Food Policy 35 (2010) 584–598

Contents lists available at ScienceDirect

Food Policy

journal homepage: www.elsevier.com/locate/foodpol

A quantitative analysis of poverty and livelihood profiles: The case of rural Rwanda

An Ansoms [a,*], Andrew McKay [b,1]

[a] Institute of Development Policy and Management, University of Antwerp, Lange Sint Annastraat 7, B-2000 Antwerp, Belgium
[b] University of Sussex, Mantell Building 3B16, Falmer, Brighton BN1 9RF, United Kingdom

ARTICLE INFO

Article history:
Received 3 December 2008
Received in revised form 15 June 2010
Accepted 28 June 2010

Keywords:
Livelihoods
Rural poverty
Poverty reduction policy
Cluster analysis
Central Africa
Rwanda

ABSTRACT

The paper applies a quantitative methodology to study poverty and livelihood profiles on the basis of a large set of variables. It takes the context of post-conflict rural Rwanda for a case study. By means of exploratory tools (i.e. principal component and cluster analysis), it combines variables that capture natural, physical, human, financial and social resources together with environmental factors to identify household groups with varying livelihoods. The paper further explores how these clusters differ with regards the incidence of poverty, livelihood strategies and their respective crop preferences. The paper concludes that Rwandan rural policies should adopt distinct and appropriate interventions for impoverished peasant groups, each having their own particular livelihood profiles.

Introduction

The overall image of Rwanda's post-war economic recovery is quite positive. After an initial post-war boom, average annual growth between 1996 and 2001 remained high at 8.56%. The actual translation of growth into poverty reduction, on the other hand, has been disappointing (Ansoms, 2005, 2007), and has jeopardized The Rwandan Government's hopes for a purely growth-led poverty reduction strategy. The Government, however, aims for a pro-poor effect by, "looking for growth in the sector where the poor are located" (Government of Rwanda, 2002). The first Poverty Reduction Strategy Paper (PRSP) document recognized the rural sector's crucial importance to Rwanda's economic future by presenting the agriculture and livestock sectors as "the primary engines of growth" (Government of Rwanda, 2002:30). This ambition reappears in the new EDPRS (PRSP-2) policy which sees equitable growth, sustainable development and poverty reduction, with rural development as key priorities (Government of Rwanda, 2007).

This is hardly surprising given that the primary sector employs almost 90% of Rwanda's active population and generates about 45% of its GDP. Moreover, rural poverty is more extensive and severe than that in urban areas. Based on a poverty line of 250 Rwf per adult equivalent per day (US$ 0.44 at nominal 2006 prices), 56.8% of the rural population are considered poor, of whom 36.8% are extremely poor (i.e. living below the food poverty line of less than 175 Rwf per adult equivalent per day, Government of Rwanda, 2007).

However, the Rwandan 'poor' are not a homogeneous group nor is the problem of rural poverty a single problem that can be solved with a uniform package of policy measures. The contribution of this paper lies in the identification of different livelihood profiles for rural households in Rwanda. By means of analytic tools (e.g. principal component and cluster analysis), it combines variables that encompass natural, physical, human, financial and social resources in combination with environmental factors to identify specific household groups or clusters with different livelihoods. The paper further explores how these clusters differ with regards to poverty incidence, livelihood strategies and their crop preferences. An understanding of the differences behind specific livelihood profiles, and the institutional constraints these groups face, is a prerequisite for effective rural policy implementation.

In search of a methodology to classify livelihood profiles

The livelihood approach finds its roots in a paper by Chambers and Conway (1991). They define *sustainable rural livelihoods* as, "the capabilities, assets (stores, resources, claims and access) and activities required for a means of living" (Chambers and Conway, 1991: 6). The approach has been taken up by many scholars as a framework for poverty and/or vulnerability analyses (Ellis, 2000; Bird and Shepherd, 2003; Bebbington, 1999; Moser, 1998; Chambers, 1995). In addition, it has been transformed into a practical

* Corresponding author.
E-mail addresses: an.ansoms@ua.ac.be (A. Ansoms), A.Mckay@sussex.ac.uk (A. McKay).
[1] Tel.: +44 1273 678739/8889.

0306-9192/$ - see front matter © 2010 Elsevier Ltd. All rights reserved.
doi:10.1016/j.foodpol.2010.06.006

tool by and for development practitioners like UNDP, Oxfam, Care and DFID (Hoon et al., 1997; DFID, 2001; Solesbury, 2003).

The livelihood approach has been innovative in several ways. First, the focus of analysis has shifted away from aggregate variables concentrating on approximations of overall well-being, often scaled down to income or consumption measures (De Haan and Zoomers, 2005). The framework also breaks with the tradition in rural development research to focus on natural resources as the crucial element in living conditions (Bebbington, 1999). Instead, the livelihood approach aims to capture the multiple interactions between peoples' resources and strategies which are dependent upon the social and institutional environment(s). In this paper, the combination of a household's resources and livelihood strategies will be referred to as the household's 'livelihood profile.'

Second, the livelihood approach accentuates the ability of social actors to play an active role in shaping their own livelihoods. It breaks with the rather pessimistic view of earlier micro-level (household) studies which often nurtured an image of 'the poor' as passive marginalized victims (De Haan and Zoomers, 2005). Bebbington sees peoples' assets, "not simply [as] resources that people use in building livelihoods; [they] give them the capability to be and to act" (Bebbington, 1999: 2022). According to Moser (1998), "the poor are managers of complex asset portfolios." This idea also approximates Sen's notion of agency (1985) which he regards as central in valuing human life. The notion of agency is relevant in all social experiences, even in cases of extreme coercion. Agency determines and is determined by a person's access to strategic resources and is embodied in social relations, closely linked with power relations and shaped through institutional structures (Long, 2001).

Both characteristics of the approach bring us to a third attribute: the livelihood approach inserts a dynamic dimension into the analysis of well-being and poverty. Indeed, the multiple links and interactions between resources and strategies may evolve over time. De Haan and Zoomers (2005) have developed the idea of 'livelihood pathways' that situate patterns of livelihood assets and activities in the negotiation process between social actors. These pathways change over time in a non-uniform and non-predefined way, but their course is embedded within an institutional and social context.

These conceptual inputs clearly imply that 'the poor' cannot be defined as a homogeneous or rigid group; they are heterogeneous and dynamic; both in terms of material well-being and agency. Bastiaensen et al. refer to the poor as, "those human beings who, for one reason or another, almost systematically end up at the losing end of the multiple bargains that are struck around available resources and opportunities" (Bastiaensen et al., 2005: 981). At the same time, there are different degrees of winning or losing that may account for different degrees of poverty. Certainly in populations where over half are classified as 'poor' according to aggregate well-being measures, it becomes crucial to look at the diversity hidden behind aggregate poverty figures and to link this with the diversity in livelihood profiles. Furthermore, one should consider and analyze how particular forms of poverty predetermine peoples' livelihood pathways.

Such analyses imply a high degree of complexity which is more often present in in-depth qualitative research than in research based upon quantitative analysis. Traditionally, quantitative research on living conditions uses the tool of regression analysis in which a dependent variable (e.g. often income or consumption as proxies for overall well-being) is estimated, based on the value of one or more independent variables (i.e. different types of production factors, assets, and strategies). Such a methodology has the advantage of identifying the strength and significance of the relationship(s) between variables. On the other hand, it gives little insight into the heterogeneity of livelihood profiles in a large population.

Other empirical quantitative endeavors attempt to account for livelihood diversity by comparing different settings. Bouahom et al. (2004), for example, compare how nine different villages in Laos respond differently to the transition from subsistence farming to more diversified livelihoods. Moser (1998) enlarges her geographical scope to four urban settings spread over different continents, comparing the changes in asset portfolios (i.e. defined by labor, human capital, productive assets, household relations and social capital) over a longer time period characterized by deteriorating macroeconomic conditions. This case-study approach allows one to make interesting comparisons between settings. On the other hand, the external validity of the research is limited.

Alternatively, one may look at livelihood heterogeneity at the household level. The external validity of research findings may be assured by departing from a regionally or nationally representative survey to identify and compare the profiles of different household groups. A crucial question is, however, which variable(s) is (are) used to differentiate those groups.

Several research papers on livelihoods analysis use income as the discriminating variable. Highly acknowledged is Ellis's methodology which has been applied to several countries (e.g. Malawi, Tanzania, Uganda and Kenya). Various papers look further at the diversity in income-generating portfolios for different groups (Ellis et al., 2003; Ellis and Mdoe, 2003; Ellis and Bahiigwa, 2003; Freeman et al., 2004). Bird and Shepherd (2003) link income groups to the likelihood of pursuing certain livelihood strategies (e.g. farming, off-farm activities, entrepreneurial activities, etc.-Bird and Shepherd, 2003: 602). McKay and Loveridge (2005), although not explicitly referring to livelihood literature, have done a similar exercise for the Rwandan case. They compare the income strategies and nutritional status of different income groups between the early 1990s and 2000. Overall, the methodology used in these studies has the disadvantage that the differentiation between groups is still based upon one aggregate monodimensional proxy for overall well-being. Groups are defined based upon income categories, after which a combination of assets and strategies, relevant for a person's livelihood profile, are inserted into the analysis.

An alternative approach combines survey data with insights from participatory poverty assessments (PPAs) to identify criteria for establishing livelihood profiles (e.g. see Carter and May, 1999). It is not, however, a straightforward task to assign all the households included in a quantitative survey to one specific qualitatively-defined PPA category (and certainly not when the household in question combines several livelihood strategies). This is illustrated in a paper by Howe and McKay who, referring to the Rwandan case, recognize that, "distinctions between the groups [identified by a PPA exercise] are not always clear at the margin, given some similarity in certain characteristics across groups" (Howe and McKay, 2007: 203). They link survey material to the combined characteristics of the three poorest PPA categories (out of six) to identify the chronically-poor households' livelihood profiles.

A third alternative to identify household groups with heterogeneous livelihood profiles – and one that takes into account a wide variety of relevant variables – is to use cluster analysis (e.g. see Orr and Jere, 1999; Orr and Mwale, 2001; Jansen et al., 2006a; Jansen et al., 2006b; Petrovici and Gorton, 2005). This paper adopts a similar factor and cluster methodology to identify different livelihood profiles in rural Rwanda. The identification of population subgroups (i.e. clusters) is based upon proxies for the different asset types identified by the livelihood framework, next to proxies for the regional context and aggregate well-being ('Identifying livelihood clusters based upon asset portfolios' of the paper). Further validation of the clusters is provided by illustrating how the identified clusters differ with regards to their poverty profiles ('Identifying livelihood clusters based upon asset portfolios'), their