



Learning from the Renewable Natural Resources Research Strategy

Poverty measurement, mapping and analysis

Although poverty analysis was not part of the original design of the Renewable Natural Resources Research Strategy (RNRRS, 1995–2006), some programmes within the RNRRS developed poverty measurement, mapping and analysis methodologies. These helped to address data gaps and provide insights for future work in this area.

Key messages

- Where possible, natural resource research projects should draw on the wealth of data and methodologies already available.
- Causal diagrams are a useful and reasonably rapid tool to display connections between the problems that collectively cause poverty, and to focus attention on root causes.
- Poverty mapping can be used as a valuable decision-support tool to help identify and evaluate investment choices, as well as being applied to policy and project design.
- Scenario building and the generation of likely progressions enable researchers to evaluate long-term developments.
- Developmental impact must be measurable and assessable and at least some of the indicators should be locally chosen and relevant.
- Poverty research and development should be planned and implemented using a broad multi-stakeholder approach including governments, civil society organisations, the poor, the research and development community and investors.

Introduction

The RNRRS research programmes were not originally designed to carry out their own poverty analysis. The thinking was that other institutions and organisations had a more direct mandate to carry out this type of work and had a comparative advantage in doing so. Generally, the RNRRS programmes were expected to use the tools and results generated by others. However, where appropriate methodologies were not available, or methodologies needed to be adapted or enhanced to suit different contexts, interesting work was carried out. This Brief shares that experience.

The Brief draws upon project outputs from four of the ten programmes: the Aquaculture and Fish Genetics Research Programme (AFGRP), the Forestry Research Programme (FRP), the Animal Health Programme (AHP) and the Livestock Production Programme (LPP). The AHP and the LPP worked on a series of projects with the International Livestock Research Institute (ILRI) and these are included here. These research clusters have been selected as examples of successful or significant use of poverty analysis. This summary serves to synthesise and highlight some of the methodologies used and does not seek to provide a detailed 'how to' guide.

Background

‘[In order] to know what helps to reduce poverty, what works and what does not, what changes over time, poverty has to be defined, measured, and studied – and even experienced’ (www.worldbank.org/poverty). Poverty has different dimensions (see Box 1) and its many facets – including vulnerability, inequality, lack of access to education and health care, and limited voice and opportunities – need to be understood. This Brief is structured according to the steps on the path to understanding poverty: measurement, analysis and mapping.

Measuring poverty

Poverty can be measured at global, national or local levels. A common method used to measure poverty (particularly at global and national levels) is based on consumption or income levels. People are categorised as poor if their income or consumption falls below a certain threshold. In addition to measuring income poverty, there are methods for measuring and studying the many other important dimensions of poverty (indicators for health, education, access to services, social exclusion and vulnerability for example). RNRRS projects tended to focus on measurement of poverty in project localities where inadequate information existed. They used a variety of methods.

Classification

Several RNRRS programmes used some form of classification or disaggregation to help assess poverty and quantify ‘recommendations domains’, the spatial areas or target groups affected by the problem or issue that particular research projects sought to address.

The LPP, for example, developed a subjective description of poverty, relating asset ownership and function to wellbeing, through work with local communities in Mexico and Bolivia and spreadsheet modelling of their livelihoods (R7823). They developed a dynamic understanding of people’s livelihood strategies, classified as ‘hanging in’, ‘stepping up’ and ‘stepping out’. ‘Hanging in’ describes livelihood strategies undertaken by households in order to maintain their livelihoods at a survival level; ‘stepping up’ occurs when

Box 1. What is poverty?

‘Poverty is hunger. Poverty is lack of shelter. Poverty is being sick and not being able to see a doctor. Poverty is not having access to school and not knowing how to read. Poverty is not having a job, is fear for the future, living one day at a time. Poverty is losing a child to illness brought about by unclean water. Poverty is powerlessness, lack of representation and freedom.’

Source: www.worldbank.org/poverty

investments are made in existing activities to increase their returns; and ‘stepping out’ occurs where existing activities are engaged in, in order to accumulate assets that can then be used as a basis for investment in alternative, higher-return livelihood activities (Dorward et al., 2005).

FRP adopted some of the Consultative Group on International Agricultural Research (CGIAR)/ Centre for International Forestry Research (CIFOR) classes of the forest-dependent poor as focus groups: resource-poor farmers, artisans, the landless and the peri-urban poor. But two years later, these focus groups were abandoned because the composite livelihoods of the forest-dependent poor meant that people shifted between the groups according to the nature of the problem.

Quantitative measurement

Some projects found that available quantitative measurements were lacking and developed methodologies to address these gaps.

An FRP funded project, for example, assessed existing information on the numbers of forest-dependent people (FDP) and found that there was no reliable regional or global data available. The project suggested alternative methodologies to allow numbers of FDPs to be estimated using reliable economic modelling and/or statistical techniques (ZF0132).

Stakeholder workshops and analysis

Stakeholder analysis is a multi-perspective participatory approach, which uses qualitative data to

assess the interests and influence of different groups with respect to an activity or reform. Stakeholder workshops have been used throughout the RNRRS to gather information as well as assess and test criteria and indicators.

AFGRP found that stakeholder analysis is also an important step in developing a shared idea of the work to be done and how to go about it, so as to improve the way research is designed and carried out.

Analysing poverty

Once poverty has been measured, poverty and its determinants can be analysed. Analysis tools can be quantitative or qualitative and range from descriptions to statistical methods. Various methods were used within the RNRRS, two of which are discussed here.

Participatory situation analysis

Participatory situation analysis aims to gain an understanding of the local situation in its wider context, including social, economic, physical and financial aspects, and uses participatory techniques and secondary information.

Participatory situation analysis was used successfully in the AFGRP cluster as the first step to investigating the social, economic and technical feasibility of aquaculture options in small-scale farmer-managed irrigation systems in the lowland dry zone of Sri Lanka. The aim was to determine the most relevant initiatives that would benefit the poor. The process progressed from regional to local level, using secondary information and key informant interviews before undertaking participatory rural appraisals (PRAs). The framework included the following components: a screening process to select field work areas; a participatory data gathering methodology used in study villages; and the use of data validation techniques.

The key elements of a situation analysis for aquaculture-related development are given in Box 2.

Causal diagrams and poverty surveys

Causal diagrams are perhaps the easiest visual tool for representing the results of poverty surveys. They are essentially pictorial devices that display the linkages between a problem and its underly-

Box 2. Major components of a situation analysis for aquaculture-related development

Regional and local situation analysis

- Institutional support:
 - process orientated: aquacultural and agricultural information systems, research bodies and support schemes, policymaking bodies.
 - action orientated: non-government organisations (NGOs), international development organisations, fisheries departments, banking and credit.
- Fisheries production (by sector, seasonal and historic), aquaculture development and seed production.
- Fisheries marketing (consumer preferences, infrastructure, wholesale and retail systems)
- Relevant political and economic situation (i.e. demography, social disintegration).

Local situation analysis (based on village level PRA and longer term monitoring)

- The local economy (labour, sources of income, credit, cash flow).
- Physical nature of the area (climate, soils, water bodies).
- Patterns of ownership and access to land and water.
- Social structure (caste, wealth) of the local community and main priorities of these.
- Farming systems (seasonal patterns, workloads)
- Role of women in farming systems (resource access and decision making powers)
- Existing indigenous knowledge relevant to research.

Source: Adapted from Lawrence et al. (1997).

ing causes. However, the terms ‘problem’ and ‘cause’ are often interchangeable (i.e. a problem may be the cause of another problem, and a cause may itself be a problem with other causes). The problems identified by the poor themselves differ considerably from considerations of financial income, and may vary between different groups of poor people.

Since 1999, FRP has invested in a number of poverty surveys to help set the priority areas for

research and ensure that these were demand-led by the poor themselves and those who represent the interests of the poor. FRP's poverty survey reports have shown the possibility of structuring causal diagrams around five causes of poverty, which equate to low levels of the five capital assets within the Sustainable Livelihoods Approach (SLA, see Maqueen, 1999).

Causal diagrams are a particularly useful tool for prioritising development activities (see Box 3). The most straight-forward means of using causal diagrams in the prioritisation of researchable constraints is to weight each of the branches. This can be done through some form of participatory ranking exercise where a score is given to each researchable constraint by a representative sample of key informants.

Classification of 'branches' or causes, such as those used by the FRP which follow, can assist the process of prioritisation:

- Poverty trap loops: refer to other branches, thereby opening up the possibility of infinite loops (e.g. the lack of credit facilities may be a

possible underlying cause of continuing marginal productivity, which itself may be a reason why few credit facilities are offered to poor farmers).

- Fixed states: physical states which cannot be changed through research (e.g., climatic aridity).
- Basic laws: principles which cannot be changed by research (e.g., free market economics).
- Current developmental policies: government positions which mitigate against the resolution of a constraint through research at this time (e.g., policies on debt relief).
- Researchable constraints: These are essentially constraints which are based on a lack of knowledge or the application of that knowledge. Consequently, research can overcome the lack of knowledge or its application through well targeted systematic investigation. Such factors can be divided into those that could or could not be addressed by a programme. Researchable constraints that occur on several branches are more likely to be significant to the eradication of a central problem than constraints relating to only one branch. Similarly, researchable constraints that are repeated within one branch are likely to be more significant than those that are not.

Box 3. Causal diagrams in practice: problem surveys in Nepal

This approach was used twice in Nepal (projects ZF0172 and ZF0172E). During 2002 and 2003, FRP identified the causes of poverty in Nepal and helped to prioritise the issues. The main problem areas were identified as finance (lack of access to credit), society/culture (caste and large families) and governance (corrupt officials). This led to the development of a list of prioritised issues for different focus groups under different themes.

Then, in 2005, problem surveys were used to update the first survey and sought to focus on understanding how the escalating violent conflict in Nepal had affected livelihoods and changed the structure of livelihood problems. The main issues identified were insecurity, declining basic healthcare and lack of employment opportunities. Traditional rural livelihood opportunities, such as the collection and marketing of non-timber forest products, had been severely disrupted.

Mapping poverty

Global and national level statistics often hide important differences between regions or areas. Maps can be used to disaggregate information geographically and plot multiple determinants, such as agroclimatic conditions and poverty.

Within AHP/LPP a number of spatial analyses were carried out. These overlaid a range of poverty indicators with livestock systems, agronomic potential, population and market access data in order to assist diverse clients, ranging from the donor community to sub-regional organisations and national agricultural research systems, with the selection of sites for implementing projects. Examples include a global map showing the density of poor livestock keepers by farming systems.

Poverty mapping can be used to help prioritise interventions. The poverty-mapping product developed by ILRI and LPP enables policy makers, researchers and service providers

to make appropriate judgements. The tool is called PRIMAS (Poverty Reduction Intervention Mapping in Agricultural Systems) and is a filtering tool that matches the characteristics of particular technological options with the spatial characteristics of particular target groups in the landscape.

A second tool called EXTRAPOLATE (EX-ante Tool for RAnking POLicy ALternatives) assesses the impact of policy measures on different target groups. The mapping architecture was designed to enable details of the individual poverty groups to be fully-screened at the touch of a button. The updated maps include the location and numbers of smallholder milk producers, crop–livestock farmers, small stock keepers, landless livestock keepers, pastoralists and transhumant groups.

Using poverty mapping for scenario analysis

In related work, ILRI undertook concurrent poverty mapping studies in twelve different countries in South Asia, sub-Saharan Africa and Latin America. These studies were undertaken to develop a better understanding of how livestock could contribute to poor people’s livelihoods and to identify specific groups of livestock keepers that donors could target. A range of maps and tables were produced that located significant populations of poor livestock keepers and produced scenarios to assess how poor livestock keeping populations were likely to change over the next three to five decades.

The modelling of ‘country poverty mapping’ has interesting applications when the results are extrapolated internationally. It can be used to identify rapid change hotspots and then to zoom-in to these areas for more detail. At a global level, and even with relatively coarse data sets, hot spots can be identified where system changes are likely to be substantial over the next 3 to 5 decades, as a result of population growth and climate change.

Lessons and conclusions

A number of lessons for research design for donor agencies and national research systems emerge from the RNRRS experience:

- Prioritisation must be undertaken at each level (regional, sectoral, programme, cluster and project).
- Participatory approaches, including stakeholder analysis, are vital to assess and understand poverty.
- Developmental impact must be measurable and assessable and at least some of the indicators should be locally chosen and relevant.
- Once poverty data has been collected, it must be put in a form which is easy to manipulate and offers clear decision making options (for example causal diagrams).
- Scenario analysis is an excellent tool for long-term poverty related projections.
- Poverty research and development must be planned and implemented using a broad multi-stakeholder approach including governments, non-governmental organisations, civil society, the poor, the research and development community and investors.
- Natural resources projects must consider how much of their own quantitative measurement should be done and how much can be used from existing work by other agencies.
- Poverty research and development must use an integrated approach and a multi-disciplinary methodology.

Additional resources

- Dorward, A., Anderson, S., Nava, Y., Pattison, J., Paz, R., Rushton, J. and Sanchez V.E. (2005). A guide to indicators and methods for assessing the contribution of livestock keeping to the livelihoods of the poor. Department Of Agricultural Sciences, Imperial College: London, UK.
- Lawrence, A., Haylor, G. and Meusch, E. (1997). Participatory monitoring of systems change in integrated aquaculture. *Aquaculture News* 24, 25–27.
- Maqueen, D. (1999) The identification and prioritisation of constraints and opportunities for greater integration between forest-based industries and communities: A sustainable livelihoods approach based on data from Belize, Guyana and the Eastern Caribbean States. DFID/FRP: UK.
- Pasteur, K. and Turrall, S. (2006). A synthesis of monitoring and evaluation experience in the Renewable Natural Resources Research Strategy. <http://www.research4development.info/pdf/>

thematicSummaries/RNRRS_ME_synthesis_FINAL.pdf

Perry, B.D., Randolph, T.F., McDermott, J.J., Sones, K.R. and Thornton, P.K. (2002). Investing in animal health research to alleviate poverty. International Livestock Research Institute (ILRI): Nairobi, Kenya.

Thornton, P.K., Kruska, R.K., Henninger, N., Kristjanson, P.M., Reid, R.S., Atieno, F., Odero, A. and Ndegwa, T. (2002). Mapping poverty and livestock in developing countries. International Livestock Research Institute (ILRI): Nairobi, Kenya.

World Bank PovertyNet: www.worldbank.org/poverty/

RNRRS projects

R7064: Small-scale Farmer Managed Aquaculture in Engineered Water Systems: Critical Design and Management Approaches

R7823 Understanding Small Stock as Livelihood Assets: Indicators for Facilitating Technology Development and Dissemination

R8119 The Impact of Aquatic Animal Health Strategies on the Livelihoods of Poor People in Asia

ZF0132: Feasibility Study on the Numbers of Forest Dependent People

ZF0172: Problem Survey Nepal, 2003

ZF0172E: Priority Problems of Forest-dependent Poor People in a Conflict Situation in Nepal: An Update Report

For further information see <http://www.research4development.info/projectsandprogrammes.asp>

About this Brief

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About the Renewable Natural Resources Research Strategy (1995–2006)

The objective of DFID's Renewable Natural Resources Research Strategy (RNRRS) was to generate new knowledge and to promote its uptake and application such that the livelihoods of poor people are improved through better management of renewable natural resources. Through its ten research programmes it addressed the knowledge needs of poor people whose livelihoods are dependent on natural resources production systems in semi-arid areas, high potential areas, hillsides, tropical moist forests, and at the forest/agriculture interface, the land/water interface and the peri-urban interface. The breadth of the strategy programme reflected the wide variety of environments in which poor people live in poorer countries and the multiple routes by which research can reduce poverty.

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