

Context-specific and Project-induced Risk: Designing Projects for Promoting Resilient Livelihoods

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Abstract Agriculture-based projects can rarely operate without having a significant impact on their participants' exposure to risk. If participant risk is not adequately considered and addressed in a project's design, there can be negative implications for the project's outcome. To avoid this, identifying and establishing mechanisms that will minimise project-induced risk is essential during the design process. In this article we examine the importance of risk within agriculture. We explore the context of risk in which the projects locate themselves, and the relationship between farmer-specific risk and sustainability of project outcomes. Drawing on a range of project documents and project immersions, we evaluate the extent to which agricultural interventions are cognisant of risks facing farm households and how the intervention itself changes the risk portfolio of farm households. We argue that understanding the ways in which projects interact and shape context-specific risk is critical for future strategising about how to build risk into monitoring and evaluation strategies.

In many agricultural development projects the main approach to farm risk focuses on production risk and addresses it through the introduction of agricultural innovations leading to higher and less variable output. How effective is this approach given the risk-context in which farmers are located? The purpose of this article is to highlight the importance of risk within agriculture and agriculture-based livelihoods. We explore the context of risk in which the projects locate themselves and, more importantly, the relationship between farmer-specific risk and sustainability of project outcomes. Drawing on a review of the relevant agricultural and risk strategies of different organisations as well as a wide range of project documents and a number of project immersions, we evaluate the extent to which agricultural interventions are cognisant of risks facing farm households and whether the intervention itself changes the risk portfolio of farm households in positive or negative ways. We argue that understanding the ways in which projects interact and shape context-specific risk is critical for future strategising about how to build risk into monitoring and evaluation (M&E) strategies.

We find that a majority of agricultural projects seek to reduce agricultural production risk. Many are designed to enable farmers to invest in productivity-enhancing technology – seeds, water, improved livestock breeds – that also reduce variability of yield, provide S&T (science and technology) or strengthen market access. However, the effort to effectively address context-specific risk as well as minimise project-induced risk has been poorly articulated. This is exacerbated by the research community which has often mystified the notion of risk. The challenge for most organisations working within agriculture is to move from commodity and technology-based understandings of risk to livelihoods-based understandings.

1 Risk and agriculture

1.1 The effects of risk

Risk affects many different aspects of people's livelihoods. It affects whether people can maintain assets and endowments, how these assets are transformed into incomes via activities and how these incomes and earnings are translated into broader development outcomes, such as health and nutrition. Risk is the

probability associated with the occurrence of a shock (or hazard). If there is exposure to risk of loss because there is inadequate ability to manage a shock when it does occur, the individual, household, community or nation is vulnerable. The severity of exposure will determine the ability of the management strategy to cope and it is the combination of high exposure and limited ability to manage risks that constrains poor people's resilience to shocks and makes them vulnerable.¹ So, risk is the *ex ante* likelihood of an adverse event and vulnerability is the *ex post* outcome. The concepts are best thought of in a dynamic context (i.e. over time). First, the ability to manage future risk may well be compromised by current risk management. Weakness in the latter will increase the likelihood of the former. Second, the frequency of shocks may be trending up or down.

For poor farm households coping strategies often only provide partial mitigation and there remains significant fluctuations in their consumption and other welfare outcomes.² There are two types of consequence of risk for poverty. Firstly, the impact of a shock may destroy or reduce physical, financial, human or social capital of the household. Secondly, the *ex ante* behavioural response to risk influences households to adopt risk management strategies that lead to lower returns and incomes. Coping with shock *ex post* may have similar results if it involves asset disposal that lowers future earnings. Both consequences result in poverty and its persistence.

A further distinction relevant for this article is between project-induced risk and other risks. While there are pre-existing risks apparent in the everyday lives of smallholder farmers, the introduction of an agriculture project or intervention will undoubtedly introduce its own set of risks or impact considerably on those already in existence. For instance, an intervention that increases reliance on local markets also increases vulnerability to price fluctuations; or a project requiring adoption of labour-using technology may introduce risks in terms of labour displacement in the household or the withdrawal of children from school in order to use their labour on the farm. When projects are implemented it is obviously important that there is awareness of these potential negative impacts on risk-taking behaviours of households.

From a policy perspective, the possible negative implications for welfare and persistent poverty resulting from shocks in agriculture or project interventions suggest the need for more effectively provided interventions to insure against shocks. As well as a focus on strengthening the poor's asset base there is a need to provide support to risk management mechanisms and an *ex post* support system (Sabates-Wheeler and Haddad 2005). Addressing risk within project and programme design has multiple positive outcomes. First, it enables consumption smoothing by minimising the transitory impacts of shocks. When shocks hit, the behaviour of households and communities change as they struggle to adapt. Second, it can counteract asset-depletion and the occurrence of poverty traps by minimising the long-term impacts of shocks. When consumption changes are not enough to ride the shock, assets may have to be sold, children may have to be pulled from school and health visits and drug purchases may become even rarer. These asset depletions undermine the ability of the households to weather the next shock and lead to a downward spiral of resilience (see Dercon (2005, 2007 for a discussion of these processes). Third, it promotes innovation and risk-taking activities because there is less need for individuals to adopt risk strategies that smooth income, but do not maximise it. Income diversification, crop diversification, livelihood diversification – all are sensible responses to very risky situations. It focuses policies on breaking the cycle of deprivation across generations.

2 Risks in developing country agriculture

Agriculture is one of the riskiest sectors of economic activity, and effective risk-reducing instruments are severely lacking in rural areas. (World Bank 2008: 89)

2.1 Context-specific risk

There are certain characteristics of the risks, stresses and shocks specifically associated with agriculture. Fleisher (1990) identifies certain risks common to agriculture: production and marketing risk, domestic monetary and fiscal policy risk, commodity price risk. Although there are certain types of risk that are not easily found, if at all, in poor rural economies, such as product cycles, in general risk is more prevalent in agriculture-based developing economies than in developed countries and the precise sources of

risk to which rural farmers in poor countries are exposed are significantly different from those seen elsewhere.

Drawing on and extending Fafchamps' (1999) work there are a number of risks prevalent in the rural economies of poor farmers:

- 1 *Disease and environmental risk* are far more widespread in developing countries with infectious diseases such as measles, malaria and pest damage much more prevalent than in the developed world.
- 2 *Seasonality: Rural livelihoods* in tropical and sub-tropical countries are entirely defined by the seasons. Farmers clear the land and prepare their fields while waiting for the rains, then they plant their seeds, apply fertiliser or manure, and weed their crops during the rainy season, then they harvest their crops.
- 3 *Price risk* relates to the fact that many businesses are vulnerable to the fluctuating prices available for commodities and primary products. The volatility of commodities and agricultural products on international and regional markets not only directly affects the market price but can also have a huge impact by inducing macroeconomic shocks that ripple through the entire economy and affect rural dwellers in various ways.
- 4 *Financial risk*: Binswanger and Sillers (1983) argues that from a review of the evidence it can be seen that farmers in developing countries are almost universally risk averse and that risk aversion may not vary greatly between different cultural or agro-climatic environments, nor be very sensitive to variations in wealth. He suggests that the cost of borrowing is the explanatory factor for the differences in investment behaviour among farm sizes in a given environment.

2.2 Project-induced risk

Agriculture-based projects can rarely operate without having a significant impact on their participants' exposure to risk. Some projects are explicitly concerned with reducing participants' risk but if this fundamental issue is not adequately considered and addressed in a project's design, there can be significant and negative results.

- One potential consequence is that if risk is identified by a project's potential target participants and not by the project designers there could be a poor level of participation or uptake of the project.
- The second potential consequence is more serious. If potential participants are persuaded to adopt new agricultural livelihood practices such as the use of new technology and there is little understanding and measures to control the risks they are exposed to, not only will the project fail and be unproductive, but the livelihoods of the participants may be adversely affected and deepen poverty in the target area.

In order to avoid such potential outcomes to agriculture-based projects, identifying and establishing mechanisms that will minimise project-induced risk is essential during the design process. This section will identify some examples of project-induced risk and highlight some ways in which they can be addressed.

2.2.1 Technology adoption risk

A great number of projects that aim to increase agricultural productivity have a theory of change that involves the adoption of a new technology. The adoption of new technologies are often regarded as the key to improving efficiency, yields and the quality of product, and are central to many agricultural projects. However, such reliance on new technologies can present a new set of risks to the adopter that need to be properly considered and addressed in the project design. Reliability of the technology and appropriate support services such as maintenance and replacement provision are essential in order to reduce the risk of technology failure. It is also important that the appropriate training and educational services are accessible in order to ensure appropriate use of the technology and to maximise the potential efficiency gains.

2.2.2 Demand risk

When farmers adopt new crops as a result of a project or substantially increase supply of an existing crop to local markets, there is a risk that prices will collapse because local demand is insufficient. Prices have collapsed in this way, especially with new crops, when local markets are thin and regional markets are not spatially integrated. Even when domestic markets are well

integrated, local price collapse may be due to external shocks – e.g. bumper harvests elsewhere or changes in purchasing contracts.

2.2.3 Finance risk

Many agriculture projects are focused on increasing production by promoting the uptake of *high risk:high reward* cropping strategies that often require investment in the form of loans. Combined with other factors such as an increased exposure to market and price fluctuations and other potential risks highlighted above, the risk of borrowing, i.e. finance, emerges as a central concern to project-induced risk. Traditional microfinance mechanisms have usually not focused on mitigating the risks associated with farmer households' borrowing. Seasonality, the variability in production cycles, and the consequences of weather, pests, diseases and other calamities affect the yield of crops (substantially in extreme cases) and the consequent ability of the farmer to make timely repayments. More adaptable and nuanced financing that can be termed agricultural microfinance – a combination of traditional microfinance, agricultural finance and other approaches – can more effectively mitigate the risk of borrowing and lending.

Analysis by the Consultative Group to Assist the Poor (CGAP) and IFAD has identified a number of features of agricultural microfinance that can successfully mitigate the risks associated with lending to agricultural households. Although their analysis focuses on mitigating risk from the supply side, there are also financial services design features identified that can be utilised in order to mitigate risk on the demand side. These include: (i) repayments that are not linked to loan use; (ii) provision and promotion of savings mechanisms; (iii) area-based index insurance; (iv) loan conditions that are adjusted to accommodate cyclical cash flows and bulky investments; and (v) contractual arrangements that help reduce price risk and guarantee repayment.

2.2.4 Social risk

A nuanced understanding of the social dynamics of a target community and how an intervention may interact within its context is essential. Projects that set out to empower communities or certain groups within a community may have the opposite effect if social dynamics are not

understood or given adequate consideration. Sensitive targeting that includes a transparent, logical and fair selection process through consultation is important in order to avoid damage to social capital, i.e. social risk. In an extreme example, poor targeting with little regard to social dynamics and community tensions can be the catalyst for violence and conflict. In Nigeria, it has been reported that selection criteria based on geographical location led to one community burning down the houses of another community in order to benefit from a particular project (Frynas 2005).

A less dramatic but possibly more insightful example of project-induced social risk can be found in Dey Abbas' (1997) work concerning gender asymmetries in intra-household resource allocation. Dey Abbas highlights the importance of considering gender resource allocation and how a project's design and introduction of new technologies may impact upon the risk to which participants are exposed.

By identifying ways in which gender asymmetries in intra-household resource allocation can limit women's ability to adopt productivity-enhancing technology, a greater understanding on how a project may expose or mitigate both social and economic risk can be generated. The specific demands on the labour and time of women (e.g. heavy domestic commitments, obligations to first attend to their husband's fields) can result in women and female-headed households being over-burdened by new technologies that may require time-specific operations in favour of crops with greater labour flexibility. Furthermore, there is well-established evidence (Dey 1981) to suggest that new technologies introduced to improve productivity on female-controlled crops or land have generally been taken over by men if they brought greater returns than the men's own crops. As a result, crops traditionally under the management of women can become crops under the control of men. Another common finding is that women have inferior access to labour. Heads of households (especially males) have greater financial resources and social influence to recruit for cultivation.

Such gender asymmetries suggest that conflicts of interest between men and women in the household over resources and control of crop and livestock products often occur leading to

inefficiencies in the household allocation of labour and the consequent failure to maximise agricultural intensification. From a risk perspective, it is important to consider what impact the promotion of an agricultural technology or innovation would have on the gender at the household level.

2.2.5 Programme placement risk

Programme placement risk is a term coined to address the implications of the specific beneficiary or client profile of a project relative to the population these participants come from. Because risk aversion is often negatively associated with income it is the better-off farmers who may adopt new technologies first. Even if the project-provided technology is risk reducing, farmer uncertainty about its full implications for livelihoods may inhibit the participation of households who are economically vulnerable. If a project is expected to have demonstration effects these may be undermined. An unintended consequence of partnering farmers who have lower-than-average aversion to risk is that better-off farmers are the main beneficiaries; intra-village inequality is increased and the project may not be delivering much directly by way of poverty reduction.

3 Lessons from programme experience

The importance of risk in agriculture-based livelihoods was examined in three major ways: a review of the literature particularly leading contemporary agricultural development frameworks that are in use today; a review of project documents and proposals from ten projects of the Bill & Melinda Gates Foundation (BMGF)³ and a series of specific questions were posed in reviewing these documents and three project immersion visits (Kickstart, PRADAN and Technoserve) including visiting offices and field sites with interviews of relevant stakeholders on matters related to risks within the projects were carried out. This work highlighted a number of commonalities and differences in the way that risk is addressed.

1 *How risk is conceptualised:* Risk is frequently conceptualised as the potential for external factors to impact on the success of the stated aims of the project. As such, risk is conceptualised in a passive regard in that it is something that might happen to the project rather than something that might be

generated by the project's activities and outcomes. Conceptualising risk in this way does encourage grantees to consider the potential challenges that they may face in the specific context of their project but it restricts reflection on the extent to which the project affects client risk. Clients also face risks exogenous to the project and these may interact within the project and affect project participation and outcomes.

2 *Risk related to project outcome:* Many of the proposals identify a range of possible circumstances that if they materialised would undermine the positive, presumed outcomes of the projects. For instance, exogenous risks such as political turmoil at the national level (e.g. conflict in Kenya – KickStart); state-level political unrest – PRADAN); organisational risks (e.g. high staff turnover – PRADAN); institutional risk (e.g. corruption and slow bureaucracy – PRADAN); policy change (e.g. seed trade policies – World Vegetable Center, AVDRC); environmental hazards (e.g. World Food Programme's P4P identifies droughts, pest infestations and floods as constraints to the project design and implementation). The African Agricultural Technology Foundation (AATF) Drought Tolerant Maize for Africa (DTMA) project stands out as recognising risks related to regulation, legislation and public perception. This is clearly due to the biotechnology components of the project. DTMA also identifies seasonality and weather conditions as a risk to research and development trials. Ways to minimise these risks are built into the project design.

Few of the projects and proposals reviewed identify global and natural shocks as a risk to the project outcome. Technoserve and P4P are exceptions in terms of the detailed and explicit attention they give to these possible problems; for instance, international trade shocks that lead to changes in prices and domestic demand; health pandemics that could lead to embargoes, shipping delays and export restrictions. CLUSA (Cooperative League of the USA) is cognisant of price risk related to currency transactions and exchange rate movements and insists that all transactions be conducted in local currencies to ameliorate this risk.

Some of the proposals recognise ‘credit risk’ in relation to the lenders linked to the project, and thus the project risk portfolio. The International Development Enterprises (IDE) project design anticipates this risk and proposes scaling up two risk-sharing models with agribusiness institutions as well as using revenue from emission offsets to co-finance credit programmes for smallholders. Again, the emphasis is on project-specific risk. Some of the projects also involve the introduction of a new technology to increase productivity and incomes (e.g. KickStart, IDE and Technoserve). As well as a financial dimension of risk that may be introduced, the reliance on a new technology introduces risks whereby reliance on functioning or repairable technology at an affordable price can increase livelihood risks. Project designs should give more attention to such considerations (as does the Technoserve project through the provision of locally available parts that can be fixed by mechanics of limited aptitude) to ensure that the risks of technological adoption are minimised. If not, project sustainability may be compromised and its impact lessened.

- 3 *Farmer risk and the risk context:* Farmer risk receives minimal attention in the reviewed proposals with almost all projects explicitly or implicitly assuming that their stated objective and theory of change will have a presumed positive impact in reducing the risks farmers face. While this may be the case, there is little consideration of the potential for increasing the risks that farmers may be exposed to by participating in these projects. The investments required for technology adoption are not widely acknowledged as a potential increase in financial risk for the farmer and nor is the greater exposure to market forces and price fluctuations that are a potential risk once farmers are integrated into commercial markets (e.g. PRADAN, CLUSA).

Technoserve offers another good example of a project that considers the implications of risk for project participants, proposing that speciality coffee is less exposed to commodity price fluctuation (price risks) and their emphasis on maintaining diverse crop production also mitigates risk. Its proposed integration of training on financial services within the project will also help mitigate

business risk. Significantly, Technoserve also recognises the need to address price risk brought about by project-induced increase in supply. Monitoring the price of project product outputs is essential if price and market risks are to be controlled.

There are some good examples in which we can see a broader consideration of risk, the implications the project will have for the risk exposure of project participants and implications this has for project impact and success. The World Food Programme’s P4P proposal, for example, introduces specific tools in an attempt to mitigate risk for the targeted farmers by providing financial services and forward contracts in order to encourage deeper investment in productivity. A focus on group-based activities is also proposed in order to reduce or pool risk. Such a strategy will tackle price risk (forward contracts) and environmental risk (microinsurance) as well as reduce the risk of borrowing.

- 4 *Social risks:* The social risks that may be affected by the projects are also given inadequate consideration with a couple of exceptions. Technoserve points out the need to monitor and provide advice and training to counter the potential social impacts of their project that would come about from increased incomes and from other intra-household gender labour and income dimensions of the project. KickStart too has made an effort to adapt technology to gender-specific needs in an attempt to increase adoption, but this has had the secondary benefit of mitigating social stigma and negative perceptions in relation to the irrigation technology. Specific attention has been paid to the gendered use and perceptions of the pump. This has been through intense interactions between KickStart staff and KickStart sales representatives with the clients, and has led to the development of a pump more suitable for many women. Before the most recent pump came on the market both men and women indicated that the pump was heavy to use, especially for women. Two considerations that have been frequently raised by women users are the weight of the pumps and the culturally specific sexual sensitivities about the pedalling action. In response to this KickStart have developed a hip pump that is just 4.5 kilograms

in weight and very popular with women. Once the M&E system is fully operational the effects of the new pump will be monitored together with other questions on adoption including: the use of the pump within the family; the gender of owners versus users; and the labour displacement effects of the pump. All of these issues are directly relevant to project-induced risk, but are raised in the business pursuit of higher uptake.

4 Lessons for project design

Comparing the risk analyses in a range of organisational strategies, proposals and projects with learning from field visits, four key points emerge. First, where there is inadequate attention in the *ex ante* risk analysis to farm-level constraints, adoption will suffer *and* the participation of the poorest farmers will be most affected. The data from KickStart illustrate this problem. Second, failure to prioritise farm financial services will slow down adoption rates. A more grounded risk assessment *ex ante* can identify the gravity of this constraint especially for poorer farmers.

Thirdly, on paper the projects that we chose for immersion visits appeared very different in development philosophies. Interestingly, once we became familiar with these projects there were some fundamental commonalities. In particular, the focus on getting farmers and smallholders linked up to markets by supporting market-based, independent livelihoods. All the projects bore some initial costs – KickStart on product subsidisation and technology development, Technoserve on facilitating financing, and PRADAN on watershed infrastructure – however, all rested on business models and promotion of entrepreneurship. This is a unifying theme, but one of potential concern. The market-based approach has a high likelihood of attracting the entrepreneurs and risk takers, who very often do not constitute the poorest groups. These programme placement effects mean that for poorer households in project areas benefits depend on spillover mechanisms, local economy effects and growth multipliers. However, are these effects real? Only PRADAN had a consciously implemented strategy to work with poor households through their geographic targeting and they then work at community-level. Given the poverty reduction mandate of many funding organisations and government programmes more

systematic effort is needed to identify the relative poverty levels of beneficiaries.

Fourthly, we tend to be fixated on the idea of risk reduction through agricultural projects because we recognise that poor people are risk averse and often forgo good chances in order to ensure a certain minimum return on an investment of money or labour. Improved risk-taking capacity of poor producers can be and very often is a result of project interventions that have improved their incomes particularly when this is translated into more assets and hence more resilience to shocks. Objective risk may not have changed but attitude towards risk can now afford to change. In the PRADAN watershed management project farmers told us how they were now able to take on modest production risk and this was a measure of improvement for them. The reason of course was that their resilience to risk had much improved since the project began. Sustainable and significant poverty impact occurs when this enhanced resilience allows farmers to take on risk associated with investments that face production and other livelihood shocks.

5 Guidelines for improving the assessment of project risk

Our review shows that considerations of risk are critical in many agricultural development projects; however, the vocabulary of risk within the commodity- or technology-oriented projects tends to focus on risks to the project. In more locally driven projects considerations of producer risk can be more embedded in the whole philosophy of the project and can incorporate attention to local perceptions of risk. The challenge is to understand the context of the farmer/client and a good way to do this is by working with and through the best placed institutions. PRADAN's BMGF-funded development of knowledge services provides an important opportunity for the BMGF to learn and to promote models of community-planned agricultural interventions. But even for projects that operate within a commodity- or technology-driven philosophy the improvements needed in project preparation and M&E are simple: to understand how farmers perceive the risks – output, financial and market especially – associated with the project relative to their overall livelihood risk. If the project is to reduce their aggregate vulnerability the proposers will have assessed, and, where needed, added design

features to address these major and pervasive types of risk.

1 *Two core components* should be included in the project process.

(a) Project designers should be asked to use proposal guidelines which provide for an assessment of *ex ante* risks affecting the livelihoods of the small farm producers that are the intended partners. Discussion of proposed interventions should be responsive to such analysis.

(b) Project design should develop M&E systems that incorporate understanding of the *ex post* risk profiles of producers participating in the project to understand how project interventions have changed the risks faced by producers.

The analysis of (a) will help determine the appropriateness and completeness of project interventions. The analysis of (b) will inform development of project implementation, especially possible modifications of or additions to project components.

Notes

- 1 Focusing on the farm household, economists typically define vulnerability in terms of the likelihood of an adverse event and the expected impact on the poverty status of a household relative to some welfare measure such as a poverty line.
- 2 The formal market for insurance against agricultural risk in developing countries is thin because providers face problems of asymmetric information. Even if insurance were to be available, poor farm households will usually not be able to afford it.
- 3 The projects were AATF – African Agricultural Technology Foundation: Combining Breeding and Biotechnology to Develop Drought Tolerant Maize for Africa (DTMA-II); AVRDC – The World Vegetable Center: Vegetable Breeding and Seed Systems for Poverty Reduction in Africa; CLUSA – The Cooperative League of the USA: Cotton Value Chain Improvement in Central Mozambique; IDE – International Development Enterprises: A Path Out of Poverty;

2 *Two core principles* should inform development of this approach.

(a) The risk analysis of specific production interventions should be locally undertaken in the specific producer context for the proposed intervention ... arguments, for example, such as ‘irrigation reduces risk in most farm contexts’ are insufficient. This is because the scope and scale of risk associated with the project must be understood relative to its significance for the farmer’s overall livelihood.

(b) If poverty reduction is an overarching objective then producer risk must be classified in relation to the relative poverty status of the participating producers.

The *ex ante* component of risk analysis is sometimes discussed in project documents, but only occasionally in detail, and the main focus is usually on the intervention itself and the external risks to the project. M&E systems usually do not address *ex post* analysis of impact on risk.

Connecting Dollar-a-Day Farmers to Affordable Small-Plot Irrigation and Markets; IDE (India) – International Development Enterprises: India Micro Irrigation: Enabling smallholder prosperity; KickStart International: KickStart in Tanzania: Getting 120,000 People Out of Poverty in Three Years and Supporting the Development of the Next Generation of Money-Making Technology; PRADAN – Professional Assistance for Development Action: developing farm-based livelihoods in endemically poor regions of India; Technoserve: Doubling Coffee Incomes for one million East African Smallholder Farmers; WFP – United National World Food Programme: Innovations to Connect African Low-Income Farmers to Markets – Purchase for Progress; WFP – United Nations World Food Programme: Home-grown School Feeding to Support Local Farmers in Africa – Conceptual framework, feasibility analysis and implementation planning. They were shared to help build learning within the Bill & Melinda Gates Foundation.

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