Examining the impact of education on Indian farm labour

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Abstract

Research on understanding the benefits of education in the rural context show positive pecuniary benefits on the farm, and a shift towards non-farm activities. Using the IHDS 2005 data, the years of education was regressed on the hours worked on the farm by restricting the sample to the progeny of farm workers. Here I find – (i) women are less involved in farm work than men indicating unobserved household work, (ii) years of education has a higher negative impact on farm work with higher farm income that imply higher farm mechanisation, and (iii) significant progress is achieved in rural schooling with 95.6 percent villages having a mid-level school within a 5 km radius but participation needs to be improved.[1]

Keywords – farm labour, education, schooling

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Examining the impact of education on Indian farm labour

According to a World Bank report in 2012, 69.9 percent of total Indian population still live in rural areas[2] (Trading Economics, 2012). According to the definition of a rural area, it is no major surprise that more than half of India's workforce is engaged in agriculture as the principle occupation, as reported by the Planning Commission (2007). However, leaving aside the issues of stagnating growth in agriculture and its rapidly declining share in the Indian GDP, when the 11th five year plan also acknowledges that "half of those engaged in agriculture are still illiterate and just 5 percent have completed Higher Secondary education" and in the next line says that "incomes and education are of course least among agricultural labourers" (Planning Commission, 2007, p. 3), we have a cause for retrospection. The causes – both direct and indirect, can be many, but here I choose to look only at the impact of rural education on agricultural households.

The task of assessing the benefits of education on young citizens of a nation that is demographically, culturally and economically diverse is as challenging as the task of endowment itself. The basic aspect of the problem can be subdivided as following – (i) *access to education*, meaning infrastructure like schools and transport; (ii) *participation from the community*, meaning enrolment and representation of all castes in the school; and (iii) *returns to education*, involving direct benefits like better and more diverse sources of income and indirect benefits to the environment through more responsible use of natural resources. For the past few decades, researchers and policy makers have been engaged in an interesting debate – how much do the

[2] A rural area is a part of the country which is not an urban area, which is defined by the National Sample Survey Organisation (2001) as follows –

(a) All places with a Municipality, Corporation or Cantonment and places notified as town area,
(b) All other places which satisfied the following criteria:
    a. A minimum population of 5000,
    b. At least 75 percent of the male working population are non-agriculturists, and
    c. A density of population of at least 1000 per sq. mile (400 per sq. km.)

benefits outweigh the cost of providing education in rural regions? What make this debate interesting are the lagged nature of benefits and the lumpy nature of costs. The benefits occur at later point in time when the student applies for a job or for higher education. This makes it difficult to assess the economic benefits in comparison to the costs of schooling even in controlled experiments (Krueger, 1999, p. 530). The lumpy and immediate nature of costs is evident quickly, as the cost of providing education may include land, school building, teachers, etc., and the cost of access to education can be measured by infrastructure such as roads, mid-day meal schemes[3] and transport facilities like buses or personal bicycles as in the case of Bihar in India (Swaroop, 2010). All of these costs are can be easily estimated as opposed to the benefits.

In a famous article, Gisser (1968) finds out the benefit-cost ratio of schooling in farm areas of America to be 2.37. He first calculated the direct and indirect costs of schooling by adding costs of building, land and equipment and also adding to it the foregone wage rate as indirect costs. Then considering education as an independent determinant of farm wage in a logarithmic model as shown below –

$$\log W = a_0 + a_1 \log C + a_2 \log W_{alt} + a_3 \log S + a_4 \log R$$

where – W: farm wage rate; this also represents the demand for labour

C: capital per farm

W_{alt}: alternative jobs available in the economy

S: level of schooling of males in rural farm areas

R: ratio of whites to total farm employees

Using pooled cross sectional data for 1950 and 1960 of average farm wages, he noted that a 10

[3] Providing poor students access to school without worrying for meals or tiffin from home.

percent increase in schooling or a 1 year increase at the secondary level, leads to an increase in 6.5 percent in wages. Assuming that this additional amount to accrue for 40 years hence, he could obtain the Net Present Value of this benefit and divide by the costs to arrive at the benefit-cost ratio of 2.37.

While Gisser's (1968) work was unprecedented and elegant, it also has several limitations in the context of developing countries. Firstly, he assumed away the farm problem of outmigration of educated individuals that he himself had shown in an earlier study (Gisser, 1965; Gisser, 1968, p.625). Secondly, the benefit-cost ratio presents a condition of arbitrage. More farmers would have opted for education given schooling was mostly free in the United States in the 1960's (Gisser, 1968). Thirdly, he does not take into account the additional cost of infrastructure in addition to the school premises like roads, transport services, utilities (water, sanitation, electricity) which are absent in rural areas of developing nations. Fourthly, Gisser's (1968) model indicates that "schooling is a vehicle for larger scale as well as for a higher degree of technological sophistication on farms", which might not be accurate for developing countries such as India and Bangladesh where the average landholding is less than 1.5 hectares. Finally, Gisser's (1968) model will also not work for rural areas where there is a high degree of landlessness and seasonal outmigration for farm work. Overall, Gisser's (1968) work shows pecuniary benefits of education for farm households.

Earlier, Gisser (1965) noted that raising the level of schooling in rural farm areas stimulates migration to urban locations, which coupled with productivity will raise the farmer's income in the long run. Kochar (2004) augments this point by reporting that urban rates of return

influence household decision on educating their children, which is highest for the landless. However, more often than not, education does not lead good urban jobs. As Krishna (2006) points out, villagers avail only a limited number of government or private jobs; and most private jobs are low-paid and on contractual basis. In the light of varying returns to rural education, the agricultural households' decision to allocate time for the child's education is not a clear 'yes-no' answer. The complexity increases with the influence of the local employer, the non-governmental organisations, the cooperatives and unions and finally the state, whose roles and interests often conflict. Thus, Kochar (2008) finds support for her hypothesis that the effect of schooling on wages reduces the profits for the landowners, which in turn reduces schooling investments from the local government.

As Desai, Dubey, Joshi, Sen, Sharif, & Vanneman (2010) note, India in 2005 was overwhelmingly rural, with stagnation in agricultural productivity finding an echo in the declining importance of farming in the household economy. Returns to education therefore increase by a shift in occupation, from previous or parental job, for families traditionally engaged in agriculture. Both education and skill provide better access to wage or salaried labour. In India, salaried work in the public sector earned an average of rupees 6,980 per month, and permanent and temporary employees in a private sector job earned an average of rupees 4,569 and rupees 2,365 per month respectively (Desai et al., 2010). Most households also preferred to mix farm work with non-farm activities (Desai et al., 2010). This finding is similar to Jolliffe's study (2004), where he notes that the returns to education in farm households determined the allocation of labour between on-farm and off-farm work. Thus, although 53 percent of the rural households

engage in farming, only 20 percent of the households draw all their income from agriculture (Desai et al., 2010).

I conclude the following points from the literature – (i) assessing the returns to education through economic benefits may sometimes be erroneous, as a shift to higher paying job does not happen all the time, (ii) the complexity of the external environment often lead households to diversify by allocating family labour between non-farm and farm work, and (iii) since families will want to maximise their total incomes, the decision on a member's participation in farm or non-farm activity will be highly associated with the person's education. Hence we can at least assess the impact of education on an agricultural household by observing a member's diminishing or increasing involvement in farm work. This can be aptly summarised as the primary question, which I intend to answer – "*do years of education impact an individual's involvement in farm labour for members of agricultural households?*"

I want to look at only those households that have been inter-generationally involved in agriculture. This reduces the chance of erroneously considering cases where households might have fallen back to agricultural labour because of poverty or other causes. Observably, the younger generation has a high chance of following the profession of her parent. This is true for many noble or not so noble professions alike for example – doctors, teachers, sports persons, film makers, musicians, politicians, farmers, business persons, etc. As a child observes her parent, she understands the nuances of the profession and becomes more capable of pursuing it later. However agriculture, traditionally being a labour intensive and rural activity in India, is less preferred and is a less satisfying job for an educated individual. For households shifting away

from farm to non-farm activities, renting out of land (Estudillo, Sawada, & Otsuka, 2009) and remittances from migrated members (Mueller & Shariff, 2009) also provide a way for the teenagers to get better education and often migrate. Hence education will lead to lower participation in agriculture.

There is also a counter view in many parts of the world where educated individuals are leasing or contracting farms for growing crops because of high returns involved. Indian farmers who have adopted new technology during the 'green revolution' in the form of better fertilizers, high yielding varieties and tractors have received high returns from farming. With higher profits and increased mechanisation, in some parts of India the traditional notion of labour intensiveness is fast eroding away. Many well-off villages have subsequently converted into townships. In this paper, I intend to look at the ground realities of farm labour in India vis-à-vis the completed years of education and reason its' implications by relying heavily on the Indian Human Development Survey 2005 data (Desai, Vanneman, & National Council of Applied Economic Research, 2005).

The datasets

The Indian Human Development Survey was conducted in the year 2004-05, and was a nationally representative, multi-topic survey of 41,554 households in 1503 villages and 971 urban neighbourhoods across India[4]. This survey was jointly organized by researchers from the University of Maryland and the National Council of Applied Economic Research (NCAER), New Delhi. It spread over 33 states and union territories of India and covered 65 percent rural

[4] This paragraph draws heavily from the description accompanying the dataset, for more information please see Desai et al., 2005.

households and 35 percent urban households. Two one-hour interviews in each household covered health, education, employment, economic status, marriage, fertility, gender relations, and social capital. Children aged 8-11 completed short reading, writing and arithmetic tests. Additional village, school, and medical facility interviews were conducted later.

The survey data is divided among 8 datasets[5] – individual, household, medical, non-resident, primary school, birth history, village and crops. The IHDS benefitted from the questionnaires of previous surveys – National Sample Surveys (NSS), National Family Health Surveys (NFHS), its predecessor, the 1994 Human Development Profile of India and from other international survey sources (Desai, Dubey, Joshi, Sen, Sharif, & Vanneman, 2010). An overall comparison of the IHDS data with the NSS (2005), NFHS-III (2006) and the Census (2001) shows broad similarities of the data and robustness of the data at the national level but caution needs to exerted while interpreting the same for sub-national levels (Desai et al., 2010). This survey is unique in the sense that unlike single topic surveys of health or consumption patterns, it measured different dimensions of human development – education, income, health, exposure to mass media, participation in institutions and more (Desai et al., 2010). Given the agenda of this paper to understand the impact of completed years of education for children of farmers and agricultural workers on their preference for farm work, the IHDS data is a natural fit.

Methodology

For this article, I picked up three IHDS datasets – individual, household and village. The entire analysis was done using Stata software (StataCorp, 2009). Before examining the impact of the years of education, I realised that it is important to understand the education

[5] All of these datasets are available in the public domain.

facilities and the differences in education for urban, rural and urban slums. For the former (table 1), the answers on 'public and private schools and colleges' from section 6 of the village questionnaire[6] was analysed. The difference of means (table 2) was obtained after first merging the individual and household datasets and then summarizing individual information based on 'rural/urban/slum' categorization in the household questionnaire. Finally for the least squares regressions, the impact of the years of education of a person on her involvement in farm work (captured by hours worked on farm per day) is estimated using the same merged file. Since this is an inter-generational set-up, there will be time varying factors like village infrastructure, which needs to be controlled for. For this reason, the village dataset was merged to the previously merged file. See appendix 1 for full description of the variables used. In the IHDS data, every individual could be mapped to a unique household (for mapping, see appendix 2). However since this survey also covered urban areas, only 66.96 percent of unique individual-household combination could be mapped to villages surveyed. This is a decent figure given the fact that the survey covered 67.06 percent rural households.

Reach of education

Considering education as a main factor in getting a high income, Desai et al. (2010) note that about 85 percent of children aged 6-14 are enrolled in schools but only 54 percent of 8-11 year olds are able to read a simple paragraph and barely 48 percent are able to do two-digit subtraction. There is also a wide divergence in the three R's (reading, writing, and arithmetic) by social and religious background, with children from Dalit, Tribal, and Muslim families falling substantially behind other communities (Desai et al., 2010). In contrast, according to a study

[6] All IHDS questionnaires can be found at http://ihds.umd.edu/questionnaires.html

conducted by the Indian Institute of Management, Ahmedabad, the Sarva Shiksha Abhiyan[7] (SSA) had achieved considerable success in reducing dropout rates, improving the enrolment of SC/ST candidates and bridging the male-female gender gap (The Hindu, 2006).

The dataset on village amenities reveal a lot about the reach of education infrastructure. Out of the 1501 villages surveyed, 160 did not have any childcare centre, 87 did not have any primary schools and one-third or more did not have higher schools (table 1). Few close by villages also share school facilities, hence numbers will be a little lesser. However the startling fact was that many village heads (> 3 percent) were not even aware of nearby education institutions. Another interesting fact is that in some places where there are no government run schools, some private run schools have come up. The differences between the first and the third column reveal the number of such institutions. Out of the 18 private primary schools – 4 are in Kerala, 3 each in Bihar and Tamil Nadu, 2 each in Orissa and Uttar Pradesh, and 1 each in Jharkhand, Maharashtra, Rajasthan and West Bengal. For villages wanting to educate their children, it is hearty to note that only 2 villages have primary schools farther than 5 kilometres. We can at least conclude here that currently there are no major problems in access to education at primary and middle levels.

[7] Sarva Shiksha Abhiyan (meaning education for all) is Government of India's flagship program for achievement of Universalization of Elementary Education as mandated by the Constitution of India. This was started in the year 2003.

Village Schools	No Govt.	No Pvt.	None	Don't know*	Within 5 kms#
1. Child care centre	162	1465	160	81	99.5%
2. Primary school (I-V)	105	972	87	58	99.8%
3. Middle school (VI-VIII)	593	1168	524	89	95.6%
4. Secondary school (IX-X)	1073	1280	957	129	77.4%
5. Higher secondary (XI-XII)	1303	1406	1252	144	52.4%

Table 1: Education facilities present in villages (as told by Village heads), Source: IHDS 05

Govt. – Government; Pvt. – Private; * Village heads who did not know any nearest facility

Percentage of villages having school in 0 - 5 km distance (excludes don't know)

Participation in education

It is well understood that, barring exceptional circumstances like poverty, households strive for sending their kids to school. These exceptional circumstances are often caused by landlessness, crop failures, drought, high medical expenses, marriages and high interest private debt, which lead to poverty (Krishna, 2006). Rural and urban slum households have a higher chance of being in poverty and this is reflected through lower participation in education. Though the overall enrolment is 85.7 percent for kids aged 6-14, I find that it is 84.3 in rural and 84.2 in urban slum areas. The IHDS data reveals that out of all children attending primary schools in rural areas, 38 percent do not get mid-day meals. Row 2 of table 2 brings another interpretation, the average years of education for rural areas is below the primary level of five years, which mean that their attendance depends on the free meal. The 'Mid Day Meal' scheme has been extended to upper primary schools (till class VIII) only in 2006-07 (Ministry of Human Resource

Development, 2012). Table 2 also exposes the rural-urban divide and strengthen the argument that the impact of education cannot be generalized across either rural – urban population or farming – non-farming populations.

Characteristics	Rural	Urban	Urban Slum	Joint P-value*
1. Age after first year of education	10.12 (10.96)	8.41 (8.30)	8.98 (8.95)	0.000
2. Years of education (22+ years)	4.19 (4.64)	7.72 (5.17)	4.94 (4.73)	0.000
3. Distance from school	2.53 (4.87)	2.32 (4.47)	1.95 (4.50)	0.000
4. Days absent/month	3.21 (5.68)	2.18 (4.56)	2.48 (4.33)	0.000

Table 2: Comparison of the means among Rural, Urban and Urban slum education

Figures in brackets represent the standard deviations from the mean, Source: IHDS 05

* P-value is for the F-test of equality of all three groups

Impact on farm work

As discussed earlier, farm households diversify their income sources by sharing the total family time between farm work and non-farm activities. Studies report that this decision is not dependent on the individual but are interrelated among family members abilities (Bjornsen & Biorn, 2010). Long back, Keating and Munro (1988) talked of the patriarchal nature of the family farms and how their work was considered ‘unpaid help’ for their husbands. More recently,

in the United States, Chang and Mishra (2008) note that if the male farm operator moved to off-farm work, it increased the family food expenditure but the reverse occurred when the female moved. Another similar study in China (Mu & van de Walle, 2011) shows that women may put more hours of work on the farm because of lower skill or lower pay. Thus there are a lot of determinants that affect the number of hours worked on a farm. On the other hand, receiving a positive endowment like education lead conclusively to more income generating activities. The first impact will obviously be lowering the time spent in farm activities – diversification or change in occupation. Thus the regression equation becomes -

$$W = b_0 + b_1 S + b_2 X + e$$

where – W: Number of hours worked on the farm per day

S: Years of schooling

X: Vector of control variables (see appendix 1 for complete list)

e: error term

The IHDS data gives the opportunity to look at the occupational choices of three different generations. The household questionnaire asked the household heads who were men about the occupation of their father and those who are women, about the occupation of their husbands. If we consider only male household heads, we get the data of the heads previous generation. Women household heads are only 9.70 percent of all rural household heads. Out of the total of these 2620 women heads, 1243 are in agriculture, where for 1011 women heads, their husbands were in agriculture. Hence, if we consider only male household heads for our inter-generation construct, we will not have spurious results. Thankfully, we do not need to make this consideration when we look at the son/daughter of the household head in table 4 later.

Household Head. The results of ordinary least squares regression of the years of schooling of male household heads on the number of hours spent in farm work per day is presented in table 3. After reducing the sample space to only originating from agricultural households, four regression models with different control variables were run to check against spurious significance. Among these control variables, the binary variables indicating caste and poverty control for individual differences and presence of primary school and the family's migration status control for access to education. Since we are looking at household heads with mean age of 47, to reduce the sample selectivity bias, I had to restrict the data to the condition they faced 40 years ago. The age of the head was restricted to more than 35 years and the binary variables were coded as 'yes' if these facilities existed when they were at school-going age of 5 years. For example, if a farm-head is currently aged 44 years, he would have been able to go to school if the school started 39 years ago (when he was aged 5). Since coefficients in multiple regressions have ceteris paribus interpretations, the final equation (IV) includes all variables and thereby reduces any omitted variable bias. The results show that the number of years the head attended school has a significant yet a very small negative impact. Thus, secondary education (10 years) will reduce hours worked by a few minutes per day (IV). Also the increase of adjusted R^2 for additional variables, mean that they are relevant. Apart from the binary variable indicating poverty, all are significant at more than 1 percent levels.

Explanatory variables	I	II	III	IV
1. Years of schooling	- 0.074**	- 0.076**	- 0.052**	- 0.018**
	(0.0057)	(0.0058)	(0.0059)	(0.0058)
2. Low caste (1= OBC/SC/ST)		0.368**	0.387**	0.286**
		(0.0550)	(0.0545)	(0.0533)

3. Below poverty line (1=yes)		- 0.069	- 0.038	- 0.096
		(0.0696)	(0.0690)	(0.0672)
4. Was primary school present in village at school-going age (1=yes)			- 0.978**	- 0.668**
			(0.0554)	(0.0550)
5. Has the head's family migrated after his school-going age (1=no)				2.024**
				(0.0680)
R^2 (adjusted)	0.0100	0.0126	0.0306	0.0794
Sample size (N)	16,714	16,714	16,714	16,714

Table 3: **Head.** Ordinary Least Squares regression – years of education on number of hours of farm work per day for household heads aged more than 35 years (IHDS, 05).

Figures in brackets are standard deviations. Note: ** 1% significance, * 5% significance.

Progeny of Household Head. The results of ordinary least squares regression of the years of schooling of household heads' children at the age of 16 to 40 years, on the number of hours spent in farm work per day is presented in table 4. The lower bound was kept considering that mean age of the sample is around 15 years and also as per International Labour Organisation Convention No. 138, the basic minimum age for working is above 15 (ILO, 2012). The maximum age was pegged at 40 so that individuals similar to household heads are not considered. Though we have 673 individuals who are aged above 40 years and the descendants of the household head, their educational impact will roughly be the same as in table 3. Therefore, to avoid complexity, this set of data is excluded from the regression models. As above, four regression models with additional control variables were run to check against spurious significance. Again, the control variables were restricted to the condition 20 years ago.

Additional binary variables indicating gender was used as a control for male-female disparity and road connectivity was used as a control for village level factors. The gender variable remains significant for all three equations but the negative sign as opposed to cited literature shows the low involvement of women in farm work in a developing country context. However if we add up household work and farm work, expectedly women will be working more hours. Interestingly all variables remain significant and except gender have small impact.

Explanatory variables	V	VI	VII	VIII
1. Years of schooling	- 0.042**	- 0.060**	- 0.058**	- 0.049**
	(0.0066)	(0.0065)	(0.0065)	(0.0067)
2. Low caste (1= OBC/SC/ST)		0.190**	0.208**	0.210**
		(0.0551)	(0.0552)	(0.0568)
3. Gender (0=male, 1=female)		- 1.961**	- 1.953**	- 1.949**
		(0.0633)	(0.0633)	(0.0654)
4. Below poverty line (1=yes)		- 0.265**	- 0.267**	- 0.194**
		(0.0670)	(0.0669)	(0.0700)
5. Was primary school present in village at school-going age (1=yes)			- 0.332**	- 0.190**
			(0.0668)	(0.0678)
6. Was village connected by paved road at school-going age (1=yes)				- 0.764**
				(0.0778)
7. Has the family migrated after his/her school-going age (1=no)				0.259
				(0.1570)

R^2 (adjusted)	0.0027	0.0656	0.0672	0.0719
Sample size (N)	14,579	14,579	14,579	13,861

Table 4: **Head Junior.** Ordinary Least Squares regression – years of education on number of hours of farm work per day for head's children aged more than 15 years (IHDS, 05).

Figures in brackets are standard deviations. Note: ** 1% significance, * 5% significance.

The impact of education is lower than expectations. One would expect significant reduction in farm hours given more income opportunities. In India though, farm income belonging to household is not apportioned among members. Even then, the impact of education is expected to differ with household farm incomes. The ordinary least squares regression was re-run on equation VIII with different samples grouped according to farm family income (see table 5). The variable of annual farm income is highly dispersed with a mean of 13,418 and a standard deviation of 59,161. Thus, discrete silos of rupees 20,000 were created. Incomes of less than 10,000 (even negative) and greater than 150,000 were put in the first and last silos respectively. The results in table 5 reveal significant insights. Firstly, the impact of education increases to almost five-fold with rising family income. Secondly, education always has a negative impact on farm work and never loses significance for all levels of income. Thirdly, the percentage of variation explained also increase ten-fold, from a meagre 3.3 percent to 22.3 percent. Fourthly, more than 50 percent of households earn less 10,000 per year.

Annual family income from farm work (in '000)	Explanatory variables (Equation VIII of table 4)			
	Years of schooling	Statistical significance (P>|t|)	Adjusted R^2	Number of observations

< 10	- 0.033** (0.0057)	0.000	0.0254	17,010
10 – 30	- 0.114** (0.0090)	0.000	0.0860	7,135
30 – 50	- 0.141** (0.0140)	0.000	0.1239	2,842
50 – 70	- 0.149** (0.0200)	0.000	0.1468	1,419
70 – 90	- 0.202** (0.0266)	0.000	0.1598	898
90 – 110	- 0.223** (0.0335)	0.000	0.1787	548
110 – 130	- 0.187** (0.0437)	0.000	0.1660	338
130 – 150	- 0.160** (0.0505)	0.002	0.2918	253
> 150	- 0.141** (0.0217)	0.000	0.2042	1,097

Table 5: Difference of percentage explained by years of education of the number of hours of farm work per day for head's children when we consider annual farm income (IHDS, 05).

Figures in brackets are standard deviations. Note: ** 1% significance, * 5% significance.

Conclusion

The link between education and higher income is not new. Similarly, many studies have focused on the change of occupation with higher education (e.g. Laszlo, 2008). My results corroborate both of the above by showing a negative impact of education on the number of farm hours worked. We see low values of adjusted R^2 and more controlled studies must be done in this aspect to probe the degree of causality. However, this was never tested in an inter-generational context and by keeping the agricultural household in focus. In the process new findings were unravelled.

Firstly, women were less involved in farm work than men. This does not suggest emancipation, but unobserved labour under housework. Most women heads of household took up agriculture from their husbands, when he was not available. This can be explored further in a later article.

Secondly, it was expected that with increasing farm income, years of education would become an insignificant determinant of farm work because educated individuals will find both farm and non-farm work equally remunerative. However, the results show a better negative association between years of education and farm work. Since high farm income is possible only if the household owns a large tract of land and has significant productivity, low hours worked on the farm can only indicate mechanisation of farm activities.

Lastly, significant progress is observed in rural schooling with 95.6 percent villages having a middle school within a 5 km radius. More progress is to be achieved on the

participation front, as there is a wide rural, urban and urban-slum divides. Rural and urban slum areas have lesser years of education and higher rates of absenteeism in the schools. Introduction of mid-day meals in upper primary schools is a positive step in this direction (Ministry of Human Resource Development, 2012).

Limitations

One of the biggest limitations of this study is the inability to use panel data. Although a sizeable portion of the household was mapped to the previous study called the Human Development Profile of India, an exact map of all variables could not be achieved. Another limitation was a part of the data – the question on household head's father's occupation, which was open-ended, and some effort was required to create a dummy variable to identify all records pertaining to agriculture.

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Appendix

1. IHDS variable description

Variable	Description	Belongs	Dummy	Values
CS4	How far is the school/college from home?	IND		
ED5	How many standard years has [NAME] completed?	IND		
FM30	How many hours a day did [NAME] work? (On farm)	IND		
ID9	Rural/Urban/Slum?	HH		
ID13	Is caste Brahmin, OBC, SC, ST or Others?	HH	ID13A	1 = OBC, SC, ST 0 = others, Brahmins
ID15	What is the principal source of income for the household?	HH	ID15A	0 = in agriculture 1 = others
ID16	How many years ago did your family first come to this village/town/city?	HH	ID16A	
ID19B	What was the occupation of the household head's father/husband (for most of his life)?	HH	ID19A	1 = in agriculture missing = others
INCFARM	Annual estimate of family farm income	HH		
POOR	Is household below poverty line?	HH		

	(Price indices based on 1970)			
RO3	Sex of [NAME]	IND		
RO4	Relationship of [NAME] to head of household	IND		
RO5	Age of [NAME]	IND		
VI3D	For how many years has this village been accessible by pucca road?	VIL	VI3DA	
VSB2	How many years ago did government primary school open?	VIL	VSB2A	

* IND – Individual data, HH – Household data, VIL – Village data

2. Dataset merging

1. Individual dataset is merged with household dataset using IDHH
2. Merged file is then merged with village dataset using the combination of STATEID, DISTID, PSUID