

BIBLIOGRAPHY OF DFID FISHERIES RESEARCH PROGRAMMES

FROM 1990 TO 2001

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The Department for International Development (DFID) is the UK Government department responsible for promoting development and the reduction of poverty. The Government is committed to halve, by 2015, the proportion of the world's poor whose income is less than one dollar a day; the proportion of people who suffer from hunger, and the proportion of people who lack safe drinking water. Other associated targets include basic health care provision and universal access to primary education. DFID works in partnership with the governments of developing countries, international organisations, voluntary bodies, the private sector and the research community. DFID's Strategy for renewable natural resources for the period 1995–2005 aims to reduce poverty by enhancing productive capacity in the RNR sector in an economically and environmentally sustainable way. There are ten DFID research programmes, of which three belong to the Fisheries Programmes: Aquaculture Research and Fish Genetics, Fisheries Management Science, and Post-Harvest Fisheries Research. These are managed by Stirling University, Marine Resource Assessment Group Ltd., and Natural Resources International Ltd., respectively. The Strategy aims to generate replicable new technologies and improved knowledge in natural and social sciences through a rigorous scientific approach to problem solving. It promotes the uptake and application of research products for the removal of constraints to sustainable development and management of renewable natural resources in tropical developing countries.

The producers of this publication have made every attempt to ensure that all entries to the Bibliography are as detailed and as consistent as possible. Copies of this Bibliography are available from the individual Programme Managers, and any queries relating to the more obscure reports, papers from conferences etc. should be directed to them. Their addresses and contact details are given in the list of projects at the end of the Bibliography.

Any reference to material in the publication should acknowledge the source as:

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INTRODUCTION

The central aim of the UK Government's Department for International Development (DFID) is to eliminate poverty by improving the livelihoods of poor people in developing countries. One of the means by which DFID addresses this aim is through its strategy for research in renewable natural resources strategy. The purpose of the Strategy is to create benefits for poor people by generating and promoting the use of new knowledge in natural resources management.

Fisheries play an important part in the social and economic lives of vast numbers of people around the world, many of whom are amongst the poorest and most marginalised people in rural communities. The International Fund for Agricultural Development (IFAD) specifically singles out fisherfolk as one of the key groups of the poor¹. In many cases fish harvesting, processing and trade is seen as the employment of last resort when other economic opportunities have run out. Fish farming is also a growing contributor to both employment and food for the poor. There are no accurate figures for the number of people involved in fisheries but it is estimated that, globally, there are tens of millions of people dependent on fisheries for their main source of income for at least some of each year – and this number is rapidly increasing.

Research into increasing the productivity and productive potential of poor fisherfolk is an important part of DFID's knowledge strategy.

DFID funds three fisheries research programmes. The programmes and the institutions which manage them are:

- Aquaculture and Fish Genetics Research (University of Stirling)
- Fisheries Management Science (Marine Resource Assessment Group Ltd.)
- Post-Harvest Fisheries Research (Natural Resources International Ltd.)

Each of these management institutions is contracted by DFID to commission research which will help to deliver the development objectives of the strategy. Research institutions in the academic, non-governmental and commercial sectors are sub-contracted by the programme managers to carry out the research. All research is conducted in close collaboration with partners in developing countries. This collaboration both increases the likely uptake of research outputs and promotes capacity in those countries.

A recent review of the efficiency and impact of the programmes concluded that the research was both cost-effective and has a significant positive impact on the lives of the poor.

As part of the research validation process, the outputs from research are published in peer-reviewed journals. Other dissemination products are also produced which address the needs of a wider audience. This Bibliography brings together the publications of the DFID funded fisheries research over the period 1990–2001. It is designed to provide a source of information about the new fisheries knowledge which DFID has generated through its fisheries research programmes.

If fisheries research is to contribute significantly to the elimination of poverty then:

- researchers need to co-ordinate their activities with each other

¹ JAZIRY, I., ALAMGIR, M. and PANUCCIO, T. (1992) *The State of World Rural Poverty: An Inquiry into its Causes and Consequences*. IFAD, Rome.

- practitioners in the field need to be kept informed of new knowledge and technologies
- policy makers need to be fully informed
- research outputs must provide a strong basis upon which to plan development programmes.

It is hoped that this Bibliography will contribute to that process.

The Bibliography is organised by reference to the three research Programmes. For each Programme there is an introduction to its aims and objectives. The publications produced by that Programme are arranged by year, then project and then by peer-reviewed and other publications.

In a few instances, where there are multiple authors, a publication may appear under more than one project. Please note that in this Bibliography some project titles have been shortened.

AQUACULTURE AND FISH GENETICS RESEARCH PROGRAMME

**Programme Manager: Professor J. Muir
University of Stirling**

The Aquaculture and Fish Genetics Research Programme (AFGRP) is a new programme arising out of the merger, in 2001, of the Fish Genetics Research Programme (FGRP) within the Aquaculture Research Programme (ARP).

Aquaculture is the farming of aquatic organisms, including fish, molluscs, crustaceans and aquatic plants. Management inputs, and the ownership and care of stock, are different from those in capture fishing, and show many parallels with terrestrial crop and animal production. Aquaculture is typically carried out in ponds, enclosures, cages and tanks, in inland or coastal environments. Within this context, genetic methods can be used to improve production and performance of cultured species, and can also be used in capture fisheries enhanced with introduced cultured stocks. Genetic techniques can also be used to identify capture fisheries stocks more accurately and provide important information for fisheries management.

The global yield from capture fisheries has levelled out (around 90 million tonnes per annum) and therefore reliance upon aquaculture-based food supply to meet present and future needs is greater than ever. This is reflected over the last decade with aquaculture production increasing from 16 million to 42 million tonnes, from 20% to 33% of world fish production. Much of this production is in tropical and subtropical countries, contributing significantly to rural and urban food supply, as well as to international trade, helping to meet important nutrition and income goals in poorer countries.

DFID has long since recognised the importance of aquaculture, particularly in its target regions, and has identified the importance of well-focused research to remove constraints, reduce vulnerability and maximise potential. The more recent expression of needs and opportunities within the context of livelihoods has also helped to focus on the ways in which a sector such as aquaculture, and its related biotechnical elements such as genetics, might best be supported and developed. While technical issues can be important, the delivery of benefit to poor households and communities requires a mix of approaches and understanding to target research more appropriately to the needs of producers and consumers.

The Programme purpose is to improve the livelihoods of the poor through increased knowledge of aquatic stocks and their selection, enhancement and culture, to generate sustainable productive benefits. A range of technical and social disciplines are involved in studying ways in which communities understand and interact with aquatic resources and their management for aquaculture, and in working with local groups and agents to promote better ways in which aquaculture and fish genetics can contribute to DFID's broader development targets.

1990

1990

Programme Output*Other Publications*

ABBAN, E.K. and SKIBINSKI, D.O.F. (1990) Genetic support for the consideration of *Oreochromis*, *Sarotherodon* and tilapia as substantive genera of tilapias. Paper presented at the International Center for Living Aquatic Resources Management (ICLARM)/Asian Development Bank (ADB) Workshop, Tilapia Genetics, August 1990.

R4222 Studies on ulcerative disease rhabdovirus infection of rice field fish species in ASEAN countries*Peer Reviewed*

FRERICHS, G.N. (1990) Efficiency of chemical disinfectants against the snakehead rhabdovirus. *Journal of Applied Ichthyology*, **6**: 117–123.

ROBERTS, R.J., FRERICHS, G.N. and MILLAR, S.D. (1990) Epizootic ulcerative syndrome—the current position. pp. 431–436. In: *Diseases in Asian Aquaculture 1. Proceedings of the First Symposium on Disease in Asian Aquaculture, Bali, Indonesia, November 1990*. Shariff, M., Subasinghe, R.P. and Arthur, J.R. (Eds.). Asian Fisheries Society, Manila, Philippines.

R4443 Studies on the culture of tropical prawns (penaeids) with particular reference to husbandry, disease and nutrition*Other Publications*

HIGUERA-CIAPARA, I., BROWN, J.H. and JAUNCEY, K. (1990) Leaching of oxytetracycline from pelleted fish shrimp feeds. Poster presented at Conference on Bacterial Diseases of Fish, University of Stirling, June 1990. [Poster]

WOOD, J.F. and BROWN, J.H. (1990) Report on a visit to India. The potential pond productivity of the tiger shrimp (*Penaeus monodon*) from semi-intensive artisanal culture in India. Report to ODA (as part of the Post-Harvest Fisheries Project R1607). Institute of Aquaculture, University of Stirling, UK.

R4452 Production of mitotic gynogenesis of superior monosex clones of tilapia and transfer of technology to the Philippines*Peer Reviewed*

MAIR, G.C., BEARDMORE, J.A. and SKIBINSKI, D.O.F. (1990) Experimental evidence for environmental sex determination in *Oreochromis* species. pp. 555–558 In: *The Second Asian Fisheries Forum, Tokyo, Japan, 17–22 April 1989*. Hirano, R. and Hanyu, I. (Eds.). The Asian Fisheries Society, Manila, Philippines.

MAIR, G.C., TAYAMEN, M.M., BEARDMORE, J.A. and SKIBINSKI, D.O.F. (1990) Developing technologies for control of reproduction in cultured tilapia, *O. niloticus* (L.) Paper presented at the International Center for Living Aquatic Resources Management (ICLARM) Asian Development Bank (ADB) Workshop, Tilapia Genetics, August 1990.

Other Publications

CAPILI, J.B. (1990) Isozyme and mitochondrial DNA restriction endonuclease analysis of three strains of *Oreochromis niloticus*. MSc dissertation, University of Wales, Swansea, UK. 46 pp.

R4523 Cryopreservation and manipulation of ova and milt in commercially important tropical species

Peer Reviewed

RANA, K.J., MUIRURI, R.M. and McANDREW, B.J. (1990) The influence of dilutents, equilibration time and storage conditions on the viability of cryopreserved *Oreochromis niloticus* (L.) spermatazoa. *Aquaculture and Fisheries Management*, **21**: 25–30.

R4680 Taxonomy and culture of tropical fungi pathogenic to fish and shellfish

Peer Reviewed

HATAI, K., WILLOUGHBY, L.G. and BEAKES, G.W. (1990) Some characteristics of *Saprolegnia* obtained from fish hatcheries in Japan. *Mycological Research*, **94** (2): 182–190.

1991

1991

R4222 Studies on ulcerative disease rhabdovirus infection of rice field fish species in ASEAN countries

Peer Reviewed

FRERICHS, G.N., MORGAN, D., SKERROW, C., ROBERTS, R.J. and ONIONS, D.E. (1991) Spontaneously productive C-type retrovirus infection of fish cell lines. *Journal of General Virology*, **72**: 2537–2539.

R4443 Studies on the culture of tropical prawns (penaeids) with particular reference to husbandry, disease and nutrition

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ADAMS, A. (1991) Detection of *Vibrio parahaemolyticus* biotype alginolyticus in penaeid shrimps using an amplified enzyme-linked immunosorbent assay. *Aquaculture*, **93**: 101–108.

ADAMS, A. (1991) Response of penaeid shrimp to exposure to *Vibrio* species. *Fish and Shellfish Immunology*, **1**: 59–70.

BRIGGS, M.R.P. (1991) Stress test for determining quality of hatchery and nursery reared postlarval *Penaeus monodon*. *Aquaculture and Fisheries Management*, **23**: 511–515.

BRIGGS, M.R.P., BROWN, J.H. and FOX, C.J. (1991) The effect of dietary lipid and lecithin levels on the growth, survival, feeding efficiency and carcass composition of juvenile *Penaeus monodon* Fabricius. *Aquaculture and Fisheries Management*, **25**: 1–16.

BROWN, J.H. and HIGUERA-CIAPARA, I. (1991) Antibiotic residues in farmed shrimp – a developing problem? pp. 394–403. In: *Problems of Chemotherapy in Aquaculture – from Theory to Reality, Paris, 12–15 March 1991*. Michel, C. and Alderman, D.J. (Eds.). Office International des Epizooties, Paris, France.

HIGUERA-CIAPARA, I., BROWN, J.H. and JAUNCEY, K. (1991) Effect of oxytetracycline and sulphamethazine on growth and survival of *Penaeus monodon* under stress. pp. 58–66. In: *OIE Conference on Problems of Chemotherapy in Aquaculture – from Theory to Reality, Paris, 12–15 March 1991*. Michel, C. and Alderman, D.J. (Eds.). Office International des Epizooties, Paris, France.

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BRIGGS, M.R.P. and BROWN, J.H. (1991) The effects of nursery rearing postlarval *Penaeus monodon* at different densities on their subsequent on growing performance in net cages. Project Technical Report. University of Stirling, UK.

HIGUERA-CIAPARA, I., INGLIS, V. and BROWN, J.H. (1991) Antibiotic residue detection in shrimp and salmon muscle using the Charm-7000 system. Paper presented at the Twenty-second World Aquaculture Conference, Puerto Rico, 16–21 June 1991.

R4452 Production of mitotic gynogenesis of superior monosex clones of tilapia and transfer of technology to the Philippines

Peer Reviewed

CARTER, R.E., MAIR G.C., SKIBINSKI D.O.F., PARKIN D.T. and BEARDMORE J.A. (1991) The application of DNA fingerprinting in the analysis of gynogenesis in tilapia. *Aquaculture*, **95**: 41–52.

MAIR, G.C., SCOTT, A., PENMAN D.J., BEARDMORE, J.A. and SKIBINSKI, D.O.F. (1991) Sex determination in the genus *Oreochromis* I: Sex reversal, gynogenesis, and triploidy in *O. niloticus* L. *Theoretical and Applied Genetics*, **82**: 144–152.

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VERA CRUZ, E.M. (1991) Growth and gonadal maturation of androgen treated Nile tilapia *Oreochromis niloticus*. MS dissertation, Central Luzon State University, Philippines. 112 pp.

R4523 Cryopreservation and manipulation of ova and milt in commercially important tropical species

Other Publications

RANA, K.J., GUPTA, S.D. and McANDREW, B.J. (1991) The influence of collection techniques on spermatology of Atlantic salmon (*Salmo salar*) In: *Genetics and Conservation of Salmonid Fishes-NATO Advanced Study Institute, Moscow, 23 June–6 July*. Pullman, USA.

1992

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R4443 Studies on the culture of tropical prawns (penaeids) with particular reference to husbandry, disease and nutrition

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R4452 Production of mitotic gynogenesis of superior monosex clones of tilapia and transfer of technology to the Philippines

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MAIR, G.C. (1992) Caudal Deformity Syndrome (CDS): An autosomal recessive lethal mutation in the tilapia *Oreochromis niloticus* (L.) *Journal of Fish Diseases*, **15**: 71–75.

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R4523 Cryopreservation and manipulation of ova and milt in commercially important tropical species

Peer Reviewed

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Other Publications

RANA, K.J. (1992) International workshop on the storage and cryopreservation of gametes and embryos of aquatic organisms, Marly le Roy, France. *Aquaculture News*, **14**: 17.

R4537 Analysis of the gene flow of the Bermuda spiny lobster

Peer Reviewed

LOCKWOOD, A.P.M. and HATELEY, J. (1992) Spiny lobster stock replenishment. pp. 12–18. In: *Fish Genetics and Development Aid. Fish Genetics Programme Research Strategy Workshop, Swansea, July 1991*. Beardmore, J.A. (Ed.). Overseas Development Administration (ODA), London, UK. 50 pp

R4723 Taxonomy culture and pathogenicity of a new, highly invasive fungus from South and South East Asia

Other Publications

WILLOUGHBY, L.G. and LILLEY, J.H. (1992) The ecology of aquatic fungi in Thailand and the fish disease relationship. *The AAHRI (Aquatic Animal Health Research Institute) Newsletter*, **1** (1): 5–6.

R4751 Development of strategies for sustainable shrimp farming

Peer Reviewed

BRIGGS, M. (1992) A stress test for determining vigour of post-larval *Penaeus monodon* Fabricus. *Aquaculture and Fisheries Management*, **23**: 511–515.

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HARTATI, R. and BRIGGS, M.R.P. (1992) The effect of some potential and commercial feeding attractants on the performance of *Penaeus monodon*. pp. 93–106. In: Coastal Zone Management (with emphasis on brackish water aquaculture). *BIOTROP Special Publication No. 47*. Southeast Asian Regional Centre for Tropical Biology, Bogor, Indonesia.

R4803 Genetic means for the production of monosex tilapia

Other Publications

MAIR, G.C., GARCIA, M.A.R., CAPILI, J.B., ABELLA T.A. and VERA CRUZ, E.M. (1992) Application of genetic manipulations for improvement of tilapia for culture in the Philippines – the GMT Project pp. 3–5. In: *Ripples, Newsletter of the Freshwater Aquaculture Center, No. 3 (1)*. Central Luzon State University, Philippines.

PASQUAL, L.P. (1992) Frequency and distribution of oocytes in *Oreochromis niloticus*. BSc thesis. Central Luzon State University, Philippines. 34 pp.

VERA CRUZ, E.M., MAIR, G.C. and RECOMETA, R.D. (1992) Growth and gonadal maturation of androgen treated Nile tilapia, *Oreochromis niloticus* L. pp. 19–27. In: *Tilapia Farming in the Philippines: Recent Developments, Proceedings of the Second National Symposium and Workshop on Tilapia Farming*. Guerrero, R.D. III and Fernandez, D.D.G. (Eds.). Philippine Council for Aquatic and Marine Research and Development, Laguna, Philippines.

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R4222 Studies on ulcerative disease rhabdovirus infection of rice field fish species in ASEAN countries

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R4523 Cryopreservation and manipulation of ova and milt in commercially important tropical species

Peer Reviewed

PASQUAL, A.B., PENMAN, D.J., RANA, K.J. and McANDREW, B.J. (1993) Cryopreservation and refrigeration storage of UV and inactivated milt for gynogenesis. *Aquaculture*, **111**: 325.

R4537 Analysis of the gene flow of the Bermuda spiny lobster

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HATELY, J.G. and SLEETER, T.D. (1993) A biochemical genetic investigation of spiny lobster (*Panulirus argus*) stock replenishment in Bermuda. *Bulletin of Marine Science*, **52** (3): 993–1006.

R4700 Use of androgenesis to regenerate diploid fish from the genetic material of cryopreserved sperm

Peer Reviewed

McANDREW, B.J., RANA, K.J. and PENMAN, D.J. (1993) Conservation and preservation of genetic variation in aquatic organisms. pp. 295–336. In: *Recent Advances in Aquaculture*. Vol. 4. Muir, J.F. and Roberts, R.J. (Eds.). Blackwell Science, Oxford, UK.

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R4721 Aquaculture in Sub-Saharan Africa

Other Publications

HARRISON, E. (1993) Fish farming in the Lake Basin, Kenya. Unpublished report, University of Sussex, Brighton, UK.

HARRISON, E. (1993) My pond has no fish: aquaculture development in Luapula Province, Zambia. Field-work findings from Luapula Province, Zambia. Unpublished report. 300 pp.

STEWART, J.A. (1993) Aquaculture in the Central and Northern Region of Malawi. Project Technical Report. Institute of Aquaculture, University of Stirling, UK. 25 pp.

R4723 Taxonomy culture and pathogenicity of a new, highly invasive fungus from South and South East Asia

Peer Reviewed

ROBERTS, R.J., WILLOUGHBY, L.G. and CHINABUT, S. (1993) Mycotic aspects of epizootic ulcerative syndrome (EUS) of Asian fishes. *Journal of Fish Diseases*, **16** (3): 169–183.

WILLOUGHBY, L.G. (1993) A new destructive disease (epizootic ulcerative syndrome) of freshwater fishes in southeast Asia. *Freshwater Forum*, **3** (2): 110–121.

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VALAIRATANA, W. and WILLOUGHBY, L.G. (1993) Spore assay of *Achlya* (Fungi, Phycomycetes) from a fish pond; apparently demonstrating strains of the genus with widely differing growth rates. *The AAHRI (Aquatic Animal Health Research Institute) Newsletter*, **1**: (1) 1–2.

R4751 Development of strategies for sustainable shrimp farming

Peer Reviewed

BRIGGS, M.R.P., BROWN, J.H. and FOX, C.J. (1993) The effect of dietary lipid and lecithin levels on the growth, survival, feeding efficiency, production and carcass composition of post-larval *Penaeus monodon* Fabricius. *Aquaculture and Fisheries Management*, **25**: 279–294.

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BRIGGS, M.R.P. (1993) Status, problems and solutions for a sustainable shrimp culture industry with special reference to Thailand. Report to the ODA. Institute of Aquaculture, University of Stirling, UK. 41 pp.

R4801 Genetic diversity and stock structure of Lake Tanganyika Kapenta introduced to African lakes

Other Publications

CARVALHO, G.R. (1993) Genetic management of African freshwater fishes. Paper presented at ORSTOM Symposium on Biological Diversity in African and Brackish Water Fishes, Dakar, Senegal, November 1993.

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HAUSER, L., CARVALHO, G. R. and PITCHER, T.J. (1993) The genetic basis of phenotypic variation in the clupeid, *Limnothrissa miodon*, following introduction of a man-made lake. Poster presented at FSBI Symposium on Factors Affecting the Distribution of Fish. Conwy, UK. July 1993. [Poster]

R4802 Molecular population genetics of *Penaeus* species in the Malaysian Peninsula

Peer Reviewed

SODSUK, McANDREW, B.J. and PENMAN, D.J. (1993) Genetic population structure of the giant tiger prawn (*Penaeus monodon*) in the Gulf of Thailand and the Andaman Sea. pp. 161–164. In: *Proceedings of AADCP International Workshop on Genetics in Aquaculture and Fisheries Management, 31 August–4 September 1992*. Penman, D., Roongratri, N. and McAndrew, B. (Eds.). ASEAN-EC Aquaculture Development and Co-ordination Programme (AADCP/PROC/3), Bangkok, Thailand.

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KLINBUNGA, S., SODSUK, S. PENMAN, D.J. and McANDREW, B.J. (1993) An improved protocol for total DNA isolation and visualisation of mtDNA RFLP(s) in tiger prawn, *Penaeus monodon*. Poster presented at International Conference on Marine Biotechnology in the Asian Pacific Region, Bangkok, Thailand, 16–20 November 1993. [Poster]

R4803 Genetic means for the production of monosex tilapia

Peer Reviewed

ABELLA, T.A., BOLIVAR, R.B., MAIR G.C. and SKIBINSKI, D.O.F. (1993) Fluctuating assymetry in *Oreochromis niloticus* selected for growth rate. pp. 87–94. In: *Fish Genetics and its Application to Aquaculture and Fishery Management*. Dodson, J., Soewardi, K., Phang, V.P.E., Enriques, G.L., Na-Nakorn, U. and Sukimin, S., (Eds.). *BIOTROP Special Publication 52*. Southeast Asian Regional Centre for Tropical Biology, Bogor, Indonesia.

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MAIR, G.C. (1993) Chromosome-set manipulation in tilapia - techniques, problems and prospects. *Aquaculture*, **111**: 227–244.

MAIR, G.C., CAPILI, J.B., BEARDMORE, J.A. and SKIBINSKI, D.O.F. (1993) The YY-male technology for production of monosex male tilapia, *Oreochromis niloticus* (L.). pp. 93–95. In: *Proceedings of AADCP International Workshop on Genetics in Aquaculture and Fisheries Management, 31 August–4 September 1992*. Penman, D., Roongratri, N. and McAndrew, B. (Eds.). ASEAN-EC Aquaculture Development and Co-ordination Programme (AADCP/PROC/3), Bangkok, Thailand.

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R6058 Selective improvement of genetically male tilapia

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R4801 Genetic diversity and stock structure of Lake Tanganyika Kapenta introduced to African lakes

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R4802 Molecular population genetics of *Penaeus* species in the Malaysian Peninsula

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R6070 Field testing and transfer to Thailand of the YY male technology for the mass production of monosex male tilapia

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R6380 Addressing technical, social and economic constraints to rice fish culture in Laos, emphasising women's involvement

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R4721 Aquaculture in Sub-Saharan Africa*Other Publications*

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R4801 Genetic diversity and stock structure of Lake Tanganyika Kapenta introduced to African Lakes*Peer Reviewed*

HAUSER, L., CARVALHO, R.G. and PITCHER, T.J. (1998) Genetic population structure in the Lake Tanganyika sardine, *Limnothrissa miodon*. *Journal of Fish Biology*, **53** (Supplement A): 413–429.

R4802 Molecular population genetics of *Penaeus* species in the Malaysian Peninsula*Peer Reviewed*

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R5502 Development of transgenic tilapia fish*Peer Reviewed*

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R5997 Studies on the biology of the EUS *Aphanomyces*

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R6011 Coastal aquaculture and environment: strategies for sustainability

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FUNGE-SMITH, S.J. and BRIGGS, M.R.P. (1998) Nutrient budgets in intensive shrimp ponds - implications for sustainability. *Aquaculture*, **164** (1–4): 117–133.

R6059 Genetic improvement of Indian and common carps for aquaculture

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R6069 Development of approaches and methods for low input fish seed production for Sub-Saharan Africa

Other Publications

HAYLOR, G. and MUIR, J.F. (1998) *A Fish Hatchery Manual for Africa*. Pisces Press Ltd, Stirling, UK. 207 pp.

R6380 Addressing technical, social and economic constraints to rice fish culture in Laos emphasising women's involvement

Other Publications

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HAYLOR, G. (1998) Raising fish in rice fields in Savannakhet Province. Extension leaflet. Livestock and Fisheries Section, Savannakhet, Laos, SE Asia. 6 pp. [Leaflet] [Lao]

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R6426 Shrimp defence mechanisms and immunomodulation to enhance sustainability and reduce antibiotic usage in shrimp culture

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R6937 Socio-economic analysis of the dissemination and impact of genetically male tilapia

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R6938 Improvement and regional evaluation of the YY male technology*Peer Reviewed*

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R6979 Applied studies on *Aphanomyces invadens*, the fungal pathogen of epizootic ulcerative syndrome (EUS)

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R7052 Fish seed quality in Asia

Peer Reviewed

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R7054 Control of bacterial disease in small-scale freshwater aquaculture

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R7100 Improved management of small-scale tropical cage culture systems in Asia

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R5502 Development of transgenic tilapia fish

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R5998 Studies on the susceptibility of farmed *Rana tigerina* and *R. rugulosa* to frog septicaemic disease and its control

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CRUMLISH, M. and INGLIS, V. (1999) Improved disease resistance in *Rana rugulosa* (Daudin) after B-glucan administration. *Aquaculture Research*, **30**: 431–435.

R6059 Genetic improvement of Indian and common carps for aquaculture

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BASAVARAJU, Y., MAIR, G.C., MUKTHAYAKKA, G., RENUKA DEVI, B.S. and PENMAN, D.J. (1999) The use of Benzocaine as an anaesthetic and sedative for carps. In: *Proceedings of the National Academy of Science (India)* **68B** (III and IV): 232–240.

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R6428 Development of monosex culture in punting species

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R6938 Improvement and regional evaluation of the YY male technology

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ABUCAY, J.A., MAIR, G.C., SKIBINSKI, D.O.F. and BEARDMORE, J.A. (1999) Environmental sex determination: the effect of temperature and salinity on sex ratio in *Oreochromis niloticus* L. *Aquaculture*, **172**: 219–234.

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R6979 Ecology, immunogenicity and treatment of *Aphanomyces invadans*

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R7051 An epidemiological approach to aquatic disease control: risk factors associated with outbreaks of white spot disease in artisanal systems in Vietnam and India

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R7052 Fish seed quality in Asia*Peer Reviewed*

HAITOOK, T. (1999) New approaches to fish seed supply. *Appropriate Technology*, **25** (4): 26–28.

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R7100 Improved management of small-scale cage aquaculture in Asia*Peer Reviewed*

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R7113 Development and use of transgenic tilapia*Peer Reviewed*

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R7463 Strategies for improved diagnosis and control of bacterial disease in small-scale freshwater aquaculture

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Programme Outputs

Peer Reviewed

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R6059 Genetic improvement of Indian and common carp for aquaculture

Peer Reviewed

MAIR, G.C. and BEARDMORE, J.A. (2000) The DFID Fish Genetics Programme. pp. 11–14. In: *Proceedings of the Second Workshop on Genetic Improvement of Carp, University of Agricultural Sciences, Bangalore, 14–16 February 2000*. Basavaraju, Y, Mair, G.C. and Penman, D.J. (Eds.). University of Agricultural Sciences, Bangalore, India.

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R6938 Improvement and regional evaluation of the YY male technology

Other Publications

ABUCAY, J.S. and MAIR, G.C. (2000) Divergent selection for growth in the development of a female line for the production of improved genetically male tilapia (GMT) in *Oreochromis niloticus* L. In: *Tilapia Aquaculture, Proceedings of the Fifth International Symposium on Tilapia in Aquaculture, Rio de Janeiro, Brazil*. Fitzsimmons, K. (Ed.). The American Tilapia Association, USA.

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R6979 Applied studies on EUS – the ecology, immunogenicity and treatment of *Aphanomyces invadans*

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BLAZER, V., VOGELBEIN, W.K., DENSMORE, C., KATOR, H., ZWERNER, D. and LILLEY, J. (2000) Etiology and pathogenesis of skin ulcers in menhaden, *Brevoortia tyrannis*: does *Pfiesteria piscicida* play a role? *Marine Environmental Research*, **50** (1): 487–488.

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R7064 Small-scale farmer-managed aquaculture in engineered water systems: Critical design and management approaches

Other Publications

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R7100 Improved management of small-scale cage culture in Asia

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R6979 Applied studies on EUS – the ecology, immunogenicity and treatment of *Aphanomyces invadans*

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R7123 Fish in irrigation systems technology

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R7284 Genetic improvement and utilisation of indigenous tilapia in southern Africa

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R7591 Development of novel high yielding tilapia

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FISHERIES MANAGEMENT SCIENCE PROGRAMME

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During 1999/2000 the Fisheries Management Science Programme (FMSP) revised its strategy and recast the Programme logical framework to reflect the evolving policies of DFID in a year which saw the publication of the second White Paper on International Development. The new strategy was implemented from 1 April 2001.

The Fisheries Management Science Programme has a single purpose:

Benefits for poor people generated by application of new knowledge to fisheries management systems.

There are two Outputs:

1. Improvements in the livelihood outcomes for poor people from better management of **capture fisheries** developed and promoted.
2. Improvements in the livelihood outcomes for poor people from better management of **enhancement fisheries** developed and promoted.

The FMSP has consistently focused on small-scale fishers and fits well into the poverty and livelihoods approach, although, particularly for capture fisheries, research activities may not directly focus on the poor but aim to create an enabling environment for the ultimate benefit of the poor.

Fisheries are of central importance to some of the poorest communities in the world. Where few livelihood alternatives exist, as is the case in many small islands or for many groups whose assets are fishery-specific, fishers are particularly vulnerable to any decline in the resources on which they depend. It is, therefore, essential for fisheries outcomes that exploitation of these resources is sustainable. But the methods of capture that are encouraged can be equally critical. Sustainable exploitation of a particular fishery can be achieved through a number of alternative patterns of effort, which may vary greatly in the type and number of livelihood opportunities that they provide, and the sorts of initiatives needed to support them. These include not just the nuts and bolts of fisheries management – the combinations of gear restrictions, area closures, catch limits etc. – and the form of governance structure adopted, but also the wider policy decisions including tax incentives to boat owners, fuel subsidies or access given to foreign fleets. Thus, in the context of fisheries, better management is the key to achieving this. However, changing the climatic, ecological and social conditions means that management is constantly needing adjustment. Current and newly identified projects seek to address these issues through the provision of management guidelines for both capture and enhancement fisheries upon which some of the poorest communities are dependent.

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R5048 Optimisation of reef fisheries

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R5484 Management of multispecies tropical fisheries

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R5023 Potential yield of small reservoir fisheries in South East Asia*Other Publications*

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R5048 Optimisation of reef fisheries*Peer Reviewed*

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POST-HARVEST FISHERIES RESEARCH PROGRAMME

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The vision of the Post-Harvest Fisheries Research Programme (PHFRP) is to improve the livelihoods and food security of poor people within the post-harvest fisheries sector by:

- working with the poor to identify constraints to better livelihoods and improved food security
- commissioning high-quality research to develop methods and tools to overcome constraints
- effectively promoting the results of research to the point where they are adopted for the benefit of the poor.

The importance of the fisheries sector for the poor in developing countries can be summarised under two headings:

Employment – fishing and the related activities of processing and trading offer employment to some of the most disadvantaged individuals. The relatively ‘open access’ nature of fisheries offers opportunities to those without access to land. The activities of processing and trading fish are dominated by women and often provide employment where few other opportunities exist.

Nutrition – fish and fish products provide a vital source of nutrition. In the majority of African and Asian countries fish accounts for between one and two thirds of animal protein intake. This compares with only 6.6% in North America and 9.7% in Western Europe. As fish is usually considerably cheaper than meat in developing countries, it is of particular nutritional importance to those on the lowest incomes.

The programme has a single purpose:

To produce benefits for poor producers, processors, traders and consumers through the application of new knowledge to the improved utilisation of fish from fisheries in South Asia and East and West Africa.

In order to achieve this purpose strategies and management systems to improve post-harvest utilisation of fish – and its impact on the lives of poor processors, traders and consumers – are being developed and promoted. The PHFRP is focusing on a people-centred approach to research that is more impact-oriented and that closely reflects local needs. Its research links into global, regional and national policy initiatives and operates through partnerships with target institutions and fisherfolk communities.

The programme has commissioned research in three main areas to achieve its purpose:

- improved generic methods for identifying the magnitude and source of post-harvest losses in capture fisheries at a local and national level
- appropriate value adding and loss-reduction processes and technologies applicable to major poor stakeholder groups
- an understanding the impact on the poor of the changing pattern of utilisation of fish and the structure and operation of market systems – including globalisation in terms of the effect of external market demands.

The results from this research will combine to provide policy makers with the knowledge to create an enabling environment for the poor in the post-harvest sector, and the tools for support agencies to provide better assistance to the poor.

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R5074 Effects of antibiotics on the microflora of aquaculture ponds and their products

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LIST OF PROJECTS

AQUACULTURE AND FISH GENETICS RESEARCH PROGRAMME

Contact: Professor J. Muir
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