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# Developing and testing a tool for measuring capacity building

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# 79

Research that works for developing countries and Australia

# Developing and testing a tool for measuring capacity building

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**ACIAR**

Research that works for developing  
countries and Australia

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2012

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Dugdale A., Sadleir C., Tennant-Wood R. and Turner M. 2012. *Developing and testing a tool for measuring capacity building*. ACIAR Impact Assessment Series Report No. 79. Australian Centre for International Agricultural Research: Canberra. 36 pp.

ACIAR Impact Assessment Series – ISSN 1832-1879 (print); ISSN 1839-6097 (online)

ISBN 978 1 921962 70 7 (print)

ISBN 978 1 921962 71 4 (online)

Editing and design by Clarus Design

Printing by Elect Printing

# Foreword

The Australian Centre for International Agricultural Research (ACIAR) and its many partners and collaborators have long expressed the need for a tool that would help them to capture information about the ways in which scientists engage in capacity development. They have required a means of more clearly describing the capabilities built during agricultural development research and the capacity development of field scientists. In response to these needs, ACIAR commissioned the development of a monitoring and capacity-development tool, initially called the ‘Capacity Snapshot’.

The Capacity Snapshot has been developed by a team from the Faculty of Business, Government and Law, and the Australia and New Zealand School of Government Institute of Governance at the University of Canberra (UC). The UC team’s first objective was to discover how capacities developed in ACIAR activities were currently understood and perceived by personnel involved in carrying out research. They then used the information gained to improve the design of a prototype capacity-evaluation instrument. Their second step was to share the initial findings, mainly with ACIAR

headquarters staff, and then incorporate their feedback into the evolving instrument. Having advanced to this stage, they then sought the opinions of field scientists in developing countries and of the Australian-based scientists collaborating with them.

There are two parts to the Capacity Snapshot. The first part can be used to measure communication or interaction between scientists and other stakeholders. The second part records the capacities or skills that scientists acquire through their project activities. Taken together, the two parts provide a picture of the capacities that are built among agricultural scientists involved in ACIAR and similar applied research projects in agriculture and related sciences. This report documents the development and testing of this, primarily qualitative, Capacity Snapshot tool.



**Nick Austin**  
Chief Executive Officer, ACIAR



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# Executive summary

The research described in this report developed a monitoring and capacity development tool initially called the Capacity Snapshot. The tool is designed to capture data on the ways in which scientists engage in capacity development, and to provide a clear picture of the capacities developed by research scientists in specific ACIAR projects. The information gathered by the Capacity Snapshot methodology can be used to aid the transfer of knowledge across projects, contribute to ACIAR's ability to foster agricultural development and assist in ensuring that ACIAR projects build the appropriate range of capacities in scientists working on agricultural development in developing countries.

The research was carried out by a team from the Faculty of Business, Government and Law, and the Australia and New Zealand School of Government Institute of Governance at the University of Canberra. The team reviewed ACIAR documents, interviewed ACIAR headquarters staff and Australian-based scientists involved in ACIAR projects, and undertook field visits to ACIAR projects in the Philippines and Fiji to interview project personnel and make first-hand observations of projects.

The tool developed has two parts. The first part can be used to measure communication or interaction between scientists and other stakeholders. The second part records the capacities or skills built in scientists through their project activities. Taken together, the two parts provide a holistic picture of the capacities that are built among agricultural scientists in ACIAR projects. The tool can be used at the start of a project to indicate capacity-building intentions, at midpoint as a monitoring mechanism to see whether capacity building is going to plan and at the end to measure the capacities built.

Part one describes in a matrix (Matrix 1) the communication and interactions between agricultural scientists and other stakeholders at different levels, from institutional and local through to regional and international. Five prefatory questions give agricultural scientists a clear indication of what they are required to do to complete the matrix. The questions focus on the nature of communication; who it is with, and the degree of its complexity. A four-point rating system, from zero, through low and medium, to high, describes the nature and depth of the communication. It starts with no communication activity, moves through one-way transfer of information to a two-way communication process and, finally, to more complex two-way processes negotiating decisions. The ratings are not meant as indicators of importance but as ways of recording types of communication and interaction. Flexibility and judgment are involved in these rankings. There is space on the matrix form to explain the ratings.

Part two measures, again in matrix form, the building of capacities in a range of project-related activities. These activities include managing, doing science/research, sharing science/research, using public media and engaging partners. There is a range of questions for each of these activities, to guide agricultural scientists when filling in Matrix 2. The communities with which the agricultural scientists engage are also in the matrix and are the same as presented in Matrix 1 on communication. A four-point rating system from zero to high is again used to measure the capacities built. Zero refers to no capacities being built, low to one or a few, low-complexity capacities, medium to a medium number and complexity of capacities, and high to a large number and high complexity of capacities. No specific numbers of capacities are presented for the different categories but it is acknowledged that ACIAR projects may wish to provide indicative numbers to aid scientists



filling in the form. Because of the varying complexity and nature of ACIAR projects, there are, as with Matrix 1, grounds for flexibility in the interpretation and use of Matrix 2, and a low ranking does not necessarily mean that a capacity is unimportant. There is space on the form to indicate the nature of the activity and its level of importance.

There are several issues that may emerge in the implementation of the Capacity Snapshot. First, it is important that participants understand the ratings systems and how to use them to complete the two matrixes, and what information to provide as additional notes. Second, there are issues concerning the use and storage of the information gathered. The report contains two appendixes giving worked examples of how each of the two forms could be completed.

# Background

The Australian Centre for International Agricultural Research (ACIAR) and its many partners and collaborators have long expressed the need for a tool that would help them to capture information about the ways in which scientists engage in capacity development. They have required a means of more clearly describing the capabilities built during agricultural development research and the capacity development of field scientists. In response to these needs, ACIAR commissioned a project to develop a monitoring and capacity-development tool, initially called the ‘Capacity Snapshot’.

The Capacity Snapshot is designed to:

- enable the capture of data on the ways in which scientists engage in capacity development
- encourage the development of a clearer articulation of the capabilities built during agricultural development research and the capacity development of field scientists.

This information will be used to aid the transfer of knowledge across projects, contribute to strengthening ACIAR’s capacity to foster agricultural development and assist in ensuring that ACIAR projects build the appropriate range of capacities in Australia, and especially overseas, for sustainable agricultural development in developing countries.<sup>1</sup>

To aid the development of the Capacity Snapshot, the project adopted an action-based research approach. The first step was to review a prototype capacity-evaluation instrument, and identify ways in which it could be better designed and deployed. The second step was to share the initial findings, mainly with ACIAR headquarters staff, and incorporate the feedback into the evolving instrument. The third stage was to seek the opinions of field scientists in developing countries and the Australian-based scientists supervising them. This involved visits to Brisbane, Sydney and Adelaide in Australia, and week-long field trips to ACIAR projects in Leyte in the Philippines and Suva and Savusavu in Fiji.

The intent of the project was not only to develop a useful tool for capacity-building evaluation but also to provide a basis for the ongoing development and testing of this tool, creating opportunities for further collaboration and capacity development.

The project’s research team was Professor Mark Turner, Dr Anni Dugdale, Dr Chris Sadleir and Dr Robin Tennant-Wood, all members of the Faculty of Business, Government and Law, and the Australia and New Zealand School of Government Institute of Governance at the University of Canberra (UC). In pursuing the research, there was close consultation between the team and research program managers in ACIAR.

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<sup>1</sup> Agriculture is used in this report to cover the range of activities in which ACIAR is involved. These include crops, livestock and fisheries, natural resource management, forestry, and economics and other social sciences.

# Methodology

With the overall aim of the project being to innovate ways of measuring capacity-building outcomes, the team was interested in how the capacities developed in ACIAR activities are currently understood and perceived by personnel involved in carrying out research. It was possible for the research team to conduct interviews with a range of people who are, or have been, directly involved in ACIAR science and other research projects as employees, project partners or beneficiaries. Two members of the research team travelled to Suva and Savusavu in Fiji and two to Leyte in the Philippines to conduct these interviews (Table 1) during a week's fieldwork at each of the locations. In addition, some of the scientists, other researchers and program managers in Australia working on current scientific projects at these two locations were interviewed. In Fiji and the Philippines, interviews were conducted with program and project managers, scientists, other researchers, Masters students involved with ACIAR projects, and ACIAR project partners. Visits were made to the University of the South Pacific, Visayas State University, the Secretariat of the Pacific Community, government aquaculture and horticulture research stations, and commercial jackfruit, pearling and floriculture operations.

The two locations presented an opportunity to compare and contrast a well-developed research program—the ACIAR horticulture and crop initiatives in Leyte—with a research program in a relatively early phase—the Pacific Agribusiness Research for Development Initiative. All the people interviewed were involved in doing research in one way or another but this was broadly defined to include those involved with the management of research and development (R&D) processes, people who identify as scientists or researchers or research assistants, and entrepreneurs and business people, including farmers investing time

and resources in R&D. Interviews did not extend to people from the community working in partnership with ACIAR projects, such as farmers carrying out crop trials and observations on their land, or to small businesses, community organisations or small-scale producers carrying out economic and market research up and down their supply chains.

The interviews were aimed at identifying the variation across the capacities that are involved in the working practices of doing science and research, and the explicit or implicit understanding of them built during ACIAR projects. Before the fieldwork, the research team identified several kinds of capacities or capabilities, which were then used to develop a semi-structured interview schedule. They included the learning and development of innovative research techniques and the capability to exchange innovative research materials; the building of networks and working relationships at local, regional and international levels; the competency to play a leadership role in drawing together and working with communities, stakeholders, interest groups and policymakers; the communication of findings and the development and execution of effective strategies for research communication, knowledge management and community receptivity; and organisational and institutional change resulting in improved research capacity. The interview schedule was used flexibly, and other areas of capacity building were discussed as they arose.

In addition to interviews, the research methodology sought to engage participants in the design process, so as to put into play the capacity measurement tools and the categories of capacity building identified before the commencement of fieldwork. This was done either with individuals or groups of individuals who were asked to role-play and talk aloud their thoughts as they interacted with mock-ups of the capacity-building

**Table 1.** Numbers and kinds of people interviewed

	<b>Scientist resident in project countries</b>	<b>Scientist resident in Australia</b>	<b>Non-scientists in project countries</b>
Philippines	7	1	5
Fiji	9 (including 5 postgraduate students)	4	10

measurement tool. These design-oriented workshops also asked participants to reflect on when the tool should be used, by whom and for what purposes. Participants were able to make suggestions for improving the tool.

# Working assumptions

Following a workshop at ACIAR on 10 December 2010, it was agreed to use the following working definition of capacity (a term which we will hereinafter use interchangeably with ‘capability’):

... the ability of individuals and organisations or organisational units to perform functions effectively, efficiently and sustainably.

Thus, the instrument we subsequently developed attempts to measure how far such capacity is being or has been built in ACIAR projects. The definition of capacity is a simple one but can be elaborated by identifying the following core capacities/capabilities (after Baser and Morgan 2008):

- **The capability to commit and engage.** Actors are able to: mobilise resources (financial, human, organisational); create space and autonomy for independent action; motivate unwilling or unresponsive partners; plan, decide and engage collectively to exercise their other capabilities.
- **The capability to carry out technical, service delivery and logistical tasks.** Actors are able to: produce acceptable levels of performance; generate substantive outputs and outcomes (e.g. agricultural technologies, changed agricultural or marketing practices, policy reforms); sustain production over time and add value for their clients, beneficiaries, citizens etc.

- **The capacity to relate and attract resources and support.** Actors can: establish and manage linkages, alliances and/or partnerships with others to leverage resources and actions; build legitimacy in the eyes of key stakeholders; deal effectively with competition, politics and power differentials.
- **The capability to adapt and self-renew.** Actors are able to: adapt and modify plans and operations based on monitoring of progress and outcomes; proactively anticipate change and new challenges; learn by doing; cope with changing contexts and develop resiliency.
- **The capability to balance diversity and coherence.** Actors can: develop shared short- and long-term strategies and visions; balance control, flexibility and consistency; integrate and harmonise plans and actions in complex, multi-actor settings; and cope with cycles of stability and change.

This elaboration of capabilities was a useful reference for assessing the prototype capacity-building tool and developing the tool further through action-based research. It facilitated a deeper understanding of what the instrument was trying to measure.

# The instrument for measuring capacity building

The team envisages that the capacity-measuring instrument for ACIAR will have two major components. This is to enable both broad and deep views of capacity building. From discussions among the team and with stakeholders, and with reference to the capability framework presented above, it was realised that a tool to measure capacity development for ACIAR projects would need to be multidimensional. In practical terms, this led to the conclusion that the prototype Capacity Snapshot would not only have to be modified but also that it would need to be supplemented by another device to capture other important aspects of capacity building.

The team's research led it to distinguish between the original tool that examined capacity building through the lens of communication and by recording communication activity, and one that looked more broadly at capacities or skills, focusing on the capabilities actually built in scientists through their project activities. Thus, the instrument now comprises two matrixes: one covers communication, the other measures capacities. Details of each matrix and how they facilitate the measurement of capacity building follow.

## Matrix 1. Communication<sup>2</sup>

### Purpose and measurement

A version of Matrix 1 appeared in the initial discussion paper of January 2010. It aimed to measure 'interaction'

<sup>2</sup> The proposed capacity-measuring form and instructions for completing it are provided in Appendix 1. Hypothetical examples of completed forms are presented in Appendixes 2 and 3.

between scientists and other stakeholders, from policymakers through to farmers in the village. The matrix was to be completed using a 1–3-star rating system:

- **one star**—simple transfer of information in either direction between scientist and partner
- **two stars**—information flowing in both directions leading to some kind of conclusion, recommendation or decision
- **three stars**—involvement of all stakeholders and decisions made by end users.

Discussions in the field and among the team led to several proposals to amend this capacity-measuring instrument. First, the team adopted a revised rating system favoured by scientists and researchers in the field. It is explicitly recognised that the rating remains subjective (as in the original instrument) and that additional details are required to illustrate what each rating means.

This revised rating system has four measures, as follows:

- **Zero**—There is no activity involving the transfer of information between scientist/researcher and other persons or organisations.
- **Low**—There is one-way transfer of information; for example, where manuals giving instructions on planting times and soil conditions are produced and provided to farmer groups.
- **Medium**—There has been two-way flow of information, such as when scientists and researchers share information with other stakeholders and receive from them feedback or local knowledge. Running workshops for the exchange of ideas on how best to introduce an improved crop species

would fall under this measure. The emphasis here is on exchange rather than instruction as a basis for enhancing agricultural production.

- **High**—Information has flowed in two-way processes and has led to decisions and/or the resolution of problems. For example, discussion, development and negotiation between ACIAR scientists and a local university research centre to establish a new approach to introduce a new species for aquaculture. Such discussion, development and negotiation would involve both an exchange of information and shared problem-solving between ACIAR scientists and the research centre.

It should be stressed that a ‘low’ ranking should not necessarily be read as unimportant; it may in fact be very important. Similarly, a ‘high’ ranking does not necessarily mean that an activity is of the highest importance; it may make only a modest contribution to the project and overall capacity building.

The ranking system needs to be applied flexibly and will require individuals to exercise judgment relating to such matters as the amount of effort involved, and the scale and importance of individual items. It may be the case that where a considerable amount of information has been transmitted, albeit one way, there could be a case for giving a ‘medium’ ranking. Similarly with the ‘medium’ ranking, where there has been much two-way transfer there may be a case for inclusion in the ‘high’ classification. Inflation of ranking such as this will need to be justified in the section of the reporting form that asks for details of activities.

### Modifying the stakeholder categories

A second set of amendments has been in the categories presented on the matrix itself. New categories of ‘Students’ and ‘Businesspeople’ have been added to the ‘Community’ column while ‘Researchers’ has been added to the category of ‘Scientist’ (see footnote 2). The former category of ‘Development workers’ has been replaced by ‘Non-government organisation development workers’, and that of ‘Extension workers’ by ‘Government development workers’. These additions and modifications were made after extensive discussions with fieldworkers and Australian supervisors and are their recommendations. They believe that these are more understandable and useful categories for agricultural scientists and researchers.

While the team believes that Matrix 1 in its present form makes a valuable contribution to measuring capacity development, a few points need clarification:

1. The instrument provides a useful, but only partial, measure of capacity.
2. It is essentially concerned with the *process* of capacity building through the measure of communication activity. Hence, Matrix 1 has been labelled ‘Communication’.
3. In addition to the basic ratings (zero to high), details of the activities are to be included on the form and they need to be concise and easily understandable to the reader.
4. The subjectivity of the zero–high measurement scale can be reduced through clear guidelines. This was one of the major objectives of the field trips to Fiji and the Philippines. The scientists and other stakeholders interviewed in these locations, and associated supervisors in Australia, provided essential guidance and information relating to the rating system, especially how it could be implemented.

### Guiding questions

To enable participants to complete Matrix 1 accurately, it is important to pose some questions that will guide them in their task. The following questions should provide appropriate direction:

- Have you been involved in communicating the purpose, activities and results of your research project?
- With whom have you communicated?
- What information have you communicated?
- Have you received feedback or been involved in dialogue and information exchange?
- Have you been active in more complex communication leading to decisions being made?

The participant can then identify the relevant activities and related capacities and both list them and convert them into a rating on the zero–high scale.



### Who answers the questions?

While the capacity-measuring instrument is primarily designed for all scientists and researchers working on ACIAR projects, the project team recommends that the term ‘scientist and researcher’ be broadly interpreted to include all members of the scientific workforce—laboratory assistants, research assistants, research students and research program managers. It also includes social scientists and is appropriate for people in other categories who are directly participating in the practices of science and research. For example, the farmer who is engaged in crop trials could be included. The women experimenting with new feed mixes in aquaculture ponds and systematically observing and collecting the results could be respondents, as could local actors involved in supply-chain analysis.

The following are definitions of each of the domains and the activities of individuals within them:

**Institution:** The person is an active communicator in their own institution. For a research scientist, the institution might be a research institute, a university department or a government unit.

**Local:** Communication extends beyond the individual’s own main institution but only locally; for example, scientists interacting with local farmers, local government officials, local non-government organizations (NGOs) or appearing on local radio.

**Provincial:** There is engagement beyond the local community, to other parts of the province or nearby provinces. This could be with provincial government,

a group of local governments from the province, the private sector or civil society, or some combination of these actors.

**National:** This denotes communication with or through national organisations such as a national government working group or scientific committee, scientific societies or national farmers’ associations. The communication could take place at national meetings and conferences, in the national media or through contribution to the design of new curricula for educational institutions.

**Regional:** This is intended to describe activity that crosses nearby national boundaries, where scientists are used as participants and resource people for projects, workshops, conferences, consultations and other events that have regional significance. Organisations such as the Association of Southeast Asian Nations, the South Asia Association for Regional Cooperation, the Pacific Island Forum Fisheries Agency and the South Pacific Regional Environment Program would be typical regional organisations. Writing journal and media articles for regional publications would also be included.

**International:** This domain embraces conferences, meetings and other activities that draw participants or have the potential to influence scientists, governments and international organisations from across the globe. Agencies such as the Food and Agriculture Organization of the United Nations (FAO), the World Bank, the Asian Development Bank, the Global Environment Facility, the International Rice Research Institute and the Asia–Pacific Economic Cooperation forum would be

**Matrix 1.** Communication

Community	Institution	Local	Provincial	National	Regional	International
Polymakers						
Scientists and researchers						
Non-government organisation development workers						
Government development workers						
Farmers						
Students						
Businesspeople						



typical international organisations. Writing journal and media articles for international publications would also be included.

**Matrix 2. Measuring capacities**

The information in Matrix 2 complements that in Matrix 1, so that the overall capacity instrument will measure the **process** of capacity building (as set out in Matrix 1) and **emerging or immediate results** (as set out in Matrix 2) of capacity building.

**Purpose**

Matrix 2 identifies the capacities or skills that have been built through the research project or program. There are two aspects of this capacity building. First, the scientist or researcher builds their own capacities or skills. Second, they contribute to building the capacities of other stakeholders. In this report we are concentrating on the first aspect.

Matrix 2 captures the link between the actions of scientists working in the field and the emerging or immediate results apparent in identifiable changes in a range of their capacities. This range of capacities is in managing, doing science, sharing science, using public media and engaging partners. Within each category there is a set of possible capacities that enables the

person completing the report to articulate specific activities. In turn, specifying the kinds of activities that contribute to changes in a capacity allows further activities to be added over time.

It should be noted that both science and research are named in the Matrix 2 capacities of ‘Doing science/research’ and ‘Sharing science/research’. This was to ensure inclusiveness as respondents in the field drew a distinction between the natural sciences (science) and those types of research associated with the social sciences (research). To ensure that the instrument captured both these activities it was recommended by respondents that both science and research be identified in the matrix.

**Guiding questions**

To enable participants to complete Matrix 2 accurately, it is important to have one or two questions that enable them to fully understand what they are required to do. The following questions should provide appropriate direction for scientists to identify both their own capacity development and their capacities to develop capabilities in others:

- What capacities have you developed for yourself through your work on this project?
- What capabilities have you developed that have enabled you to build capacities in others?

The participant can then identify the relevant activities and related capacities and both list them and convert them into a rating on the zero–high scale outlined below.

**Matrix 2. Measuring capacities**

Community	Managing	Doing science/research	Adopting innovation into practice	Sharing science/research	Using public media	Engaging partners
Policymakers						
Scientists and researchers						
Non-government organisation development workers						
Government development workers						
Farmers						
Students						
Business people						

## Who answers the questions?

As with Matrix 1, it is the scientists and researchers on ACIAR projects who are the prime targets for this second matrix. This group includes all field scientists and research workers whether locals or expatriates, and supervisory and other associated research staff resident in Australia. Like Matrix 1, this second matrix could be completed by other persons involved in doing and sharing science as components of their roles in ACIAR projects.

The following lists of items that could be included under particular categories may assist persons filling in the form in the field. The lists are indicative rather than exhaustive.

- Managing
  - leadership skills (e.g. motivating others, ethical behaviour, developing visions)
  - planning skills (e.g. developing a strategic plan, analysing organisational data, operating planning tools)
  - financial skills (e.g. budgeting, expenditure management)
  - organising skills (e.g. human resource management skills, designing structures, designing processes)
- Doing science/research
  - acquired new scientific knowledge and research skills
  - enhanced existing scientific knowledge and research skills
  - able to design an experiment
  - able to run an experiment
  - able to conduct quantitative or qualitative social, economic and management science research
- Adopting innovation into practice
  - policy adopted by Ministry of Agriculture using research from project
  - farmers adopting new soil-management system
  - farmers cultivating a new plant
  - designing a new university course in aquaculture
  - commercialisation of research
- Sharing science/research
  - with farmers
  - with government officials
  - with immediate colleagues
  - with other scientists in the country or internationally
- Using public media
  - appearance on local television
  - appearance on national television
  - making a radio broadcast
  - article in newspaper (could be by the scientist or feature the scientist)
  - internet communication
- Engaging partners
  - able to deal with conflicts between stakeholders
  - able to work effectively in a setting where different cultures interact
  - able to communicate with diverse stakeholders
  - able to understand different points of view

## Determining the measurement scale

In capturing the emerging or immediate results, the question arose as to whether Matrix 2 should involve a star system like the one originally envisaged for Matrix 1; should it simply list achievements under each of the general capacities listed across the top of the matrix; or should the zero–high scale of Matrix 1 be employed? Field respondents and others judged that the star system would present considerable difficulties in embracing all of the categories heading the columns of Matrix 2. This is because the categories are diverse (e.g. managing versus sharing science). The problem with the second option, listing skills, is that the matrix could become cluttered with text and difficult for persons to gain a quick and concise picture of capacity development. Furthermore, all the skills would have the same weight. It may be that acquiring and demonstrating one particular skill is of vital importance (e.g. ability to run an agricultural experiment) while others in the same category are not judged to carry the same weight.

Following discussions in the field with scientists and other research staff and their Australian supervisors, it was decided to use the same zero–high evaluation scale

as in Matrix 1. However, because Matrix 2 is seeking information different from that for the first matrix, the descriptions of the rankings must change, as follows:

- **Zero**—no new capacities developed in this area

For example, a business faculty researcher at a local university has participated in a research project. He has contributed as a joint author to a publication; this is their first publication in an international journal. They have played no role beyond that in the public communication of results. They would record ‘medium’ for ‘Sharing science/research’ but ‘zero’ for ‘Using public media.’

- **Low**—a low increase in the number and complexity of capacities developed in oneself

The judgment to be made here is about the change in one’s own skill level or capacity. For example, a Master’s student working on an aquaculture research project might rate themselves as ‘low’ under ‘Engaging partners.’ This may be because their supervisor did most of the engagement with the business entrepreneur with whom they conducted their research, and the student already had connections to the business.

- **Medium**—a medium increase in number and complexity of capacities developed in oneself or others

For example, an agribusiness R&D program manager may have very little past experience in developing partnerships. They decide to put ‘medium’ for ‘Engaging partners’ because they are developing new skills in finding and engaging donors such as Unifem, the Australian Agency for International Development (AusAID) and FAO. The same person might put ‘medium’ when considering their capacity to develop and train government development workers. They would have put ‘low’ if the government development workers were brought into the project at the end and trained to deliver a series of village workshops. This researcher has trained government development workers like this many times before, but this project used an innovative approach. Government development workers were trained to organise and conduct participatory workshops with farmers to identify the research they needed. This

required the agribusiness researcher to develop a very different approach to training.

- **High**—a high increase in the number and complexity of capacities developed in oneself or others

This ranking should reflect real jumps in capacity. For example, an aquaculture researcher who had been involved in making a film about building and caring for ponds might not classify themselves as ‘high’ in the capacity of ‘Using public media,’ because they were experienced in this kind of media production before the project. But they would write ‘high’ if they were implementing an innovative approach to public media; for instance, building an online portal and training village communities to make and post their own short videos showing their work with, say, a new prawn species.

The obvious operational issue with this ranking system is specifying meanings for low, medium and high. Do we specify this for each category, possibly allocating particular numbers? There are two possibilities: either indicative numbers are provided by ACIAR for all projects, or individual projects determine their own interpretation of the three levels. There is a further ranking issue. Due to the complexity of, and variation between, projects, there are grounds for flexibility in the rankings. For example, if a large number of low-complexity capacities is developed, there may be grounds for a medium assessment rather than a high one, whereas if a low number of complex capacities is developed, there are grounds for a medium rather than a low categorisation. This is a difficult area and requires normative judgment. The details given on the form will enable others to assess the appropriateness of the rankings.

As with Matrix 1, it should be noted that a ranking of ‘low’ does not necessarily mean that an activity is unimportant. Depending on the design, aims and make-up of a project, an item ranked ‘low’ may still be one of vital importance for a project. A note on an item’s importance may be placed in the spaces for details on the matrices.

# General issues

## Who should complete the instrument?

There are several questions relating to who should complete the instrument for measuring capacity development. First, it is primarily directed at the category of 'Scientists/ researchers', as specified in the terms of reference for this project. As for Matrix 1, the project team recommends that the term 'scientist and researcher' be broadly interpreted to include the entire scientific workforce, including laboratory managers, field assistants, research students and so forth. However, it is entirely possible to administer this instrument to other stakeholders, e.g. farmers and government development workers. Such stakeholders can potentially provide valuable feedback about projects and their capacity-building effectiveness.

A second question concerns whether the instrument should be self-administered or if supervisors should be charged with the job of completing the task in consultation with the person being assessed. This may have to be considered on a case-by-case basis as in some instances this may be acceptable and appropriate but in others it may not. Feedback from the field favoured individual completion of the instrument.

## When should the instrument be completed?

The capacity evaluation instrument could be used at various stages in a project. It could be used at the outset to map the expectations about what capacities will be developed. These capacities might be specified in the project planning documents. The tool could then be used

at the project midpoint to gauge the degree to which expectations were being realised and what other capacities were emerging. It might also be used towards the end of a project as an evaluation mechanism. At the midpoint stage, the results obtained from using the instrument should be considered in terms of whether capacity-building expectations are being met, what measures should be taken to meet expectations or what additional opportunities have arisen since the start of the project. At the end of a project, the instrument can be used to inform project evaluation relating to what capacities have been developed and what lessons have been learned.

## What problems may emerge in self-administration of the instrument?

The critical issue is to ensure that participants understand how to complete the instrument. This should largely be achieved by providing clear guidelines and illustrations of how to determine what activities to include and what point on the zero-high scale should be chosen for particular items. Participants must also realise that their responses will probably involve perceptions of how their work has helped build not only their own capacities but also those of others. However, it is their own capacities that are the primary concern.

## Use and storage of information

The intention of the capacity-measuring instrument is that the information recorded on the two matrixes be used to aid decision-making about and within

ACIAR projects. For example, information gathered at the middle of a project can be used to plan and adjust activities for the later stages of the project. Information gathered in one project could be applicable to other similar projects or projects in the same country. Aggregated information at headquarters can be used to identify activities and approaches that contribute to sustained achievements on behalf of ACIAR in capacity building and conversely those that do not.

For the information to be useful it must be in an appropriate form. However, what is appropriate for one situation may be inappropriate in another. Raw data from a project may be the ideal for working within that project but other users may require some processing to have occurred. For example, headquarters staff concerned with identifying new initiatives will require the latter.

To be useful, data must be accessible. It is therefore recommended that the data gathered using this

capacity-building instrument be made widely available in ACIAR. This would facilitate timely usage. Internal organisational publicity about what the instrument is, why it is useful and how it can be used will be required to familiarise staff with the database. The data also need to be stored in a user-friendly manner that makes identification of what's relevant easy and its retrieval a simple process.

It was clear from our interviews in Australia and overseas that scientists and researchers are actively seeking new ideas for application in ACIAR projects and information about whom they can contact to find out more about particular items. They are looking for innovations and successes. The data gathered through this capacity-measuring instrument will assist them to identify how capacities are being built across all ACIAR projects. Thus, the instrument can serve as a networking tool that further facilitates capacity building.

# Reference

Baser H. and Morgan P. 2008. Capacity, change and performance. Study report. Discussion Paper No. 59B. European Centre for Development Policy Management: Maastricht, The Netherlands.



# Appendix 1 Using the capacity-measuring instrument to assess capacity built: survey instructions and form

## General

Capacity building is a key objective of ACIAR projects. This is a survey intended to help you and ACIAR understand what capacity development is occurring in your project. The survey measures the individual capacities that have been developed during participation in this ACIAR project in a variety of areas, for example, in management, science, communication.

There are two parts to the survey. One measures the communication aspect of capacity building (Matrix 1). In this part of the survey you are being asked to reflect on and record your communication activities. Part 2 of the survey measures a range of relevant capacities developed (Matrix 2). In Matrix 2 you are asked about the capacities you have built or improved by being involved in this ACIAR project or program. Together, they provide an overall picture of what capacities have been developed by you for yourself, including your capacities to build capability in others.

## How to complete Matrix 1: Communication

1. This matrix is about communicating science and research. Record your activities.
2. Please use the following rankings and place them in the appropriate boxes on the table.

- a. **Zero**—no activity involving the transfer of information between scientist/researcher and other persons or organisations.
  - b. **Low**—one-way transfer of information.
  - c. **Medium**—where information flow has taken place in a two-way process; for example, such as when scientists and researchers share information with other stakeholders and receive feedback from them.
  - d. **High**—where information has flowed in two-way processes and has led to decisions and/or the resolution of problems.
3. There is flexibility in these rankings. For example, somebody who has done a great deal of one-way transfer—for example, teaching graduate and undergraduate classes or making presentations to stakeholders—might grade themselves ‘Medium’ rather than ‘Low’.
  4. The following questions will help you to decide the rankings:
    - a. Have you been involved in communicating the purpose, activities and results of your research project?
    - b. Who have you communicated with?
    - c. What information have you communicated?
    - d. Have you received feedback?
    - e. Has this feedback led to decisions being made?
  5. For each entry (not the Zero entries) on the table, please give a brief explanation in the spaces below the table.



### Matrix 1. Communication

Community	Institution	Local	Provincial	National	Regional	International
Policymakers						
Scientists and researchers						
Non-government organisation development workers						
Government development workers						
Farmers						
Students						
Businesspeople						

### Explanatory notes for Matrix 1

- |    |     |
|----|-----|
| 1. | 6.  |
| 2. | 7.  |
| 3. | 8.  |
| 4. | 9.  |
| 5. | 10. |

### How to complete Matrix 2: Measuring capacities

1. This matrix is about the actual capacities developed by you for yourself in this project, including your capacities to build capability in others. Record increases in and development of your capacities.

2. The guiding questions are:

- what capacities have you developed for yourself through your work on this project?
- what capabilities have you developed that have enabled you to build capacities in others?

3. There are many possible capacities under each capacity heading. Examples are provided below:

- **Managing**
  - leadership skills (e.g. motivating others, ethical behaviour, developing visions)
  - planning skills (e.g. developing a strategic plan, analysing organisational data, operating planning tools)

- financial skills (e.g. budgeting, expenditure management, grant management and grant applications)
- organising skills (e.g. human resource management skills, designing structures, designing processes, operating processes)

- **Doing science**
  - acquired new scientific knowledge and research skills
  - enhanced existing scientific knowledge and research skills
  - able to design an experiment
  - able to run an experiment
  - able to conduct quantitative or qualitative social, economic and management science research

- **Adopting innovation into practice**
  - policy adopted by Ministry of Agriculture using research from project
  - farmers adopting new soil management system
  - farmers cultivating a new plant

- designing a new university course in aquaculture
  - commercialisation of research
  - **Sharing science**
    - with farmers
    - with government officials
    - with immediate colleagues
    - with other scientists in the country or internationally
  - **Using public media**
    - appearance on local television
    - appearance on national television
    - making a radio broadcast
    - article in newspaper (could be by the scientist or feature the scientist)
    - internet communication
  - **Engaging partners**
    - able to deal with conflicts between stakeholders
    - able to work effectively in a setting where different cultures interact
    - able to communicate with diverse stakeholders
    - able to understand different points of view
4. Please use the following rankings and place them in the appropriate boxes on the table.
- a. **Zero**—no capacities developed in oneself or others
  - b. **Low**—a low number and complexity of capacities developed in oneself or others
  - c. **Medium**—a medium number and complexity of capacities developed in oneself or others
  - d. **High**—a high number and complexity of capacities developed in oneself or others

**Matrix 2.** Measuring capacities

Community	Managing	Doing science/ research	Adopting innovation into practice	Sharing science/ research	Using public media	Engaging partners
Polymakers						
Scientists and researchers						
Non-government organisation development workers						
Government development workers						
Farmers						
Students						
Business people						

**Explanatory notes for Matrix 2**

- |    |     |
|----|-----|
| 1. | 6.  |
| 2. | 7.  |
| 3. | 8.  |
| 4. | 9.  |
| 5. | 10. |

## Appendix 2 Hypothetical example of a completed survey form for a research scientist in the field

### Background

Maere is a research scientist, originally from Kiribati, working with the Regional Pacific Community (RPC). Her background is that of a research Master's qualified university researcher in aquaculture and she has gradually moved into coordinating scientific research in aquaculture for the RPC. She has been working in this role for 10 years and has extensive experience in a wide range of projects, communities and sectors in the Asia-Pacific region.

Given her role, responsibilities and residency in the Pacific she fits the characteristics of an in-country scientist.

Maere's experience as a career scientist and scientific advisor means that she knows the importance of being clear about the kinds of capacities that have or are emerging from the project work. The project she is reporting on is one introducing *Macrobrachium rosenbergii*, a giant freshwater prawn species that can be grown in intensive farming in the Pacific region. This project has been running for 3 years and has been successful in testing the viability of this species as a source of protein and as a commodity for trade. Maere is always seeking opportunities to communicate what she has learned on this project and to establish a basis for the next phase.

The purpose of the past 3 years of project work was to test the prawn's productivity and identify suitable feedstocks. Field trials have demonstrated that unlike other freshwater prawn species this is one that does not defend its territory aggressively. In working with landowners to introduce the species the project has established that ponds can simply be dug and, with a reasonable amount of care, will provide a suitable habitat for the prawns to grow. Pond yields are clearly viable and competitive with other aquaculture varieties and other crops. Once removed from the ponds these prawns, if kept in fresh water, will survive up to 10 hours, bringing the prawn well within the time needed to reach local markets.

This initial project has involved funding from ACIAR as a mini project to conduct basic field trials. These trials have involved recruiting and working with two extension officers directly coordinating the trials in two locations; input from two lecturers and their graduate students from the University of the South Pacific (USP); and coordination between Maere, ACIAR and AusAID in Suva.

In completing the form, Maere has been reluctant to include a 'Zero' rating: much of what she does involves some form of significant communication across all these categories. Instead she has concentrated on the key relationships in delivering this project.

**Matrix 1. Communication**

Community	Institution	Local	Provincial	National	Regional	International
Policymakers				Medium (1)	Medium (2)	Medium (3)
Scientists and researchers	Medium (4)				High (5)	High (6)
Non-government organisation development workers						
Government development workers					Medium (7)	
Farmers		Low (8)	Low (8)			
Students						
Businesspeople						

**Explanatory notes for Matrix 1**

- At the outset of this project I met with and explained the project to the Head of Fisheries in the country where we are trialling this prawn species. We have kept in regular contact via email, phone, letters and face-to-face meeting on this project and we are about to develop a new training initiative through the Ministry of Fisheries.
- Liaison at the beginning of the project to identify with regional counterparts the importance of this project. Part of organising this project was the commitment to regular communication with counterparts in the region on this trial, and I have provided regular updates on progress over the past 3 years.
- My work involves linking the project, ACIAR and AusAID. I do this by regular communication with ACIAR in Suva and the scientists working from Australia. Through the RPC I became aware that AusAID could provide additional funding for the extension work associated with this research, and I liaised with ACIAR and AusAID to explore and then develop the approach we have now adopted and carried to completion.
- From the outset this project built in opportunities to work with, involve and draw on the research and teaching at USP. By talking with the lecturers working on feed projects at USP we have developed a healthy dialogue on ways to improve the trial. Also, I have participated in seminars at USP over the past 3 years on this project, which has helped communicate what we are learning to staff and students at USP.
- Working with counterparts in RPC has been critical to successfully delivering this project. Communication first focused on the development of the project brief in consultation with my country counterparts in the fisheries area. However, as we worked to find appropriate feed I was able to draw on the depth of expertise in prawn species and feed types, with one scientist providing invaluable input as we designed the feed types and trials.
- I presented an invited paper to an international conference on large prawn aquaculture in July 2010. This was an important opportunity to share the results of the project and gain further knowledge from an international conference. While I have presented at international conferences in the past, this was a particularly significant conference and I was an invited keynote speaker.
- This involved working with the national fisheries department to recruit and then train government fieldworkers to talk with local and regional farmers groups.
- I tend to work with farmers on a fly-in, fly-out basis, whereas my two development workers/scientists are regularly working with landowners to jointly solve problems.

**Matrix 2.** Measuring capacities

Community	Managing	Doing science/research	Adopting innovation into practice	Sharing science/research	Using public media	Engaging partners
Polymakers			Low (1)			High (2)
Scientists and researchers	Low (3)	Medium (4)	Medium (5)		Medium (6)	
Non-government organisation development workers						
Government development workers			Medium (7)	Medium (8)		
Farmers						
Students		Medium (9)				
Business people						

**Explanatory notes for Matrix 2**

- I am talking with the Head of Fisheries in the country where we have been conducting the trial and with local scientists about adopting more widely the innovations we have developed in this project. Part of this is developing a training program for those in the Fisheries Department and for farmers not involved in the trial. To date we have established a training module and will be exploring how and where to introduce that module. This is fairly routine and draws on my existing skills and capacities, but every project has its challenges. In the next phase I am hoping to work with fisheries departments in three other Pacific countries. That will be more challenging.
- We are establishing a formal memorandum of understanding (MOU) between the Fisheries Department and this project so that we can together investigate opportunities to work with FAO to extend this project across the Pacific region. I have developed MOUs with the Fisheries Department in the past but I have not coordinated negotiations with FAO.
- I have managed projects such as these in the past, so I am familiar with many of the tasks involved in successfully completing such a project.
- Because aquaculture is a mixture of different types of expertise we called on country project counterparts to advise on the giant prawn as a species for intensive cultivation, possible feeds, and optimising feeds. This involved research work extending scientific knowledge in understanding this particular species and its suitability for commercialisation.
- Both adopting innovations into practice and the sharing of science have been captured in a training module. The knowledge gained through this project has been recorded and developed into a prawn-farming module to be used in the training of farmers. There was some innovation in developing the module and I was involved in working with teachers and senior school students to trial the module, not something I have done before.
- I will be working with RPC to establish a website on large prawns in the Pacific, to help enable access to the information we have collected in this project. I have done static information websites in other projects but this time we are adding social networking tools.
- I worked with the national fisheries department to train a small group of development workers to help with the first field trials. This involved preparing the fieldworkers by introducing the

*continued ...*

*Matrix 2. (continued)*

techniques we knew were likely to work when conducting the field trials. Part of the training was in the use of participatory co-design workshops, something new for me, but we are hoping this will engage village communities and give participants more of a sense of ownership.

8. Wider training of Fisheries Department officers and government and NGO extension workers is yet to happen but there is considerable interest from the Fisheries Department and we will be organising training before the end of this year.

9. Several postgraduate students have become involved in the trialling of feedstock and testing of growing conditions for this prawn. I have been working with their supervisors to help identify the kinds of techniques those students should be familiar with, or areas where further research could be usefully conducted by those students. I organised a seminar for the students to present and discuss their projects, a much more hands-on role with the students than I have had for some years.

## Appendix 3 Hypothetical example of a completed survey form for a research assistant in the field

### Personal profile

I am a research assistant on a protected cropping project in the Philippines. My work involves working with research scientists to develop elements of the project

and doing community organisation and fieldwork, particularly with farmers.

This capacity-building snapshot is being undertaken at the midpoint of the project to determine progress and provide some directions for the future and long-term development for the project.

**Matrix 1.** Communication

Community	Institution	Local	Provincial	National	Regional	International
Policymakers		Zero (1)				
Scientists and researchers	High (2)	High (2)	High (2)			
Non-government organisation development workers	Low (3)	High (4)	Medium (4)			
Government development workers		Medium (5)	Medium (5)			
Farmers	High (6)	High (6)	Medium (6)			
Students	Low (7)					
Businesspeople	Low (8)	High (8)		Medium (9)		

### Explanatory notes for Matrix 1

1. While I have had no input into local policy yet, part of my role is to work closely with the local community and community leaders. It is intended that this involvement will lead to policy adoption towards the end of the project.
2. I work closely with the research scientists at my university and with other researchers at the local level. This has included meetings and discussions with scientists on different and related projects up

*continued ...*

*Matrix 1. (continued)*

- to and including provincial level to share ideas and outcomes of specific project activities.
3. I attended a seminar with NGO development workers at the university as observer.
  4. I have worked closely with NGO development workers in the field and have ongoing communication with them, particularly at the local level where practices have been changed and influenced as a result of this work. Interaction at provincial level has been less active, but includes formal and informal meetings.
  5. I have participated in field days with local and provincial government development workers.
  6. I work closely with farmers across my local and provincial areas. Interaction and communication includes community organisation, field days, data collection and community meetings.
  7. I have spoken to a class of undergraduate students undertaking introductory studies in agricultural innovation.
  8. I participated in three forums with businesspeople at the local level who have shown an interest in the project and its potential for local economic development.
  9. As a result of these forums, I was invited to participate in a national business forum to discuss the project.

**Matrix 2. Measuring capacities**

<b>Community</b>	<b>Managing</b>	<b>Doing science/research</b>	<b>Adopting innovation into practice</b>	<b>Sharing science/research</b>	<b>Using public media</b>	<b>Engaging partners</b>
Polymakers	Low (1)		Low (1)			
Scientists and researchers	Medium (2)	Medium (2)	Medium (2)	Medium (2)		
Non-government organisation development workers	Medium (3)	Medium (3)	Medium (3)	Medium (3)	Low (4)	Medium (3)
Government development workers		Zero (5)	Low (6)	Low (6)		
Farmers	High (7)	High (7)	High (7)	High (7)		High (7)
Students	Low (8)	Low (9)		Low (9)		
Business people			Low (10)	Low (10)		Medium (11)

**Explanatory notes for Matrix 2**

1. I am developing new skills in managing and working with local decision-makers to put agricultural innovations into practice.
  2. I have set up and run experiments, including the collection and collation of data, maintenance of equipment and ongoing monitoring, with colleagues, farmers and community members. For the first time, I really felt I was in charge and that these tasks were my responsibility.
  3. Interaction with NGO development workers has included updates and briefings on progress, organising and running meetings between NGOs
- continued ...*



*Matrix 2. (continued)*

and farmers, maintaining lines of communication between them and field scientists. I am experienced with this aspect of the work but there were some challenges in this project with some conflicts that needed sorting out.

4. I wrote an article for a newsletter for one of the NGOs, describing the project and its potential benefits, and went on radio and the local TV news. Doing live broadcasting is something I find challenging, so a good chance to practice.
5. In the second half of the project I will be working with development workers from the Department of Agriculture to produce an extension to this project for wider application.
6. I learned new techniques of crop monitoring relevant to this project and am planning to incorporate these into the trials.
7. I have worked extensively with the farming community and have developed skills in most

of these areas through applied science and community management and development. But this project has called on all my skills and more, due to conflicts over land use and land management. I have been working with the Land Justice Project to help resolve some of these issues and have increased my capacity to facilitate activities in conflict situations.

8. I assisted in arranging a field excursion for students to our field sites.
9. I spoke to the class on-site about the project and answered their questions.
10. I spoke to businesspeople about the project.
11. As a result of being able to speak to business people I have been able to begin engaging them as active partners in our project with the hope of gaining additional funding to extend it to other areas. I have worked with the business community before but not as funding partners—interesting.

## IMPACT ASSESSMENT SERIES

No.	Author(s) and year of publication	Title	ACIAR project numbers
1	Centre for International Economics 1998.	Control of Newcastle disease in village chickens	AS1/1983/034, AS1/1987/017 and AS1/1993/222
2	George P.S. 1998.	Increased efficiency of straw utilisation by cattle and buffalo	AS1/1982/003, AS2/1986/001 and AS2/1988/017
3	Centre for International Economics 1998.	Establishment of a protected area in Vanuatu	ANRE/1990/020
4	Watson A.S. 1998.	Raw wool production and marketing in China	ADP/1988/011
5	Collins D.J. and Collins B.A. 1998.	Fruit fly in Malaysia and Thailand 1985–1993	CS2/1983/043 and CS2/1989/019
6	Ryan J.G. 1998.	Pigeonpea improvement	CS1/1982/001 and CS1/1985/067
7	Centre for International Economics 1998.	Reducing fish losses due to epizootic ulcerative syndrome—an ex ante evaluation	FIS/1991/030
8	McKenney D.W. 1998.	Australian tree species selection in China	FST/1984/057 and FST/1988/048
9	ACIL Consulting 1998.	Sulfur test KCL–40 and growth of the Australian canola industry	PN/1983/028 and PN/1988/004
10	AACM International 1998.	Conservation tillage and controlled traffic	LWR2/1992/009
11	Chudleigh P. 1998.	Postharvest R&D concerning tropical fruits	PHT/1983/056 and PHT/1988/044
12	Waterhouse D, Dillon B. and Vincent D. 1999.	Biological control of the banana skipper in Papua New Guinea	CS2/1988/002-C
13	Chudleigh P. 1999.	Breeding and quality analysis of rapeseed	CS1/1984/069 and CS1/1988/039
14	McLeod R, Isvilanonda S. and Wattanutchariya S. 1999.	Improved drying of high moisture grains	PHT/1983/008, PHT/1986/008 and PHT/1990/008
15	Chudleigh P. 1999.	Use and management of grain protectants in China and Australia	PHT/1990/035
16	McLeod R. 2001.	Control of footrot in small ruminants of Nepal	AS2/1991/017 and AS2/1996/021
17	Tisdell C. and Wilson C. 2001.	Breeding and feeding pigs in Australia and Vietnam	AS2/1994/023
18	Vincent D. and Quirke D. 2002.	Controlling <i>Phalaris minor</i> in the Indian rice–wheat belt	CS1/1996/013
19	Pearce D. 2002.	Measuring the poverty impact of ACIAR projects—a broad framework	
20	Warner R. and Bauer M. 2002.	<i>Mama Lus Frut</i> scheme: an assessment of poverty reduction	ASEM/1999/084
21	McLeod R. 2003.	Improved methods in diagnosis, epidemiology, and information management of foot-and-mouth disease in Southeast Asia	AS1/1983/067, AS1/1988/035, AS1/1992/004 and AS1/1994/038
22	Bauer M, Pearce D. and Vincent D. 2003.	Saving a staple crop: impact of biological control of the banana skipper on poverty reduction in Papua New Guinea	CS2/1988/002-C
23	McLeod R. 2003.	Improved methods for the diagnosis and control of bluetongue in small ruminants in Asia and the epidemiology and control of bovine ephemeral fever in China	AS1/1984/055, AS2/1990/011 and AS2/1993/001
24	Palis F.G., Sumalde Z.M. and Hossain M. 2004.	Assessment of the rodent control projects in Vietnam funded by ACIAR and AUSAID: adoption and impact	AS1/1998/036

## IMPACT ASSESSMENT SERIES <CONTINUED>

No.	Author(s) and year of publication	Title	ACIAR project numbers
25	Brennan J.P. and Quade K.J. 2004.	Genetics of and breeding for rust resistance in wheat in India and Pakistan	CS1/1983/037 and CS1/1988/014
26	Mullen J.D. 2004.	Impact assessment of ACIAR-funded projects on grain-market reform in China	ADP/1997/021 and ANRE1/1992/028
27	van Bueren M. 2004.	Acacia hybrids in Vietnam	FST/1986/030
28	Harris D. 2004.	Water and nitrogen management in wheat–maize production on the North China Plain	LWR1/1996/164
29	Lindner R. 2004.	Impact assessment of research on the biology and management of coconut crabs on Vanuatu	FIS/1983/081
30	van Bueren M. 2004.	Eucalypt tree improvement in China	FST/1984/057, FST/1987/036, FST/1988/048, FST/1990/044, FST/1994/025, FST/1996/125 and FST/1997/077
31	Pearce D. 2005.	Review of ACIAR's research on agricultural policy	
32	Tingsong Jiang and Pearce D. 2005.	Shelf-life extension of leafy vegetables—evaluating the impacts	PHT/1994/016
33	Vere D. 2005.	Research into conservation tillage for dryland cropping in Australia and China	LWR2/1992/009 and LWR2/1996/143
34	Pearce D. 2005.	Identifying the sex pheromone of the sugarcane borer moth	CS2/1991/680
35	Raitzer D.A. and Lindner R. 2005.	Review of the returns to ACIAR's bilateral R&D investments	
36	Lindner R. 2005.	Impacts of mud crab hatchery technology in Vietnam	FIS/1992/017 and FIS/1999/076
37	McLeod R. 2005.	Management of fruit flies in the Pacific	CS2/1989/020, CS2/1994/003, CS2/1994/115 and CS2/1996/225
38	ACIAR 2006.	Future directions for ACIAR's animal health research	
39	Pearce D., Monck M., Chadwick K. and Corbishley J. 2006.	Benefits to Australia from ACIAR-funded research	AS2/1990/028, AS2/1994/017, AS2/1994/018, AS2/1999/060, CS1/1990/012, CS1/1994/968, FST/1993/016 and PHT/1990/051
40	Corbishley J. and Pearce D. 2006.	Zero tillage for weed control in India: the contribution to poverty alleviation	CS1/1996/013
41	ACIAR 2006.	ACIAR and public funding of R&D. Submission to Productivity Commission study on public support for science and innovation	
42	Pearce D. and Monck M. 2006.	Benefits to Australia of selected CABI products	
43	Harris D.N. 2006.	Water management in public irrigation schemes in Vietnam	LWR1/1998/034 and LWR2/1994/004
44	Gordon J. and Chadwick K. 2007.	Impact assessment of capacity building and training: assessment framework and two case studies	CS1/1982/001, CS1/1985/067, LWR2/1994/004 and LWR2/1998/034
45	Turnbull J.W. 2007.	Development of sustainable forestry plantations in China: a review	
46	Monck M. and Pearce D. 2007.	Mite pests of honey bees in the Asia–Pacific region	AS2/1990/028, AS2/1994/017, AS2/1994/018 and AS2/1999/060

## IMPACT ASSESSMENT SERIES <CONTINUED>

No.	Author(s) and year of publication	Title	ACIAR project numbers
47	Fisher H. and Gordon J. 2007.	Improved Australian tree species for Vietnam	FST/1993/118 and FST/1998/096
48	Longmore C., Gordon J. and Bantilan M.C. 2007.	Assessment of capacity building: overcoming production constraints to sorghum in rainfed environments in India and Australia	CS1/1994/968
49	Fisher H. and Gordon J. 2007.	Minimising impacts of fungal disease of eucalypts in South-East Asia	FST/1994/041
50	Monck M. and Pearce D. 2007.	Improved trade in mangoes from the Philippines, Thailand and Australia	CS1/1990/012 and PHT/1990/051
51	Corbishley J. and Pearce D. 2007.	Growing trees on salt-affected land	FST/1993/016
52	Fisher H. and Gordon J. 2008.	Breeding and feeding pigs in Vietnam: assessment of capacity building and an update on impacts	AS2/1994/023
53	Monck M. and Pearce D. 2008.	The impact of increasing efficiency and productivity of ruminants in India by the use of protected-nutrient technology	AH/1997/115
54	Monck M. and Pearce D. 2008.	Impact of improved management of white grubs in peanut-cropping systems	CS2/1994/050
55	Martin G. 2008.	ACIAR fisheries projects in Indonesia: review and impact assessment	FIS/1997/022, FIS/1997/125, FIS/2000/061, FIS/2001/079, FIS/2002/074, FIS/2002/076, FIS/2005/169 and FIS/2006/144
56	Lindner B. and McLeod P. 2008.	A review and impact assessment of ACIAR's fruit-fly research partnerships—1984 to 2007	CP/1997/079, CP/2001/027, CP/2002/086, CP/2007/002, CP/2007/187, CS2/1983/043, CS2/1989/019, CS2/1989/020, CS2/1994/003, CS2/1994/115, CS2/1996/225, CS2/1997/101, CS2/1998/005, CS2/2003/036, PHT/1990/051, PHT/1993/87 and PHT/1994/133
57	Montes N.D., Zapata Jr N.R., Alo A.M.P. and Mullen J.D. 2008.	Management of internal parasites in goats in the Philippines	AS1/1997/133
58	Davis J., Gordon J., Pearce D. and Templeton D. 2008.	Guidelines for assessing the impacts of ACIAR's research activities	
59	Chupungco A., Dumayas E. and Mullen J. 2008.	Two-stage grain drying in the Philippines	PHT/1983/008, PHT/1986/008 and PHT/1990/008
60	Centre for International Economics 2009.	ACIAR Database for Impact Assessments (ADIA): an outline of the database structure and a guide to its operation	
61	Fisher H. and Pearce D. 2009.	Salinity reduction in tannery effluents in India and Australia	AS1/2001/005
62	Francisco S.R., Mangabat M.C., Mataia A.B., Acda M.A., Kagaoan C.V., Laguna J.P., Ramos M., Garabiag K.A., Pagua F.L. and Mullen J.D. 2009.	Integrated management of insect pests of stored grain in the Philippines	PHT/1983/009, PHT/1983/011, PHT/1986/009 and PHT/1990/009
63	Harding M., Tingsong Jiang and Pearce D. 2009.	Analysis of ACIAR's returns on investment: appropriateness, efficiency and effectiveness	
64	Mullen J.D. 2010.	Reform of domestic grain markets in China: a reassessment of the contribution of ACIAR-funded economic policy research	ADP/1997/021 and ANRE1/1992/028

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No.	Author(s) and year of publication	Title	ACIAR project numbers
65	Martin G. 2010.	ACIAR investment in research on forages in Indonesia	AS2/2000/103, AS2/2000/124, AS2/2001/125, LPS/2004/005, SMAR/2006/061 and SMAR/2006/096
66	Harris D.N. 2010.	Extending low-cost fish farming in Thailand: an ACIAR–World Vision collaborative program	PLIA/2000/165
67	Fisher H. 2010.	The biology, socioeconomics and management of the barramundi fishery in Papua New Guinea’s Western Province	FIS/1998/024
68	McClintock A. and Griffith G. 2010.	Benefit–cost meta-analysis of investment in the International Agricultural Research Centres	
69	Pearce D. 2010.	Lessons learned from past ACIAR impact assessments, adoption studies and experience	
70	Harris D.N. 2011.	Extending low-chill fruit in northern Thailand: an ACIAR–World Vision collaborative project	PLIA/2000/165
71	Lindner R. 2011.	The economic impact in Indonesia and Australia from ACIAR’s investment in plantation forestry research, 1987–2009	FST/1986/013, FST/1990/043, FST/1993/118, FST/1995/110, FST/1995/124, FST/1996/182, FST/1997/035, FST/1998/096, FST/2000/122, FST/2000/123, FST/2003/048 and FST/2004/058
72	Lindner R. 2011.	Frameworks for assessing policy research and ACIAR’s investment in policy-oriented projects in Indonesia	ADP/1994/049, ADP/2000/100, ADP/2000/126, AGB/2000/072, AGB/2004/028, ANRE1/1990/038, ANRE1/1993/023, ANRE1/1993/705, EFS/1983/062 and EFS/1988/022
73	Fisher H. 2011.	Forestry in Papua New Guinea: a review of ACIAR’s program	FST/1994/033, FST/1995/123, FST/1998/118, FST/2002/010, FST/2004/050, FST/2004/055, FST/2004/061, FST/2006/048, FST/2006/088, FST/2006/120, FST/2007/078 and FST/2009/012
74	Brennan J.P. and Malabayabas A. 2011.	International Rice Research Institute’s contribution to rice varietal yield improvement in South-East Asia	
75	Harris D.N. 2011.	Extending rice crop yield improvements in Lao PDR: an ACIAR–World Vision collaborative project	CIM/1999/048, CS1/1995/100 and PLIA/2000/165
76	Grewal B., Grunfeld H. and Sheehan P. 2011.	The contribution of agricultural growth to poverty reduction	
77	Saunders C., Davis L. and Pearce D. 2012.	Rice–wheat cropping systems in India and Australia and development of the ‘Happy Seeder’	LWR/2000/089, LWR/2006/132 and CSE/2006/124
78	Carpenter D. and McGillivray M. 2012	A methodology for assessing the poverty-reducing impacts of Australia’s international agricultural research	
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