

**THE PRIME MINISTER****DECISION No. 97/2007/QĐ-TTg OF JUNE 29, 2007, APPROVING THE SCHEME ON BIOTECHNOLOGY DEVELOPMENT AND APPLICATION IN THE FISHERIES DOMAIN UP TO 2020****THE PRIME MINISTER**

*Pursuant to the December 25, 2001 Law on Organization of the Government;*

*Pursuant to Directive No. 50-CT/TW of March 4, 2005, of the Party Central Committee's Secretariat, on accelerating biotechnology development and application in service of national industrialization and modernization;*

*Pursuant to the Prime Minister's Decision No. 188/2005/QĐ-TTg of July 22, 2005, promulgating the Government's program of action for the implementation of Directive No. 50-CT/TW of March 4, 2005, of the Party Central Committee's Secretariat, on accelerating biotechnology development and application in service of national industrialization and modernization;*

*At the proposal of the Minister of Fisheries,*

**DECIDES:**

**Article 1.-** To approve the Scheme on biotechnology development and application in the fisheries domain up to 2020 (referred to as the Scheme) with the following principal contents:

**I. Objectives****1. General objectives**

To create new aquatic animal breeds of high yield and high quality and biotechnological preparations for aquaculture development. To research into and apply post-harvest technology and processing technology, raise

the proportion of aquatic and marine products processed by biotechnology, improve the competitiveness of these products on the market and better serve consumption and export demands.

**2. Specific targets for each period****a/ The period from now to 2010:**

- To research into and create some aquatic animal breeds of high yield and high quality for aquaculture; to create new aquatic biotechnological preparations, especially feed and curative medicines, in order to effectively serve aquaculture and reduce post-harvest loss; and to raise the proportion of processed aquatic and marine products;

- To apply biotechnology to effectively prevent and treat common dangerous diseases in major reared aquatic animals; to treat waste and discarded matters from aquaculture and aquatic product processing for environmental protection; to conserve, develop rationally exploit and sustainably use gene sources of aquatic animals and marine microalgae;

- To improve technical and material foundations and train human resources for scientific research and biotechnology teaching, transfer, development and application in the fisheries domain;

- To satisfy 30% of the demand for high quality and disease-free breeds of key reared aquatic animals (black tiger prawn, sutchi catfish, tilapia, giant river prawn, sea crab, snapper, porgy, cobia, grouper and clam); to increase the yield of major reared aquatic animals by 15% thanks to biotechnology development and application in the fisheries domain.

**b/ The 2011-2015 period:**

- To further research into, and create new aquatic animal breeds, biotechnological preparations and vaccines in service of aquaculture and prevention and treatment of some common dangerous diseases in major reared aquatic animals; to develop technology for preservation and processing of aquatic and marine products. To initially develop an aquatic biotechnology industry;

- To increase the capacity of biotechnology research, development, transfer and application in the fisheries domain;

- To satisfy 70% of the demand for high-quality and disease-free breeds of key reared aquatic animals (black tiger prawn, sutchi catfish, tilapia, giant river prawn, sea crab, snapper, porgy, cobia, grouper and clam); to increase the yield of major reared aquatic animals by 20% thanks to biotechnology development and application in the fisheries domain.

c/ Vision towards 2020:

- To bring aquatic biotechnology up to the level of advanced countries in Southeast Asia. To form a network of small- and medium-sized aquatic biotechnological enterprises which effectively serve aquaculture, prevention and treatment of aquatic animal diseases and processing of aquatic products;

- To satisfy 100% of the demand for high-quality and disease-free breeds of key reared aquatic animals (black tiger prawn, sutchi catfish, tilapia, giant river prawn, sea crab, snapper, porgy, cobia, grouper and clam) suitable to different ecological areas; to increase the yield of key reared aquatic animals by 30% thanks to biotechnology development and application in the fisheries domain.

## II. Major tasks

1. Basic research, applied research, scientific research and technological development (R-D) and trial production (P) for biotechnology development in the fisheries domain:

a/ Production of aquatic animal breeds:

- To combine traditional breed selection with DNA variation analysis and use gene techniques to select precious and superior genes to develop breeds of key and important aquatic animals (black tiger prawn, sutchi catfish, tilapia, giant river prawn, sea crab, snapper, porgy, cobia, grouper and clam); to create fast-growing, high-quality, disease-resistant and cold-tolerant strains;

- To apply genetic technologies such as gene transplanting, polyploidy and sex control in order to

create fast-growing tilapia strains, all-male tilapia strains, all-male giant river prawn and all-female black tiger prawn strains;

- To apply biotechnology (nutrition, reproductive physiology and gene technology) to create disease-free parent black tiger prawn and schools of white-meat sutchi catfish of a high fillet percentage to meet export demands and raise the competitiveness of aquatic products on the market;

- To apply cell technology in tissue culture to produce pure varieties of seaweeds so as to supply varieties for seaweed culture.

b/ Conservation and exploitation of aquatic gene sources:

- To develop technologies for cold preservation of genes (including sperm, ovum and embryo preservation) in combination with the use of genetic markers for long-term preservation of pure breeds and conservation and revitalization of genes of indigenous aquatic animal breeds. In the immediate future, to concentrate efforts on building a frozen sperm bank for fishes and shrimps in order to conserve gene sources and supply materials for breed creation;

- To study and apply biological achievements and advanced biotechnologies in the world for long-term cold preservation of sperms, ova and embryos for the selection and creation of aquatic animal breeds of high yield and high quality;

- To apply maternal and paternal reproduction technologies to several aquatic animals and take the initiative in carrying out artificial breeding so as to conserve gene sources and raise the quality of aquatic animal breeds;

- To develop technologies for preservation of rare and precious marine microalga and aquatic plants and building of a marine microalga bank.

c/ Feed, disease prevention and treatment and fisheries environmental management:

- To research into and apply enzyme, protein and microbiological technologies to the production of highly digestible feeds of low cost for key reared aquatic animals

(black tiger prawn, sutchi catfish, tilapia, giant river prawn, sea crab, snapper, porgy, cobia, grouper and clam) ensuring fast growth and food safety and hygiene;

- To apply molecular biology to diagnose diseases in reared aquatic animals: to produce bio-preparations and kit sets for quick diagnosis and effective prevention and treatment of some common dangerous diseases in black tiger prawn, sutchi catfish, tilapia, giant river prawn, whiteleg shrimp and some marine fishes;

- To develop bio-preparations aiming to increase resistance against and effectively prevent and treat MBV disease, white-spot disease and yellow-head disease in black tiger prawn;

- To develop vaccines, especially new generation vaccines (recombinant vaccines and gene vaccines), for prevention of diseases in fishes and shrimps;

- To apply biotechnology to aquacultural waste treatment;

- To develop some bio-preparations and active substances for treating aquacultural waste and using as substitutes for chemicals and antibiotics in the production of aquatic products (especially in black tiger prawn and sutchi catfish rearing), so as to raise efficiency while ensuring environmental protection and food safety and hygiene.

d/ Post-harvest technologies, processing technologies and technologies for management of quality, hygiene and safety of aquatic products:

- To apply biotechnology to post-harvest preservation, processing of aquatic products, safety management of aquatic products and treatment of waste and discarded matters from the processing of aquatic products;

- To research into the extraction of bio-active compounds from marine organisms for the manufacture of curative medicines;

- To use highly active enzyme preparations in the processing of aquatic products so as to raise the quality and competitiveness of aquatic products and create new aquatic products of high value;

- To research into and apply biotechnology to the

treatment of discarded matters and wastewater from the processing of aquatic products;

- To develop and apply methods for quick and accurate detection of dangerous agents and chemical and antibiotic residues in aquatic food.

2. Building resources for biotechnology development and application in the fisheries domain:

a/ Human resource training:

- To send scientists who possess doctoral or master degrees to countries with advanced aquatic biotechnology for re-training between 6 months and one year;

- To send students to countries with advanced aquatic biotechnology for postgraduate training according to the Scheme's research contents.

- To train at home aquatic biotechnology engineers, doctors and masters according to the Scheme's research contents;

- To train at home aquatic biotechnology technicians who will implement the Scheme in localities and enterprises;

- To train a contingent of aquatic biotechnology personnel who possess high professional qualifications and adequate knowledge about intellectual property and copyright in the domain of aquatic animal breeds;

- The training of human resources for aquatic biotechnology must reach the following targets: in the 2007-2010 period, 5-7 scientists will be re-trained while 15-20 new masters, 8-10 new doctors and 150-200 technicians will be trained; in the 2011-2020 period, 8-10 scientists will be re-trained while 35-40 new masters, 15-20 new doctors and 300-350 technicians will be trained.

b/ Building technical and material foundations and modernizing machinery and equipment:

- To invest in upgrading and modernizing aquatic biotechnology research and training establishments; to further supply machinery and equipment for synchronizing and modernizing existing aquatic biotechnology laboratories so as to raise their capacity

for scientific research and development and application of aquatic biotechnology to production;

- To invest in building key laboratories on genetic breed selection and conservation of rare and precious aquatic gene sources;

- To build a website and a national database system on aquatic biotechnology in order to supply information to and share information with interested units and individuals.

### 3. Building and developing an aquatic bio-industry:

- To found and encourage enterprises of all economic sectors to invest in technology transfer and application; to widely and effectively apply technical advances and new and advanced technologies to the production of, trading in, and provision of services related to, key products and goods turned out by aquatic biotechnology for consumption and export;

- To form and strongly develop an aquatic bio-industry, creating a favorable and open market to promote enterprises to invest in projects on production of, trading in, and provision of services related to, key aquatic products and goods.

### 4. International cooperation in the domain of aquatic biotechnology:

- To closely coordinate with developed countries in the world in the transfer, receipt, master and application of new, advanced and modern aquatic biotechnologies to production and life in Vietnam;

- To implement about 30 schemes, subjects and projects on cooperation in scientific research and technological development in the domain of aquatic biotechnology with foreign countries and organizations and scientists so as to boost aquatic biotechnology development and application in Vietnam.

## III. Major solutions

1. Accelerating the application of scientific research findings to production, encouraging technology transfer, creating a favorable investment market for and strongly developing the aquatic bio-industry:

- To boost the implementation of schemes on basic research, applied research, scientific research and technological development (R-D) in order to create advanced technologies and widely apply them to production so as to turn out aquatic animals and breeds and aquatic products of high yield and high quality; to effectively execute projects on trial production (project P), projects on international cooperation and projects on industrial production of key products and goods in the aquatic biotechnology domain.

- To create a favorable market and strongly accelerate the formation and development of an aquatic bio-industry for industrial production of, trading in, and provision of services related to, key aquatic products and goods of high quality and competitiveness for consumption and export. The State adopts incentive policies on credit capital, tax and land use rights for enterprises investing in biotechnology development and application in the fisheries domain.

### 2. Increasing and diversifying investment capital sources for effective and timely realization of the Scheme:

- The total fund for the realization of all contents of the Scheme will be determined on the basis of the funds for each specific project and task under the Scheme already approved by competent authorities. Annually, the State allocates investment capital from the budget for the realization of the Scheme. Apart from the state budget, it is necessary to increase and diversify other investment capital sources from domestic and foreign enterprises, organizations and individuals, external economic capital (ODA and FDI) and other international cooperation capital sources for effective development and application of biotechnology in the fisheries domain;

- Total state budget capital for the realization of the Scheme in the first 10 years is estimated at about VND 500 billion (about VND 50 billion for each year). This source will be spent on basic research; applied research; scientific research and technological development (R-D); research into technology renovation and renewal to raise the productivity, quality and competitiveness of products; support of trial production (project P which will have 60% of its total funds to be recovered);

technology transfer for industrial production of key goods by aquatic biotechnologies; intensive investment on building technical and material foundations, modernizing machinery, equipment and laboratories of research institutes and universities in the aquatic biotechnology domain; human resource training, international cooperation and other related contents of the Scheme;

The Ministry of Fisheries shall elaborate annual and long-term plans on state budget capital for the realization of the Scheme and send them to the Ministry of Planning and Investment and the Ministry of Finance for sum-up and submission to the Prime Minister for approval.

- Investment capital for development of the aquatic bio-industry is mainly covered by enterprises.

3. Enhancing resources for aquatic biotechnology in terms of technical and material foundations and human resource training:

- To step up the construction of technical and material foundations and modernization of machinery and equipment for laboratories, research and training institutes in order to improve their scientific research, technological development and human resource training capacity so as to meet the development requirements of aquatic biotechnology;

- To step up domestic and overseas training of high-quality human resources at all degrees, meeting human resource demands for management and effective realization of the Scheme, contributing to the sustainable development of aquatic biotechnology in Vietnam.

4. Accelerating the formulation and perfection of mechanisms, policies and legal documents on biotechnology development and application in the fisheries domain:

- To accelerate the elaboration, review, amendment, supplementation, promulgation and perfection of mechanisms, policies and legal documents on biotechnology development and application in the fisheries domain. Mechanisms, policies and legal documents should be designed in the direction that institutes, universities, enterprises, organizations and individuals that invest in

biotechnology development and application in the fisheries domain are entitled to the highest incentives regarding loans, credit capital, taxes, land use rights, promotion policies and other related policies according to current regulations.

- To fully enforce intellectual property regulations on protection of copyright and industrial property rights to aquatic animal breeds, technological processes, machinery, equipment, inventions and innovations in aquatic biotechnology.

5. Expanding and enhancing international cooperation in aquatic biotechnology

- To boost bilateral cooperation and expand multi-lateral cooperation with countries with advanced aquatic biotechnology and foreign organizations and individuals with strong potential so as to learn their experiences in biotechnology development and application in the fisheries domain;

- To take the initiative in formulating and implementing programs, schemes and projects on international cooperation with countries with advanced and modern aquatic bio-industry in order to make the fullest use of their intellectual and financial support and investment for the purpose of sustainable development of the aquatic bio-industry in Vietnam.

#### IV. Organization of implementation

##### 1. The Ministry of Fisheries:

- To assume the prime responsibility for, and coordinate with the Ministry of Science and Technology, concerned ministries, branches and localities in, organizing the realization of the Scheme and periodically report the results to the Prime Minister.

- The Minister of Fisheries shall set up an inter-branch coordination board for organizing the realization of the Scheme, which shall be composed of the Minister of Fisheries as its head. The composition and operation regulation of the inter-branch Coordination Board and its assisting agency (based at the Science and Technology Department) shall be decided by the Minister of Fisheries.

2. The Ministry of Science and Technology shall, basing itself on its functions, tasks powers and state management scope, coordinate with the Ministry of Fisheries in selecting units in charge of, and organizing the realization of contents, tasks, schemes and projects; evaluate and organize the take-over test of implementation results; and organize the transfer of technologies and technical advances created under the Scheme to enterprises for production of key products and goods of aquatic biotechnology for consumption and export.

3. The Ministry of Education and Training shall assume the prime responsibility for, and coordinate with the Ministry of Fisheries in, organizing the training of high-quality human resources, meeting the requirements of scientific research and biotechnology development and application in the fisheries domain.

4. The Ministry of Planning and Investment, the Ministry of Finance and the Ministry of Science and Technology shall arrange, allocate, and guide the use of, capital for the effective and timely implementation of the Scheme's contents, tasks and projects.

5. Ministries, branches, localities and concerned organizations and individuals wishing to join in the implementation of the Scheme's contents, tasks and projects shall register with the Ministry of Fisheries and the inter-branch coordination board for consideration.

**Article 2** - This Decision takes effect 15 days after its publication in "CONG BAO."

**Article 3.**- The Minister of Fisheries shall organize the effective and timely implementation of this Scheme's contents.

Ministers, heads of ministerial-level agencies, heads of government-attached agencies, presidents of provincial/municipal People's Committees, and concerned organizations and individuals shall implement this Decision.

**Prime Minister**  
**NGUYEN TAN DUNG**