,70	1.449.398,10	1.610.011,60	77.633,30	13,56

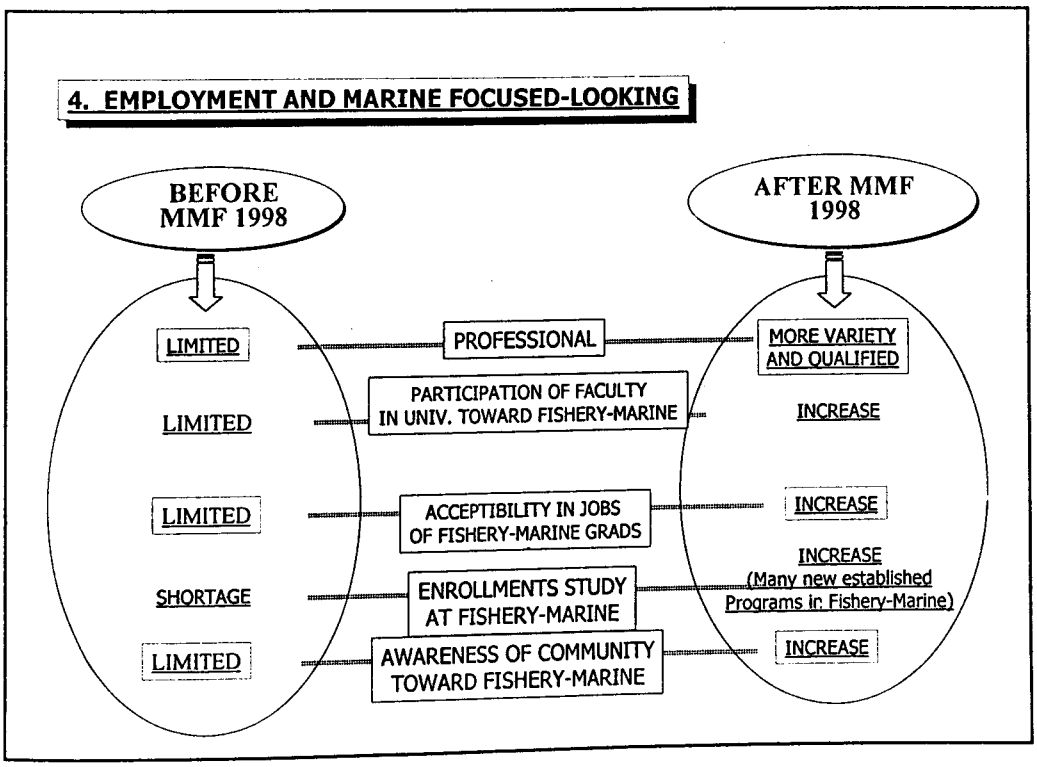
Source : Center Statistical Bureau
*Keterangan : *) temporary figures*
***) figures up to Three-monthly I*

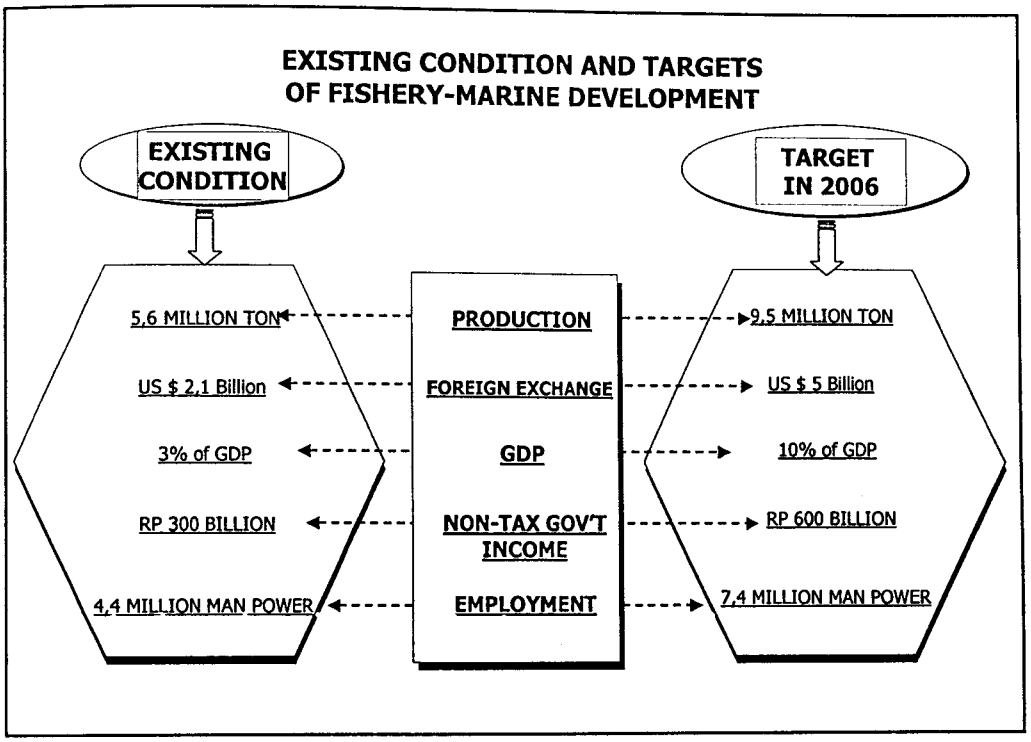
Contribution of Fishery products to national GDPI = 2,9% (2002)
= 2,1% (2001)


Output Comparation of Fishery Subsector and Fishery Processing Industry
percentage (%)
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
-
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
Year
Subsektor Perikanan
Industri Pengolahan Perikanan
Total Sektor Perikanan


2. POLICY AND REGULATION
BEFORE MMF 1998
AFTER MMF 2003
NOT EXIST
NOT COMPLETE
NOT AVAILABLE
OUT OF CONTROL
US $ 1,5/M3
COASTAL AREA LAW
FISHERY LAW
SMALL ISLANDS
SEA SAND
PRICE SEA SAND
PROCESSING...
MORE COMPLETE (CLOSE TO FINISH)
1. UTILITY GUIDANCE
2. UPDATING DATA
3. PROFILES
UNDER CONTROL/TEMPORARY CLOSED
US $ 3,0/M3


3. PERFORMANCE OF GOVERNMENT SUPPORT
BEFORE MMF 1998
AFTER MMF 2003
<RP 70 BILLION
GOVERNMENT BUDGET
- >RP 2 TRILLIONN
- DEKONS
DGF Was under Ministry of Agriculture
GOVERNMENT COMMITMENT
-MINISTRY OF MARINE -EXPLORATION
MMF OF RI
-GERBANG MINA BAHARI (11 Oktober 2003)
LIMITED POWER
EMPOWERMENT OF FISHERS COMMUNITY AND FISH FARMERS
- PEMP-PROGRAM
- INBUDKAN-PROGRAM
- UNIV. GRAD. COUNTERPART
- Fuel St. at 1.260 Locations


4. EMPLOYMENT AND MARINE FOCUSED-LOOKING
BEFORE MMF 1998
AFTER MMF 1998
LIMITED
PROFESSIONAL
MORE VARIETY AND QUALIFIED
LIMITED
PARTICIPATION OF FACULTY IN UNIV. TOWARD FISHERY-MARINE
INCREASE
LIMITED
ACCEPTIBILITY IN JOBS OF FISHERY-MARINE GRADS
INCREASE
INCREASE
SHORTAGE
ENROLLMENTS STUDY AT FISHERY-MARINE
(Many new established Programs in Fishery-Marine)
LIMITED
AWARENESS OF COMMUNITY TOWARD FISHERY-MARINE
INCREASE



FISH CONSUMPTION, 2000-2003

ITEM	2000	2001	2002*)	2003*)	INCREASE (%)
TOTAL (ton)	4.506,93	4.687,64	4.841,55	5.308,68	5,65
PER CAPITA (kg/Cap/YEAR)	21,57	22,47	22,84	24,67	4,61

Note :
**) Temporary Figures **) Estimated Figures*

SUBJECT OF GMB

ACCELERATION OF DEVELOPMENT OF SUSTAINABLE MARINE AND FISHERY FOR NATIONAL PROSPERITY

MISSION, GOAL AND TARGET

MISSION :

Acceleration of Implemented Program Development in Marine and Fishery in order to Alleviate Economic crisis toward Indonesian prosperity. This is done through utilization of Marine and Fishery resource optimally, sustainable, and justice.

GOAL

1) **To increase Fishers, Fish Farmers and other coastal community welfare,**
2) **To increase Foreign exchange and the contribution to GDP.**
3) **To create employment and opportunity**
4) **To increase fish consumption and supply raw material for local industry.**
5) **To maintain sustainability of natural resources and the ecosystem.**

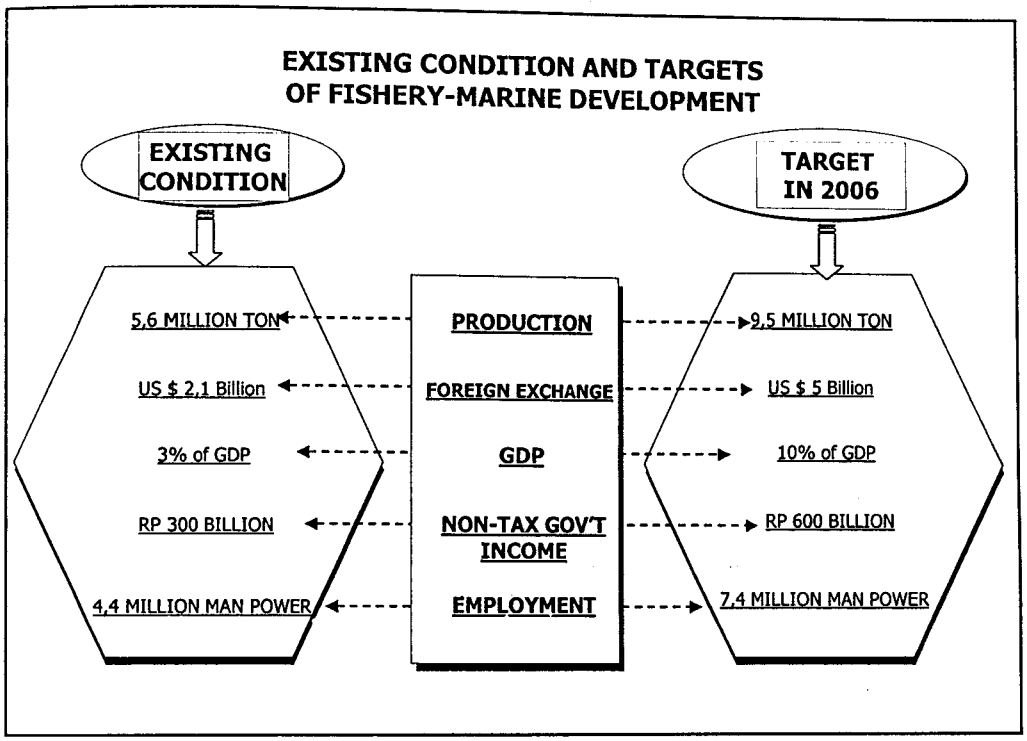
TARGETS

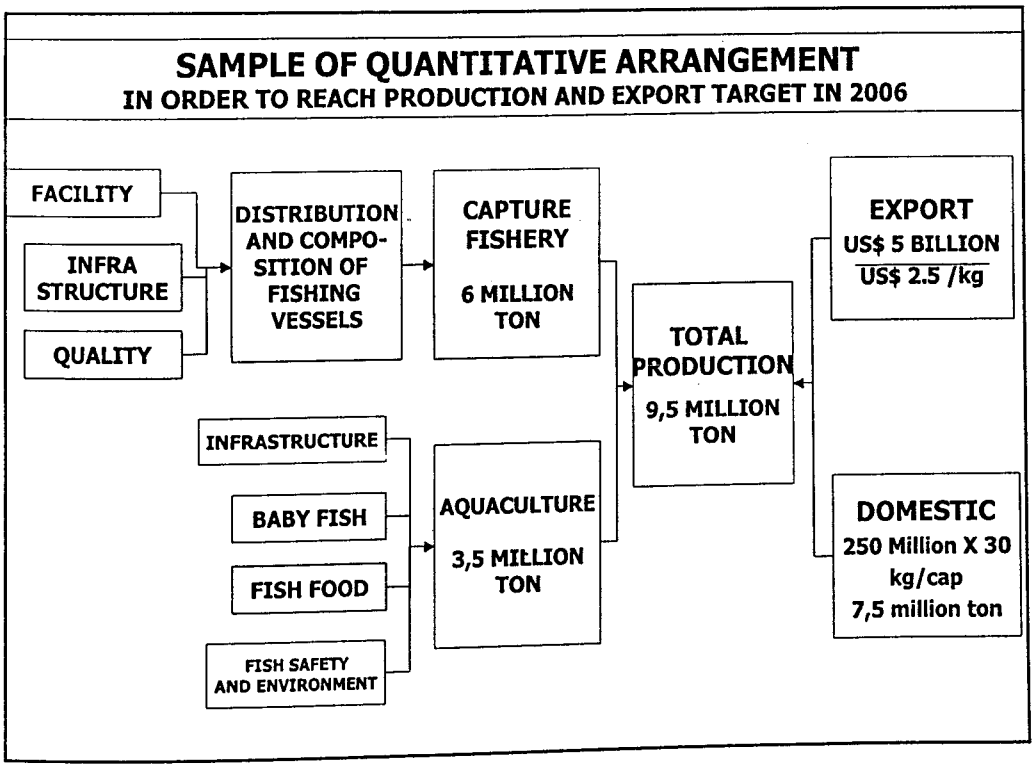
A. SCENARIO WITHOUT MOVEMENT (BUSINESS AS USUAL) IN 2006

1. Fishery Production : 6,6 million ton
2. Foreign exchange from Fishery : US $ 3 billion
3. Contribution to National GDP : 5 %
4. Absorption of man power : 6,6 million people
5. Increase of Fish Consumption/capita : 25 kg/cap/year
6. Foreign exchange from sea transport. : US $ 10 billion
7. Foreign exchange from marine tourism : US $ 1,5 billion

B. SCENARIO WITH MOVEMENT (2006)

1. Fishery Production : 9,5 million ton
2. Foreign exchange from Fishery : US $ 5 billion
3. Contribution to National GDP : 10 %
4. Absorption of man power : 7,4 million people
5. Increase of Fish Consumption/capita : 30 kg/capita/year
6. Foreign exchange from sea transport. : US $ 10 billion
7. Foreign exchange from marine tourism : US $ 5 billion


EXISTING CONDITION AND TARGETS OF FISHERY-MARINE DEVELOPMENT
EXISTING CONDITION
TARGET IN 2006
5,6 MILLION TON
PRODUCTION
9,5 MILLION TON
US $ 2,1 Billion
FOREIGN EXCHANGE
US $ 5 Billion
3% of GDP
GDP
10% of GDP
RP 300 BILLION
NON-TAX GOV'T INCOME
RP 600 BILLION
4,4 MILLION MAN POWER
EMPLOYMENT
7,4 MILLION MAN POWER

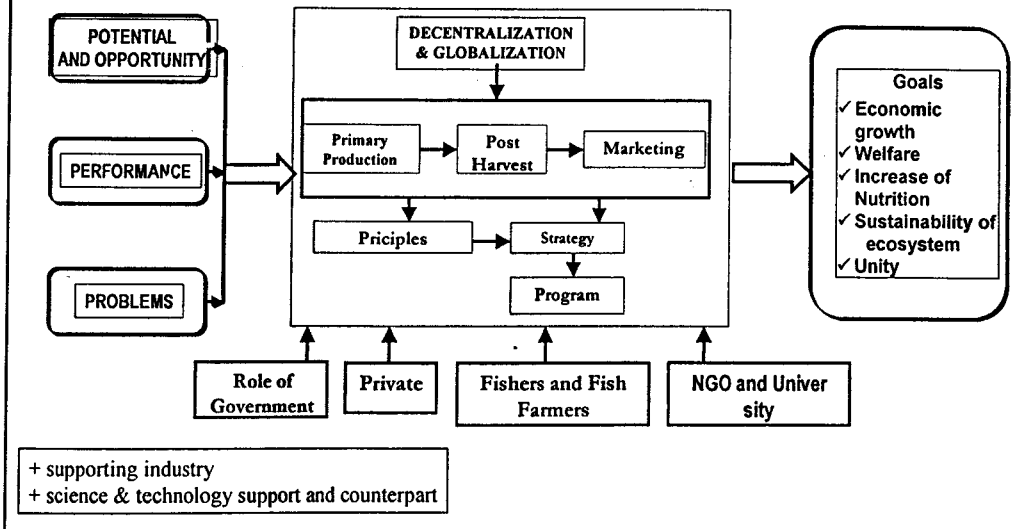

SAMPLE OF QUANTITATIVE ARRANGEMENT
IN ORDER TO REACH PRODUCTION AND EXPORT TARGET IN 2006
FACILITY
INFRA STRUCTURE
QUALITY
DISTRIBUTION AND COMPO-SITION OF FISHING VESSELS
CAPTURE FISHERY
6 MILLION TON
INFRASTRUCTURE
BABY FISH
FISH FOOD
FISH SAFETY AND ENVIRONMENT
AQUACULTURE
3,5 MILLION TON
TOTAL PRODUCTION
9,5 MILLION TON
EXPORT
US$ 5 BILLION
US$ 2.5 /kg
DOMESTIC
250 Million X 30 kg/cap
7,5 million ton

COMPONENTS OF G.M.B.

- PRESIDENTIAL REGULATION :
  1. CONDUSIVE MACRO POLICY FOR MARINE AND FISHERY BUSINESS *(CAPTURE FISHERY, AQUACULTURE AND PROCESSING INDUSTRY, MARINE BIOTECHNOLOGY INDUSTRY, MARINE TOURISM AND SEA TRANSPORTATION)* :

     (1) SOFT LOAN, (2) SECURITY AND LEGAL ASPECT, (3) TATA RUANG, (4) PENGENDALIAN PENCEMARAN, AND (5) DEVELOPMENT OF INFRASTRUCTURE.
  2. GOVERNMENT BUDGET SUPPORT
  3. TARGET ORIENTED TASKS TO HEAD OF LOCAL GOVERNMENT (GOVERNOR, AND MAYOR)
  4. TO ESTABLISH TRAINING AND EDUCATION CENTER AND AVAILABILITY OF PENYULUH IN EVERY REGIONS
  5. STRUCTURE AND JOB-MECHANISME OF ORGANIZATION

SCHEME OF NATIONAL DEVELOPMENT MOVEMENT OF MARINE AND FISHERY



PROGRAM OF MARINE AND FISHERY DEVELOPMENT 2004 - 2009

1. To strengthen program and activity during 2000 -2003.
2. To continue GERBANG MINA BAHARI (GMB)
3. To utilize natural resources of Fishery and marine environment.
4. To keep struggling on the position of marine and fishery as mainstream of national economic development.

XII. CLOSING

COMPARATION BETWEEN DEVELOPING AND DEVELOPED COUNTRIES.

❋ **Not Caused by these factors:**

1. **Age:**
   - India and Egypt are > 2000 years old → developing countries
   - Canada, Australia, New Zealand are 150 years old → Developed countries
2. **Natural Resources**
   - Indonesia is rich of Natural Resources→ developing countries
   - Japan, South Korea, and Singapore are poor of Natural Resources→ developed countries
   - Switzerland does not have chocolate plantation → developed country producing top quality of chocolate in the world
3. **Race**
   - Immigrant (non-productive in origin countries) → become productive power in European developed countries.
   - Executives from rich countries show no significant intellectual difference to executives from poor countries

WHAT IS THE DIFFERENCE BETWEEN POOR COUNTRIES AND RICH COUNTRIES ?

- The difference is the attitude of the people, framed along the years by the education & the culture.
- The great majority of people in developed (rich) countries apply the following principles in their lives:
  1. Ethics, as a basic principle
  2. Integrity
  3. Responsibility
  4. Respect to the laws & rules
  5. Respect to the rights of other citizens
  6. Work loving
  7. Strive for saving & investment
  8. Will of super action
  9. Punctuality

Ask not what your country can do for you, Ask what can you do for your country *(John F. Kennedy, President USA, 1961, Died at Dallas, Texas 1963)*

- Therefore, every element of the country should:
  - Work harder, Think smarter, and contribute their best for the shake of the nation
  - To be unity and create brotherhood as a single body.

MAIN CONDITION OF DEVELOPING COUNTRY IN ORDER TO BE DEVELOPED COUNTRY

Change from "*soft state*" to "*hard state*"

(Gunar Myrdal, 1968)

IN POLITIC, SECURITY AND NATIONAL WELFARE

- To create political stability, social disciplines, law enforcement and business safety.
- To increase more good people, professionals, hard workers, good manners persons, parallel with decreasing bad people (*source of moral hazards*).

PART III
PRESENTATIONS AND DISCUSSIONS

Management of fishery resources and trade in fishery products

Kuniyuki Miyahara
Managing Director
JF-Zengyoren

I. Changes in the global environment relative to fisheries

1. Decrease in fishery resources

(1) Level of fisheries stocks and production

Fisheries production reflects the productive capacity of natural resources. Concerning this relationship, we often use the phrase: "The ocean is like a bank. Fishes are our deposit." This implies that fishery products are like bank interests gained from natural resources, which we are allowed to use. Fishers in Japan have continued to implement community-based fisheries management such as by promoting abstention from fishing activities among themselves who share same fish stocks during certain period of time. For this purpose, they have tried best as they could to share the information such as on ecology, quantity of catch, and the current stock levels of target fish stocks.

On the extreme opposite end of these efforts are such activities as poaching in violation of the relevant provisions of the Fisheries Law such as on fishing seasons, areas and fish size limit, illegal operations using prohibited fishing gears, and increasing fishing practices by illegal, unregulated and unreported (IUU) fishing by those who do not participate in international agreements and arrangements.

Further, there are cases, when no appropriate fisheries regulations are in place and no information required for ensuring appropriate levels of stocks are made available due to delays in resource studies, that we do not have measures with which to prevent resources from being overexploited.

The present worldwide demand for fishery products is strong and firm: 37% of fishery products produced in the world are exported. Trade liberalization of fishery products has been being discussed at the WTO in its DDA (Doha Development Agenda) sessions. However, if fishing is encouraged, competing for higher catch in order to win the export race, in response to the international demand, without paying any consideration to sustainable use of resources, overexploitation will certain to accelerate at a far faster pace than at present. This is the environment surrounding fishery resources of the world at present.

(2) World production and trade of fishery products

According to the statistics of the United Nations Food and Agriculture Organization (FAO), the world's total production of capture fisheries and aquaculture in 2001 amounted to 130 million ton. (see Fig.1)

This was an increase of 2.4 million ton over the previous year. Of this, marine capture fisheries plus aquaculture production was 83.6 million ton, freshwater fisheries 6.7 million ton, and freshwater aquaculture 37.8 million ton.

See Fig 2 for capture fisheries production by country and Fig. 3 for aquaculture production by country.

In the area of capture fisheries production, it seems that the world's resources have been nearly fully exploited to their maximum limit: its production has leveled off after the 1990s. On the contrary, the production of aquaculture has continued to increase.

According to FAO's Report on Trade of World Fishery Products, the total world's trade in fishery products shows an increasing trend year after year, and in 2001 it amounted to US$55,864 million in terms of value. FAO says 30 to 40% of fishery products produced worldwide are being exported, constituting one of the major trade merchandize.

Of these, major product items that constitute top group include shrimps, squid, mackerel, skipjack, tunas and salmon.

FAO also observed that 47% of the world's major fishery resources have been fully exploited, and 28% either over-exploited, depleted or recovering from depletion. (Recovery usually implies drastic and long-lasting reductions in fishing pressure and/or the adoption of other management measures to remove conditions that contributed to the stock's over-exploitation and depletion.) These figures if combined, indicate that more than three quarters of major stocks have been exploited exceeding the maximum limit. (Fig.4)

2. Progress of trade liberalization and its impact

Trade in fishery products is influenced by large-scale development of fishing grounds and fish stocks, and changes in the international financial and economic environment, such as fluctuation of exchange rate and progress in the reduction of tariffs under the General Agreement on Tariffs and Trade (GATT) and so forth. In response to these developments, there have been changes in percentage composition of fish species exported, in terms of value and quantity, reflecting as such, and in the production of aquaculture, which has increased to accomodate the changing situations in the market. This is what is happening at present.

Figs. 5 and 6 show the trend of export and import of fishery products by country. In terms of net import value, Japan was the number one importer in 2000. It is noted here that in 2000, the total amount of import of fishery products in Japan was 15,513 million US$. This was more than the total value of domestic fisheries production (= marine fisheries and aquaculture production in Japan), namely, 1,761 billion Yen, equivalent to 16,307 million US $ (exchange rate: 108 Yen/US$). (Fig.7).

The following may be attributable as the reasons for why such a huge import has taken place in Japan:

First, the average import tariff on fishery products in Japan had been successively reduced to as low as 4 % as a result of each round of GATT negotiations; and

Second, the exchange rate of Yen has continued to be appreciated against US $. Thus, these favorable conditions for import in Japan, or the other way around, export from the standpoint of exporters, contributed to the overall increase of fishery products in Japan. (Fig.8)

II. Diverse impacts of trade in fishery products

1. Social impact in importing countries – a case in Japan.

Increase in imports of fishery products gives various impacts to importing countries. Examples in Japan are as follows:

(1) Decline in self-sufficiency rate

In Japan where large quantities of fishery products are imported, imports increased drastically under the aforementioned circumstances. Therefore, Japan's self-sufficiency rate in fishery products has declined to 53%, and, in calorie base, to as low as 40% including agricultural products.

This naturally caused concern among the general public. According to a consumer opinion poll conducted by the Japanese government, 80% of the respondents replied they had uneasiness over the reality of the present calorie-based food self-sufficiency rate remaining at 40%. They indicated that, in order to improve this situation in the future, they agreed with the proposition that domestic production and supply should be promoted and increased. Making a public education to promote reducing food left-overs should be included in such movement.

To coincide with this development, there have been wide-ranging media reports on suspension of imports such as of some vegetable produced in a large scale abroad, in which residual agricultural chemicals were found in quantities largely surpassing the standard levels. Also reported were such incidents as follows:

- antibiotics found in imported aquacultured eels;
- import ban imposed on beef from the United States and Canada in the wake of outbreak of BSE (bovine spongiform encephalopathy); and
- outbreaks of exotic viruses which largely infected cultured carps in Japan, dealing a heavy blow to the carp culture industry.

All of these incidents have been widely reported. It seems that such incidents have contributed to the outcome of the opinion poll, demonstrating the concern and uneasiness that the general consumers have.

(2) Decline in fish prices in Japan and its impact on domestic fisheries

In Japan, the import of fishery products continued to increase to such an extent that its value reached a level almost equivalent to that of domestic production. In fish landing areas, of the 33 major species, the prices decreased in 26 species during the years from 1991 to 2001, while in 7 species the prices increased. Increased prices reflect decreased catch.

The decreased prices of fish result in reduced income of the fishing households and their economy. In 1991, the average income of fishing households, which use fishing vessels of less than 10 gross ton in size (which is a representative group of vessels, accounting for 95% of the total fishing households in Japan), was 1 % higher that that of ordinary salaried workers households. However, in 2001, after a bit more than 10 years, this relationship became reversed: the former became 4 % lower than the latter, or 5 % decrease when compared to that of 1991.

For this reason, during the same period, the number of fishers decreased 30 % from 370,000 to 260,000.

This means, from the standpoint of fishers, that in the future when the demand and supply situation changes, and increased supply from domestic sources rendered essential, shortage of skilled labor, namely fishers, might ensue. If that is the case, it may result in reduced landings even if resources are abundant.

Reduced vitality in fisheries and fishing communities is also a source of our serious concern since it might affect environmental conservation of national land and sustenance of societies.

Urbanization, or development of cities and towns, often occurs in certain limited areas of national land in a concentrated way.

In each of hilly, mountainous areas, which accounts for higher percentage of national land areas, as well as in flat land areas, and coastal areas, there are communities, namely, mountainous communities, agricultural communities and fishing communities. It should be pointed out that in the fishing communities,

which are located in geographically disadvantaged areas, in particular, coastal fisheries and aquaculture constitute major source of income to the villagers, generating and providing employment opportunities, though in small scale. They account for important position in the local fishing economies.

As reported by the United Nations Environmental Program (UNEP) and other various institutions, it is essential for us to ensure sustenance of fishing communities, which in most cases consist of small-scale fisheries. For this purpose, it is necessary for us to boil various arguments down to enable gradual shift to, and promotion of, community-based fisheries management and trade liberalization of fishery products in a gradual manner that does not run to too much extremities to enable sustainability of fisheries resources.

(3) Possible loss of multiple roles and functions fisheries and fishing communities

Fisheries and fishing communities have been playing various roles and functions (what is often termed as "multi-functionality") including not only supply of fishery products to the people through fisheries production activities and providing people with employment opportunities, but also the following tangible and intangible benefit:

- development of diversified culture based on the traditional and local natural features;
- conservation of natural environment;
- cooperation to maritime rescue operations and national border patrol, and so forth.

Specifically, the cooperation of fishing communities to the country's maritime rescue operations and national border surveillance activities has been valuable because of the nationwide network of fisheries cooperative associations.

However, there are cases wherein such multi-functionality has been lost have been reported, for example, as follows:

- Environmental degradation

  Beach cleaning activities by residents of fishing communities slows down and the environment is adversely affected, if the population in the fishing communities decreases. Often, we see quite a lot of wastes drifted onto the beaches and being left abandoned away from the nearest fishing communities;

- Waste of money

  Seaweed such as Ulva species become rotten after being drifted onto the beaches. Such beached seaweed are collected, removed and disposed by using public funds. However, fishers and residents of fishing communities collected and marketed them for human consumption.

- Weakened support to the government's activities of maritime rescue operations and national border surveillance

  In certain areas of Japan, maritime rescue operations as well as national border surveillance by the government have become weakened because the number of fishers decreased (due to poor business affected by fishery products import) which management difficulties etc, which led to the overall

These examples above are apparently a loss in terms of social benefit .Who in the world, should be the party to cover such cost ?

(4) Impact on fishery resources and fishing ground environment

i) Impact to exporting countries

As stated in the foregoing, sustainable utilization of natural resources is the essence of fisheries. Therefore, either for domestic consumption or export, adequate management of the resources should be ensured in fisheries. At least, efforts for this goal should be made.

However, implementation of resource management and enforcement is often inadequate in many fish exporting countries. In addition, in those countries not much studies have been made, and information required for management of fisheries resources are often in shortage. Thus, there are many cases of rampant poaching and violation to fisheries regulations.

If, in addition to these, fishing operations directed at increasing exports are intensified, attracted by the potential short-term profit, under the current trend of trade liberalization, the pressure to the stocks will surely increase and may lead to serious consequences, irreparable in terms of medium and long-term perspectives.

The depletion of haddock (Melanogrammuus aeglefinus) in the eastern Atlantic fishing grounds and the drastic decline of cod in the EU waters have both seriously affected seafood supply and employment security in the areas concerned.

Further, we see many areas of abandoned farm lands in some of the Southeast countries where prawns had once been extensively cultured. Mangrove tree areas were turned to prawn culture ponds by felling the trees. However, the prawn farmers were obliged to pull out from the business because of the outbreaks of diseases. As a result, the prawn culture ponds have been left abandoned in the form of dried out salty land, unfit for agriculture: This is a typical example of environmental degradation vividly depicting the failure of short-sightedness, a result which shows what will wait for the action for quick money. This could happen anywhere.

ii) Impact to importing countries

Fisheries resource management requires large amount of money, money and efforts for coordination of interest among fishers. Thus, the products produced without such costs can be sold at lower prices, and compared to the former, become stronger in terms of competitiveness in the international market. This is simply not fair. Any government should be responsible and implement fisheries resource management.

In recent years, bilateral negotiations such as FTAs (Free Trade Agreements) and EPAs (Economic Partnership Agreements) have been increasingly promoted.

However, in some countries where they share same fish stocks in the waters contiguous to the neighboring countries, the negotiations involve various complex factors, and are not so easy. If import tariff is eliminated and/or reduced in one of such countries, the countries sharing the same species in the same fishing ground may likely to intensify their export-oriented fishing activities. This will then, it is feared, not only lead to over-fishing and depletion of resources in such areas, but also adversely affect fair competition to the importing country (countries) sharing the same species/stocks wherein much efforts have been (or are) paid to fisheries resource management such as by TAC.

III. Resource management in Japan

1. Resource management of offshore fisheries (management of pelagic fish caught in large quantity, or "mass-caught fish")

Except for fish species designated under the TAC system, resource management is carried out by what is called "limited access" system in Japan.

In offshore fisheries, fishing effort is controlled by limited access: roughly speaking, large scale fishing vessels are controlled by the central government, and medium scale vessels by the prefectural government in such a way that issuance of licenses be limited to meet the level of stocks by species and by fishing area, depending upon the fishing areas and the number of vessels be limited should are by way of number of licenses issued by and : the central government being responsible for large scale fishing vessels and the prefectural government for medium scale vessels.

In the "mass-caught fish" species, the central government manages the resources by way of TAC (total allowable catch) regulations.

Both the central and prefectural governments set out various regulations including, among others, such fisheries regulations as, for example, fishing area, fishing period, size limit (total length etc) and so forth by gear and by species in order to prevent over-fishing from happening. In order to ensure effective enforcement of such fisheries management control measures, both the central government and the prefectural government are deploying patrol boats and inspection vessels to deter and control illegal fishing and poaching activities.

Even with these regulatory efforts, stocks in some of the species have decreased in recent years. In order to restore the levels of such stocks, the central government has introduced a stock recovery program. Under this program, the following measures have been implemented:

- restrictions of fishing effort, that is, intensified control of fishing effort (= introduction of TAE system, Total Allowable Effort System) such as by limiting the number of days fishing multiplied by number of fishing vessels;
- payment (by subsidies) of part of the compensation for abstention from fishing; and
- payment (by subsidies) of part of the expenses for replacing fishing gears from those of the existing ones in order to facilitate reduction in the fishing effort, and so forth.

2. Voluntary community-based fisheries resource management movement and its practices in various fish and shellfish species in the coastal fisheries

In Japan, there are approximately 6,500 fishing communities along the coasts where fishing has long been the main industry. Here, a fishing community is defined as the community area where:

- there are more than 10 households, each of which has more than one fisher; and/or
- fishing households account for more than 30 % of the total number of households in the area concerned.

Many of those fishing communities exist in geographically disadvantaged areas, such as on peninsulas, remote islands and so forth. This means that there are fishing communities, on average, one per every 5 kilometer of coastline. Further, there are about 1,500 fisheries cooperative associations (FCAs) in the country. These FCAs are a fishers' organization which has developed in modern era from traditional fishing communities. They (FCAs) are mostly engaged in the management of littoral species etc. so as to, as described before, ensure

development of fisheries to meet the level of stocks, such as by implementation of size limit etc..

FCAs are engaged in various businesses such as, credit (banking), supply, marketing as well as in non-economic activities such as member education, lobbying and guidance etc. In remote, outpost areas, FCAs function as the de fact center of the communities.

There are approximately a total of 460 aquatic animal and plant species on which production statistics is taken by prefectural governments. Every year in Japan, such statistics is published by each prefectural government. The list includes a variety of species including fish, protochordates, echinoderms, mollusks, arthropods, and seaweed.

From olden times, fishers in Japan have made efforts to develop their fishing skills and techniques to obtain as many aquatic species as possible. A variety of methods to use them for human consumption have been developed in many parts of the country, and been handed down from generation to generation. Thus, a diversified "food culture" has continued to this day.

It should be noted that in addition to the public regulations for the management of fisheries by the governments, fishers have been actively engaged themselves in the resource management efforts, further fine-tuning them, often making them more stricter, so as to meet their requirement in their localities to ensure better management results.

Both the governments and FCAs have cooperated in their efforts of fisheries resource management in the past nearly 50 years, and, as a result, according to the latest fisheries census available, we see that there were as many as 1,735 fisheries management organizations (FMOs) in 1998. Management tools used, according to this census included the following:

- voluntary restrictions on fishing, including setting up of prohibited fishing areas, restrictions on fishing period, fishing gears and methods;
- release of less-than-restricted size of fish; and
- protection of parent fish (brood stocks), and so forth.

FCAs, in most cases, act as a core institution to provide assistance to the fishers in their efforts for the promotion of community-based fisheries resource management, to which prefectural government and refectural fisheries research institutes provide necessary advices, as appropriate. They say that today in most of the fishing communities in Japan, there are FMOs implementing community-based fisheries resource management. We JF ZENGYOREN (National Federation of Fisheries Cooperative Associations of Japan) have taken initiatives to mobilize every possible resources to promote, across the nation, the community-based fisheries resource management movement under the slogan of "The ocean is like a bank. Fishes are our deposit.". We will continue these efforts in the future.

3. Other

Today, there are many regional and international fisheries management organizations. Some of them that have been established in order to manage tuna species are but a few of such examples. They are engaged in management of the resources based on international researches. Notably, we have to take necessary measures to get rid of IUU (Illegal, Unreported and Unregulated) fishing vessels

under the current regimes where not necessarily management has been complete with regard to some of the species of which depletion are being worried.

IV. On trade and fisheries

1. Development on issues of trade and fisheries after the UNCED, or the "Earth Summit" held in Rio de Janeiro

The UNCED (United Nations Conference on Development and Environment) was held in Rio de Janeiro, Brazil, in June 1992. It was at this conference that the Rio Declaration incorporating the basic concept of sustainable development was adopted.

In the declaration, it was explicitly stated in Agenda 21 that each State had the obligation to ensure conservation and sustainable utilization of marine living resources on the high seas as well as in its own jurisdictional area.

More specifically, 17.46 and 17.74 of the Agenda 21 say respectively as follows:

<Excerpts from Agenda 21 of the UNCED, Rio de Janeiro, 1992>

1746. States commit themselves to the conservation and sustainable use of marine living resources on the high seas. To this end, it is necessary to:

(a) Develop and increase the potential of marine living resources to meet human nutritional needs, as well as social, economic and development goals;

(b) Maintain or restore populations of marine species at levels that can produce the maximum sustainable yield as qualified by relevant environmental and economic factors, taking into consideration relationships among species;

(c) Promote the development and use of selective fishing gear and practices that minimize waste in the catch of target species and minimize by-catch of non-target species;

(d) Ensure effective monitoring and enforcement with respect to fishing activities;

(e) Protect and restore endangered marine species;

(f) Preserve habitats and other ecologically sensitive areas;

(g) Promote scientific research with respect to the marine living resources in the high seas;

1774. Coastal States, particularly developing countries and States whose economies are overwhelmingly dependent on the exploitation of the marine living resources of their exclusive economic zones, should obtain the full social and economic benefits from sustainable utilization of marine living resources within their exclusive economic zones and other areas under national jurisdiction.

The intent of the Rio Declaration on Sustainable Development was reconfirmed at the outset of the declaration adopted at the Johannesburg Summit on Environment held in 2002--10 years after the Rio Conference. The Summit also reconfirmed the importance of reinforcing mutual support in the matters pertaining to the environment and trade.

With regard to trade of fishery products, we think it essential that due considerations are paid to ensuring of environmental conservation and sustainable use of resources. From this standpoint, we think that it is important that we retain the mechanism with which to avoid adverse impacts on these issues. In this respect, I believe that tariff policies and the administration have important roles and functions to play.

Today, the world total population is more than 6 billion. We have more than 800 million people on this globe who are suffering from the shortage of food. Food is the source of our life. Its production tends to be easily influenced by the fluctuation of climate. Further, in recent years, it has been subjected to international trade liberalization as merchandize same as ordinary goods.

To guarantee food supply to the nationals is one of the most important domestic political issues for any nation. In terms of this perspective from the fisheries sector, it is essential that utmost consideration is given to ensuring sustainable use of fisheries resources, and fisheries as well as resource management are substantially institutionalized, based on scientific studies and analyses. The responsibility of the government for ensuring food safety to the nationals in any nation has become ever more important in this age of global food shortage.

2. The Ministerial Declaration of the WTO at Doha (implications on market access negotiations of fishery products from the sustainable use perspective)

In the Ministerial Declaration adopted in Doha, in 2001, it reads as follows:

"We strongly reaffirm our commitment to the objective of sustainable development as stated in the Preamble to the Marrakesh Agreement."

We take this to mean that in the fishery sector, trade liberalization should not come in conflict with sustainable use of resources and conservation of the environment.

Incidentally, it should be noted that the WTO was established, based on the Marrakesh Agreement.

In the actual negotiations at the WTO, extreme views on trade liberalization were put forward, neglecting this sustainable development aspect, in the draft elements of modalities for negotiations on non-agricultural products by Mr. Girard, Chairman of the Market Access Negotiation Group on Non-Agricultural Products.

In order to ensure establishment of trade rules that are acceptable to both fish exporting and importing countries, I think it is absolutely necessary for us to create a negotiation environment prioritizing the need for sustainable use of the resources as our common and basic approach. Other factors such as the state of fisheries vis-à-vis the level of fisheries resources must also be put into due perspective from the objective point of view before such rules are put in place.

3. The two essential points that the Japanese fishing industry has been calling for world's understanding and support

We in the fishing industry of Japan have continued to make our efforts to screen out major issues and policies and measures to be taken in relation to international trade of fishery products through various forums and discussions, bearing the on-going WTO negotiations in mind. In this connection, in order to facilitate having understanding and support to our position concerning desirable policies and measures, we have dispatched our industry delegations to various countries, to the governments and NGOs, and exchanged opinions with them.

What we have stressed all through these activities are the following two points:

- CONSERVATION OF FISHERY RESOURCES AND SUSTAINABLE USE

  According to the FAO, the world's major fishery stocks have been fully or over-exploited. If fishing efforts continue to increase in excess of biologically appropriate, sustainable level, fishery stocks will be depleted, sustainable use of resources rendered impossible, and trade development impeded.

Accordingly, trade rules on fishery products to be established by WTO should be such that would duly contribute to ensuring sustainable use of fishery resources, and thus unilateral trade liberalization without such measures be done away with.

- NEED FOR TAKING EACH COUNTRY'S ACTUAL SITUATIONS OF FISHERIES AND FISHING COMMUNITIES INTO CONSIDERATION

Local communities are the basic social unit for people's living and national existence: to sustain and develop the traditional society of local communities is a very important subject.

In fishing villages and communities, the sustenance of societies can be ensured only when fisheries are kept and developed, and at the same time, fisheries and fishing communities play various roles and functions, including supply of valuable food by appropriate management and utilization of fishery resources and maintenance of oceanic environment in good order etc. .

Accordingly, in drawing up trade rules, the WTO should take full consideration of actual situations of each country so that their fisheries and fishing communities should not be unduly threatened by promotion of global scale trade liberalization.

I think that the above two assertions would also apply to small-scale fisheries in any nation. To give due considerations to these points is a prerequisite condition to which I believe nobody would oppose, before deliberations on the trade of fishery products get started. Consideration of these two points, for instance, to have flexibility taking into account the actual situations of each country in implementing trade liberalization, is required for sustenance and continuation of fisheries and fishing communities.

As a matter of fact, we have received understanding and support to this cause from many NGOs of various countries.

In the years to come, multilateral negotiations at the WTO and bilateral negotiations such as by FTAs and EPAs are expected to gain momentum for trade liberalization. In the WTO, all goods are to be bound under certain modalities of trade, and in that sense, fishery products are no exception.

However, as described in the foregoing, we should always keep in mind the sustainable use of fisheries resources as the most important priority: even if demand for certain species of fish stocks increases, discretion should be made to avoid furthering the fishing efforts so as to avoid over-fishing from happening. It is also very important from the standpoint of food security that in order to ensure transmission of fisheries technologies from generation to generation, business environment is maintained to help keep viability of their business.

That said, in conclusion, I would like to reiterate the following:

- we should not forget that we are one of the parties who are responsible for supply of food to the people, and from this standpoint, we should always keep sustainable use of fisheries resources and environmental conservation in mind;
- utmost considerations be paid to ensuring sustainability of small-scale fisheries and fishing communities on which so many fishers depend their livelihood in so many countries;

I think these should be the rules and principles concerning international trade of fishery products. We should not be unnecessarily subjected to unjustifiable

pressure from world trade liberalization trend that runs counter to these rules and principles. Every country and every fisher, without prejudice to national borders, should pay due respect to them in the 21st century in order to ensure dependable world trade system.

CONCLUSION

WE WANT TRADE RULES THAT ENSURES SUSTAINABLE USE OF FISHERY RESOURCES AND THAT MAKES IT POSSIBLE FOR FISHERIES OF EACH COUNTRY OF THE WORLD TO CONTINUE TO EXIST

1. IN ORDER TO ENSURE CONSERVATION OF FISHERY RESOURCES AND SUSTAINABLE USE

   The world's major fishery stocks have been fully or over-exploited. If the present trend of exploitation continues.

   ↓

   Sustainable use of resources will become impossible, and

   ↓

   Development of trade will be impeded.

   - ❖ Accordingly, fishery products trade rules should be made as such that would duly contribute to ensuring sustainable use of fishery resources.

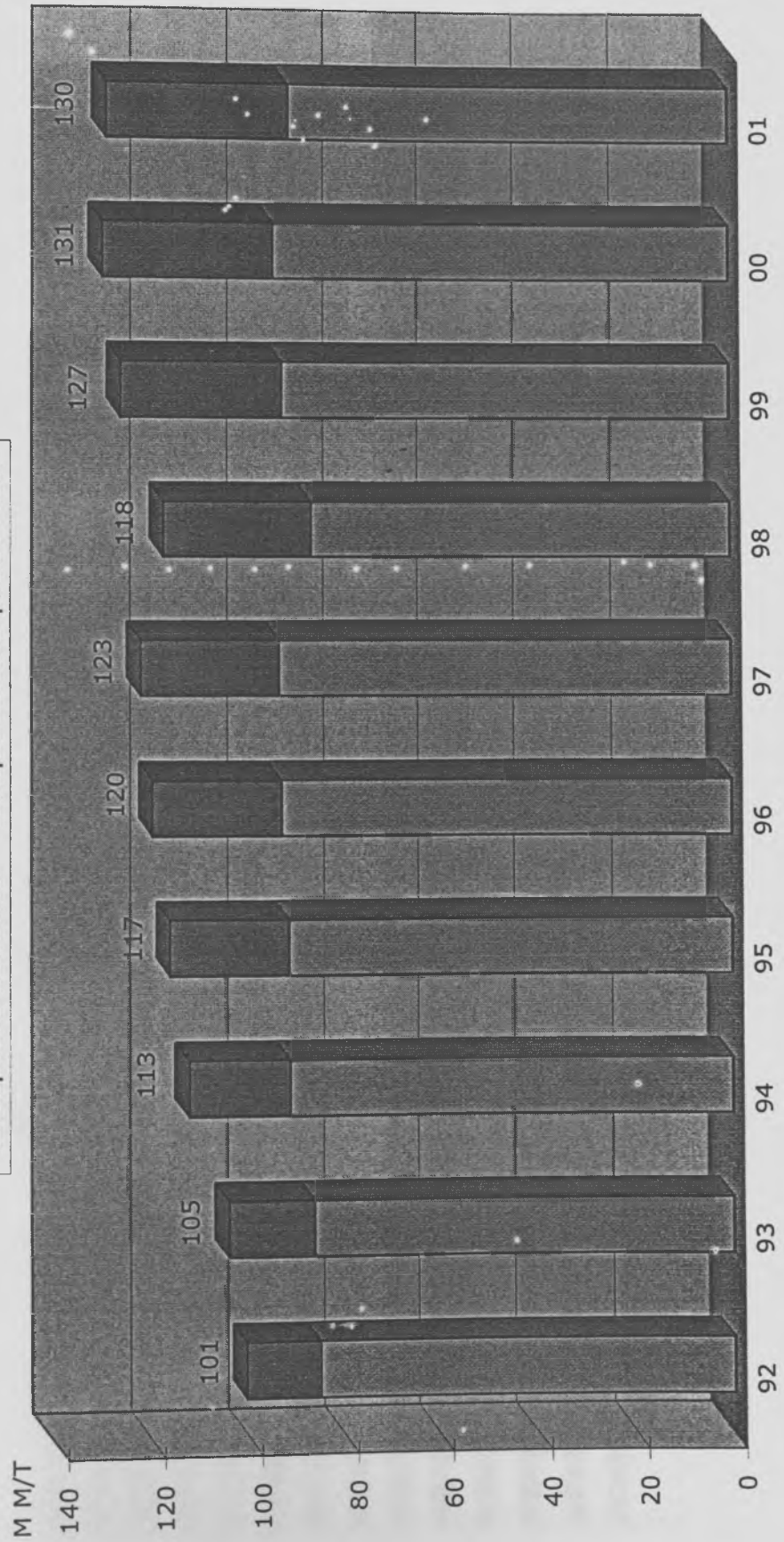
2. ACTUAL SITUATIONS OF EACH COUNTRY'S FISHERIES AND FISHING COMMUNITIES SHOULD BE FULLY TAKEN INTO CONSIDERATION

   It is very important to sustain and develop the traditional society of local communities, which constitutes the very basic social unit for people's living and national existence.

   The sustenance of fishing communities as well as supply of food from the fisheries sector become only possible when fisheries are sustained and developed.

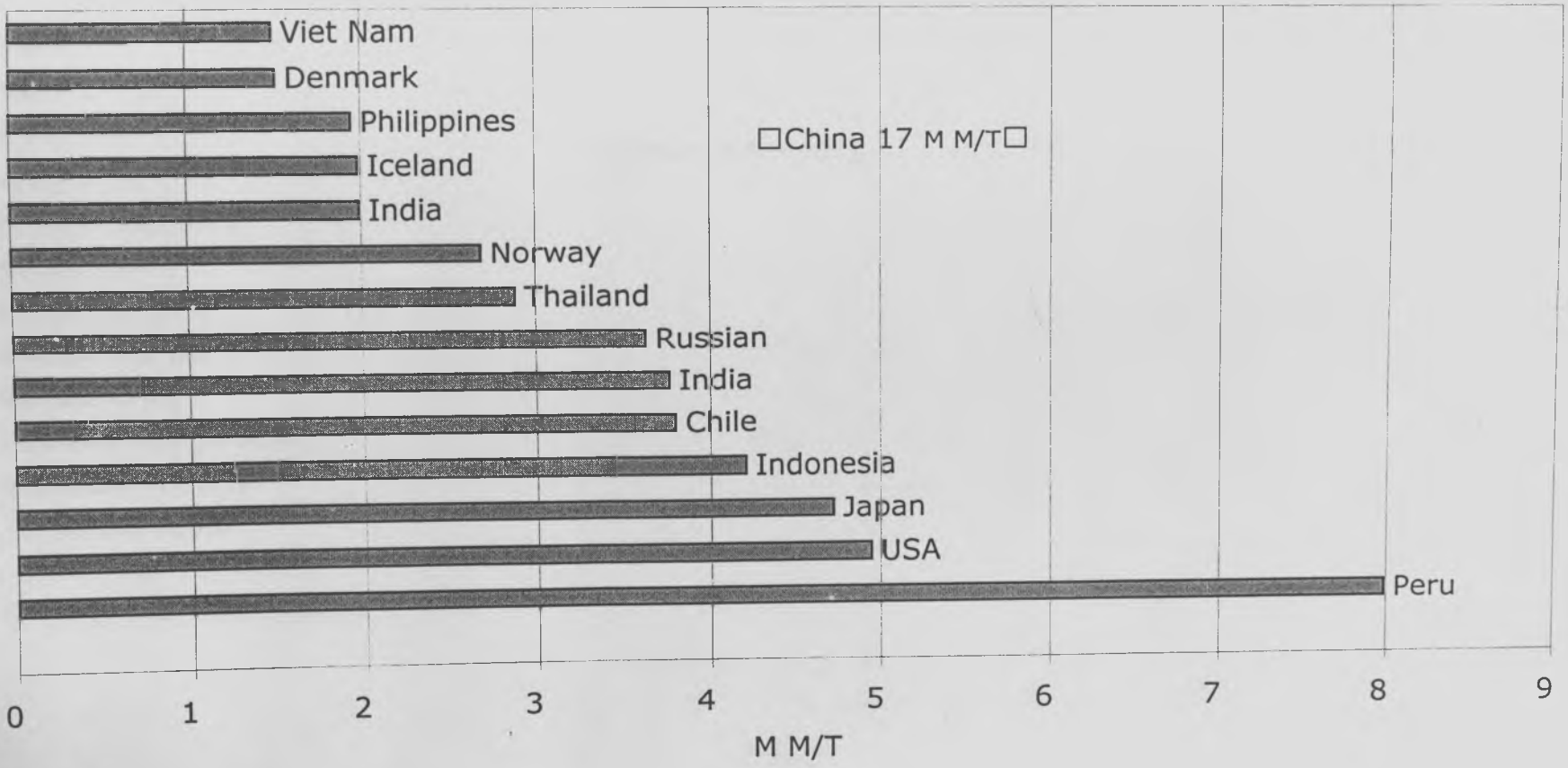
   - ❖ Accordingly, the WTO should give full consideration to the effect that each country's fisheries and fishing communities should not be unduly threatened by promotion of global scale trade liberalization.

Fig 1 World capture fisheries and aquaculture production



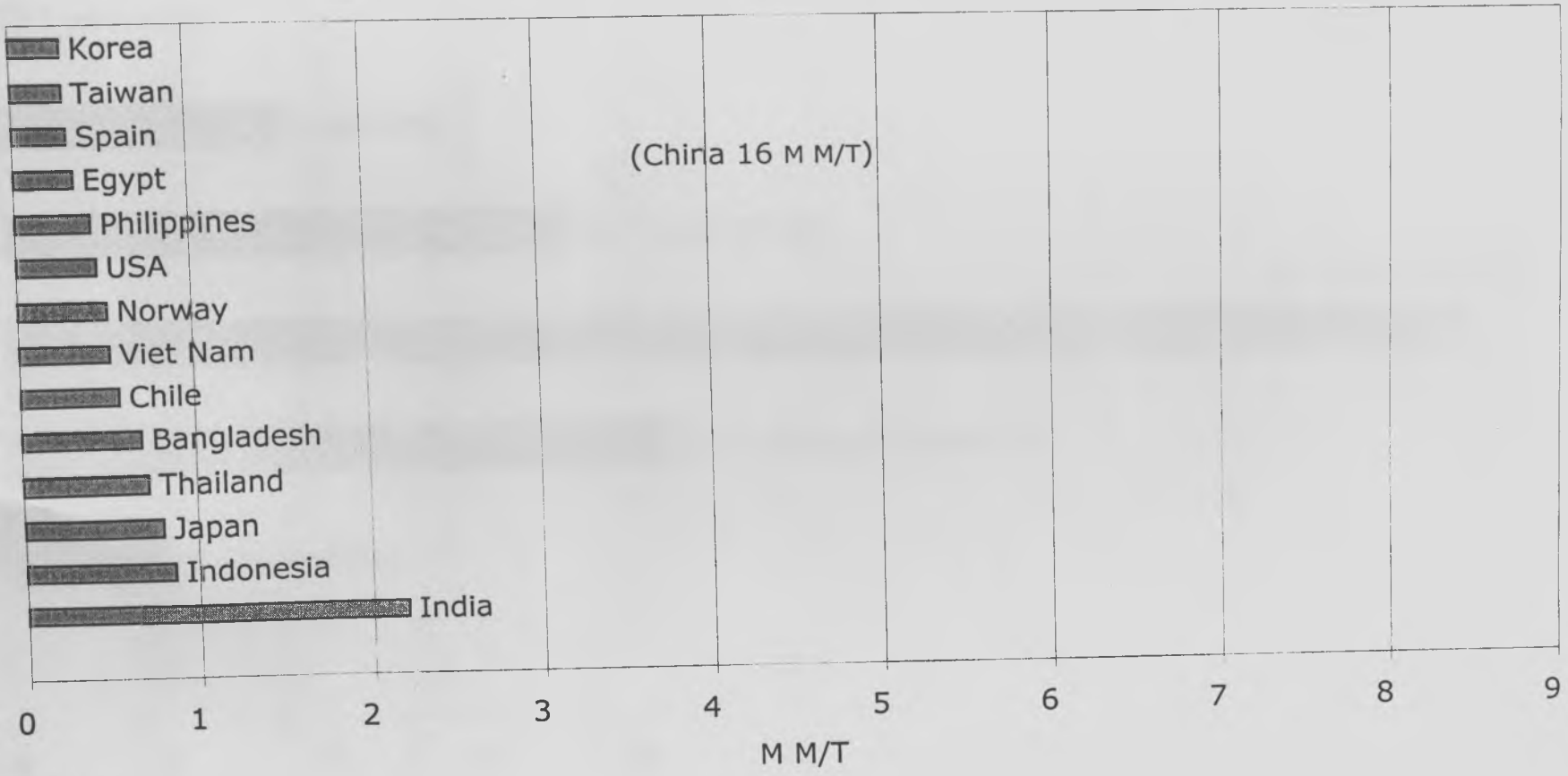
Source: FAO

Fig 2 Marine and inland capture fisheries production: top 15 producer countries in 2001



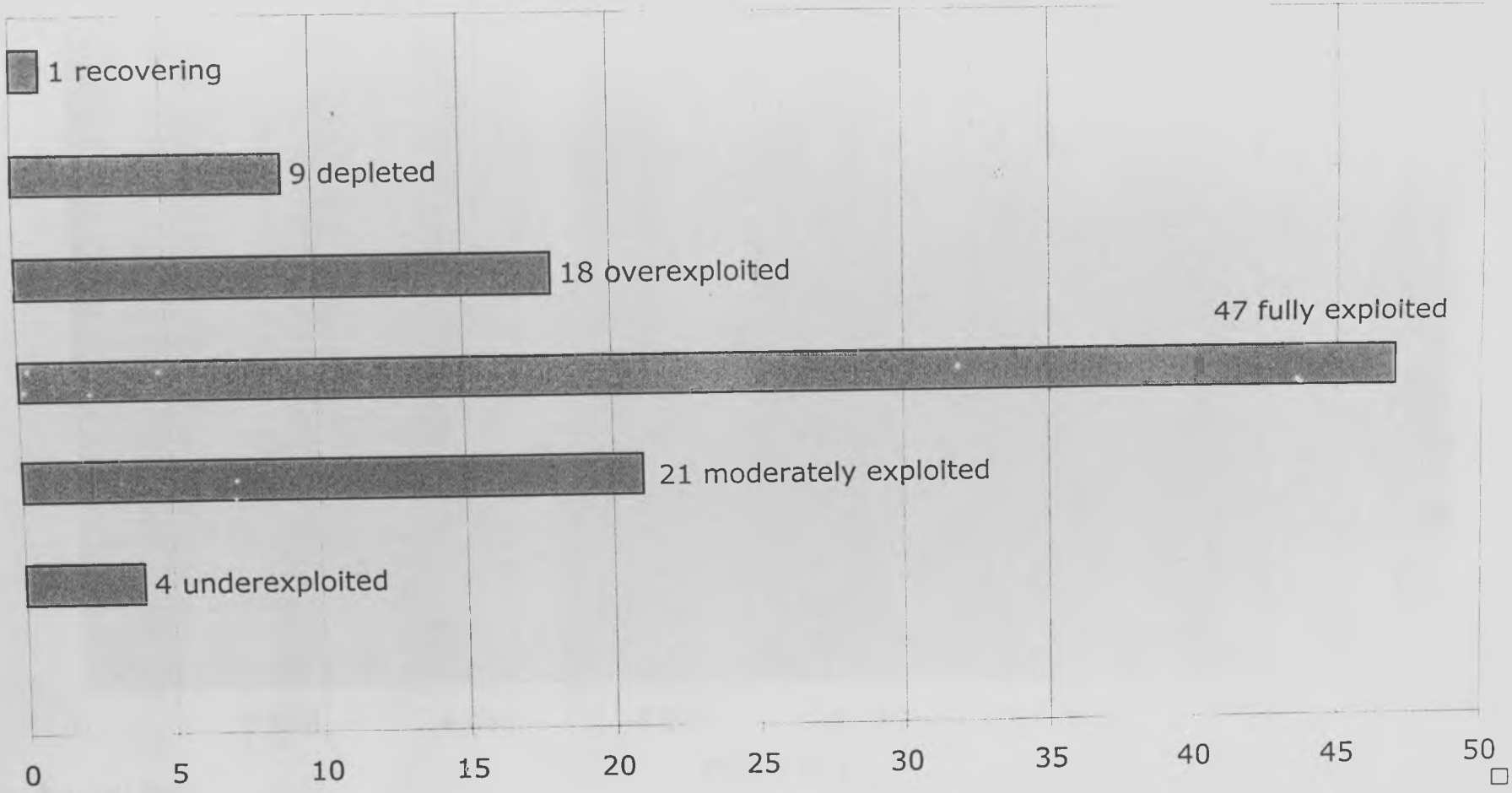
Source: FAO

Fig 3 Aquaculture production:
top 15 producer countries in 2001



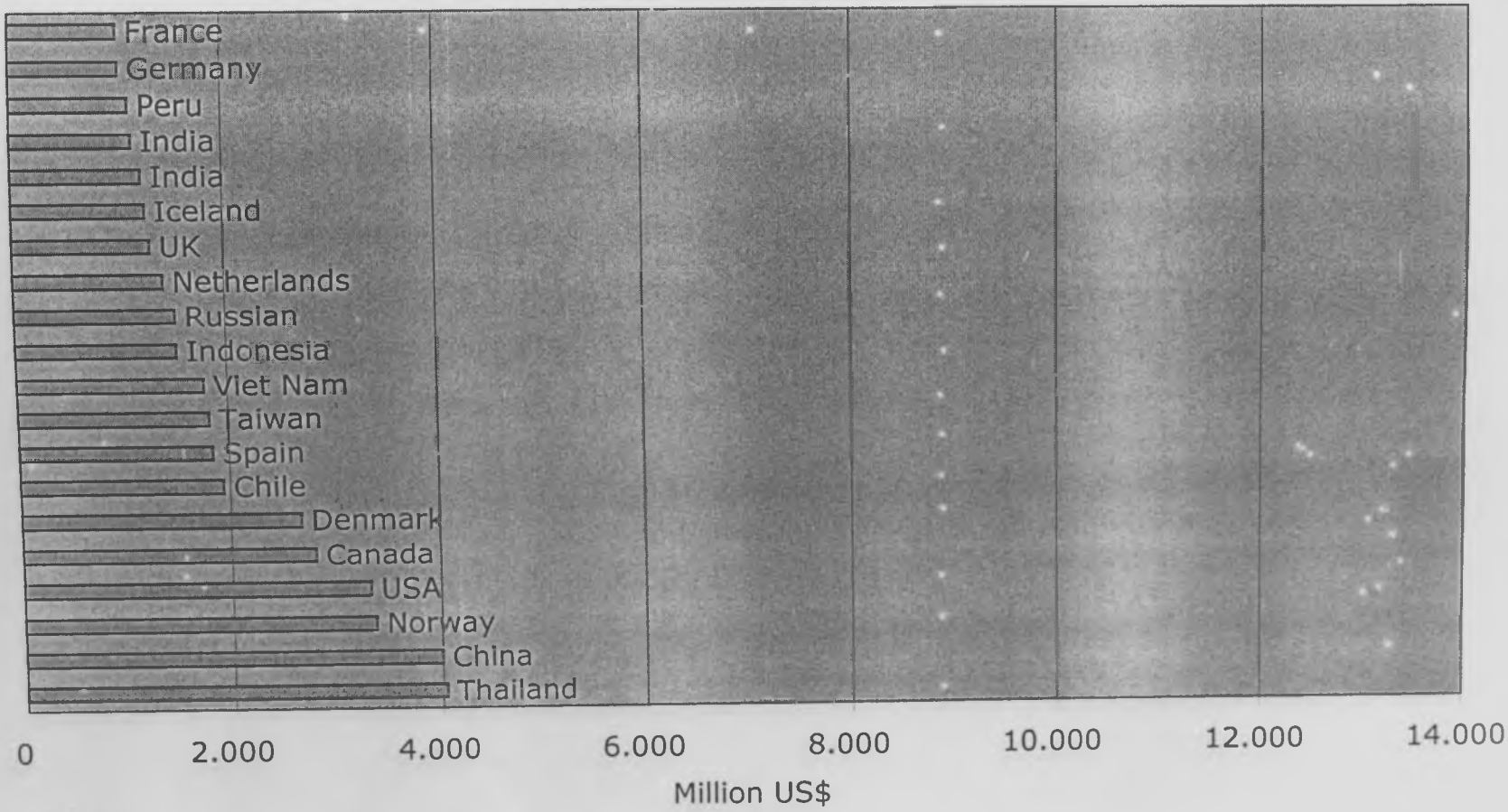
Source: FAO

Fig 4 The state of fish stocks in 1999



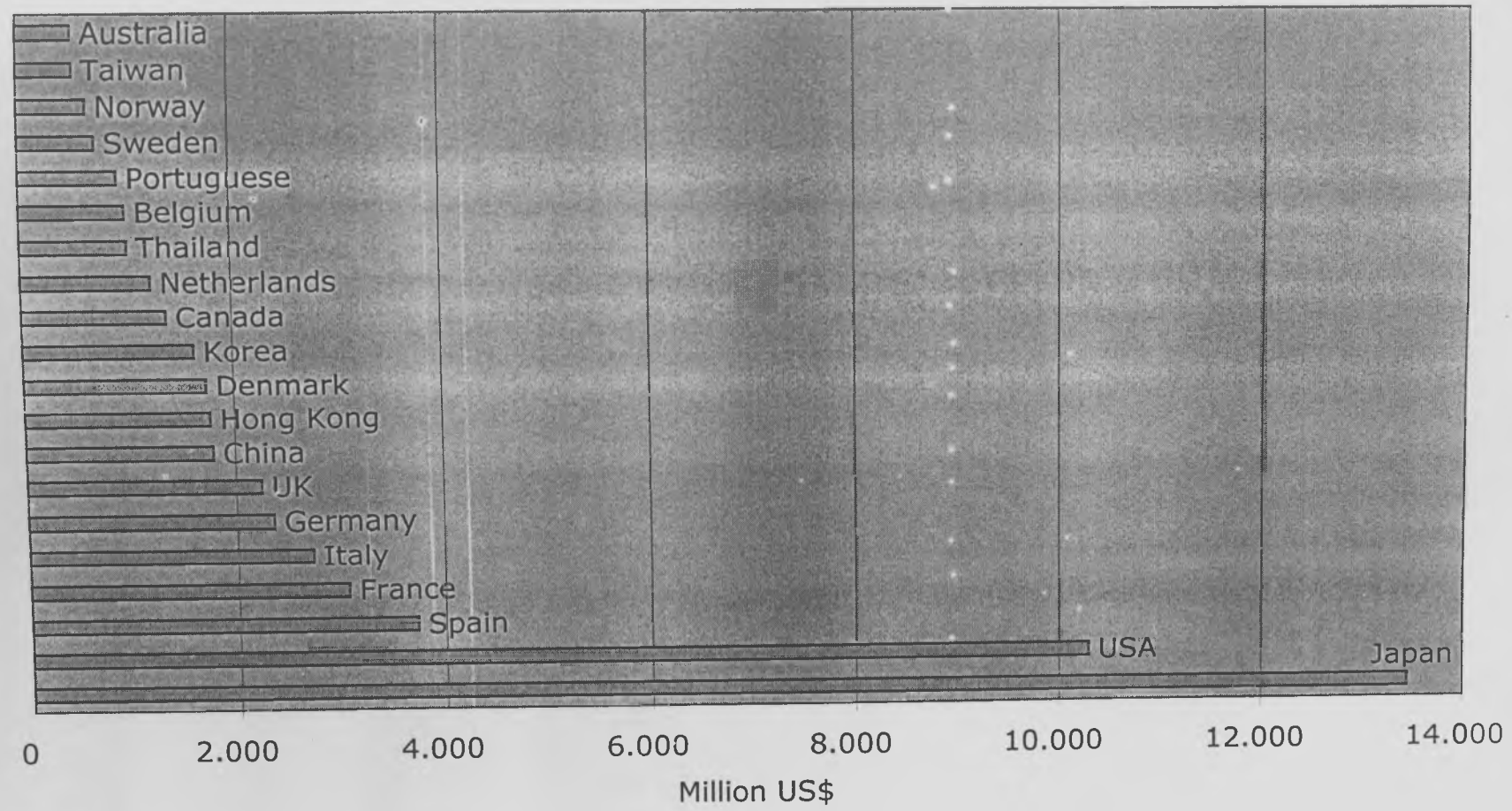
Source: FAO

Fig 5 Export of fish and fishery products in 2001



Source: FAO

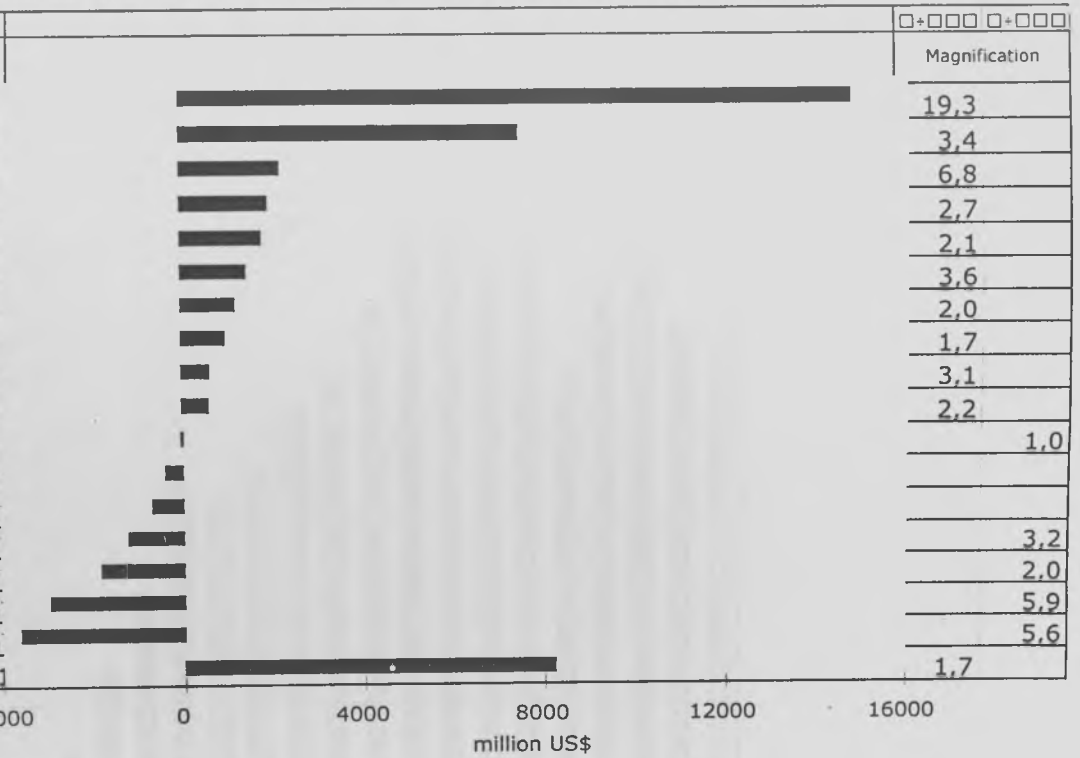
Fig 6 Import of fish and fishery products in 2001



Source: FAO

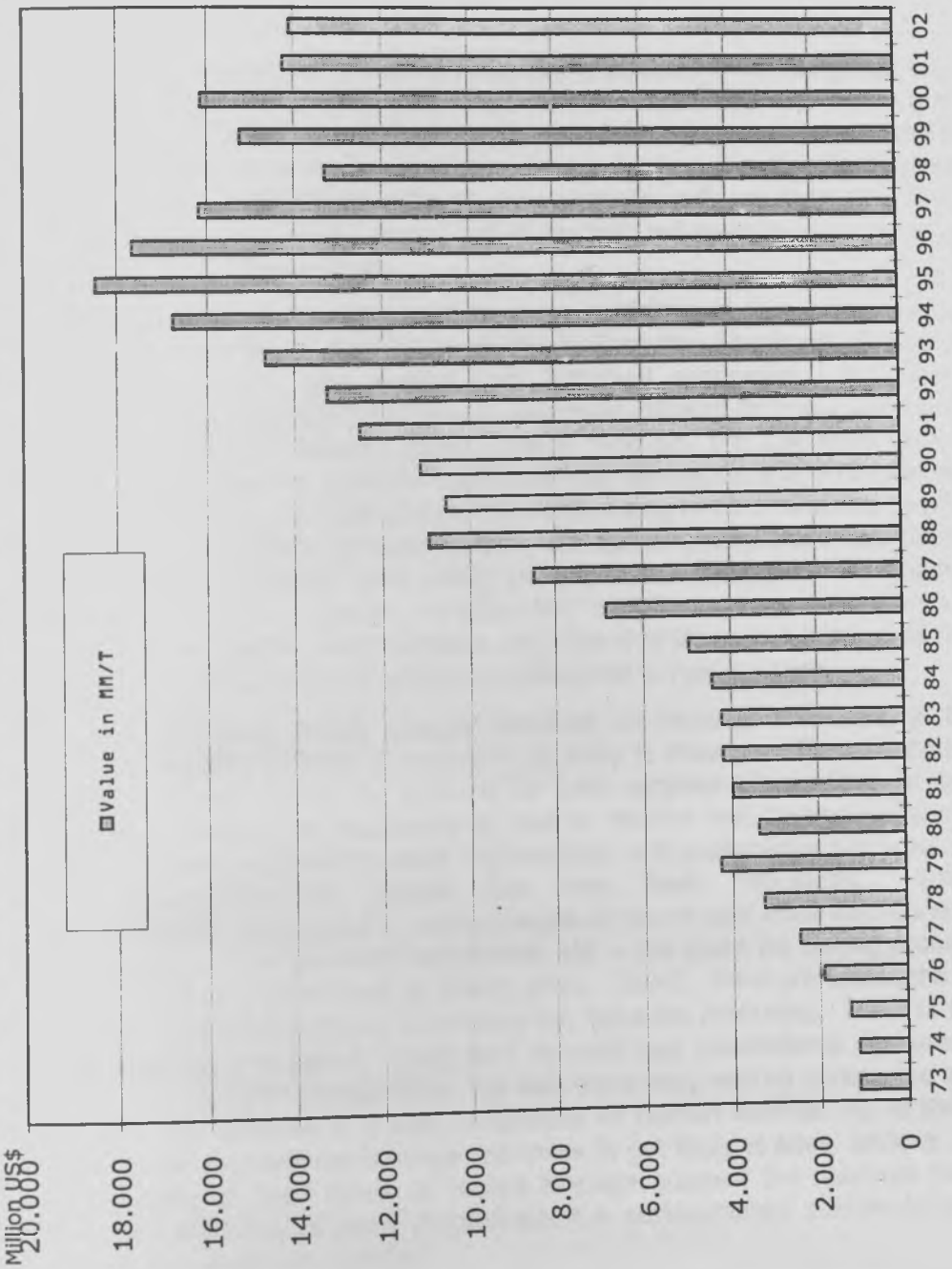
Fig 7 Fishery commodities trade of the world in 2000 (import/export by country)

	□mport amount (million US$)	Export amount (million US$)	Difference (million US$)	Magnification
Japan	15,513	802	14,711	19,3
USA	10,453	3,055	7,398	3,4
Italy	2,535	373	2,163	6,8
France	2,984	1,096	1,888	2,7
Spain	3,352	1,600	1,752	2,1
Hong Kong	1,949	545	1,404	3,6
Germany	2,262	1,105	1,157	2,0
UK	2,184	1,259	925	1,7
Portuguese	861	281	579	3,1
Belgium	1,028	469	559	2,2
Korea	1,372	1,386	(14	1,0
Bangladesh	0	371	(371	
New Zealand	0	666	(666	
Taiwan	547	1,756	(1,209	3,2
China	1,796	3,606	(1,810	2,0
Norway	597	3,533	(2,936	5,9
Thailand	782	4,367	(3,586	5,6
EU	19,609	11,398	8211	1,7



Source: FAO

Fig 8 Changes in Exchange Rate and Total Value of Fishery Products in Japan, in 2000



SUSTAINABLE DEVELOPMENT OF FISHERIES

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1. THE SUSTAINABILITY ISSUE

The environmental sustainability of fisheries has plainly become a serious global issue over the last ten years. It seems clear that fisheries resources are under great pressure. Total global landed catches generally were increasing up to approximately 1994/95, but since that time have plateaued with no further growth. Total global catches are now in the order of 100 million tonnes annually, with approximately 70-80 million tonnes from the Asia-Pacific region, and there does not seem much prospect of large-scale landings beyond this level.

Numerous studies and government actions have highlighted this environmental sustainability issue, including research from the World Bank, the Asia-Pacific Economic Cooperation (APEC) forum, and studies from individual economies. In Canada specifically, for example, fisheries have been a distressed industry for many years now, particularly on the eastern, Atlantic coast. From 1992-on, the Canadian federal government has been forced to close the east coast cod fishery, once upon a time one of the largest and most important fisheries in the world, owing to stock depletion having been so great that the natural renewal process still cannot justify fresh cod fishing twelve years after the moratorium was initially put in place. Different studies suggest that up to two-thirds of all fish species are either fully exploited or have been driven to danger markers for extinction, while perhaps only one-quarter or one-third of all fish species are really capable of making greater contributions to food supplies.

Moreover several prevailing trends suggest pressure on fisheries resources, in the absence of any off-setting policies or programs, is likely to increase. First, continued global population growth means the demand for food supplies will continue to rise. Second, if prevailing real living standards do rise in relation with technological and industrial improvements, demand for tasty, higher-value, and protein-intensive seafood will increase disproportionately greater than even basic population. Third, technological innovation in fisheries – such changes as sonar and electronic hunting, large-scale processing, wide area net catchments, etc. – will make the fishing process still more effective for any given level of fishing effort. Fourth, there are limitations on our knowledge of, and management techniques for, fisheries resources. Most of the world's oceans remain unmapped. Only very recently has international agreement been reached on mapping responsibilities. As well, there may well be unreported and illegal fishing. Finally, seafood is a vital component of human survival. All of these factors imply that the pressure on fisheries resources is not likely to ease, while at the same time the reality of fixed levels of landed tonnage suggest the resource base simply cannot be asked to give more. Accordingly, the environmental sustainability of capture fisheries is a significant question.

Besides environmental sustainability, there are also issues of economic sustainability. For example, a further complicating factor is recent initiatives towards trade liberalization in the fisheries sector. An illustration would be the Early Voluntary Sectoral Liberalization (EVSL) initiative of the Asia-Pacific Economic Co-operation (APEC) forum in respect of fisheries. Such trade liberalization raises questions of the economic sustainability of many fishers and fishing communities. In theory, trade

liberalization would seem a desirable goal. Liberalized trade, in principle, furthers the efficiencies of comparative advantage, whereby international trade reflects what each economy can do relatively most effectively. However, in light of resource constraints, in the fisheries sector trade liberalization could actually make both environmental and economic sustainability worse, as even more fish could be captured with even fewer fishers and vessels. Unemployment would likely increase in the sector. This would hit especially hard "artisonal", small-scale, fishing businesses and communities, as they are probably most vulnerable to displacement.

In sum, essential limits on fisheries resources have been reached, but the prevailing trends, in the absence of any off-setting management, want to force more demands on the resource base. We have to consider the prevailing policy and program environment to see if these trends can be offset.

2. THE PREVAILING POLICY ENVIRONMENT

In December 2000, the Fisheries Working Group of the Asia-Pacific Economic Co-operation (APEC) published a report entitled Study Into the Nature and Extent of Subsidies in the Fisheries Sector of APEC Members Economies. (The current author was the Principal Researcher for this Study). This report provides an extensive inventory and overview of the policies and programs related to fisheries across APEC economies.

The total number of APEC programs discovered at that time was 162, and the total value of all these programs was estimated at $US 12.6 billion. The research team also carried out an analysis to categorize all the programs, based on the inventory developed for the project.

For the purposes of categorizing programs or subsidies, the research team chose to classify each program in three ways:

- Modality – how the program or subsidy operates;
- Application – where in the fisheries sector the subsidy is used; and
- Scale – whether the program is "small scale" or "large scale" (defined below).

Modalities

"Modality" refers to how the program or subsidy operates, i.e. what is its *mechanism* within the fisheries sector?

A classification list of six (6) modalities was developed for the project. These modalities parallel the generic list of global subsidies described in many other international studies. These are:

1. Direct Assistance to Fishers and Fisheries Workers
2. Lending Support Programs
3. Tax Preferences and Insurance Support Programs
4. Capital and Infrastructure Support Programs
5. Marketing and Price Support Programs
6. Fisheries Management and Conservation Programs

It should be noted that a few subsidies operate through more than one Modality, e.g., a Lending Support program may also be a Capital and Infrastructure support program. In these cases, it was categorized both ways.

Applications

"Application" is used here to differentiate *where* in the fisheries sector the program or subsidy operates. Three application areas were considered:

- Capture Fisheries – naturally available fish biomass, taken from the seas;
- Aquaculture – fish grown through an artificial process; and,
- Fish Processing – transformation of any fish into food products.

Small Scale Versus Large Scale

Finally, the subsidy programs were also categorized by differentiating between "small scale" and "large scale".

"Small scale" refers to programs that either contain total funding allotments of less than U.S. $10 million, or that are distributed widely, so that no one party can receive more than U.S. $1 million. "Large scale" refers correspondingly to programs with funding allotments greater than U.S. $10 million and where single parties or organizations can conceivably obtain more than U.S. $1 million.

Small scale typically relates to subsidy programs that are aimed at supporting small- or individual-based business, for example, "artisonal" or traditional-culture fisheries.

Large scale typically relates, in contrast, to substantial capital infrastructure programs – for example, shipbuilding. This is of value to large, "industrial"-level businesses. The small-scale (as described here) subsidy programs turned out to be much less likely to attract challenges under WTO rules than the large scale ones.

Concentrations of Subsidies by Number of Programs

The following sections illuminate the most-used concentrations of subsidies by APEC member economies. These concentrations have been derived by categorizing the total inventory of support programs and subsidies according to the above-described modalities and applications matrix, and also according to large- or small-scale. Exhibit 1 gives the distribution of programs by modality and application area.

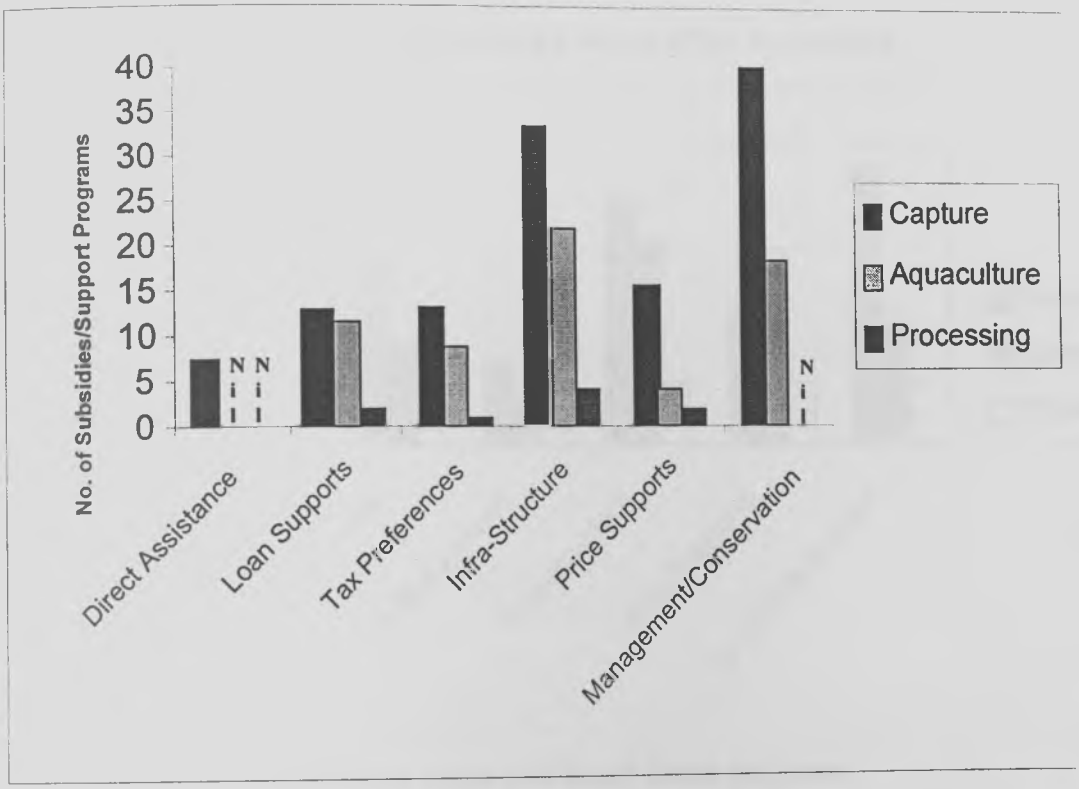
The left-hand (vertical) axis shows the calculated total of support programs or subsidies. The bottom (horizontal) axis is divided into six modalities. Each of the six modalities is further divided by application area – capture fisheries, aquaculture, or fisheries processing. There are, accordingly, 18 possible positions. If each position were evenly represented, then each should have 5.5% of the total number of programs, which is approximately nine. (The calculation is in reality somewhat more complex, because a few programs are categorized in more than one place, but the principle remains valid.)

Exhibit 1 shows certain clear concentrations of subsidies within APEC economies. The heaviest single concentration of the inventory's subsidies is in Management and Conservation Programs applied to Capture Fisheries. Out of 162 inventoried programs or subsidies, no less than 41, or over 25% of the total, fall into this single category.

The second heaviest concentration is in the Capital and Infrastructure Support modality, again for Capture Fisheries applications. There are 34 programs in this concentration.

The Management and Conservation modality, and the Capital and Infrastructure modality, applied to Capture Fisheries, together form the largest concentrations. The same two modalities, applied to Aquaculture, then form the third and fourth heaviest concentrations, at 22 and 20 programs respectively.

Exhibit 1: Subsidies – Concentrations by No. of Programs



Much less common are programs or subsidies that relate to Loan Supports, Tax Preferences, or Price Supports. However, it can again be seen that Capture Fisheries are ahead of Aquaculture in concentration by application. There are between approximately 5 and 15 programs in each of these positions.

Finally, support programs or subsidies going to Processing applications, or Direct Support to Fishers modality, are extremely limited. For Processing, there are only a tiny number in each of the Loan Support, Tax Preferences, Capital and Infrastructure, and Price Support modalities. In the case of the Direct Support modality, it all goes to Capture Fisheries applications.

The project team observed that the programs related to Management and Conservation appeared to be more recent than the others, particularly the Capital and Infrastructure programs. The Management and Conservation programs, judging from their apparent dates of introduction, seemed a relatively new phenomenon. Historically, the Capital and Infrastructure programs were more significant.

Concentration of Subsidies by Number of Economies

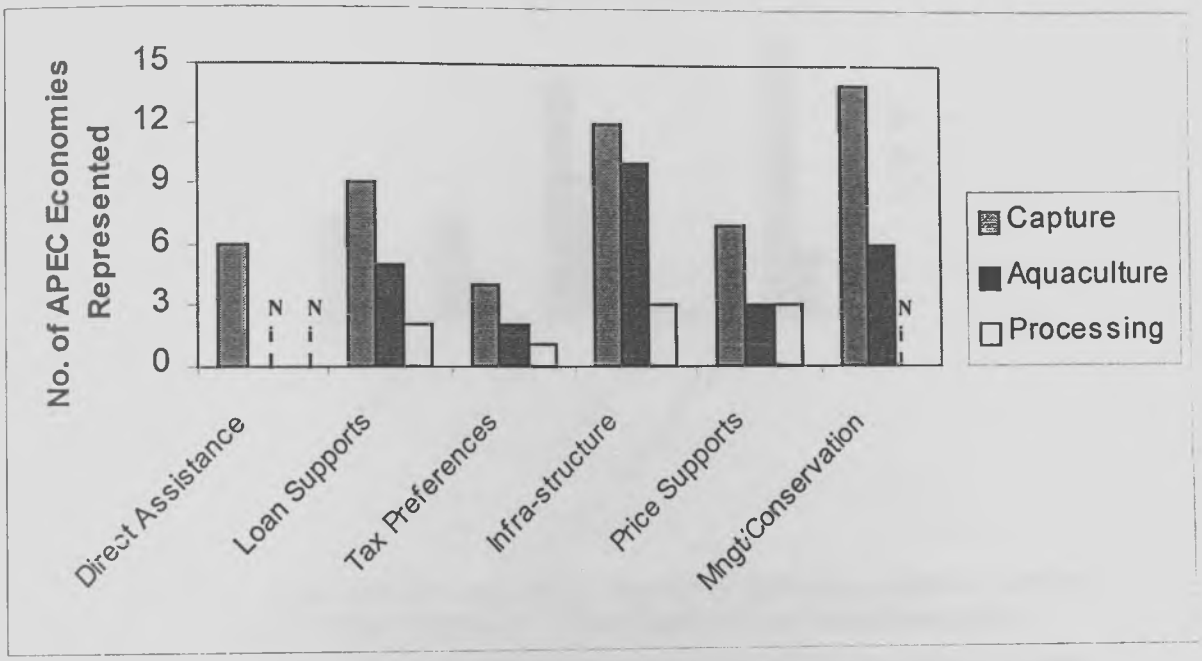
Exhibit 2 repeats the analysis of the inventory, but this time calculates by number of APEC member economies rather than by number of programs. (Recall that, because any given subsidy can appear in more than one category, the number of APEC economies with a subsidy in any given category can appear improbably numerous.)

What is striking about Exhibit 2 is that the *pattern* strongly repeats Exhibit 1. The concentrations are again in the Management and Conservation, and Capital and Infrastructure modalities, within the Capture Fisheries and (somewhat less) Aquaculture application areas.

This finding suggests that there is a considerable overall harmony among APEC economies in terms of the favoured concentrations of subsidies. If, for example, some economies had different favoured concentrations, then the pattern in Exhibit 2 could be

presumed to differ from Exhibit 1 in important respects. It does not. Virtually the exact same concentrations re-appear.

Exhibit 2: Subsidies – Concentrations by No. of APEC Economies



Concentrations Within Large Scale and Small Scale Programs

After dividing up the programs into large scale and small-scale groupings, each group was analyzed in the same way by modalities and applications.

Concentrations by Number of Programs Within Large Scale Funding

Using the definition given above, there are 61 large-scale programs out of the 162 total. Taking only those programs that met the criteria of "large scale", the concentrations are as shown in Exhibit 3.

Yet again, the profile of the Large-scale programs resembles the overall profile. The most favoured programs are those in Management and Conservation, and in Capital and Infrastructure, applied to Capture Fisheries. There are a few programs in Loan Supports and Tax Preferences, again applied to Capture Fisheries. There are also a few programs in Management/Conservation, and in Capital and Infrastructure, applied to Aquaculture. There are scarcely any large-scale Direct Assistance modality programs, and also scarcely any large-scale programs, regardless of modality, devoted to Fish Processing applications. This profile, in sum, replicates the pattern of the overall profile.

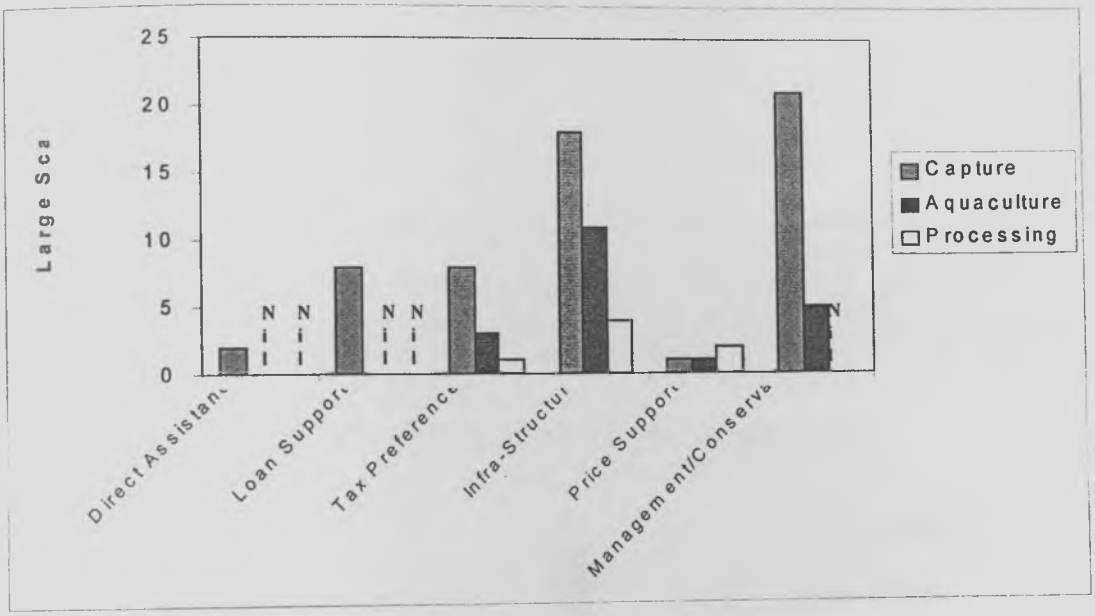
Concentrations by Number of Programs Within Small Scale Funding

Using the definition given above, there are 101 Small-scale programs out of the 162 total. Taking only those programs that met the criteria of "small scale", the concentrations are as shown in Exhibit 4.

For once, the concentrations showed a somewhat different pattern.

The Small-scale programs are more broadly arrayed. There are some concentrations in Management and Conservation, and in Capital and Infrastructure applied to Capture Fisheries, which parallels the overall and large scale program profile, but there are also strong concentrations in Loan Supports, Capital and Infrastructure, and Management and Conservation applied to Aquaculture. This is a modification of the overall profile.

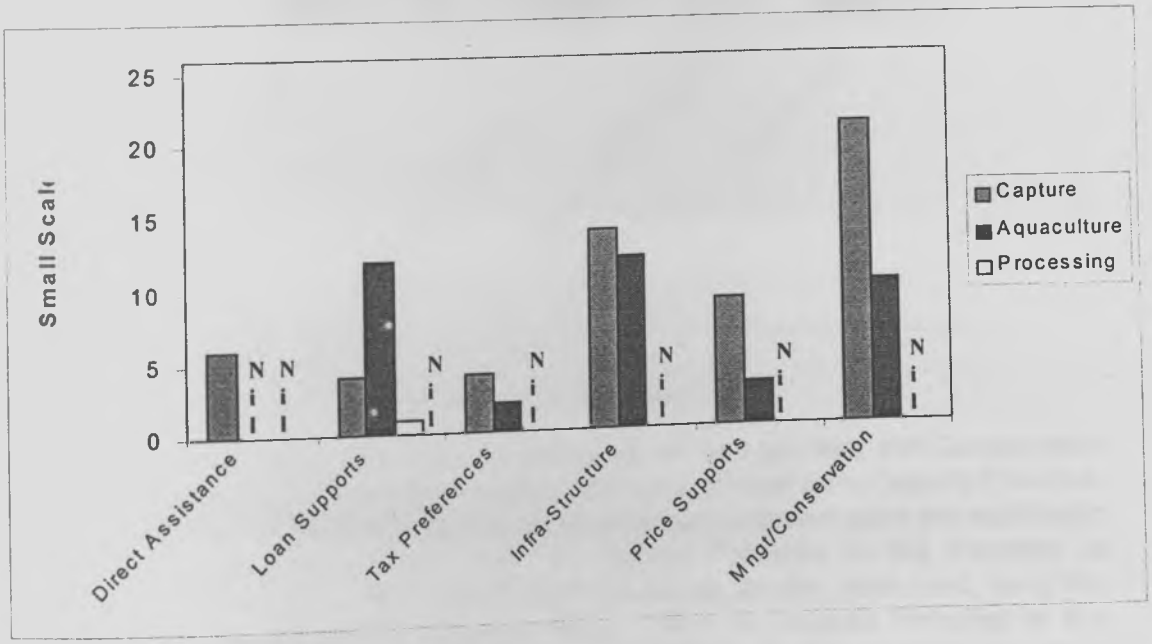
Exhibit 3: **Concentrations by No. of Programs, Within Large Scale Funding Allotments**



However, there are again scarcely any Direct Assistance modality programs, and no programs at all applied to Fish Processing. These factors follow the overall profile.

The small-scale programs are more broadly based than the subsidy programs overall. There is certainly much less concentration than for the large scale ones.

Exhibit 4: Concentrations by No. of Programs, Within Small Scale Funding Allotments



Concentrations of Fishery Subsidies by Dollar Value

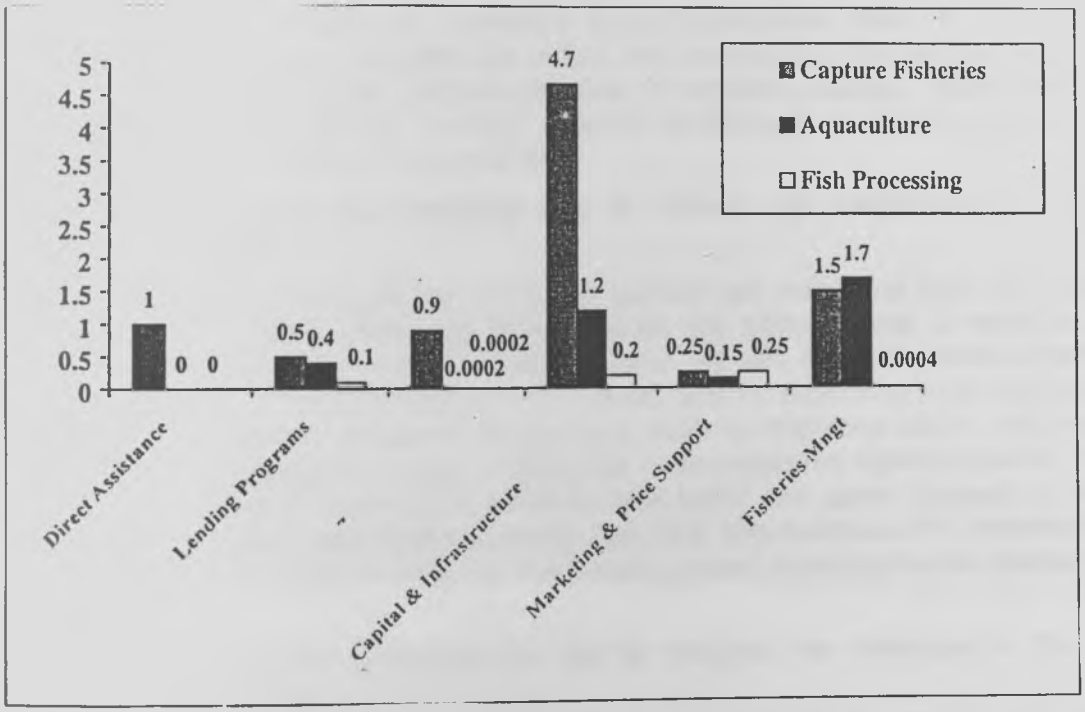
Exhibit 5 shows concentrations of fisheries subsidies by dollar value. The greatest dollar value concentration is in the Capture Fisheries Application area; this follows the usual concentration pattern. Approximately $US 8.9 billion of the $US 12.6 billion in total value of subsides and programs are intended for the Capture Fisheries, over half ($US 4.7 billion of the $US 8.9 billion) being applied to Capital and Infrastructure Support. Many of the Capital and Infrastructure support programs are large-scale projects.

The Aquaculture support and subsidy programs are concentrated by value in the areas of Lending Support, Capital and Infrastructure Support, and Fisheries Management. This follows the pattern of the concentration by the number of programs by application.

There is very little dollar value support for fish processing programs. Approximately $US 0.7 billion dollars worth of subsidies and programs identified were applied to fish processing. Of the $US 0.7 billion the largest component was $US 0.25 billion, allocated for marketing and price support programs and subsidies.

Overall, when all programs are assessed by dollar value, the pattern of concentration actually remains similar to the profile of concentrations by number of programs and concentrations by number of APEC economies. Capital and Infrastructure, and Management/Conservation, remain the most significant. There is actually a significantly higher proportion of funding going to Infrastructure than is true of the other profiles.

Exhibit 5: Concentrations of Fisheries Subsidies by Dollar Value



Summary of Findings on Most-Favoured Subsidies

To a considerable extent the two concentrations on Management and Conservation programs, and on Capital and Infrastructure programs, all applied to Capture Fisheries, are contradictory. The Management and Conservation programs carry the implication of limiting the fisheries sector "take" in Capture Fisheries in the interests of sustainability. The Capital and Infrastructure programs, on the other hand, carry the implications of expanding the fisheries sector "take" in Capture Fisheries in the interests of increasing food resources. This is precisely the opposite objective. However, the *financial* balance between these two is still heavily weighted in favour of Capital and Infrastructure Support.

Nevertheless, this policy and program profile helps explain why sustainability has become a critical concern in fisheries: much of the program support effort across numerous economies in the past has gone to enhancing relatively large-scale, industrial infrastructure that accelerates total landings. Even the management and

conservation efforts that have been made seem to be large-scale programs that relate to industrial fishing.

In contrast, it is the small scale programs that relate better to aquaculture infrastructure, direct assistance to fishers, and for preserving employment and economic sustainability of fishing communities.

3. FINDING NEW POLICY MODELS.

Following completion of the Study on Subsidies in the APEC region, the APEC Fisheries Working Group commissioned the same team, together with a team from Kyungnam University in Masan City, Korea, led by Prof. Hyunwook Koh, to organize and facilitate a Seminar on Options for Policy Model Evolutions Harmonious with Early Voluntary Sectoral Liberalization (EVSC). The Seminar was held in Busan, Korea, in the summer of 2001. The objective of this Seminar was to reach as much consensus as possible on policy models that could facilitate trade liberalization. Most APEC economies were represented at the Seminar.

Of course, policy models for facilitating trade liberalization have to be equally harmonious with fisheries sustainability. In fact, the consensus at the Seminar was that sustainability should be the *primary* objective of fisheries policies. Moreover, the consensus achieved at the Seminar included agreement on several desireable principles to guide policies for sustainability.

Policy for Fisheries Sustainability Has to Reflect the Conditions in Each Individual Economy.

In some economies there are fish species or regional sea areas that could be further exploited, but in many others the circumstances are different, and a reduction in capture fishing effort may have to be brought about. As well, aquaculture has powerful potential benefits for both increasing ocean stocks and for expanding food production in caged, local waters. However, aquaculture, while an important option, still faces certain possible drawbacks: caged stocks have to be preserved against disease, and inadvertent release of aquaculture stock to open water can cause damage to their natural counterparts. Not every economy has ideal circumstances for encouraging aquaculture. Accordingly, in sum, for many reasons each economy has to develop its own policies.

Policies for Fisheries Sustainability Has to Respect the Heritage of People Involved in the Sector

This was one of the most important principles developed at the APEC Seminar. It has more then one dimension.

First, there is the question of the multifunctionality of fisheries and fishing communities. Certainly in practical terms, fishing communities have social value beyond merely supporting a fisheries economy. This can include safety at sea, cultural activities, tourism, and many other important functions. Accordingly, allowing solely market forces to determine the fates of fisheries and fishing communities could be unwise, however economically efficient it may be, because other value provided by a community or a fishery can also be lost if a given community or fishery is not economically competitive.

Second, and arguably even more important, the skills, capabilities, and knowledge base of fishing communities, and fisheries workers, should be preserved. This is a vital question in sustainability. If this is not done, fisheries will become increasingly industrial in scale. This may well be efficient economically; but it could lead, at an extreme, to a seafood production chain that closely resembled large industrial sectors such as oil extraction or metals refining – output concentrated among a few, very large,

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Second, and arguably even more important, the skills, capabilities, and knowledge base of fishing communities, and fisheries workers, should be preserved. This is a vital question in sustainability. If this is not done, fisheries will become increasingly industrial in scale. This may well be efficient economically; but it could lead, at an extreme, to a seafood production chain that closely resembled large industrial sectors such as oil extraction or metals refining – output concentrated among a few, very large,

firms. In the past this structure has led to occasional but severe problems, such as the infamous so-called "oil crises" of the 1970s, and certainly in sectors with this sort of structure there have been repeated large-scale price fluctuations that are not helpful to systematic economic development.

Accordingly, an appropriate response from a sustainability perspective would be to attempt the judicious preservation of existing expertise and fishing communities. Their continuing existence provides a supply option that offers resilience in the vital global food supply chain. In the long run this could involve extra costs, or the necessity of subsidies; nevertheless, depending on the precise evolution of trade liberalization, such expenditures may be well-worthwhile investments. None of us expect our homes to be burnt down in a fire; but most of us buy fire insurance nonetheless.

Policies for Fisheries Sustainability Should Involve Increasing International Co-operation

While each individual economy has to develop its own policies in respect of its own circumstances, nevertheless an increasing level of international co-operation is going to be required. There are numerous dimensions to this.

First, there is a requirement for transfer of environmentally-sustainable technology from developed to developing economies. The emphasis must be on environmentally sustainable technologies. These are not necessarily the cheapest or the most economically efficient.

Second, it is going to be more and more useful and desireable to harmonize standards among economies. For example, logos and branding of seafood with internationally-recognized environmentally-benign standards would quickly communicate the existence of sustainable products from others. Similarly, sharing of oceanographic knowledge would be helpful.

Finally, voluntary co-operation among economies on fisheries management, and targets for production could also be an eventual end to increased international co-operation.

4. SOME SPECIFIC RECOMMENDATIONS

For sustainable fisheries, these policy principles generated several specific recommendations for APEC economies at the Seminar.

Re-balance Government Support

There was consensus that government support programs and subsidies should be gradually changed. The balance of funding between different modalities and applications should be re-directed.

First, Capital and Infrastructure support should be decreased as a proportion of total programs, and more funding should be given as Direct Assistance to fishers.

This may seem to representatives of some economies, particularly those most strongly in favour of trade liberalization, as a surprising recommendation. Generally subsidies to individuals or businesses are considered in economic theory as undesirable. However, there is considerable logic to this recommendation. It allows adjustment from an employment standpoint. Some fishers can be encouraged to diversify out of fisheries, but others can be encouraged to stay (preserving expertise) or to develop aquaculture businesses. Accordingly, funds reduced from Capital and Infrastructure could become available to either diversify economically or expand fish stocks through aquaculture. Similarly, gradual reductions in Capital and Infrastructure support would allow more funding for Fisheries Management and Conservation – particularly in respect of international, co-operative programs.

Second, within Capital and Infrastructure support, more funding should go to aquaculture infrastructure as opposed to Capture Fisheries. Once again, this moves support funding for fisheries from a relatively constrained environment – Capture Fisheries – to a relatively less constrained environment, namely, aquaculture.

Increasing Emphasis on Small-Scale Programs

There was also a consensus that the small-scale programs were more advantageous to sustainability. It was the small-scale programs that supported the small business and artisonal fishers, and that tended to support aquaculture. The large-scale programs tended to be in Capital and Infrastructure support. Accordingly this recommendation is thoroughly harmonious with the first.

Increase Cost-Recovery for Industrial-Level Fishers

For large-scale, industrial-level fishing operations, there was a consensus that greater emphasis should be put on cost-recovery measures. This would represent a re-balance of costs from government to industry. In particular, Capital and Infrastructure costs could legitimately be passed on to industrial-level fishers, which would free up funding opportunities for small-scale aquaculture infrastructure and direct support to artisonal and small-business fishers and their communities.

Establish an International "Eco-tech" Fund

This sort of fund would represent a material illustration of the value of greater international co-operation. This fund could be the mechanism for technology transfer, oceanographic knowledge-sharing, and international acceptance of environmentally-benign products and processes. It is likely most of the cash component in this fund would have to come from developed economies, but it should be emphasized that developing economies can contribute valuable expertise, environmental knowledge, etc. If public sector funding were correspondingly reduced on the Capital and Infrastructure component, funding for an international "Eco-fund" could be facilitated within existing revenue streams.

5. SUMMARY AND CONCLUSIONS

Sustainable development of fisheries involves both environmental and economic factors. In the past, policies and programs in the fisheries sector across the Asia-Pacific region have tended to emphasize large scale Capital and Infrastructure projects, and still do when total funding is taken into account. More recently, there has been increased emphasis on Management and Conservation, but still oriented toward large scale programs. In contrast, the small scale programs have been more broadly oriented, supporting fishers directly, fishing communities, and aquaculture development.

For both environmental and economic sustainability, re-balancing of programs and funding seems desirable. This re-balancing should involve gradual relative reductions in Capital and Infrastructure support, but actually increase support to small scale fishers and fishing communities, so as to preserve expertise, promote business diversity such as aquaculture development, and facilitate employment adjustments.

While economic theory suggest any increase in subsidies is an undesirable policy, in fact increasing support to small scale fishers and fishing communities has a great deal of merit in light of the particular structural and environmental factors in this sector.

Over time, as international co-operation in fisheries management improves, and as fishers and fishing communities globally adjust to changing economic and natural environments, such subsidies can be reduced or eliminated. But sustainable development of the fisheries sector nevertheless has to take into account more than just either natural environmental limits or economic imperatives.

Nutritional Characteristics of Fishery Products

TANEKO SUZUKI
Doctor of Agriculture
Visiting Professor, Kokusai Gakuin Saitama Junior College

Summary

Fishery products now enjoy a high popularity both in Japan and overseas for the reason that they are healthy food. Today I would like to speak about the nutrient ingredients contained in fishery products, why they are good for health, as well as the results of research and studies that provide basis for this fact.
The order of topics and the gist of the lecture are as follows:

1. Characteristics of nutrients contained in fish
2. Characteristics of micronutrients contained in fish
3. Characteristics of fat contained in fish
4. Functions of EPA (IPA) to prevent thrombosis and cancer
5. Functions of DHA to activate brain cells and lower hostility, etc.
6. Epidemiological surveys on frequency of consuming fish and disease and mortality

1. Characteristics of nutrients contained in fish

The ingredients, without consumption of which man cannot sustain his life, are called nutrients. Of them, protein, fat and carbohydrate are called three major nutrients. In terms of contents of the three major nutrients, fish meat is totally equal with pork, beef and chicken. As fishes and meat contain carbohydrate only in small amount, these foods are not suited as supply source of carbohydrate.

2. Characteristics of micronutrients contained in fish

Unlike three major nutrients, the substances which exist in very small amount and adjust metabolic functions of the body are called micronutrients. Micronutrients, which are typically in larger amount in fishes, are vitamin B12 (effective for prevention of anemia) and vitamin D (effective for promotion of absorption of calcium), and those vitamins are found in small amount in meat, and not contained at all in cereals and beans. Further, iron, which is an essential mineral (effective for prevention of anemia) is found abundantly in red meat and bloody-color meat of fish in the form of well-absorbed organic iron. Calcium (effective for prevention of bone loss, etc.) is found in small amount in animal meat but abundant in fish meat. Particularly, small fishes for which viscera are also consumed, enhance absorption of calcium along with vitamin D.

3. Characteristics of fat contained in fish

Fat and oil contained in fishes are very different from animal oil and fat and vegetable oil.

Omega-linolenic acid fat acid, which is found in small quantities in animal fat and oil and vegetable oil, is contained in fish oil abundantly.

Fat acids of fat in fishes and seaweeds are called o-linolenic acid EPA (also called IPA) and DHA. These fat acids are not found in animal fat and oil and vegetable oil at all. Numbers of studies have been made public in recent years about the functions of EPA and DHA in maintaining health.

4. Functions of EPA (IPA) to prevent thrombosis and cancer

EPA is an acronym of eicosapentaeic acid (icosapentaeic acid). This fat acid prevents thrombotic diseases such as myocardial infarction and cerebral infarction. Further, EPA

came to be known lately to be useful in preventing allergy and cancer. EPA is contained particularly in large quantities in the blue-skin fishes such as tuna, yellowtail, mackerel, sardine and saury. The contents and functionality of EPA do not change much by processing, cooking and frozen.

5. Functions of DHA to activate brain cells and to lower hostility, etc.

DHA is a fat acid having a very similar structure to EPA. DHA is an acronym for docosahexaeic acid. It has been clarified by the studies of the animal brain that the fat of the brain is DHA, and that

DHA is necessary for the growth of synapsis of brain cells. DHA is useful in the formation of brain in the embryo and improvement of dementia by aging. Recent studies have confirmed that consumption of DHA not only activates brains but also stabilizes emotion and lower hostility. DHA is also found in large amount in blue-skin fishes, and its contents and functionality undergo almost no change by cooking, freezing for preservation and canning.

6. Epidemiological surveys on the frequency of consuming fish and disease and mortality

In Japan, large-scale epidemiological surveys were conducted on the relations between the frequency of fish consumption and the causes of death. Follow-up surveys were conducted for 16 years for the following four Groups: (1) eat fish every day, (2) eat sometimes, (3) eat rarely, and (4) not eat at all. The survey showed that the Group (1) has generally low mortality rate as compared with the Group (4), especially very low rate of mortality by various types of cancer, ischemic heart disease and cirrhosis hepatis. Currently, in the way to support the above finding, studies are also being advanced about the fish ingredients relating to effectiveness of maintaining health and preventing diseases.

Text

Lately fishery products enjoy a high popularity as healthy food among people. Todayl would like to speak about the nutritional ingredients contained in fishery products and the reasons why they are good for health based on the results of scientific research.

The lecture will take the following order as shown here (OHP).

1. Characteristics of nutrients contained in fish
2. Characteristics of micronutrients contained in fish
3. Characteristics of fat and oil contained in fish
4. Functions of EPA (IPA) to prevent thrombosis and cancer
5. Functions of DHA to activate brain cells and lower hostility, etc.
6. Epidemiological surveys on frequency of consuming fish and disease and mortality

First I will speak about the characteristics of nutrients contained in fish.

There are three important nutrients, called three major nutrients. These are contained in every kind of food, and its contents have different characteristics from one food to another. Please refer yourselves to the Table shown here. The three major nutrients all generate energy within the body. Particularly, protein becomes material tissues composing human body, enzymes necessary for metabolism, and hormones. Fat and oil produce energy very efficiently, and is a material for local hormones which, in tiny amount, perform very important functions. And carbohydrate mainly becomes energy source but it is also constituent tissues and cells. Consumption of rice, wheat and potatoes that contain much carbohydrate as staple food so as not to consume important protein as energy source is observed in food cultures of many countries.

In passing, I may say that as carnivorous fishes are not suited for converting carbohydrate into energy, feed of high protein density is given to cultured fishes.

The Table (OHP) compares the contents of three major nutrients of fish meat with those of other foods. As you see in the table, you will find that fish meat is an excellent food as supplier of protein in the same way as animal meat. Generally, fish meat has smaller amount of fat and oil as compared with animal meat, and conversely more protein. As the saying goes that beans are "the meat of the field," it has abundant protein among plant-derived foods. Compared with grains, peas and potatoes, both fish and animal meat have a visibly lower level of carbohydrate and therefore is not suited for the purpose of taking carbohydrate.

Differences in nutrient contents in foods

Major nutrients	Fish Flesh (muscle)	Animal meat	Rice	Soybean
Protein	77 %	60 %	6.3 %	40 %
Lipids (fat and oil)	20 %	37 %	0.8 %	22 %
Carbohydrate	0.2 %	0.3 %	92 %	32 %

(Average value for which nutrients of edible parts of various types of food were calculated per anhydrate)

In this way, fish is a food rich in protein. Now let us assess the nutritional quality of protein in various foods on the basis of amino acid score which is a measurement for nutritional value of protein. When the amino acid score of certain food is 100, it means that it has the highest quality protein from nutritional point of view. As seen in the table, the amino acid score of fish meat protein is 100 like animal meat, whole egg and milk.

Amino acid score of various foods

Food item	Amino acid score
Fish flesh	100
Pork	100
Beef	100
Egg (whole)	100
Soybean	86
Rice	65

As you see in the above table, both fish meat and cattle meat have more or less the same nutritional values. However, fish meat protein has its characteristic functions, namely, to reduce blood pressures and prevent cerebral apoplexy. This table presents data obtained from animal experiments. It shows the results of feeding various types of food to a rat that has serious high blood pressures because of aging and is likely to die of cerebrovascular accidents. This is the result of research by Shimane Medical University. As seen in the table, when salt is added to ordinary feed, the rat would die certainly of cerebral apoplexy. By contrast, there is no development of disease with high protein food. When we look at the functions to reduce blood pressures, we find that those functions are more conspicuous in fish protein than soybean protein. It is known that there are functions to lower blood pressures in low-molecular peptide--a substance to dissolve protein--for fish and soybean proteins.

The results of feeding various types of proteins to rats likely to develop cerebral apoplexy.

Type of feed	Rate of developing apoplexy (%)	Blood pressure (mgHg)
• Ordinary feed (control)	84	220-245
• Ordinary feed + 1 % salt water	100	190-245
High protein feed		
• Fish protein	0	170-210
• Soybean protein	0	190-225
High protein feed + 1 % salt water		
• Fish protein	10	188-230
• Soybean protein	10	205-245

Next I would like to speak about micronutrient contained in fishes.

Micronutrients are components that are contained in very small amount and perform important functions for metabolism of the body. As they are not combined within the body, there is a need to consume them as nutrients from food.

The vitamins found in small amount in cattle meat and soybeans but especially abundant in fish meat are shown in the table. They are Vitamins B12 and D. Almost no vitamin B12 is found in soybeans and rice, but it is contained in animal foods, such as fish and cattle meat. The table also shows that it is in larger quantity in fishes and shellfishes than cattle meat. When there is a lack of vitamin B12, malignant anemia tends to develop. Recent studies on vitamin B12 as the vitamin activating amino acid necessary for the activities of the brain and preventing geriatic dementia are attracting attention.

Vitamin D has the function to facilitate absorption of calcium and phosphor. It deposits phosphorous acid calcium in bones and teeth, making them robust. It is a vitamin indispensable for preventing ospteoporosis and osteomalacia.

As shown in the table, vitamin B12 is found in abundance in fishes and shellfishes, and fishes contain a large amount of vitamin D. The internal organs of fishes contain a large amount of vitamin A, but the contents of vitamin A in fish meat is very small. As exception, the meat of eels and congers contain large quantities of vitamin A.

Contents of vitamin B12 in various types of food

(The figure is in micro gram per 100g of edible parts.)

Fish and shellfish		Meat etc	
Mackerel	10.6	Pork (ham)	0.3
Salmon	4.6	Pork (shoulder)	0.4
Carp (cultured)	10.0	Beef (round)	1.1
Saury	17.7	Beef (shoulder)	1.6
Short-necked clam	52.4	Soybean	0
Scallop	11.4	Rice	0

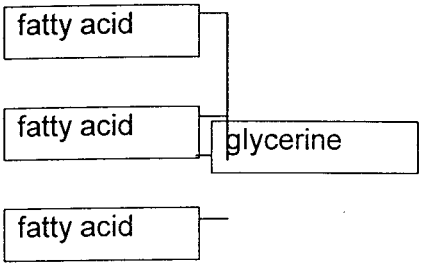
Contents of vitamin D in various foods

(The figures are in micro gram per 100g of edible parts)

Fish and shellfish		Meat etc	
Mackerel	11	Pork (ham)	Tr.
Salmon	32	Pork (shoulder)	Tr.
Filefish	43	Beef (round)	0
Carp (cultured)	14	Soybean	0
Eel (cultured)	18	Rice	0

(The characteristics of eels is that they contain as much as 2,400 mg of vitamin A per 100 gram of edible part.)

to this glycerin. Diverse characteristics occur to the physical properties and physiological functions for animal fat, vegetable fat and fish oil.



In the structure of fat acid, the fat not having double combination of carbons is called saturated fatty acid. The fat with one double combination is called monounsaturated fatty acid. Further, the fat with more than one double combination is called polyunsaturated fatty acid. Saturated fatty acid and monounsaturated fatty acid are found in many of animal meat fat, and polyunsaturated fatty acid is contained in large quantities in vegetable oil and fish oil and fat. Polyunsaturated fatty acid is divided into two groups from its physiological functions. As shown in the figure, they are linoleic acid and alpha-linoleic acid and have different physiological functions.

Types of fat and their biological function

Type of fat	Food item which contains large amount	Functions in the body
• Saturated fatty acid	meat , egg, milk	converted to energy
• Monounsaturated fatty acid	olive oil	

Both saturated fatty acid and monounsaturated fatty acid are made from protein and carbohydrate in the body.

Type of fat and their biological function

poly unsaturated fat

Type of fat	Food item	Functions in the body
-linoleic acid		converted to arachidonic acid
• linoleic acid	animal fat plant oil	materials for hormones to promote coagulation of blood vasoconstriction coagulation of blood
Alpha linolenic acid		converted to EPA, DHA
• linoleic acid	perilla oil plant oil	materials for hormones to restrain coagulation of blood anti thrombosis
• EPA, DHA	fish and shellfish	

Linoleic fatty acid promotes coagulation of blood and alpha-linoleic acid restrains coagulation of blood. Linoleic acid becomes arachidonic acid in the body and alpha-linoleic acid becomes EPA, DHA and so forth.

Among alpha-linoleic acid, EPA (eicosapentaeic acid) and DHA (docosapentaeic acid)

are found in a characteristic way only in fishes and seaweeds. No EPA and DHA are found in vegetable oil, such as soybeans, and beef and pork oil and fat. Unsaturated fatty acid belonging to alpha-linoleic acid group are contained in small amount in vegetable oil and vegetables as linoleic acid and are turned into EPA and DHA in the body.

Now I would like to speak about the functions of EPA (IPA) to prevent such diseases as thrombosis and cancer.

I would like to present the background leading to the discovery of EPA. A survey was conducted on the relations between meals and myocardial infarction based on the fact that Inuit living in Greenland are less liable to have this disease as compared with the people on the mainland Denmark. As shown in this figure, the ratio of Inuit dying of myocardial infarction is less than one tenth of the people in the mainland Denmark. Further, there are almost no case among Inuit to develop lifestyle related diseases such as arterial sclerosis and diabetes.

Comparison of disease between Inuit and residents on the mainland Denmark

(c: Inuit n: Danish)

	Inuit (= Eskimos)	Danish
acute myocardial infarction	cc	nnnnn nnnnn nnnnn nnnnn
arterioscleorosis	0	nnnn
diabetes	c	nnnnn

Comparison of diet between Inuit and residents of the mainland Denmark (1970s)

Inuit	Danish
seals, fishes, and shellfish	meat, eggs and cheese

Dr. Daiaberg and Dr. Bang of Denmark clarified why such differences exist. Analyses of blood of Inuit and mainland Danish showed that there are differences in the fat in their blood. In the blood of Inuit 26.5% of EPA was found whereas in the blood of mainland Danish arachidonic acid was found in a large amount with only 0.2% of EPA.

In the blood of Inuit emigrating to mainland Denmark, a lesser degree of EPA was found while the contents of arachidonic acid increased. From this it was considered that these differences were due to the differences of dietary habit between Inuit and mainland Danish. The mainstay diet of Inuit at that time was seal meat. Unlike fat of terrestrial animals, the fat of seals that consume fishes is the same as that of fish, and has abundant EPA and DHA that is fatty acid belonging to the alpha-linoleic acid. This EPA generates the hormone that prevents coagulation of blood, and prevents thrombotic diseases such as myocardial infarction. Mainland Danish consume animal meat-based food in larger amount than fishes. Animal based food contains substantial amount of linoleic acid and tends to promote coagulation of blood.

It was clarified that the reason for little or no occurrence of thrombotic diseases among Inuit is that they habitually consume seal meat and fishes which contain EPA. The daily consumption of cholesterol by Inuit is 800mg. This amount is about twice the average consumption of cholesterol by a Westerner. Inuit consume almost no vegetables because they cannot grow them due to frozen land. Nonetheless, Inuit have no arterial sclerosis. It is because they consume a large amount of fatty acid belonging to alpha-linoleic acid group such as EPA and DHA.

In the surveys as well, the average consumption of EPA in fishing villages where a large amount of fishes are consumed is 2.5g per day, which is by far larger than the average daily EPA consumption of 0.99g in farming villages, and mortality because of thrombosis is lower in fishing villages than in farming villages.

EPA and DHA are found abundantly in fishes whose back is blue-colored such as sardine, saury, mackerel, tuna and yellowtail. The figure shows foods that contain EPA and DHA abundantly. Both EPA and DHA do not undergo drastic changes in contents and functions when cooked, processed or frozen.

Processed fishery products containing large amount of DHA and EPA

Unit: g/100 g of edible parts

Kind of product	DHA content	EPA content
Monkfish liver	3.65	2.32
Canned mackerel	2.37	1.72
Salted salmon roe	2.17	1.90
Salted mackerel	2.16	1.55
Round dried sardine	2.12	2.26
Small dried sardine	1.61	1.06
Broiled eel	1.49	0.86
Dried saury	1.20	0.73
Dried horse mackerel	1.16	0.46

Fishes containing large amount of DHA and EPA

Unit: g/100 g of edible parts

Species of fish	DHA content	EPA content
Bluefin tuna (oilypart)	2.38	1.29
Seabream (cultured)	1.83	1.09
Yellowtail (natural and cultured)	1.78	0.8
Mackerel	1.78	1.21
Conger eel	1.50	0.51
Rockfish ("kichiji")	1.47	1.47
Saury	1.40	0.8
Japanese sardine	1.14	1.38
Salmon	0.8	0.5

Next I would like to speak about the functions of DHA to activate brain cells and lower hostility.
EPA is a high-level unsaturated fat having 20 carbons and six double combinations. However, DHA, also a high-level unsaturated fat having 22 carbons and six double combinations, has been drawing attention recently. DHA is said to be a substance facilitating activities of the brain. Although DHA and EPA have a similar structure, only DHA can enter into the brain while EPA cannot. DHA is an essential fatty acid for the brain.

It is said that the number of brain cells is determined from the period from the state of embryo and infant. And the brain cells develop protuberance (neuron) existing in each cell in order to communicate information. The protuberance communicates information by combining with other cells. DHA is necessary to extend and maintain protuberances.

DHA is necessary to expand the protuberance of brain cells.

Neurons are linked among themselves.

This linkage is called synapse, and it functions to communicate information.

It is necessary for DHA to be supplied amply from mother's body during the time of embryo when brain cells are formed. Also, as infants need DHA, baby milk now being marketed in Japan has addition of DHA. Based on the experiments on learning capability of the rats fed with the feed containing DHA and those fed with the feed not containing DHA at all, it has been clarified that the former have higher learning capability. There are several methods to measure learning capability of rats as shown in the figure.

Experiments to determine learning capability of rats

In another experiment, thirsty rats were put in a maze at the end of which water is placed.

In an experiment to have a rat to memorize the stool by making it swim, the rats taking mother's milk containing DHA learned the location of the stool more quickly than those that do not take mother's milk.

It has already been recognized that DHA is essential in maintaining health. What is at issue among researchers is the effect of DHA from mental point of view. A research on the "relations between DHA and emotional activities," by Prof. Tomohito Hamazaki of Toyama Medical and Pharmaceutical University, is now drawing attention. In the survey, 41 university students were divided into two groups. Capsuled DHA were given to one group and vegetable oil capsules were given to the other for three months, and hostility (aggressiveness) was measured at the start and the end of the experiment. There was an examination after the completion of the experiments. Ordinarily, stress is intensified and hostility increase at the time of examination. Hostility increased for most of the students in the group consuming vegetable oil, while it was restrained in the group consuming DHA. I think these are data supporting DHA's functions to restrain stress.

Further, the relations between fish oil and mental diseases were examined. There are also data that showed that intake of DHA alleviated general atacticus (schizoid) and depression. It has been elucidated that EPA and DHA have effect not only on circulatory organs but also on mental diseases.

Frequency of fish consumption and epidemiological surveys of diseases and mortality

An epidemiological survey was conducted on a large scale in Japan on whether fish diet is good for health. A total of 265,118 people surveyed were divided into four groups: (1) eat fish every day, (2) eat sometimes, (3) eat rarely, and (4) not eat at all. Based on this division, a tracing survey was conducted for 16 years on people of aged 40 and over at the start of the survey regarding mortality rate and cause of death. As shown in the figure, the overall mortality rate was the highest for the group "not eating fish at all." The mortality rate declined in the order of frequency of fish consumption. Regarding the diseases causing death, the mortality rate by ischemic heart disease, cirrhosis hepatis, cholesistitis, cancer, and cerebrovascular disease is higher for the "not-eat-at-all" group than those eating fish every day.

It is ideal to consume fish every day. But it has become a common recognition in the world that consumption of fish twice or three times a week reduces dangerous factors for various types of diseases. As to the reasons for these effects, further studies are currently underway regarding the functions of fishes to maintain health.

Age standardized mortality rate by frequency of consumption of fish
(relative risk degree)

Comparison was made among the following four groups of people concerning mortality rate by different causes of disease such as acute myocardial infarction (ischemic heart disease), stomach cancer, cerebral vascular accident and subarachnoid hremorrhage.

Group A: eat fish everyday
Group B: eat fish often
Group C: eat fish rarely
Group D: do not eat fish at all

As a result, it was found that those who eat fish every day, both in male and female, apparently showed that

- their total mortality was lower than those who did not eat them at all.
- their mortality rate due to acute myocardial infarction was apparently lower than those who did not eat them at all.
- their mortality rate due to cancer (all sorts of cancers) was lower than those who did not eat them at all.
- their mortality rate due to stomach cancer was lower than those who did not eat them at all.
- their mortality rate due to cerebral vascular accident was lower than those who did not eat them at all.
- their mortality rate due to subarachnoid hemorrhage lower than those who did not eat them at all.

And further, it was shown that frequency of eating fishes clearly had positive effect in reducing mortality rates in each of the above-mentioned diseases.

THE QUALITY CONTROL SYSTEM OF FISHERY PRODUCT IN INDONESIA THE RECENT SITUATION AND ITS PROBLEMS

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1. THE NEW TRADING ISSUES OF FISHERY PRODUCT AND FOOD IN THE BEGINNING OF 21 CENTURY

During 2002 to 2003, it was noted some issues and activities on changing and development of marine product and world fishery trading as followings.

1. On June 12th 2002, the President of United State, George Walker Bush give his speech on giving a sign for Public Health Security and Bioterrorism Preparednees and Response act of 2002 which which is then well known as The Bioterrorism Act or TBA it started to be effective in 18 months in advance that sign.

   Basically, this Act consists of 5 chapters. First National Preparation towards Bioterrorism and Emergency case on other public health. Second, control improvement towards Biology Agent and dangerous poison. Third, Protection for safety and security of Food and Drugs : supply, Fourth protection for drinking water and Fifth, the Additional Regulations.

   However, the United State postpones the implementations of regulations until August, 12th 2004. During the 8 moths in advance, the United State will do some researches towards the possibility of penalty implementation and even rejects the shipping in case of serious repetitive breaking.

   The postponement is probability related to United State government which even finds difficulties if TBA is going to be applied at the moment as the matter of fact, they got problem on food supply, espencially those are from import which causes the expensive needs.

   During the 8 months period, FDA and the institution related will do certain appropriate way to educate its industry and society in order to understand well TBA regulation. FDA and the institution related will apply penalty and rejection as wall as they are doing serious infraction, even though they didn't properly apply yet the TBA.

   FDA convinces that they are doing such a serious way to protect customers perhaps from terror attack through food, during the transition period. FDA is doing survey to guaranty the safety of imported food as well as FDA will do some researches, investigations and law implementation as long as it's needed.[1]

2. The policy of implementing free residual antibiotic and hormon was done by Uni-Europeen since March,3rd 2001. Those several basic policy are veterinary drugs (EC/2377/90) about antibiotic. Procedure for regulations and maximum Residual level (MRL) establishment, guideline 96/23/EC about residue control framework in exporting countries, commission decision 2002/657/EC about requirement for analytical method and analytical result and commission decision : 2003/181/EC about MRL chloramphenicol.

Given at ICA/ICFO/IKPI Seminar for Promotion of Sustainable Development of Fisheries in Indonesia, with special emphasis on promotion of domestic fish consumption and development of local fishing industry. At Mezzanine Ballroom, Arya Duta Hotel, Jakarta on 16 – 19 March 2004.

Due to its policy, the volume of exported shrimp from Asia to Uni-Europeen was slightly decreasing in 2001. In Indonesia it's decreasing 64 percents in Vietnam.

One year later, this condition is getting worse, the volume of exported shrimp from Asia to Uni-Eropeen is even rest 10 percent from 65 percents the total volume of imported shrimp in its countries as much as 429.303 ton.

This fact makes the price of certain marine commodities is getting cheaper. And it even causes uninteresting work because the aboard market is limited in the future.

In October 2002, Vietnam got facilities and was free from regular check out since January 1st 2003 this policy was taken back by Uni-Europeen commission because it was found one box shrimp contains of chloramphenicol and nitrofuran.

On February 12th 2003, the shrimp producer countries in south east Asia and China threaten to apply embargo for exported shrimp to Europeen it was considered not fair. It was proven that all imported meat, flour and milk from Uni-Europeen contains of the some antibiotic.

3. The other development, the united state government is arranging an implementation for entering fee of imported shrimp as much as 100.000 US$ for each container box. This policy was made because American Fisherman and several shrimp producer company insisted to stop the impor. The reason, this work business has decreased the volume of local shrimp production. However, this policy was strongly opposed by a shrimp importer in united state.

   They consider the import business as an important economic business and involved some various institution, from importer, restaurants, companies, seller and even the food supply shop.

   Having high entering fee tariff, it was sure that exported shrimp to us will be shopped the price of imported shrimp is us now is about 100.000-125.000 US$ per each box the economic impac in united state which is directly related to imported shrimp is the increasing income as much as 1,37 billion US$. It involved 138.000 worker the turn over of maney in manykind of processing import and marketing reach 18,7 billion US$. On the other hand, the price of imported shrimp in United State is highly cheap. It costs 10 US$ per kilogram. The local price in United State is about 30-40 US$ per kilo.

   Therefore, the shrimp importers in US also incessantly approached the parliament to abrogate the import duty plan. Yet, in few month later, the import duty plan was conducted by US government in which the antidumping regulation was also imposed on 12 producer countries included Indonesia and exporters that effectively valid on 31 December 2003.

   Nevertheless, US Government called off the shrimp antidumping regulation upon Indonesia, yet US government still carried it out upon another six big exporter countries such as Thailand, China, Vietnam, India, Brazil and Ecuador.

4. Furthermore, world society, which gathered in The World Aquaculture Society (WAS) and International Association of Fish Inspectors (IAFI), has intensively discussed the issue in convention, which took place in either Netherlands or Bangkok, Thailand on 22-25 September 2003. The theme was "Quality : The Focus of Asia Aquaculture". Apparently, all fish importers who participated in that convention had similar demand. They urged on security and quality guarantee of fishery product, started from processing until serving, which is commonly known as "From Table Farm To Table Assurance". Security it self means free from chemical substances (especially CAP and Nitrofuran), physical

substances (metal) or biological (Bacteria V.Parahaemoliticus, Ssalmonella and E.Coli). The conventions was the continuity of Aquaculture Development Beyond 2000 : The Bangkok Declarations and Strategy which was exposed on Aquaculture Development in The Third Millennium Conference on 20-25 February 2000 in Bangkok, Thailand and Conference on Aquaculture organized by FAO in Kyoto, Japan which also proclaimed The Declaration on Aquaculture.

Meanwhile, Thailand as The Biggest producer country of shrimp cultivation has anticipated the issue by pronouncing what they called "From Farm To Fork". It indicated the government willingness to guarantee the level of security and shrimp quality from processing until serving on the best condition. Although has performed good socialization to fishery stakeholders throughout the country.

5. Last but not least, by 1st January 2004, Japan government has seriously tightened the regulation to all shrimp importers from Indonesia. Initially, imported shrimps were allowed to contain 0,05 part per million (ppm) of antibiotics Oxytetracyclin and Chlortetracyclin but the measurement was strictly tightened up to 0,01 ppm. In addition, the checking period, which formerly only took 3 days, finally was also extended up to 10 days.

   Those issues seemed to focus on cultivation activities nevertheless on previous discussion there was discussion about another fisheries production aspect, i.e. fish catching. In fact, the US government threatened to ban shrimps import from Indonesia because they received report from USA Marine Fisheries Inspector which mentioned that Indonesia tend to ignore the usage of Turtle Excluder Device (TED) the device that enable turtle to release from the trawlers.

   By that period, Indonesia had an opportunity to explain to US government not later that 10 July 2001 otherwise they would find difficulty in importing the shrimps since there was reliable report to Congress which was submitted by US Foreign Affair Ministry. In effect, Custom Service in US would reject the shrimp product from Indonesia and announced the rejection to Federal Register.

   If only Indonesia got the sanction from US Government, they will lose hundreds of million US Dollar. According to US Custom Service Data, in the year 2000, Indonesia has successfully exported shrimp product up to 184,294 millions US Dollar and become the 7th biggest shrimp exporter country after Canada, Mexico, India, Ecuador and Vietnam.

   As one of the export destination country, US was commonly acceptable in conducting inspection in exporting countries regarding with TED usage. The report was essential to determine the appropriateness of certain country to export the shrimp product to US.

   At present, Indonesia is still holding Certificate of Compliance and enable them to export the shrimp product to US. Nevertheless, in the last few years, US has intentionally determined TED as obligations for shrimp exporters in Eastern part of Indonesia and handed out the local supervision to Indonesia Ministry of Ocean and Fisheries.

   The other important issue which occurred was the embargo of yellow fin tuna export from Belize, Bolivia, Colombia, Vanuatu and Venezuela on 3rd October 2000 followed by Spain on 6th October 2000 and Peru on 17th May 2002.

   The ban was based on violation upon certain stipulation on the usage of ship Purse Seine that exceeded 363 metrics tons and another international stipulation included tuna preservation, such as :

   - Code of Conduct for Responsible Fisheries 1995.

- IUU Fishing and FOC (Flang of Convenience) Vessel.
- Tuna Conservation :
  - ICCAT (International Commission for The Conservation of Atlantic Tuna).
  - IAATC (International-American Tropical Tuna Commission).
  - CCSBT (Commission for Conservation of Southern Bluefin Tuna).
  - IOTC (Indian Ocean Tuna Commission).
  - Agreement on Straddling Stock and Highly Migratory Fish Species and also another convention that concerned on sea creature, i.e. CITES (Convention on International Trade of Endangered Species of Flora and Fauna).

Some others issues that brought serious effect on fishery products were Mad Cow disease (Bovine Spongiform Encephalopathy) upon American's cow on 24th December 2003, SARS (Severe Acute Respiratory Syndrome) in China and Avian region included Indonesia (on early February 2004).

Based on the available record, Indonesia has suffered from Avian Virus which has been spreading out since October 2003, it reaches 7.7 trillion rupiahs and 1.25 millions of people lost their job. The source from Agriculture department says that 51 regions and 10 provinces have been contaminated by such virus until January 2004, more than 4.7 millions of chicken killed.

2. INFORMATION ABOUT DISEASE CAUSED BY FISHERY PRODUCT CONSUMPTION

It's difficult to get accurate data on how many kinds of disease people might suffer from due to consuming fishery product. There's no obligation for almost every country to make report on how fishery product can cause people who consume it get health problem or disease, not to mention that reporting system and data information which are inaccurate. The data simply mentions that only 1 % of the entire cases caused by food consumption (Mossel, 1992).

To notice that Indonesiaan people are lack of awareness comparing with other asian countries, for example Singapore mentioned about 101 people got ill after consuming sea product and in Malaysia about 1.240 cases caused by cholera.

Center for Disease Control (CDC) in Atlanta, United States arranged all information about disease caused by fishery product consumption accurred in US in 1993 to 1997, it mention as that the data covers 2.751 disease case and 86.000 people have reported the impact of the case. Table 1, shows the complete data of the report.

Based on data available, etiological agent causes a disease is approximately 50% caused by consuming Molusscan Shelfish, and almost 90 % caused by consuming fish (Olsen *et al.*, 2000). There possibility some disease are caused by virus which shellfish contains. Besides, outbreak alert (CSPI, 2001) noted case diseases from 1990 – 1998 which is more than 5000 cases cursed by consuming seafood. The detail is as follows :

Seafood group	Outbreaks	Cases
Fish	263	1.661
Molluscan shellfish	66	3.281
Other shellfish	8	146
Total	**337**	**5.088**

Tabel 1. **Food implication in causing disease in US in 1993-1997 (modified from Olsen *et al.*, 2000)**

Food	Outbreak		Case		Death	
	Amount	%	Amount	%	Amount	%
Meat	66	2.4	3205	3.7	4	13.8
Pork	28	1.0	988	1.1	1	3.4
Poultry	52	1.9	1.871	2.2	0	0.0
Other meat	22	0.8	645	0.7	2	6.9
Shellfish	47	1.7	1.868	2.2	0	0.0
Fish	140	5.1	696	0.8	0	0.0
Egg	19	0.7	367	0.4	3	10.3
Dairy products	18	0.7	313	0.4	1	3.4
Ice cream	15	0.5	1194	1.4	0	0.0
Bakery goods	35	1.3	853	1.0	0	0.0
Fruits and vegetables	70	2.5	12369	14.4	2	6.9
Salads	127	4.6	6483	7.5	2	6.9
Other	66	2.4	2428	2.8	0	*0.0*
Several foods	*262*	*9.5*	*25628*	*29.8*	*1*	*3.4*
Total known foods	*967*	*35.2*	*58908*	*68.5*	*16*	*55.2*
Total unknown foods	*1784*	*64.8*	*27150*	*31.5*	*13*	*44.8*
Total	*2751*	*100*	*86.058*	*100*	*29*	*100*

From 1661 cases caused by consuming fish, majority cased are those by sconbroid or ciguatera. Later, some 300 cases are caused by salmonellasis. However, these cases are not fovid in all states. Only in Hawaii and Florida diseases are caused by consuming shellfish while in Alaska diseases are caused by consuming food from fermentation.

	Outbreaks					Cases				
Agent	total	%	Hawaii	Florida	Alaska	total	%	Hawaii	Florida	Alaska
Scombroid	131	50	46	10	0	759	47	287	55	0
Ciguatera	98	37	73	16	0	394	24	260	82	0
Botulism	14[1]	5	1	0	10	43	3	3	0	30
Salmonella	11	4				305	18			
Haff disease[2]	2	1				6	-			
S. aureus	1	-				2	-			
E. coli O157	1	-				3	-			
V. cholerae	1	-				26	2			
C. perfringens	1	-				25	2			
Norwalk	1	-				37	2			
Tetrodotoxin	1	-				3	-			
"chemical"	1	-				58	4			
Total	263	100				1 661	100			

1. *One outbreak in New Jersey (salted whitefish) and two in California (both home-canned tuna)*
2. *Haff disease is an unexplained rhabdomyolysis (the breakdown of muscle fibres with leakage of potentially toxic cellular contents into the systemic circulation) in a person who ate fish in the 24 hours before onset of illness.*

Etio logical agent identified from 146 cases, 1990-1998 (CPIS, 2001), Norwalk virus caused one outbreak and 46 cases, followed by *Salmonella* (one outbreak, 45 cases), *Campylobacter* (one outbreak, 32 cases), *Vibrio parahaemolyticus* (one outbreak, 7 cases), *Staphylococcus aureus* (one outbreak, 2 cases) and 3 outbreak for *V.cholerae* (14 cases).

In US, FDA is given a mandate to manage any performances concerning with food, medication, and cosmetic (FDA, 2002). Those activities widely cover food sector includes the transportation, distribution, medication, cosmetic, chemical stuff, orthopaedic equipment, etc. Import Refusal Report is published every month. The data collected general data from FDA's operational and *Administrative Import Support* (OASIS). More or less 10 % of available data constrains a refusal of fishery product. See complete data in table 2.

Filthy" is a common excuse to import refusal, altough "filthy" isn't the main character of product, yet it is not the main cause of contamination by microorganism. The second excuse of refusal is delectable salmonella, particularly for cooked product, ready to eat, and frozen food. The other category covers labeling false, indefinite product description and uncertain verification of HACCP plans.

Tabel 2. **Seafood import refusals by US FDA from July 2001 to June 2002**

Year	Month	No. refused		No. of seafood import refusals according to reason					
		Total	Seafood	Filthy	*Salmonella*	*Listeria*	Histamine	Poison	Other
2001	July	1497	122	74[1]	20	5	2	4	21
	Aug	954	146	79	40	3	3	4	25
	Sep	906	59	27	14	7	0	2	11
	Oct	1082	136	59	50	2	3	4	26
	Nov	1079	121	51	39	4	0	1	26
	Dec	826	83	57	18	2	2	5	7
2002	Jan	1452	177	84	71	2	6	1	42
	Feb	1569	184	84	35	12	4	0	64
	Mar	1630	213	90	38	8	4	4	73
	Apr	1381	126	60	20	0	0	5	43
	May	1621	174	72	41	1	1	5	64
	Jun	1525	143	80	41	3	2	2	34

1. Number of rejections where "filthy" is stated as a reason. Note that for some products several reasons, e.g. both "filthy" and "Salmonella" are given as reason for rejection.

European Commission is applying Rapid Alert for production. This system is applied to inform the entire European Countries which belong to "UE" about the problem and risk of food. This regulation is mentioned in the Council Decision 92/59/EEC (EC 1992) about general product safety.

Data collected by HUSS (200) in 1999 show 107 out of 295 from the total amount of sea product included in to the Rapid Alert. Main product covers chilled and frozen fish (75 cases) where in pathogenic bacteria lika vibro spp, salmonella, listeria, monocytogenes, staphylacoccus, enterobacteriaceae, "aerobic mesophiles" are identified dangerous chemical substance like; pestiside reside, within shrimp product, cray fish tails, crab tails (without certification to approve whether the procut is cooked or not/raw) it covers 30 cases, besides, there about 6 cases wherein pathogenic bacteria being identified (vibro pathogenic, spp, salmonella, staphycoccus) within tuna-fish procut (either canned, frozen, or fresh). Some of sea products which are not specific contain histamin (3 cases), Hg (1 case) or salmonella, or "aerobic mesophile".

Biotoxin or virus (fiscal coliform, E.coli) are identified within shellfish (8 cases). Based on importir countries, (69.8 %) case found in Asean countries, (17.8 %) from Africa, (88 %) from America, (27 %) from Europe, (non EU) and (0.9 %) from Oceanic.

3. QUALITY MANAGEMENT SYSTEM BASED ON HACCP CONCEPT

3.1. Short History of HACCP

The application of HACCP concept was once introduces by Pillsbury Coporation, a company which produced and supplied food for NASA Austronouts in 1960's. Pillsbury corporation considered that quality product control which was applied at that time proved unable to thoroughly gave a quality assurance that the food product was not contaminated/free from contamination.

Pillsbury corporation decided to develop a system which was able to prevent from the danger-risk to occur during food-cooking process. Eversince, this system was wordly admitted as an effort to control the food protection, yet this system was not throughly able to eliminate all risk caused by the possibility of a significant danger towards food protection, but this system was design to minimize the risk, and this effort was accepted.

HACCP concept was firstly being deeply discussed in aconference held by National Food Protection in USA in 1992 FDA (food and drug administration) in 1993 obligated HACCP syatem to be applied in food process particularly for canned-food product to get rid of clostridium botulium bacteria which can cause poisoning cse due to some poison case and issue on food safety in modern country, started from 1987 HACCP concept. Has been developed and discussed by quality experts or by quality controller.

Since 18th of December 1997 Code of Federal Regulation 123, regulation number 21, which was published on 18th of December 1995, the fishery producers have been obliged to apply HACCP Program if they send their product to USA. It is also implemented in European Union, which is written in Council Directive no. 94/493/EEC, and Canada has effectively executed this regulation since 1992, which is then changed to 1998 HACCP Plus.

3.2. Definition of HACCP

Hazard Analysis Critical Control Points (HACCP) consists of two key words; *Hazard Analysis Critical Control Points.* HACCP generally means quality management system that emphasizes on specific food safety, which is based on systematic approach to anticipate the possibility of hazard during its production process and to decide its critical control points which have to be closely controlled.

3.3. Main reasons for the development of HACCP

There are two reasons why HACCP should be developed:

a. There are more people who become aware of health. Therefore it will emerge some demands on safe and healthy food that they consume..
b. Apperently the usage of End-Product Inspections is not enough to guarentee the safety of the food. Therefore, there is a need to develop a system which emphasizes on quality control starting from raw material until final product (In-Process Inspection)

3.4. The 7 (seven) HACCP Principles

The philosophy of HACCP concept is an attempt of early prevention with the possibility of hazard risk which are identified inproduction process. In HACCP concept, there are 7 (seven) HACCP principles:

1. Potentially Hazard Analysis

Potentially hazard analysis can be defined as an identification process with the possibility of hazard risk in processing or manufacturing product. The

aim of potentially hazard analysis is to identify whether there is an activity which can give negative impact to the final product, which later will be consumed by consumers. Potentially hazard analysis is designed to determine the significant potential hazard which has to be observed at certain critical control points.

In HACCP concept, which was developed by USA, potentially hazard analysis was only based on food safety aspect, but in its development, this approach can be expanded into wholesomeness aspect as well as illegal aspect, which later can cause losses to the consumers economically (economic fraud), depending on the countries that develop HACCP concept itself, or on HACCP users.

Basically risk assessment on potentially hazard analysis includes two conditions; *probability and severity.*

2. Critical Control Point

Critical control point is a critical point when control failure can cause rejections or loss risk by consumers. According to the pure HACCP concept, the procedure in identifying critical control point is by using Decision Tree Diagram.

3. Critical Limits

Crtitical limits are requirement and tolerance which have to be fulfilled by significant potential hazard as the limits of product rejection. For each significant potential hazard, critical limit has to be determined based on the exixted criteria. The criteria for deciding critical limit can be referred to the law in each country or international requirements from the buyers, or consumers. Companies can decide their own critical limit called *Operating Limit*, so they can avoid violating the certain limit. Therefore, this operating limit has to be stricter than the critical limit.

4. Monitoring Procedure

Monitoring procedure is a planned monitoring activity by testing or supervising control process effectiveness on significant hazard risk in its critical limits.

The aims of monitoring procedure are :

- To help in collecting data.
- To give early warning if there is deviation.
- To prevent or reduce product loss.
- To help solving problems occured.

There are some points in monitoring procedure:

- Method in monitoring *(How).*
- Time and frequency *(When).*
- Object that will be monitored *(What).*
- Subject that is monitoring *(Who).*
- Place *(Where).*

5. Corrective Action

Corrective action is a planned activity, which is conducted, if critical limit has been exceeded or it hasn't been reached. Corrective action needs to be conducted if during supervision there has been some hazard risk.

Corrective action has to be designed to follow up on the product and the returning process to the control limit.

6. Record Keeping

There are some points in record keeping :

- Records on the observation which gives the description, wheter critical limit or operating limit has been reached for each significant hazard risk on critical control point.
- Records on the observation when critical limit for each significant hazard risk has been exceeded.
- Giving records of the observation starting from beginning until the end.
- Identifying trends during the process.

7. Verification Procedure

Verification procedure is legitimizing the systematical supervision and review result to an effective implementation on HACCP System. Verification is a statement to quarentee that systematic implementation of HACCP has been conducted correctly and affectively, based on what has been written in HACCP Plan.

3.5. Development of HACCP

1. Pre-requisite on food production facility

Pre-requisite in manufacture unit is an essential factor in the development of HACCP, because a manufacture unit is anticipated to be able to carry out HACCP program effectively, if the pre-requisite status value has fulfiled a certain minimum standard.

Pre-requisite aspect of food production facility has been compiled into Guidelines for the Application of Food Production No. KH. 00.04.3-3.011, which includes the following aspects: attitude and commitment of the company's employer, environmental sanitation, factory facility, equipment, water supply and/or ice, individual hygiene, warehouse, packaging storage, raw material and finalproduct, bacteria test result and supervision activity.

2. Development stages in HACCP Program

HACCP program development consists of the following stages:

- Organizing HACCP team.
- Describing product.
- Identifying the utilization of the final product.
- Making flow chart diagram.
- Verifying flow chart diagram.
- Implementing the 7 HACCP Principles.

4. POLICIES ON THE APPLICATION OF QUALITY CONTROL SYSTEM AND FOOD SAFETY BASED ON HACCP CONCEPTION IN INDONESIA

4.1. Background of the Policies

The presently expanding globalization in the economy has created various issues at the International level designed to restrict imports based on not only tariffs

but also non-tariffs which include requests on equality in quality assurance systems in the efforts to seek breakthrough to new market of food products.

One phenomenon ahead all these is the establishment of the 'World Free Market' marked by the formation of a number of free trade areas such as the FTA, NAFTA, Euromarket and the APEC, have caused even tighter competition for food marketing, particularly on the International market in terms of price and quality. This competition is made even more critical by the global issues such as those of Food Safety, the environment, genetically modified organism (GMO), etc., and the inclusion of the agreement on Sanitary and Phytosanitary (SPS) as a component of the GATT in the Uruguay Round.

The above conventions will get Indonesia involved in a more competitive global trade in the future. One critical factor in this regard is quality in the broadest sense of the word which includes food safety, and product development and the market as well as efficiency in the productivity of the handling and processing stage, which will all be required to win the competitions on the free market.

At the International level, the quality standard and/or food safety is based on the principles of Risk Management. The World Trade Organization (WTO) recommends that the International trade on food be based on the Risk Assessment as assessment of the risk causing unsafe conditions of the food.

The Joint Commission of the FAO and WHO in its Session on 'Codex Alimentarius Commission' (CAC) in Geneva of June 28 – July 7, adopted the technical guidelines (RCP: Recommended Code of Practice) of the application of the HACCCP in the Guidelines for the application of the Hazard Analysis Critical Control Point system (Alinom 93/13A, APP.11) connected to the technical requirements of sanitation and hygiene as concluded in the General Principles of Food Hygiene' 1-1969, 3rd Revision (1997). There are still other requirements a country is to fulfill.

In essence, the global objective of the WTO through the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS) is that the member countries need to take formal actions to protect the lives and health of their consumers. However, it is expected that the concerned countries will not make us of this convention to unhealthily restrict trade. The member countries of the WTO are expected to consider protection of the consumers at a stricter level than as provided under the CAC, by applying the risk assessment techniques due to unsafe conditions of food.

The food production businesses must be responsible for their consumers' safety and health that they should apply safe production system of food. Hence, to prove the responsibility that the production system has been applied safely applied and thus production of the required quality is ensures, documentation management should be applied through which to prove that the quality and safety control system of food has been applied effectively with continuous efforts for improvement through a control mechanism applied internally by the business as 'self regulatory quality and/or safety control' as well as externally by the institution having the competent authority to conduct supervision.

4.2. Standar Nasional Indonesia (SNI) (Indonesian National Standard)

Law of the Republic of Indonesia Number 23 of 1992 on Health is one effort of the Government to guarantee safety of food and drinks, and a safety environment (Part Four: Safety of Food and Drinks, Article 21; Part Five: Environmental Health, Article 22).

Law of the Republic of Indonesia Number 7 of 1996 concerning the imposition of the responsibilities of food manufacturers as 'Businesses producing processed food for distribution and/or individuals in the businesses assign to manage such business shall be responsible for the safety of the food they produce on the health of other people consuming the food.'

The regulations and the rulings on the above Laws have been declared, setting forth the standards the producers are required to satisfy in order to ensure food products of the required safety and quality.

The Standar Nasional Indonesia (SNI) No. 01-4852-1998 concerning Hazard Analysis Critical Control Point or the HACCP) and the Guidelines on the Application thereof have been issued by the National Standardization Agency (BSN) as the competent authority for determining the standards as provided in the Presidential Decree Number 13 of 1997. This standard is one of the quality management systems using product quality warranty with food safety, risk management risk assessment approaches.

This SNI completely adopts the Standards of the FAO and the WHO CAC/RCP (Recommended Code of Practice – General Principles of Food Hygiene – Annex) 1-1969, 3rd Revision (1997) on the HACCP System and Guidelines for the Application.

The HACCP is an applied science based on science and is systemically used to identify potential hazards and the actions to control such risks in order to guarantee food safety. The HACCP is one tool to analyze potential hazards that will significantly produce risks of the safety and quality of the product. This requires the application of the control system that focuses on early control of such potential hazards instead of relying on the quality control at the final stage. Each HCCP System is able to accommodate changes such as suitable equipment design, processing procedure or technological advancement.

The HACCP may be applied through the chain of food production – from the primary product to the final consumption. However, the scope of activities and the instructions of the application of this system may be used in accordance with the capability and the determination of the HACCP practitioners for the control purposes.

The application of the HACCP Program must be supported by monitoring data as scientific proof of the presence of risk hazards of the product that affect the health of human being.

Besides, for food quality and safety assurance, the application of HACCP System is a self-regulatory quality control by actor and the validity of the quality assurance must be countered by the competent authority for external control.

The application of this HACCP System may also improve the reputation of and trust of producing safe, consumable food, as it is a system equivalent to that applied by the importing countries. Hence, it is expected that by applying the HACCP there will be recognitions of the national as well as International levels.

The success in the application of the required responsibilities, commitment and support as well as involvement of the management and the other staff of the manufacturer. The HACCP Team members as the designer of the Program, the prime mover in the application of the Program are required to possess he qualifications of various disciplines, the related competencies in such fields as agronomy, veterinary medicine, production, microbiology, pharmacology, public health, food technology, environmental health, chemistry, so that any potential

hazards could be more accurately analyzed from the viewpoint of their respective competencies.

4.3. Accreditation System of the HACCP Program Application

As provided in the BSN guideline 1001, the HACCP Certification System (LSSHACCP) must also obtain an accreditation of the National Accreditation Committee (KAN) of the National Standardization Agency, regarding its performance as a Food Administration Certification Institution, particularly as regards supervision on the applicability of the facilities, capability of the staff in charge and the effectiveness in the application of the LSSHACCP management system. In the implementation, the LSSHACCP is generally assessed to assure the validity of the supervision on the application of the HACCP system.

The HACCP System Certification Auditor and/or the LSSHACCP Accreditation Auditor should have the following qualifications:

- Background of knowledge that suits the applied discipline of the HACCP system;
- Knowledge on supervision method;
- Knowledge on the references and requirements regarding Food Supervision System;
- Experienced in the application of HACCP system;
- Successful completion of the special training on the HACCP System Audit.

Besides, as an HACCP System Certification Auditor and and/or LSSHACCP Accreditation Auditor must understand the code of ethics:

a) Acting in a reliably, professionally and independently manner;
b) Giving information to the principal institution on any relationship the SSHACCP Auditor or the LSSHACCP Accreditation Auditor may possess to the institution to be supervised before an assessment function is administered by the institution;
c) The SSHACCP Auditor or the LSSHACCP Accreditation Auditor and those reporting to him or her shall not receive anything that may affect the work quality;
d) Responsible for the confidentiality of all the information and documents they know and have obtained during the SSHACCP assessment process, except in writing by the party being assessed as well as the institution doing the assessment;
e) Avoiding to act in any manner that will adversely affect the reputation or interests of the institution doing the assessment and the registration system;
f) In the case of an offense to the provision of items a) through e), the SSHACCP Auditor or the LSSHACCP Accreditation Auditor must face a hearing in accordance with the prevailing procedure.

Besides the above legislations, there are still many other regulations on the safety of food issued by the Minister of Health and the Director General of Medicine and Food Supervision and other related agencies.

4.4. Policies on Integrated Quality Management Program of Fishery Products

The regulation on quality improvement program and food safety for fishery products has actually been in place since the issuance of the Joint Decree of the Minister of Agriculture No. 31/Kpts/UM/I 1975 and No. 32/I/Kab/BU/75. Along with the issues on food safety, a number of developed countries require the application

of Fishery Product Quality Control System based on the concept of the Hazard Analysis Critical Control Point (HACCP).

The quality control program application based on the HACCP concept for the fishery products in Indonesia is provided in the Decree of the Minister of Agriculture No. 41/Kpts.Ik, 210/2/1998, concerning Integrated Quality Management System of Fishery Products dated February 9, 1998, and Decree of the Director General of Fishery No. 14128/Kpts/Ik.130/XII/98 concerning Guidelines on the Implementation of Integrated Quality Management System of Fishery Products. Later, since the establishment of the Ministry of Maritime and Fishery, the quality control program of fishery product is provided in the Decree of the Minister of Maritime and Fishery KEP.01/MEN/2002 concerning Integrated Quality Management System of Fishery Products effective as from January 25, 2002. Meanwhile, the guidelines on the implementation thereof have so far still been based on the Decree of the Director General of Fishery No. 14128/Kpts/Ik.130/XII/98 concerning Guidelines on the Implementation of Integrated Quality Management System of Fishery Products.

Since the effectiveness of the said decree, various regulations on quality control of fishery products have been improved and the most recent has been the issuance of the Decree of the Minister of Maritime and Fishery No. KEP. 06/MEN/2002 which lays down the requirements of the procedure of fishery product quality control of the fishery products entering the territory of the Republic of Indonesia.

The Decree of the Minister of Maritime and Fishery KEP.01/MEN/2002 concerning Integrated Quality Management System of Fishery Products of January 25, 2002 consists of 25 chapters and 34 articles. The chapters include as follows:

- General provisions and scope;
- Basic requirements on the application of the HACCP program, namely, the possession of the Standard Sanitation Operating Procedure (SSOP) and the Good Manufacturing Practices (GMP), covering the chapters on the requirements of raw materials, use of auxiliary materials and additives of food; processing unit eligibility requirements; and processing requirements.
- Application of the Quality Management System, comprising articles on activities of HACCP program validation, audit and certification of application;
- Quality standards;
- Importation of fishery products to the territory of the Republic of Indonesia;
- Guidance;
- Supervision;
- Investigation;
- Funding;
- Administrative actions;
- Transitional and closing provisions.

Meanwhile, the guidelines on integrated quality management system of fishery products based on the Decree of the Director General of Fishery No. 14128/Kpts/Ik.130/XII/98 concerning Guidelines on the Implementation of Integrated Quality Management System of Fishery Products consists of eight requirements and procedures, namely:

- Requirements and procedure of obtaining Processing Eligibility Certificate (SKP)
- Requirements and procedure of obtaining Fish Processor Certificate (SPI);
- Requirements and procedure of Certification of PMMT Application and Implementation of PMMT Application Guidance;

- Requirements and procedure to obtain Certificate of Quality and/or Health Certificate of Fishery Products.
- Requirements and procedure of appointment of Fishery Product Quality Supervision;
- Requirements and procedure of Supervision and Reporting Administration;
- Fees required for the implementation of this decree and the date the decree becomes effective.

5. EVALUATIONS ON THE APPLICATION AND ADMINISTRATION OF THE QUALITY MANAGEMENT SYSTEM OF FIHSERY PRODUCTS IN INDONESIA

5.1. TECHNICAL ASPECTS

Based on the data of the apprenticeship reports of the Diploma-3 Program students of the Academy of Fishery Products (AHP, of the Faculty of Fishery and Maritime Sciences, from 1999 through 2003, in various fishery product units that are mostly located in Java, and the monitoring of these activities (Riyanto, 2003), it could be generally concluded as follows:

1. Fish Catching and Handling from vessels
   In general, the activities of handling from the vessel to the selling, that comprise loading of fish onto the hatch, unloading from the hatch, auction and purchase by resellers, show a generally decline in the freshness of the fish by around 20%. As regards the freshness of the fish when it arrives to the consumer (from the resellers) will be around 40%.

   Based on the activities done through these handling activities, all data reported by the Fishery Product Quality Testing Laboratories in Java show that the *E. coli* bacteria are always present in all the fishery products landed, on the hatch, in auction, as well as in baskets. This means the processing through the chain is not hygienic.

2. Frozen Shrimp Processing Unit
   - The conditions of the raw materials to be process for the windu shrimp (*udang windu*) is mostly still below the First Quality (FQ), that is, 30% of the Standard Quality (SQ) and the Below Standard (BS) being 60%. The aspects of evaluation used include: tail root, algae, soft meat, broken shell, loose shell, deform, black leg, white sport, bruise.
   - Of the shrimps harvested from the ponds, the average reports of the apprentices also show that the *E. coli* is always present in all the products harvested.
   - Regarding antibiotics, the average of all these reports do not show an accurate data, but all these reports discuss and conclude the need of intensive analysis on the antibiotics content.
   - The use of chlorine in general have fulfilled the standards, particularly for the product washing, being on average 5 ppm at a temperature of around 5^0C, though in some companies, the chlorine used tend to be in higher than the specified rate. However, of concern here is the techniques of determining and solution of the chlorine powder to chlorine solution, as some of the reports show wrong calculation techniques.
   - The use of sodium tripoliphosphate (STPP) as additives, added to shrimps in liquid form at the concentrations of 30-50% and are generally more diluted to 5-10%. The duration of drowning is generally around 30 minutes. The results of this practice are, among other things, increased weight of the shrimp and

the concealment of poor level and category of quality of shrimps (BS-below standard).

- The freezing and storage temperature are in general fulfilling the applied standard.
- There are still a number of products found as containing metal, such as the strapless.
- The reports of a number of product tests with treatments after thawing show there is still the presence of much filth, particularly broken hair.
- The products ready for exports have fulfilled all the prevailing regulations, including the safety of the food products.

The evaluation of these reports also found that the development of the added value products is increasingly applied (around 90% of the existing shrimp processing units). One such product is cocked shrimp frozen. The reports in this respect indicate three aspects of potential hazards that warrant proper attention, including:

The cooking process which includes the temperature and duration of the cooking as well as the cooking equipment used.

The cooling process after the cooking; and

The additive addition process (salt, natrium tiosulfite, spices, etc.)

3. Fresh and Frozen Tuna Processing Unit
   - The histamine content of the tuna raw materials to be processed is on average around 20 mg/kg. The result of this analysis generally uses the histamine kit.
   - The use of chlorine has fulfilled the specified standard, particularly in the product washing being on average around 5 ppm at the temperature of 5^0C. All the reports of the apprentices assigned to the tuna processing unit do not indicate any mistakes in the calculation techniques.
   - However, almost all the reports indicate the use of CO_2 increase the red color on the flesh. This use of gas is done by the larger part of the frozen tuna processor, particularly the loin tuna. The reports did not indicate the validity of the gas used and the percentage of gas used, but all the reports described that all the faces of the workers when feeding the gas become red and they always drink milk for neutralization.
4. Tuna, Mackerel and Sardine Processing Units
   - The histamine content in the raw materials of the tuna to be processed is on average 30 mg/kg.
   - There is still the presence of *anisaki* worm, particularly for the mackerel. This activity is presently categorized as the critical control point.
   - The canned tuna and sardine with sauce generally use the sauce made from vegetables and fruit in Indonesia. Some manufacturers use imported raw materials because the quality of the existing vegetables and fruit is still below the criteria and the quality required by the buyers. There are no descriptions of whether the vegetables and fruit have been grown without any genetic treatments.
   - Regarding the retort used, almost all the reports informed there had never been any monitoring and inspection of the heat penetrated into or to the central point of the can, that there is a fear the sterilization process has not been very effectively done, though intensive observation of the duration of the commercial sterilization process has always been recorded and reported.

5. Pasteurization Small Crab Canning Unit
   There are two potential hazards that warrant attention here, including:
   - The pasteurization process comprising the temperature and duration of the pasteurization, particularly the effectiveness of the heat penetration.
   - The cooling process after cooking. In this process, the pasteurized cans will generally be directly cooled off using cold water of 0^0C along with the addition of chlorine solution. Such a drastic change in the temperature also causes a change in the can structure that there is a potential stretch in the can joints. The potential presence of chlorine residue is another hazard.

The reports of the studies conducted by the students of the Fishery Product Technology Study Program in the same years, i.e., from 1999 through 2003, show that some applications of the HACCP programs have much been reviewed and some have even been developed, including the application of the HACCP program application in Ponds. Besides, observations on the HACCP applications have also been made in the fish selling points, particularly in large supermarkets in Jakarta.

The application of the HACCP program in ponds that have potential hazards includes the stages of pond construction inspection, cleaning of the beds and installation of pond facilities, pond drying, water filling, water sterilization, plankton growing, young *windu* shrimp (*benur*) quality checking, water management, feed management, pond bed management, shrimp health management, harvest preparation and harvest supervision.

As regards the application of HACCP program in fish selling points. the potential hazards include the supporting facilities as the location, promotion, cleaning facilities, cutting, ice, package and friendly services, cold chain, transportation, acceptance handling, display, price, purchase contract or payment, and packaging or containerization.

Existing reports of the studies show that all the supermarkets and the hypermarkets in Jabotabek area have not applied the HACCP program for fishery products, but they already possess the Standard Operating Procedure (SOP). In general, the freshness rate of the fish sold is still good and re-ordering is always made, averagely every 4 days, and the average selling period being around 7 days.

As regards the development and application of the HACCP of the traditional fishery products the reports show that not much has been done. This is because a number of the basic requirements as high commitments of the processors and the basic requirements of the eligibility, such as cleanliness of the existing infrastructures and facilities and the good manufacturing practice (GMP) still require much attention. If development and application of this HACCP is considered, it would also be necessary to consider various other aspects that are closely related to it, such as poverty eradication, improvement in the quality of education, as well as various aspects of policies and joint commitments that combine to serve improving the awareness of the whole society.

A number of potential hazards that were noted in the HACCP program application on the traditional fish processing units are:

1. Salted fish processing

   There are still a lot of people using the hazardous insecticides, such as hazardous insecticides containing dichlorvost and propocsure, as the DDT, aldrin, dieldrin, endrin, heptachlor, chlordan, mirex, tocsafen, polychloronated biphenyls (PCBs), or minawet (insecticide containing organophostat compound with active substance of primiphos methyl), etc. Development in insecticide has found new type of insecticide, namely, pyrethroid synthetic. In their uses with

salted fish, the study reports of Riyanto, et. al. (1998) show that the alpha cypermethrin appear to be fairly effective in preventing infestation of flies and insects. Further study using neostosan insecticide or Antiset 15 EC and Antiset 1.5 L (using the newest active substance of synthetic pyrethroid, i.e., theta cypermethrin, as reported by Riyanto, et. al. (2000) also showed fairly effective rate in preventing the infestation of flies and insects in salted fish.

2. Preservation of large fish with salt without drying (*pemindangan*)
   Using formalin to increase the toughness of the product.
3. Terasi
   Many producers are still using textile dyes.
4. Smoking
   Use of various chemicals for the development of liquid smoking. Besides, the use of liquid gas composition and the effects produced were not much described.
5. Product processing (balls, nuggets)
   Use of hydroperoxide, antioxidant BHT and BHA, texture formation substance and hazardous dyes such as auramin, ponceau 6R, and rhodomin B.
6. Oysters
   - Heavy metal content taken in the oysters taken in the Jakarta Bay in the past three years show the highest values being recorded as for Pb, around 16.5 ppm, Cd 2.7 ppm, Cu 19.5 ppm, and Zn 309.46 ppm.
   - In intensive study conducted by Damar (2003) in the coast of the Jakarta Bay during the wet season estimated the organic matters entering the Jakarta Bay as increasing by four times the as that in the dry season. This difference in the load causes a difference in the mean of phytoplankton biomass. This blooming of the phytoplankton is also a routine occurrence, such as in September and October, the phytoplankton boom of the Skeletonema costatium and Noctiluca scintillan is found in a fairly long period (2-4 weeks), causing the water to become thickly green.
     Results of the examination by Adnan (1993) show the mass deaths of fish in the Jakarta Bay is closely associated with the phytoplankton bloom. A number of toxic species is also found in the Jakarta Bay, such as the Protoperidinium spp, Gymnodinium spp, and Alexaandrium spp., that are fortunately still in small quantity.
   - The use of formalin in the cooking of oysters which is identified as high, i.e., 1 liter of formalin for 100 kg of oysters cooked.
   - The use of hazardous dyes in the hard, peel, boil, process where 1 kg of preserver is used in 1 hour of drowning.

5.2. POLICY ASPECTS

In 2003, based on the Maritime and Fishery Development Reflection through October 2003, regarding the role of guidance to the processing units, the government has issued 215 Processor Eligibility records (SKPs) where 65 are new processing units and 150 are extension certificates. The certificates of validation or verification audit of HACCP program application (certificate of quality) came to 243. Based on the data of 2001, there were 484 units that were issued SKP certificates and 285 units obtaining HACCP application certificates. Not much information was obtained of why there has been such a significant decrease. To support these activities, the government, in these regards, the Ministry of Maritime and Fishery

has built 34 Laboratories for Quality Guidance and Testing of Fishery Products (LPPMHP) located in almost all fishery clusters in Indonesia.

However, based on the same source of data, there were in 2003 14 cases of fishery export rejects by UE due to use of prohibited antibiotics – Chloramphenicol (12 cases). Cases of fishery product export rejection were also came from the United States, involving 133 cases, due to the increased quality requirements.

Also, based on the same data, the results of handling and monitoring of the use of prohibited antibiotics (Chloramphenicol) in the period of October 2001 through January 2003 show residue range of 0.12 – 37.32 ppb. It is more surprising to note that such residues were found in all the clusters of shrimp culture. Besides, these residues were also present in the shrimp feed used, with some containing up to 175.85 ppb.

Based on the existing information, several application, stipulation and the guideline of the implementation such as The Bioterrorism Act 2002, providing the examination facilities on the prohibited antibiotic residu (Chloramphenicol, nitrofuran with the appropriate maximum residu level and its derivative which is touching the metobolic descent aspect) had not been implemented yet, the said anticipation of several issue is impressing late, un focus and is impressing lack of coordination.

Parallel with the increasing of domestic market, based on the report in the Retail Indonesia Magazine, March 2004, the consumers of fresh food including fish were infected by their anxious and hesitant feelings toward the correctness of the label and the promotion on the freshness of the fresh fisheries products which were done by the supermarket. Who are actually resposible in assertaining to the consumers that the said products are realy fresh? The consumers have the rights to demand for the protection.

As usual in international world, the institute which has the right to issue the certificate or label is the Institute which had been accredited by a certain Government institution. In Indonesia the National Accreditation Committee constitutes the said above institute. Besides that, the Derector General of Catch Fisheries is apparently has the right to the prevailed stipulation as mentioned above too.

The problem or the main issue that are still suspending is the credibility of the already existing Accreditation Institute. Though the communitiy had given good response toward the pro-active movements coming from the communitiy, the Ministry of Maritime and Fishery through the Director General of Catch Fisheries is still feeling hesitate in giving accreditation that had been done. As the holder of a competent authority, they are feeling as of having the right to stipulate everything. But, since the increasing of the expansion of problematics, which are not related only with fisheries for food, in broadly meaning including trades, such as whole salers, retailer, this stipulation is probably regarded by many parties as contains confliet of interect, because it is presumed to be having vested of interest in that business.

The Ministry should also arrange the system that could be anticipating, avoiding the possibility of existing practice of coruption, collution and nepotism which in Indonesia had been deeply rooted. Private companies may also deed as Certification Institute. Idealy, this Certification Institute has the quality of independent, free from all kind of production business and fisheries product marketing. It means, that the Certivication Institute is not involved in the business, such as to own share in production industry and fisheries product marketing, so that it could be avoiding itself from the vested interest takes place.

If the consumers do not believe again toward the system of certification which had been built, the whole certification program will be dropping off and the very important thing which still should be done is that the process of certification is necessary to be kept correctly, honestly, carefully and credible. On the contrary, if the above matter is done perfunctorily, it will have consequences of erosion of the consumers' trust toward the existing certificates.

The consumers need protection toward the correctness of the predicate of health of the product which they bought with enougth high price. Though the producer or supplier had been certificated, the responsibility is not 100% falling on the institute which was giving the said certivication. After the certification of the product, there is still needed labelization of the product which should be following the Government Regulation on label and advertisment in Indonesia, which known as P.P. (Govt Regulation) No: 69/1999.

5.3. OTHER DEVELOPMENT ASPECTS

Parallel with the more and more competitive of the world market and the great demand from the consumers, the availabelity of only the good quality products or goods and services, is not enough. Several aspects wich are basing and inspiring the creation of the above mentioned quality of goods or services are more and more needed and more and more felt.

So that the program on quality management which is more integrated is more and more needed. The cohesiveness between HACCP and ISO 9000, ISO 14000, the health, the job safety and the Human Right (ISO 18000) and also the several technical development in the appraisal on quality management such as Statistica Process Control (SPC). The Six Sigma, and Balance Score Card become more and more felt.

5.4. HUMAN RIGHT ASPECTS

As regard to one of the new programs, HACCP is realy not much understood yet by the big part of the community. The concept coming from outside and not in the form of routine activities of Indonesian Communities is felt more and more heavy to be developed, since this concept was rolled on in the communities, untill nowadays there are still many lacks faced.

As an entrusted institute to develop high educations in the community the Department of technology of Fisheries Products, Faculty of Fisheries and Maritime Science, Bogor Agriculture University has been aware about the important meaning of this program for the community and also for the science. HACCP and also the education on quality management at the Department of TFP had been carried out since 1982, coincided with the establishment of the above mentioned Department, that the time was named as Fisheries Product Processing. Several Programs on quality and quality educations were always followed and tried to be kept on develop and also contributing the role to the livelihood of the community. Since this stipulation put into effect by the Government in 1998, one year later the Department of TFP hade made this as one of a special subject of lecture and also had been entering in the lecture curriculum which is obliged to be taken by the whole student, with the total of 5 SKSs or equal with 8 hours/week.

This subject of lecture is given at the last of the year of the entire programmed lectures. This lecture becomes very meaningful due to its aspect of competence. The skilled and the sharpness of analysis on problems becomes a very important aspect in appraising the succesfull of a student who follow this lecture.

This commitment is also proven, that only a student who obtained quality's letter A and B will receive certificate of graduate, whereas the student who obtained D value, won't be promoted to a higher class. Based on the result of evaluation, apparently there were only 60% from the whole student received certificate of graduate. To support this subject of lecture the program on planning study with giving the requirement of lectures, among others the introduction of fisheries product technology, fisheries product biochemical, fisheries product microbiology, sanitation and hygiene integrated quality management of fisheries product and fisheries product processing management.

Parallel with the said above matter, at present is included also the lecture subject on statistic which becomes a requirement to follow the lecture subjects. Based on the activities and our result of evaluation during 5 year, there are many students whom at present become quality controlers for the development of HACCP program at the entire fisheries enterprise in Indonesia and also abroad (such as Malaysia). Besides that, there are also many students of FPT become quality controlers at several food processing enterprises in Indonesia, though scientifically the department of FPT was deepening on the field of fisheries expertice only.

But it is regretted, that the lofty activities to accelerate the implementation of this Fisheries Product Quality Management Program, once again is collided with the holder of competent authority. Based on the stipulation of the Regulation of Director General of Fisheries No. 14128/Kpts/IK.130/XII/98 regarding the implementation guideline of the integrated quality management system of fisheries product, in the second determination viz.: The requirement and the procedure to obtain Fish Processor Certificate (FPC) especially in Chapter III concerning the requirement and Chapter IV concerning the procedure to obtain FPC, all aspect on education and teaching concerning HACCP becomes the competence of the above mentioned institute. As regards to the complete contents of the said stipulation are as follows :

Chapter I
General Stipulation
Pragraph 1

(1). FPC is a certificate issued by the Minister of Agriculture (now Minister of Maritime and Fisheries) in this case the Director General of Fisheries who certifies that one had obtaned a certain education and or training and have had a mastery of knowledge in the field of fish processing.

(2). The person in charge is the person who is given the task to be responsible for the processing and quality control.

Chapter II
Scope
Pragraph 2

This stipulation constitute an Implementation guideline of Paragraph 11 article (2) of the Decision of the Ministry of Agriculture No. 41/Kpts/IK.210/2/98 (renewed by the Decision of the Minister of the Maritim and Fisheries No. KEP.01/MEN/2002 as mentioned above).

Pragraph 3

The FPC is given to the graduate of the Fisheries High School, Ministry of Agriculture Study Program on Product Processing Technology or to whom complies with the requirement stipulated in this Decision.

Chapter III
Requirement
Pragraph 4

(1). Each unit of fish processor is obliged to employ someone to be responsible as the owner of FPC.

(2). To obtain the FPC as mentioned in Paragraph 1 article 1 someone has to be in compliance with the following reguirements

a. Certified Diploma IV from Fisheries High School, of the Ministry of Agriculture, Study Program on Product Processing Technology.

b. Certified scholar or Diploma IV from Fisheries High School, of the Ministry of Agriculture, Study Program on Product Processing Technology or of the same kind.

c. Certified Agriculture Development School, Study Program on Fisheries Product Technology and one who owns Certificate of Assistant of Fish Processing or Certified Diploma III Study Program on Fisheries (other than Study Program on Product Processing Technology), Food Technology, Biology, Chemistry, Nutrient or other Study Program related with food processing and has had working experience in the field of fisheries product processing minimum 3 (three) years, or

d. Certified scholar or Diploma IV Study Program on Fisheries (other than Study Program on Product Processing Technology) Food Technology, Biology, Chemistry, Nutrient or other Study Program related with food processing and has had working experience in the field of fisheries product processing minimum 2 (two) years.

(3). Someone who has been in compliance with the reguirement as mentioned in article (1) and (2) letter b or c or d should have passed the training on Processing Technology and Fisheries Product Quality Management, Organized by Directorate General of Fisheries.

Chapter IV
Procedure
Pragraph 5

(1). To obtain FPC as mentioned in Paragraph 1 article (1) and had been in complience with the reguirement as mentioned in Paragraph 4 article (2) letter a, the Chairman of Fisheries High School – Ministry of Agriculture, propose the aplication to the Directorate General of Fisheries, attached the list of names and their respective biodata.

(2). Based on the application as mentioned in article (1) : the Director General of Fisheries gave the FPC to the respective graduates.

Pragraph 6

(1). To obtain FPC as mentioned in Paragraph 1 article (1) and had been in compliance with the reguirement as mentioned in Paragraph 4 article (2) letter b, the leader of the high school or individual propose the application to the Director General of Fisheries.

(2). The application proposed by the leader of the high school as mentioned in Chapter (1), attached the list of names and their respective biodata.

(3). Based on the application as mentioned in article (1), the Director General of Fisheries organized a training concerning Processing Technology and Quality Management on Fisheries Product.

(4). The training's participants as mentioned in article (2) who were passing the examination, were given the FPC by Director General of Fisheries.

Pragraph 7

(1). To obtain the FPC as mentioned Paragraph 1 artcle (1) and had been incompliance with the reguirement as mentioned in Paragraph 4 article (2) letter c or d, the leader of fish processing unit or individual proposed the application to the Director General of Fisheries.

(2). Based on the application as mentioned in article (1), the Directorate General of Fisheries organized a training concerning Processing Technology and Quality Management on Fisheries Product.

(5). The training's participants as mentioned in article (2) who were passing the examination, were given the FPC by Director General of Fisheries.

Pragraph 8

The bestowal of FPC as mentioned in Paragraph 5 article (2), Paragraph 6 article (4) and Paragraph 7 article (3) were done after taking oath/pledge and signing the Official Report.

CLOSING

The expansion of problems of food products of fisheries are more and more obtain many challenges. Several development of communities abroad as well as internal will certainly claim the better condition of the situation. Parallel with that, several cases on security and safety of food consumption begin much being felt, especially the case related with live environtment. These problems are not only for the developed countries but also for all humanities who comsume foods. This situation, needed to be prepared as optimally as possible, starting with the government policy and wit the implementation aspect in the field as well.

The existence of HACCP as an aspect that can help to develop in the food product control system become very important to be implemented. With self regulatory quality and/or safety control which to be as the guidance is hoped will be much more playing a role to increase the awareness of the community.

The evaluation on the existing activities has to be kept on implemented and to be informed to the community. The existing lacks have to be kept on increased and this constitutes a cooperation and also our hard of working.

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"Dietary Life of Indonesian People with Special Reference to Present State of Fish Consumption and Problem"

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Abstract

The fisheries sector is an important contributor to the Indonesian economy in terms of protein supply, employment and income generation. Average per capita of fish consumption was 18.00 kg in 1990 and 22.84 kg in 2002. In the last ten years, the dietary life of Indonesian people mainly consist of cereal 194.55 kg, starchy roots 67.46 kg, oilcrop and vegetable oils 53,08 kg, fruits 31.35 kg, vegetables 23,59 kg, fish and aquatic products 16.60 kg, sugarcrops and sweetener 15.14 kg, meat and offals 10.31 kg, milk 5.48 kg, pulses 3.88 kg, eggs 2.52 kg, and others 3.06 kg per capita per year.

The demand for fish is facing an inelastic demand function, Fish, however, account for more than 60% of animal protein consumed in Indonesia. Fish consumption in urban area is slightly higher than that of rural area, the dominant fresh fish consumed are indian mackerel, skipjack, eastern tuna, tilapia, milk fish and for processed food are anchovies, indian mackerel, trevallies, tilapia. Total expenditure items for consumer who monthly per capita income above Rp 300,000,- was spent 33.14% for food which are 4.38% for cereal, 2.18% for fish, 5.90 for meat, eggs, milk and consumer who monthly per capita income less than Rp 150,000 was spent 72.32% for food which are 31.54% for cereal, 8.39% for fish, 0.36 for meats, egg, milk.

Fish is considered the main source of protein especially for lower income, therefore, increasing fish consumption is depending on improving of people's purchasing power and availability of fish within affordable price range. Based on static demand analysis income elasticity of demand of fish was 0.506 which showed per capita income definitely increase fish consumption, demand of fish is inelastic with elasticity of price – 0.102 and the cross price elasticities of chicken and egg were 0.028 and 0.271 both products are substitute for fish especially for higher income. The dynamic model of demand analysis explained fish consumption is related to a psychological fish-buying habit, this condition support the phenomenon of higher consumption of fish in coastal area but this habit is eroding quiet rapidly. The short run marginal propensity to consume is relatively low (0.17) which is consistent with lower growth of fish consumption but the long run marginal propensity to consume is higher (0.701) which means promising growth in fish consumption in the future. The expected increase in consumption in the future is not only because of habit, but is also due to the increase in per capita income. The dynamic analysis showed sizeable differences between the short and long run elasticities and the adjustment coefficient is low. The finding indicates that per capita consumption of fish is growing but at a slow rate. Therefore, policy to enhance consumers' preference towards fish by extension, advertising and increasing purchasing power especially in the densely populated areas, could boost fish consumption in Indonesia at a faster rate.

Background

Fishery sector contributes significantly to the economy of Indonesia in providing animal protein, labor force absorption, foreign (exchange) and society's income. In 2003, fishery products reached as many as 5.9 tons with average growth over 2000-2003 being 5.21%/year. Its export value was as much as US$ 2.4 billions with the volume being 395.5 thousand tons. Averagely the price per kilogram for such product is

US$ 6.15 (Ministry of Maritime Affairs and Fishery, 2003). From the fish consumption perspective, there is an increase in the community's consumption as many as 18 kg/capita/year or 49 grams/capita/day in 1990 into 22.84 kg/capita/year or 62 grams/capita/day in 2002.

However, the average fish consumption level of the Indonesian that is 22.84 kg/capita/year is still inferior against the consumption level/capita/ year of the other ASEAN countries, such as Singapore whose fish consumption level is as many as 80 kg, Malaysia 45 kg, Thailand 35 kg and Philippine 24 kg. This low fish consumption level indicates the low fish consumption culture of the Indonesian. The people of many developed countries the like of Japan and the United States turn to fish as their source of animal protein. The average fish consumption level of both countries is 110 kg and 80 kg/capita/year each. The lack of knowledge of the Indonesian on the nutritional contents of the fishery products as well as the low income suspiciously leads to the low average fish consumption level.

Fish is a source of animal protein highly significant to human growth and intelligence improvement. Fish protein consists of nutrition and Omega 3. The nutrition in fish protein consists in one of the sources for bodily growth, whereas Omega 3 contains DHA & EPA. DHA is one of the substances stimulating intelligence improvement. DHA and EPA are high- density cholesterol preventing the blood fats from lumping so as not to form flints attached to the blood vessels. Hence, EPA and DHA are good for health. In improving the fish consumption, apart from the factors on the benefits of fish, one has to account for community's attitude and socio-economic factors. By doing so one can start formulating the proper steps to improve the welfare of the public in general as well as fishery products producers in particular.

INDONESIAN'S FISH CONSUMPTION LEVEL

Fish and Non-Fish Consumption

FAO reports that over the last 10 years, Indonesian's average fish consumption level has been 16.6 kg/capita/year. In the same period the food supplies with the highest consumption has been cereal as many as 194.6 kg/capita/day, followed by Starch Roots 67.5 kg, vegetable oils 53.1 kg, fruits 31.4 kg and vegetables 23.6 kg.

The calories content of the fish consumed is averagely 35.2 kcal/capita/day/year for the same period. This calories content of the fish is relatively inferior against the other non-fish food supplies. However, the amount of the calories content consumed by Indonesian is still higher compared to the fish-substituting foods such as eggs (10.5 kcal/capita/day) and other animal fats (10 kcal/capita/day).

From the perspective of protein content, the amount of protein from the fish consumed is relatively smaller than that of the other food supplies save that of cereal (35.1 grams/capita/day) and vegetable oil (12.3 grams/capita/day). The amount of fish protein obtained from the fish-substituting foods over the same year, such eggs and other animal fats is each 0.8 gram/capita/day and 0.1 gram/capita/day.

The calories and protein contents above indicate that fish is the calories and animal protein source with the highest consumption. There is still another fact indicating that food groups derived from plant are better consumed than those derived from animals. The amount of calories consumable from vegetables is 2,651.7 kcal/capita/day whereas that of the animal-derived food is as low as 122.7 kcal/capita/day. The amount of protein consumable from vegetable foods is as much as 52.6 grams/capita/day whereas for animal-derived it was 10.9 grams/capita/day.

This is very contradictive to average calories and protein consumption from fish and meat of other Asian countries, United States, Europe and Japan. In 1998, the fish

calories and protein consumption in Asian countries was 31 kcal and 4.9 g/capita/day; USA 29 kcal and 4.8 g/capita/day; European countries 36 kcal and 5.5 g/capita/day whereas Japan was as high as 180 kcal and 23.7 g/capita/day. The meat calories and protein consumption for the same year was 182 kcal and 8.4 g/capita/day for Asian countries, US 445 kcal and 40.5 g/capita/day, European countries 347 kcal and 24.2 g/capita/day whereas Japan was as high as 159 kcal and 13.8 g/capita/day. Despite the high level of fish consumption in American and European countries, the highest preference to fish is shown by Japan. It is evident that Japanese consume more calories and protein from fish than from meat.

FISH PRODUCTION AND POPULATION

The result of the projection of the demands for consumption fish related to the population growth of the Indonesian using three growth scenario based on the data from Statistic Central Bureau reveals that based on the assumption that the population growth will reach 1.66 percent/year, then in 2005 it is predicted that the number of the population in Indonesia will be around 227,958,900. Whereas in 2010, 2015 and 2020 with 1.52 percent growth assumption, the Indonesian population will be around 243,846,500; 258,069,000 and 280,211,800 respectively. With an assumption that fish demand growth is 1 percent, then it is predicted that in 2005, 2010, 2015 and 2020 the fish consumption level will be around 18.82 kg; 19.78 kg; 20.79 kg and 21.85 kg/capita/year. This consumption level based on Ministry of Maritime Affairs and Fishery data (2003) has obviously been exceeded, considering that in 2002 Indonesia's fish consumption level was already as high as 22.84 kg/capita/year. The following table presents the projected illustration and the estimation on fish demand and production in full details.

The table indicates that in the coming years when the population growth is assumed to be higher than 2% and the fish demand growth higher than 1.5%, Indonesia will have to import fish since the domestic production capacity will not be able to meet the demands.

There is an interesting notion that if the Indonesian's fish consumption level in 2002 was as high as 22.84 kg/capita/year, then based on the assumption that the number of Indonesia's population in the same year was 220 millions, so the amount of the domestic fish demand was 5,024,800 tons. The domestic production can still meet the number. However, if one raised the assumption, it should be very likely that the domestic fish demand would inflate.

RURAL AND URBAN COMMUNITIES' CONSUMPTION PATTERN

Urban and rural communities show a relatively distinctive fish consumption pattern. Actually, urban community consumes more fresh fish than its counterpart in rural area. On the other hand, the rural community consumes more processed fish than the urban community. Area characteristics distinction contributes to this fact. Most fish producing areas are situated at beaches 'next' to urban areas where there are accessible infrastructures and structures enabling the transportation of the fresh fish. Meanwhile rural areas are mostly isolated from fresh fish distribution. This is evident in the difference of the fresh fish consumption of the urban community that is higher than the rural.

The 1999 Socio-Economic Survey conducted by the Statistic Central Bureau reveals that the fresh fish consumption level for urban areas is 11.54 kg/capita/year whereas for rural areas it is 10.56 kg/capita/year. The processed fish consumption level for urban areas is 1.55 kg/capita/year whereas for rural areas it is slightly higher that is 2.27 kg/capita/year. The amount of consumers' expense/capita for urban areas is relatively higher that is Rp. 105,404 and Rp. 84,760 for rural areas.

The dominant types of the fish consumed in urban areas consist of Mackerel 1.82 kg/capita/year, followed by Litle Tuna, and Tuna and Skipjack Tuna 1.51 kg/capita/year and Muzambique Tilapia 0.99 kg/capita/year. Meanwhile in rural areas the most dominant types of fish consumed consist of Litle Tuna, tuna, and Skipjack Tuna 1.40 kg/capita/year; Mackerel 1.14 kg/capita/year and Muzambique Tilapia 0.83 kg/capita/year.

For processed fish (preserved fish), the dominant types of processed fish consumed by urban community consist of Anchovies (1.55 kg), Mackerel, Litle Tuna and tuna, each weighing 0.40 kg, 0.21 kg and 0.17 kg/capita/year. Whereas in rural areas the dominant types of processed fish consumed (2.27 kg) consist of Anchovies as much as 0.54 kg/capita/year, Mackerel 0.31 kg/capita/year, Litle Tuna, tuna 0.17 kg/capita/year and Snakeskin 0.17 kg/capita/year.

THE PROBLEMS OF FISH CONSUMPTION

Known as maritime country as it is with huge maritime and fishery potentials and whose population mostly lives along the beach, the fish consumption level of the Indonesian is relatively low. As previously discussed, despite the positive growth in fish consumption level/capita in Indonesia that is as many as 18 kg/capita/year in 1990 to 22.84 kg/capita/year in 2002, such consumption level is still inferior against the fish consumption level in countries like Japan (110 kg), South Korea (85 kg), United States (80 kg), Singapore (80kg), Hong Kong (85kg), Malaysia (45kg), Thailand (24kg).

The poor knowledge of the society on the benefits and nutrition contents of fish strongly contributes to the low fish consumption level. Further, most Indonesians are not skilled enough to able to process fishery products to make them more competitive and varied against other non-fish substitute processed food products such as eggs and meats. The other factor is the low income.

Egg is a substitute product with a considerably significant price elasticity level. The results of the analysis on the demands for fish in Indonesia by Kusumastanto and Jolly (1997) reveal that egg is indeed a substitute product highly significant against fish. The calculation shows that the cross price elasticity of the demands for eggs against fish is 0.271, whereas for chicken it is only 0.028. The cross price elasticity shown by the egg demand coefficient discloses that when the price of fish increases by 1% the demand for eggs will increase about 0.271%. Chicken as a substitute product is not deemed significant for its relatively high real price. Even when it is included in the models, the calculation will not significantly change.

The other results show that using the double-log model, the fish demand double-log coefficient is 0.102%. The figure indicates that the price elasticity towards fish demand is not so elastic of which means that when the fish price drops by 1% it lessen the demand for fish as much as 0.102%.

Analysis by Kusumastanto and Jolly (1997) also reveals that income is a highly significant variable in the demands for fish. The elasticity of income against fish demands is 0.506%. This is an indication that fish is a normal commodity. The coefficient value as high as 0.506% also discloses that when the fish price climbs by 1% the increase of income required will be 0.506%. In other words the fish consumption increase will depend on the increase in income.

Tabel. Projection and Estimation of Fish Consumption Demand and Fish Production

Proyeksi	Tahun	2005	2010	2015	2020	2005	2010	2015	2020	2005	2010	2015	2020
	Rasio Pertumbuhan	1.66%		1.52%		1.66%		1.52%		1.66%		1.52%	
	Populasi	1%				1.25 %				1,65 %			
	Permintaan Ikan												
Konsumsi Ikan (Kg/Kap/th)		18,82	19,78	20,79	21,85	19,10	20,32	21,62	23,00	19,56	21,23	23,04	25,00
Populasi (x 1000 jiwa)		227.958,9	243.846,5	258.069,0	280.211,8	227.958,9	243.846,5	258.069,0	280.211,8	227.958,9	243.846,5	258.069,0	280.211,8
Permintaan Ikan (ton)		4.290.186	4.823.283	5.365.255	6.122.627	4.353.680	4.954.795	5.578.975	6.444.871	4.458.644	5.175.997	5.944.901	7.005.294
Limbah (ton)	15%	757.092	851.168	946.81	1.080.464	768.296	874.376	984.525	1.137.330	786.82	913.411	1.049.100	1.236.228
Total suplai domestik (ton)		5.047.278	5.674.451	6.312.065	7.203.091	5.121.976	5.829.171	6.563.500	7.582.201	5.245.464	6.089.408	6.994.001	8.241.522
Ekspor (ton)	16.63%	995.449	1.119.143	1.244.896	1.420.629	1.010.181	1.149.657	1.294.485	1.495.399	1.034.536	1.200.983	1.379.391	1.625.433
Impor (ton)	0.95%	56.866	63.932	71.116	81.154	57.707	65.675	73.948	85.426	59.099	68.607	78.799	92.854
Produksi (ton)		5.985.861	6.729.662	7.485.845	8.542.566	6.074.450	6.913.153	7.784.037	8.992.174	6.220.901	7.221.784	8.294.593	9.774.101

Sumber : DKP (2001)

Recommendation

Indonesians' fish consumption level is still low despite the fact that fish consumption culture may significantly contribute to growth and intelligence improvement. Therefore there is an urgent need to improve fish consumption in Indonesia. First, there should be a socialization and promotion on the nutritional contents from fish consumption, especially in densely populated areas. This is important considering that it is the poor knowledge of the society on the nutritional contents in fish contributing to the low fish consumption level. Second, there is a necessity to encourage the improvement of income of the society, considering that the society's income consists in the significant factor in determining the demands for fish in Indonesia. Third, there should be some efforts to improve the society's ability in processing fishery products to make them more interesting to consumers.

As previously discussed, one of the methods to increase consumers' preference to fish is by improving the taste and variations of the products offered. Hence, an effective packing method is necessary to enable the products to last longer considering that fish product is a highly perishable product.

Fourth, in line with the efforts to improve the income, an incentive towards the development of fish catching and processing technology may be necessary, especially in terms of the provision of the raw materials with good quality. One of the important factors to improve fish consumption is the ability to supply the fish products. Fifth, there should be production and distribution efficiency of fishery products. This is to improve the price at the producers level (fishermen) especially in terms of improving the fishermen's income. Hence the efficiency in fishery products distribution will be able to minimize the price at the consumers level. Such action is expected to improve the consumers' purchasing power as well as improving Indonesians' fish consumption level.

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The Role of Fish Consumption in Supporting the National Food Security

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Introduction

Fish as one of the food commodities in Indonesia basically consists in an animal protein food source needed and mostly consumed by public in general. In medication world, animal –derived food consumption, including fish, is much needed by human body as the protein functioning as development agents and genetic characteristics carrier. In general, the animal-derived food protein has higher digestibility and utility than that of the vegetable-derived food source.

Protein consumption can also be used as one of the indicators in determining certain society's nutritional condition and government's success in the national development by various development indexes. Protein consumption is tightly related to development in agriculture, fisheries, animal farming, health and socio-economics in a whole. The better the economic development and growth of a country is the better the purchase power of its society for food needs becomes.

On the other hand, the more welfare achieved, the better the government's support in providing foods. The government support in developed countries is manifested via various efforts to protect either the producers (fishermen and farmers) or the consumers in the form of protection and subsidy.

National food availability shall not be an absolute measure to achieve yet it is a necessity for a nation. In the efforts to bring the nation to progress, the state shall be able to provide foods for the whole region all the time. However, as one requirement for sufficiency, the food security shall realize the ability of every household and individual to gain access to foods and nutrition according to their needs as well as their own choice to grow and live healthily and productively. This shall mean that the food security ought to be embedded to every individual, family, society, in the regional to national or even to global level.

To better look into fish consumption as the fulfillment of animal protein needs for Indonesian takes more than just referring to the availability of fish resulting from the fish production successes. The fish-derived protein fulfillment should be looked into from the consumption sufficiency in household and individual level. Food availability per capita shows the average individual's opportunity to obtain foods whereas food consumption per capita reveals average individual's ability to gain access to foods.[1]

Thus, one cannot measure society's fish-derived animal protein food fulfillment by just referring to the level of production only (availability). One will also need to account for the food economic system that includes the ability towards the availability, distribution and consumption.

Awareness towards the importance of food security stability does not revolve around the national level only; it goes beyond to international peripherals. The international body FAO endeavors to knit cooperation among its members in terms of realizing food security for international society. The effort began with the 1974 World *Food Summit* planning to combat hungers and malnutrition in just one decade. It was followed with the *International Conference on Nutrition in Roma in 1992* resolving that food security should be defined as the household ability to fulfill its member's food needs from time to time to live healthily and be able to do daily activities.

In the *1995 in Committee on World Food Security meeting*, it was extended with the requirement to account for the local culture. The 1996 *World Food Summit* confirmed the commitment and concrete actions of its members to achieving food security for everybody. The 1996 *World Food Summit* in Roma targeted that in the next 20 years (2015) the world should be able to reduce the number of its citizens suffering hunger into half of its current size, to become 400 millions lifes. The Food Security was then defined as the realization of everybody's ability to gain access either physically or economically to sufficient, nutritious and safe foods to meet their needs to be able to live healthily and productively from day to day.

The Food Security Concept goes basically hand in hand with the message carried by the 1945 Constitution desiring a social welfare, where food sufficiency is one of its main pillars. Hence, the message carried by the 1945 Constitution stands in line with the declaration resolved during the World Food Summit aiming at bringing welfare to the world's society. As the implementation of the commitment to food security, the Law Number 7/1996 on Food was adopted. The law No. 7/1996 defines food security as 'the condition where every household can meet its food necessities reflected the availability of the food sufficiently either in amount, safety, coverage and accessibility."

Food in a more general notion shall not be restricted to rice only; it also includes foods derived from farmed animals and fish. Sufficient provision means provision that complies with the needs of every individual to fulfill either macro (Carbohydrate, protein and fat) or micro (vitamins and minerals) nutrient inputs. Food available in a safe condition means the food is free of materials and substances hazardous against health. Food available in a full coverage condition means that the food is available all the time in every populated location. Food fulfillment in an accessible condition means that the food is easily accessible to each household either physically or economically, that is to say in a distance and price accessible all the time.

This paper describes the consumption of fish as an animal-derived protein source by taking into account the dynamics of the society's purchase power, participation and consumption level based on income groups, food procurement sources, [2] and main occupations.[2]

The Animal-derived Food Expense Shares

Expense structures (food and non-food) acquire a relatively significant meaning and implication either economically or socially. A food expense that is relatively big against total incomes (calculated from the total expense) indicates a relatively low welfare level. Furthermore the fluctuation of food availability and price will pose serious impacts towards public welfare and purchase power.

• Based on the Rural-Urban Area

Aggregately, the total expense (food and non-food) of the Indonesian enjoys an increase from Rp. 69,977,- to Rp. 206,336/capita/month during 1996-2002, increasing about 24.3%/year (Table 1). This relatively significant increase, unfortunately, does not reveal the same of the purchase power of its society. This is because the real income only slightly increases. Using composite consumption price index deflators from 43 cities (Economic and Financial Indicators, BPS/*Central Bureau of Statistics*), the society's real income only increases 1.3%/year, that is from Rp. 69,977 to (1996=100) Rp. 75,305,-. This slight change in the purchase power will not pose significant impacts towards the changes of the society's expense structure.

[1] Ning Pribadi: *Availability and Food Security, 2003*
[2] Paper is the summary of the *'Strategy on Fish Protein Needs Fulfillment in Enforcing the National Food Security, 2003*

Table 1 reveals the region-based (rural-urban) changes of the society's expense structure over three periods of time, 1996, 1999, and 2002. Aggregately, (rural + urban), there has been, as the results of the economic crises, an increase in the budget allocation for foods during 1996-1999 period. During this period, the proportion of the food expense increases from 55.3% to 62.9% or as much as 7.6% during three years period.

This increase in the proportion of the food expense indicates a decrease in the society's welfare due to the same decrease in the proportion of the budget for non-food needs expenditures, such as for dressing, education, health, and so on.

In 2002 there was a decrease in the proportion of the food expense to 58.5%, yet it remained relatively high compared to the pre-crises proportion (1996) that was 55.3%. The crises recovery process currently rolling is expected to recover the society's welfare as indicated by betterment to the Indonesia household budget allocation structure.

The bodily shape and the improvement of these rural and urban societies have different impacts towards each society's expense structure, in the following description (Table 1): **(a)** Rural community with lower level income tends to have bigger proportion of expense for food than that of urban community; **(b)** As an illustration food expense proportion for year 2002 for rural community and urban community is each 66.6% vs. 52.8%; **(c)** for the relatively small improvement on the Indonesians' purchase power (real income) during 1996-2002, then there were no significant changes in the expense structure for foods; there was even an increase for the rural from 63.3% to 66.6% and from 48.0% to 52.8% for the urban; **(d)** the crises (1996-1998) has caused an increase in the budget allocation for foods from 63.3% to 70.2% in rural area and from 48.0% to 56.2% for urban; **(e)** the economic rises recovery efforts have yet fully recovered the welfare of either rural or urban community indicated with the proportion of budget allocation for foods that is yet still bigger than that prior to the crises (1996).

Table 1. The Development of food and non-food expense shares based on rural-urban areas in Indonesia, 1996-2002

	Expense		Total expense (Rp/cap/month)
	Food	Non-food	
Urban			
1996	48.0	52.0	100,639
1999	56.2	43.8	180,500
2002	52.8	47.2	273,294
Rural			
1996	63.3	36.7	52,711
1999	70.2	29.8	109,523
2002	66.6	33.4	152,784
Urban + Rural			
1996	55.3	44.7	69,977
1999	62.9	37.1	137,453
2002	58.5	41.5	206,336

Source: *National Socio-Economic Survey, BPS, Jakarta.*

The development of expense shares for farm and fishery products (animal-derived foods) based on regions (rural and urban) is presented in Table 2. For the Indonesian Community (rural + urban), of the 60.0% food expense proportion only a very view of such proportion is spent on animal-derived products (farm and fishery). As an illustration, of the expense for foods amounting 58.5% in 2002, only 11.3% was spent for animal-derived food products consisting of 6.1% for farm products and 5.2 for fishery products. A closer look into the dynamics during 1996-2002 will reveal the

following interesting information: **(a)** during the period of 1996-2002 (crises impacts) there was an increase in the allocation of the expense for fishery products from 4.8% to 5.6%, whereas for farm products there was a decrease from 6.2 % to 5.2%; **(b)** with the improvement towards economic condition in 2002, the expense allocation for farm products increased to 6.1%, whereas for fishery products it dropped to 5.2%; **(c)** such condition indicates that more priority is given to farm products when there is improvement in the community's real income; and **(d)** save during the economic crises (1996), allocation of expense for farm products is bigger than that for fishery products.

Yet there is still more interesting information if one takes a closer look by referring to either rural or urban region in the following description (Table 2); **(a)** Rural community with limited income gives bigger priority of their expense budget for fishery products whereas urban community gives bigger priority to farm products; **(b)** As an illustration, during 2002 the rural community's budget allocation for farm and fishery products was 5.0% and 6.1%, whereas for the urban community it was 6.9% and 4.5%; **(c)** the 1999 economic crises posed similar impacts subject to regions (rural or urban), in which there was a fall in the allocation of the expense for farm products; and **(d)** such condition above implicitly indicates that farm products are superior against fishery ones in which an improvement towards purchase power results in the bigger budget allocation for the former.

Table 2. The Development of fish and livestock expense shares based on rural-urban areas in Indonesia, 1996-2002

	Livestock (%)	Fish (%)	Foods	
			(%)	(Rp/Cap/Month)
Urban + Rural				
1996	6.2	4.8	55.3	38725
1999	5.2	5.6	62.9	86511
2002	6.1	5.2	58.5	120649
Urban				
1996	6.9	4.0	48.0	48278
1999	6.0	4.8	56.2	101394
2002	6.9	4.5	52.8	144352
Rural				
1996	5.4	5.6	63.3	33345
1999	4.3	6.4	70.2	76854
2002	5.0	6.1	66.6	101692

Source: *National Socio-Economic Survey, BPS, Jakarta*

- **Based on Commodity and Income Groups**

Expense structure that is based on commodity and income groups gives more comprehensive information on the description of the budget expense and communal welfare. The expense on farm and animal-derived food products based on income groups in 2002 is presented in table 3. Indicators reveal: (a) a consistent increase in the expense for farm products along with the increase on the aggregate income as well as an increase based on the regions (urban and rural); (b) notwithstanding income groups of less than Rp. 40,000/month, expense share for fish increased as well, even though in slower rate compared to that of farm products; (c) in the second highest income groups (urban) and the highest income (rural) a fall occurred to the expense allocation for fish; (d) the allocation of expense for fish looks higher that for farm products in the fourth highest income groups (Rp. 150,000 - 199,000/capita/month) for rural community; (e) in urban community the allocation of expense for fish is slightly higher in the income level of Rp. 100,000 – 149.000/capita/month (fifth highest).

Generally, one can say that low-income community tends to give the priority to fish commodity to meet its animal-derived food product needs. The better the income gets the bigger the priority to farmed animal-derived food products gets. The implication is that in accelerating the fish products consumption one has to catch up with the increase in the community's income instrument by improving the quality of fish, its processing technique (product development), and socializing the information on the role of fish products in health with several benefits unavailable in other animal-derived foods. Distribution and availability factors as well as product diversification accessible to public in general have indispensable importance too.

Table 3. Expense Shares for Fish based on Income Groups in Indonesia, 2002 (%)

Income Groups (Rp/cap/month)	Urban + Rural		Urban		Rural	
	Livestock	Fish	Livestock	Fish	Livestock	Fish
<40,000	1,2	11,6	-	-	1,2	11,6
40,000-59,999	2,1	7,4	1,6	4,2	2,2	7,6
60,000-79,999	3,4	7,6	4,4	5,4	3,2	7,9
80,000-99,999	4,4	7,6	5,2	6,4	4,2	7,9
100,000-149,999	6,3	9,6	7,8	8,0	5,7	8,8
150,000-199,999	8,8	9,3	10,0	8,8	7,8	9,7
200,000-299,999	11,7	9,3	12,8	9,0	10,0	9,9
300,000-499,999	14,7	9,0	15,1	8,7	13,0	10,1
>500,000	17,1	8,1	17,4	7,9	14,1	9,3

Source: *National Socio-Economic Survey, BPS, Jakarta*

Animal-derived Food Consumption Participation

Fish consumption participation is included in a separate animal-derived food product group: fresh fish, processed fish, several types of fish main products, and farmed animal-derived food products.

Fresh fish consumption participation in aggregate nationally varies according to areas, in which the rural consumption participation is lower than that of the urban (Table 4). The economic crisis has posed an impact resulting in the decrease in participation level. In rural areas, the fresh fish consumption level dropped from 73.65% (prior to the crisis) to 72.82% (1999) and 61.78% in 2002. Similarly, during the same period the consumption participation in urban areas fell from 84.90% (1996) to 80.03% and 73.11%.

Recent condition (2002) reveals that the rural fresh fish consumption is significantly lower than that of the urban (61.78% Vs 73.11%). About 39.0% of the rural community in 2002 removed fresh fish from their daily menu, whereas it was only about 27.0 % of the urban community who did the same. The various strategic policies related to the efforts to increase and level the income, to increase the availability and distribution, and public awareness on the foods and nutrition will improve the public's fresh fish products consumption participation either in rural or urban areas.

Quite contradictive to level of fresh fish consumption participation, the performance of consumption participation in rural areas in aggregate is higher than that in urban ones during the period of analysis (Table 4). It is true that the economic crisis has contributed to the fall in the consumption participation, yet the condition in 2002 did recover as before even with higher participation level than prior to the crisis (1996). During 2002 the level of processed fish consumption in rural and urban areas was each 58.23% and 47.90%. The quick economic recovery and the higher participation level in

rural areas are suspected to be related to the fact the quality of the processed fish is lower than that of fresh fish. Both these types of fish are considered substitutive.

Table 4. The development of fresh fish and processed fish consumption participation level based on areas, 1996-2002 (%)

	Urban			Rural		
	1996	1999	2002	1996	1999	2002
Fresh fish	84.9	80.03	73.11	73.65	72.82	61.78
Processed fish	43.42	40.12	47.9	53.08	50.25	58.23

Source: *National Socio-Economic Survey, BPS, Jakarta (processed)*

Table 5 presents the development of fresh fish and processed fish consumption participation level based on income groups in Indonesia. Aggregate nationally it is seen that the higher gets the income level the better gets the fresh fish consumption participation. The economic crisis has contributed to the fall of participation level and such condition kept going on till 2002. The situation indicates that fresh fish is categorized as a relatively expensive commodity compared to other animal-derived food products. Despite the fact, that the community's economic condition was quite improved in 2002, yet there has been no evident proof of the betterment towards fresh fish consumption participation. Over 2002, the fresh fish consumption participation level was still below that in 1999, worse even if one tries to compare it to that prior to the crisis (1996). In 2002, the fresh fish consumption participation for communities with low, medium and high incomes was each 55.53%, 70.41% and 76.51%. It is evident that improvement in income significantly contributes to the betterment in fresh fish consumption participation level.

Next, the consumption participation generally increases in the medium income groups and decreases in the high - income groups. Aggregately in 2002, the consumption participation suffered a consistent decrease along with the improvement in community's income. On the other side, the economic crisis posed negative impacts against consumption participation, especially for low-income community. However, it recovered in 2002.

Table 5. The development of fresh fish and processed fish consumption participation level based on income groups, 1996-2002 (%)

	Low			Medium			High		
	1996	1999	2002	1996	1999	2002	1996	1999	2002
Fresh fish	69,49	66,06	55,53	82,16	80,31	70,41	88,19	86,91	76,51
Processed fish	49,93	43,71	59,23	50,39	48,35	54,46	45,52	46,37	43,77

Source: *National Socio-Economic Survey, BPS, Jakarta (processed)*

National aggregately, the lowest fish consumption participation falls on the community that dwells on agricultural sector as its way of living, followed by the industrial/trading community and finally on the community that dwells on service or other ways of earnings. Between the last two communities there are no distinctive contrasts with some indications that the latter has better performance. In its early stage, the economic crisis seemed to have no significant impacts towards the participation level (especially on the agricultural sector). However, in 2002 the consumption participation level dropped in these three community groups. Over the recent year the fresh fish consumption participation level of the community groups that earn from agriculture, trade/industry and service has been 60.41%; 70.17% and 71.26%. Almost 40.0% of the agricultural community does not serve fresh-fish based menus in their daily dishes and

about 30.0% of the non-agricultural community does the same. This seems to be connected to the purchase power of the community in question.

National aggregately, in its early stage the economic crisis posed negative impacts towards processed fish consumption participation, yet it quickly recovered that in 2002 the participation level was even higher compared to the same prior to the crisis (Table 6). The situation applies to the three community groups with different sources of earning.

Table 6. The development of fresh fish and processed fish consumption participation level based on sources of earning, 1996-2002 (%)

	Agriculture			Industry/trade			Service + others		
	1996	**1999**	**2002**	**1996**	**1999**	**2002**	**1996**	**1999**	**2002**
Fresh fish	72.92	72.58	60.41	82.62	80	70.17	83.54	78.60	71.26
Processed fish	53.14	50.9	58.41	46.88	44.08	52.09	45.18	42.74	48.83

Source: *National Socio-Economic Survey, BPS, Jakarta (processed)*

Animal-derived foods consumption

The 1998 National Workshop on Foods and Nutrition VIII recommends that that the protein sufficiency figure for Indonesian shall be 48.22 grams/capita/day at consumption level and 55 gram/capita/day at availability level. Of such sufficiency figure at the consumption level, about 30 % (equal to 15 grams/capita/day) shall better be met with animal-derived foods. Further, of such animal-derived protein, two third is met by fish (9 grams/capita/day) and the other one third (6 grams/capita/day) by farmed animal-derived food products.

- **Fresh fish consumption**

Based on the Indonesian food nutritional composition every 150 grams of fresh fish contains 17 grams of protein. If it is assumed that the protein content in fresh fish can be made the proxy for the whole type of fish consumed, referring to the sufficiency figure of animal protein from fish as above (9 grams/capita/day), then the annual fish consumption need for Indonesians will be 22 kg/capita/year. [3]

Based on the empirical data in table 7, such amount of the national fish consumption needs is accessible only to high-income households. Such trend has become more and more significant since the outbreak of the economic crisis. Such crisis brought about negative impacts towards fish consumption yet in an intensity that varies among either household or area groups. Considering the importance of the fish consumption contribution in terms of fulfilling the animal protein necessities, such situation requires laborious efforts to encourage the fish consumption level by promoting fish-based menus and support policies in the production field (catching) and community's income which hand in hand the three of them will ease the access to consumption.

Compared to 1996, the total consumption of fish nationally dropped during the economic crisis and crept back during the recovery period (2002), save for community groups with low-income. Based on regional aggregation, the fish consumption level in urban areas was as high as 20.8 kg/capita/year or higher than the consumption level in urban areas that was 17.42kg/capita year. Yet during the crisis the fish consumption level in urban areas was more dramatic, reaching as low as –21.8 % whereas it was only 16.4% in rural areas.

[3] Nikijuluw, V.P.H, A.K. Seta And G.D.H Yusuf. '*Post Economic Crisis Fishery Development Policy Reorientation*, National Workshop on Foods and Nutrition VII, 2000.

Nevertheless, during the recovery period, the pace of fish consumption in rural areas increased slightly higher than that in the urban ones. Implicitly, this situation indicates, that from the point of view of fish consumption, the economic crisis has severer impacts in the city than in the village.

Table 7. The Development of the Total Fish Consumption based on Areas, Income and Main Earnings in Indonesia, 1996-2002 Kg/cap/yr)

Year	Area		Income			Earnings		
	Urban	Rural	Low	Medium	High	Agriculture	Industry/trade	Service/ others
1996	20.77	17.42	16.06	19.17	23.32	17.74	17.72	21.2
1999	16.24	14.56	12.91	15.45	19.53	14.49	14.59	16.4
2002	16.48	15.48	10.4	16.54	23.03	15.42	15.67	16.85
Pace (%)								
96-99	-21.8	-16.4	-19.6	-19.4	-16.3	-18.3	-17.7	-22.6
99-02	1.5	6.3	-19.4	7.1	17.9	6.4	7.4	2.7

Source: *National Socio-Economic Survey, BPS, Jakarta (processed)*

Income class -based -household –grouping reveals that, during the period above, the sharper falling pace of fish consumption occurred to low-income household groups. During the crisis the fish consumption level of these groups fell about 19.6% compared to that prior to the crisis. The fish consumption level fell about 19.4 and 16.3% in the medium and high-income household groups. Into the recovery, notwithstanding increase in the consumption level in both household groups, there had been no clear improvement to the fish consumption level of the low-income household group. In 2002, the total fish consumption level of the low-income household group was 10.4 kg/capita/year or only 45 percent of the high-income household groups' consumption level that was 23.0kg/capita/year. Suffering a fall during the crisis, the high-income household groups' fish consumption had returned to normal, even better compared to the consumption falling level as the results of the crisis.

Prior to the crisis, the fish consumption level of the household groups with main earnings in service/others was as high as 21.2 kg/capita/year, much higher than that of either agricultural and industrial/trading household group (each about 17.7 kg/capita/year). However, during the crisis such household group suffered severer fish consumption level decrease compared to the two other household groups. Similarly, into the recovery the pace of the increase of fish consumption in the household group that dwells on service/others was lower than that of agriculture and industry/trade.

In the fish consumption, fresh fish' consumption contribution is better than that of processed fish. Fresh fish' contribution to the total fish consumption in Indonesia ranged between 77-92 percent. Such high consumption preference of the household towards fresh fish might be related to easier processing, accessibility of the sources, price as well as taste freshness factors.

Looking into the domination of fresh fish' contribution towards the total fish consumption, one may conclude that the performance of the total fish consumption above is strongly influenced by the performance of fresh fish consumption (table 9). Fresh fish consumption preference is higher in urban areas than that in rural ones. In 1996, the fresh fish consumption level in urban areas averagely was as high as 19.04 kg/capita/year, whereas in rural areas it was as high as 14.6 kg/capita/year. Despite the fact that the drop of the fresh fish consumption in urban areas was more drastic (-22.3%) during the crisis than that in rural ones (-16.6%), quantitatively the consumption

level in urban areas was still better than that of rural ones (14.8 kg/capita/year vs. 12.2 kg/capita/year). Into the economic recovery, while the pace of fresh fish consumption in urban areas was still declining, the fresh fish consumption in rural areas crawled up as much as 3.5 % in three years (1999-2002).

Table 8. Fresh Fish Share towards Total Fish Consumption based on Area, Income and Main Earnings in Indonesia, 1996-1992 (%)

Year	Area		Income			Earnings		
	Urban	Rural	Low	Medium	High	Agriculture	Industry/ trade	Service / others
1996	91.67	83.81	83.13	88.16	91.51	83.48	88.49	90.52
1999	91.07	83.65	83.42	87.31	90.99	83.37	86.02	89.63
2002	88.47	81.46	77.60	84.76	89.41	81.26	86.34	87.30

Source: *National Socio-Economic Survey, BPS, Jakarta (processed)*

Table 9. The Development of Fresh Fish Consumption based on Area, Income and Main Earning in Indonesia, 1996-2002 (kg/capita/year)

Year	Area		Income			Earnings		
	Urban	Rural	Low	Medium	High	Agriculture	Industry/ trade	Service/ others
1996	19.04	14.60	13.35	16.90	21.34	14.81	15.68	19.19
1999	14.79	12.18	10.77	13.49	17.77	12.08	12.55	14.70
2002	14.58	12.61	8.07	14.02	20.59	12.53	13.53	14.71
Pace (%)								
96-99	-22.32	-16.58	-19.33	-20.18	-16.73	-18.43	-19.96	-23.40
99-02	-1.42	3.53	-25.07	3.93	15.87	3.73	7.81	0.07

Source: *National Socio-Economic Survey, BPS, Jakarta (processed)*

Regionally, either for rural or urban areas, the fresh fish consumption level in the provinces in Java is lower than that outside Java Island. In Java, the highest consumption level is in DKI Jakarta that was as high as 15.43 kg/capita/year in 2002 (urban areas) and the lowest being in DI Yogyakarta (with consumption level in urban area being 4.29 kg/cap/year and 2.53 kg/cap/year in rural area).

The consumption level grouping based on income class reveals that generally fish is a normal commodity. The higher gets the household income class the better gets its fresh fish consumption level. In 1996, the fresh fish consumption level for low, medium and high-income classes was each 13.35 kg/cap/year, 16.90 kg/cap/year and 21.34 kg/cap/year. The consumption gap between the low-income class and the high-income class was as much as 1.6.

Besides the factor related to limited purchase power, the drop in fresh fish preference might be related to the fact that fish' price tended to crawl up in line with the catching cost increase resulting from the soaring price of oil fuel and the trend to meet the foreign market demands as a result of the correction towards rupiah so that most households diverted their consumption choice to other cheaper fish-based food products. In 2002 the fresh fish consumption for the low-income households was as low as 8.07 kg/capita/year, whereas for the medium and high-income households was 14.02/kg/cap/year and 20.59 kg/cap/year each.

Comparison based on the main earning sources reveals that the fish consumption preference of the agricultural households is lower than that of the non-agricultural ones. And since the mobility of earning sources from agriculture to non- agriculture

(industry/trade and service/others) reflects an increase towards income, this conclusion confirms the previous analysis that the fish consumption level tends to crawl up as the household's income increases. For 1996, the average fish consumption level in agricultural households is as high as 14.81 kg/cap/year, industrial/trading households 15.68 kg/cap/year and service/other households 19.19 kg/cap/year. However, the economic crisis thunderstorm had hit the non-agricultural households more severely than the increased price of fresh fish 'subjugated' such household class to reduce their fish consumption portion largely to result in that their fish consumption level pace fell more dramatically than that of the agricultural ones.

- **Processed Fish Consumption**

  Apart from adding economic values, the goal of fish production processing is to extend the consumption period. Processed, fish products may survive for days, weeks or even months from the day of the production or catching. There have been various fish processes feasible. However, simple technology (traditional) has been dominating processed fish products. Some of the traditional technologies commonly applied consist of fish drying, salting, smoking, and made presto. In a more advanced technology fish processing is done by canning or high-pressure processing. However, this method requires a huge amount of capital so that it will not be feasible for household scale.

Table 10. The Development of Processed Fish Consumption based on Area, Income and Main Earning in Indonesia, 1996-2002 (kg/capita/year)

Year	Area		Income			Earnings		
	Urban	*Rural*	Low	Medium	High	Agriculture	Industry/ trade	Service/ others
1996	1.73	2.82	2.71	2.27	1.98	2.93	2.04	2.01
1999	1.45	2.38	2.14	1.96	1.76	2.41	2.04	1.70
2002	1.90	2.87	2.33	2.52	2.44	2.89	2.14	2.14
Pace (%)								
96-99	-16.18	-15.60	-21.03	-13.66	-11.11	-17.75	0.00	-15.42
99-02	31.03	20.59	8.88	28.57	38.64	19.92	4.90	25.88

Source: *National Socio-Economic Survey, BPS, Jakarta (processed).*

Complying with the previous exposition, currently the national processed fish consumption preference is relatively inferior against fresh fish (consisting of only 9-25% of the fresh fish consumption). The choice of fish itself is restricted to types of fish commonly available locally. The types of processed fish commonly consumed are: dried *anchovy, fish peda, stripped mackerel, snake skin gourame* and snake head.[4] Despite taste factor, the low consumption preference towards processed fish is strongly related to the ease to access fresh fish and the availability of fishery source potentials in a huge amount through out the country.

From the point of view of processed fish development, the low consumption preference towards processed fish is strongly related to various problems encountered in the fish processing industry resulting in the increased products price and questionable sustenance of the business opportunity apart from the fact on the mismatch between the types of fish processed and the consumer's preference. The fish canning industry has to deal with the following problems: **(1)** the lack of supply of raw materials resulting that the production capacity can only cover about 30-40 % of

the load capacity, **(2)** expensive packing cost and various uncontrolled levies in the production areas, **(3)** weak quality control implementation, **(4)** inter-countries trade barriers in the form of tariff and non-tariff and **(5)** limited types of fish for processing. About 65 percent of canned fish consist of sardines and mackerels and the other 35 percent is tuna fish.[5]

Basically, processed fish demand is not elastic against income, meaning that processed fish consumption is abandoned when the household's income increases. The results of the previous case study reveal that one of the factors contributing to the low consumption preference towards processed fish, especially those done traditionally, is bad processing quality.[6] Based on the data analyzed, prior to the crisis the processed fish consumption preference is higher in the households with low income, living in rural areas and earning their living from agricultural sectors giving the impression that processed fish is an inferior product. However, during the crisis (2002), the consumption preference of the medium and high-income households increased with even sharper growth rate. Such situation implies a shrunken budget line to both income groups to have made them reallocate their household expense on cheaper food products such as processed fish. Another possibility is that fresh fish' price increased after the crisis compared to that of processed fish so that with a weakened purchase power consumers' tended to look to cheaper fish.

In the household grouping based on income there is an interesting pattern change. Before the crisis, processed fish consumption preference tended to be higher in the low-income household groups and consistently falling with the increase in income (indicating that the status of processed fish in the household consumption pattern in Indonesia is inferior).

The Role of the Animal-derived Foods in the Protein Consumption

Protein is one of the nutrients indispensable to human body, either as the body-developing or growth agent as well as the body-maintaining agent that controls and preserves the body's immunity against certain diseases. Besides that, protein can be a source of energy when there is not enough energy produced from carbohydrates and fats. The latter function of the protein determines that the protein sufficiency assessment be commenced when the energy sufficiency is readily met.

- **Based on areas**

  The average protein consumption in rural areas is lower than that in urban ones and this tendency tends to be very consistent for the past six years (1996-2002) as presented in Table 11. In 1996 the urban protein consumption was as high as 59.4 grams whereas the rural was as high as 56.6 grams/capita/day. Yet, during the economic crisis (1999), there was only a very slight difference between the urban and rural protein consumption level. The difference was only one gram. This signifies that the protein consumption pattern change tends to occur in the urban community than in the rural one. The 2002 protein consumption already indicates an increase from the previous year that is 56 grams/capita/day in urban areas and 53.2 grams/capita/day in rural areas. Yet, the average protein consumption in 2002 is still lower than prior to the economic crisis. This serves as an indication the Indonesia's economy has not fully recovered as before the economic crisis.

[4] Martianto, Drajat: *The Animal-derived Foods Consumption and Demands in the Provinces in Indonesia.* Thesis, unpublished IPB Postgraduate Program, 1995.

[5] Sutandinata,H & A Surya: *The Globalization Impacts towards Processed Foods Production and Trade. Illustration on fish products*, National Workshop on Foods and Nutrition VI Proceeding,pp 479-485, 1998

[6] Nurasa, T. and Manadiyanto: *Community Attitude towards Processed Fish in Semarang*, Salt Water Fishery Research Journal, 62:29-37. 1991.

Comparison between the households in Java and the households outside Java Island reveals a similar pattern that is that the urban protein consumption is averagely higher than that of the rural areas. The trend has been very consistent during 1996-2002. As an illustration, in 2002, the protein consumption in Java was 54.6 grams/capita/day for urban areas and 51.9 grams/capita/day for rural areas whereas for outside Java Island it was 56.3 grams/capita/day for urban areas and 53.5 grams/capita/day for rural areas.

Protein-producing foods belong to the relatively expensive food groups. Hence, purchase power consists in the main component to obtain the desired food. The factors contributing to low protein consumption in rural areas than in urban ones have been low income and welfare. The fact reveals that the food expense share in rural areas is higher than in urban ones, meaning that the welfare level of the rural community is lower than that of the urban one.

Table 11. The development of protein consumption and sufficiency level and the animal protein share based on areas in Indonesia, 1996-2002

Area	Total protein (g/cap/day)			Sufficiency level (%) *)			Animal protein share (%) *)		
	1996	1999	2002	1996	1999	2002	1996	1999	2002
Indonesia									
- Urban	59.4	49.0	56.0	123.8	102.1	115.7	26.9	21.6	29.6
- Rural	56.5	48.1	53.2	117.8	100.2	102.1	20.7	17.5	23.0
Java									
- Urban	56.9	47.5	54.6	118.5	99.0	113.8	21.6	15.5	21.6
- Rural	54.1	46.7	51.9	112.7	97.3	108.1	14.2	11.0	11.0
Outside Java									
- Urban	60.0	49.4	56.3	125.0	114.8	117.3	29.7	22.9	31.2
- Rural	56.9	48.4	53.5	118.5	107.3	111.5	21.8	18.7	25.5

Note: *) *Towards protein sufficiency figure (48 g/cap/day); **) towards protein total*
Source: *National Socio-Economic Survey, BPS, Jakarta (processed)*

The 1998 National Workshop on Foods and Nutrition (WKNPG) VII recommends that the average recommended protein consumption per capita per day shall be 48 g. Based on such recommendation, the consumption level in rural and urban areas, either in Java or out of Java, has exceeded the level recommended. Even in 1996, the protein consumption level soared as high as more than 110% (Table 11). During the economic crisis indeed the protein consumption dropped in all areas. However the protein consumption out of Java was still above 100%, whereas in Java it did not meet the recommended figure (< 100%). This is clearly indicating that the economic crisis posed severer impacts in Java whose population mostly dwells on agricultural sub sector and informal sector rather than the population outside Java who mainly earns their living from fisheries and plantations.

In 2002, the condition relatively recovered. The protein consumption level was readily above 100 percent, with the urban being higher than the rural. Provincially, although the protein consumption varies among provinces, generally the average protein consumption has exceeded the recommendation. The provinces whose protein consumption is less than recommended in 2002 were Maluku for urban areas and Maluku and Papua for rural ones.

- **Based on Income Groups**

As previously discussed one of the factors contributing to the protein consumption level is the society's income level. Table 12 clearly indicates that the higher income level gets the better protein consumption. The economic crisis has evidently weakened the protein consumption in all social level in all areas. Yet, in 2002, the increase on protein

consumption only happened to the medium and high-income community and was still inaccessible to the low-income (poor) community as seen in table 12. In 1996, the protein consumption for low, medium and high-income groups is 53.7 grams/capita/day, 57.8 grams/capita/day and 65.4 grams/capita/day each. While in 2002 still with similar groups the figure was 44.4 grams; 56.5 grams and 70.3 grams/capita/day each.

Although the protein consumption level in the low-income group consists in the smallest, if one refers to the protein consumption recommendation one will notice that since 1996 the protein consumption sufficiency of such community has exceeded the recommendation (>100%). Aggregately, the protein consumption sufficiency level during the economic crisis is still within the boundary (±100%) either in the low, medium or high-income community. However, island to island, the 1996 protein sufficiency level in low and medium-income groups in Java is only 97-98 percent lower than that out of Java. In 2002, there was an increase in the protein consumption sufficiency level but such increase did not take place in the low-income households. The condition was even worse than in 1999. In 1999 the protein consumption sufficiency level of such group was 100 % and dropped to 92.5% in 2002. The similar happened to the low-income household groups either in Java or out of Java slipping from 96.7 and 100.6 % in 1999 to 91.0 and 92.9 percent in 200.

- **Based on Main Earning Sources**

Based on the main earnings, the households are classified into three groups namely: **(a)** agricultural households **(b)** industrial and trade households and **(c)** service and other households. Agricultural sector is one of the sectors producing various types of commodity namely the commodities that include food crops, fisheries, farms and plantations. Thus, the agricultural households generally produce various types of food commodity. On the other hand, however, Table 13 reveals that the protein consumption level in this agricultural household group is the lowest compared to that of the non-agricultural household groups. Such trend does not only prevail over time but over areas as well. As an illustration, the 1996 protein consumption of the agricultural households was as much as 55.4 grams whereas for the industrial/trade and service/other households the figure was each 58.0 grams and 60.1 grams/capita/day. The year 2002 witnessed the same pattern too; the figure in orderly manner was 52.7 grams; 54.9 grams and 56.4 grams/capita/day.

Table 12. The development of protein consumption and sufficiency level and the animal protein share based on income groups in Indonesia, 1996-2002

Income Groups	Total protein (g/cap/day)			Sufficiency level (%) *)			Animal protein share (%) *)		
	1996	1999	2002	1996	1999	2002	1996	1999	2002
Indonesia									
- Low	53.7	48.0	44.4	111.9	100.0	92.5	19.3	17.3	16.0
- Medium	57.8	48.5	56.5	120.4	101.0	117.7	23.9	20.0	21.5
- High	65.4	48.5	70.3	136.6	101.0	146.6	28.7	22.1	28.9
Java									
- Low	51.3	46.4	43.7	106.9	96.7	91.0	15.0	10.9	16.5
- Medium	55.9	47.1	56.4	116.5	98.1	117.5	19.3	14.2	22.0
- High	66.1	49.2	69.5	137.7	102.5	144.8	25.1	16.6	26.6
Out of Java									
- Low	54.3	48.3	44.6	113.1	100.6	92.9	20.2	18.2	16.5
- Medium	58.2	48.9	121.3	121.3	101.9	24.8	24.8	21.2	22.0
- High	65.3	48.3	70.6	136.0	100.6	29.5	29.5	23.5	29.4

Note: *) *Towards protein sufficiency figure (48 g/cap/day); **) towards protein total*
Source: *National Socio-Economic Survey, BPS, Jakarta (processed).*

The trend implies that the foods produced by the agricultural households are not intended towards fulfilling its own household (foods?) needs. Some of them are sold to fulfill other household needs such as for education and others. Meanwhile, side businesses are not always obtainable for the low quality human resources, mismatch between the skills and the labor market demands besides the fact that no jobs are available in their areas.

Despite the fact that the protein consumption for the agricultural households is the lowest compared to the other household groups, the figure has clearly exceeded the recommended norms. In aggregate the 1996 protein consumption sufficiency level for agricultural, industrial/trade and service/other households was in orderly manner each 115.4, 120.8 and 125.2 percent. Such figure slipped in 1999 for the three household groups but crawled up again in 2002. However, the 2002 protein consumption sufficiency level was still lower than the condition prior to the crisis. Such protein consumption for the three household types in Java is still inferior against the same out of Java. In 2002 the condition was equally balanced between Java and out of Java in which the protein sufficiency level was still lower than that in 1996.

Meanwhile, the share for animal protein is still below 30% against the total protein with the agricultural household being lower than the other households. In 1996, the animal protein share for agricultural, industrial/trade and service/other households was each 20.2 percent, 24.1 percent and 25.8 percent. The year 2002 witnessed an increase for the three types of household with the agricultural household remaining the lowest compared to the others. The share out of Java was still superior against that in Java, either for the agricultural or non-agricultural households.

Table 12. The development of protein consumption and sufficiency level and the animal protein share based on main earning sources in Indonesia, 1996-2002

Income Groups	Total protein (g/cap/day)			Sufficiency level (%) *)			Animal protein share (%) *)		
	1996	1999	2002	1996	1999	2002	1996	1999	2002
Indonesia									
- Agriculture	55.4	48.9	52.7	115.4	101.9	109.8	20.2	17.0	22.7
- Industry/trade	58.0	50.9	54.9	120.8	106.0	114.4	24.1	18.6	27.8
- Service/Others	60.1	52.3	56.4	125.2	109.0	117.5	25.8	20.8	28.8
Java									
- Agriculture	54.4	51.1	52.2	113.3	106.5	108.8	16.8	13.9	16.2
- Industry/trade	55.7	49.6	54.1	116.0	103.3	112.7	19.7	14.7	20.3
- Service/Others	57.9	52.3	55.1	120.6	109.0	114.8	23.0	15.3	21.2
Out of Java									
- Agriculture	55.6	48.4	52.8	115.8	100.8	110.0	21.0	17.8	24.0
- Industry/trade	58.6	51.2	55.1	122.1	106.7	114.8	25.1	21.0	29.3
- Service/Others	60.7	52.6	56.7	126.5	109.6	118.1	26.5	22.1	30.3

Note: *) *Towards protein sufficiency figure (48 g/cap/day); **) towards protein total*
Source: *National Socio-Economic Survey, BPS, Jakarta (processed)*

Conclusion and Policy Implication

Expense structure is one of the public welfare indicators. The smaller gets the expense for foods, the higher gets the public welfare level. During 1996-2002, the share for food expense in rural community was always higher than that of urban community, the proportion being 66.6% vs. 52.8% in 2002. The 2002 animal-derived foods expense allocation reveals that the farm products expense share in urban areas is higher than that of rural areas (6.9 vs. 5.0%) and for fishery products it is to the contrary (4.5% vs.

6.1%). With limited income, rural community tends to look to fishery products. To improve the welfare of the rural community, through improvement in the animal-derived products consumption, especially fishery products requires a facilitation in the form of an efficient distribution and marketing system to maintain the availability and price accessible to public.

The food consumption participation based on areas, income groups and main earning sources are closely interconnected. The mobility of earning from agriculture to industry/trade and service, from rural to urban community, will be followed by increasing income. The higher the income level gets the better the fresh fish consumption participation is. The structural changes in demography and economy towards urban community with non-agricultural main earnings will be followed by increasing fresh consumption participation. These extending market potentials require facilitation in terms of the establishment of fresh fish agribusiness network, especially for the extension of production areas besides the interconnection between production chains and ever intensifying demands.

Different from fresh fish, processed fish participation declines as the society's income improves, along with the mobility of the agricultural family's main earning and the increasing urban community. The structural changes in community and economy are followed by the declining processed fish' consumption participation and market potentials. This is a challenge against the development of the domestic market potentials for processed fish. The improvement in the community's income will be followed by products' characteristics changes with better quality. It is necessary to improve the quality of processed fish currently considered inferior by ordinary public. Improvement towards processed fish products with better quality ever increasing along with the increasing income is believed to have multiplying effects. Quality processed products will acquire better elasticity of income followed by improved market potentials and farmers-fishermen welfare.

Fresh fish contributes more than 78% towards the total fish consumption. From the perspective of animal protein sufficiency, fresh fish consumption is still very low and even lower for the economic crisis. Over 1996-1999, the consumption level dropped from 19.04 kg to 14.79 kg/capita/year for urban areas and from 14.60 kg to 12.18 kg/capita/year for rural areas. The consumption decline in urban areas had not yet recovered until 2002. Compared to the agricultural households, the consumption level for industrial/trade and service/other households is still higher. However, despite the fact that the fresh fish consumption is still higher in urban areas than that in rural ones, the consumption response towards fish' price change is more elastic. A more elastic response is seen in the low-income household group and those whose main earnings are in service/other sectors.

Compared to fresh fish, the preference for processed fish ranges between 9% to 25%. The higher preference prevails over rural and agricultural households. Prior to the crisis the consumption preference of the low-income group was higher however such trend changed as the crisis calmed. The consumption response towards changes in the processed fish' price tends to be elastic in the city, low-income households and those whose main earnings are from agricultural sector.

Diets and Health? Promotion of Domestic Food Productions and Comsumption? Lessons from Japanese Longevity by WHO – CARDIAC Studies

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Abstract :

World-wide epidemiological surveys covering 60 populations in 25 countries have demonstrated fish and soybean diets contribute to healthy longevity in the world through the prevention of cardiovascular diseases (CVD) in Japanese, particularly in Okinawans consuming a lot of fish and soy products since 24-hour urinary (hub) excretions of turbine and is flavones, rich in fish and soybeans were proven to be inversely related to mortality rates of coronary heart diseases (CHD). Immigrant studies on Okinawans in Hawaii and Brazil proved that their dietary factors were more important determinants of CVD than genetic factors. Intervention studies in these immigrants and Scottish people whose CHD mortality rates were among the highest in the world, confirmend that fish oil, DHA as well as soy protein isoflavone fortified diets alleviated the risks of CHD and osteoporosis. These results indicate Indonesian fish and soybean production and consumption will surely contribute to the health promotions in the country.

Key Words :

Fish, Taurine, DHA, Soy Isoflavones, Soy Protein, Coronary Heart, Diseases, Stroke, Prostate Cancer, Breast Cancer, Breast Cancer, Hypertension, Cholesterol, Osteoporosis, Longevity.

1) Introduction

Japanese females are now enjoying the longest average life expectancy (85.23 years) in the world. WHO Report also indicates that the Japanese disability-adjusted life years (DALY), 74.5 in average, are the longest in the world. Since average life expectancies are inversely related with age-adjusted mortality rates of CHD and all cancers in the world, the lowest mortality rates of these diseases in the Japanese contribute to the longest life expectancy among the developed countries. (Fig.1)

We have been engaged in WHO-Coordinated Cardiovascular Diseases and Alimentary Comparison (CARDIAC) Study in 60 communities of 25 countries in the world since our proposal of this study in 1983 (Fig.2), and we are confirming that the relationship of Japanese diets containing much sea-foods and soybeans with their worldly-known healthy longevity, based on the analyses on biological markers of these dietary intakes such as taurine and isoflavones in 24-hu.

Fig.1

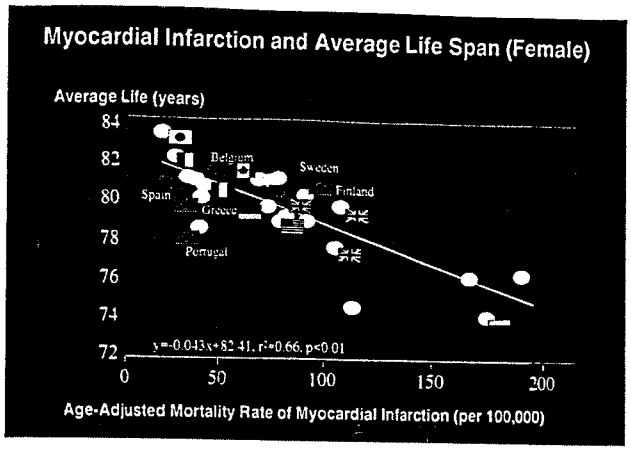
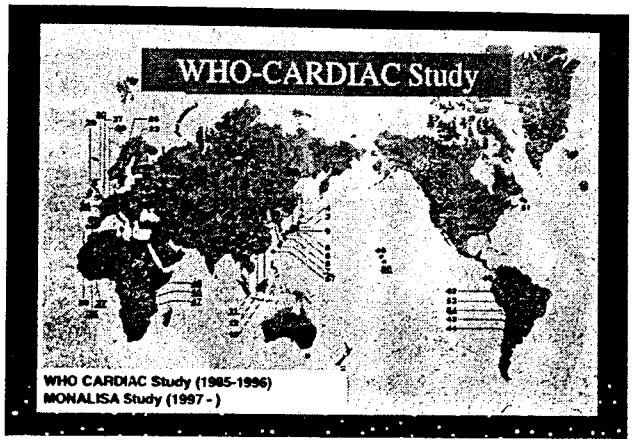


Fig.2



2) WHO – CARDIAC Study

This study successfully demonstrated that mortality rates of CHD were positively related with serum cholesterol (Cho) levels (Fig.3) and inversely related with 24-hu taurine excretions, and the rates of n-3 fatty acids in the plasma phospolipids, (Fig.4) the indices of sea food consumption and particularly 24-hu isoflavone excretions, (Fig.5) the marker of soy product intake for the first time in the world. On the other hand, stroke mortality was positively related to 24-hu Na exertions (Fig.6) and Na/K ratio, and was inversely related to serum Cho levels.(Fig.7) Okinawan's risk factors of stroke were proven to be the lowest among the Japanese because of their lowest 24-hu Na excretions corresponding to NaCl intake, 8g a day in Japan, and their lower CVD mortality rates were ascribed to the medium serum Cho levels (180-200mg/all in average), keeping both stroke and CHD mortalities the lowest as well as to their marked soy bean consumption and appropriate fish intake proven by the biological markers of these dietary intakes in 24-hu samples and blood.

Fig.3

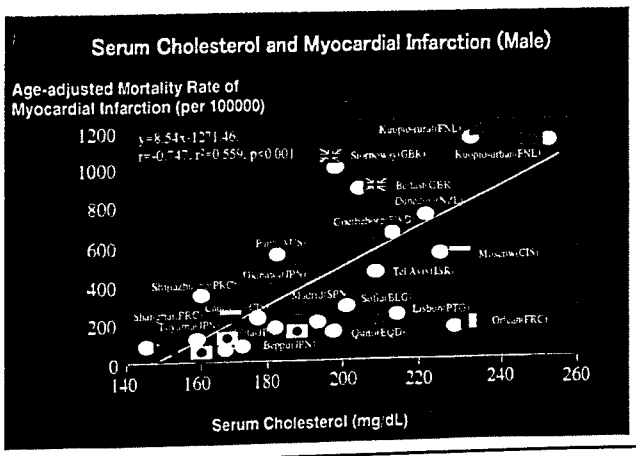


Fig.4

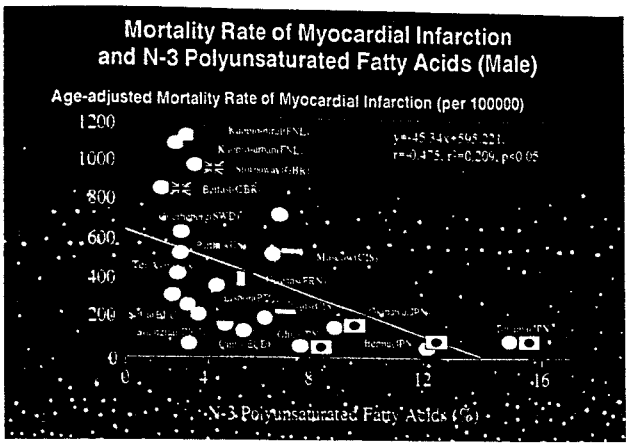


Fig.5

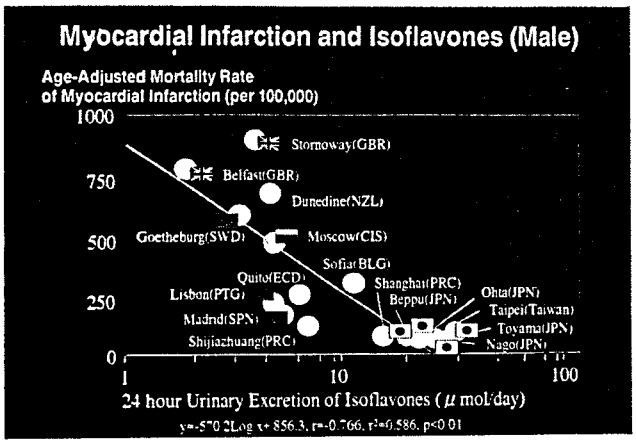


Fig.6

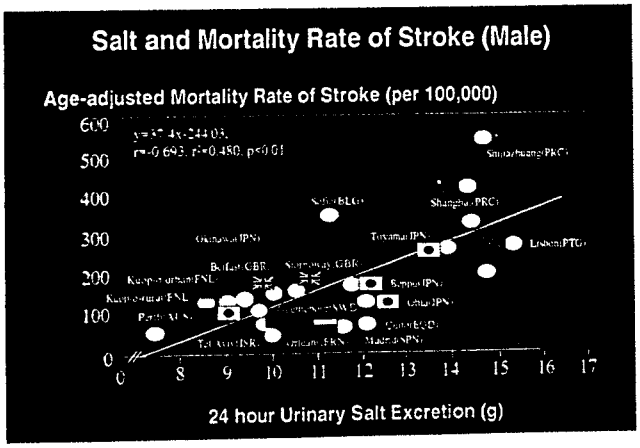
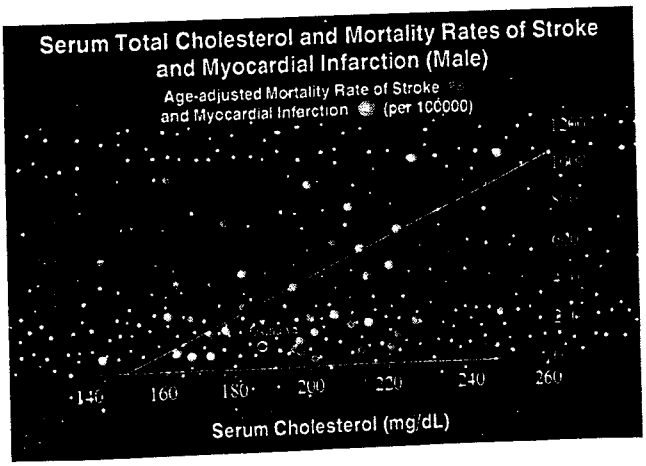


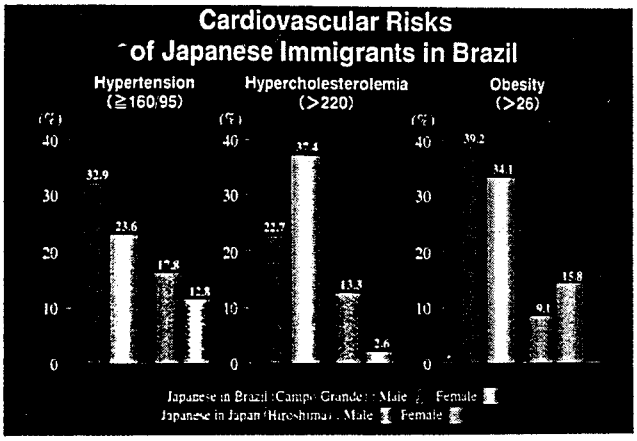
Fig.7



3) Immigrant Study on the Jepanese (Okinawans) in Hawaii and Brazil

Three Okinawan populations were comparatively studies for their CVD risk factors in Hilo, Hawaii, Campo Grande, Brazil and Nago, Okinawa, where about 100 males and 100 females aged 47-57 were randomly selected for the health examinations of the WHO CARDIAC Study. The lowers values in the prevalence of hypertension, hypercholesterolemia, obesity and diabetes mellitus were shown in Okinawans immigrants in Brazil, (Fig.8) indicating that the extreme Westernization of dietary habits particulary, the loss of habitual fish and soybean consumptions proven by their biomarkers, appeared to be involved in the shorter life expectancy due to high CVD mortalities.

Fig.8



4) Intervention Studies

Study in Japanese Immigrants in Brazil

The selected high risk people from Japanese immigrants in Brazil, aged between 47-57, 10 males and 10 females who were given 3g of DHA daily showed a significant reduction in blood pressure (BP) (Fig.9) and the same number of people who were given 5g of seaweed powder daily showed a significant reduction of serum Cho. (Fig.10) Twenty females aged 47-57 who were given 50mg of soy isoflavones daily showed significant reductions in BP, Cho (Fig.11) as well as 24-hu pyridinoline and deoxypyridinoline, markers of Ca resorption from the bone. (Fig.12)

Since risk factors in these Japanese immigrants were beneficially affected within 3 to 10 weeks by typical nutrients from fish, seaweed and soybeans common in Japanese, particularly Okinawan diets, CHD are expected to be prevented by these nutritional factors.

Fig.9

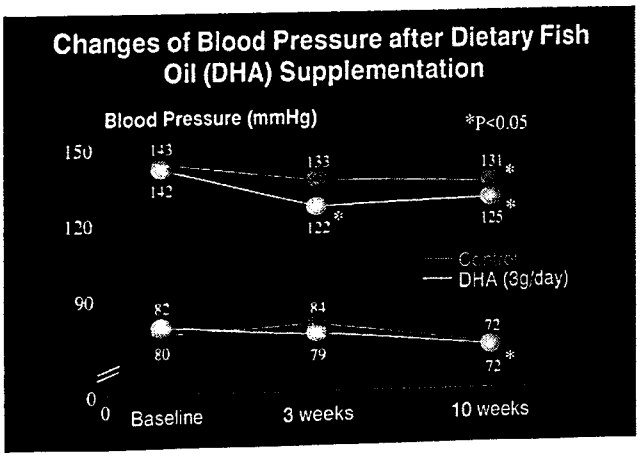


Fig.10

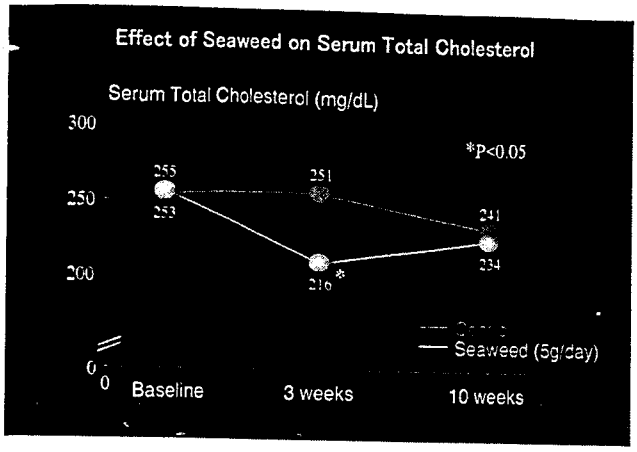


Fig.11

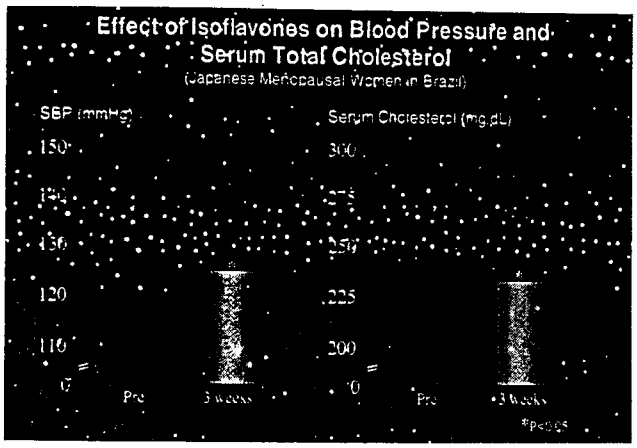
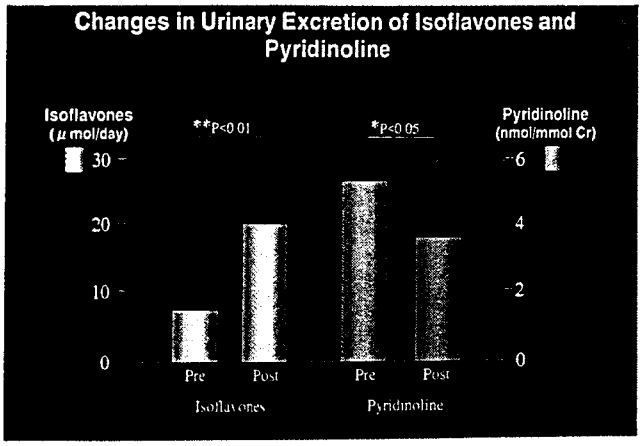


Fig.12



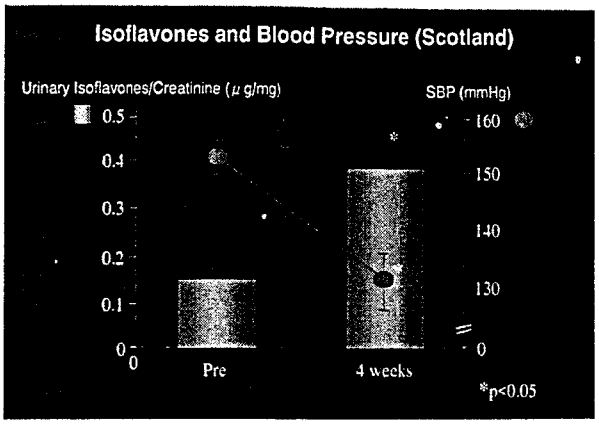
Studies in Japanese Immigrants in Hawaii

After the health examination on 238 Japanese immigrants aged between 45 and 59 by WHO-CARDIAC Study protocol, 80 individuals (43 males and 37 females) with mild hypertension and hypercholesterolemia were invited to an 8-week nutritional intervention for taking soy-protein fortified diets (over 25g a day). Their BP and serum total Cho levels were significantly reduced from the initial levels, but no reductions was observed in the control group.

Studies in Scottish People with a High CVD Mortality

WHO-CARDIAC/MONALISA study for Scottish people (Lewis and Skye Islands) in 1999 confirmed the further increase of CHD risk factors, compared with the result from the previous study in 1987. 60 menopausal women with relatively high CVD risk factors were divided into 2 groups, 30 each, to take a jelly containing 50mg of isoflavone excretion was significantly increased and a significant BP reductions was observed in the isolfavone group but not in the placebo group. (Fig.13)

Fig.13



5) Okinawan Diets and Cancers

Okinawans' stomach cancer mortality, the lowest in Japan, is related to the lowest Na intake and the lower mortalities of prostate, breast cancers and all cancers were proven to be inversely related to the 24-hu isoflavone excretion in WHO-CARDIAC Study populations. (Fig.14,15,16) The preventive mechanism of isoflavones, rich in Okinawan popular soy bean dishes, are ascribed to the weak estrogenic activity, estrogen receptor-blocking activity or the inhibition of angiogenesis. Therefore, Okinawans' healthy longevity can be ascribed to their lower CHD and cancer mortalities due to the merits of Okinawan daily diets, characterized with low salt, rich in soy bean, fish, seaweeds and probably also greenish vegetables containing antioxidants, which are all richly available in Indonesia.

Fig.14

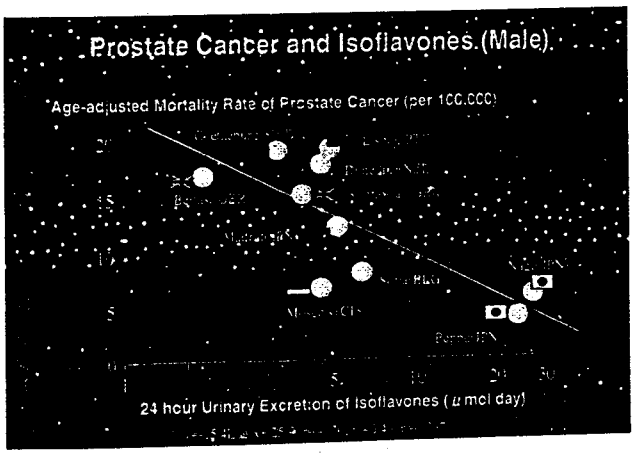


Fig.15

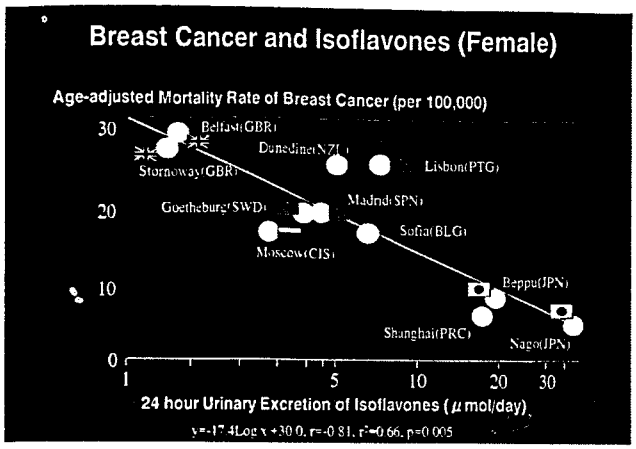
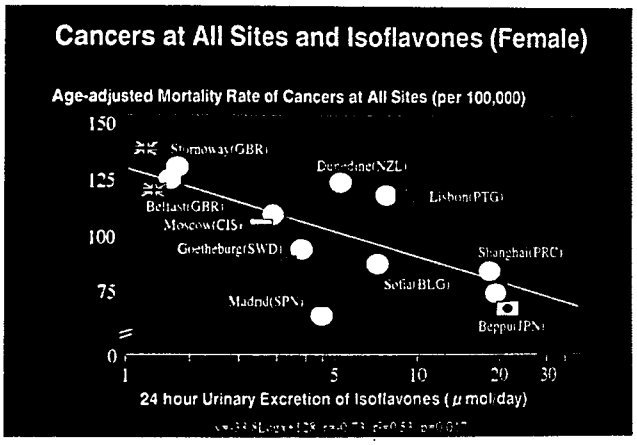


Fig.16



Conclusion

WHO-CARDIAC Study indicates, by the world-wide comparison of biological markers of fish consumption, 24-hu taurine excretion and n-3 fatty acid rations in the serum phospholipids as well as soy bean consumption, 24-hu isoflavone excretion, that increased fish and soy bean consumption would reduce CHD mortality thus could contribute to healthy longevity. Moreover, soy consumption, popular in Indonesia as in Japan could decrease not only CHD mortality but also prostate, breast and all cancer mortalities and thus contribute to healthy longevity world-wide as in Okinawa, where soy product consumption is the highest in Japan. Since CHD and cancer mortalities are higher in populations consuming less fish and soy beans, the promotions of sea foods and soy bean utilization as human nutrients by the technological improvement of sea food and soy bean production and processing as well as by harmonizing oriental and occidental or traditional and modern dietary customs will hopefully contribute to "health for all" and solve serious problems of protein supply to the expanding population on the earth.

MINISTRY OF MARINE AFFAIRS AND FISHERY
OF REPUBLIC INDONESIA

CAPTURE FISHERY IN INDONESIA, PRESENT CONDITION AND ITS PERSPECTIVE DEVELOPMENT

By:

Husni Mangga Barani, M.Si
Director General of Capture Fishery

INTRODUCTION

Indonesia is an archipelago country, not a maritime country that is the fact. To realize a strong maritime country is very possible, considering the potency that we have, consisting 17.502 Islands, and beach line in the length of 81.000 km with area width of fishery at sea around 5,8 millions km^2, that consists of archipelago waters and territory with width 3,1 millions km^2, and *Indonesian Exclusive Economic Zone* (ZEEI) with width 2,7 millions km^2. The fact shows that prospect of Indonesian fishery is considered promising and become one of strategic economic activity.

Fishery resources that live at Indonesian waters area is considered have the highest bio diversity. The resources at least cover 37% of fish species in the world (Office of State Minister of Life Environmental, 1994). At Indonesian waters area there are some types of fish, which has high economical value, namely tuna, skipjack, shrimp, mackerel, kakap, squid, coral fish (*kerapu, baronang, lobster*), ornament fish and shellfish, including seaweed.

Based on study result of *Research Board of Marine Affairs and Fishery* (BRKP) cooperate with *Indonesian Science Institution* (LIPI), the potency of Indonesian sea fish sources is estimated about **6,410 millions ton** per year, that consisting of sea area waters of territory around 4,625 millions ton per year and ZEEI waters around 1,785 millions ton per year. Nevertheless, due to fishery management has precautionary approach, so the *Catch Number Permitted* (JTB) is stipulated 80% from the potency or about **5,1 millions ton** per year. Besides the potency Indonesia also has opportunity optimizing the potency of fishery resources at high seas.

Level of exploitation in zone reached about **70%** from preserved potency or with production **4,5 millions ton**. The level of exploitation, besides still limited also not distributed evenly, even fishery resources at some certain waters, mainly at beach waters (<12 mil) has been intensive and shown over fishing, such as Java sea and Malaka straits

From the existing exploitation level, there is opportunity toward utilization of fishery resources. Based on the area distribution, the opportunity is at *Area of Waters Management* (WPP) South China Sea, Makasar straits and Flores Sea, Banda Sea, Seram Sea and Tomini bay, Sulawesi Sea and Pacific Ocean, Arafuru Sea and Indies Ocean.

Although the above macro description showing that capture fishery still has opportunity to be developed, but at one side still there are some problem of development capture fishery, among others:

1) Most of fishermen still a traditional fisherman with social culture characteristics that has not really conducive for a progress.
2) Fleet structure of fishery still dominated by small/traditional scale with low *Science and Technology* (IPTEK) competency.
3) Unbalance condition of exploration level of fish stock between one area and other seawaters area.
4) There are still many illegal, unregulated, and unreported (IUU) fishing practice, that happens due to law enforcement at sea still weak.
5) Improper support of facility and infrastructure of capture fishery.
6) There is a damage sea ecosystem environment, such as damage of mangrove forest, ridge of rock, sea grass beds, that actually a habitat for fish and other sea organism, spawning ground, feeding ground, or nursery ground.
7) Low ability in handling and processing fishery product, mainly by traditional business refers to consumer preference and quality product standardization internationally (such as *Hazard Analysis Critical Control Point*/HACCP, sanitation requirement, etc).
8) Weak of market intelligence that covers information mastering concerning competitor, market segmentation, and preference of consumer concerning type and quality of fishery commodity.
9) Improper infrastructure of economic and transportation system and communication to support distribution or delivery of fishery product from producer to consumer at a right time, mainly outside of Java and Bali.

POLICY AND PROGRAM OF CAPTURE FISHERY DEVELOPMENT

Development of marine and fishery sector, including the development of capture fishery sub sector, is an integral of national development that directed to (1) increasing fishermen welfare, fisher culture and other coastal society, (2) increasing the role of marine and fishery sector as a source of economic growing, (3) increasing nation intelligence and health through increasing fish consumption, (4) maintaining and increasing support and environmental quality of fresh waters, coastal area, small island and sea, and (5) increasing sea role as nation integrity and increasing Indonesian Maritime culture.

The development of capture fishery is basically aimed to increase people welfare, especially the fishermen, and also to keep fishery source preservation and its environment. The purpose currently is by widening the coverage, so that not only to increase people welfare and keep fishery source preservation, but also to increase contribution of Capture Fishery Sub Sector toward the development of national economic, mainly to assist overcoming economic crisis befell our country, either in the form of preparing job opportunity, foreign exchange income through export or *Non Tax State Income* (PNBP).

To achieve the purpose, an effort that can be done is by applying integrated and directed Management of Capture Fishery, so that utilization of fishery source can be done continuously from generation. This due to fishery sources can degrade even disappeared if exploited without any control, although fishery resources are renewable resources.

Besides that, an application of good fishery management, also a realization of commitment implementation of Indonesian government toward issue concerning responsible fishery management as stated in FAO – *Code of Conduct for Responsible Fisheries*, that currently is used as global guidance.

In connection with the above matter, Directorate General of Capture Fishery has stipulated a policy, target, strategy and work program from year to year and the activities are always evaluated, and then further perfecting refers to the strategic environmental alteration.

Development implementation of capture fishery is based on society economic system that directed to market mechanism and free competition. This development is supported by industry development based on natural resources superiority human resources superiority in achieving a high competitive ability.

By considering strategic environmental alteration and obstacles and the existing opportunity, so the development of capture fishery is directed to realize **Vision** of development of capture fishery, namely **Capture Fishery Business that able to Increase people welfare, having competitive ability, exploiting resources efficiently and continuously.**

To realize the vision, so the missions are as follows:

1) To increase fishermen's income and welfare;
2) To keep preservation of fishery resources and its environment;
3) To build a competitive capture fishery business;
4) To increase the role of capture fishery sub sector toward national economic development.

In accordance with Vision and Mission mentioned above, so that the target of fishery development are:

1) To increase capture fishery production
2) To increase fishery product export
3) To increase domestic fish consumption
4) To increase absorption of manpower (fishermen)
5) To increase national economic contribution through *Non Tax State Income* (NPBP).

Policy that will be applied in term of fishery development for next five years is to increase fisherman's welfare through optimization of utilization of fishery resources, and increasing of added value of fishery product.

Strategies that will be implement are:

1) Increasing productivity & efficiency of fishing business.
2) Increasing quality and added value of capture fishery product.
3) Developing facility and infrastructure of capture fishery.
4) Increasing service and control of permit of fishing business.
5) Perfecting the regulation.
6) Perfecting statistic system of capture fishery.
7) Increasing Indonesian role in international organization/Institution.

Operationally, the achievement of purpose and target area implemented through implementation of **Prime Program, and Development Support of Capture Fishery**, among others are as follows:

Prime Program

1) Program of development of small-scale capture fishery Business.

This program is directed to: a) realize productivity and efficiency of small scale fishing business through applicable technology touch, and environmental hospitality and also professional management, b) increase selling value of fisheries product through organizing pure auction at fish landing center, c) increase added value of fishery

product trough product development of qualified fishery product, and d) accelerate marketing distribution of fishery product. Besides that, this program will also **support national fleet strength**, mainly which owned by small scale fishermen so that be able to operate at offshore area, either for the sake of economic interest or as security belt function for completing inspection effort and security done and will be done an optimization of catching intensity (number of fishermen and number of fishing vessel) at every waters area refers to preservation potency.

Its activity coverage covers assistance package and technical training and business management started from effort of capture fishery from waters to fish landing center (*Optimization of Fishing Business*/OPTIKAPI); then continued to auction process (*Optimization of Fish Auction Organizing* /OPTILANPI) to get high selling fish price, and then management process (Optimization of Fishery products processing business/OPTIHANKAN); and finally market the fishing product and processing product of fishery product until the consumer's hand (*Optimization of Marketing Effort of Fishery Product*/OPTISARKAN).

2) Program of Quality Increase and Added Value of Fishery Products;

The increase of fishery production tends to be limited, it is better followed with upgrading effort of fishery products quality and increase services in publishing health certificate of fishery product, so that it will increase state foreign exchange income from fishery products export. Lately, export activity of Indonesian fishery faced at some obstacles, namely (a) Some importer country tends straighten the requirement and or enclosing new requirement either connected with quality (such as *separating tools of turtle*/TED, Eco labeling, etc) and (b) Import tariff is still quite high (for instance, Europe Union impose tariff of 24% for conned tuna fish import).

In order to overcome the above obstacles some effort has and will be done, among others:

a) Increasing quality of fishery products by implementing *Hazard Analysis Critical Control Point* (HACC P).
b) Increasing harmony of quality inspection system with import partnership countries in the form of MRA/MOU.
c) Developing marketing network, including market diversification of export destination.
d) Diversification of export commodity.
e) Increasing inspection effort.
f) Developing and strengthening information system (including market intelligence).
g) Laboratories strengthen of quality construction (LPPMHP).

Main Program

3) Program for Increasing Utilization of fishery resources;

This program is directed to realize a responsible fishery resources management refers to *Code of Conduct for Responsible Fisheries* (CCRF).

The activity that has been implemented is: a) CCRF socialization, b) FKPPS meeting, c) Composing and socializing general guidance for fisheries management plan.

4) Program for developing capture fishery infrastructure.

This program is directed to realize fishing port as center of economic growing based on capture fisheries. The activity that has been implemented are a) composing service standard at fishing port, b) constructing small scale fishing port (PPI) development Plan, c) developing fishing port.

5) Program for developing capture fishery facility

This program is directed to increase productivity of fishing unit that covers fishing vessel, fishing gears and additional gear through applicable technology touch refers to waters environmental condition and types of fisheries resources.

Activities that have been done are: a) Composing build plan and technical specification of fishing vessel, b) standardization of fishing unit, c) Developing and engineering of technology of fishing.

6) Program for Increasing service and controlling fishing Business Permit.

This program is directed to prevent *Illegal, Unreported and Unregulated* (IUU) *Fishing*, also to support target achievement of *Non Tax State Income* (PNBP) of marine and fisheries field by keeping on considering controlling of exploration of fisheries resources. Activities that have been implemented are: a) permit socialization of capture fishery business, b) accelerate *Non Tax State Income* (PNBP) income, c) permit computerization.

Supporting Program

7) Program for increasing Indonesian role in Indonesian organization/institution connected with capture fisheries.

This program is directed to stabilize Indonesian position in international organization/institution connected with capture fishery in managing fisheries resources and its environment. Activities that have been implemented are joining ICCAT, IOTC, CCSBT meeting, etc.

Through some programs and activities that has been implemented fisheries development until this moment, generally showing a clear result. With its directed policy and program for developing and managing capture fisheries during 2001 – 2003 it also increasing some development indicator of capture fisheries, among others:

- Production of capture fisheries increasing about 5,15% namely from 4.276.720 ton in 2001 become 4.728.320 ton in 2003.
- Total domestic consumption of fish increasing about 6,415% per year, namely from 4,69 million ton in 2001 become 5,30 millions ton in 2003, while from consumption level per capita per year increasing 4,83% per year, If in 2001 consumption level is 22,47 kg/capita/year so in 2003 is 24,67 kg/capita/year.
- Export volume and value increasing each about 19,615% and 11,92%, If in 2001 export volume and value each about 487.117 ton with a value 1.631.899.000 US$, so in 2003 increasing become 696.290 ton with value 2.004.067.000 US$.
- Import volume and value decreasing each about 6,45% and 5,38%, If in 2001 import volume and value each about 162.472 ton and 103.616.000 US$, so in 2003 decreasing become 136.870 ton and 92.312.000 US$.
- Number of fishing vessel increasing about 0,64%, namely from 468.521 in 2001 become 474.540 in 2003.
- Number of fishermen increasing about 2,86%, namely from 3.268.500 in 2001 become 3.476.200 in 2003.
- Fishermen productivity increasing although not quite significant, if in 2001 fishermen productivity is 1,30 ton/person/year so in 2003 only increasing 1,36 ton/person/year.
- *State Income of Non Tax* (PNBP) increasing sharp, if in 2001 PNBP from new fishery catch is reaching 4,033 billions rupiah, so in 2003 (until December 19th), has reaching 355,720 billions. So in period 2001 – 2003, the average increase of PNBP per year is 2.523,8%.

III. FUTURE CAPTURE FISHERIES DEVELOPMENT

Issue and problem that still and will dominate the capture fishery development in the future, among others: (1) fishermen economic condition that still under poverty line about 65%; (2) *Illegal, Unregulated and Unreported* (IUU) fishing practice that still high; (3) Over fishing at some fishing grounds for some fish stocks, and under fishing at other fishing ground for other fish stocks, and under fishing at other fishing ground for other fish stock; (4) the use of fishing method that still destructive, (5) Marginal position of fishermen in "trade chain" of fisheries; (6) and some other problems that become derivative of the above main problem.

The development of capture fisheries in the future begun and will be dominated by *Movement National Development of Marine and Fisheries* (Gerbang Mina Bahari/GMB) that has been proclaimed by the president at Tomini bay in October, last year. This new condition show that government together with DPR have a strong commitment, it is seen from application of special Allocation Fund and Non reforestation Fund (DAK non DR) in which Department of waters and fisheries become one of 4 Department that get "special treatment".

To implement Gerbang Mina Bahari, Ministry of Marine Affairs and Fisheries has stipulated some quantitative target where some targets are tightly connected with capture fisheries among others: (1) increasing production up to 9,5 million ton; (2) Export value up to 5 billions US$; (3) manpower absorption as an effort to reduce unemployment level up to 7,4 million people; (4) level of domestic consumption up to 30 kg/capita/year.

As one of commitment to implement *Gerbang Mina Bahari* (GMB) to achieve the stipulated target, Directorate General of Capture Fisheries try to some efforts in order to accelerate the development that can be implemented among others by bearing program and activity as follows:

1) Re structuring and Modernization of Capture Fishery Fleet.

This effort is based that shallow waters area (<12 mil) that until this moment become fishing ground for small scale fishermen that achieve over fishing level, in which it has been known together that characteristic of this area one of them as nursery ground and spawning ground for certain type of fish.

The approach that will be done through managing and exploiting fisheries resources based on characteristic of fishing ground, type and stock of fisheries resources, fishermen ability of social and culture of local society and technological application of environmental hospitality.

2) Fishermen relocation

As an effort for exploiting fishery resources that happen evenly either from area side or certain fish stock side, the government has a program to relocated fishermen business mainly which located at Pantura (North beach of Java) to eastern Indonesia area such as Majene, Tual, Takalar, Wetar and Mamuju.

The objectives in order that the under fishing area that generally located at eastern area of Indonesia (such as Sulawesi sea, Pacific ocean, Arafuru sea, and Flores sea) can be exploited optimally. Other objectives that want to be gained are to create new growing center.

In 2003 through governmental pattern have been relocated 400 families from fishermen and fisher culture at Pantura area. They are spreader at 4 locations, namely:

- Punaga, Takalar regency, south Sulawesi: 100 families (fishermen)

- Salutambung, Majene regency, south Sulawesi: 100 families (fishermen).
- Duhiadaa, Gorontalo regency: 100 families (fisher culture)
- Tanakeke, Takalar regency: 100 families (fishermen)

From the inventorying result of candidates that will be relocated, the member's potency from sender area among others: 1) Cirebon (506 families), 2) Indramayu (47 families), 3) Pandeglang (742 families), 4) Serang (271 families).

3) Revitalization of Fisheries Port become "Small Scale of Ministry of Marine Affairs and Fishery"

Through revitalization concept, gradually will be integrated some activities of work unit of Eselon I of Ministry of Marine Affairs and Fisheries at fishing port until all service function and construction can be done and can become barometer for the development of fisheries at an area.

Target that will be achieved through this concept is (1) Creating a conducive climate for business activity so it coned press the operational cost of user at fishing port, (2) Fishing port can because agent of development for fishery business, (3) Fishing port hoped become growth center of economic for area surround (backwash effects and spread effect in harmony), (4) Fishing port as implementers of Ministry of Marine Affairs and Fisheries function at rural area, hoped it can become barometer for fisheries development at one area.

Beginning target of this program at 6 locations namely *Ocean Fishing Port* (PPS) Jakarta, *Fishermen Fishing Port* (PPN) Cilacap, *Ocean Fishing Port* (PPS) Kediri, *Fishermen Fishing Port* (PPN) Pekalongan, *Fishermen Fishing Port* (PPN) Tanjung Pandan, and *Fishermen Fishing Port* (PPN) Pelabuhanratu.

4) Developing Outer Ring Fishing Port/ORFP).

Meanwhile the concept of development of fishing port outer ring in Indonesia area is based on the fact that (1) exploration of fishery sources until this moment still unevenly, where there are some fishing ground has reached over fishing level but there are some at under fishing level, (2) IUU Fishing practice that has caused loss for the country 4 – 6 billions per year, (3) High potency but not supported with the proper facility and infrastructure, (4) Security of border area still low, (5) creating new economic growth center.

Location of ORFP development is located at 25 location points among others Sabang, Labuan Haji, Sibolga, Bungus, Baai Island, Awang Bay, Kupang, Tual, Merauke, Belawan, Tarempa, Pemangkat, Nunukan, Bitung, Kwandang, Ternate, Sorong and Biak.

5) Developing Integrated Fishery Co-operation

This program will be done at 30 PP/PPI locations, co-operate with state Ministry of Co-operation & Small scale and Medium Enterprises (UKM), Ministry of Domestic and IKPI. Activities that will be done are: (1) increasing service through preparing staple need, such as fishing gears, staple food for fishing, ice, petroleum, clean water, etc, loading and unloading service; management and marketing; capital; increasing human resources through training of cooperation management, integrated quality management, etc.

6) Developing *Solar Packed Dealer* (SPD/SPBN)

Until this moment *Oil & Petroleum* (BBM) becomes very important production input for fishermen either for small scale or industry scale, this is caused by a fact that about 26 – 30% of fishing operation cost burdened by the need of BBM. Implication

of BBM increase that has been stipulated by government direct or indirectly will "hit" fishermen that have a very high dependency to this.

Realizing this matter, Ministry of Marine Affairs and Fisheries through Directorate of Facility and Infrastructure of Capture Fishery of Directorate General of Capture Fisheries has done a cooperation with PT. Pertamina to overcome BBM need at fishing port center through Development program of *Solar Packed Dealer for fishermen* (SPD/SPBN) at location of fishing port, fish landing center and traditional ship basis. This purpose is answered through this program is to lighten the fishermen burden, giving price certainly and to assure stock/distribution of BBM.

7) Controlling Effort of Permit and Decreasing Foreign Ship.

Based on the report of party who operates ship and result of document legal checking, found that fishing vessel > 30 GT with Indonesian flag are 70% of document of ship domestic made are not legal and 90% document of foreign made are not legal/deletion certificate.

Therefore controlling program for fishing activity through permit that will be done in the future among others:

- Re-registration:
  - Modernize fleet data of Indonesian fishing
  - Assessment of actual fishing capacity
- Stopping new permit allocation for over-exploited WWP and directing the development of effort at under-exploited WPP.
- Perfecting permit service (hardware, software and widening service points) to perfect service.
- Checking legality of ship document.
- Re-advice to origin flag for foreign ship, together with the stipulation implementation (including stipulation concerning the use of TKWNAP) consistently.
- Giving an opportunity to foreign ship to operate at ZEEI with license skim.
- Decreasing fleet of foreign ship from ZEEI step by step refers to the development of Indonesian fisheries fleet.

While optimization of exploitation program of SDI at WPPRI by fleet of Indonesian Republic among other:

- Increasing capacity of fishing for domestic fleet.
  - Technical skill and management.
  - Business partnership, KUB development or cooperation, joint venture Business.
  - Infrastructure support.
  - Support of upstream and downstream industry.
  - Access of capital.
  - International market penetration
- Fairness of capacity of domestic fishing feet from WPP of dense fishing to less optimal WPP of its SDI.

Certain effort to decrease foreign ship:

- Increasing pickings value of fisheries per unit of fishing capacity measurement (US$/GT or US$/M3 Polka).
- Three choices for company owing foreign ship of license skim:
  - Keep on operating with license skim but pay higher pickings.

- Cooperate with its partner in Indonesia and make a joint Venture in the field of integrated fisheries industry.
- Out from Indonesian WPP.
- Those programs will be done through cooperation with Ditjen PSDKP and *Mabes* (Headquarters) TNI AL and will be standardize in the from of SKB (letter of agreement) or PKS (cooperation Agreement).

8) **Increasing quality and product with added value.**

Main issue that will influence the quality policy in the future among others: (1) International security of fisheries product, (2) International Trade (3) continuous fisheries and (4) AFTA Application.

To anticipate this issue, Directorate General of Capture Fisheries through Directorate Quality and Processing Product will do some programs, among others program of Increasing inspection that will be done for the sake of increasing security of fisheries product, namely: (1) Technology introduction of processing fisheries product with environmental approach, (2) Applying PMMT/HACCP and SNI in compulsory, (3) increasing inspection/test means, (4) Increasing the quality of human resources, (5) socializing and dissemination of CCRF, SPS/WTO stipulation.

Campaign of eating fish through electrical and printed media (book, brochure, leaflet, etc) also will be increased so that the target of consumption increase in this country can be achieved.

IV. CLOSING

Development results that have been achieved until this moment either formerly done by Directorate General of Fisheries or after Ministry of Marine Affairs and Fishery is formed, so ideally it should be defended or increased.

Through spirit of Gerbang Mina Bahari Implementation, hoped that capture fisheries actors can more "Struggle" and focus to achieve the stipulated targets. This effort really needs cooperation and participation every stockholder such as: Related department, local government, LSM, university, organization and society in general. So, finally, the beginning objective to welfare the fishermen in the form of exploiting and managing SDI optimally and preserved so that God's willing will be achieved.

Jakarta, March 2004

Directorate General of Capture Fisheries

FISHERY AQUACULTURE PRESENT CONDITION AND ITS DEVELOPMENT PERSPECTIVE*)

By : **Anto Sunaryanto, M.Sc**

Directorat General of Culture Fisheries

INTRODUCTION

In the effort of economic recovery in Indonesian, the development of marines and fishery sector are hoped can give big contribution toward national development. In connection with this, fishery business either in the field of capture or aquaculture can become the prime mover. In aquaculture field, the reasons are based on (i) a very big resource potency, (ii) demand toward fishery product is keep on increasing, (iii) relatively high efficiency, with ICOR (Incremental Capital Output Ratio) 3,1 – 4,0 (iv) Having strong backward and forward linkages to the industries, (v) absorbing high manpower, and (vii) renewable resources.

Since the establishment of Ministry of Marine Affairs and Fishery Department until this time, the development of aquaculture fishery has indeed should a significant increasing, if seen from indicator of production increase. Export and fish consumption of aquaculture result. During that period, the average increase of production is reaching 8,4% per annum, export volume 9,76% per annum and fish consumption 5,7% per annum. Nevertheless, if compared with potency of aquaculture sources owned, and if compared with other countries that have smaller potency of aquaculture sources, so that the achieved result still far from the expectation.

Therefore, through *Gerakan Pembangunan Mina Bahari* (GMB) /Fishery & Marines Development Moment, that has been proclaimed by President of Indonesia Republic in 11 October 2003, the development of fishery and marines sectors, including development of aquaculture fisheries will be more encouraged to increase higher achievement level of management of aquaculture fishery sources. Through GMB, hoped that at the end of 2009, production of aquaculture fisheries can reach 5 millions ton and export US$ 6,75 billions.

Nevertheless we realize that challenge and obstacle faced in the development of aquaculture fisheries are really complicated, both concerning infrastructure, capital, and social and economic institution, marketing and management pattern of world fishery. Therefore, a support from all stakeholders will be very needed in term of perspective of aquaculture fisheries development in the better future.

POLICY AND RESULT ACHIEVED AT THIS MOMENT

To do acceleration steps of aquaculture fisheries development in the future, it is necessary to know the policy that has been implemented the achieved result with development indicator of cultivation area export, fish consumption and export, and problem encountered in the implementation of aquaculture fisheries development.

2.1. Development Policy

In accordance with the owned sources potency and also in term of encountering a global challenge, including in the field of fishery, development policy of aquaculture fisheries which is reflected in its vision, namely Aquaculture Fishery **"source of main economic development, implemented through system of aquaculture fishery business which is competitive, continuous and fair".**

In its implementation, aquaculture fisheries development is implemented through 5 main programs, namely:

(1) Intensification Development Program of Aquaculture Fisheries (INBUDKAN);

This program is aimed to (a) facilitate income increase and fisherman's welfare through together movement to support increasing of production quality and productivity of aquaculture business efficiently and continuously, (b) support production increase and productivity of aquaculture fishery business with export oriented to increase state foreign exchange and stabilize national food endurance, and (c) support economic development in villages through manpower of fisherman in a strong institution, capitalizing, partnership relationship in term of stabilizing preparation of production means and marketing result. INBUDKAN program covers the development of shrimp commodity at 24 provinces, kerapu at 22 provinces, seaweed in 18 provinces and nila at 26 provinces.

(2) Development Program of Integrated Aquaculture Area with other sectors. *(Integrated Aquaculture);*

This program is aimed to (a) establish outlet (place of marketing result) for product of aquaculture fisheries so that able to support the increase of activity aquaculture and finally will be able to increase income and well fare of people who cultivates the fish, (b) support economic development of fishermen especially and people around location of integrated aquaculture in general, and (c) support method of aquaculture fisheries which economical in input, environmental hospitality and hygiene and also accelerate implementation of code of conduct for responsible fisheries in aquaculture fishery.

(3) Development Program of Rural Aquaculture;

This program is aimed to (a) optimize area use to fulfill family nutrient need an income increase through aquaculture development of consumption fish, local fish and ornament fish, (b) Approach activity aquaculture with family life to build next generation in the field of aquaculture fisheries, and (c) increase economic development in rural area.

(4) Development program of culture Based Fisheries;

This program is aimed to (a) increase productivity of a public waters by increasing catching result of fishermen through spreading fish of aquaculture result by considering ecosystem preservation and local fish, (b) Increase care and people ability of public fisheries and waters in managing and preserving productivity public waters area at its region, and (c) increase people advocacy of public fishery and waters in the effort of pressing the pressure of pollution waste and preservation threat of public waters in its regions.

(5) Increasing Program of Green Productivity

This program is aimed to (a) build aquaculture system that combine the effort of increasing business productivity altogether, effort of sources preservation and environmental function, (b) build and strengthen people care toward aquaculture fishery toward ecosystem preservation of waters, protected area, and supporting area, (c) build people cultivation care to cultivate aquaculture method which environmental oriented and also apply responsible aquaculture principle, and (d) build and socialize aquaculture method in an environmental hospitality manner

2.1. Result Display

2.2.1. Area Development

The aquaculture area is estimated increasing from 594.176 ha and 80.919 units in 1999 becomes 730,090 ha and 315.000 units in 2003 with growing rate 5,3% and 43,6% per annum. Rate of growth of aquaculture area width in sea, karamba, and floating net at the same period is quickest among other aquaculture business, namely 56,9%, 35,2 and 28,3% per annum.

2.2.2. Production Development

At period 1999 – 2003, production of aquaculture fisheries is estimated to increase 8,4%, namely from 882,989 ton in 1999 become 1.220,000 ton in 2003 (table 2.2). The production increase of aquaculture fisheries become there is a tendency, which directed to more advance technology application, aquaculture area width and stock support of many type of qualified germ and its quantity. The biggest percentage of production increase happened at waters aquaculture business and KJA of fish water. Meanwhile, if it is seen from its production value, during the same period is increasing 15,2 % per annum, namely from 8.568,8 billions rupiahs become 14.977,9 billions rupiahs as seen at table 2.3.

2.2.3. Export Development

During the period of 1999 to 2003, export volume of aquaculture fisheries result is estimated to increase 9,76 % per annum, namely from 154,771 ton become 219,850 ton (Table 2.4), while its value is estimated only to increase 1,81% per annum, namely from US$ 720,17 millions become US$ 760,06 millions (Table 2.5). Based on the data, showing that during period in 2001 to 2003 there is a tendency of average price decreasing of export commodity of fishery result, mainly Shrimp. This is caused among others the effect of monetary crisis at import companies and other trade obstacles.

Table 2.1. Growth of Aquaculture Area width, 1999-2003

DETAIL	1999	2000	2001	2002 *)	2003 **)	Increase/ Annum (%)
Sea (unit)	48,775	122,776	142,690	190,299	240,000	56,9
Embankment (ha)	393,196	419,282	438,010	458,107	480,000	5,1
Pond (ha)	65,889	77,647	85,900	94,240	100,000	11,1
Karamba (ha)	34	76	80	86	90	35,2
Floating Net (unit)	32,144	37,413	72,280	72,655	75,000	28,3
Wet field (ha)	135,057	157,346	150,680	148,909	150,000	3,0
Total (ha)	**594,176**	**654,351**	**674,670**	**701,342**	**730,090**	**5,3**
Total (unit)	**80,919**	**160,189**	**214,970**	**262,954**	**315,000**	**43,6**

*Remark: *) Tentative number **) Estimated number*

Table 2.2. Production Development of Fishery Aquaculture, 1999–2003

Unit: Ton

Details	1999	2000	2001*)	2002*)	2003**)	Increase/ Year (%)
Sea	135,969	197,114	221,010	234,859	250,000	17,5
Embankment	412,935	430,017	454,710	473,126	500,000	4,9
Pond	177,622	214,393	222,790	245,626	280,000	12,2
Wet Field	94,634	93,063	98,190	86,627	90,000	-1,0
Karamba	32,323	25,773	39,340	40,742	45,000	11,6
Floating Net	29,506	34,602	40,710	47,172	55,000	16,8
Total	**882,989**	**994,962**	**1,076,750**	**1,137,153**	**1,220,000**	**8,4**

*Remark: *) Tentative number **) Estimated Number*

Table 2.3. Development of Production Value of Fishery Aquaculture 1999 – 2003

Units: Rp. millions

Details	1999	2000	2001*)	2002*)	2003**)	Increase/ Year (%)
Sea	224,039	1,368,664	728,221	793,309	844,453	119,9
Embankment	6,280,068	7,464,326	8,162,860	9,491,537	10,030,665	12,5
Pond	1,200,400	1,311,677	2,237,334	2,557,042	2,811,856	26,0
Wet Field	532,646	586,425	726,282	642,233	665,703	10,2
Karamba	246,352	168,886	264,958	277,851	306,890	33,7
Floating Net	103,340	147,093	235,620	273,020	318,327	6,5
Total	**8,586,846**	**11,047,071**	**12,355,274**	**14,034,993**	**14,977,894**	**15,2**

*Remark: *) Tentative number **) Estimated Number*

Table 2.4. Export Volume Development of Fishery Aquaculture Result, 1999–2001

Units: Ton

Details	1999	2000	2001	2002*	2003**	Increase/ Annum (%)
Shrimp	76,755	81,331	90,181	87,335	100,220	7.11
Other fish	35,450	21,635	16,958	22,974	37,860	9.92
Crab	1,041	1,238	1,166	1.23	1,030	0.28
Frog's thigh	239	415	393	383	350	14.29
Sea weeds	25,084	23,073	27,874	28,560	38,030	12.10
Ornament Fish	1,945	1,897	1,877	2,460	2,180	4.04
Snail	187	291	307	265	340	18.93
Pearl	73	9	22	6	0,19	-28.20
Others	13,997	14,211	15,384	35,265	39,840	38.00
Total	**154,771**	**144,100**	**154,162**	**178,371**	**219,850**	**9.76**

*Remark: *) Tentative number **) Estimated Number*

Table 2.5. Export Value Development of Fishery Aquaculture Result, 1997 – 2001

Units: US$ 1000

Details	1999	2000	2001	2002*)	2003**)	Increase/ Annum (%)
Shrimp	622,287	701,486	654,492	585,594	630,380	0.79
Other fish	32,802	24,655	23,737	25,667	37,480	6.40
Crab	5,440	6,821	8,734	9,035	8,090	11.61
Frog's thigh	653	1,108	1,418	1,354	1,100	18.60
Sea weeds	16,284	15,670	17,230	15,785	20,160	6.38
Ornament Fish	7,981	9,510	10,222	10,538	9,850	5.80
Snail	322	477	573	432	550	17.74
Pearl	20,426	25,686	25,257	11,471	1,850	-28.59
Others	13,775	18,648	21,218	26,711	50,600	40.64
Total	**720,170**	**804,061**	**762,890**	**686,587**	**760,000**	**1.81**

*Remark: *) Tentative number **) Estimated Number*

2.2.4. Development of Fish Consumption

Fish consumption per capita in whole originated from catching result and aquaculture in period of 1999 – 2003 to increase 3.9% per annum, namely from 21.22 kg/kap/year become 24.67 kg/kap/year (Table 2.6).

Table 2.6. Development of Fish Consumption, 1998 – 2002

Detail	1999	2000	2001	2002*)	2003**)	Increase/ Year (%)
Total consumption (1000 Ton)	4,263.48	4,352.93	4,692.96	4,841.55	5,308.68	5.7
Consumption per capita (Kg/kap/year)	21.22	21.69	22.47	22.84	24.67	3.9

*Remark: *) Tentative number **) Estimated Number*

2.3. Problem

Although the development of aquaculture fisheries still to show increasing from year to year, but its increase is relatively very small compared to potency of the available source. This also can be seen from marketing side, although its volume tends to increase, but its value tends to decrease, in which this condition also influence business level by aquaculture fishery. Obstacles, either internal or external, cause this. In which it is a challenger in development of fishery aquaculture, as follows:

(1) Trade Globalization

World trade globalization has an impact toward fishery product marketing namely: (a) competitive fishery result export, (b) Tightness of quality requirement applied by import country, (c) Environmental issue, and (d) Implementation support of code of conduct for Responsible Fisheries (CCRF). The developed countries that import fishery result product of Indonesia by tightening the quality requirement formulate this condition.

As the effect of this, lately there are some times of export of Indonesia fishery result arrested, because containing antibiotic or other environmental issue. This tightening seems also aimed as disguised protection for the sake of its country interest, after the obstacles is not permitted in the current trade system.

At the same time, Indonesia as a producer country of fishery result is demanded to implement responsible fishery management manner (CCRF) that to be International issue.

(2) Regulation and Ordinance

One of the obstacles faced in the development of aquaculture fisheries is the limitation of regulation and ordinance that regulate development of aquaculture fishery. Ordinance No. 9 year 1985 concerning fishery less accommodate the development of aquaculture fisheries, essence of the ordinance more focused on the handling of exploitation and exploration, and less regulate generative activity. As a result, the development of aquaculture fishery walks alone, without support from the available ordinance.

(3) Layout

Business certainty in the field of aquaculture fisheries cannot be separated with problem of layout. Interest conflict among the sectors and sub sectors always happen if there is no clear planning of layout area. Besides uncertainty of lay out and changeable also become obstacles in the development of aquaculture fishery business in an area. A fact in the field gives description that shrimp/fish aquaculture business often happens an overlapping with another activities, which tends to cause negative impact toward aquaculture business. Worse than this, aquaculture fishery business is often sacrificed for the sake of other activities, such as industry, tourism, housing or mining. In fact it is really realized that business actor of aquaculture fisheries is fishermen who has limited capital and need guidance of effort. The description always appears because of development sidelines toward small-scale fishermen still low.

(4) Capital

One of the purpose of development of aquaculture fisheries is to increase fishermen's welfare, so that needed supporting factor to accelerate their business activity namely through capital assistance. Capital assistance in the form of credit facility from banking institution or other financial institutions with low interest is really expected. There are many reasons delivered in distributing capital assistance from banking for aquaculture fisheries activity, namely by mentioning that aquaculture fishery business has a high risk, in fact the disability to pay credit is not caused by failure of harvest, but mainly by the use of credit fund which not refers to the business plan. Besides that, process of credit liquidity is relatively difficult, also becomes one of the obstacles to get the capital. Creation of aquaculture group become bankable group through business association will be very important to be done.

(5) Information Institution

Other obstacle in accelerating the development of aquaculture fisheries is institution of fishermen institution. The institution that feels really important is information institution.

As we have that information institution in the field of aquaculture fisheries has not run well yet, because the information and technology current is cut from Research Board and UPT to the fishermen. This happens because since Directorate General of Fishery moved to Marine affairs and fishery Department, so that infrastructure of information institution at area which previously polyvalent between agriculture and fishery become less effective in informing in the field of fishery. Meanwhile the available institution of fishermen group should increase their duty and function, because if will facilitate in business guidance, or training in term of fishermen manpower.

(6) Marketing

Problem in aquaculture fisheries mainly in cultivate freshwater fish in which most of its result aimed to fulfill the domestic need, namely marketing problem. More intensive business pattern balanced with increasing business area width can cause supply is higher than demand. The condition lasts almost all the year and a big problem because affect the decrease of fish price, especially freshwater fish, such as: nila, patin, etc. Main market of shrimp commodity is Japan besides United States, while producer country of shrimp aquaculture is not only in Indonesia.

Thailand and some countries at Latin America are mentioned become country of shrimp exporter and become competitor for Indonesian shrimp. Some countries such as Australia, Madagascar and Vietnam also become growing as shrimp producer in the world. So, it is possible there is over supply of shrimp to Japan and United States. Implementation of market intelligent in searching new marketing area becomes a must, because if not available so the industry of shrimp and aquaculture fisheries generally will not ever be realized.

(7) Technology

Aquaculture fisheries development through in cultivates the fresh water, salty water and sea. Aquaculture fisheries development of fresh water does not get a significant technological obstacle, mainly in the effort of growing, except in the stocking of qualified germ. In the field of shrimp aquaculture, unknowns about technology of plant disease eradication and shrimp disease and also the decreasing of environmental quality become obstacle besides technology of breeding for shrimp that still very rare. Until this moment only Mexico and Ecuador who have successfully produce shrimp fry that resistant toward virus white spot. At the field of sea aquaculture, problem encountered is a fact some certain commodity, the available technology still in tryout phase.

(8) Aquaculture facility and infrastructure

Some production input in aquaculture fisheries becomes significant obstacles, among others caused by weakness of rupiah value toward dollar. It is depends on import mainly food material for fish/shrimp. The dependency toward import food at least becomes obstacles in accelerate the development rate of aquaculture fisheries, beside quality of production, which has not been available yet. Another obstacle is that rare stock of medicine and peptized to control plant disease.

(9) Security

Long economic crisis causes the level of unemployment keeps on increasing and level of social crime is higher in the form of "staling" including at shrimp pond, pearl aquaculture, etc at some areas. Besides technical factor, the above condition make shrimp aquaculture business becomes less conducive.

FUTURE DEVELOPMENT PERSPECTIVE

In the effort to more increase its contribution, so development acceleration of aquaculture fisheries as has been proclaimed through GMB has stipulated development targets in period of 2004 – 2009 that much bigger than targets stipulated in the previous RENSTRA.

Through some program of aquaculture fisheries that will be implemented at period 2004 – 2009, projected that at the end of 2009 will produce aquaculture fisheries about 5 millions ton, with average growing per year about 20,50%. The production is from sea aquaculture that growing with a speed 26,97% per year, embankment aquaculture with a speed 10,95% per year, pond aquaculture with speed 20,51% per year, karamba aquaculture with speed 20,51% per year, floating net aquaculture with a speed 20,42% per year, and wet field aquaculture with a speed 20,51% per year. While its export volume and value is expected each can increase the average about 24,90% and 18,90% (see table 3.1).

Table 3.1 Production and Export Target, 2004 – 2009

Details	2004	2005	2006	2007	2008	2009	Increase/ Annum (%)
Total of production (Ton)	2,000,000	2,700,000	3,500,000	4,000,000	4,500,000	5,000,000	20.50
Sea	684,477	1,043,794	1,465,313	1,7000,219	1,935,124	2,170,028	26.97
Embankment	559,577	635,753	711,806	787,920	864,118	940,147	10.95
Pond	449,269	606,514	786,223	898,540	1,010,858	1,123,175	20.51
Karamba	71,765	96,883	125,589	143,531	161,472	179,413	20.51
Floating net	83,002	112,053	145,254	166,004	186,755	207,505	20.42
Wet field	151,855	205,005	265,747	303,711	341,675	397,638	20.51
Export volume (ton)	900,022	1,135,197	1,431,824	1,775,462	2,201,573	2,729,950	24.90
Export value (US$ 1000)	2,900,000	3,800,000	5,000,000	5,750,000	6,250,000	6,750,000	18.90

Development target of aquaculture fisheries is bigger than achievement period of five year ago that expected can be accelerated, mainly through INBUDKAN Program, that covers commodity of shrimp, kerapu, seaweed and nila, besides production increase of potential commodity through other programs. In connection with this, area target and production of INBUDKAN program period of 2004 to 2009 can bee seen a table 3.2 and 3.3, while production target of Non INBUDKAN program of period 2004 – 2009, can be seen at table 3.4.

Table 3.2 Target of INBUDKAN Area, 2004 – 2009

No.	Commodities	2004	2005	2006	2007	2008	2009
1.	Shrimp	328,426	379,395	480,849	581,827	704,010	851,852
2.	Kerapu						
	- KJA (unit)	19,050	23,241	28,354	34,592	42,202	51,487
	- Embankment (ha)	1,160	1,392	1,670	2,004	2,405	2,886
3.	Seaweed						
	- Sea (ha)	37,320	46,650	60,645	81,871	114,619	166,198
	- Embankment (ha)	10,315	12,378	14,854	17,824	21,389	25,667
4.	Nila						
	- Pond (ha)	38,048	44,895	52,977	62,514	73,765	87,046
	- KJA (unit)	20,144	24,173	29,007	34,809	41,770	50,125
	- Keramba (unit)	78,184	93,822	112,585	135,103	162,121	194,545

Table 3.3 Target of INBUDKAN Production, 2004 – 2009 (Ton)

No.	Commodities	2004	2005	2006	2007	2008	2009
1.	Shrimp	226,553	251,599	281,901	318,565	362,935	416,616
2.	Kerapu	12,590	15,336	18,576	22,759	27,728	33,779
	- KJA (unit)	11,430	13,944	17,002	20,756	25,322	30,893
	- Embankment (ha)	1,160	1,392	1,564	2,003	2,406	2,886
3.	Seaweed	175,068	202,345	273,525	429,305	569,210	786,219
	- Sea (ha)	149,280	186,600	242,580	327,483	458,476	664,790
	- Embankment (ha)	25,789	15,745	30,945	101,822	110,734	121,429
4.	Nila	241,541	286,036	338,753	401,216	475,198	562,879
	- Pond (ha)	190,242	224,477	264,885	312,572	368,827	435,232
	- KJA (unit)	50,360	60,433	72,518	87,023	104,425	125,313
	Keramba (unit)	938	1,126	1,351	1,621	1,945	2,335

Table 3.4 Target of production program of Non-INBUDKAN 2004 – 2009 (Ton)

No	Type of Activities	2004	2005	2006	2007	2008	2009
1.	Sea	535,197	857,194	1,222,733	1,372,736	1,476,648	1,505,238
2.	Embankment	533,789	620,008	680,861	686,098	753,384	818,720
3.	Pond	259,027	382,037	521,338	585,968	642,031	687,943
4.	Karamba	70,827	95,757	124,238	141,910	159,527	177,078
5.	Floating Net	32,642	51,620	72,727	78,981	82,330	82,192
6.	Wet field	151,855	205,005	265,747	303,711	341,675	379,638
Total		**1,583,337**	**2.211,621**	**2,887,644**	**3,169,404**	**3,455,595**	**3,650,809**

SUPPORT NEEDED

To achieve development acceleration target of aquaculture fisheries that has been stipulated, a support from all parties both internal and external in the form of the development of infrastructure, institution and adaptive technology research are needed, as follows:

1) Lay-out;

Layout of aquaculture area is very important to ensure the long life of fish/shrimp aquaculture business and protect negative impact of waste influence from other activities. Support of this lay out is needed from Directorate General of beach and Small Islands (P3K) and Local Government. Layout needed is at the existing embankment area or at a new area.

2) Development of Irrigation net;

To fulfill the need of means of fish/shrimp aquaculture is needed a development/rehabilitation the available irrigation channel. Considering that this activity needs a very big fund, so a support from other sector, namely resident and area infrastructure Department is really needed.

3) Environmental Controlling;

Waters environmental that getting worse lately, is caused both by internal and external waste that come from activity outside of embankment, such as industry, resident and agriculture. Therefore, a support from BAPEDAL (Board of Environmental Impact Control) is really needed in term of controlling the embankment waters environment, through upholding the rule of environmental management.

4) Human Resources Development and Information Institution

The increasing of human resources skill both cultivation or informant at the field is extremely determining the success of fish/shrimp aquaculture development. In connection with this, the forming of reliable information institution should get support from pusdiklat/training center (Setjen DKP).

5) Capital

Fund from government through APBN/APBD basically is only a stimulus in developing shrimp aquaculture business, while the biggest part of fund to move shrimp aquaculture business from the society, either through banking or cultivation innate effort. In the condition of fish/shrimp aquaculture like this moment, the preparing capital from banking credit is really needed. Therefore, a support from Directorate General of capacity development of institution and marketing (PK2P) – DKP is really needed to afford credit skim for development of fish/shrimp aquaculture business.

6) Extension of export Market

In the era of Global trade, export competition of fishery product, including shrimp will be very tight, besides shrimp producer countries try to increase shrimp production so that increasing supply, meanwhile its demand tends stagnant as a result of recession condition of global economics.

Therefore a support from PK2P in term of increasing market intelligence is needed to strengthen shrimp export market at world market.

7) Security

Besides technical problem, shrimp aquaculture business currently face many safety disturbance in the form of shrimp stealing at the embankment. To create a conducive climate of shrimp aquaculture business, it is needed a good safety at the embankment environment. In connection with this, a support from POLRI to guarantee the safety at the embankment area of shrimp is really needed.

8) Quality Construction

Many antibiotic cases contained at the exported shrimp showing that quality control done by laboratory of Quality Test of fishery result has not functioned properly yet. Therefore, construction of quality laboratory by Directorate General of Capture Fishery that has authority in constructing LPMHP is very needed in order that production will be exported has quality guarantee, free of antibiotic content and other dangerous materials.

Jakarta, March 2004

DIRECTORATE GENERAL OF FISHERY AQUACULTURE

Improvement of Infrastructure for Fisheries and Fisheries Communities Aiming at Sustainable Fisheries

by:

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1. Fisheries and Fisheries Communities in Japan

(1) Fishermen and Fish Products

Fishermen and Fish Products

Item	Japan		Indonesia	
	1996	2000	1996	2000
Amount of fish products(thousand tons)	7,417	6,384	4,452	5,107
Marine capture fisheries	7,250	6,252	3,383	3,807
Marine aquaculture	1,276	1,231	-	197
Inland fisheries including Freshwater aquaculture	167	132	1,069	1,116
Fishermen (person)	287.4	252.3	4,668	5,287

(2) Fisheries in the world

Fisheries in the world (2000)

	Trade of Fish Products (thousand US$)			
	Export	World Ranking	Import	World Ranking
Japan	801,580	Below 50th	15,513,059	1st
Indonesia	1,584,454	10th	95,075	39th

(3) Japan's EEZ

EEZ of Japan

	Area of EEZ (million km2)	World ranking of the area of the EEZ
Japan	4.51	6rd
Indonesia	5.41	3th

(4) Fishing ports in Japan

Number of the fishing ports in Japan (2000)

	Managed by the Central Government	Managed by the Local Governments
Japan	0	2,931
Indonesia	32	627

4) Living conditions on fisheries communities in Japan

Living condition on fisheries communities in Japan (2001)

	Fisheries communities	Small-size cities
Coverage of water supply	96.2 %	98.4 %
Coverage of sewage treatment system	31.8 %	56.9 %
Roads available for automobile access	76.2 %	82.2 %
Coverage of garbage collection service	98.9 %	100 %
Percentage of population with over 65 years old in all the population	26.7 %	18.8 %

2. Roles of the fishing ports, fishing grounds and fisheries communities

In Japan, the island nation surrounded by sea, people have utilized rich fisheries resources as high quality protein. For that reason, fisheries have been promoted on the coastal areas and the fisheries communities have been formulated near the coastal fishing grounds since earlier times. Those activities were promoted from fish landing/handling places, fisher's residences are accumulated near them and then fishing ports have been formulated. Furthermore, the roles of fishing port have extended to for processing, vessel mooring, fishermen's residence/dormitory, vessel repairing, fish stock water areas, and recreational space. Fishing ports are identified as the complex of kinds of facilities/activities related fisheries and fisheries communities.

According as people' s taste and life style have shifted to healthy and natural, the people's demands of fisheries resources, as healthy protein, and fisheries communities, where nature and tradition has been preserved, have been strengthened.

On the other hand, most of the fisheries communities are located at areas surrounded by steep mountains behind and far from industrialized cities because of Japanese geographical characteristics. Under those conditions, the fisheries communities have been suffered natural disasters such as Tsunami and those living conditions has been serious; lower improvement of roads and sewage, compared with industrialized cities. Furthermore, the disordered coastal development near the fisheries communities and fishing grounds can destroy the fishing grounds and precious natural conditions of fisheries communities. Kinds of countermeasures have been introduced to solve those issues and well recovered the original roles of fisheries communities and fishing grounds for the purpose of the achievement of sustainable supply of fisheries products. The expectations by the people have been strengthened in order to appropriately utilize the coastal fishing grounds and fisheries communities for the purpose of the achievement of sustainable fisheries and promotion of fisheries communities with comprehensive and strict fisheries resource management scheme, according as Japanese 200 miles EEZ schemes has been disseminated since application by Japan of the UNCLOS.

The fishing ports, fishing grounds and fisheries communities in Japan have kinds of important roles including the sustainable supply of fisheries products. The expectation of the as follows:

(1) Sustainable supply of kinds of fisheries products meeting kinds of demands of the people :
  (1-1) Nursery and living grounds for marine living resource
  (1-2) Base for execution, promotion and dissemination of "Responsible fisheries with resource management" and "Sea farming and aquaculture fisheries"

(1-3) Base for fishing activities
(1-4) Base for distribution and processing

(2) Formulation of cores in the regional communities
(2-1) Living space for fishers
(2-2) Space for the activities of fisheries oriented industries activities which contributes to promoting regional economic growth
(2-3) Base of communication and transportation among remote rural areas, remote islands and urban areas
(2-4) Base for the training of fishermen

(3) Provision of rich and naturally beauty and healthy recreation-space toward the people
(3-1) Nature oriented recreational space
(3-2) Space for the marine recreation
(3-3) Space for preservation and succession of marine culture
(3-4) Base for the marine field education

(4) Security of lives and properties of residents in the local coastal communities
(4-1) Protection of fisheries communities against natural disaster such as Tsunami and High-tide Nature through fishing port facilities such as breakwaters
(4-2) Base of shipping relief commodities at emergency such as natural disasters

(5) Security and management of coastal areas in Japan
(5-1) Preservation of national lands and natural environment
(5-2) Provision of information on and finding poaching and illegal immigration
(5-3) Base for the refuge of fishing vessels at rough weather
(5-4) Preservation of multiple echo system on coastal areas

3. Long Term Plan on the Improvement of Fishing Ports and Fishing Grounds

Fishing ports, fishing grounds and fisheries communities have kinds of roles; however they also have problems to be solved in order to achieve sustainable fisheries and promotion of fisheries communities. "Long Term Plan on the Improvement of Fishing Ports and Fishing Grounds (Hereinafter referred as to "the Long Term Plan")" , which started in 2002, was authorized in order to effectively and comprehensively improve fishing ports, fishing grounds and fisheries communities as one body for the purpose of sustainable fisheries and promotion of fisheries communities under the strict resource management scheme of Japan.

3.1. Duration of the Long Term Plan

The duration of the Long Term Plan is 5 years from the Japan fiscal year 2002 to 2006.

3.2. Objective of the Long Term Plan

In the Long Term Plan, the following basic issues shall be put priority and implemented in a comprehensive way. On implementing the plan, it is given attention to infrastructure improvement based on considering software measures, application of cost-reduction, application of project assessment so as to ensure effective implementation of the programs under the Long Term Plan.

(1) To ensure sustainable use of fisheries resources and to develop an efficient and safe supply system of high-quality fisheries products
   - Promotion of "rich productive sea farm" to support "sea farming and aquaculture fisheries"
   - Strengthening of distribution scheme for fisheries products, such as restructuring collecting and shipping scheme for fisheries products and strengthening quality and sanitary monitoring and management scheme
   - Improvement of work condition

(2) To preserve, rehabilitate and create fishing grounds, which are also utilized as a nursery and living space for fisheries resources
   - Promotion of "rich productive sea forest" through development of seaweed beds and tidal lands which provide rich living environment to fisheries resources

(3) To comprehensively promote fisheries communities through the promotion of fisheries preserve, for the purpose of creation of rich and comfortable living condition
   - Creation of safe and comfortable fisheries community spaces
   - Vitalization of fisheries communities through symbiosis and active communication with urban areas

With comprehensive and effective actions for the issues above, the Long Term Plan, approximately within ten years, aims following:

(1) To recover the same condition of the coastal fisheries grounds and increase to the same size of fisheries products as the last of the 70th just after Japan applied the 200 miles EEZ scheme of the UNCLOS and to strengthen the producing and distribution scheme, through the implementation of fishing ports and fishing grounds

(2) To improve sewage treatment system in order to increase the coverage of sewage treatment system in the fisheries communities to approximately 60%, nearly the same as the small cities' average in Japan, for the purpose of improvement of fisheries resource living environments in/near the fishing ports and fishing grounds and living and working conditions.

3.3. Input

In a manner of focusing the priority areas selected, kinds of programs will be inputted as follows with according to the Long Term Plan within the duration of the Long Term Plan:

(1) To improve approximately 750 priority core areas among the core areas where propagation and aquaculture are to be promoted, and approximately 350 priority core areas among the core areas where effective producing, distribution and quality and sanitary control/management are to be strengthened

(2) To preserve and rehabilitate/create fisheries resource living environments equivalent to approximately 5,000 ha sea weed beds and tidal lands

(3) To improve approximately 430 fisheries communities for vitalizations of those areas

4. Major Programs for the Improvement of the Infrastructure for the Fisheries and Fisheries Communities

In Japan, almost all the fisheries and fisheries communities infrastructure has been improved and managed by the local offices to achieve sustainable fisheries. Fisheries Agency of Japan, as the central government, has provided kinds of support programs to improve infrastructures to support mainly those local offices' activities to ecologically maintain the good condition of fish grounds, to effectively and sustainably supply high-quality fish products and to improve living fisheries communities under the following concepts;

- Unified improvement of fishing grounds and fishing ports
- Large scale Improvement of offshore fishing grounds to enhance fisheries resources
- Improvement of cores of lading, distribution and processing places for unification of markets at landing place and strengthening of quality and hygiene control, etc.
- Enhancement of fishing grounds through creation/rehabilitation of sea weed bed and tidal land, removal of sludge, improvement of sewage and drainage system
- Comprehensive promotion of fisheries communities through the improvement of the infrastructures for comfortable living environment and working environment and close communication with urban areas

4.1. Major Programs under the Program for the Improvement of Fisheries Infrastructures

(1) Improvement of the Infrastructure Improvement for the Supply of Fish Products

Middle or large size improvement of fishing port facilities such as breakwaters, basin, mooring facilities, transportation facilities, improvement of off-sore fishing grounds, fish breeding facilities, based on the improvement plan for each priority areas drew by local municipalities□

(2) Preservation of Fisheries Resources

Improvement of water influx system, dredging and covering with soil at fishing grounds with environmental deterioration and fishing grounds where sludge and toxic materials accumulated on the sea beds

Improvement of facilities for removal of floating rubbish, treatment of waste oil, water influx, removal of sludge on the sea bed in the fishing port basins for the purpose

(3) Comprehensive Improvement of the Fisheries Communities

Improvement of living environmental facilities such as sewage systems, roads, water supply, park/greenery areas, athletics grounds, rest facilities, artificial beach in the fishing communities for the betterment of inferior living environment of fisheries communities, which have narrow flat lands for living spaces and are surrounded by steep mountains

4.2. Other Major Programs supporting the Program for the Improvement of Fisheries Infrastructures

Besides programs above under the Long Term Plan, following programs are mainly inputted to support the programs above based on the Long Term Plan.

(1) Programs to contribute to vitalizing the fishing ports and fisheries communities

Following program items are provided to vitalize the fishing ports and fisheries communities:

(1-1) Effective utilization of fishing ports

(a) Improvement of lodging facilities for illegal moored/left vessels such as mooring, quay wall, vessel lifting, accumulated sand removal, open space

(b) Betterment of the amenity and beauty of the fishing ports with the improvement of parking space, greenery, toilet, garbage treatment, management tower, ferryboat terminal

(c) Improvement of floating quay wall, unloading facilities, navigation signal, facilities for removal accumulated sands, oil fences, market space washing facility, sewage system for the purpose of the betterment of safety, working condition, sanitary in fishing ports

(d) Improvement of facilities to intake Deep Sea Water, which is generally defined as seawater under 200m depth where the sunlight does not reached. General characteristics of the Deep Sea Water are low temperature stability, rich in nutrients and cleanness. The Deep Sea Water has been developed as high quality fresh/sea water for aquaculture and fish processing and high-quality healthy drinking water, high quality ice for maintaining freshness of fish products and coolant for cold storage facilities in Japan.

(e) Improvement of Information System such as CATV for the purpose of strengthening communication on fisheries products, weather information and tourism promotion information with other fisheries communities, market and urban areas

(1-2) Vitaiization of Fisheries Communities

(a) Improvement of natural resource supply system, recycling system retirement/garbage for the purpose of achievement of echo-recycling communities to relief a burden toward the environment

(b) Improvement of barrier-free facilities, information system, disaster prevention facilities, settlement facilities to better living environment and welfare for senior people

(c) Communication facilities such as direct sales stores/restaurants, marine living resources observation facilities, visitors lodge for fisheries echo tourism, landscape preservation facilities, information system for the purpose of betterment of scenery and enhancement of communication with urban residents

(1-3) Other Study & Investigation Programs

Fisheries Agency of Japan are providing species of studies & investigation programs to improve and utilize the infrastructures for fishing grounds, fishing ports and fisheries communities, and dissemination & enlightenment programs on fisheries and fisheries communities.

4.3. Budget for Infrastructure Improvement

The Annual Budget for the programs implemented by Fisheries Agency of Japan is as the Table below. Those budgets are, with a certain subsidy rate which depends on the area' s condition, transferred mainly to priority activities implemented by local municipalities.

Budget for infrastructure related to fisheries and fisheries communities

	1998	2000
Amount (million US dollars)	2,320	2,352

Exchange rate for one US dollar : one hundred ten JPY

PART IV
RECOMMENDATION

Recommendations

We, participants in the ICA/ICFO/IKPI Seminar for Promotion of Sustainable Development of Fisheries in Indonesia held in Jakarta during March 16-19, 2004,

Recognizing the important roles and functions of fisheries and fishing communities in Indonesia, such as their contribution to a healthy seafood supply to the population, sustainable food self-sufficiency, and enhancement of the local economy;

Pledging that we in the fisheries cooperative sector in Indonesia will comply with various national, regional and international rules and regulations concerning resource management and environmental conservation;

Call for the necessity of ensuring promotion of sustainable development of fisheries in Indonesia; and, for this purpose,

Recognizing that domestic market development is the key;

Are resolved as follows:

1. That a "fish consumption movement" of fisheries cooperatives and/or KUDs Mina should be further promoted by the government, and for this purpose it should provide financial support to their activities in order to ensure stable development of fisheries in Indonesia;
2. That, since one of the means for increasing fishers' income would be for general consumers to recognize the difference between high quality fish and poor quality fish, wherein high quality fish mean good taste and command high prices in the market place, promotion of fish consumption through mass media and other appropriate means should be strongly encouraged;
3. That member fishers of KUDs, with financial and technical support from the government, should try to improve the quality of fish products in local markets by improving hygienic conditions throughout the production process and at fish markets, in order that the fish consumption of Indonesian people be increased to 43 Kg/capita/year by 2006 as based on the recommended daily intake of protein by the government;
4. That fish consumption should be promoted to young people including children through various educational tools, starting from elementary school age, so that the health of Indonesian people can be improved;
5. That trade rules established by the WTO should be written so as to contribute fully to the goal of ensuring the sustainable use of fisheries resources, and that the promotion of liberalized trade on global level should not threaten the viability or very existence of fishing communities of Indonesia. Moreover, from this standpoint, the government of Indonesia should support such views at the WTO negotiations;
6. That the government should review its previous fisheries policies, and based upon such review, make policies and measures appropriate for improving the economic status of coastal fishing communities in Indonesia. Such reviews should facilitate effective implementation of resource management, environmental conservation, welfare improvement of fishers, increased value-added fisheries products, and so forth, all of which should lead to attaining sustainable development of fisheries in Indonesia;
7. That government fisheries development projects should be well coordinated among the relevant agencies concerned, in order to ensure optimum implementation thereof;

8. That the government should increase its financial support for the establishment and improvement of various community and regional infrastructure (including fish landing wharves or fishing ports, fish market facilities, etc.), and to allow fisheries cooperatives and/or KUDs Mina to manage infrastructure operations in place of local governments. Furthermore, the government should make credit facilities more easily accessible to fishers than they are at present, preferably through fisheries cooperative systems in Indonesia, which are deserving strong government support;
9. That the government should provide non-formal education (training, etc.) in the fields of fish production, marketing, and processing technology for coastal fishery communities in Indonesia;
10. That the government should implement food safety criteria strictly but also implement strict controls of non-tariff barriers in order to prevent the entry of illegal import or smuggled low quality fisheries products from external sources;
11. That the government should study the possibility of introducing an appropriate fish price stabilization mechanism in Indonesia, in order to help enhance the income of coastal small scale fishers. To this end, government support policies and measures implemented in the European Union and other economies should be considered carefully before such a mechanism appropriate to Indonesia is introduced; and
12. That in order to help reduce the cost of fishing operations, it is desirable that lower priced fuel oil is supplied to fishers. To this end, a network mechanism for supplying fuel oil, such as through fisheries cooperative chains headed by IKPI, should be considered in cooperation with PERTAMINA and the government.
13. That study should be made of the possibility of introducing insurance programs in the fisheries sector (such as for life insurance, property insurance, fishing vessel insurance, business insurance, etc.). To this end, IKPI is requested to lead the studies in cooperation with the government.

March 19, 2004

Jakarta, Indonesia

PART V
CLOSING CEREMONY

CLOSING SPEECH
of The ICA / ICFO / IKPI Seminar
for "Promotion of Sustainable Development of Fisheries in Indonesia"
18 March 2004

by:

Wibisono Wiyono
President of IKPI

Distinguished guests from ICFO,

Dear Lecturers and Moderators,

Dear Participants of the Seminar and members of IKPI.

Ladies and Gentlemen,

Peace be unto you and Allah's mercy and blessing as well.

Good Evening.

First of all let us pray and thanks be to God, the Almighty, especially that in this evening we have been Blessed to be arriving in the closing ceremony of the Seminar which we all together could attend in a good health condition, and we also thanks to Almighty God that the Seminar could go along smoothly without any significant obstacles.

Dear audiences,

I am feeling very proud and feeling of honor to the lecturers, the moderators, internal as well as from abroad and to all participants who had attended the Seminar in response to our invitation and diligently following the whole presented subject matters, which I am feeling aware that it was really a hard doing and you would be suffering from fatigue. Especially to the members of IKPI besides following the Seminar, they had to attend the 54th Annual Members Meeting of IKPI, which had been held and finished last night. This would be also felt by the whole members of Organizing Committee who had been successfully arranging and organizing this combined programs went on smoothly.

Dear Audiences,

Some matters, which I would like to note during the implementation of the Seminar. Firstly, all lecturers had been successful to present their ideas attractively and productively so that they became very valuable materials for all of us. Secondly, the high enthusiasm of the whole participants to actively involve at every discussion enriched the every agenda session, and those all had been poured into the recommendation of the Seminar, which was produced. Thirdly, we are feeling that the great attention and support of the Government in the implementation of this Seminar, which become our hopes at once that, this event could be kept on continuing present and participate in our efforts of struggling at our respective places.

Dear Audiences,

Finally, we are feeling aware that the very important outcome of this program is the realization of the strong joint commitment to implement various matters needed for the welfare of fishers. The other matter, which we also obtained during the seminar, is the interlaced of the bonds of friendship more widely among us to interlace mutual understanding and more widely open our insight, which will become a capital to face problems in our respective places.

That is all and I end my speech along with I pray, may we all could return home safely, and good bye.

Peace be unto you and Allah's mercy and blessing as well.

PART VI
STUDY VISIT

STUDY VISIT
TO MUARA ANGKE – JAKARTA

Date : March 19th, 2004

Time : 08.00 to 11.00 a.m

Number of participant : ± 40 persons, including 3 persons from Japan (Mr. Masaaki Sato, Mr. Jun Machiba and Mrs. Taneko Suzuki).

Object 1 : Muara Angke Area (08.00 – 09.30 a.m)

- Discussion/dialogue with the Chief of Technical Implementer Unit (Mr. Riyadi) and with the Chairman of Fisheries Co-operative " Mina Jaya" (Mr. H. Fachrudin AR).
- Moderator : Mr. Hardadi Lukito (Secretary of IKPI)
- Result :
  - Muara Angke's area located at North Jakarta, managed by Technical Implementer Unit of the Management of Fishing Port areas and Fish Landing places of the Animal Husbandries, Fisheries and Maritimes Affairs Service, of the Province of DKI Jakarta.
  - The main task of the Unit is organizing, managing and maintaining the facilities of fishing ports, fish auction and fish landing places and their supporting facilities, managing the fisher's settlement and its facilities, safe keeping orderliness of the environment of fishing port and fish landing places of Muara Angke.
  - The facilities which will be bilt in the Unit in accordance with the Muara Angke's masterplan are Fish Auction building, Pier, Fishers' Meeting Hall, Cold Storage, Integrated Services Office, Handling/ Processing Unit of Fisheries Products, Workshop building for Fish/Fillet Processing, Dock/Slip way for > 30 GT Fishing Vessels, Fish Draining and Processing Places, Dual Function Fuel Filler Station for Public, Wholesaler Market, Hygienic Fish Market and Retailer, Service Building for Fisheries Business of Muara Baru, Pier for Vessels of the Thousand Islands and of the Local Government, Eco-Marine Tourism, Communal housing with stories of Muara Angke, Canal.
  - The mechanism of fish auction at Muara Angke is carried out by Fisheries Co-operative Mina Jaya.

Object 2 : Fish Landing and Fish Auction Places of Muara Angke – Jakarta (09.30 – 10.00 a.m)

Observing the activities of fishing boats landing, fish sorting and fish auction.

Object 3 : Sarana Mina I Shop (10.00 – 10.15 a.m)

Introductions Sarana Mina I Shop owned by IKPI in co-operation with Fisheries Co-operative "Mina Jaya", selling boat engines and fishing gears to fulfill the fishers' necessities.

Object 4 : Swamitra Mina I (10.15 – 10.30 a.m)

Constitute a saving and credit unit of Fisheries Co-operative "Mina Jaya" in collaboration with Bank BUKOPIN to extend service to the member fishers.

Object 5 : Fisheries Co-operative "Mina Jaya" (10.30 – 11.00 a.m)

- Discussion/Dialogue with :

  The Chairman of Fisheries Co-operative "Mina Jaya" : Mr. H. Fachrudin AR and other board members.

  Moderator : Mr. Hardadi Lukito (Secretary of IKPI)

- Conclusion :

  - The quality of fish in Muara Angke is not qualified for export to Japan.
  - It is possible to cooperate with Japan to increase the services to the member fishers, to enhance the quality of fisheries products and export of fish to Japan through the government line (G to G), in this case with the Ministry of Maritime and Fisheries.

PHOTOS OF PARTICIPANTS, LECTURERS, MODERATORS and ORGANIZING COMMITTEES

PHOTOS OF PARTICIPANTS, LECTURERS, MODERATORS AND ORGANIZING COMMITTEES

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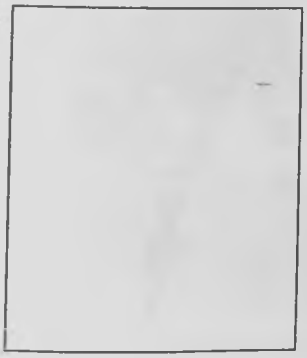
54. 

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