

Belief Systems and Wealth Outcomes

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Abstract:

One large area of research in which much work remains to be done is the role of belief systems and how they affect economic performance and wealth accumulation. The problem with any research along these lines is that it is difficult to isolate belief systems as a causal variable in any social dynamic. When looking at populations that are otherwise demographically equal, however, it becomes possible to connect specific outcomes to specific beliefs. This paper will look at how belief systems affect wealth distribution by testing whether Robert Caldwell's observations in South India are still valid after 150 years.

Key words: Principal component analysis, Socio-economic status, fieldwork, India, beliefs, economic outcomes

JEL Code: C43, C83, O10, Z12

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differences when comparing Hindu and Christian villages. Caldwell writes (1857:116) Christian villages were neater, had better built houses, more trees, “greater prosperity and comfort” and improvements in certain psychological traits. In this paper, I want to see if there is still a wealth disparity between villages. On the other hand, do we see convergence in the villages? Since knowledge of success leaks (Easterly 2001:146ff) have the Hindu households and villages taken advantage of the new knowledge and adapted it to increase their success. Some historians think there has been convergence (Grafe 1990).

The villages in India that I visited had similar demographic features. For example, all the villages are located in the same district in India (Tuticorin/Thoothukudi) (see Figure 1-1), the inhabitants all speak the same language (Tamil) and belong to the same caste (Nadars), the villages are geographically located in similar terrains (e.g. receive similar amounts of rainfall, use mainly well based irrigation etc.) and the villages are similar in size. Nevertheless, the villages chosen have very different religious beliefs: Arokiapuram is a Christian village, Melaramasamiapuram is a Hindu village, and Arulanandapuram/Vallivillai is a mixed village of approximately 60% Hindu and 40% Christian¹. Since I control for the extraneous variables, it becomes possible to connect specific outcomes to specific beliefs in these villages.

This article proceeds as follows. Section 2 shows the research methodology used, section 3 is the history of Nadars, section 4 develops the socio-economic score using Principal Components Analysis, section 5 tests Caldwell’s observations and section 6 contains preliminary conclusions and suggestions for follow-up work.

¹ Christians in these villages are all Protestant. All Protestant Christians in these villages belonged to the Church of South India.

2.2 Data Collection--Field Trip 2011

During the summer of 2011, a second field trip was completed. In this trip, I conducted the survey method (an *ex-post facto* method) to allow for direct hypothesis testing. The survey questions covered areas of health, time preferences, wealth, household particulars, education, and trust questions. I used some questions to crosscheck other questions.

I used ten different surveys to develop the final survey used in India (see Appendix A for the list of surveys used). The survey had 84 questions and had an additional module that contained questions on agriculture if the household was involved in agriculture and livestock issues. Everyone who was available in the village participated in the survey (exhaustive survey)³.

Using all these tools in the two different field trips, I hope to triangulate information. The idea of triangulation is using different techniques to find results for a set of research questions. Triangulation serves two purposes: confirmation and completeness (Arksey and Knight 1999:21). Further triangulation allows for blending and integrating various methods of research to strengthen the conclusion.

The main problem in the survey comes from measurement errors and translation errors. The survey was first compiled in English and then translated into Tamil. In the process of translation, a handful of questions came out with different meanings. This problem could have been minimized with retranslation into English (Tripathi 2005:77). Measurement errors can occur from the interviewer effect.

3. Historical Context

Since my fieldwork was in Nadar villages, I will include in this section a historical overview of the Nadars to help the reader understand how many Nadars became Christians in an overwhelmingly Hindu India.

³ The mixed village consisted of 58 households, the Christian village consisted of 36 households, and the Hindu village consisted of 64 households for a total of 158 households.

The Nadars were part of the Dravidian race of the Indus Valley Civilization in present day Pakistan, Afghanistan, and Northern India (3000 to 1500 BC). The Nadars lived in that region until the “Aryan Invasion” around 1400 to 1000 BC when they were driven out to other parts of modern India (Immanuel 2002:xxxv).

The early history of the Dravidians is known through palm leaf manuscripts and records in Hindu temples. While the Nadars in modern Indian society indicate a caste position, the original Dravidians were a casteless society. History shows that many Nadars were once Jains and Buddhists (casteless religions). The introduction of Caste in Southern India probably occurred between the 8th and 11th century AD with the entry to the south by a large group of Brahmins. During this time, the influence of Buddhism was destroyed (Immanuel 2002:270).

Due to infighting among Nadar groups, this group was weakened, with the result that Nadars were not allowed to worship in their own temples starting in 1664. The Brahmins also teamed up with other castes to suppress the Nadars. There were more than 100 taxes imposed on the Nadars in the 19th century. They included taxes for having legs, for walking, for palm leaf texts, for wedding chains, for using the plough, for being born, for dying, for treating the sick, etc. (Immanuel 2002:App.1). The tortures of the Nadars were so inhumane that in the 17th through 19th centuries the Christian missionaries found a community that was receptive to their message.

The designation of Nadars as either high caste or low caste is not without controversy. Some have said the Nadars would be in the Kshatriya (warrior/king) caste (high caste), and historically the kings among the Dravidians were also priests (Bergunder 2008:16; Immanuel 2002). This Kshatriya designation is not without controversy (Grafe 1990:104, 212; Kent 2004:68ff; Mallampalli 2004:247). Missionaries on the field have designated the Nadars at the high end of the low caste (Caldwell 1857:45), but they also note the claim of Nadars being of high caste (Caldwell 1857:33)⁴.

⁴ It seems that Nadars were called Shanars (a derogatory term) during the time period of the missionaries, but later took the name Nadars (Lords) when their status improved (Frykenberg 2008: 208).

Their mass conversion to Christianity resulted in some villages becoming Christian. This was seen as a threat to the local landlords, who perceived a loss of control over the Nadars, who with other castes attacked these new converts. Thousands fled their villages and eventually formed many new villages as places of refuge (Frykenberg 2008:209f; Grafe 1990:27).

Regardless of where the Nadars stand in the caste hierarchy, their mass conversion to Christianity and their involvement in trade brought their (including Hindu Nadars via spill over effects) (Grafe 1990:212) economic transformation (Polgreen 2010). The Christian villages established various institutions including dispensaries, hospitals, basic educational institutions⁵, colleges, seminaries, welfare institutions, etc. These institutions transformed the “political economy of the Tirunelveli area, thereby also beginning to bring about profound transformations in local culture and society” (Frykenberg 2008:212). Historian Grafe notes that Christian Nadars emerged “early as one of the groups who rose from social lowliness to occupy places formerly reserved for Brahmins” (1990:84).

4. Construction of a Socio-Economic Status Index using Principal Component Analysis

To test the observations of Caldwell over 150 years ago and recently by Grafe and Frykenberg, I developed a socio-economic status index using Principal Component Analysis (PCA).

4.1 Compilation of the wealth index using Principal Component Analysis

I used the PCA method to create a wealth index. Filmer and Pritchett (2001:128) note that the PCA “provides plausible and defensible weights for an index of assets to serve as a proxy for wealth” and measures the long-run economic status of a household (2001:116). By using the PCA method, the researcher avoids having to provide arbitrary weights to each component in the wealth index.

⁵ Caldwell (1857: 95) writes that in many of the larger Christian villages about 25% of the population was in school and overall among all the Christian villages the number was 16%. This was a high proportion at that time.

on the overall asset index, whereas having a refrigerator, more rooms in the house, and having a toilet provides for the largest positive effect to the overall asset index.

Table 4-1, provides the mean, standard deviation, and component scores for all the variables. There is a wide range of ownership of goods. Larger weights (component scores) are assigned to assets that vary the most and zero for those assets in all households or in none of the households. Nearly all households have a color television whereas only a few households have a car. All component scores for durable goods is positive, indicating possibly that creating one index which includes all three villages is reasonable (Vyas and Kumaranayake 2006:464).

<<<<<<<<Insert Table 4-1 Here>>>>>>>>>>>

4.3 Socio-Economic Scores for Households & Internal Consistency Check

The weights (component score) from the first principal component is used to create a score for each household. This score is the socio-economic score (SES). The distribution of the SES scores of households shows a normal graph (see Figure 4-2). This score could be used in a regression, but the interpretation of results is not easy. Therefore, one way to overcome this limitation is to divide the households into broad categories. I have divided households into quintiles.

<<<<<<<<Insert Figure 4-2 Here>>>>>>>>>>>

To test for the internal validity of the wealth index, the mean asset ownership needs to be analyzed for each quintile. From table 4-2, we see that, when comparing poorest and richest households (and also the other quintiles), the data is coherent. For example, under cooking fuel, wood/coal is used by 100% of the poorest households, whereas about half of the richest households use it. Only 9% of the poor

Christian teachers⁷. The importance of providing education for their children had spilled over to the Hindu village. Therefore, while there are spill over effects, the wealth disparities remain.

<<<<<<<Insert Table 5-1 Here>>>>>>>>>>>>>>>>>>>>>>

6. Preliminary Conclusion and Future work

PCA was used to create a wealth index to test Caldwell’s observations and to test for convergence. The support for the observations of Caldwell on divergence is still true today. Christian villages are better off and Christian households are better off in the mixed village. There is no convergence as of yet. However, have the rural Hindu Nadars benefitted from the growth of the rural Christian Nadars? Has there been spill over effects? The answer to these questions is yes, as documented by many sources. The Nadars as a whole have moved ahead of their peers (Polgreen 2010).

While in the villages chosen, we have a case of *ceteris paribus*, there could be an overlooked confounding factor that has not been taken into account. Further, instead of using a wealth index alone to test for convergence, a consumption based index would also add clarity to the conclusion. However, developing a consumption index is difficult and prone to error.

In this research, I have shown that beliefs affect economic (wealth) outcomes in these villages, and there is no convergence. However, for the conclusion to be broadened, further research is needed. The next step would be to increase the number of villages albeit within the Nadar community. Further, I would need to control for the idiosyncratic effects of the village. Community level questionnaires with household surveys need to be completed if one expands the number of villages. Further, the sample size needs to be increased and instead of completing an

⁷ Christians in India have generally been active in education for a long time. Therefore Christian schools and Christian staff seem to be a brand name for high quality. Further, the hiring of Christians in a Hindu school could also be due to more Christians in the education field and hence available to teach when there are job openings.

exhaustive survey, cluster sampling of each village can be done. Retrospective surveys of households can be done to get more data points on wealth.

Appendix A: Surveys used for creating the Survey in India.

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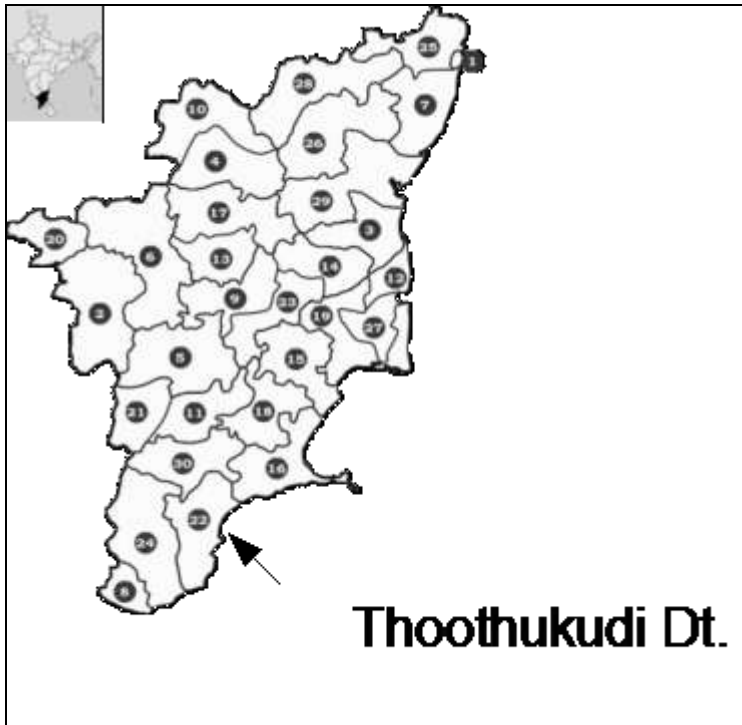


Figure 1-1: Map of Tamil Nadu, India (http://en.wikipedia.org/wiki/Tamil_Nadu accessed August 2005). The District of Thoothukudi (number 22) is where these villages are located.

Table 2-1: The total number of people interviewed⁸ in the three villages is shown below. M/F stands for Male/Female.

Village	Population in Village ⁹ M/F	Total interviewed
Arulanandapuram/Vallivillai	180/194	14
Melaramasamiapuram	137/158	12
Arokiapuram	90/103	17

⁸ The small number of people interviewed was due to the fact that I focused mostly on educational issues during the first trip.

⁹ These numbers have shrunk when compared to the second trip in 2011 as people are migrating to cities.

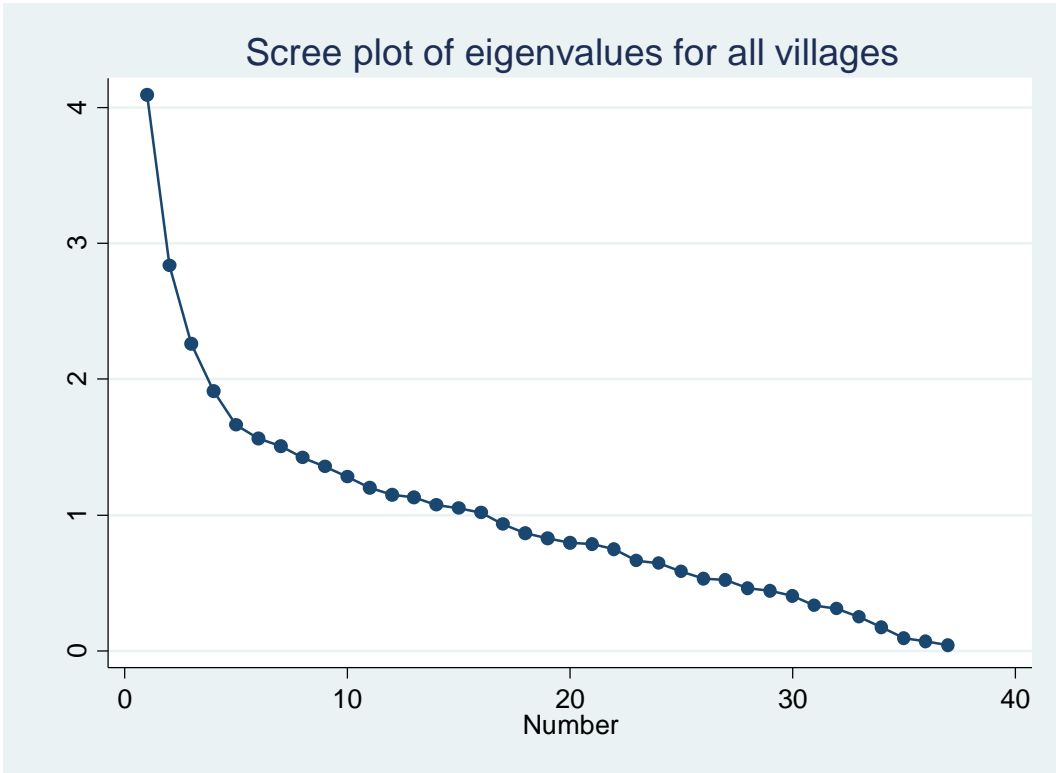


Figure 4-1: The Scree plot of eigenvalues with the turning point occurring between fourth and fifth component.

Table 4-1: Results from Principal Component Analysis

Variable	Mean	SD	Component Score	N
Cooking Fuel				
Wood/coal	0.886	0.319	-0.303	158
Dung	0.000	0.000		158
Kerosene	0.241	0.429	0.0993	158
Gas	0.544	0.500	0.213	158
Electricity	0.013	0.112	-0.0041	158
Roof Material				
Grass thatch	0.158	0.366	-0.2678	158
Asbestos	0.038	0.192	-0.0241	158
Cement/Concrete	0.449	0.499	0.226	158
Iron Sheets	0.044	0.206	-0.0095	158
Shingles/Tiles	0.405	0.492	-0.0213	158
Flooring in House				
Earth/dung	0.127	0.334	-0.2762	158
Bricks	0.000	0.000		158
Tiles	0.063	0.244	0.1828	158
Cement	0.842	0.366	0.1178	158
Wood/bamboo	0.000	0.000		158
Water Source				
Borehole	0.089	0.285	0.106	158
Well	0.025	0.158	0.0524	158
River/Spring	0.000	0.000		158
Community Kiosk	0.285	0.453	-0.0225	158
Stand in pipe/tap	0.658	0.476	-0.0368	158
Durable Goods				
Bed with mattress	0.222	0.417	0.2412	158
Television	0.905	0.294	0.1037	158
Radio	0.253	0.436	0.074	158
Cell phone	0.886	0.319	0.1417	158
Land Line Phone	0.070	0.255	0.2392	158
Refrigerator	0.057	0.233	0.2997	158
Bicycle	0.658	0.476	0.0627	158
Motorcycle	0.285	0.453	0.1968	158
Animal drawn cart	0.006	0.080	0.0572	158
Car/truck	0.006	0.080	0.1547	158
Washing Machine	0.025	0.158	0.1312	158
Compound Wall				
Mud	0.000	0.000		158
Wire	0.038	0.192	-0.057	158
Brick	0.532	0.501	0.2087	158
Thatch	0.373	0.485	-0.252	158
Limestone	0.006	0.080	-0.0068	158
Stone	0.025	0.158	0.0681	158
Sticks	0.013	0.112	-0.001	158
Thorns	0.013	0.112	-0.0938	158
Miscellaneous				

Own home	0.829	0.378	0.005	158
Have Toilet	0.462	0.500	0.2534	158
Rooms in House	2.399	1.226	0.2701	158

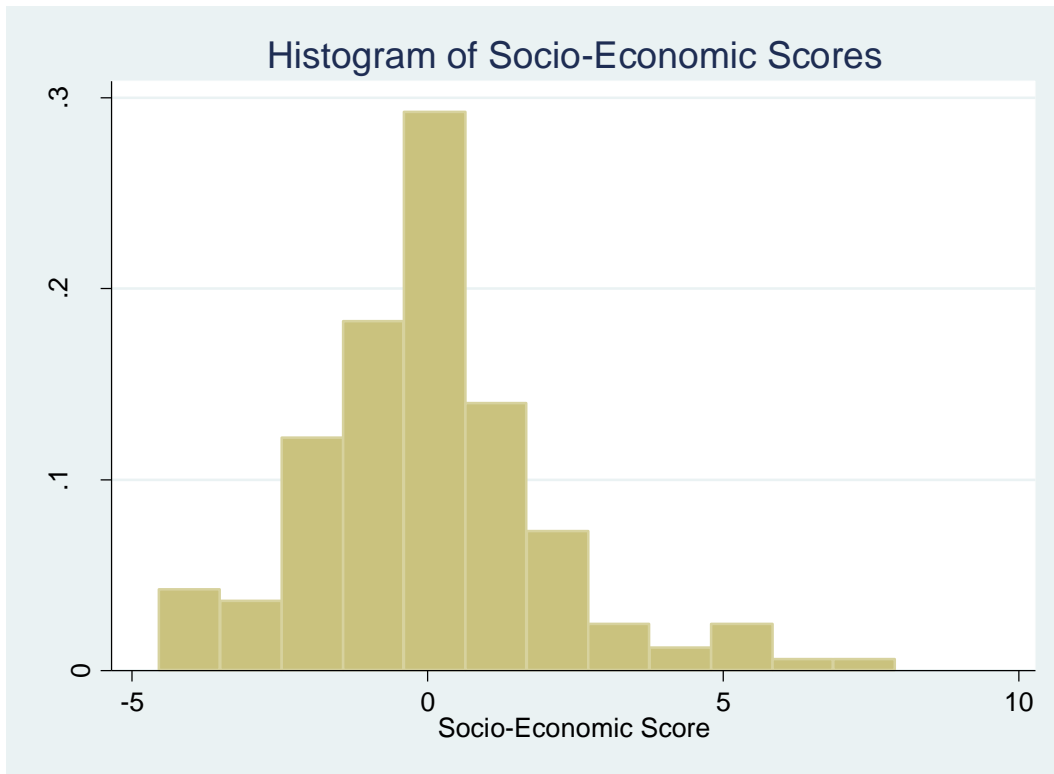


Figure 4-2: Distribution of socio-economic scores in the three villages.

Table 4-2: Checking the validity of the Wealth Index by checking characteristics of households in each quintile.

Variable	Poorest	Second	Middle	Fourth	Richest
Cooking Fuel					
Wood/coal	100%	100%	94%	94%	56%
Dung	0%	0%	0%	0%	0%
Kerosene	9%	19%	13%	39%	41%
Gas	28%	29%	50%	74%	91%
Electricity	0%	3%	0%	3%	0%
Roof Material					
Grass thatch	69%	6%	0%	3%	0%
Asbestos	6%	0%	9%	3%	0%
Cement/Concrete	9%	42%	44%	52%	78%
Iron Sheets	3%	13%	0%	0%	6%
Shingles/Tiles	25%	52%	53%	48%	25%
Flooring in House					
Earth/dung	56%	6%	0%	0%	0%
Bricks	0%	0%	0%	0%	0%
Tiles	0%	0%	3%	6%	22%
Cement	53%	97%	97%	94%	81%
Wood/bamboo	0%	0%	0%	0%	0%
Water Source					
Borehole	9%	0%	3%	3%	28%
Well	0%	0%	0%	6%	6%
River/Spring	0%	0%	0%	0%	0%
Community Kiosk	31%	29%	19%	29%	34%
Stand in pipe/tap	66%	71%	81%	61%	50%
Durable Goods					
Bed with mattress	0%	10%	13%	26%	63%
Television	81%	84%	100%	94%	94%
Radio	16%	29%	25%	16%	41%
Cell phone	81%	68%	97%	100%	97%
Land Line Phone	0%	0%	0%	6%	28%
Refrigerator	0%	0%	0%	0%	28%
Bicycle	53%	58%	75%	74%	69%
Motorcycle	13%	10%	19%	42%	59%
Animal drawn cart	0%	0%	0%	0%	3%
Car/truck	0%	0%	0%	0%	3%
Washing Machine	3%	0%	0%	0%	9%
Compound Wall					
Mud	0%	0%	0%	0%	0%
Wire	9%	3%	3%	3%	0%
Brick	22%	39%	50%	71%	84%
Thatch	81%	55%	34%	13%	3%
Limestone	0%	0%	3%	0%	0%
Stone	0%	3%	0%	3%	6%
Sticks	3%	0%	0%	0%	3%
Thorns	6%	0%	0%	0%	0%
Miscellaneous					

Own home	84%	77%	84%	81%	88%
Have Toilet	9%	26%	53%	55%	88%
Avg. Rooms in House	1.469	2.161	2.500	2.355	3.500

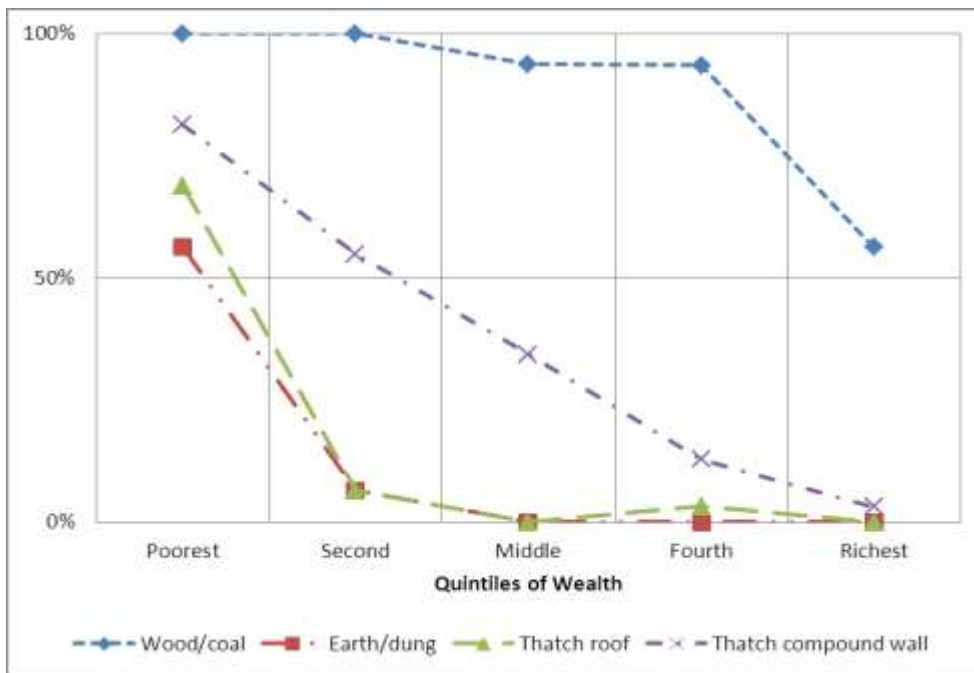


Figure 4-3: Inequality based on the largest negative component scores.

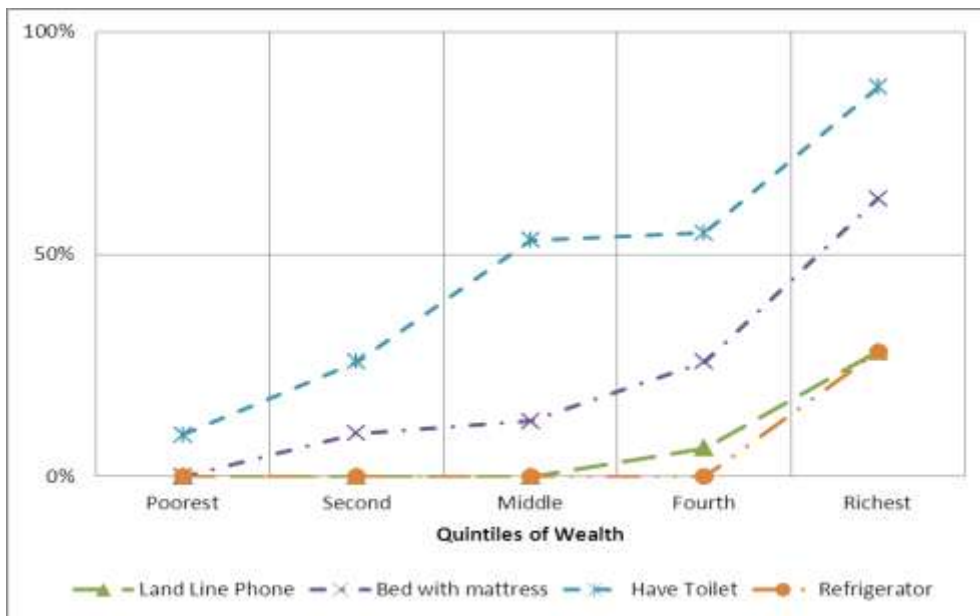


Figure 4-4: Inequality based on the largest positive component scores (excluding average number of rooms).

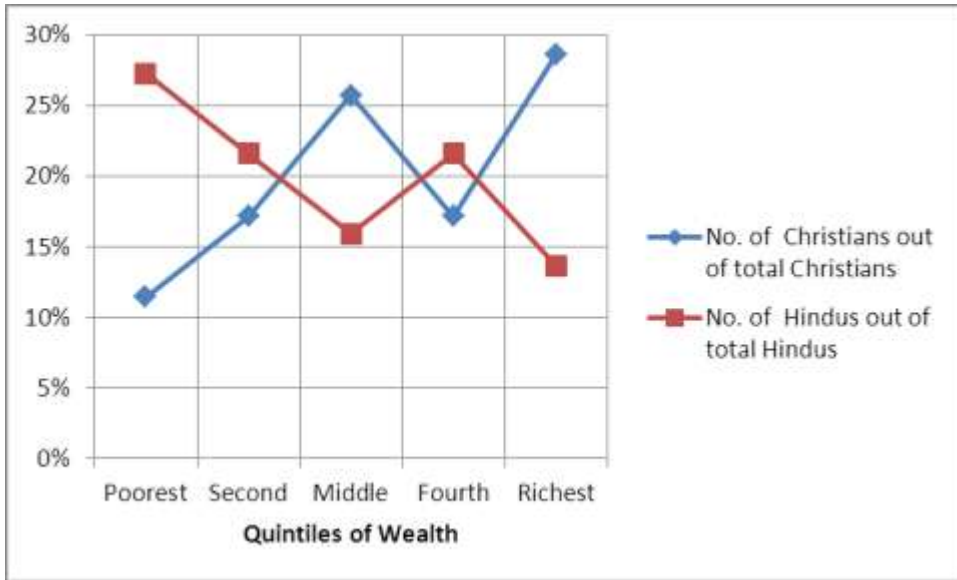


Figure 5-1: The location of Christian and Hindu households in the different quintiles.

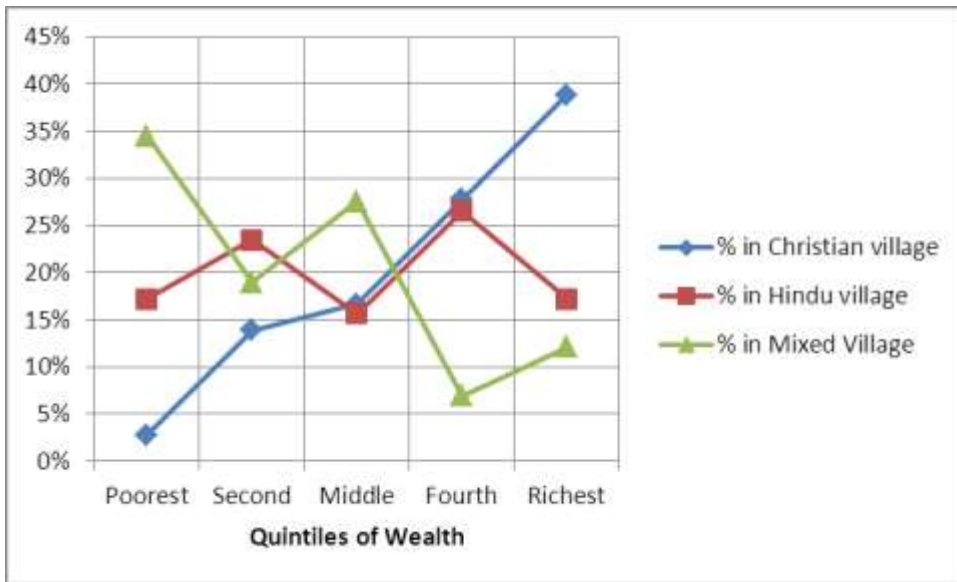


Figure 5-2: Distribution of households by village.

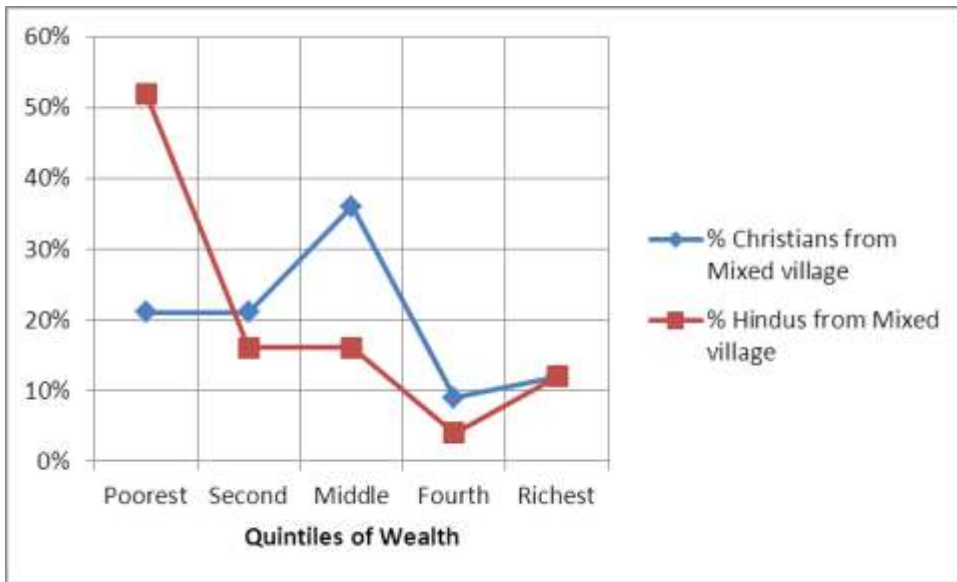


Figure 5-3: Distribution of households in the mixed village.

Table 5-1: Basic information regarding the infrastructure found in the schools.

Village	Electricity	Private Bathroom	School Furnishing
Arulanandapuram/Vallivillai (Mixed)	Yes	Yes	Good
Melaramasamiapuram (Hindu)	No	No	Minimal
Arokiapuram (Christian)	Yes ¹	Yes	Best

¹ The school borrows electricity from the nearby church.