

Measuring the contribution of small-scale aquaculture

An assessment



Cover photographs:

Left top to bottom: Feeding grass carp pond (Viet Nam); small-scale seaweed culture (Philippines).

Right top to bottom: Tilapia seed nursery (Malawi); small-scale oyster culture (Philippines).

All photos courtesy of Dr Melba B. Reantaso (FAO).

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FAO
FISHERIES AND
AQUACULTURE
TECHNICAL
PAPER

534

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Preparation of this document

The Aquaculture Management and Conservation Service (FIMA), Fisheries and Aquaculture Management Division (FIM) of the Fisheries and Aquaculture Department of the Food and Agriculture Organization of the United Nations (FAO), is implementing a project entitled “Methods and indicators for the appraisal and evaluation of the contribution small-scale aquaculture to sustainable rural development”. The project, which commenced in 2008, is being carried out through a combination of commissioned thematic papers, two expert workshops and the implementation of pilot case studies.

As part of the project implementation, the “FAO Expert Workshop on Methods and Indicators for Evaluating the Contribution of Small-scale Aquaculture to Sustainable Rural Development” was held in Nha Trang, Viet Nam, from 24 to 28 November 2008.

The commissioned review papers and expert workshop were technically supervised by Dr Melba B. Reantaso, Fishery Resources Officer (Aquaculture) of FIMA.

The study and expert workshop were made possible with financial support through the FAO Multi-Partnership Programme (FMPP) under B.1 Objective administered through the FishCode Programme of the FAO Fisheries and Aquaculture Department.

Abstract

The contribution of small-scale aquaculture (SSA) to sustainable rural development (SRD) include, for example, securing food, efficient use of water, farm materials and other resources, creating wealth, diversifying livelihoods, generating rural employment and income, utilizing family labour, fostering social harmony and empowering women. While recognized as such, there has not been a systematic assessment which clearly measures its contribution.

An “FAO Expert Workshop on Methods and Indicators for Evaluating the Contribution of Small-Scale Aquaculture to Sustainable Rural Development”, held in Nha Trang, Viet Nam from 24 to 28 November 2008, attempted to develop an indicator system which can measure the contribution of SSA to SRD. Indicators are measures, used for different purposes, to help understand issues or conditions, to know how well a system is working and to determine what direction or solutions may be taken to address an issue or a problem before it gets too bad. While indicators are as varied as the systems they try to monitor, there are certain characteristics that effective indicators have in common, e.g. relevance, ease of understanding, reliability and data accessibility.

The expert workshop used a number of processes and series of steps in the development of the indicator system. These included the following: (i) understanding the subject of measurement, (ii) identifying an analytical framework and setting criteria, (iii) developing a list of SSA contributions, (iv) categorizing the contributions based on analytical framework and agreed criteria, (v) devising and organizing the indicators of contribution, and (vi) measuring the indicators. The major outcome was the development, through an iterative process, of an indicator system which was thought to provide a good measure of the contribution of SSA using an analytical framework (i.e. the Sustainable Livelihood Approach or SLA) and agreed criteria (accuracy, measurability and efficiency or AME). Using the SLA and AME criteria, the experts narrowed down to some 20 (from a freelist of some 50), indicators which were deemed appropriate to assess the contribution of SSA to SRD. The SLA was selected as an appropriate analytical framework as it reflects the primary objective of an SSA system which is to balance the use and/or build up of the five livelihood capitals or assets (natural, physical, human, financial and social).

The experts agreed by consensus that the 20 potential indicators include: (1) flows/enterprises, (2) off-farm nutrient use/farm products (input/output ratio), (3) enterprises' contribution to cash income, (4) productive use of pond water, (5) return to land capital and labour; trends in physical asset used for SSA, (6) income from SSA and derived from SSA, (7) SSA contribution to Gross Domestic Product (GDP), (8) farmers who are members of active farmer associations or community organizations, (9) household consumption of fish, (10) seasonal distribution of fish consumption, (11) women access to resources and benefits of SSA, (12) women engaged willingly and as active decision-makers in SSA (including post-harvesting), (13) batch testing for banned chemicals or poor quality aquatic products aquatic, (14) farmers adopting Better Management Practices (BMPs), (15) farmers involved in traceability system, (16) export earnings, (17) employment generation, (18) disease, (19) vulnerability, and (20) resource use conflicts.

This publication contains two parts: Part 1 contains the report of the above expert workshop; Part 2 contains 10 technical papers presented during the expert workshop and an additional paper which provides a detailed account of the processes undertaken in the development of an indicator system to measure the contribution of SSA to SRD.

Bondad-Reantaso M.G.; Prein, M. (eds).

Measuring the contribution of small-scale aquaculture: an assessment.

FAO Fisheries and Aquaculture Technical Paper. No. 534. Rome, FAO. 2009. 180p.

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Acknowledgements

This publication is an outcome of the contributions from many individuals who participated in the FAO Expert Workshop on Methods and Indicators for Evaluating the Contribution of Small-scale Aquaculture to Sustainable Rural Development, held in Nha Trang, Viet Nam from 24 to 28 November 2008. They are all gratefully acknowledged.

Special thanks are due to Nha Trang University – Dr Huu Dung Nguyen and his staff for logistic arrangements and Prof. Hoang Hoa Hong for gracing the opening ceremony of the workshop.

The editors would also like to thank F. Schatto and T. Farmer (FAO Fisheries and Aquaculture Information and Statistics Service) and Juan Carlos Trabuco (formatter) for assistance during the final production of this document, N. Hishamunda (FAO Fisheries and Aquaculture Economics and Policy Division) and S. Siar (FAO Fish Products and Industry Division) for their kind assistance during the expert workshop. J. Jia, R.P. Subasinghe, L. Chen, C. D'Angelo and S. Lozzi (FAO Fisheries and Aquaculture Management Division), I. Kollavik-Jensen (Programme Coordination Unit of the FAO Fisheries and Aquaculture Department), J. Turner and M. Verbanck (FishCode Programme) are all gratefully acknowledged for their support, encouragement and for facilitating funding support to the project through FIMA's Regular Programme and the FAO Multi-Partnership Programme (FMPP).

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Acronyms and abbreviations

ADB	Asian Development Bank
AESA	Agro-ecosystem analysis
ACF	Aquaculture carbon footprint
AFP	Aquaculture footprint
AHP	Analytical Hierarchy Process
AIT	Asian Institute of Technology
AME	accurate, measurable, efficient
ASEAN	Association of Southeast Asian Nations
BRFDs	Bioresource flow diagrams
BOD ₅	Biological oxygen demand
CAARP	Community Agriculture and Aquaculture Resource Persons
CARE	Cooperative for Assistance and Relief Everywhere
CBA	Cost-Benefit Analysis
CBOs	Community-based Organizations
CO ₂	Carbon dioxide
COLA	Cost of living allowance
CSD	The UN Commission on Sustainable Development
CV	Coefficient of variation
DFID	Department for International Development of the United Kingdom
DO	Dissolved oxygen
EAA	Ecosystem Approach to Aquaculture
eFCR	Economic Feed Conversion Ratio
FAO	Food and Agriculture Organization of the United Nations
FFA	Farmer field school
FFER	Fish Feed Equivalence Ratio
FIMA	Aquaculture Management and Conservation Service
FMA	Farm management analysis
GDP	Gross domestic product
GIS	Geographic information system
GMO	Genetically modified organism
GNAEP	Greater Noakhali Aquaculture Extension Project
HDI	UN Human Development Index
IAA	Integrated agriculture-aquaculture
IAASP	Integrated Aquaculture-Agriculture Systems Program
ICLARM	International Center for Living Aquatic Resources Management
IIRR	International Institute of Rural Reconstruction
IoE	Intensity of exploitation
IRR	Internal rates of return
ISEAL	International Social and Environmental Accreditation and Labeling
JPOI	Johannesburg Plan of Implementation
KAP	Knowledge Attitude Practice
MA	Millenium Assesment
MBN	Minimum Basic Need
MCDM	Multi-Criteria Decision-making

MDGs	Millennium Development Goals
MDGIs	Millennium Development Goal Indicators
MEA	Millennium Ecosystem Assessment
MFA	Material Flow Accounts
NACA	Network of Aquaculture Centres in Asia and the Pacific
NAMEA	National Accounting Matrix including Environmental Accounts
NEDA	National Economic Development Authority
NPVs	net present values
NRTs	natural resource types
NTU	Nha Trang University
ODA	Official Development Assistance
OXFAM	Oxfam International
PAD	Pangasius Aquaculture Dialogue
PI	Profitability index
PIPs	Processes, institutions and policies
PME	Participatory monitoring and evaluation
POPDEV	Population and Development Indicators
PRA	Participatory rural appraisal
PSR	Pressure state response
RESTORE	Research Tool for Natural Resource Management, Monitoring and Evaluation
RFLDC	Regional Fisheries and Livestock Development Project, Noakhali Component
RRA	Rapid rural appraisal
SAPA	Sustainable Aquaculture for Poverty Alleviation
SD	Sustainable development
SDI	Sustainable development indicator
SEARCA	Southeast Asian Regional Center for Graduate Study and Research in Agriculture
SES	Special Evaluation Study
SESAM-UPLB	School of Environmental Science and Management University of the Philippines Los Baños
SIEEA	System of Integrated Environmental and Economic Accounting
SL	Sustainable livelihoods
SSA	Small-scale aquaculture
SLA	Sustainable livelihoods approach
SMART	specific, measurable, accurate, repeatable, timely
SRL	Sustainable rural livelihoods
TMR	Total materials requirements
TN	Total nitrogen
TP	Total phosphorus
TWG	Technical Working Groups
UK	United Kingdom
UNDP	United Nations Development Programme
UPLB	University of the Philippines at Los Baños
VAC	Vuon, ao, chuong (in Vietnamese which means garden/pond/livestock pen)
WCED	World Commission on Environment and Development
WFC	WorldFish Center
WWF	World Wide Fund for Nature/ World Wildlife Fund
ZOMAP	Lake zone map

