Overseas Development Institute

social protection

Using economic modelling to understand the linkages between agricultural growth and social protection[1]

The proposal raises a set of questions, some of which require an economic analysis and therefore appropriate modelling instruments and quantitative analysis methods to be answered. The range of issues that relate to the complementarity between agricultural growth policies and social protection is large and goes from household behaviour to determinants of food supply and regional market integration. We therefore need to look at the impact of policies from the microeconomic level first and then to enlarge the analysis to macro-economic phenomenon.

Moreover, the issue of vulnerability, in the sense this proposal defines it, is often ignored or underestimated in analytical frameworks that aim to reflect household behaviours. While risks – and tools to mitigate them- are largely discussed in recent literature, the impact of stresses is indeed not addressed while they clearly influence household behaviour. This inception report will propose a set of methods and tools that allow the role of stresses in household response to agricultural growth (AG) and social protection policies (SPP) to be taken into account.

The questions raised in the proposal that call for economic approaches to be answered, can be classified as follows:

A. On the impact of social protection policies:

i) What are the potential economic effects of the different social protection measures defined in the proposal, at the household level, at the market level and at the macroeconomic level?

ii) What are the effects of these various social protection policies on savings, investment, and productive asset accumulation?

iii) What are the trade-offs between food versus cash transfers -as social protection tools- in the context of a given food market structure and its integration with other markets. What are the distortive effects of both measures on markets, prices, household consumption and purchasing power at different poverty levels? What are the externalities such as impact on income distribution and inequality?

B. On the impact of vulnerability and stresses:

i) At the household level, are market opportunities being missed because of risk?

ii) What are the effects of stresses on household behaviour?

iii) What could be the potential impact of credit and insurance on household behaviour, on investment in productive assets and on choices?

iv) What could be the potential impact of access to credit and risk mitigating tools at the village economy level?

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C. On the complementarity between social protection policies and agricultural growth:

i) How to test the complementarity between policies that increases agricultural productivity and these that offer social protection?

ii) What are the synergy between both policies and how to measure them?

iii) Is the multiplier effect stronger when policies are combined and what is this effect composed of?

D. On policy recommendations:

i) Criteria to guide policies in the context of a given economy. What are the different elements to look at when designing SPP and AG programmes? On what criteria should policy makers decide on SPP and AG programmes?

ii) Criteria for sequencing policies of both sorts.

These questions relate to different levels of analysis; looking either from a micro or a macro economic perspective on the determinants of policy outcomes. There are therefore two different sets of tools that can be used to answer these questions. The first one is the 'household models' that allow the way in which households might respond to changes in their producing and consuming environment to be understood. The second is the so-called 'village economy models' that allow the implications at the village level of the SPP and AG policies, given linkages between households and the markets, and given market structures and regional integration, to be understood.

In the following sections, I define some of the economic concepts that are used in the proposal, and by doing so, justify the different ways they can be incorporated in the analysis. I then describe the different modelling tools and quantitative analysis instruments that are relevant to answer the different questions raised here. I finally explain to what extent each tool allows each question to be answered.

Economic effects induced by agricultural growth and social protection policies

1.) Growth in agricultural productivity

This proposal defines agricultural policies as policies that increase productivity in the agricultural sector. This generic economic concept could refer to various sorts of changes relative to the production function and according to whether it refers to a change in labour productivity or a technical change. *The impact on labour income would especially be different.* It is therefore important to make the distinction between those things that would have a major effect on household income from labour (labour productivity increase); a relatively larger impact on capital income (capital productivity increase); or a similar effect on both (for example, technical progress or new technology adoption).

Access to finance, for example, could lead to a change in the technology used by farmers, while public investment in irrigation could improve the productivity of labour and land. This distinction might appear trivial and rather theoretical but it is a determinant for the quantitative analysis exercises we suggest later on in this report as it states the impact of AG on household income.

The most generic and unrestrictive specification of production functions is the so-called 'Cobb Douglas function', conceptualised as follows:

$$X_i = A.\left[\alpha.L^{\frac{\sigma_i - 1}{\sigma_i}} + (1-\alpha).K^{\frac{\sigma_i - 1}{\sigma_i}} \right]^{\frac{\sigma_i}{\sigma_i - 1}} \quad (6)$$

where:

X_i : production of the good i, in volume,

L : labour demand,

K : capital stock,

σ_i : elasticity of substitution between labour and capital to produce the good i,

A_i : efficiency parameter.

In this proposal, the term 'agricultural growth' stands for an increase in productivity in one/several rural production factors(s). It therefore can designate a change in σ_i, α or A, while a technological change necessarily corresponds to an increase in the parameter A.

The distinction between investment that favours labour income and capital income is relatively important for us to acknowledge given that our focus is on poverty reduction and vulnerability. Given that factors are paid at their marginal productivity, labour income and capital income will differ according to the productivity change that is induced by the agricultural growth policy.

The existing empirical literature that tests the impact of investment on productivity change in the agricultural sector is rather thin, especially when it comes to investment in rural areas. Whether the investment is public or private, the magnitude of its impact on the production function could be different. Anderson et al (2006) review the empirical works that seek to asses the impact of public investment on productivity and technology. Whether they look at the macroeconomic or at the sectoral level impact, most of the existing empirical works assume that public investment foster technical change, therefore affects similarly all the production factors.

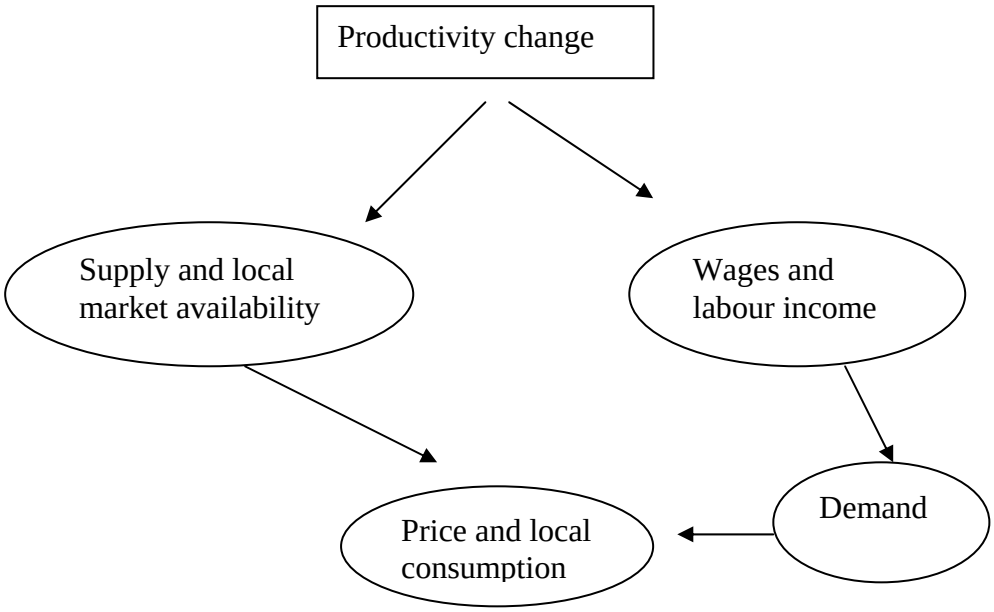
The magnitude of this change varies from one paper to an another, with a larger impact on average in developing economies when one focuses on productive investment as opposed to the so-called 'defence investment'; which refers to military spending. Among the main contribution to this literature are Aschauer (1989 and 2000), Binswanger et al. (1993), Dessus and Herrera (1996), Devarajan et al. (1996) Fan et al. (2004b) (see Hurlin (1999) for a review).

As for private investment, the existing empirical literature is also very thin, certainly due to the lack of available data on rural production. While labour is a factor that is often reported in surveys and census on rural areas in developing countries, capital, productive assets, land and investment are usually more difficult to use. What is especially hard to estimate is private investment returns in rural productive activities.

For the purpose of this study, we will suggest in the following section how to use the existing literature on investment returns and how to test the different assumptions that are not directly tested in the literature, for which we do not have a empirical measure of the magnitude or the form, but for which we can propose different assumptions to test.

What are the potential micro and macro economic impacts of agricultural productivity growth ?

At the village level, an increase in agricultural productivity directly affects:
-output and local food availability
-marketable surplus
-wages and income (relatively more in case of labour productivity change and rather less in case of capital productivity change)
-employment
-prices
-regional trade, depending on market integration for agricultural products.



The impact of a simultaneous shift in both demand and supply on the local market can be quite difficult to assess. Price can either increase (Figure 1 below) or decrease (Figure 2 below), and therefore the impact on poor households can be positive or negative. Because of the complexity of the impact of market change on purchasing power for the different households, we need to have a better representation of the linkages between households and the local markets.

Figure 1: Price increase resulting from demand and supply shift

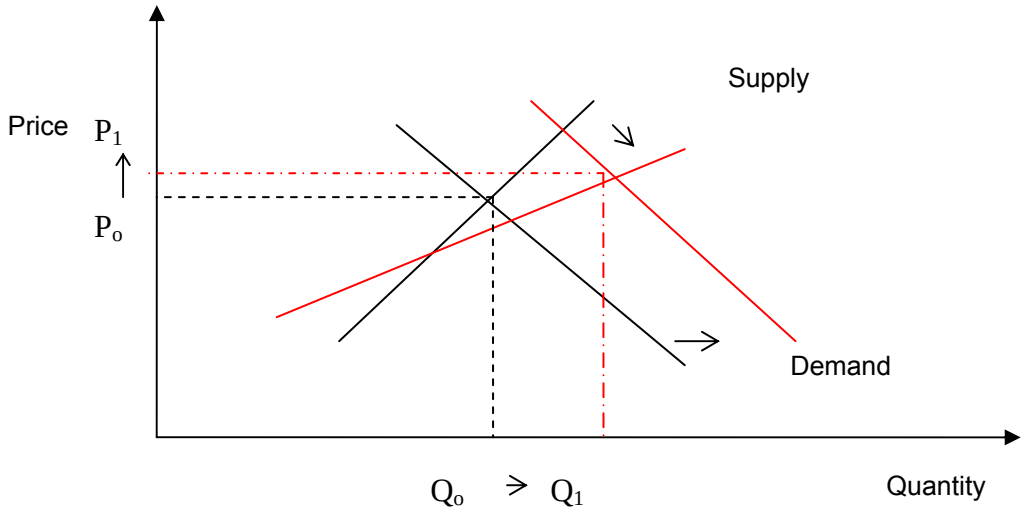
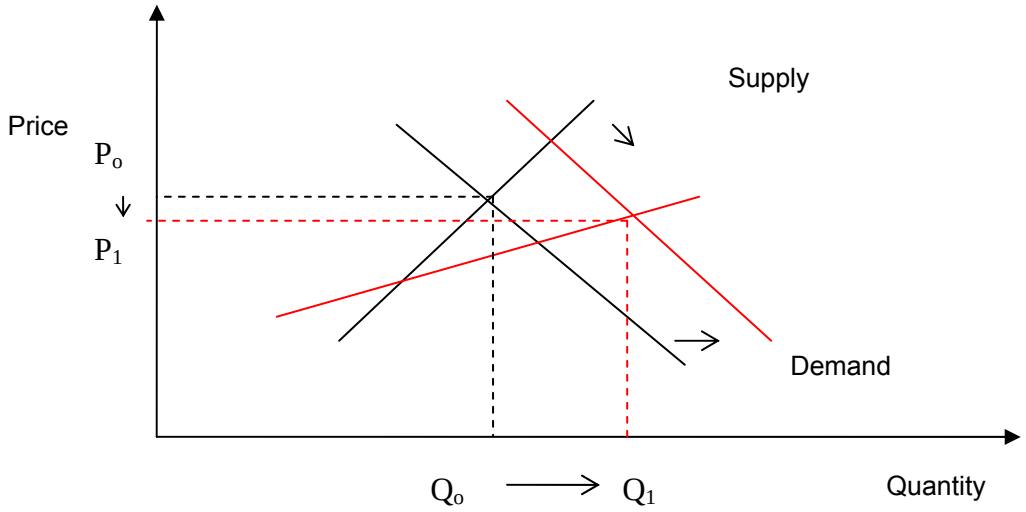


Figure 2: Price decrease resulting from demand and supply shift



Indirect effects also occur, essentially through income, employment and prices effects. The main ones would be:
-savings and investment, in productive assets or in risk mitigation, and
-household access to services, including health and education.

Because of the various channels through which AG could have an economic impact, we need to use a framework that allows us to take into account how markets and

households are linked and capture the synergy between the different policy outcomes. For this reason we suggest, in the next section, the use of general equilibrium models to answer our initial sets of questions.

2) Social protection policies

The proposal defines social protection policies as measures to reduce the vulnerability of households to both shocks and stresses. It therefore suggests a large range of measures, each adapted to the category of households they aim to target, according to their sources of income.

For those unable to engage in productive activities, such as the elderly, disabled, sick or single mothers with children, social protection could take the form of transfers, in food or in cash. For farmers, we suggest a set of financial tools, such as crop insurance and access to micro-credit, which could reduce their vulnerability to risks. These financial instruments could especially have a substantial impact on investment behaviour at the household level by promoting productive asset accumulation and allowing the farmer to take better advantage of market opportunities even though it implies more risky choices.

As we will explain in the next section, the impact of such financial tools on household behaviour, given the shocks and stresses that affect its vulnerability on a permanent basis, has not yet been addressed adequately in the existing literature. In that section, we will propose some analytical tools that could allow us to resolve this shortcoming.

3) Impact and complementarity

If we refer to the household categories described in the proposal, the potential impact of the SPP and AG, as now defined, could be as summarized as in Table 1 below:

Table 1: main impact of agricultural growth and social protection policies

Social protection impact		***Schematic characterisation of rural HH[2]***	***Poverty links/ Characteristics***		***Agr. Growth impact***
Through demand increase	→	Large-scale farmers	As above, but to a lesser extent; moderately vulnerable to shocks and stresses	←	Direct impact on production processes: direct impact on supply, costs and factor demand, profits, certainly investment
Through demand increase	→	Medium/small-scale farmers	The poor as entrepreneurs – highly vulnerable to shocks and stresses	←	Direct impact on production processes: direct impact on supply, costs and factor demand, profits, certainly investment
Mostly through impact on labour demand as a result from product demand increase	→	Marginal farmers	Rely on agriculture for job creation and cheap food	←	Indirect impact through (i) labour demand and (ii) price change and increased food supply
Direct effect on income and vulnerability if beneficiaries from soc. protect. policies	→	Farm labourers	Relate to agriculture mainly as consumers – increased income will be spent mainly on food	←	Direct impact as producer (productivity increase, profit, auto consumption) plus impact through as consumer through market change: supply and price effect
Direct effect on income and vulnerability if beneficiaries from soc protect. policies	→	Those unable to engage regularly/fully in economic activity (very elderly, sick, disabled, very young….)		←	Through market impact: lower prices, higher supply from local producers Potentially higher transfers from other groups with increased income

[2] To simplify for present purposes, productive activity is limited to agriculture (though in its broad definition to include livestock, forest and fisheries). Similar categorisations from higher to lower income, including those unable to participate, could be made for any other productive sector in rural areas

We will now propose different methodologies to test these different effects, their magnitude, their synergies and their complementarity at the village level. We will suggest some tools that allow us to understand what could happen at the household level when such policies are implemented, in terms of changes in consumption, production and investment decisions, when market impacts are ignored and considered exogenous to the household behaviour. We will then propose tools that allow us to look simultaneously at households and markets, given that household and markets are intimately linked and influenced by each other. We will explain how village general equilibrium models allow us to capture the interaction between household decisions as a response to a policy change, and labour, goods and services markets. Village economy models do enable us to test the impact and the complementarity of the different policies suggested in this proposal. If used in an adequate way, they allow the determinants for policy outcomes to be understood. In other words, what the main elements that policy makers should consider at the village level to decide on the implementation and the sequencing of rural development policies are.

From micro to macro impact: what analytical tools to use?

Households are the recipients of agricultural growth and social protection policies as suggested in this proposal. It is therefore important to understand how they are affected by each of the measures proposed, what their possible response to the policy implementations would be, and how their behaviour might change as a result of these policies. Household models could provide us with a tool that does precisely this.

A) Household models

The aim of household models is to anticipate how a typical, representative household would react in response to an exogenous shock, such as change in a food price or income transfer. Households have to take a number of decisions regarding their time dedication to work and leisure; the role of each household member in producing activities, inside and outside the family production structure (who is going to work on the farm and house and who is going to sell his/her work outside on the village labour market) given their consumption needs, and of those which could be satisfied by farm products and auto-consumption of the family produced goods.

In developing countries, rural households often make their decisions as producers in accordance with their needs as consumers. The quantity of labour that they would use or hire to produce and cultivate the soil will depend on what they expect to get from their productive activities, both in nature and in profit, to satisfy the family needs. The frontier between the producing activities and the consumer economic unit is often inappropriate in this context; unlike it could be in urban areas where the family often does not contribute as a unit to the labour market, and where auto-consumption is less observed. Household models were developed to capture this complexity that classical utility functions ignore.

The classical way to model household utility function is index it on consumption, and possibly also on leisure. A household model consists of modelling the household decision on the basis of a utility function that depends on tradeoffs between work and leisure. The household is considered as a global economic unit both in terms of its labour supply and in terms of its consumption needs. These models therefore aim to assess the behaviour of a household given prices (that are exogenous), products

expected from the different producing activities, time constraint and disutility from work on one hand, and household needs on the other hand.

1.) Unitary household models

Unitary household models assume that a household maximises its utility as if it was an 'individual' economic unit. In 1965, Gary Becker developed the first unitary household model, where household utility function was dependent on leisure and work. This paper defines the household as 'a "small Factory" that combines capital goods, raw materials and labour to clean, feed, procreate and otherwise produce useful commodities'.

Such a model is likely to predict that the family member with the lower expected wage rate or the higher aptitude in the 'household sector' would specialize in the 'household sector'. This approach is strongly labour market oriented as it mainly explains the decision of households to allocate time between marketed labour, household producing activities and leisure.

Singh, Squire and Strauss (1986) propose a complete integration of both household functions -producer and consumer- into a synthetic framework, coupling two neoclassical models: the producer one and the consumer one. This model allows the impact of both labour and product price changes, on i) consumption, ii) market surplus and iii) supply response to be anticipated.[3]

2) Intra-household models

Various adaptations of household models have followed Singh et al. work to make it fit more closely to the complex reality of decision making by rural households. De Janvry, Fafchamps and Sadoulet (1991) for example introduce the notion of missing markets into the household model analysis. Imperfect institutions and imperfect market integration into regional economy could justify some paradox observed empirically. By introducing missing markets into the analytical framework, de Janvry et al. show that household response to a change in market condition can be very different from what household models suggest: the functioning of markets is a clear determinant in household response to changes in market conditions.

Among other developments of household model framework, Haddad, Hoddinott and Alderman (1997) and Duflo (2000) distinguish the role of different family members as income earners and decision makers (intra-household models). In contrast to unitary household models, intra-household models take into account the difference in individual preferences and therefore utility functions among family members. Some recent works also include bargaining power (Chiappori et al. 2001, Fafchamps and Quisumbing, 2003).

3) Limits

Household models generally do not include investment behaviour, as an inter-temporal decision on saving. Risk and vulnerability are also excluded from the analytical framework, while they both clearly determine investment decisions and sometimes crop or producing activity choices. The link between shocks and stresses on one hand and saving and investment behaviour on the other hand can therefore not be made. In order to understand the potential impact of financial tolls on capital

[3] It also gives the output price elasticity, the consumption price elasticity and the income elasticity of consumption.

accumulation and crop choice, we need to introduce this link into the analytical framework. *We therefore propose to incorporate vulnerability and stresses into the Singh et al. (1986) type household model. Such a tool could allow us to answering questions A i), A ii), Bi), Bii), B iii), and Di) raised in the introduction.*

Another limit of household models is that they take market prices as exogenous: they are faced by households who want to buy or sell products on the village markets. The decision of a representative household, whose demand and supply is marginal to the market, does not affect the market price. If the number of households who benefit from the measure is big enough to make the impact of their decision not insignificant at the market level, then use of the household model to anticipate the impact of policies can be very misleading.

Households base their decision on their real income, rather than on their nominal one. And any change in prices may affect their decisions. In the same way, the quantity of product that households supply the village market with is an essential determinant of price.

Because the linkages between markets and households are operating in two ways - because household decisions affect markets and prices and prices and markets affect household decisions- the household models, even the most sophisticated ones, do not allow us to understand the impact of agricultural growth policies. They offer a myopic vision of the phenomenon that can occur as a result of policy implementation. Only by looking, at the village level, at the different relationships between markets and households (who interact with markets both as producers, consumers, labour suppliers, investors etc.) can we have an approximate understanding of the determinant of policy impact.

From a macroeconomic point of view, we can certainly state that the impact of any SPP will depend on the country's initial situation regarding initial income distribution, market integration and transport costs. However, market structure could vary considerably from one village to another, as does the structure of household incomes. The differences between a village in Malawi and a village in India could be substantial, in terms of household income distribution, sources of income among households, integration of different categories of households to local markets, integration of village markets to national ones or to international trade. These parameters, together with other village specificities, determine the potential impact of the various SPP we suggest in this proposal. We therefore need to incorporate the whole structure of the economy in the analytical framework that we want to use to answer the questions raised in this proposal. For this reason, we suggest developing a village economy model in order to take into account feedback effects, market integration and multiplier effects.

B) Village general equilibrium models

A village economy model is a general equilibrium model that takes the village economy as the unit for economic analysis. In this report we refer to it using both terminologies (village economy and village general equilibrium model).

1) What is a general equilibrium model?

Computable General Equilibrium models (CGEs) belong to the category of simulation tools and therefore could be particularly helpful to understand the complex economic mechanisms that can result from productivity change and livelihood protection measures. They could be of great relevance to assess the effectiveness and the

impact of these policies. The price effect that would result from cash transfers for example could be evaluated together with its impact on household consumption and poverty. The other major advantage of using CGE models would be that they allow us to test the complementarity of both policies, and the need to complement them with some other poverty reduction strategies.

CGE models aim to represent a country economy through all the flows that occur in a given year between different agents or institutions. They are especially helpful in analysing the stakes of policy choices as they allow feedback effects to be taken into account. Among other advantages, CGEs only require data for a given year, unlike econometric models which require long time series. They are broadly used and applied to developing countries by research institutions and development agencies.

CGEs allow for quantitative macroeconomic analysis of a large variety of social protection policies. These models can be designed to focus on any particular group of economic agent (and therefore allow for in-depth approach of the targeting question in this study). They also allow disaggregating a particular sector of activity or a market, to distinguish between different categories of households according to their location, activities and/or income. Ideally, the estimate of demand functions should be obtained through econometric analysis of household expenditure surveys incorporating information on consumption levels and final goods prices. Therefore, the changes in income can be analysed at a very disaggregate level for the different types of households.

Why are CGE models particularly relevant to understand the impact of social protection and livelihood promotion? Any shock in food demand or supply can be analysed not only at the sectoral level, looking at the food market, but also in terms of household consumption and welfare, domestic and international trade, and more globally in terms of food dependence and self-sufficiency. The cash transfer impact on prices could be quantified and the general equilibrium framework is particularly helpful in understanding the complex outcomes and the sequence of economic mechanisms that would result from it. The impact on growth, poverty and income distribution can be both explained and quantified in a model that will take into account enough of the country specificities.

Therefore, in the context of this study, the general equilibrium analysis could be particularly useful to investigate and document:
-the efficiency of SPP and AG measures,
-their complementarity as well as the need to complement them with other development strategies,
- efficient sequencing of policies,
- the targeting approach in the specific case of each country given income distribution and group's vulnerability, and
-the impact of policies on growth, income distribution and poverty.

CGE allow studying the economic impact of each measure on:
-Prices, shift in demand and/or in supply,
-Consumption and production with a sectoral approach,
-Poverty and income distribution,
-Growth, and
-Ideally on investment and productive strategies, but this would require specific data to model saving and investment behaviour. Facilitation of this would be considerably improved if the household model analysis described in the previous section has been undertaken prior to the general equilibrium analysis.

2) What is a 'village general equilibrium model'?

A village CGE model takes the village economy as the reference unit. Every flow from or to outside the village will be considered as 'rest of the economy' in the same way imports and exports would be considered as such in a CGE model. The village economy model is based on a village SAM in the exact same way CGEs are based on national SAM: each flow that occurs in a given year within the economy is considered as an expense from one agent and a receipt for another. All the flows are accounted for twice (once as a spending, once as a receipt) and all the accounts are balanced for that given year.

Instead of having different types if households based on geographical parameters (for example rural households as opposed to urban ones) as it is sometimes the case with CGEs, the distinction between households will be based on their sources of income or on their family characteristics for example. The model also allows the assumption that part of the agricultural production is consumed by households who produce it while another part of it enters the exchange economy inside and outside the village.

In 1996, Iram Adelman and Edward Taylor offer the first comprehensive work on village economy models. In *Village Economies* (Adelman and Taylor 1996), the author explains the design, the estimation and the use of village wide economic models. Five chapters are dedicated to the presentation of village SAMs for Senegal, India, Mexico, Kenya and Indonesia. In addition to explaining and describing the flows that occur during one given year period in a village of this country, each chapter explains the choice of economic agent category, including households, according to economic specificities in the village. The work is impressive not only for the data side, but also for the extraordinary understanding of the village economy and the linkages between household and the markets.
Unique in its kind, this book is the reference we should use to develop our methodology in this project. The data are displayed, allowing for a new model construction and additional simulation work.

3) Limits of Village CGE analysis:

i) The way they are defined in the project, agricultural growth policies could impact either the technology used to produce or the quantity or the productivity of one or several factors. The distinction between both is relatively important in the context of this study because of the way income, wages and output are affected by AG measures. For example, investment in communal assets (access to water, irrigation, soil conservation systems etc.) could simply increase the productivity of all factors and being considered as a technology improving measure. With the same quantity of all factors (land, labour, capital), more output could be generated. Investment in individual assets could instead impact the quantity of factor used in the production process, and modify the productivity of one factor in particular. Modelling choices will therefore have to be made accordingly to the AG policy.

Unfortunately, there is no consensus on how investment (private or public) affects the production function. The literature that offers quantitative assessment for this impact is limited essentially because of the difficulty in accessing data on agricultural production. The results from the modelling work will be influenced by the way each policy is linked with productivity or technological change. One way to overcome this difficulty is to test several assumptions regarding the impact of a given policy; preferably based on existing empirical work.

ii) The village market integration for each type of good and service will be an important factor for the policy impact. This should be empirically tested (see Ravallion (1986 and 1987), Bhagwati et al. (1973), Levy (2004)) and included in the theoretical framework. An alternative possibility will be to replicate the same sets of simulations assuming different degrees of market integration to understand what the different policy outcomes in different market situations could be.

4) Advantages of Village CGE analysis

i) Village CGEs allow us to take into account both the economic phenomenon that occur inside the village as a result of one set of policies but also to understand trade response given integration of the village economy to the rest of the economy for each type of good or service.

ii) Prices are endogenously determined given local supply, demand and trade, as opposed to household models where they are exogenous. Non-monetary transactions are included.

iii) Economic linkages among households within the village are perfectly well represented. Institutions are represented in village economy models.

iv) The model allows us to capture different types of market integration that matter for price change and policy impact:
1st: integration of household with village market, and
2d: integration of village market with external markets (especially important for households who produce exports).

v) Different aspects of policy impact can be considered simultaneously. The chain of economic effects resulting from, for example, productivity change can be understood both on the supply and the demand side. On the demand side: from productivity change to wages, income, and consumption on one side. On the supply side: from productivity to production and supply, local market availability and trade, price, demand and consumption.

vi) Village economy models allow us to distinguish between the exogenous and endogenous forces that shape the impact of policy in a village.

Village economy models could allow answering the whole sets of questions A, C, D and the question B. iv).

Conclusion

Policies that aim to reduce vulnerability have effects at the micro-level. It is therefore necessary to develop appropriate tools to understand how insurance and access to finance affect the behaviour of households in terms of risk aversion, behaviour and choices. With respect to the process of intra-household decision making, anthropological and sociologic approaches are useful in understanding at the microlevel, or at the community level, what the determinants of these policies impact are.

But whether the household decide to consume more, or differently; to save more; to invest in new assets; to produce new crops, or to change its producing activities, its behaviour changes have direct and immediate economic impact **and** indirect impact at the meso or macro level. Because households are linked through a very large range of transactions; because of their reliance on the village market, either as

worker, producers, and consumers- all economic functions- we need to understand the economic processes that result from the policies that this project studies, in the context of the village economy. *Synergies and multiplier effects could only be analysed and measured through appropriate economic analysis framework that take into account linkages and interactions at the village economy level.*

Village CGEs are the most appropriate tools to do so. They allow the integration of different types of linkages and relationship in the economy; to decompose the multiplier effects that could result from policies; the impact of these policies on poverty, inequality and welfare at the household level; and also on value added production, employment, food self-sufficiency, regional trade and growth at the village level. This type of method should answer the question of which determinants policy makers should look at when deciding on the nature and the sequencing of policy packages to promote rural development and poverty reduction in a given place.

By not looking at the village economy on its all, by ignoring the relationship that link agents together and constitute the village economy in all its complexity, policy analysts take the risk of ignoring part or all the phenomenons that they might generate. Ignoring the market effects for example can be very misleading, especially when policies create price distortions that can affect poor households very badly.

Therefore, the impact at the market level and at the macroeconomic level request an economic approach because the phenomenons that occur as a result of both agri-growth policies and social protection policies are economic phenomenons that need to be understood in the context of the village economy.

E Taylor and I. Adelman's books show the possible risk of ignoring labour and product market effects. In the first chapter of their book, they illustrate this by running the same simulation using a household model, SAM model and village CGE model. They take the example of remittance from outside the village. They analyse the impact of remittance received by households, using these different tools. When the analysis is conducted at the household level using a household model, there is no apparent effect on production as households choose to reallocate their resources differently according to their utility function.

In a household model, prices are indeed considered as exogenous, while it is clear that transfers create price distortions even if they are moderate. No household model can reflect the actual changes that result from transfers simply because the magnitude of the impact needs to be measured at the market level to be integrated satisfactorily and realistically. Taylor and Adelmam show that even when a SAM analysis is conducted, part of the effect at the village economy level could be ignored or misunderstood. The exercise they based their conclusions on demonstrates that there is a clear risk of drawing false conclusions on the policy impact when the rest of the economy is not included in the analytical tool used to assess the impact of the chock.

Village Economies present different social accounting matrixes for villages in different developing economies, in Africa, Latin America and Asia. Not only do the corresponding chapters explain the way the social accounting matrixes are constructed to reflect village's differences in household composition, resource allocations, and consumption and production patterns. The chapters also display the data that results from this exercise in each case. *It would therefore be possible to use the data made available to construct village CGEs that will allow us to answer questions A, C and D of our proposal.*

It is extremely interesting to see in the last chapter of this book the differences in the results that are obtained from the village CGE analysis across countries. The variety of economies that are studied has an extremely rich potential for our study because they potentially could illustrate different cases in which the agricultural growth and social protection policies could have different impact on poverty, income distribution and growth at the village level.

I suggest the use of the data made available to us in this book to run the simulations that correspond to our objectives in our project. While agricultural productivity growth is one of the simulations the book considers, the social protection policies that we are interested in are not. Moreover, the issue of complementarity between the different rural development policy tools is not looked at in the book. The concluding chapter recognises the limit of their analysis by mentioning the fact that agricultural productivity and transfers to the households that are not fully engaged in productive activities are essential complements to each other, but none of the chapters actually studies or measure this complementarity.

In Levy (2006), techniques are developed that allow the complementarity between different rural development policies in the framework of a CGE analysis for Chad to be studied. These techniques can be adapted to our objectives and included in village economy CGEs in order to allow us to answer (i) the impact, (ii) the multiplier and (iii) the complementarity questions.

From their work on the different village CGEs, Adelman and Taylor (1996) reached a set of conclusions that are very relevant to our project. In particular, in their concluding chapter, the authors explain that *'Quick fix' income transfer and income subsidy policies are inadequate to increase real income and alleviate rural poverty. They clearly state the need of coupling transfer policies with efforts to increase productivity of family's resources in poor households.*

Questions	Tools	
	Household models	Village economy models
A. On the impact of social protection policies:		
i) economic effects of SPP	X	X
ii) savings, investment, and productive asset accumulation effect	X	X
iii) trade-offs between food versus cash transfers + distortive effects of SPP		X
B. On the impact of vulnerability and stresses:		
i) market opportunities being missed	X	
ii) effects of stresses	X	
iii) impact of credit and insurance	X	X
iv) impact at the village economy level		X
C. On the complementarity between SPP and AG:		
i) test the complementarity		X
ii) measure the complementarity and synergies		X
iii) multiplier effect components		X
D. On policy recommendations:		
i) Criteria to guide policies	X	X
ii) Criteria for sequencing policies		X

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