Livelihood Diversification in Rural Andhra Pradesh:

Household asset portfolios and implications for poverty reduction

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Young Lives
An International Study of Childhood Poverty

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Preface

This paper is one of a series of working papers published by the Young Lives Project, an innovative longitudinal study of childhood poverty in Ethiopia, India (Andhra Pradesh State), Peru and Vietnam. Between 2002 and 2015, some 2,000 children in each country are being tracked and surveyed at 3-4 year intervals from when they are one until 14 years of age. Also, 1,000 older children in each country are being followed from when they are aged eight years.

Young Lives is a joint research and policy initiative co-ordinated by an academic consortium (composed of the University of Oxford, the University of Reading, the London School of Hygiene and Tropical Medicine, London South Bank University and the South African Medical Research Council) and Save the Children UK, incorporating both inter-disciplinary and North-South collaboration.

Young Lives seeks to:

- produce long-term data on children and poverty in the four research countries

- draw on this data to develop a nuanced and comparative understanding of childhood poverty dynamics to inform national policy agendas

- trace associations between key macro policy trends and child outcomes and use these findings as a basis to advocate for policy choices at macro and meso levels that facilitate the reduction of childhood poverty

- actively engage with ongoing work on poverty alleviation and reduction, involving stakeholders who may use or be impacted by the research throughout the research design, data collection and analyses, and dissemination stages

- foster public concern about, and encourage political motivation to act on, childhood poverty issues through its advocacy and media work at both national and international levels.

In its first phase, Young Lives has investigated three key story lines – the effects on child wellbeing of i) access to and use of services, ii) social capital, and iii) household livelihoods. This working paper is one of a series which consider an aspect of each of these story lines in each country. As a working paper, it represents work in progress and the authors welcome comments from readers to contribute to further development of these ideas.

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Acknowledgements

Contents

Introduction

Diversification has been defined by Ellis as 'the process by which rural households construct an increasingly diverse portfolio of activities and assets in order to survive and to improve their standard of living' (Ellis, 2000: 1). Barrett *et al.* (2001: 3) suggest that '[d]iversification patterns reflect individuals' voluntary exchange of assets and their allocation of assets across various activities so as to achieve an optimal balance between expected returns and risk exposure conditional on the constraints they face'. If appropriate interventions are to be effective in reducing rural poverty, and vulnerability to poverty, it is important to have an understanding of households' preferred livelihood diversification strategies and the extent to which these strategies are feasible.

Livelihood strategies in rural areas can be classified into three categories: agricultural intensification, diversification and migration. However, this paper focuses on diversification only and examines the different diversification strategies and the reliance of households on incomes from different sources in the Andhra Pradesh (AP) context. It seeks to address two main questions:

- What are the main livelihood activities in AP? How do these differ across (sub-state) regions and districts and in urban compared to rural areas?

- What is the relationship between household livelihood diversification strategies and the household asset base? For example:
    · How are assets distributed according to other demographic characteristics?
    · How do asset portfolios affect vulnerability or household responses to shocks?[1]

This topic is of particular relevance given the acute political attention that the recent agricultural crisis in the state – resulting in hundreds of farmers' suicides – has received. Although the current state government is undertaking concerted measures to address the relative neglect of the agricultural sector by the previous Chandra Babu Naidu government, policies will be better informed if there is a greater understanding of household asset portfolios and the links between these assets and household diversification. By drawing on Young Lives data which cover 20 sites across six districts in Rayalseema, Telangana and Coastal Andhra, our aim in this paper is to facilitate policy-makers' capacity to make more nuanced decisions about the optimal entry point for addressing rural poverty. In the long term, we hope that this analysis of household diversification patterns will provide us with the foundations upon which to analyse links between different diversification strategies and child wellbeing outcomes, given the Young Lives mandate to better understand the dynamics of childhood poverty.

Section 1 provides a literature review, drawing on India and AP sources where possible. Section 2 describes the Young Lives sample and the methods of analysis employed. Results are discussed in Section 3, and Section 4 examines the possible policy implications of our findings.

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[1]   We have referred to household responses to shocks as 'vulnerability' for ease of reporting.

I. Literature review

The literature on livelihood diversification has analysed the individual and household characteristics, socio-cultural, institutional and macro-economic factors, as well as natural resource and infrastructural contexts that shape household livelihood strategies. The following section will briefly discuss these factors in turn, but will pay particular attention to the socio-cultural constraints and macro-economic changes that have been highlighted by analysts of Indian rural livelihoods. It draws on studies of Andhra Pradesh wherever possible.

1) Household characteristics

Asset portfolios and capitals

Policies addressing poverty are usually aimed at improving the asset resource base of the poor and may take the form of either broadening the asset base or increasing the productivity of assets already accessed, or both. Assets are a household's endowment of resources with which it makes a living; assets require investments of time and money in order to be acquired or created. Using DFID's formulation of livelihoods resources, there are different types of assets:

- human capital ('the skills, knowledge, ability to labour and good health important to the ability to pursue different livelihood strategies')

- natural capital ('the natural resource stocks from which resource flows useful for livelihoods are derived')

- physical capital ('the basic infrastructure ... and the production equipment and means which enable people to pursue their livelihoods')

- financial capital ('the financial resources … whether savings, supplies of credit or regular remittances or pensions … which provide [people] with different livelihood options')

- social capital ('the social resources … upon which people draw in pursuit of livelihoods' (Carney, 1998: 7).

Focusing on the interconnections between asset portfolios and the multiple strategies that groups and individuals undertake to improve their material wellbeing, Barrett and Swallow (2004) argue that agricultural extension services need to be tailored to households' distinct asset portfolios and hence livelihood strategies. For example, households that are relatively rich in land and labour, but poor in assets and income-generation potential, might focus on knowledge-intensive techniques. This is particularly important in the case of the poorest of the poor who may lack 'the capacities, networks and resources' to take advantage of new opportunities (Saxena, 2003: 24). Indeed, this pattern was confirmed in the AP context by the AP Livelihoods Assessment Report (2002) which draws on life history data which reconstruct household development trajectories for the last 29 years. It found that households that lacked assets and skills tended to combine agricultural labour activities and own agriculture. In contrast, Barret *et al.* (2001) argue that only those households that are well-endowed

with assets can move into lucrative niches and, thus, accumulation-led diversification tends to be available only to limited sub-populations.

Child labour

Labour availability is one potential factor that helps households diversify their activities. On the one hand, having more young children in the household may mean there is less labour available for new activities as it raises caregivers' reproductive burden. On the other hand, as children grow older, they may become a potential labour source and increase potential diversification opportunities. However, more children may necessitate greater income to support their basic needs – what is termed the 'income effect' in economics. Block and Webb (2001) found a positive association between family dependency ratios and diversification. This could be because households with more child labour have better chances to be involved in activities such as fuel wood trading, small business or livestock management which employ child labour. Therefore, the welfare effect of such a relationship depends on whether the household is practising it as risk aversion or asset accumulation. Family size has relatively larger effects on off-farm wage employment than on self-employment (Woldehanna, 2000).

In the AP context, the 2002 Young Lives Baseline Survey found that approximately nine per cent of children from all social classes were involved in economic activities and that the pattern followed an inverted U-Curve, suggesting that those at either end of the wealth spectrum were less involved in economic activities.

2) Natural resource factors

Chandrasekhar and Ghosh (2004) conceptualise land as an important part of livelihood strategies. Although the government recognises the current problems of the agricultural crisis in AP and that land may not seem to provide households with a viable livelihood strategy, it continues to distribute land on the basis that the crisis is a temporary phenomenon. However, they argue that it is important that land distribution is complemented by programmes that provide necessary inputs – including irrigation, marketing, seeds, skills and information – to enable the poor to make effective use of the land.

Another key natural resource issue relates to common property resources (CPRs) – including communal land holdings, forest areas and water supplies. The AP Livelihoods Assessment Report (APLAR) concluded that AP does not have a good framework in place to manage CPRs especially to safeguard the rights of the poor. There have been multiple problems including illegal encroachments, poor conservation practices, etc. There have been similar problems in the case of watershed projects and joint forest management schemes where the poor have not benefited equally. Recent policy initiatives are attempting to address these problems (*ibid.*: 112-13).

3) Socio-cultural factors

Economic opportunities are not taken in a vacuum, but within a specific socio-cultural context. Thus, one important dimension of an analysis of livelihood diversification is whether diversification 'offers freedom and choice to move out of entrenched and dependent class, caste or gender-based categories' (Start and Johnson, 2004). Under what circumstances does social status determine access to new opportunities? Have traditional rules of access and structures of inequality been reproduced in new forms of work (*ibid*: VI)?

Caste

Clearly, in the Indian context one key social factor relates to caste divisions. The APLAR found considerable differences among the livelihood strategies of different caste groups, suggesting that the government should tailor any targeted programmes according to these social stratifications (ITAD Ltd, Sochursord and CESS, 2002). The report found that backward castes (BCs) have the highest dependence on agriculture, but because the sector has been performing poorly over the past five years, they now represent some of the poorest households in the state. Scheduled castes and tribes (SCs/STs) are primarily involved in agricultural labour. The APLAR estimated that it constitutes approximately 50 per cent of STs' income, while SCs derive 70 per cent of their income from agriculture, as they are gaining access to land through the lease market and constitute a significant proportion of tenant farmers. Meanwhile, OCs (other castes) are moving out of agriculture into dairy, micro-enterprises, services and small businesses. The report also found that caste-based occupations are declining in importance over time.

The 2002 Baseline Survey which covers three rural districts in AP – Srikakulum, Anantanapur, Telangana – similarly found significant caste-based differences. SCs were found to be involved in wage employment in large numbers, with many households dependent on remittances from migration. Tribal groups were found to be increasingly involved in diversified livelihood strategies involving wage employment, agricultural and non-agricultural activities as they move off forestlands. Both BCs and OCs were found to be more reliant on the external economy and thus more involved in migration and wage employment in Srikakulam District (Dev *et al.*, 2002).

Gender dimensions

Building on a broader literature of the ways in which economic choices are socially embedded, Ellis (1998: 23) argues that:

> *'The spatially-extended concept of the household is the social arena around which most economic work on livelihood diversification has been undertaken. The strength of this approach is its recognition of the joint circumstances in which household members find themselves; its weakness it its neglect of the determinants and effects of diversification differentiated between men and women'.*

He goes on to emphasise the ways in which gender affects diversification options, including the choice of income-generating occupations (both farm and non-farm) due to culturally defined roles, social mobility limitations and differential ownership of/access to assets, including educational opportunities, productive assets, and credit. Coppard (2001) makes a similar argument in the Indian context, especially with regard to restrictions for women's entry to emerging non-farm rural economic occupations. Hussein and Nelson's (n.d.) work is similarly critical of the assumption within the livelihood diversification literature that the central unit of analysis is the nuclear family. They go a step further, with particular relevance to Young Lives, and argue that 'the household is internally complex and multi-active, so it must be disaggregated: hence the different roles and activities of individuals (men, women, natural and adopted children)…[all of whom] have different degrees of autonomy of action and control over resources' (*ibid.*: 23-4).

4) Institutional factors

Various formal or informal institutions relating to production and redistribution can constrain or enhance the way in which households pursue economic opportunities (Start and Johnson, 2004). These institutions can include land title and land tenure systems, institutions which transmit information about markets, economic opportunities and skills training, credit institutions, national and sub-national governmental agencies, etc. In the Indian context, the following factors have been emphasised: decentralisation (although Coppard (2001) points out that there is little evidence about whether decentralised governance, due to greater equity, transparency and accountability, translates into improved local economic activity), credit institutions and information barriers.

Credit

Toulmin *et al.* (2001) argue that one of the key factors required to address rural poverty is the enhancement of access to credit – through both formal and informal credit institutions. Coppard (2001) argues that the Government of India's failure to regulate adequately the formal credit sector has meant that small rural enterprises have lost out to larger manufacturing enterprises in accessing credit.

Information barriers

Wilson (2004) pays considerable attention to the importance of information as a factor that shapes household livelihood choices. He argues that there is often a lack of awareness about existing social safety net benefits among those who need it most, while those with better connections generally have better access. Although land reform has helped, there is a need for better knowledge about agriculture, especially on matters related to non-indigenous forms of knowledge such as access to new seed varieties.

5) Macro-economic factors

Start and Johnson (2004), in their analysis of livelihood diversification in India (of which AP constitutes one case study), argue that in order to understand whether households are diversifying to 'cope' or 'thrive', any analysis should be contextualised within an analysis of the broader political-economic structures, processes and institutions. In particular, they highlight the importance of shifts in the global environment, especially increased flexibility, an expanding sub-contracting market and new opportunities and sources of competition. 'Rather than the study of multiple income sources, livelihood diversification relates to current transformations of global, national and local economies' (*ibid.*: 45).

Non-farm rural economy

In the context of rural development policies that have had only limited efficacy, rural industrialisation,[2] including infrastructural development and urbanisation, has been promoted to alleviate rural poverty since the early 1990s. Government initiatives have included schemes to create entrepreneurship, subsidised loans, skills building programmes, wage employment schemes (including food-for-work programmes) which aim to simultaneously create rural infrastructure and generate additional income for the rural poor, as well as packages to promote employment in specific labour-intensive industries such as the handloom and handicraft sectors (Saxena, 2003).

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[2]   Although traditional household industries constitute the largest sub-sector of rural manufacturing in terms of workforce, their importance is declining as more modern industries grow and increasingly contribute to the export market.

Coppard (2001) argues that rural non-farm employment in India has played an important role in reducing rural poverty, especially among the landless and small/marginal farmers who have been able to combine agricultural activities with non-farm occupations to improve their incomes. However, he points out that there is also evidence that inequalities are growing as a consequence of differential access between those with different levels and types of assets – including between men and women, regular and casual workers. This is particularly because liberalisation in the 1990s increased the demand for labour, but this increased demand was biased toward casual, intermittent, low remunerated and urban-based labour in the rural non-farm economy. This trend was also observed by Deb *et al.* (2002) who found that, as the proportion of income from agriculture has decreased over time, there has been increased movement into non-farm wage employment rather than self-employment.

Both Saxena (2003) and Deb *et al.* (2002) argue that linkages between agricultural sector growth and the non-farm economy are crucial. India's experience has shown that declining agricultural growth has led to a decline in the rural non-farm sector (Saxena, 2003). Policy strategies are needed to encourage forward and backward linkages to agriculture by supporting enterprises that either enable better agricultural production (for instance village repair services for agricultural machinery and implements), or the process of adding value to agricultural production before it leaves the village (for example milling, food processing, packaging and transportation (Deb *et al.*, 2002).

Globalisation

Since the 1991 deregulation of previously government-controlled trade and industry, livelihoods in rural India have become increasingly linked to the wider global economy. This has led to considerable changes in household livelihoods and movements in and out of poverty. Wilson (2004) argues that the impacts of integration have been mixed. Better markets and transport links provide better opportunities, but simultaneously introduce greater threats and competition from competing goods, increased pressure on land holdings and changing preference patterns. He finds that the poor are neither better nor worse off as a result of integration, as globalisation and structural adjustment have not been associated with an erosion of safety nets as they were in Latin America and Eastern Europe, for example. However, more expensive medical treatments and dowries are added pressures to spend more money and are hence increasing the general level of indebtedness (*ibid.*).

Vulnerability to shocks

Shocks have a disproportionate impact on poor families, often leading to a depletion of their asset base (Wilson, 2004). The APLAR found that vulnerability due to drought and related crop failure is particularly severe and has led to pressures to migrate to pursue jobs, mainly in the construction industry. This distress-led diversification has been further exacerbated by the disproportionately small increase in the prices for cereals (Deb *et al.*, 2002).

2. Young Lives sample and methods

2.1 The Young Lives sample

The AP Young Lives sample consists of households from the first round of a longitudinal study of child poverty in AP which is part of the Young Lives project (see www.younglives.org.uk for full details). Table 1 illustrates the various locations of the selected Young Lives sentinel sites. Although it is not yet possible to look at the dynamics of livelihoods until data have been collected from further surveys, this analysis will at least be able to establish a baseline from which to study trends and dynamics as well as point to further hypotheses for future analysis.

This paper does not make a distinction between households that diversify for choice or survival reasons – ie for growth-led or distress reasons. Nor does it examine other determinants such as seasonality, credit markets or risk management. However, by providing information on livelihood activities employed at the time of the first Young Lives survey in 2002, it provides a baseline against which future data collection can be compared, such as the changing nature of activities. It should also be noted that at this juncture in Young Lives, we only have cross-sectional data; we are only representing a 'snap-shot' in time, and are thus unable to draw conclusions about causality. For example, we would not be able to tell if a lack of education was a cause or a result of diversification. Such information is not available from round one data but will be addressed retrospectively in the next survey round. Instead, what we do intend to do is generate hypotheses for future testing, as well as use the information to inform the policy process. Lastly, although the Young Lives project does have community-level data, and we recognise the importance of these data in the analysis of livelihood diversification, we have not included it here as we are more interested in how household assets may affect household choice.

Table 1. Location of sentinel sites

Site no.	Mandal/sentinel site name	Type
	DISTRICT: WEST GODAVARI (non-poor, coastal)	
1	Eluru	Urban
2	Buttayagudem	Rural
	DISTRICT: SRIKAKULAM (poor, coastal)	
3	Srikakulam	Urban
4	Seethampeta	Rural
5	Regidi Amadalavalasa	Rural
6	Kotabommali	Rural
7	Mandasa	Rural
	DISTRICT: CUDDAPAH (non-poor, Rayalaseema)	
8	Chapad	Rural
9	Atlur	Rural

DISTRICT: ANANTAPUR (poor, Rayalaseema)		
10	Anantapur	Urban
11	Vajrakarur	Rural
12	Bukkapatnam	Rural
13	Gudibanda	Rural
DISTRICT: KARIMNAGAR (non-poor, Telengana)		
14	Karimnagar	Urban
15	Kataram	Rural
DISTRICT: MAHABUBNAGAR (poor, Telengana)		
16	Amrabad	Rural
17	Nawabpet	Rural
18	Devarakadara	Rural
19	Dharur	Rural
DISTRICT: HYDERABAD (poor, metropolitan)		
20	Hyderabad	Urban

Respondents were caregivers of one-year-olds from 505 urban households and 1,506 rural households, and caregivers of eight-year-olds from 251 urban households and 757 rural households. Respondents were selected from 20 sentinel sites (15 in rural areas and five in urban areas) following a multi-stage sampling scheme using both non-probability and probability methods (see India Young Lives sampling paper, forthcoming).

The sample for this analysis consisted of rural families (N=2,055), and does not include those households migrating to urban areas since we were looking at rural non-farm and off-farm diversification only. Datasets for both the one-year-olds and eight-year-olds have been combined since there were no significant differences between these households for diversification type (x²=4.29, p=0.12). However, for future analyses regarding determinants of household diversification and impact on child welfare, it will be necessary to look at these households separately.

2.2 The Young Lives questionnaires

The livelihoods analysis uses information from a number of Young Lives questionnaires (see www.younglives.org.uk for full questionnaire details). The household roster gives information on household composition, such as age, sex and level of education achieved by each family member. Other information in both the one-year-old and eight-year-old household questionnaires included: information about livelihoods, transfers (monetary) and debts (section 7); socio-economic status (section 8); shocks (section 9); social capital (section 11).

2.3 Activities

To classify the type of activity, we used the International Standard Industrial Classification (ISIC) system. Interviewers wrote a description of each activity and four-digit ISIC codes were later assigned. Using these codes, activities were then categorised into one of nine 'sectors': agriculture, hunting, forestry and fishing; mining and quarrying; manufacturing; electricity, gas and water; construction;

wholesale and retail trade; transport, storage and communications; finance, insurance, real estate and business services; community, social and personal services.

With so many different codes, it was difficult to assign codes consistently to the descriptions given. We therefore decided to look only at those sectors into which households fell. Thus, household members with activities coded within the same sector, eg agriculture, may have very different jobs with different implications. For example, both a self-employed crop farmer and a livestock herder fall into Sector 1: agriculture, hunting, forestry and fishing, although their incomes are obviously different. The time spent on these activities was also recorded in an attempt to establish the importance of the activity. However, this must be interpreted with caution since a small amount of time spent on an activity does not necessarily suggest a low return, and vice versa.

2.4 Diversification strategies

The data collected from AP allowed us to look at the different types of activities carried out across sub-state level geographic areas, by wealth status and by both rural off-farm (diversification within the same sector but across employment status) and rural non-farm (diversification across rural sectors) diversification activities. At this stage of the Young Lives study, we were more interested in examining diversification typologies by compiling mean portfolios in order to describe observable group strategies. However, while it is recognised that there is a danger in describing diversification typologies, 'diversification obeys a continuum of causes and motivations that vary across families at a particular point in time and for the same families at different points in time' (Ellis, 1998: 7). So, if we are to describe a sample simply in terms of 'group means' then there is a possibility of over generalising regarding different livelihood strategies when analysing at the sub-group level.[3] However, compared to diversity indices or income portfolios, typologies would appear to be a better method (Ellis, 2000). Nevertheless, caution should be maintained regarding the interpretation of the results.

Livelihood information captured by the Young Lives questionnaire in AP allowed us to categorise households into three diversification strategy groups:[4]

- households that do not diversify

- non-farm diversification: households that diversify between farm and rural non-farm activities, whether self-employed or waged, such as farm labour and petty trading (eg selling non-agricultural produce) within rural areas

- off-farm diversification: households that diversify between self-employment and waged employment, such as members of own farms taking on waged farm labour (or wage earners taking on self-employed activities) within rural areas.

Although we were able to capture quite adequately those households engaging in off- and non-farm activities, it was not possible to do this for households who were either specialising (eg using new technology to increase crop production) or engaged in on-farm activities (eg diversifying types of crop or livestock or carrying out two or more waged farm employment). The nature of the data collected

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3   This is due to the high possibility of intra-group variability (since households are invariably different in terms of composition, access to assets and responses to vulnerabilities) and we are thus faced with different sets of possible outcomes concerning diversification opportunities.

4   One other point to mention concerns migration. Migration is an important diversification strategy in AP and we therefore felt that it warranted separate attention and as such will be examined in more detail at a later date.

did not allow us to distinguish adequately between these two groups. We therefore decided to focus on off- and non-farm diversification and place all other households into a comparison group.

It is also possible that households could fall into more than one group, for example, engage in both off- and non-farm diversification, either simultaneously or at different times of the year. About 20 per cent of households were in this situation. However, since we are working from the hypothesis that non-farm diversification enables households to move out of poverty, it is especially important to observe the household characteristics and determinants of this type of diversification. Households which do not diversify into any non-farm activities (both non- and off-farm) are the comparative group.

Lastly, although this paper explores some of the characteristics of households engaged in different types of diversification, we are unable to determine whether the assets identified and the order specified are necessary for a particular diversification strategy. This would require several rounds of quantitative data as well as more in-depth qualitative analysis. We cannot ascertain whether it is the number of assets or the type or quality of an asset that is more, or as, important for any particular diversification strategy. Different combinations of particular assets may be the reason why some households diversify and others do not; again, it is something that is difficult to conclude definitively from the present analysis. Not knowing whether households chose a particular diversification strategy because of distress, growth or distress mitigation further limits the interpretation. However, by looking at the data and complementary secondary sources, we are able to get a good idea of the possible reasons and form some hypotheses.

2.5 Household characteristics

Household characteristics are to some extent covered in the asset base (discussed in the next section). However, we have included household size and education level here for interest. The other variables are wealth, development level, caste, gender of household head and vulnerability (see Table 2). We are interested in the distribution of assets between different diversification strategies at both the aggregate and disaggregate levels.

The variable used to define poverty has been described in earlier Young Lives publications (see Working Paper No. 3). We use the same classification of 'poorest', 'poor' and 'non-poor'. Although we talk about a 'non-poor' group, it should be remembered that the Young Lives sample is a purposive pro-poor sample and that any household falling within the 'non-poor' group is not necessarily a 'rich' household but a household that is distinguishable from the 'poorest' and the 'poor' households in terms of assets.

There is no overlap between the assets used for livelihood classification and those used in the calculation of poverty, ie the assets used to define poverty are different from those used to classify the livelihood asset base.

The development index was constructed using economic, infrastructure and human development levels; it is explained in more detail in the AP Young Lives sampling paper (forthcoming). Development index is defined at the community level and each household is assigned the development index of the community to which it belongs.

For vulnerability, we considered the number of 'serious' events (or shocks) that had happened at the household level. These ranged from natural disasters, such as seasonal effects that resulted in loss of crops or crop failure, to life-cycle events, such as death or illness, to unavoidable and idiosyncratic events such as being a victim of crime or loss of employment.

Table 2: Variables used to define household characteristics

Household characteristics	Variable name	Description
Household size	hhsize	Continuous variable
Mean age of working household population[1]	mageofwp	Continuous variable
Mean education level	maxeducc	Continuous variable
Education level	edcat	0=none, 1=primary, 2=secondary, 3=higher
Wealth status[2]	poverty	1 = poorest, 2= poor 3 = non-poor
Development	devdist	0=backward, 1=developed
Caste	motheth	ST = scheduled caste SC = scheduled tribe BC = backward caste OC = other caste
Gender of household head	headgend	1=male, 2=female
Number of shocks (vulnerability)	noofevents	0=none, 1=one, 2=more than one

[1]   The mean age of the working household was taken to represent adults aged from 15 to 60.

[2]   The household wealth index (WI) is a score between 0 and 1 constructed from an average of the following components: (1) housing quality, the average number of rooms per person and quality of floor, roofing, and walls; (2) number of consumer durables the household has access to (radio, bicycle, TV, electric fan, motorbike, refrigerator, land phone, mobile phone, and car/truck); and (3) services of drinking water, electricity, toilet and fuel. In this paper, wealth groups are divided into tertiles: <0.20 'poorest', 0.20-0.4 'poor', >=0.5 'non-poor'.

2.6 Asset portfolio

Rather than grouping the various assets into the five different capitals according to the Sustainable Livelihoods framework, we decided to look at each asset as a separate variable. In this way, we can examine the nature of the relationship between assets and diversification strategy, as well as provide a baseline of access to assets for comparison over time.

The asset portfolio was constructed using data from the household questionnaires (see Table 3). We defined them as follows:

a). Human capital

Human capital was measured according to highest education level attained in the household, for both males and females separately, and household labour size. Labour size was disaggregated into age groups, with adults further disaggregated by sex. Both these variables were classified as continuous and categorical. It was not possible to obtain other information such as skills, capacity or knowledge from the quantitative questionnaire. Nor was it possible to use the disability variable since the extent of the disability was unknown and many of those who were disabled were also working.

b). Natural capital

From the available data, we were able to construct a natural capital asset base from both household access to land and the extent of irrigation of this land. These were both continuous variables.

c). Physical capital

Physical capital was taken to mean productive assets, and as such, livestock was included in this category. Productive assets were divided into farm and non-farm assets. Farm assets consisted of tractors, threshing machines, carts and pumps; non-farm assets were sewing machines. Livestock consisted of draught animals, milk animals, sheep/goats/pigs or rabbits/poultry. We decided against using indicators relating to, for example, road access or distance to nearest town since this information was collected at the community level and, as such, was not appropriate for use in the definition of household livelihoods.

d). Financial capital

Data on incomes or consumption were not collected in the Young Lives survey. Wealth was measured as a function of available assets. However, there are data available on whether any member of the household received any money or goods on a regular basis and the type of organisation (government or non-government) from which such assistance was received. Since there was no information on credit, we used the information relating to family debt (although it was difficult to establish whether the reason for debt was distress or growth). In this category, we have also included a poverty binary variable (poor or not poor) and a development binary variable (backward or developed). The number of 'serious events' experienced by the household was also included under financial capital as a categorical variable (0, 1, >1).

e). Social capital

Social capital was defined as structural social capital, that is membership of community group organisations, and was categorised as 'member' or 'non-member'. We also used information on whether a household shared farm vehicles and/or shared farm labour.[5] We also included in this category a 'caste' variable, coded 1/0 for BC, OC/SC and ST, since this is a direct proxy for membership of informal social networks.

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[5]   The practice of shared labour is very common in some of the areas practising rain-fed agriculture. It is used in peak season for activities such as ploughing, transplantation, and harvesting and to avoid cash transactions. This is mainly practised by marginal and small farmers.

Table 3: Household asset base variables

Variable definition	Justification	Availability in Young Lives datasets*
Human capital		
Labour supply - household labour supply Education level - maximum level achieved in household	Activities are proportional to quantity and quality of household labour supply	Question 2.5.1 (ID) Question 2.5.8 (YRSCHOOL)
Natural capital		
Land	Linearly related to agricultural activities	Question 9.9.1 (LAREA)
Irrigated land	Linearly related to agricultural activities	Questions 9.9.1, and 9.10 (LAREA, PERIRRIG)
Physical capital		
Livestock	Linearly correlated to agricultural activities	Question 9.16 (ANYAIM)
Farm equipment	Positively correlated to agricultural activities	Questions 9.7.7, 9.7.8, 9.7.15 and 9.7.16 (TRACTOR, PUMP, CART, THRESH)
Sewing machine	Linearly related to non-farm activities	Question 9.7.11 (SEWING)
Financial capital		
Credit access - at the household level	Essential for investments in the farm and for self-employment activities	Question 7.15 (DEBT)
Transfers - number of sources of transfers	A livelihood strategy in itself. It can be a source of asset building for other activities.	Question 7.3.1 (REMIT)
Social capital		
Structural social capital		Question 11.1.1 (MEMBER)
Sharing - farm equipment - labour		Question 9.12 (FARMSHR) Question 9.13 (LABSHR)

* All questions are in the Household Questionnaires for both one- and eight-year-olds.

2.6.1 Asset analysis

Scoones (1998) has suggested three ways of examining the relationships between assets and diversification: sequencing, substitution and clustering of assets. Sequencing refers to identification of the starting capital, which may be an essential precursor to other capitals necessary for diversification. Substitution refers to the possibility of substitution among different assets to pursue a livelihood strategy. Clustering refers to the combination of different assets for the pursuit of a livelihood strategy. However, these methods will be more appropriately applied to the qualitative and longitudinal data. What we are able to do with the current (quantitative) data is examine the relationship between the household asset base and the type of diversification (question 1 below) and the relative importance of the different assets in relation to diversification strategy (adapted question 2 below).

Thus, the following are key questions of an asset-based analysis of livelihood strategies (Scoones, 1998; Ellis, 2000):

- What is the relationship between the asset base and the type of household diversification?

- What is the starting point (in term of assets) of a diversification strategy, ie which of the assets is the most important for enabling diversification?

- What kind of asset substitution (if any) takes place to enable diversification? Is one asset substituted for another to enable diversification?

- Are different assets needed in combination to pursue a given strategy?

Analysis of assets, including sub-group analysis, was carried out using multinomial logistic regression techniques on standardised asset variables. More descriptive analyses were carried out across asset quintiles, where each household was assigned a quintile group depending on their access to assets. Thus, quintile 1 was defined as 'asset-poor' and quintile 5 as 'asset-rich'. Defining assets groups like this allowed us to look at the disparities in assets across various groups (explained in greater detail in section 2.6.3).

2.6.2. Standardisation of assets

In order to compare variables of differing magnitude and distribution and of different units of measurement, assets needed to be standardised. This was achieved by using the 'std' command in Stata 8 so that all variables have a mean of 0 and a standard deviation of 1, meaning that they become, in a sense, unit-less. Only standardised b-coefficients (beta weights) can be compared in order to judge the relative predictive power of independent variables; this is carried out by comparing the magnitude of the standardised beta-coefficient regardless of the sign of that coefficient.

Obviously, some variables which contribute to a composite asset, such as livestock, have more importance than others. Similar differences are those between owning a draught or milk animal, or tractor and owning rabbits or other small ruminants. These differences were taken into account by giving a weight to the various assets making up physical capital (see Table 4). Ownership of farm assets was modelled as a quadratic variable as this reflected the distribution of the variable.

Wealth status and caste in the aggregate and disaggregate analyses were modelled as binary variables since having too many categories results in an unstable model. For wealth status, the 'poorest' and 'poor' groups were combined as these two groups were considered more similar than the 'non-poor'

group. For the same reason, SC and ST were combined to represent one caste group, and OC and BC another caste group. This was deemed appropriate since policies aimed at reducing poverty would most likely be targeted at the poorest groups which include the lower caste groups.

Table 4: Construction of household asset base variables

Assets	Measurement
HUMAN	
Max HH Education level Male Female	Max household education achieved (interval)
Labour size	Number of productive household members (interval)
HH members <7 years 7-14 years 15-17 years 18+ years Male Female	Number of productive household members (interval)
PHYSICAL	
Livestock	(Draught animals + milk animals + ((sheep or pigs)*0.25)) + ((rabbits or chickens*0.1))
Productive assets Farm equipment Sewing machine	(Tractor +((pump*0.5) + (Cart*0.5) + (Thresher*0.5)) Sewing machine – Binary variable 1=yes, 0=no
NATURAL	
Land	Area of land (hectares)
Irrigated land	Proportion of land that is irrigated
FINANCIAL	
Wealth status	Binary variable 1=poor 0=non-poor
Caste	Binary variable 1=SC/ST 0=BC/OC
Development index	Binary variable 1=backward 0= developed
Debt	Binary variable 1=yes, 0=no
Transfers NGO Government	Binary variable 1=yes, 0=no Binary variable 1=yes, 0=no
No of hh shocks	Categorical variable 0, 1, more than 1
SOCIAL	
Membership	Binary variable 1=yes, 0=no
Shared labour	Binary variable 1=yes, 0=no
Shared farm equipment	Binary variable 1=yes, 0=no

2.6.3 Measurement of asset inequities

Borrowed from the measurement of inequalities which commonly addresses disparities across wealth groups, here we have examined the inequities in access to assets across different groups. The measurement used is simply an (asset) poor-(asset) rich ratio which addresses the disparities in access to assets between those in the extreme groups of asset access, ie those households in the bottom and top 20 per cent. Although it is a rather crude index, especially as it ignores information from the middle three groups, it does provide a general order or magnitude of difference in access to the number of assets. However, it does not tell us about the quality of the various assets although this may be more important than the quantity of assets and this may, in turn, be dependent on the level of development. For example, the quality of assets in developed areas could be higher than those in backward areas and, as such, the quantity of assets in developed areas is not as important.

2.7 Data analysis

All data analysis was carried out using Stata8 software. Pearson chi squared and ANOVA (for independent groups) statistics were used for the univariate analysis. Multinomial logistic regression[6] analyses were used for comparing standardised independent variables (assets) on a dependent variable (in this case, type of diversification) with more than two independent categories. All analyses were carried out using robust standard errors to account for clustering within sites.

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[6]   An extension of binary logistic regression, but where the dependent variable consists of more than two independent variables.

3. Results

Descriptive results

Primary activity by geographic location and wealth status

Tables 5-8 provide the distributions of activity by geographic location and wealth status at the individual level.

The distribution of activities among the Young Lives 15-60-year-old population for both urban and rural areas is shown in Table 5. The results are expected: people in rural areas engage in more agricultural activities than those in urban areas. While the urban population is engaged in a wider range of activities, the majority of the rural population is engaged in activities from mainly one sector.

Table 5: Distribution of primary activity types in working population (aged 15-60) by urban/rural area

	Urban	Rural
Activity sector	n=1245	N=8660
	%	%
Agriculture, hunting, forestry & fishing	1.8	82.5
Mining & quarrying	0	0.1
Manufacturing	18.4	3.6
Electricity, gas & water	0	0
Construction	9.3	4.0
Wholesale & retail trade	13.3	1.7
Transport, storage & communications	10.0	1.6
Finance, insurance, real estate & business services	23.7	1.5
Community, social & personal services	23.5	5.0
Total (%)	100	100

Primary activity by region

Table 6 shows the distribution of activities at the (sub-state) regional level. In the rural areas of all three regions, workers are primarily dependent on agriculture and allied activities as the primary economic activity. However, this dependency is more pronounced in Rayalaseema and Telengana than in coastal Andhra; the former two regions are poorer than the coastal regions. In urban areas, the predominant primary economic activities are services followed by manufacturing, especially in Rayalalaseema.

Table 6: Distribution of primary activity types in working population (aged 15-60) by region

Activity sector	Region					
	Coastal Andhra		Rayalseema		Telangana	
	Urban	Rural	Urban	Rural	Urban	Rural
	n=489	n=2162	n=249	n=2806	n=507	n=3692
	%	%	%	%	%	%
Agriculture, hunting, forestry & fishing	2.7	76.3	0.8	84.9	1.4	84.4
Mining & quarrying	0	0.2	0	0.1	0	0
Manufacturing	18.8	4.0	14.1	3.5	20.1	3.3
Electricity, gas & water	0	0	0	0	0	0
Construction	9.4	6.2	10.8	1.9	8.5	4.4
Wholesale & retail trade	13.9	2.8	14.5	1.4	12.2	1.4
Transport, storage & communications	7.2	2.2	6.4	1.7	14.6	1.2
Finance, insurance, real estate & business services	28.2	1.7	22.5	1.4	19.9	1.4
Community, social & personal services	19.8	6.6	30.9	5.1	23.3	4.0
Total	100	100	100	100	100	100

Primary activity by district

Observation by district (Table 7) shows that in all rural districts, agriculture and allied activities are the primary activities, although this is less pronounced in West Godavari and Srikakulam which are both in the developed coastal region. These two districts are also exceptional in that, in the urban areas, the most common activities take place in the financial sector. For other rural districts, services followed by manufacturing are the main activities pursued by the working population.

Table 7: Distribution of primary activity types in working population (aged 15-60) by district

Activity sector	District										
	West Godavari		Cuddapah	Karimnagar		Srikakulam		Anantapur		Mahbubnagar	Hyderabad
	Urban	Rural	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Rural	Urban
	n=221	n=389	n=957	n=222	n=579	n=268	n=1773	n=249	n=1848	n=3113	n=285
	%	%	%	%	%	%	%	%	%	%	%
Agriculture, hunting, forestry & fishing	3.2	77.6	82.8	2.3	86.9	2.2	76.0	0.8	85.9	83.9	0.7
Mining & quarrying	0	0.3	0.3	0	0	0	0.2	0	0.1	0	0
Manufacturing	19.5	11.1	3.5	20.7	1.6	18.3	2.5	14.1	3.6	3.6	19.7
Electricity, gas & water	0	0	0	0	0	0	0	0	0	0	0
Construction	17.7	1.5	1.2	9.9	4.2	2.6	7.2	10.8	2.3	4.4	7.4
Wholesale & retail trade	12.2	0.8	1.4	12.6	1.0	15.3	3.2	14.5	1.4	1.5	11.9
Transport, storage & communications	5.4	3.3	2.6	17.1	2.4	8.6	1.9	6.4	1.2	1.0	12.6
Finance, insurance, real estate & business services	24.9	0.3	1.5	15.8	1.9	31.0	2.0	22.5	1.4	1.3	23.2
Community, social & personal services	17.2	5.2	6.8	21.6	2.1	22.0	6.9	30.9	4.2	4.3	24.6
Total	100	100	100	100	100	100	100	100	100	100	100

Emphasis on agriculture and allied activities is negatively correlated with wealth status in rural areas (see Table 8): 71 per cent of the rural non-poor compared to 87 per cent of the rural poorest engage in activities in the agriculture sector. In urban areas, manufacturing is positively correlated with poverty status: 19 per cent of the urban non-poor compared to nine per cent of the poorest are engaged in manufacturing. These results must be interpreted with caution (see section 2.4): we can see that for some activities, the engagement of the poorest and non-poor is very similar, for example in the wholesale and finance sectors. If we were to examine more closely the exact nature of the activities, we would find the poorest engaging more frequently in self-employment such as petty trade, eg selling fruit along the roadside, than the non-poor who might be involved more in self-employed district or regional exporting activities; the latter are more economically productive.

Table 8: Distribution of primary activity types in working population (aged 15-60) by wealth status

Activity sector	Wealth status					
	Poorest		Poor		Non-poor	
	Urban	Rural	Urban	Rural	Urban	Rural
	n=44	n=3494	n=99	n=3810	n=1101	n=1355
	%	%	%	%	%	%
Agriculture, hunting, forestry & fishing	0	87.0	1.0	82.7	1.9	70.6
Mining & quarrying	0	0.2	0	0.1	0	0
Manufacturing	9.1	2.9	18.2	3.7	18.8	5.0
Electricity, gas & water	0	0	0	0	0	0
Construction	15.9	4.2	25.3	4.1	7.6	3.6
Wholesale & retail trade	15.9	0.5	9.1	1.6	13.6	5.3
Transport, storage & communications	13.6	0.9	9.1	1.8	10.0	2.9
Finance, insurance, real estate & business services	20.5	0.8	12.1	1.4	24.8	3.3
Community, social & personal services	25.0	3.6	25.3	4.7	23.3	9.4
Total	100	100	100	100	100	100

Table 9 illustrates the distribution of the sample into rural non-farm activities. The most common non-farm activities are those in the community, social and personal sectors, followed by construction and then manufacturing.

Table 9: Distribution of non-farm activities

Non-farm activity sectors	Rural
	N=1295
	%
Agriculture, hunting, forestry & fishing	-
Mining & quarrying	0.5
Manufacturing	20.3
Electricity, gas & water	0
Construction	22.1
Wholesale & retail trade	10.5
Transport, storage & communications	9.2
Finance, insurance, real estate & business services	8.3
Community, social & personal services	29.0
Total (%)	100

Table 10 shows that both off-farm (31 per cent) and non-farm (32 per cent) activities are undertaken equally among 63 per cent of the rural population engaged in diversification activities. Thirty-seven per cent of the population are not engaged in diversification activities; a fuller examination of the determinants of diversification strategies will be developed longitudinally from further qualitative and quantitative Young Lives research.

The univariate analysis (Table 10) shows that the households in our sample engaged in diversification activities are larger (p<0.001), slightly older (p=0.004), more likely to be poor (p<0.001), from backward areas, and from the backward caste (p<0.001). Households which experienced two or more shocks showed an increasing trend towards diversification activities compared to those who reported just one or no shocks (p<0.001). There was no significant association between diversification and the gender of the head of the household (p=0.91).[7]

Table 10: Distribution of household characteristics and shocks by diversity level for rural working population (univariate)

		Diversification			
		None	Off-farm	Non-farm	Statistical test (p value)
Number of households n (%)	N = 2055	772 (37.6%)	633 (30.8%)	650 (31.6%)	
Mean household size (n)		5.0	5.6	6.0	F=36.3(<0.001)
Mean age of working household (n)		29.7	30.3	30.7	F=5.6 (0.004)
Mean schooling grade (n)		6.3	5.1	7.2	F=36.6(<0.001)
Highest household education level	None	39%	38%	24%	
	Primary	36%	37%	27%	
	Secondary	37%	29%	34%	
	Higher	40%	16%	43%	χ^2=65.5 (<0.001)
Wealth status	Poorest	38%	35%	27%	
	Poor	33%	33%	34%	
	Non-poor	47%	17%	36%	χ^2=57.8 (<0.001)
Development	Backward	33%	34%	33%	
	Developed	49%	23%	28%	χ^2=47.9 (<0.001)
Caste	SC	37%	31%	32%	
	ST	46%	31%	22%	
	BC	29%	35%	36%	
	OC	54%	18%	28%	χ^2=85.5(<0.001)
Gender of head of household	Male	38%	31%	32%	
	Female	36%	31%	33%	χ^2=0.19 (0.91)
Number of shocks (vulnerability)	None	44%	22%	34%	
	1	43%	28%	28%	
	>1	29%	41%	30%	χ^2=85.9 (<0.001)

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7   This somewhat surprising finding might be explained by the fact that not all the female-headed households are poor. Moreover, our sample of households was selected according to the age of the child, and does not represent the general population.

Table 10 also characterises the type of households within each diversification category. Households engaged in off-farm diversification activities were more likely to be the poorest, less educated and most vulnerable (having had two or more shocks). Households engaged in non-farm diversification activities were more likely to be larger, older, better educated, richer and less vulnerable (no shocks). More households from the backward caste than other castes reported both off- and non-farm activities. SCs were the least likely caste to report non-farm activities, while OCs were the least likely to report off-farm diversification.

Figure 1 illustrates the patterns of diversification strategies by wealth decile group. It is clear from the U-shaped graph that diversification activities are lower at either end of the wealth scale. It would not be unreasonable to assume that 'not diversifying' was not by choice for those households in the decile one (the poorest of the poor) whereas for those households in deciles nine and ten (the richest of the non-poor), we might assume that agricultural intensification is the primary, and only, activity. When looking at access to assets, over 60 per cent in decile one are asset-poor (quintiles one and two) compared to only six per cent in decile ten, and 16 per cent in decile nine.

Further examination of the relationship between diversification strategy and wealth[8] illustrates that for poorer households, engagement in off-farm activities was greater than for non-farm activities. This pattern changes around decile five where there is more diversification in non-farm than off-farm activities. Off-farm diversification patterns show a much greater difference across wealth deciles, with non-poor groups reporting much lower levels. This disparity is not seen as much for non-farm diversification, and the results suggest that non-farm activities are slightly more accessible to non-poor groups than poor groups.

Figure 1: Diversification strategies by wealth decile

Diversification by wealth decile
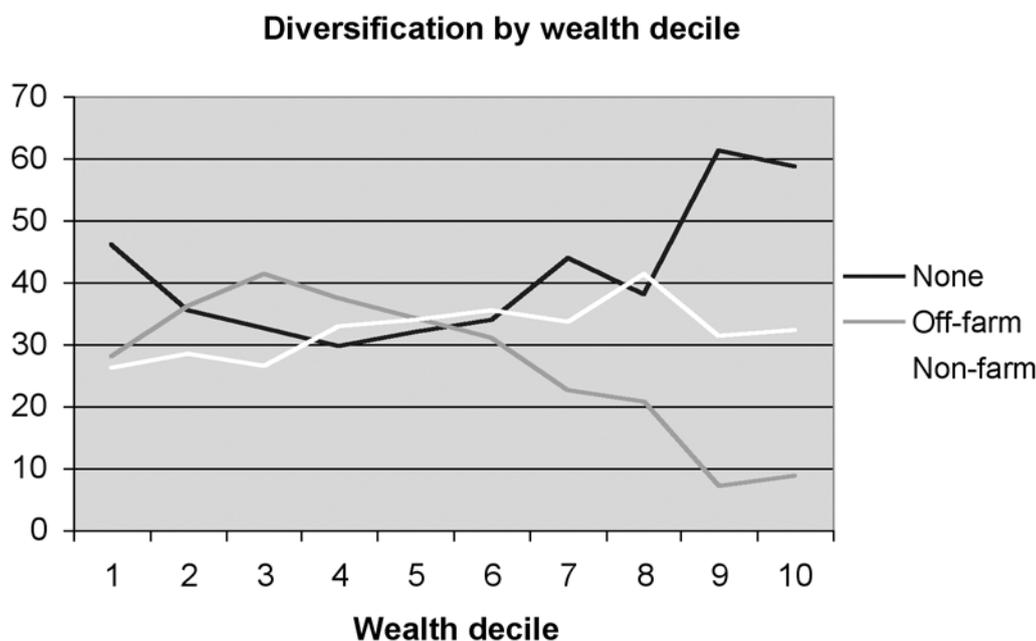
Table 11 shows the distribution of mean standardised asset quintiles by region, site, level of development, wealth status and caste.

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8   For details on the Wealth Index, refer to Galab *et al.* (2003).

Table 11: Distribution of standardised asset means (%) by region, site, wealth status, development level and caste for rural households

		Asset quintiles (std means)					High: low ratio
		Q1	Q2	Q3	Q4	Q5	Q1/Q5
N (%)		411(20%)	411(20%)	411(20%)	411(20%)	411(20%)	
Region	Coastal	26	22	22	17	13	1.9
	Rayalaseema	17	20	18	21	25	0.7
	Telangana	18	17	21	23	22	0.8
Site	Buttayagudem	25	28	19	17	10	2.4
	Seethampeta	22	21	28	20	8	2.8
	Regidi amadal	31	19	20	13	17	1.8
	Kotabommali	29	20	21	15	14	2.0
	Mandasa	19	21	23	21	16	1.2
	Chapad	17	23	20	24	16	1.1
	Atlur	20	25	18	22	15	1.3
	Vajrakarur	15	14	18	20	34	0.4
	Bukkapatnam	21	19	17	18	25	0.9
	Gudibanda	10	17	17	20	37	0.3
	Kataram	30	19	23	20	8	4.0
	Amrabad	25	17	19	17	21	1.2
	Nawabpet	13	20	22	18	27	0.5
	Devarakadara	9	17	20	24	29	0.3
	Dharur	5	10	19	36	31	0.2
Development	Backward	19	18	20	20	23	0.8
	Developed	23	24	20	21	12	1.9
Wealth status	Poorest	31	22	21	16	10	3.0
	Poor	15	20	20	22	23	0.7
	Non-poor	9	14	21	23	33	0.3
Caste	SC	25	22	23	17	13	1.8
	ST	27	25	22	17	9	3.0
	BC	19	19	19	21	22	0.9
	OC	9	13	20	23	35	0.3

The low/high ratios between the top and bottom 20 per cent of asset groups present a compelling story regarding the inequity in the access of assets. In Telangana, there are 30 per cent more households which are asset-rich than asset-poor. In Coastal Andhra, the opposite is true, with 40 per cent more households who are asset-poor than asset-rich. In Rayalaseema, the distribution of assets is more equal.

The most striking disparity with regard to the distribution of assets occurs in Kataram where there are about four times as many asset-poor as asset-rich households. Conversely, in Dharur, Gudibanda and Devarakadara roughly 70 to 90 per cent of households are asset-rich. This is somewhat surprising as two of these three sites (Dharur and Devarakadara are in the same district, Mahabubnagar, in Telengana region) are described as poor. Part of the explanation may lie in the fact that the mean of all assets is higher in backward areas, suggesting that there may be more households who possess the assets that are included in the Young Lives asset index than in developed areas (ie largely rural agricultural-oriented assets). Two additional reasons may include: a) the fact that we did not consider the quality of assets, which could be higher in developed areas, and b) the fact that the categorisation of backward and developed districts is based on community infrastructure and connectivity rather than household-level variables. While SCs are twice as likely to be asset-poor, the opposite is true for OCs where there are more than twice as many asset-rich as asset-poor households.

Figure 2 illustrates the distribution of diversification by asset quintile. Households diversify more (but to varying degrees) as access to assets increase up to the fourth quintile, after which a reverse trend can be observed. Households which have three or more assets are more likely to diversify than those with fewer assets. Off-farm diversification is greater in households having four assets, while asset-rich households (ie in the top 20 per cent) reported more non-farm activities.

Figure 2: Diversification strategies by asset quintile
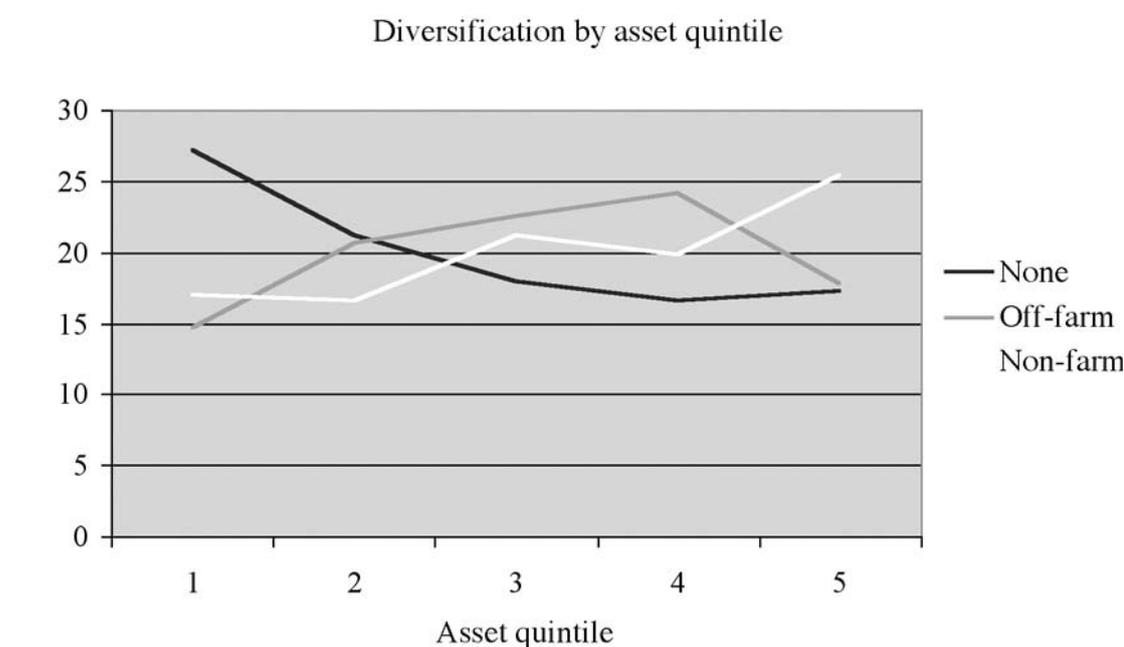
Table 12 illustrates the relative importance of the various assets in terms of either off - or non-farm diversification compared to 'no diversification' at the aggregate level. In general, the most important common predictors of both off- and non-farm diversification are shared labour, large labour size, being landless or having irrigated land, being poor and coming from a backward district. Assets (or lack thereof) particular to off-farm diversification are vulnerability, low female and male education status,

and having productive assets. In the case of non-farm diversification, defining assets (or lack thereof) are debt, high male education status and being in receipt of both NGO and government transfers. Looking at the order of magnitude of these assets can tell us about the relative importance of the assets; the order is different depending on the type of diversification.

For off-farm diversification, the four most important assets are shared labour, labour size, being from a backward district and being vulnerable. For non-farm diversification, these are labour size, being landless, being from a backward district and, equally, having a sewing machine and using shared labour. However, this does not mean that having one or a certain combination of these assets is sufficient for diversification. Further investigation in future Young Lives rounds will be undertaken to establish the sequencing, clustering and substitution of assets in order to understand entry barriers and requirements for diversification strategies.

Table 12: Relative importance of assets for diversification strategy (aggregate level)

	Diversification			
	Off-farm		Non-farm	
	Beta co-efficient	*p-value*	Beta co-efficient	*p-value*
HUMAN CAPITAL				
Maximum household education				
Male	-0.183	0.01*	0.116	0.09
Female	-0.235	<0.001*	-0.119	0.07
Labour size	0.374	<0.001*	0.519	<0.001*
Household members				
Less than 7 years	0.001	0.99	0.063	0.33
7-14 years	0.124	0.07	0.054	0.41
15-17 years	0.041	0.52	-0.020	0.75
18+ years – male	-0.010	0.92	0.170	0.07
18+ years – female	0.025	0.78	0.018	0.83
PHYSICAL CAPITAL				
Livestock	0.057	0.41	-0.093	0.24
Productive assets				
Farm	0.095	0.12	-0.173	0.018*
Non-farm	-0.056	0.43	0.199	<0.001*
NATURAL CAPITAL				
Land	-0.232	0.01*	-0.255	<0.001*
Proportion of irrigated land	0.305	<0.001*	0.185	<0.001*
FINANCIAL CAPITAL				
Poverty	0.300	<0.001*	0.132	0.03*
Development	-0.349	<0.001*	-0.228	<0.001*
Debt	-0.006	0.93	0.153	0.016*
Transfers				
NGO	0.072	0.26	0.120	0.04*
Government	-0.004	0.95	0.118	0.06
Vulnerability	0.322	<0.001*	0.032	0.63
SOCIAL CAPITAL				
Caste	0.087	0.17	-0.077	0.22
Membership	0.091	0.14	0.034	0.57
Shared labour	0.451	<0.001*	0.199	0.01*
Shared farm equipment	-0.067	0.36	-0.024	0.74

* significant at 5% level

Tables 13 and 14 illustrate the importance of assets disaggregated by wealth group and development level. Table 13 presents all the results, while Table 14 presents only those assets significantly associated with diversification but which are ordered by relative importance.

At first glance, it is apparent that poor households in both backward and developed areas have more assets significantly associated with both off-farm and non-farm diversification than non-poor households, and that these assets are different for the different categories of both development levels and type of diversification. For example, in backward areas, the assets associated with off-farm diversification (in order of importance) are shared labour, labour size, increased vulnerability, low female education status, irrigated land, low male education and children aged 7-14 years. This is different in developed areas where human capital assets (labour or education) do not appear to be significant; instead, we find more association with natural, physical and social capitals. This is also partly true for non-poor households where, in backward areas, human capital is associated with off-farm diversification compared to developed areas where the significant asset is social capital.

Table 13: Relative importance of assets for diversification strategy by wealth group and development

DIVERSIFICATION

	Backward district – poor				Backward district - non-poor				Developed district - poor				Developed district - non-poor			
	Off-farm		Non-farm		Off-farm		Non-farm		Off-farm		Non-farm		Off-farm		Non-farm	
	Beta co-efficient	p-value	Beta co-efficient	p-value	Beta co-efficient	p-value	Beta co-efficient	p-value	Beta co-efficient	p-value	Beta co-efficient	p-value	Beta co-efficient	p-value	Beta co-efficient	p-value
HUMAN CAPITAL																
Maximum household education																
Male	-0.189	0.04*	0.122	0.18	-0.156	0.42	0.087	0.60	-0.185	0.24	0.395	0.006*	-0.651	0.16	0.591	0.217
Female	-0.325	<0.001*	-0.138	0.13	-0.413	0.03*	-0.021	0.88	0.100	0.52	0.133	0.345	1.180	0.08	-1.217	0.015*
Labour size	0.448	<0.001*	0.627	<0.001*	0.871	<0.001*	1.044	<0.001*	0.139	0.45	0.552	0.001*	0.144	0.87	1.040	0.083
Household members																
7-14 years	0.156	0.051*	0.001	0.99	0.060	0.74	-0.179	0.21	0.105	0.42	0.000	0.999	-0.204	0.76	1.939	0.002*
NATURAL CAPITAL																
Land	-0.051	0.56	-0.160	0.15	-0.866	0.01*	-0.131	0.42	-1.160	0.004*	-1.571	<0.001*	-4.780	0.06	0.157	0.718
Proportion of irrigated land	0.293	<0.001*	0.207	0.05*	0.241	0.20	0.230	0.13	0.619	<0.001*	0.315	0.014*	0.725	0.25	0.073	0.874
PHYSICAL CAPITAL																
Productive assets																
Farm	-0.027	0.75	0.266	0.003*	0.115	0.38	-0.142	0.29	0.536	0.002*	0.250	0.162	0.681	0.40	0.108	0.828
Non-farm	-0.005	0.97	0.061	0.48	-0.161	0.37	0.160	0.14	-0.277	0.14	0.161	0.174	0.178	0.59	0.795	0.004*
FINANCIAL CAPITAL																
Transfers																
NGO	0.132	0.16	0.043	0.59	0.024	0.87	-0.108	0.36	-0.083	0.58	0.040	0.766	0.444	0.25	0.264	0.426
Vulnerability	0.409	<0.001*	0.061	0.15	-0.062	0.75	-0.392	0.02*	0.290	0.04*	0.125	0.354	0.612	0.37	-0.522	0.278
SOCIAL CAPITAL																
Caste	0.076	0.35	-0.123	0.14	-0.571	0.05*	-0.183	0.34	0.275	0.04*	0.072	0.565	0.581	0.20	0.388	0.387
Membership	-0.010	0.90	0.043	0.59	0.227	0.20	0.137	0.35	0.349	0.01*	-0.230	0.124	-0.397	0.49	-0.609	0.192
Shared labour	0.566	<0.001*	0.275	0.01*	0.046	0.84	0.112	0.54	0.234	0.19	0.168	0.358	1.983	0.03*	-0.953	0.116
Shared farm equipment	-0.127	0.17	-0.146	0.15	0.104	0.60	-0.143	0.37	0.071	0.75	0.540	0.01*	-	-.	-0.183	0.748

* significant at 5% level

For non-farm diversification in backward areas, labour is the most important asset for both poor and non-poor households.[9] However, that is the only commonality. Assets associated with poor households are lack of farm productive assets, shared labour, NGO transfers, owning a sewing machine and having irrigated land. For non-poor households, non-farm diversification in backward areas is associated with low vulnerability. Again, as with off-farm diversification, the types of assets associated with non-farm diversification in developed areas is different for poor and non-poor households than in backward districts. Assets associated with non-farm diversification in developed areas for poor households are lack of land, labour, shared farm equipment, higher male education and irrigated land. For non-poor households, significant assets are children 7-14 years of age, lack of female education and owning a sewing machine.

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9   Although we have included the breakdown of household members in the analysis, and it would appear that there are some associations between having children aged 7-14 years and both off- and non-farm diversification in developed and backward areas, and in poor and non-poor households, interpretation should be cautious. While this variable was included as a proxy for child labour, we do not know with certainty the percentage of these children engaged in labour activities. We did measure child labour according to UNICEF guidelines (children working more than two hours per day in either paid or unpaid activities), but these children only made up six per cent of the sample and none of the associations with diversification were significant. It may be that the data collected were not a true reflection of the overall proportion of children working in rural AP because the question asked did not capture this information very well. More specifically, the question asked parents to estimate the amount of work children did. However, parents may under-estimate the amount of work their children do, either because they want to hide the fact from investigators or they may not define the activities children are involved in as 'work' for a variety of socio-cultural reasons (eg Ansell, 2005).

Table 14: Relative importance of significantly associated assets by development and wealth

		DIVERSIFICATION			
		OFF-FARM		NON-FARM	
		Poor	Non-poor	Poor	Non-poor
BACKWARD					
	1.	Shared labour	Labour	Labour	Labour
	2.	Labour	Landless	Less farm assets	Less vulnerable
	3.	More vulnerable	BC/OC	Shared labour	
	4.	Lower female education	Lower female education	NGO transfers	
	5.	Irrigation		More non-farm assets	
	6.	Low male education		Irrigation	
	7.	HH members 7-14			
DEVELOPED					
	1.	Landless	Shared labour	Landless	HH members 7-14
	2.	Irrigation		Labour	Lower female education
	3.	More farm assets		Shared farm equipment	More non-farm assets
	4.	Membership		Higher male education	
	5.	More vulnerable		Irrigation	
	6.	SC/ST			

4. Discussion

Agriculture remains the main activity in rural areas in AP, whereas in urban areas, households are engaged in a more diverse range of activities. There is also less emphasis on agriculture in better-off rural regions and districts, and among non-poor households.

Our results also found that households with irrigated land, non-farm productive assets, access to credit (proxied by debt), access to transfers and high male education status in developed areas are probably diversifying for growth-led diversification reasons, choosing non-farm over off-farm activities.

In contrast, households involved in off-farm activities were vulnerable to a greater number of shocks, while those engaged in non-farm activities were less susceptible to shocks. This indicates that there is no safety net for natural disasters that affect community-wide agriculture. Moreover, rather than reduce the risk of vulnerability, such off-farm diversification may actually increase vulnerability.[10]

Interestingly, however, we also found an association between poor households in backward areas and non-farm diversification. Although this appears counter-intuitive at first glance, when placed within the context of the government's Employment Guarantee Scheme which aims to provide minimum wage income-generating opportunities to all citizens for 100 days per year, it is easier to explain. Non-farm activities for the rural poor range from the lucrative to the poorly paid, including public works programmes involving construction and rural infrastructure development.

Natural resources

The landless poorest of the poor (ten per cent of the sample) are also more likely to be the most vulnerable. Sixty-five per cent of the landless poorest of the poor (in decile one) were not diversifying, which would suggest that households in this group (ie with fewer options) are probably engaging in casual labour only (possibly on more than one farm). Fifty-six per cent of this group were asset-poor, compared to just 17 per cent among non-poor households.

Only in poor households did we find significant associations between having irrigated land and involvement in either off-farm and non-farm diversification strategies. This was true irrespective of location in developed or backward areas.

Increasing land size and proportion of land irrigated is associated with off-farm diversification in both backward and developed areas. It might be that, especially for off-farm diversification and backward areas, this is a form of distress mitigation where irrigation acts as a cushion. However, for non-farm diversification in developed areas where households have less land, but where a greater proportion of that land is irrigated, this could be growth-led diversification.

Social capital

For both off- and non-farm diversification strategies, it would appear that social networks that facilitate the sharing of farm equipment and labour as well as membership in community groups are important assets for the poor, especially in developed areas.

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10   For example, Alwang (1999) found that working on another farm may lead to neglect of one's own farm.

Similarly, NGO assistance was positively associated with non-farm diversification. In backward areas, poor households were found to be more involved in non-farm diversification when assisted by NGOs. It could be that residence in a developed region serves as a substitute for some assets, especially as market integration is generally stronger in developed areas, and such assistance is therefore less important. However, given that NGOs, including those which support self-help groups, seed development initiatives, skills training and petty trade development, tend to target the poorest of the poor, they are more likely to provide assistance in backward areas and help poor households compensate for underdeveloped market mechanisms.

Human capital

Our findings on education levels are difficult to interpret, especially where having low education levels (for both females and males) is associated with diversification. It may be that diversification activities prevented the adequate schooling of all members of these households. However, the association between high male education and non-farm diversification in developed areas could be seen as the positive impact of education on non-farm diversification.

Household labour supply emerged as an important factor shaping livelihood diversification strategies, especially among poor households. On the one hand, a large body of literature suggests that as households see others with fewer children investing more in each child and moving into more lucrative occupations, they too seek to limit their family size (eg Sachs *et al.* 2004). On the other hand, in the context of limited income-generating opportunities, having more able-bodied household members facilitates diversification into multiple activities, thereby dissipating risk.

We found significant variation between males and females only in terms of education levels and livelihood patterns. While high levels of male education were linked to non-farm diversification, low levels of female education were similarly associated with non-farm diversification. However, this differential may be capturing the different ends of the spectrum of non-farm occupations (ie from the lucrative to subsistence level). In the case of off-farm occupations, low levels of education among men and women were found to be positively associated, suggesting that much off-farm work is distress-led. In terms of other gender-related factors, we believe that data limitations probably account for the lack of perceived potential gender differences: in the case of the gender of the household head, our sample population was too small, while in the case of occupational distribution, our questions were too limited.

In line with the literature on livelihood diversification in India, we found that caste differences were associated with variations in household asset bases. Lower caste groups were found to be asset-poor while OCs were found to be asset-rich.

Productive assets

Ownership of farm productive assets is associated with off-farm diversification in developed areas. It is possible that poor households with farm productive assets opt for off-farm diversification because they have farm assets which they can utilise for such diversification. Alternatively, it could reflect the in-migration of poor people who do not have farm productive assets and move to an area in order to undertake non-farm work.

However, when looking at the ownership of non-farm productive assets and non-farm diversification, the relationship appears to be clearer. It is interesting that, in backward areas, it is poor households that are significantly associated with non-farm diversification compared to non-poor households in developed areas. It may be that it is more difficult for poor households in developed areas to establish themselves due to a greater demand for non-farm services such as tailoring. In backward areas, however, this does not appear to be the case. We have also seen disparities in access to non-farm diversification across wealth deciles.

5. Conclusions and policy implications

In sum, although our analysis was not able to unpack household motivations for diversification (as discussed above, this would necessitate longitudinal data and/or qualitative research), we have been able to paint a detailed picture of the asset base underpinning the livelihood strategies adopted by diverse rural households in AP. Our findings point to a number of possible policy implications.

First, our results underscore the urgency of the current concern in AP regarding the state's agriculture crisis and the need to find a holistic and joined-up policy solution to tackle the decline of this sector which impacts on a significant proportion of the population. It also suggests that in order to help households move out of poverty, greater opportunities to engage in non-farm activities are needed. These could include forestry,[11] mining and quarrying, processing, manufacturing, construction, utilities, trade, warehousing, transport, rural tourism[12] and basic services (health, education, business and financial services).

Second, given the importance of land, particularly irrigated land, in staving off vulnerability, AP's current agricultural policy emphasis on supplementing land redistribution programmes with irrigation facilities is an important and necessary move to ensure that the land is viable. However, in line with our findings, natural resources alone are not adequate; investment in human capital development and information transfers (ie agricultural extension services, including the provision of information to farmers) are crucial for poor rural households to take advantage of agriculture-based opportunities.

Third, our results point to an association between higher education and the adoption of more lucrative diversification strategies. This suggests that promotion and support of existing vocational training policies should be encouraged in the short term, while adequate budgetary support to the education sector should be promoted to ensure quality education in the medium to long term. Government of India and AP policies provide non-farm wage labour opportunities (eg Watershed Plus programmes, Employment Assurance Schemes, and the recent Employment Guarantee Law) for unemployed unskilled labourers who experience seasonal unemployment in agricultural slack seasons; however, the emphasis should be on the quality of human capital as well. There are focused efforts to improve the quality of human labour for various traditionally disadvantaged groups (women, youth, etc.) by providing training to move into more lucrative occupations. The training of unemployed youth, especially SCs in the IT sector, is a successful case in point but could be expanded to the sub-district

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[11]   The scope for forest-based livelihoods is great, and includes bamboo work, tamarind processing and medicinal plants. There has been an attempt to promote livelihoods centred on forestry by the government through the Joint Forest Management (JFM) / Community Forest Management (CFM) programme. This programme has successfully increased the involvement of forest dependent communities in forest regeneration and management. However, in order to ensure sustainability there is a need to broaden the scope of this programme by integrating forestry with other sectors and poverty alleviation measures, particularly co-ordination with the Tribal Welfare Department.

[12]   In rural tourism, there is considerable scope for promoting the entire sector (eg publicity, hotels and restaurants, transport services, guides and travel agencies, handicrafts and curios marketing) throughout the state.

level and could harness workers to contribute to the wider benefit of the agricultural sector and rural development.

Fourth, given the stark differences in livelihood strategies and the underlying asset base of rural households with different regional levels of development, poverty status and caste positions, policies to address the livelihood options of the rural poor should consider tailored approaches to suit these varied circumstances. In this sense, the Andhra Pradesh Rural Livelihoods Programme (APRLP)[13] is a good example of a government policy designed to address the livelihood needs of diverse resource-poor households. Although watershed programmes typically benefit more resource-rich farmers, APRLP introduced a 'watershed plus' component whereby the poor (including landless labourers, small and marginal farmers, tribals, dryland farmers, women, rural service workers) are provided with credit and training in order to move into more sustainable off-farm and non-farm occupations. However, the challenge of implementation is still considerable.[14]

Lastly, social capital and NGO assistance facilitates livelihood diversification among the poor. However, if these often small-scale groups and programmes are to benefit the poor more generally instead of remaining limited to a relatively small number of communities, the state will need to actively support NGO activities and scale up effective pilot initiatives. This could, for example, include grassroots actions with communities facilitated by NGOs (such as GRAM and Outreach in the case of the collective marketing of agricultural produce and agricultural extension services), as well as the work of development-oriented private sector entities such as BASIX.[15] In this regard, emphasis on carrying out quality evaluations in order to understand the relative importance and efficacy of a particular policy will be essential.

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[13]   The APRLP is expected to improve the livelihoods in some sections of the population in five districts in AP.

[14]   This challenge was highlighted by a five-member DFID delegation to AP in 2005. See further details in 'DFID accords priority to livelihood of poor' (staff reporter). www.thehindu.com.2005/11/16/stories/2005111607680300.htm

[15]   GRAM is a private development organisation involved in the social, economic, cultural and political empowerment of the poorest of the poor and women in Nizamabad and Adilabad districts. Outreach seeks to promote both land-based and non-land-based alternative livelihoods to reduce pressure on the resource base. It has developed a 'watershed-plus' approach of which microfinance is a part, and operates in the drought-prone areas in three states: Karnataka, AP and Tamil Nadu. BASIX is a new institution which promotes rural livelihoods. Operating in 19 districts of AP, it promotes a large number of sustainable livelihoods, and targets the rural poor and women through the integrated provision of financial services and technical assistance.

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Young Lives is an international longitudinal study of childhood poverty, taking place in Ethiopia, India, Peru and Vietnam, and funded by DFID. The project aims to improve our understanding of the causes and consequences of childhood poverty in the developing world by following the lives of a group of 8,000 children and their families over a 15-year period. Through the involvement of academic, government and NGO partners in the aforementioned countries, South Africa and the UK, the Young Lives project will highlight ways in which policy can be improved to more effectively tackle child poverty.

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