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Focus on

Studying rural poverty dynamics: feedback on the rural observatories in Madagascar

Madagascar's rural observatories were created 22 years ago in 1995. Initially set up as pilots, they were structured in a network in 1999 (Réseau des Observatoires Ruraux, ROR) in response to demand from development operators. In November 2016, a conference co-organized by DIAL, UMI Résiliences and the ROR celebrated its 20th anniversary. The two-day conference was attended by over a hundred academics, researchers, statisticians, development operators and policymakers who had used or contributed to the analysis of the ROR's data. These two days provided the opportunity to present some scientific studies from different disciplinary fields based on the data, explore the way forward for the network and its methodology, present other innovative information systems, and discuss the political and scientific applications of this kind of survey tool. The wide range of participants and animated discussions showed the large interest the ROR still attracts in different development circles 20 years on and proved its capacity to be a select tool for dialogue between these spheres.

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DIAL's researchers were behind the first pilot observatories launched by the MADIO project in the 1990s (Roubaud, 2000) and they followed the ROR in the 2000s with a project financed by a Ministry of Higher Education and Research incentive programme (ACI) entitled "Rural Poverty Dynamics in Madagascar" (Gubert & Robilliard, 2007a). Yet, the survey system owes its longevity essentially to its structuration in a network in 1999 with the help of researchers from French development research institute IRD (now with UMI Résiliences) and the interest its managers raised among development operators and Malagasy policymakers to guarantee its financing and autonomy. Today, the ROR is a public institution partially funded by the Malagasy government. The commitment by the government and development bodies to keeping this tool running reflects their strong demand for data on the living conditions of Madagascar's rural households, which account for over 65% of the total population.

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So over the last two decades, the ROR has evolved and is not used only as a research instrument but also as a policymaking support and development project impact monitoring tool. In a country drawn to an agricultural development model based on an agribusiness sector that does little to be inclusive, the ROR is also a first-rate observation instrument of smallholder agriculture.[1]

The methodology has remained virtually unchanged throughout these developments. Surveys are taken of households every year using questionnaires that have little changed, and are structured in the same way as in the early years so that a certain number of variables can be observed over a number of years. Households are tracked from one year to the next when the household head or spouse can still be found and are replaced if not. The number of observatories mushroomed from four in 1995 to 17 in 2004 before falling back to five following the 2009 political crisis. However, three of the four original observatories were able to keep running through to 2014. The ROR's longevity and frequency make it effectively one of a kind compared with other household panel survey tools. Yet, like all these survey designs, it faces important measurement and sampling challenges (Dercon & Shapiro, 2007).

The following presents what makes the ROR original and its strengths compared with other more classic survey designs before discussing certain sampling methodology limitations, especially for the analysis of poverty dynamics. It concludes with a presentation of more recent surveys that try to meet these methodological challenges.

1- An original socioeconomic information system

1995 saw the first observatories set up under the MADIO (Madagascar-Dial-Instat-Orstom) project, briefed to improve Madagascar's statistical system to help analyse the country's economic transition (Roubaud, 2000). At the time, agricultural statistics were thin on the ground in a country where 80% of the workforce worked in the agricultural sector (the last census dated back more than ten years previously). It was therefore vital to collect data on this sector to be able to report on the situation and developments in the countryside. Yet rather than opting for an expensive nationally representative survey, the team preferred a more flexible system of observatories set up at sites chosen to represent particular agroecological issues (Droy, Ratovoarinony & Roubaud, 2000).

The ROR hence belongs to the family of socioeconomic observatories that makes reference to a set of data collection tools using different approaches and methods, but all sharing the common goal of collecting "continuous" observation of a particular social category's developments over a given period using quantitative and qualitative information to measure and explain these developments (Dubois, 1998, cited by Droy, Ratovoarinony & Roubaud, 2000).[2]

[1] It is also a member of the World Agriculture Watch (WAW) network, an FAO initiative backed by CIRAD (Agricultural Research Centre for International Development).

[2] IRD participated in setting up a large number of socioeconomic observatories in many different fields and contexts, including the Niakhar observatory, a population watch in Senegal that celebrated its 50th anniversary in 2014. See, for example, *Science au Sud* article "Observations au Long Cours" (Link).

In the case of the ROR in Madagascar, the approach used is mainly quantitative, but the sites were selected based on a qualitative approach and expert knowledge of the ground to be able to illustrate the wide range of rural situations. Survey organisation pays particular attention to the quality of the data collected, using a methodological charter. Interviewers are recruited locally and have a command of the dialects spoken at the selected sites. They have to live in the village for the full duration of the survey, which only starts following an "assimilation phase" during which the interviewers meet the local authorities, conduct interviews and collect information on the survey site presented in a community report drafted on each site every year. The surveys are then conducted on 500 households per observatory. Households are randomly selected the first year and followed up the following years. The continuous aspect of the observation lies in the choice of its annual pace.[3]

The originality of the ROR is twofold. Firstly, it combines quantitative and qualitative approaches in both its choice of sites and information collection. Second, it conducts the surveys annually and tracks the households thereby building a household panel).

2- Household panel tracking: an efficient poverty monitoring tool?

Despite a sharp rise in research on households' economic vulnerability over the last two decades, the lack of reliable longitudinal data, especially in an African context, leaves many questions unanswered as to which public policies to conduct to improve the resilience of farming households. The ROR's multi-round surveys and multiannual panel tracking are consequently particularly useful for analyses of household vulnerability and impact studies of shocks to households' living conditions. They can be used to compare the situation of the households before and after a shock, and to compare this new situation with that of households not affected by the shock. In this way, the impacts of shocks on rural households can be evaluated over the short, medium and long run.

The panel built by the ROR has made it possible to conduct research into these questions. Gubert and Robilliard (2007b) take five successive survey waves to study the impact of the income shocks, mainly crop shocks, on children's school participation. Senne (2014) using the same data analyses the impact of adults' death on child schooling. Thomas and Gaspart (2015) analyse the factors involved in persistent poverty and find that a high dependency ratio, low level of education and low factor input endowments increase the risk of persistent poverty. Rakoto-Tiana (2012) lastly analyse child fostering, its causes and its impact on schooling. All these analyses go to show the extreme vulnerability of the rural households studied and the intergenerational poverty transmission mechanisms. They fill a gap in our knowledge of the sources of vulnerability and the insurance mechanisms that rural households in a developing country put in place to cope with them.

This ROR survey data can be used to rigorously test the impact of what are termed exogenous phenomena on the households. What do these results suggest in terms of public policy and, more generally, what do these data have to tell about the evolution of poverty and vulnerability in the Malagasy countryside and its causes? The key to answering these

[3] See Droy, Ratavoarinony & Roubaud (2000) for a more detailed description of the methodology.

questions is knowing for which groups of households the results obtained are valid. The fact that it is not possible to respond this question constitutes an important limit of such kind of surveys.

Although national, if not district, representativeness was ruled out from the start at the survey system design stage, village representativeness was initially obtained by random household sampling. Yet as shown by Vaillant (2013), this representativeness declines sharply over time due to attrition and the ageing of the households in the panel. The tracking rule adopted by the ROR is to focus on the household head or his or her spouse when the head has left the village. Only when neither household head nor spouse can be found is the household replaced by a new household randomly sampled from the rest of the village. This rule means that households are no longer monitored once head and spouse have left the village. It also means that individuals who leave the household to form their own household, for example, also leave the sample. Given that Malagasy households are particularly mobile, attrition is approximately 20% per year. At individual level, attrition is even higher since this same rule implies that only the household of the household head (or his or her spouse) is monitored, but not the households of the individuals who have left the initial household. This attrition would not be problematic if it were random or independent of the variables of interest such as income and living conditions, but this is unfortunately not the case. The link between living conditions and migration in particular is well established in the literature.

In 2005, DIAL researchers working on a project on rural poverty dynamics (see Gubert & Robilliard, 2007a) undertook to seek out the members of the households surveyed in an ROR village (Bepako) in 1995 who had left the sample and to interview their households, regardless of whether they were still in the village or elsewhere. That same year, the survey was taken of all the households in the village, not just the panel households. The tracking procedure is detailed by Vaillant (2013) in an article in which the author also analyses the biases caused by attrition. The results show first of all that attrition is not random and that it is negatively correlated with the household's initial income and the individual's level of education, among other characteristics. The individuals who dropped out of the sample between 1995 and 2005 were therefore poorer to begin with than those who stayed in the sample.

The author then compares the change in income across all the village households from 1995 to 2005 with the change in income for the households in the initial sample that were still to be found in the village ten years later. The trend gap is important. Whereas average income rose 6% across all the villagers between these two dates, the income of the households initially interviewed and still to be found in the village ten years later had risen 37%. This gap is even wider when comparing the evolution of all villages all the individuals sought and found in the village outside of their initial households (42%) and the individuals found outside of the village (66%).

Attrition and household ageing mean that the household panel data paint an increasingly distorted picture of the household's living conditions over time, a picture that moreover underestimates poverty. The data cannot be used to observe households' migration strategies

in response to high vulnerability. And given that they do not track the new households created by the members of the old households, neither can the data be used to study what are actually frequent household decomposition and recomposition strategies in Madagascar (Andriamaro & Delaunay, 2012). Consequently, the ROR presents an incomplete depiction of the insurance strategies used by households and hence of the sources of vulnerability and mobility in poverty. It therefore stands to reason that after 20 years, ten years after these analyses were conducted, the biases would have grown even more. In 2012, however, the ROR started replacing part of the sample in the oldest observatories, doubtless re-establishing representativeness at village level.

The ROR shares these limitations with a large number of household living conditions monitoring systems (Dercon & Shapiro, 2007). They prove problematic, especially since the data in the case of the ROR are used not only by researchers, but also by a range of development operators including public policymakers who are not aware of these limitations. The risk is that these biases give rise to decisions out of touch with the reality or omitting a particularly fragile part of the population.

3- Which mechanisms should be used to monitor poverty and analyse vulnerability?

Attrition is seen as the "Achilles' heel" of panel surveys. Although it has long been underestimated, most panel surveys today include a tracking system for households present in the first survey (tracking surveys). However, it is not enough to track the households. The individuals from these initial households also need to be found to take account of household composition and recomposition and partial migration. This makes these tracking surveys more expensive. Initially located in one region, they can spread throughout a country and even beyond, substantially increasing the number of households to be surveyed.

The Kagera Health and Development Survey (KHDS) in the Kagera region of Tanzania is an example of this. The first waves were conducted on 800 rural households from 1991 to 1994. In 2004 and then in 2010, researchers from Oxford University and the World Bank (including Joachim De Weerdt, Kathleen Beegle and Stefan Dercon) undertook to seek out all the individuals surveyed by these first waves. They were able to find 85% of the individuals still alive although 50% of them had migrated, mostly within the region, but some to other regions and sometimes other countries. The number of households rose from 800 in 1991 to 3,300 in 2010. Many studies, on migration strategies in particular, were able to be conducted using these data.

Another experience, closer to DIAL this time, is the Poverty and Family Structure survey carried out in Senegal (ANSD, 2015, De Vreyer et al., 2008). This survey seeks to gain further insight into the complex family structures in Senegal and the household composition, decomposition and recomposition strategies. These structures are indeed far from the stable nuclear model "assumed" by most household consumption surveys, which give a warped picture of the economic strategies in play. A first survey was conducted in 2006 on a sample of 1,800 urban and rural households representative of the country. In 2010 and 2011, a second wave was conducted on the individuals surveyed in the 2006 households. The interviewers

managed to find 85% of the individuals spread across 2,950 households, making for a 64% increase in the number of households in five years.

Although tracking households and individuals is highly beneficial, it places a considerable financial and logistical burden on the surveys. The ROR may well need to rethink its sampling strategy, but it would find it hard to absorb such an increase in cost and time. Note, however, that with its annual frequency, it retains a not-inconsiderable advantage over the two systems mentioned above. Multiannual observation of a unit with regular, frequent tracking makes, for example, for much more accurate income and consumption variance analyses than with these other mechanisms.

A household living in Bepako in 2005 and 2016.

© Anne-Sophie Robilliard - a household in Bepako in 2005

© Camille Saint-Macary - the same household in Bepako in 2016

Conclusions

The ROR experience raises interesting questions in terms of both methodology and the governance and financing of such mechanisms. Initially set up by IRD researchers, the mechanism has gradually become "Malagasised" and found a viable economic model, which is a success story in itself. Today, the ROR is asked to meet a range of demands from development bodies, public policymakers and researchers, essentially making it a public good.

The challenge put to all these players today is to develop its methodology while preserving its public good aspect, maintaining scientific rigour to guarantee its credibility and sustaining a viable economic model. This will entail reconciling sometimes-divergent interests. The policymaking demand would probably be better met by surveys of representative samples. It is more in the interests of development operators seeking to evaluate their projects to have samples targeting the beneficiaries and non-beneficiaries of their projects. Researchers, for their part, are more interested in monitoring households or at least villages. Yet it is in all these players' interests for the ROR survey system to continue to operate and contribute to the definition of development policies and programmes that effectively reduce rural poverty in Madagascar.

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