Augsburg, Britta

Research Report

Safe sanitation: Findings from the impact evaluation baseline survey in Thiruvarur, Tamil Nadu, India ; Financial Inclusion Improves Sanitation and Health - FINISH Project

IFS Report

Provided in Cooperation with:
Institute for Fiscal Studies (IFS), London

Suggested Citation: Augsburg, Britta (2011) : Safe sanitation: Findings from the impact evaluation baseline survey in Thiruvarur, Tamil Nadu, India ; Financial Inclusion Improves Sanitation and Health - FINISH Project, IFS Report, Institute for Fiscal Studies (IFS), London

This Version is available at:
https://hdl.handle.net/10419/64605

Financial Inclusion Improves Sanitation and Health – FINISH Project

Safe Sanitation:

Findings from the Impact Evaluation Baseline Survey in Thiruvarur, Tamil Nadu, India.

Britta Augsburg

March 2011

Contents

1. Overview

2.1. Introduction

FINISH – Financial Inclusion Improves Sanitation and Health - is a joint undertaking of a wide range of actors that came together to address the challenges of micro finance, insurance and sanitation and health. **The overall goal of the project itself is to built 1 million safe toilets (possibly sanitation systems), financed through microfinance loans.**

The actors involved are: Waste (Dutch sanitation and waste NGO), SNS Real (Dutch listed insurance-banking group), TATA-AIG LIFE Insurance Co Ltd, BISWA (Tier 1 Microfinance Institution in Orissa, India) and UNU/Merit (United Nations University, The Netherlands).

The microfinance institutions BISWA is involved in the design of the project as well as the sanitation system delivery, but it is actually a number of MFIs that will offer the sanitation loan to reach together the target of building a million safe sanitation systems.[1] The participating MFIs are stimulated to do so through long term structural relations established between TATA-AIG. They are further incentivized to increase sanitation coverage loan products using the World Bank developed Output Based Aid (OBA) model, whereby small subsidies are paid to MFIs if they reach their targets. This money is raised from donors, i.e. the Dutch government approved Euro 4.5 million for this.

Figure 1 - 1 below shows the FINISH project area as of April 2009.

Figure 1 - 1: FINISH project Area (as of April 2009)

North:

- Gwalior, Madhya Pradesh (SAMBAV)
- Rajasthan (IIRD)

West:

- Maharashtra (WOTR/ SAMPADA)
- Gujarat (SEWA)

East:

- Orissa (BISWA)

South:

- Tamil Nadu (BHARATI)

[1] Within the first phase of the project, these MFIs (besides Tier 1 MFI BISWA) are Tier 2 MFIs ESAF and IIRD as well as Tier 3 MFIs BWDC, SAMBHAV.

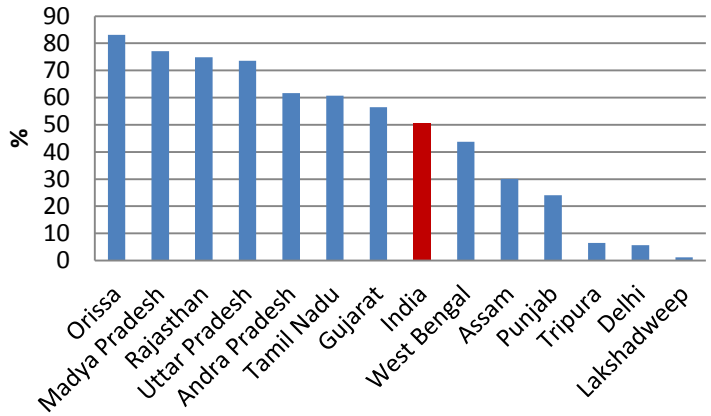
2.2. Project Background

India has 135 million financially excluded households according to a report of the Boston Consultancy Group (2007)[2]. The report states further that 17 million households should have entered the financial markets thanks to income growth by last year, 2010, and 30 million could have entered thanks to innovative banking business models. It is estimated that such 30 million households represent a bottom of the pyramid business worth Rs 10,000 crore (about US$ 2.5 billion) for banks and Rs 20,000 crore (US$ 5 billion) for insurance companies. Inclusion of the 'excluded' segment represents surely not only a social reality but also an economic opportunity. Nevertheless, these economic opportunities require redesigning of business models. More specifically, in order to be successful, business models need to take into account Bottom of the Pyramid market characteristics.

A major concern for inclusion of the bottom of the pyramid into financial markets is their erratic, uncertain and low income streams. Incidental data from Micro Finance Institutions hint that around 25 - 30% of their clients disposable households' income is not realised due to poor health. Major cause of such frequent illnesses is poor sanitation[3]. If the markets can target this, their client base can be broadened – due to higher and less uncertain income, income growth and new business models.

Recent reports by UNICEF observe that 50 % of households in rural India still practice open defecation, with some states even having figures of up to 80 % (see Table 1 - 1). No or poor sanitation is a principle cause of the death – estimated at 1,000 children in India every day[4]. The diarrhoea death toll of children alone is 386,600 per year[5]. This loss of life could be averted by simple interventions such as improved sanitation and handwashing.

Table 1 - 1 Percentage of households practicing open defecation



Source UNICEF October 2010

2 Sinha, Janmejaya & Arvind Subramanian. Boston Consultancy Group (2007). 'The next Billlion Consumers: A Roadmap for Expanding Financial Inclusion in India'.

[3] Bartram J, Cairncross S (2010). Hygiene, Sanitation, and Water: Forgotten Foundations of Health. PLoS Med 7(11): 1000367; Hunter PR, MacDonald AM, Carter RC (2010) Water Supply and Health. PLoS Med 7(11) : e1000361; Mara D, Lane J, Scott B, Trouba D (2010) Sanitation and Health. PLoS Med 7(11): e1000363; Cairncross S, Bartram J, Cumming O, Brocklehurst C (2010) Hygiene, Sanitation, and Water: What Needs to Be Done? PLoS Med 7(11): e1000365

[4] UNICEF/WHO (2009). Diarrhoea: Why Children are still dying and what can be done.

[5] Ibid.

In this context socially responsible investment in sanitation refers to financial outlays by organizations towards lowering such unhealthy practices that only degrade the environment, lower the dignity of the women in the community and act as one of the barriers to social development. Investing organizations can range from financial intermediaries (Banks / micro finance institutions (MFIs)) to public agencies (Government /Bilateral and multilateral donors), community enterprises (SHGs) and civil society groups(NGOs).

Grant based interventions in sanitation have had limited success in creating sanitation densities and social change due to several factors – some of them being: (a) the quantum of grant being inadequate to construct an acceptable yet functional sanitation system; (b) the grant beneficiaries in the population i.e families living below the poverty line being ambiguous, resulting in low sanitation densities in the zone concerned with insignificant improvements in health status; (c) lack of financial stake of the beneficiary households in the intervention that somehow have failed to act as an incentive for usage and habit change; and (d) the sustainability of such interventions given the resources and the potential implementation leakages.

Among the different forms of socially responsible investment, microcredit through SHG bank linkages and Joint-liability Group based MFI interventions are growing the fastest. Microcredit essentially directs capital from investors and lenders to communities that are financially excluded. While traditional microcredit refers to provision of access to credit, equity and capital, i.e asset side banking products to facilitate immediate consumption or livelihood enhancement, new financial packages need to be developed under microcredit that combine creation of awareness, building of capacities and access to credit that develop communities and promote a better quality of life for beneficiaries. The resultant of the above i.e *Socially Responsible Investments*, will ensure that microcredit remains a financial inclusion tool serving the needs of development.

Financial packages can for instance link a sanitation loan to lowering of healthcare insurance premiums and that way incentivize social change in ways beneficial to all stakeholders. FINISH is a program that is trying to do just that – it is trying to diffuse microfinance packages that are tied to investment in an asset that low-income communities need but do not demand – namely SAFE toilets. This is a very big challenge as research clearly shows that safe toilets are a product for which 'effective demand' needs to be created in rural areas – even though there is a need.

2.3. Project Components

Any financial scheme supporting a social investment program has to satisfy three conditions: (1) It must be economically sustainable for all organizations on the supply side of the 'financial loop'. (2) It must be demanded by the beneficiaries on the borrowing side of the 'financial loop' and the delivery platform has to be scalable so that development impact is realized across the community. And (3) it must be socially responsible – i.e. it must be viable for the beneficiaries to pay-back without incurring catastrophic debt burdens and the outcome must not involve damage to the environment or increase social tensions.

To meet these three conditions, the FINISH Project employees a two prong strategy of [i] providing access to credit through Micro Finance Institutions which are joined as partners in the Project and [ii] generation of demand for sanitation through creation of awareness.

As for the former point [i], project partners believe that Microfinance Institutions which have wide base in rural areas and which provide service to the rural population at their doorsteps are the best alternative as the commercial Banks cannot be expected to handle such activities for want of reach and penetration. Care is taken by FINISH to ensure that only those NGOs /MFIs are taken as partners in the project which have [a] strong base in the rural area,[b] have some experience of financing and supervising construction of toilets and [c] which show inclination to allot at least 10 % of their loan portfolio for sanitation promotion.

The Project also provides capacity building in the form of assistance for training of Animators Technical Personnel and the Project Coordinators from the MFI Partners and the Masons to ensure best design in conformity with the requirement of the terrain and local culture.

Furthermore, in order to achieve sanitation densities, the MFI Partners are assured output based aid, namely a payment of small incentives for crossing certain prescribed thresholds of sanitation coverage.

To ensure demand generation (point [ii] of its strategy), FINISH follows a bottom-up approach, the main aim of which is to get in touch with the community and remove their doubts and misgivings.

The main aim to achieve this is through the MFI partners.

The partners get financial support and training to engage animators whose specific task it is to develop contacts with the members of the community. The animators are usually above-average literate females with good communication abilities and generally from the same area.

The project partners are also provided IEC material and audio visual aids for better communication of ideas. The Project also provides for the engaging of Project Coordinators by the MFIs

2.4. Specificities of FINISH with BHARATHI[6]

This report focuses on the baseline study undertaken in Thiruvarur with BHARATHI.

The Bharathi Women Development Centre (BWDC), Kattur, Thiruvarur is one of the established organizations in the State of Tamil Nadu and mainly engaged in the uplift of down-trodden communities through their own efforts and the emancipation of women in particular. This object is achieved through the promotion of people's organization for self regulation and empowerment. The structure created facilitated the organization to implement people centred sustainable development projects over the years both with the help of Central & State governments and other International Donor Agencies.

The BWDC's operational area is presently restricted to a compact area consisting of three contiguous districts namely, Thiruvarur, Thanjavur & Nagapattinam. Though Tamil Nadu is classified as one of developed states and as such all the districts are not evenly developed. A few districts still continue to be backward in-spite of successive five year plans.

The three districts covered by the BWDC are agriculture/fisheries based and with the exception of Thanjavur district, the remaining two districts fall much below the State average in terms of various vital socio-economic indicators. Keeping the backwardness in mind, BWDC has accorded priority in

[6] This section was contributed by Mr. Nagarajan, CEO of Bharathi Women Development Centre.

adopting Thiruvarur and Nagapattinam districts for an intensive development. Women's empowerment and environmental sanitation were given preference in the development efforts. The initiative promoted by BWDC also includes the construction of UNICEF model twin pit pour flush latrines with people's participation. As a part of this, it had constructed as many as 300 latrines with pucca super-structure and these units effectively utilized.

Based on the work background and the credentials, the BWDC was chosen by The Project FINISH to be one of their partners from the State of Tamil Nadu in their endeavour to facilitate the construction of one million toilets throughout country over a period of five years or so. The aim of The Project FINISH is to make the end-user households to have the toilet facility on their own through credit support with the help of MFI NGO partners. In this process, The Project FINISH is committed to render assistance in building the capacities at various levels.

The inclusion of BWDC in The Project FINISH's plan is a constructive for expanding the organisation's portfolio to cover sanitation. Many SHGs have come forward to avail loan for onward lending to the members of the group for the purpose and this has created multiplier effect. It has become a movement by itself. The programme is also focused to bring improvement in the following areas:

- Improvement in design to reduce the cost of construction so as to make affordable.
- User friendly design to cater to the needs of specific target groups – children & elderly people.
- Improvement in design & the use of materials to reduce water requirement/ easy maintenance.
- Popularization of sanitary napkins as a part of hygiene.
- Creation of livelihood opportunities etc.

BWDC is covering 136 panchayats falling under Thiruvarur & Nagapattinam districts under the The Project FINISH with the aim of saturating the area with sanitary facilities. The activities undertaken are as under:

- Orientation of office and field staff on environmental sanitation.
- Identification and training of village based Animators selected exclusively for the purpose.
- Organizing awareness generation camps at the panchayat level involving SHG leaders/its members and interested panchayat functioneries on environmental sanitation (through wall painting, hand bills, posters, film shows etc.).
- Training of village masons on cost effective construction techniques.
- Branch office/staff posted takes care of credit assessment, disbursement, utilization of the credit for the intended purpose, recovery etc.

I terms of the characteristics of this sanitation loan, BWDC extends loans of Rs. 8,000 (~USD 175[7]), which covers either a double pit or a sceptic tank. The tenure of the loan is 16 to 20 equal monthly instalments, the exact length of which is chosen by the borrower herself. The interest rate on the loan is 21% per annum on a declining balance.

[7] Using the following exchange rate: 1 INR = 0.02188USD

2.5. The FINISH Evaluation Study

The FINISH *project* will test whether the use of microfinance for rural sanitation can be implemented at scale, in order to: accelerate access by the poor to demand-led sanitation, resulting in health, economic, and social impact; and greater sustainability in sanitation service delivery.

The United Nations University (UNU/Merit) together with the Institute for Fiscal Studies (IFS, UK) is responsible for the evaluation of the programme interventions; programme partners believe that the impact of sanitation on various levels including health, income, and general well being needs to be demonstrated at local levels and on a sufficient scale. For example, generally the rural poor do not yet regard sanitation as an income generating activity. Though, if their sanitation situation improves, their (sanitation related) health expenditures should decline and their free disposable income will increase. Such hypothesis will be tested through a rigorous impact evaluation study.

To verify the impact the UNU/Merit/IFS conducts a randomized control trial with three implementing agencies, implying an impact evaluation in three different states of India. The chosen institutions are:

(1) Bharat Integrated Social Welfare Agency (**BISWA**) in Orissa (Eastern India)

(2) Bharathi Women Development Centre (**BHARATHI**) in Tamil Nadu (Southern India)

(3) **Sambhav** in Madhya Pradesh (Northern India)

The general evaluation design is the same in all areas and is elaborated on in the next section. A few particularities and differences exist between the surveys which will be flagged in the discussion to follow.

The goal of this impact evaluation to measure in how far this 'mainstreamed approach' leads to desired health, economic, and social impact.

We are interested in the effect on outcomes that can be categorized in five different groups:

(1) health
(2) economic conditions (including costs),
(3) social conditions
(4) behavioural change, and
(5) demand.

More details on these are given in Section Outcome Indicators 2.3.

The improved evidence to come out of this evaluation study, will support development of large-scale policies and programs, and will inform donors and policy makers on the effectiveness and potential effects of providing microfinance loans for the purpose of constructing safe sanitation systems on a set of relevant outcomes. The study is designed in such a way that we will gain a deeper understanding how effects vary according to each state's programmatic and geographic contexts, and generating knowledge of relevant impacts.

2. Methodology

2.1. Randomization

The evaluation will be based on a randomised control trial (RCT).

Randomisation is important because it ensures that treatment and control individuals are, on average, statistically the same in terms of observable *and unobservable* characteristics[8]. In other words, randomisation removes selection bias (i.e. pre-existing differences between the treatment and control groups, such as different levels of education, that might make one household more likely to follow hygiene practices than another). In theory, this should ensure that when we compare the outcomes of treatment and control the only difference is due to the receipt of the FINISH intervention and not due to any unobserved differences between them. It allows one to obtain unbiased effects of the treatment on poverty.

While the need for randomisation is clear from a methodological point of view, one should also take its ethical implications into account. In particular, during the period of the experiment (approximately one to two years) some areas will be excluded from the FINISH implementation areas although they would qualify to be covered in principle. Here it should be noted that implementing agencies would not be able to roll-out the FINISH programme across all of areas of operation within the time of the evaluation. In practice, implementing agencies work in phases – covering one area, and then extending to another and so forth. We simply exploit the existing capacity constraint during the expansion phase of the programme to define the control groups. We come in the second of the implementing phase, assuring that initial implementing problems are minimized.

2.1.1. The randomization Design:

The project consists of an experimental set up in which some households will gain access to the FINISH intervention (treatment group), and some households will not for a limited period of time (control group).[9]

In terms of the nature of the randomisation, there are essentially two possibilities: to randomise the programme across a geographical unit (such as a village or gram panchayat) or across households within such a unit. The option of randomizing across households for this study was excluded from the start. The reason for this is that the FINISH project is designed to build dense sanitation pockets, rather than built sanitation systems loosely spread over a large area. The rationale behind this approach is the hypothesis that a health impact can only be achieved if a certain percentage of households use sanitation systems. If for example one household has a toilet but the neighbours

[8] The terminology 'treatment' and 'control' stems from the medical literature – where the treatment group are those individuals or areas that are given a treatment (or covered under a programme) and the control group are subjects or areas that do not receive active 'treatment'.

[9] The exact amount of time will depend on loan take-up. Implementing institutions agreed that within a period of about one year, 50% of households should own a toilet. We plan the follow-up survey once this threshold has passed in order to have at least half of the sample 'treated' with sanitation infrastructure. The exact time of the follow-up survey therefore depends on loan take-up.

continue to defecate in the open, drinking water of the household with a toilet might still be contaminated and so health effects not achieved.

The choice of a geographical unit was – in Tamil Nadu and Orissa – between the village or the gram panchayat. We decided to go for the latter for two main reasons: First, it is administratively and politically much easier to manage the randomisation across gram panchayats than villages. It would have been very impractical and difficult to exclude some villages in a gram panchayat whilst offering loans to other villages, most likely close-by. Second, and more importantly, the FINISH intervention in a village could have effects on villages in that same gram panchayat who do not receive the intervention (spillover effects), invalidating the comparison between treatment and controls.

In total approximately 2,000 respondents are interviewed in each of the survey areas twice: once before the randomisation ('baseline survey') and once about a year later ('follow-up survey').[10] The size of the geographical area these households live in differs depending on the operation area of the institution in general as well as operation area for FINISH of the institution in particular

On the basis of the survey results, the potential impact of FINISH in a number of outcomes (to be discussed below in more detail) will be estimated by comparing the outcomes of households participating in the intervention with those not participating. We will run regressions of the following type:

(1) $$y_{ij} = \alpha + \beta T + \gamma X + \nu_j + \varepsilon_{ij}$$

where y_{ij} is the outcome of household *i* in gram panchayat (GP)[11] *j*, *T* is a dummy variable taking the value 1 if the individual lives in a treatment GP and 0 otherwise, *X* is a vector of observed household and GP characteristics, v_j is a cluster-specific unobserved effect, and e_{ij} is a random error term. It will be important to take into account that the error term may not be independent across households. This is because households living in the same GP cannot be considered as independent observations as they will be affected by similar events. In other words, observations from the same GP are likely to be much more like one another than observations from different GPs. So in computing the standard errors of the estimate of β from the above, we will use formulae that control for the presence of clusters (GPs in our case). This inflates the variance over and above what it would have been in the independent case.

Controlling for the baseline values of covariates likely to influence the outcome will not affect the expected impact, but a baseline survey is important for the following reasons. First, to check that observed characteristics of treatment and control households are not statistically different from each other. This is like a diagnostic test to check if randomisation has been successful. Second, the baseline values can be used to improve the precision of the estimates. This is the case when baseline characteristics and values of the outcome variables are sufficiently strong determinants of the final outcomes. And third, they are important to analyse and understand second-round attrition. Non-response is likely to be more of an issue in the second round (as individuals have received the loans or not, and may be more or less inclined to participate in the study; moreover it may be difficult to track people who have moved far away, though we will put considerable effort into this) so it is good to collect as much information on background characteristics as possible at the baseline.

[10] See footnote 2 for discussion on timing between the two survey rounds.

[11] For simplicity, we will refer to the sampling unit as GP although this is not correct for the survey area in Madhya Pradesh. Here, one should read 'slum/village' instead of 'gram panchayat'.

2.2. Sampling Size and Strategy

As elaborated on above, the main unit of analysis is the gram panchayat in Tamil Nadu and Orissa and the slum in Madhya Pradesh. The selection of the gram panchayats or slums to be included in the survey was done by the implementing agencies. They were instructed to draw up a list of areas they would consider covering under the FINISH project, were they not resource constraint. This list was then used and a subset of areas randomly allocated to a control group, to be covered in the next expansion phase to take place after the follow-up survey is conducted.

The evaluation team gave no other instructions to the implementing agencies for selection of survey areas. This does not imply that the institution itself has not a certain set of guidelines and requirements for selection of areas of operation. And, as explained above, some criteria were given by the FINISH project itself.

The selection of survey households within the survey area was done on a purely random basis. Since one of the project goals is to reach dense sanitation pockets with high coverage, rather than building one million toilets spread all over India, no certain part of the population is the main target group. This can also be seen in the fact that FINISH gives incentive for implementing institutions to reach 100% coverage in villages. We therefore aimed to get a representative sample of the population were the implementing agencies chose to work.

The precise sampling lists were drawn-up as follows: A predetermined number o f random numbers was created for each gram panchayat/slum, the random numbers ranging from 1 to maximum the number of households within the area. The interviewers then went with this list to the gram panchayat office and matched the random numbers to the corresponding household in the area population list. It should be noted that this list includes plots that are not inhabited, temples or other buildings. Interviewers were instructed to copy information on the next entry if this was the case. Since these lists available at the gram panchayat or area office are usually not 100% up to date, a set of back-up numbers and households was provided, which were to be covered in case a household had moved, or died.

2.3. Outcome Indicators

Poor sanitation has many actual or potential adverse effects on populations as well as national economies. Conversely, measures for improving sanitation mitigate those negative impacts, hence stimulating economic growth and reducing poverty. Based on available evidence, the major anticipated impacts of poor sanitation are on health and water resources. Nevertheless, as described above, FINISH is a complex intervention that that concentrates on providing safe sanitation, but issues such as sustainability and delivery mode are of crucial importance. We therefore expect impacts on a number of additional margins, which we will be elaborated on in this section

As mentioned above, we are interested in the effect on outcomes that can be categorized in the following five groups: (1) health, (2) economic conditions (including costs), (3) social conditions, (4) behavioural change, and (5) demand.

(1) Health Impact Indicators:

Poor sanitation has a number of documented adverse impacts leading to disease and premature death, polluted water resources... Some population groups – children, women and senior people – are particularly vulnerable to some of these impacts, which considerably affect their quality of life. According to the 2006 UNICEF Human Development Report "In countries with high child mortality rates, diarrhoea accounts for more deaths in children under five years of age than any other cause of death – more than pneumonia and more than malaria and HIV/AIDS combined. [...] The largest single cause of these deaths is an unsafe and unhygienic environment: over 90 per cent of diarrhoeal deaths are attributed to poor hygiene, sanitation, and unsafe drinking water."

Given such available evidence, we assume some of the major impacts of improved sanitation through FINISH on health indicators.

Indicators to be considered are premature deaths, costs of treating diseases; productive time lost due to people falling ill, Percentage of children aged <3 years who had diarrhoea in the past 2 weeks, per capita daily water use, self-rated health...

Nevertheless, the problems with recall data about issues such as diarrhoea are well known. We therefore do not want to rely on self-reported health outcomes only and collect additional, more objective measures, namely anthropometrics and, in some of the project areas also measure of anaemia and worms.

The anthropometrics will be used to construct a measure of nutritional status (weight for age), linear growth (height for age - stunting), and a measure of acute or short-term exposure to an unhealthy environment (weight for height - wasting). We also collect the arm circumference (AC) to construct AC for age and AC for height, which are additional measures to determine the nutritional status of a population.

The stool samples undergo a stool ova & parasites test, which is done to detect the presence of intestinal parasites. Different forms of parasites are checked for, depending on their structures, life stages, and transmission forms. A parasite may still be an egg (ova), of immature form (larvae) or of mature form (worm). Within the mature form, there are two diagnostic life-cycle stages commonly seen in parasites - the cyst and the adult trophozoite stage. Especially worms in children are a serious concern since they take the nutrients of the child leading to malnourishment. Some worms can also cause serious problems like intestinal obstruction.

The stools are furthermore checked for colour, consistency, the presence of mucus, and its pH.

The blood tests are taken to measure anaemia. The rationale to look at anaemia is nicely summarized by the WHO, stating that "Anaemia is common throughout the world. Its main cause, iron deficiency, is the most prevalent nutritional deficiency in the world. Several infections related to hygiene, sanitation, safe water and water management are significant contributors to anaemia in addition to iron deficiency. These include malaria, schistosomiasis and hookworm."[12]

More details on the collection of the anthropometrics and medical tests are given in section 2.4 Instruments for Data Collection below.

[12] http://www.who.int/water_sanitation_health/diseases/anemia/en/. Accessed 1.02.2011, 18:47.

(2) Economic Indicators (Microfinance Sanitation Loan):

The second focal issue of the academic evaluation will be to quantify the effect of a microfinance loan for sanitation. The question of interest is how households can cope with the burden of a non-income generating activity (given that the loan is used for the intended purpose, which will have to be captured in the survey). Outcome indicators for this analysis are therefore mainly economic ones, but also stress indicators will be considered. The latter is based on a study in South Africa which found a significant effect of having a loan on female's stress level. It is hypothesised that the stress level will be increased when the loan is not invested in an activity offering monetary return.

The financial impact of this sanitation loan is expected to have two opposing effects, which we aim to quantify: Firstly, as mentioned above, the sanitation loan is a loan for a non-income generating activity. Households will therefore have to divert some of their income into paying back the instalments which, given the poverty status of targeted households, can result in a reduction of consumption expenditures and/or an increase in labour supply - possibly of children which will in turn affect school attendance... On the other hand, improved sanitation facilities in combination with behavioural change should result in improved health, which in turn is hypothesized to positively influence productivity[13] and hence the above mentioned economic indicators.

It is of interest to quantify which of these effects dominates in order to judge whether a non-income generating loan is indeed a "non-productive loan" or can actually be seen as "productive" in the traditional meaning of the word.

We should be mindful that we cannot expect very large effects, particularly in the short run. This is why data collection includes information on consumption expenditures, which reflects among other household's longer term expectations. Furthermore, it is crucial to emphasize that the collection of follow-up information not only a year after the introduction of the intervention is of utmost importance to measure economic impacts in the context of this intervention.

(3) Indicators for Social Conditions:

Improved sanitation facilities are expected to have positive effects on privacy, safety as well as status and prestige. Especially women are beneficiaries in terms of these indicators. Closed toilets give them privacy and a private toilet spears them to walk to public toilets or open defecation sites during the night.

But, it is also households in general that benefit. Having a private toilet is generally associated with an increased status in the village. This is for example due to the fact that people with house toilets often play key roles in arranging important ceremonies such as funerals.

(4) Behavioural Change:

It is widely known that simple hygiene behaviour, practices for cleanliness such as hand-washing and the use of soap, are key to improving health. Behavioural change of the targeted population in a sanitation intervention has therefore been recognized as an essential part of any successful intervention. This is highlighted in a conclusion drawn by the Bremen Overseas Research and Development Association (BORDA) about a Community Based Sanitation – Decentralized Wastewater Treatment System (CBS-DEWAT) project:

[13] It has been shown that a high incidence of water-related diseases contributes significantly to low productivity.

*"*The first Health Impact Assessment (HIA)-field results from (CBS-) DEWATS-project areas in India reveal that despite the provision of clean sanitary infrastructure, incidences of water and vector borne-diseases are still at unacceptable levels and the project's impact on hygiene behavioural change has been much less than expected."[14]

Several studies reveal that promotion of hygienic behaviour does indeed induce change in people's practices. Nevertheless, little is known about which interventions are more likely to encourage change and result in breaking of old habits, implying a change that is sustained over time and not dependent on for example the regular visit of program staff (or an interviewer for that matter).

As discussed above, the FINISH Intervention incorporates such promotional activities. Furthermore, it is envisioned to work with NGOs in certain intervention villages that concentrate on educating women with respect to sanitation. Women are typically seen as key players in the promotion of hygiene and sanitation behavioural change as more often than not they are the ones caring for the children and preparing food – both matters where hygiene is of utmost importance. Nevertheless, especially in South Asia, it is foremost men who show reluctance to use toilets and break their old habits, preferring to defecate in the fields.

(5) Demand Drivers:

Based on previous studies in Asia (such as the WHO's "Health Impact Assessment (HIA)" and World Bank surveys), the following factors are issues considered as important by rural household with respect to sanitation facilities and can hence be seen as demand drivers: a reduction of smell and flies, cleaner surroundings, privacy while defecating and taking shower, less embarrassment when friends visit, and reduction of diarrhoea/ill-feeling. Changes with respect to these indicators will hence give an indication of demand for services and we collect data on these.

2.4. Instruments for Data Collection

The baseline survey included a household questionnaire, a questionnaire for the main woman in the household, if applicable, a community questionnaire, anthropometrics and blood and stool samples in some of the survey areas.

Household questionnaire: The household questionnaire was administered by a male or female interviewer. If available, the household head was questioned, otherwise another knowledgeable household member. One or more household members could be present during the interview. The questionnaire comprises of XX Sections, namely:

A *Household Roster, General Household Characteristics, Education, Economic Activity, Children's time Allocation*
B *Characteristics of Dwelling*
C *Sanitation, Bathing facilities, Water*
D *Household Consumption*
E *Health Care – outpatient & hospitalization*
F *Assets*
G *Household income*
H *Risk Perception*

[14] http://www.borda-net.org/modules/news/article.php?storyid=102

***I** Shocks*
***J** Credit, Savings and Insurance*
***K** Observations by the interviewer*

Woman questionnaire: The woman questionnaire was administered to the main woman in the household (if applicable). This was exclusively done by female interviewers due to the sensitivity of some of the questions. Emphasis was put that the interview was conducted in private. The following sections make up the woman questionnaire:

***A** Background and status*
***B** Hygiene practices – food hygiene & personal hygiene (bathing, toilet, menstruation)*
***C** Children – babies & children 1.5-16 years of age*
***D** Knowledge*

Community questionnaire: The community questionnaire (slum or village) was administered by one or more interviewers, often as a first step when entering a new village, as part of meeting the community head or other important personalities in the community. Information was usually collected from more than just one person and on consecutive days. Sections of the questionnaire are:

***A** Population & area/location*
***B** Transportation*
***C** Infrastructure*
***D** Sources of water & sanitation*
***E** Community activities*

Anthropometrics: Anthropometrics were collected from all kids up to the age of 16 as well as the main woman in the household. Five measures were taken, namely height, weight, and arm circumference.

Blood and stool samples (if applicable): Prior permission from the district and/or state government was obtained before collecting blood and or stool samples.

The collection and analysis was done differently in the survey areas. This is described in more detail in Section 2.5..

Blood testing was done through a prick blood test, and the blood was tested for anaemia. Blood was taken from the main woman in the household, where applicable.

Stool samples were collected in a clean container and then sent to the laboratory. Laboratory analysis included microscopic examination, chemical tests, and microbiologic tests. Stool samples were taken from the main woman as well as children between the age of five and ten years. A complete examination was undertaken, looking at Ova, Cyst, Trophozoite, Flagella, RBC, Pus, reaction and colour.

2.5. Specifics for Study in Thiruvarur with BHARATHI

The previous sections described the general set-up of the FINISH evaluation. While these generalities are the same in all three survey areas, specificities remain, just as with the particular FINISH

implementation details outlined in section 0 Any financial scheme supporting a social investment program has to satisfy three conditions: (1) It must be economically sustainable for all organizations on the supply side of the 'financial loop'. (2) It must be demanded by the beneficiaries on the borrowing side of the 'financial loop' and the delivery platform has to be scalable so that development impact is realized across the community. And (3) it must be socially responsible – i.e. it must be viable for the beneficiaries to pay-back without incurring catastrophic debt burdens and the outcome must not involve damage to the environment or increase social tensions.

To meet these three conditions, the FINISH Project employees a two prong strategy of [i] providing access to credit through Micro Finance Institutions which are joined as partners in the Project and [ii] generation of demand for sanitation through creation of awareness.

As for the former point [i], project partners believe that Microfinance Institutions which have wide base in rural areas and which provide service to the rural population at their doorsteps are the best alternative as the commercial Banks cannot be expected to handle such activities for want of reach and penetration. Care is taken by FINISH to ensure that only those NGOs /MFIs are taken as partners in the project which have [a] strong base in the rural area,[b] have some experience of financing and supervising construction of toilets and [c] which show inclination to allot at least 10 % of their loan portfolio for sanitation promotion.

The Project also provides capacity building in the form of assistance for training of Animators Technical Personnel and the Project Coordinators from the MFI Partners and the Masons to ensure best design in conformity with the requirement of the terrain and local culture.

Furthermore, in order to achieve sanitation densities, the MFI Partners are assured output based aid, namely a payment of small incentives for crossing certain prescribed thresholds of sanitation coverage.

To ensure demand generation (point [ii] of its strategy), FINISH follows a bottom-up approach, the main aim of which is to get in touch with the community and remove their doubts and misgivings.

The main aim to achieve this is through the MFI partners.

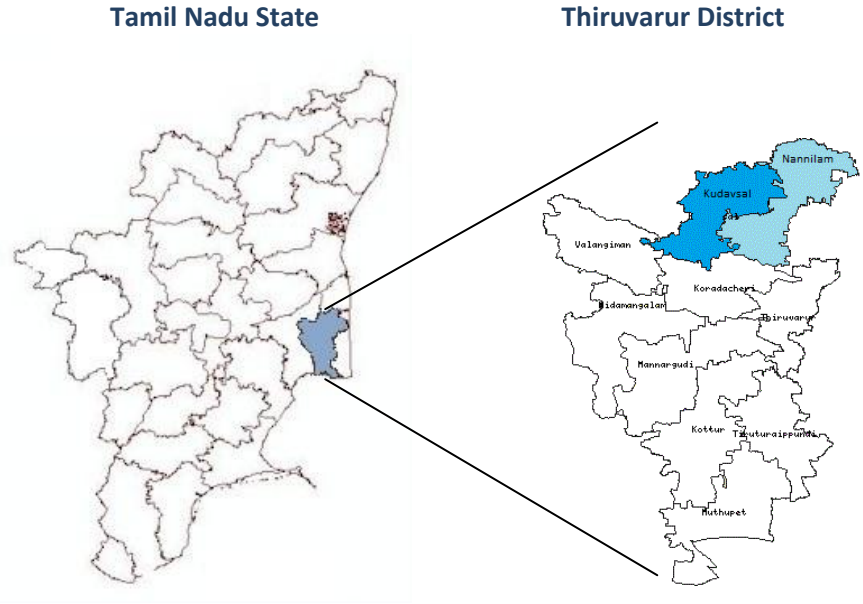
The partners get financial support and training to engage animators whose specific task it is to develop contacts with the members of the community. The animators are usually above-average literate females with good communication abilities and generally from the same area.

The project partners are also provided IEC material and audio visual aids for better communication of ideas. The Project also provides for the engaging of Project Coordinators by the MFIs

Specificities of FINISH with BHARATHI.

In Tamil Nadu, the survey is conducted in 76 gram panchayats spread over 2 blocks, namely Nannilam and Kudavasal in the district of Thiruvarur. Figure 2 shows a map of the state of Tamil Naud as well as the district of Thiruvarur, highlighting in blue the survey blocks Nannilam and Kudavasal. Out of the 76 survey gram panchayats, 49 are in the block of Nannilam and 27 in the block of Kudavasal. The list of gram panchayats was finalized by BHARATHI in October 2009 and randomization of treatment and control areas done successively. The list of gram panchayats included in the survey is displayed in Table A1a in the Appendix and also includes the outcome of the randomization.

Figure 2: Survey Area, BHARATHI



The baseline survey started on the 4th of December 2009 and the final and 1938th interview was collected on the 2nd of February 2010[15].

The survey team was headed by J.Kirubakaran from The Institute of Sustainable Development, Chennai. He managed a team of 20 full time interviewers and 2 team supervisors. From January 2010, five more interviewers joined the team. In addition, students from Women Studies at Bharathidasan University supported the team part-time.

The collection of anthropometric measures and stool and blood tests was outsourced to the Thiruvarur Medical Centre. They started the data collection on the 7th of June and completed the work on the 15th of September 2010. Nevertheless, due to a number of reasons, their achievement in reaching the targeted number of blood and stool samples as well as anthropological measures was very low (numbers to be presented further below). To increase the sample size, a small team was re-trained and sent to the field.

The final sample sizes for each survey instrument is as follows:

Household questionnaire:	1938 interviewed households
	8567 household members
Woman questionnaire:	1747 interviewed women
Community questionnaire:	168 villages of 60 gram panchayats
Anthropometrics:	2,840 household members of 1,238 households
Blood test:	1,206 household members of 1,205 households
Stool tests:	911 household members of 589 households (in 186 two household members were tested, in 120 three and in 16 four).

[15] Data collection started in Kudavasal on the 4th of December 2009 and was completed on the 22nd of the same month. Data collection started successively in Nannilam on the 26th of December and was completed on the 2nd of February 2010.

2.6. Comparison between Treatment and Control

As explained above, the evaluation methodology will be based on the comparison of outcomes between gram panchayats identified as FINISH areas and where FINISH is implemented first and FINISH areas where the implementation is postponed. The potential impact of the intervention on areas such as health, household standards of living and poverty will be estimated by comparing the outcomes these two different groups.

In order to be able to attribute any effects to the microfinance program, it is imperative that the two groups being compared are similar in all respects. Randomisation is the best tool at our disposal for achieving this; the key is to conduct it properly. In particular, randomisation removes selection bias (i.e. pre-existing differences between the treatment and control groups, such as different levels of education that may influence the outcomes of interest, such as household income etc.). In theory, this should ensure that when we compare the outcomes of treatment and control individuals the only difference is due to the receipt of the loan and not due to any unobserved differences between them. It allows one to obtain unbiased effects of the treatment (provision of FINSH) on poverty. These key advantages can be compromised in a number of ways: a. because of non-random non-response (i.e. related to treatment allocation) in the selection of the sample from the eligible population (marginal clients who accepted to be part of the programme); b. non random attrition related to treatment status.

In part it is possible to test whether bias arises at each stage of the study: we compare the observable (pre-treatment) characteristics and test that there are no significant differences in their distribution in the treatment and control sample. If we accept the null, this can be taken as evidence that the samples are balanced in the unobservable dimension as well, given there has been randomisation in the first place. A similar test can be carried out on the follow up samples, based on variables that cannot be affected by treatment.

At baseline we can compare variables such as consumption, enterprise, assets and savings, as well as background characteristics that cannot be changed by the program such as age, sex, adult education, and so on. **This is what we formally test in this report**. We present tables showing the average values of different variables for treatment and control households. We then conduct two-way comparisons between control and treatment households (as ultimately these will be the comparisons made in the impact evaluation), to see if any observed differences between the means are statistically significant at conventional levels.[16]

Before proceeding, note that in all of the tables that follow, we use the following format. The first column gives information on which variable is concerned. We then show the mean, standard deviation, minimum and maximum for the whole sample (treatment and control combined). The following two columns show the mean of the control and the treatment group separately.

The last column shows the two-way comparisons between treatment and control, showing the p-value of the test of statistical differences between control and treatment means. The null hypothesis being tested is that the mean of the variable of controls is equal to the mean of the variable of

[16] By a 'statistically significant difference' we mean there is statistical evidence that there is a difference between the average values of the two variables. We use a significance level of 0.05, which means that the average values we are comparing are only 5% likely to be different, given that the null hypothesis that the means are equal is true. A p-value below 0.05 leads us to reject the null hypothesis that the means are equal.

treated individuals. Note that throughout, the tests account for clustering of the standard errors at the gram panchayat level.

3. Findings – Households

In this section, we present summary descriptive statistics for key demographic, socio-economic, hygiene, health, and child development variables.

As described in the previous section, we provide here a formal statistical comparison between treatment and control units. Testing for the similarity between the two groups is very important for the impact evaluation that will follow approximately a year after programme implementation starts in the treatment survey area.

The second major aim of this section is to give a flavour of what our sample looks like. We will therefore not only present information on our outcome indicators but will go into more detail for certain areas of interest.

3.1. General Household Characteristics

Table 3 - 1**Error! Reference source not found.** provides information on the household's caste, religion, primary activity and living status. The greater proportion of households in our sample in Tamil Nadu (43%) belong to the backward caste, followed by scheduled caste (35%) and about a fifth of the household belong to the most backward caste (21%). Only one percent of the sampled households belong to the forward caste. We can see from the last column, that there is no significant difference between these proportions between the treatment and control areas. The very similar means reflect this statistical insignificance. For example in the control area, 44% of households belong to the backward caste and in the treatment areas 41% do.

Table 3 - 1 Household characteristics

Variable	Whole sample				Mean		p-value
	mean	sd	min	max	C	T	T vs C
Caste (fraction)							
Forward caste	0.01	0.1	0	1	0.01	0.01	0.14
Backward caste	0.43	0.49	0	1	0.44	0.41	0.383
Most backward caste	0.21	0.41	0	1	0.2	0.23	0.349
Scheduled caste	0.35	0.48	0	1	0.34	0.36	0.763
Scheduled tribe	0.00	0.05	0	1	0.00	0	0.93
Religion (fraction)							
Hindu	0.93	0.26	0	1	0.94	0.92	0.641
Muslim	0.05	0.21	0	1	0.04	0.06	0.483
Christian	0.03	0.16	0	1	0.03	0.02	0.678
Primary Activity of households (fraction)							
Agricultural labourer	0.66	0.47	0	1	0.64	0.67	0.404
In agriculture	0.68	0.47	0	1	0.66	0.71	0.242
Professional	0.13	0.33	0	1	0.14	0.11	0.172
Government job	0.05	0.21	0	1	0.05	0.05	0.913
Other	0.05	0.21	0	1	0.05	0.05	0.913
Living (fraction)							
Households lived in dwelling all their life	0.97	0.18	0	1	0.97	0.96	0.631
Households lived in village all their life	0.98	0.13	0	1	0.98	0.98	0.934
Households have plans to migrate	2.75	0.66	1	3	2.81	2.68	0.032

In terms of religion, the great majority of households are Hindu (93%), the remaining ones are Muslim (5%) or Christian (3%).

Most of the households (68%) gain their primary income from agriculture, mainly agricultural labour. For 13% of households in the sample, the primary income stems from a professional activity (technical, managerial, executive, teacher...); 5% work for the government and the remaining ones fall within remaining categories, such as skilled labourers, construction workers, dairy and the like. None of these general household characteristics differ significantly between the two evaluation groups.

We next describe the characteristics of the dwellings that our sample resides in. Again, we show average values for the whole sample and information on the mean in all control, and treatment gram panchayats, along with p-values for differences between the means. These are shown in Table 3 - 2.

Table 3 - 2 Information on the dwelling

Variable	Whole sample				Mean		p-value
	mean	sd	min	max	C	T	T vs C
Owns dwelling (fraction)	0.94	0.24	0	1	0.94	0.94	0.937
Nr of rooms	2.19	1.53	0	32	2.23	2.15	0.482
Dwelling structure (fraction)							
Pucca house (strong structure)	0.21	0.41	0	1	0.23	0.19	0.143
Semi-pucca house (semi-strong structure)	0.3	0.46	0	1	0.29	0.31	0.372
Kutcha house (weak structure)	0.47	0.5	0	1	0.46	0.49	0.337
Material of walls (fraction)							
Concrete/brick	0.61	0.49	0	1	0.64	0.57	0.027
Mud/brick/stone	0.29	0.45	0	1	0.27	0.31	0.062
Other than above	0.11	0.31	0	1	0.1	0.12	0.326
Material of roof (fraction)							
Cement/rcc or stone	0.26	0.44	0	1	0.28	0.23	0.126
Roofing tiles	0.27	0.44	0	1	0.27	0.28	0.636
Sheet/tin, thatch, other	0.46	0.5	0	1	0.44	0.48	0.183
Material of floor (fraction)							
Tiles	0.04	0.19	0	1	0.04	0.03	0.423
Cement	0.69	0.46	0	1	0.69	0.68	0.633
Stone, mud/earth, other	0.26	0.44	0	1	0.25	0.28	0.369
Main fuel for cooking and lightning (fraction)							
Cooking: firewood	0.67	0.47	0	1	0.66	0.68	0.609
Cooking: lpg, biogas, kerosene or other	0.33	0.47	0	1	0.34	0.32	0.609
Lightning: electricity	0.94	0.24	0	1	0.94	0.94	0.781
Lightning: generator, battery, candle…	0.06	0.24	0	1	0.06	0.06	0.781

One can see that the great majority (94%) of households own the dwelling they live in, which has on average approximately two rooms and is for almost half of the sample a kutcha house (weak structure); 30% live in a semi-pucca house (semi strong structure) and 21% in a pucca house (strong structure).

In 61% of the cases the walls of the building are made of concrete and/or brick, 30% of a combination of mud, brick and stone and the remaining 11% have dwellings of which the walls are made of mud and wooden planks, tin, or a thatch/bamboo structure.

Also the floor is in most cases a cement floor (69%), otherwise of stone and/or mud (26%). Only four percent of the households have tiled floors.

Finally we look at the main fuel used for cooking as well as lighting. In the bottom panel of Table 3 - 2 we can see that most households cook over a woodfire (67%) and have electricity for lighting (94%). Remaining households cook with lpg, biogas or kerosene and those that do not have electricity for lighting use a generator, battery or candles.

We can see in the last column, that – at a conventional level of 5% - in control areas significantly more households have walls made of concrete/brick (64%) than in treatment areas (57%). Of course in a series of tests over a large number of characteristics one expects some rejections (as implied by the type 1 error), so that this finding is not of great concern, and we indeed expect a few more variables to show significant differences.

3.2. Household Members and the Household Head

We next look at some characteristics of our sampled households, the household head and individual household members.

We see from Table 3 - 3 that the typical household of our sample in Tamil Nadu has 4 household members, more or less equally distributed between male and female. Each household has on average one or more children (0.3 children in the age range 0-5 and 0.9 children aged 6-14 years).

On average, 1.4 household members work for pay. We will discuss a bit more details on this labour supply further below.

It is to note that we observe no statistically significant differences across treatment and control areas.

Table 3 - 3 Household composition

Variable	Whole sample				mean		p-value
	mean	sd	min	max	C	T	T vs C
Nr of household members	4.42	1.71	1	14	4.42	4.42	0.946
Nr of male household members	2.28	1.21	0	8	2.26	2.3	0.562
Nr of female household members	2.22	1.17	0	10	2.24	2.2	0.368
Nr of kids 0-5 years of age	0.29	0.63	0	5	0.31	0.27	0.268
Nr of kids 6-14 years of age	0.92	1.11	0	6	0.93	0.91	0.662
Nr of male household members >16 yrs of age	1.02	1.16	0	6	1.04	0.99	0.36
Nr of female household members >16 yrs of age	1.71	0.97	0	7	1.68	1.73	0.981
Nr of household members that work for pay	1.65	0.84	0	6	1.64	1.65	0.589

The next Table (

Table 3 - 4) provides information on the household head of our sample households. A typical household head is male, 49 years of age, married and went to school up to grade VIII at most.

More specifically, 86% of all households are headed by a male, with an average age of 49 years. 89% of the household heads are married, 9% separated or divorced, 8% widowed and 3% have never been married. 15% have no formal education, 26% completed a grade up to grade V, further 26% went on completing grade VI, VII or VIII, 23% completed either grade IX or X and only 9% completed a higher grade or vocational training. This education level makes 75% of households claim to be able to read and understand a newspaper and 71% to be able to write a formal letter.

Most household heads (66%) engage in paid work outside their family's or own farm (if they have one) as their main economic activity; 10% do paid work on their own farm and another 8% do unpaid work on their own farm. 14% engaged in an activity which no direct monetary income, such as being a homemaker (3%), being retired (2%), being unemployed (8%) or having no activity due to illness (1%).

On the conventional level of 5%, two of these variables differ significantly between treatment and control: 12% of households in the control group are headed by a female compared to 16% in the treatment group and 5% of household heads have higher education than grade XII (or vocational training) in control areas as compared to 3% in treatment groups.

Table 3 - 4 Information on the household head

Variable	Whole sample				mean		p-value
	mean	sd	min	max	C	T	T vs C
Gender (fraction female)	0.14	0.35	0	1	0.12	0.16	0.029
Age of household head	49	13	20	100	49	49	0.876
Marital status of household head (fraction)							
Never married	0.03	0.16	0	1	0.03	0.02	0.341
Married	0.89	0.32	0	1	0.9	0.88	0.225
Separated, divorced or widowed	0.09	0.28	0	1	0.08	0.1	0.064
Educational Attainment of household head (fraction)							
No formal education	0.15	0.35	0	1	0.15	0.14	0.57
Up to grade V	0.26	0.44	0	1	0.24	0.28	0.069
Grade VI-VIII	0.26	0.44	0	1	0.27	0.26	0.606
Grade IX-X	0.23	0.42	0	1	0.23	0.22	0.518
Grade XI-XII	0.05	0.22	0	1	0.05	0.06	0.301
Higher education	0.04	0.2	0	1	0.05	0.03	0.040
Able to read newspaper	0.75	0.43	0	1	0.76	0.74	0.357
Able to write formal letter	0.71	0.45	0	1	0.72	0.7	0.47
Main Activity (MA) of household head (fraction)							
Paid work on family's/own farm	0.09	0.28	0	1	0.08	0.09	0.718
Paid work outside family's/own farm	0.66	0.47	0	1	0.66	0.66	0.961
Unpaid work on family's/own farm	0.08	0.27	0	1	0.09	0.07	0.088
Unpaid work outside family's/own farm	0.01	0.08	0	1	0	0.01	0.202
Homemaker	0.03	0.18	0	1	0.03	0.03	0.962
No main activity due to illness	0.01	0.11	0	1	0.01	0.02	0.17
Retired	0.02	0.14	0	1	0.02	0.02	0.649
Does not work	0.08	0.26	0	1	0.08	0.08	0.982
Nr of hrs worked by hh head in last week	21	26	0	168	22	21	0.839

Payment received for work by hh head in last week (Rs.)	435	868	0	10000	434	437	0.968

We repeat Table 3 - 4 below (Table 3 - 5), displaying the same information, separated for male and female household heads – the first columns give statistics for male household heads and the last ones for female household heads.

We can see that the average age is very similar between the two groups, 49 years for men and 50 years for women. Nevertheless, the marital status, distribution of educational attainment and also the main activity differ substantially. While most male household heads are married (97%), most female household heads are separated, divorced or widowed (59%). In terms of educational attainment, 12% of male household heads have no formal education compared to 32% of female household heads. This is also reflected in a much lower ability to read and write for female household heads.

The last row displays average weekly earnings of the household head. We also observe in this category a sharp discrepancy between male and female household heads: Males earn on average Rs. 471 per week (~USD 10,30) and female household heads only Rs. 212 (~USD 4,64). Conditional on actually having earned, the difference remains: males earn Rs, 887 (~USD 19,41) per week and females Rs. 578 (~USD 12,65).

Table 3 - 5 Information on the household head – by gender

Variable	Male		p-value	Female		p-value
	mean	sd	T vs C	mean	sd	T vs C
Age of hh head	49	13	0.75	50	13	0.94
Marital status of household head (fraction)						
Never married	0.02	0.15	0.34	0.03	0.18	0.53
Married	0.97	0.17	0.19	0.37	0.48	0.79
Separated divorced or widowed	0.01	0.09	0.34	0.59	0.49	0.64
Educational Attainment of household head(fraction)						
No formal education	0.12	0.32	0.20	0.32	0.47	0.71
Up to grade V	0.25	0.43	0.14	0.32	0.47	0.56
Grade VI-VIII	0.27	0.44	0.95	0.21	0.41	0.98
Grade IX-X	0.25	0.43	0.78	0.09	0.28	0.28
Grade XI-XII	0.06	0.23	0.16	0.03	0.16	0.49
Higher education	0.04	0.21	0.04	0.01	0.09	0.89
Able to read newspaper	0.79	0.41	0.90	0.51	0.5	0.17
Able to write formal letter	0.75	0.43	0.63	0.46	0.5	0.08
Main Activity (MA) of household head (fraction)						
Paid work on family's/own farm	0.09	0.28	0.89	0.08	0.27	0.05
Paid work outside family's/own farm	0.68	0.47	0.89	0.49	0.5	0.14
Unpaid work on family's/own farm	0.09	0.28	0.11	0.03	0.18	0.54
Unpaid work outside family's/own farm	0.01	0.08	0.20	0	0	.
Homemaker	0.01	0.09	0.56	0.21	0.41	0.21
No main activity due to illness	0.01	0.12	0.32	0	0.07	0.31
Retired	0.02	0.15	0.60	0.01	0.1	0.90
Does not work	0.07	0.25	0.76	0.14	0.35	0.53
Nr of hrs worked by hh head in last week	23	26	0.73	12	21	0.18

Payment received for work by hh head in last week (Rs.)	471	897	0.88	212	618	0.91

The final characteristics discussed in this section are the same ones as for the household head, this time for all household members above the age of 16. The information is displayed in Table 3 - 6.

We get confirmation that about half (49%) of the sample is female, and the average age is 39 years. The majority (66%) of household members older than 16 years is married or has been married (6%). 15% have no formal education and 75% state that they can read a newspaper and 72% can write a formal letter.

Table 3 - 6 Information on the household members

Variable	Whole sample				Mean		p-value
	mean	sd	min	max	C	T	T vs C
Gender (fraction female)	0.49	0.5	0	1	0.579	0.490	0.5
Age of household head	49	13	20	100	49	49	0.876
Marital status of household member (fraction)							
Never married	0.27	0.45	0	1	0.369	0.27	0.45
Married	0.66	0.47	0	1	0.223	0.66	0.47
Separated, divorced or widowed	0.07	0.25	0	1	0.372	0.07	0.25
Educational attainment of household member (fraction)							
No formal education	0.15	0.36	0	1	0.847	0.15	0.36
Up to grade V	0.19	0.4	0	1	0.05	0.19	0.4
Grade VI-VIII	0.22	0.41	0	1	0.845	0.22	0.41
Grade IX-X	0.22	0.41	0	1	0.261	0.22	0.41
Grade XI-XII	0.09	0.29	0	1	0.828	0.09	0.29
Higher edu than grade XII or vocational training	0.11	0.31	0	1	0.179	0.11	0.31
Able to read newspaper	0.75	0.43	0	1	0.52	0.75	0.43
Able to write formal letter	0.72	0.45	0	1	0.343	0.72	0.45
Main activity of household member (fraction)							
Paid work on family's/own farm	0.05	0.22	0	1	0.989	0.05	0.22
Paid work outside family's/own farm	0.44	0.5	0	1	0.103	0.44	0.5
Unpaid work on family's/own farm	0.04	0.2	0	1	0.467	0.04	0.2
Unpaid work outside family's/own farm	0	0.06	0	1	0.27	0	0.06
Looking for job	0.01	0.12	0	1	0.913	0.01	0.12
Attending school	0.06	0.23	0	1	0.432	0.06	0.23
Homemaker	0.16	0.37	0	1	0.473	0.16	0.37
No main activity due to illness	0.01	0.11	0	1	0.537	0.01	0.11
Nr of hrs worked by hh member, last week	12	22	0	168	0.875	12	22
Payment received for work by hh head, last week (Rs.)	265	678	0	10000	0.366	265	678

3.3. Sanitation & Bathing

In this section, we turn to the sanitation and bathing facilities of the household. We also look at hygiene practices since diarrheal disease is often the result of virus and bacteria propagation, keeping a clean and disinfected environment is crucial in its prevention.

Table 3 - 7 gives a broad picture of the sanitation and bathing situation in our survey area. As can be seen, only 27% of all households state to have a toilet either inside or outside their dwelling. A slightly bigger percentage (30%) owns some type of bathing facilities.

While 92% of all households state to bathe daily (99% without fully undressing themselves), only 19% report to wash their hands with soap and water after going to the toilet. All these indicators are balanced between our two evaluation groups.

The following tables in this section will give a more detailed picture, not considering the balance of the sample given that most descriptive shown are conditional, such as conditional on households having a toilet or not.

Table 3 - 7 Sanitation & bathing facilities

Variable (fraction)	**Whole sample**				**Mean**		**p-value**
	mean	sd	min	Max	C	T	T vs C
Own a toilet (inside or outside)	0.27	0.44	0	1	0.28	0.25	0.551
Usually wash hands (with soap and water) after toilet	0.19	0.39	0	1	0.2	0.18	0.453
Own bathroom (inside or outside)	0.30	0.46	0	1	0.30	0.30	0.851
Bathe daily	0.92	0.28	0	1	0.92	0.92	0.934
Undress to bathe	0.01	0.1	0	1	0.01	0.01	0.55

3.3.1. Toilet Ownership

As we can see from Table 3 - 7, 27% of the sampled households have a toilet. We will now go into more detail about this toilet and habits related to its use.

Table 3 - 8a Type of toilet

Households with toilet:	**Frequ**	**%**
Type of toilet		
Water seal	139	29.0
Pourflush	335	69.8
Dry toilet	6	1.25
Where toilet refuse goes:		
Single pit	47	9.18
Twin pit	11	2.15
Septic tank	451	88.1
To the fields	2	0.39

Of the 519 households that state to have a toilet, 107 (21%) have it inside their dwelling, the other 79% have one outside their dwelling.

We can see in Table 8a that the most common toilet is a pour flush toilet (70% of household with a toilet have such a model) and for 88% the refuse goes into what is perceived as a septic tank. [17]

[17] Please note that these might not actually be sceptic tanks. From experts' observations in the field we know that many so-called sceptic tanks do actually have an outlet or a pipe, which automatically declassifies it as a sceptic tank.

The second most common model is a water seal, which is owned by 29% of all sampled households. Less than 2% of households have a dry toilet. This is not surprising given the decision of the FINISH project to start their work in areas where water scarcity is not a major problem.

Table 8b shows that most of the households that have a toilet arranged the construction on their own (85%) and also used their own money and savings to do so (91%). Only 10% of households constructed it through the TSC and availed funding through them.

Table 3 - 8b Construction & funding

Households with toilet:	Frequ	%
Toilet construction:		
Arranged themselves	412	85.7
Through TSC	48	9.98
Already there when moved in	20	4.16
Other	1	0.21
Funding:		
Own money/savings	412	90.8
From the Government	37	8.15
Loan from informal source	3	0.66
Other	2	0.44

Not one household states to have taken a loan from a formal financial source to construct the toilet.

We also asked households for their motivation to build a toilet: Half of the households state greater convenience for the main reason, 37% state that the women in the household wanted one. Better hygiene and better safety were also among the most often stated reasons. We present these findings in Table 8c.

We asked more specifically whether the household believes that their social status in the village increased after they had built the toilet and 60% of households stated that their status indeed increased due to having a toilet.

Table 3 - 8c Main Motivation to construct toilet

Households with toilet:	Frequ	%
Motivation to construct toilet		
More convenience	230	49.7
females wanted one	173	37.4
status in the village	1	0.22
better hygiene	26	5.62
greater safety	27	5.83
financial support gvnmt	6	1.3

A further 93% claim that they save time because of having the toilet now in or close to their houses.

3.3.2. Toilet Usage

We can see from Table 8d that for most households (88%), if they have a toilet, it is used by all household members.

It 10% of the cases the main users are women only. It is also either the women (in 49% of the cases) or all household members together (45%) who carry the responsibility of cleaning the toilet.

We asked, whether the toilet is perceived to be clean, more specifically whether there are any flies, it smells or both. The great majority of households (94% states that their toilet neither smells nor do they report there to be any flies. Two percent of households with a toilet state that the toilet smells and that there are flies, 2.5% say it

Table 3 - 8d Users and caretakers

Households with toilet:	Frequ	%
Users of toilet		
Everybody	455	87.8
Women	45	8.88
men	9	1.74
nobody	6	1.16
Main caretaker		
Everybody	224	44.9
Women	243	48.7
Men	12	2.4
Grandparents	1	0.2
Nobody	5	1
Helper	14	2.81

smells but there are no flies and a further 2% finds flies in their toilet but do not think it smells.

3.3.3. Households without own toilet

73% of all households in the areas that BHARATHI chose to implement FINISH in their second phase do not have their own toilet. We now look at where and when these households go to release themselves. We also look at why they do so, whether it is their own preference or which constraints they face to have their own toilet.

From Table 9a we can see that most of the households that do not have their own toilet, namely 74%, go to the open fields.

Table 3 - 9a Alternative if no own toilet

Households without toilet:	Frequ	%
Alternative if no own toilet		
Public toilet	22	1.58
Neighbor's toilet	5	0.36
Outside near dwelling	330	23.7
Open fields	1037	74.3

Another 24% also go outside, but near their own dwelling. Less than 2% use a public or their neighbour's toilet. On average, household members need to walk 120m to get to the place where they relieve themselves. The distance ranges from 0 to 2000m.

We ask households about when they usually go out to relieve themselves. Privacy is an important issue when it comes to going to the toilet and it is often reported that especially women only go early in the morning or late at night and avoid the hours of daylight. We will look more specifically at women in our sample households in the following chapter. But, we do want to already get an idea whether household members are constrained as to when they go and other problems they perceive with the alternative they use. Table 9b provides statistics on this issue.

We can see that only 37% of households state that they go any time they need to go. The remaining households are constrained to a certain time, mainly early in the morning (50%).

Table 3 - 9b Timing & Problems

Households without toilet:	Frequ	%
Time(s) alternative is used		
Any time I need to go	489	36.1
Any time I need to, often early morning	14	1.03
In the early morning	675	49.8
In the late evening	9	0.66
At night	12	0.89
During the day	122	9.00
Some other combination of times	34	2.51
Associates following problem(s) with alternative:		
uncomfortable	817	59.9
inconvenient	35	2.6
no water	330	24.2
unsafe/dangerous	14	1.0
embarrassing	118	8.7
fear of animals (snakes…)	19	1.4
unhealthy	16	1.2
takes much time	12	0.9

The main other problem associated with the alternative to a personal toilet used (mainly the open field), is that is it uncomfortable (stated by 60% of households), that here is no water available (24%). It is also perceived to be embarrassing (9%).

We asked those households that do not have a toilet whether they would prefer their own. 95% stated that they would prefer to have one on their own instead of using the alternative place.

We therefore wanted to know their main constraint to owning a toilet themselves. The answer to this question is summarized in Table 9c: The great majority (95%) states that a toilet is too expensive for them. Only 1.5% of all interviewed households state that there is actually no need for them, 2% believe they do not have enough space and 1% never thought about having their own toilet.

Table 3 - 9c Reasons for not having own toilet

Households without toilet:	Frequ	%
Reason for not having own toilet		
No need	21	1.53
Too expensive	1297	94.7
No space	28	2.04
Toilet should not be close to house	3	0.22
Never thought about it	14	1.02
Other	7	0.51

3.3.4. Bathing facilities

We will now analyse the bathing situation in our sample in more detail, as we did with the toilet situation just above.

To recapture from Table 3 - 7, only 38% of our sample have their own bathing facility (as compared to 27% of households who have their own toilet). 70% of those households that have a bathing facility have at the same time a toilet.

Table 3 - 10a provides information about where household members typically bathe – separated by whether they stated to have their own bathing structure or not.

One can see that about 22% of households that have their own bathroom, have it inside their house (13.4 a closed bathroom, 8% an enclosure), and 61% have a bathing structure outside their house (36% closed, 25% an enclosure). The remaining households bathe in a shielded or thatched structure and a few use open bathing space outside the house.

For households that do not state to have their own bathroom, the main place to go for a bath is some open bathing space outside the house (47%). 33% of households are more specific and state that they bathe in a river, open tanks, canal or pond.

Table 3 - 10a Typical bathing place for household

	own bath	
	yes	no
Place where household typically bathes (%)		
Closed bathroom inside the house	13.4	-
Bathroom enclosure inside the house	8.3	-
Closed bathroom outside the house	36.0	-
Bathroom enclosure outside the house	25.4	-
Shielded/thatched structure	14.1	16.8
Public bathing facilities	0.3	2.22
Open bathing space outside the house	2.18	47.0
River/open tanks/canals/ponds/etc.	0.41	33.7
Other	-	0.34

Table 3 - 10b Perception of bathing place

	Own bath	
	Yes	No
Perceives bathing place to be… (%)		
convenient	92.1	49.0
safe	90.1	35.5
clean	91.7	52.9
healthy	87.7	40.6
smelly	14.4	30.3

We ask households about their perception of the place where they typically bathe. The statistics are displayed in Table 10b and we again split the sample into households with and without their own bathing facility. We can see that the great majority of households who have their own facilities find these to be convenient (92%), safe (90%), clean (92%) and healthy (88%).

Those households that use public space are less satisfied with their bathing place: Only 49% find it convenient, 35% safe, 53% find it clean, 40% health and 30% find it smelly.

We finally want to know the main reason why households without their own bathing facilities do not have one. We can see in Table 10c that as for the toilet, most find it too expensive (95%). Only 3% do not see the need and 1% states to have no space.

Table 3 - 10c Reason for public bath

Households without bathing facility:	Frequ	%
Reason for not having own bath (%)		
No need	20	2.93
Too expensive	649	95.2
No space	7	1.03
Never thought about it	4	0.59

3.4. Water

The survey also investigated household water source for the purpose of drinking, cooking, bathing, washing utensils and usage in the kitchen. We ask from which source households collect or get water for the different purposes and collect information that allows us to estimate how much time the household spends on collecting water in a week. We ask the main set of questions only for the season when the survey was conducted and add some questions that gives us information how the situation differs for households in the dry season. We will point to these differences where appropriate. Results related to the main source of drinking water, amount of water consumed and sources used are summarized in Table 3 - 11.

Table 3 - 11 Drinking Water

Variable	Whole sample				mean		p-value
	mean	sd	min	max	C	T	T vs C
Main source of drinking water (fraction)							
Pump	0.37	0.48	0	1	0.39	0.36	0.503
Household connection	0.2	0.4	0	1	0.2	0.19	0.753
Other	0.43	0.5	0	1	0.41	0.45	0.22
Dry season: Pump	0.39	0.49	0	1	0.41	0.38	0.511
Dry Season: HH connection	0.19	0.39	0	1	0.2	0.18	0.692
Dry Season: Other	0.42	0.49	0	1	0.4	0.44	0.184
Purification of drinking water (fraction)							
No need to do anything	0.8	0.4	0	1	0.79	0.8	0.786
Boil the water	0.38	0.48	0	1	0.37	0.38	0.917
Add chlorine tablets	0	0.06	0	1	0	0	0.348
Add alum tablets	0	0.04	0	1	0	0	0.17
Filter it through a cloth	0	0.03	0	1	0	0	0.138
Use water filter	0	0.06	0	1	0	0	0.444

20% of sampled households get their drinking water from a household connection and for a further 37% a hand pump or mini-power pump is the main source from which drinking water is collected. The remaining households get their drinking water from a public tap (41%) (and 2% get their drinking water from a river, stream, lake, pond or open well). Almost all households use the same source

during the dry season – we only see a slight shift from a household connection to a pump. The source of drinking water does not differ significantly between our two evaluation groups.

We do not only collect information on the main drinking source of the household but also about the treatment that households apply to their drinking water. The lower panel of Table 3 - 11 gives summary statistics about purification practices of drinking water of our sample households. Note that households were able to give multiple answers. 80% believe that there is no need to do anything with the drinking water they get – 24% of these still report to boil the water. Overall, almost 40% of the sample boils their drinking water. Basically none of the households add chlorine or alum tablets, or filter their water through a cloth or proper water filter. Again, practices do not differ between the treatment and control group.

Table 3 - 12 tabulates whether households believe they do not need to purify their drinking water by the main source from which they collect their drinking water. As mentioned above, 41% of all households (789 households) get their drinking water from a public tap. Of these, 84% state that there *is* need to do anything for purification of the water. Similar percentages of households believe that their source of drinking water is not safe for direct consumption for all other sources.

Table 3 - 12 Purification of drinking water

Primary Source of drinking water	Do NOT purify their drinking water	Do purify their drinking water
Public tap	16.0	84.0
hand pump	24.5	75.5
HH service connection	21.9	78.1
Mini-power pump	42.9	57.1
River / Streams	25.0	75.0
Other	16.7	83.3
Open well	0.0	100.0
Lake / Pond	33.3	66.7

Table 3 - 13 displays information on the number of litres used per household per purpose as well as number of litres collected from different sources. We already know that most households get their drinking water through a pump – this is confirmed by the number of litres used per day per household from this source. The second most used source in terms of litres per day per household is a public tap, followed by piped connection.

All in all, each household uses on average 201 litres per day for all the above mentioned purposes. This translates to on average 45 litres per household member per day.

The last row of Table 3 - 11 gives information on the average amount of time spent on collecting water in a week, which is 590 minutes per household. This translates into on average 1hr and 24minutes that each household spends on collecting water per day. We ask households how much more time they spent in the dry season. Households report that they spent on average 50 minutes more during the dry season, implying that 2hrs and 14 minutes are spent on water collection per household during that time.

Please note that we again find no statistically significant differences between the treatment and the control group in all variables related to water.

Table 3 - 13 Water consumption & water sources

Variable	Whole sample				mean		p-value
	mean	sd	min	max	C	T	T vs C
Water consumption (litres per household)							
Total litres per day	201	154	0	982	209	192	0.176
litres for drinking	28	120	0	4000	34	23	0.052
litres for bathing	130	598	0	20000	153	104	0.12
litres for washing	62	279	0	5005	69	54	0.37
litres for cooking	33	187	0	5000	34	31	0.761
litres for kitchen	5	62	0	2500	6	4	0.474
litres for other	3	19	0	200	4	2	0.205
Water source (litres)							
litres from shallow pump	111	895	0	31500	146	71	0.1
litres from public tap	83	223	0	5033	79	88	0.45
litres from piped source	50	355	0	12000	56	44	0.497
litres from other	8	61	0	954	10	6	0.223
litres from borewell	7	48	0	748	7	7	0.821
litres from river	1	10	0	150	1	1	0.92
litres from own open well	0.81	19.51	0	794	1.02	0.58	0.584
litres from public open well	0.36	10.99	0	386	0.67	0.03	0.176
litres from tanker	0.09	3.77	0	165	0.16	0	0.325
litres from pond	0.08	2.42	0	100	0.12	0.03	0.371
litres from field	0.05	2.06	0	90	0	0.1	0.325
Time spent (minutes per week)							
time spent collecting water(min), week	590	969	0	9240	554	629	0.212

3.5. Consumption

We next turn to consumption expenditures of the households. We present here statistics for consumption categories. These are constructed by aggregating information that was collected of a wide range of items. The questionnaire for example collects consumption expenditure for 21 different food items. The aggregated variable “Food expenditure” includes amounts actually spent on these different food items as well as estimates for the food that was consumed but not bought – i.e. food that was home produced, used from storage or that the household received as a gift or a mean of payment. The variable therefore captures the estimated value of consumed food.

Also note that households were asked to recall their food consumption from the last week (the same holds for alcohol and tobacco consumption), non-durable consumption items (such as transport, electricity, education fees...) are recalls from the last month and durable consumption items (such as clothing, shoes, repairs and maintenance...) are recalls over the last year. We followed common practices in deciding these recall periods.

Summary statistics are displayed in Table 3 - 14.

Table 3 - 14 Total household consumption expenditures

Variable	Whole sample				Mean		p-value
	mean	sd	min	max	C	T	T vs C
Expenditures in last year (Rs.)							
Total consumption expenditures	63,996	75,248	0	960,000	61,354	66,965	0.227
Food expenditure	22,108	17,107	0	200,000	21,208	23,120	0.138
total yearly food (plus alcohol and cigarettes) expenditure	22,662	17,498	0	200,000	21,761	23,675	0.149
Expenditure on alcohol and tobacco	581	2,720	0	52,000	553	612	0.659
Nondurable consumption expenditure	29,418	65,911	0	1,700,000	27,514	31,558	0.323
Durable consumption expenditure	11,279	54,717	0	2,200,000	9,830	12,909	0.259
Fraction of hhs that paid dory last year	0.04	0.19	0	1	0.030	0.040	0.063
Amount of dowry paid	2,943	28,096	0	500,000	2,249	3,723	0.363

We can see from Table 3 - 14 that households spend on average Rs. 63,996 per year on food, other non-durable and durable items. This translates to USD 1,400, which again implies that households spend approximately USD 3.84 a day, or - without using an equivalence scale – USD 0.87 per household member. We will make these same calculations when looking at income of the households and look at how many of our sampled households live below the internationally used poverty line of $1.25 a day.

The average household in the survey area spent slightly more than a third (34%) of their total expenditures on food, about 44% on other non-durable items, and the remaining 17% on durable items.

One of the items included in durable expenditure are dowries paid. While we understand that many household will conceal or misreport this type of information, we still display statistics separately in Table 3 - 14, given that this can be a quite substantial expenditure for an Indian household. About 4% of households in our sample report to have paid a dowry within the last year. The reported amount paid is on average Rs. 90,482 (ranging from Rs. 100 to Rs. 500,000 – note that statistics reported in Table 3 - 14 are unconditional and therefore do not correspond to the amounts stated here.)

3.6. Assets

In this section we look at the wealth of households in terms of their assets. As in the section on consumption, also variable on assets are for the most part aggregate constructs. Households are asked during the interview whether they own certain items, how many, and how much they would expect to earn if they were to sell it. Questions are asked in this way to get information on the current market value of the item rather than the value it had when it was bought.

Summary statistics are reported in

Table 3 - 15. Important in view of this report is – as before – the finding that control and treatment groups do not display any significant difference with respect to the value of the assets they own.

Table 3 - 15 Asset values

Variable	Whole sample				Mean		p-value
	mean	sd	min	max	C	T	T vs C
total value of all assets (Rs.)	180,000	320,000	0	5,100,000	180,000	180,000	0.874
value of main dwelling (Rs.)	110,000	230,000	0	5,000,000	110,000	100,000	0.757
Value (Rs.) of…							
Livestock	5,329	12,389	0	210,000	5,003	5,694	0.306
Agricultural equipment	5,448	38,514	0	600,000	6,007	4,818	0.499
Vehicles (includes bicycles)	8,199	52,930	0	1,800,000	6,793	9,779	0.256
Furniture	6,072	13,266	0	210,000	6,220	5,906	0.685
Electric items (refrigerator, fan...)	5,605	8,165	0	120,000	5,381	5,858	0.434
Jewellery	31,790	84,620	0	2,000,000	33,064	30,358	0.587

More than half (61%) of the overall asset value of Rs 180,000 (~USD 3,938) comes from the estimated value of the dwelling the households own. The second most valuable item owned is jewellery. Again, as with the dowry, we assume that this value suffers mis-reporting, so that the average value of Rs. 31,790 (~USD 695) should probably be seen as a lower bound.

Not included in the statistics just discussed is the value of potentially owned land (which was not collected). We know though that 31% of all households own land (which is again not different between the treatment and the control group). On average, households that own their own land possess 4.5 acres, which is for 95% the same amount as a year ago. In addition, about 11% of households that do not own land themselves rent some.

3.7. Income

We now turn to the income of the household. We take here income from all household members together and rather look at the amounts earned from different income sources.

The first row of Table 3 - 16 reports summary statistics of total yearly income of interviewed households. The average income is Rs. 63,855 (~USD 1,397). Making the same back-of-the-envelope calculations as in the section on consumption, we find that the average household in BHARATHI's FINISH area lives on USD 3.83 per day. Recalling that each household has on average 4.42 household members, this translates into ~USD 0.867 per day. Even if we ignored children in the household and used only the number of adults (an adult being someone older than 16 years of age) to make the calculation, we would still find that the average adult in our sample lives, with USD 1.14 a day, far below the internationally accepted poverty line of USD 1.25 a day.

Table 3 - 16 gives furthermore information on the sources the households receive their income from. We already know from **Error! Reference source not found.** that for 68% of all households in the sample, the primary source of income is in agriculture. We see the importance of this income source confirmed in this section, where 61% report to have received income from wages from agricultural labour, 27% from non-farm self-employment and 5% from farm profit. Other common sources stated are government employment (42%) and pensions (24%). Note that government employment can include programmes such as the popular 100-day rural employment scheme.

Table 3 - 16 Household income

Variable	Whole sample				mean		p-value
	mean	sd	min	max	C	T	T vs C
Total household income (Rs.) (last year)							
Total yearly income	63,855	86,599	0	1,300,000	63,379	64,389	0.851
Household received income from… (in last year) (fraction)							
...wages agricultural labour, not own farm	0.61	0.49	0	1	0.59	0.63	0.271
…non-agricultural sector, formal	0.10	0.3	0	1	0.1	0.1	0.96
...non-agricultural sector, informal	0.27	0.45	0	1	0.28	0.27	0.699
...government employment	0.42	0.49	0	1	0.41	0.44	0.578
...wages from public relief work...	0.13	0.34	0	1	0.13	0.14	0.685
...non-farm self-employment	0.27	0.44	0	1	0.27	0.26	0.833
…farm profit	0.05	0.21	0	1	0.04	0.06	0.069
...dairy activities	0.01	0.07	0	1	0.01	0	0.02
...sales of handicrafts...	0.01	0.11	0	1	0.01	0.01	0.764
...traditional hedetary occupation	0.06	0.23	0	1	0.06	0.05	0.513
... pension	0.24	0.43	0	1	0.24	0.25	0.689
...government schemes	0.01	0.1	0	1	0.01	0.01	0.856
... Dowry	0.03	0.17	0	1	0.02	0.04	0.095
... Remittances	0.61	0.49	0	1	1	1	0.451

An income source as common as income from agriculture is remittances with 61% of household having received income through this channel in the last year. This can be seen in the last row of Table 3 - 16. We get more information on this income source from Table 3 - 17. The amount received (Rs. 14,385) corresponds to about 23% of overall income, so that the average yearly income without remittances amounts to about Rs. 48,500 (with a standard deviation of Rs. 86,600).

In comparison, only 10% of households gave remittances in the last year, and the average amount given is only a small fraction (8.7%) of the amount received.

Table 3 - 17 Remittances

Variable	Whole sample				mean		p-value
	mean	sd	min	max	C	T	T vs C
Remittances							
Household *received* remittances (fraction)	0.61	0.49	0	1	1	1	0.451
Amount remittances *received* last month (Rs.)	2,042	11,111	0	300,000	1,537	2,608	0.072
Amount remittances *received* last year (Rs.)	14,385	47,967	0	1,200,000	13,749	15,101	0.662
Household *gave* remittances (fraction)	0.10	0.30	0	1	0	0	0.382
Amount remittances *given* last month (Rs.)	282	4,197	0	120,000	207	367	0.431
Amount remittances *given* last year (Rs.)	1,261	14,851	0	400,000	1,558	927	0.321

3.7.1. Comparison Income & Consumption

We want to get a rough idea how these earnings compare to consumption expenditures discussed previously in Section **Error! Reference source not found.**.

The first row of Table 3 - 18 Difference between Income and Consumption expenditures**Error! Reference source not found.** presents statistics for the difference between reported yearly income of the household and yearly total consumption expenditures. We can see that the average household spends more than it earns by just Rs. 511 (~USD 11).

Table 3 - 18 Difference between Income and Consumption expenditures

Variable	Whole sample				mean		p-value
	mean	sd	min	max	C	T	T vs C
Total household income minus consumption expenditures, yearly	-511	68,006	-440,000	490,000	738	-1,920	0.53
Total hh income (incl. home produced & gifts) minus cash expenditures, yearly	3,768	86,991	-940,000	840,000	6,637	540	0.286

This number is not an informative statistic for the financial situation of the households though given that consumption includes the value of for example home produced food or gifts. The second row of the same Table presents statistics for a different construction. Here we look at the difference between income and consumption, where income includes all income earned by the household plus the value of own produced food and food received as gifts (assuming they could have produced these for sale and then paid things by the income earned).Consumption is solely consumption of items paid for with cash.

We can now see that the average household in the sample makes savings of Rs. 3,768 according to information provided. The median value of this variable is -1,603 though, implying that more than half of the households spend more than they earn.

In view of this it is interesting to look at the household's financial situation, which we will do in the next section.

3.8. Credit, Savings and Insurance

In this section we look at financial transactions of the household, namely at their debts and savings as well as insurance. We first consider the indebtedness of the households.

3.8.1. Credit

From Table 3 - 19 we can see that 88% of households state to know a source where they can turn to in case they need to borrow money. It seems that the majority of households are able to turn to formal lending sources: 55% state to be able to borrow from a bank, 10% from an MFI, 8% from an NGO, 44% from a cooperative and 52% from a SHG. Other popular sources stated are moneylenders (42%), relatives (42%), friends (38%) and pawnbrokers (57%).

These are potential sources though: while 88% state not to be credit constrained, 58% of households report to actually have debt outstanding.

Table 3 - 19 Credit - Access

Variable	Whole sample				Mean		p-value
	mean	Sd	min	max	C	T	T vs C
CREDIT (fraction)							
Knows a source to borrow from	0.88	0.32	0	1	0.89	0.87	0.43
Has debt outstanding	0.58	0.49	0	1	0.59	0.56	0.381
States to be able to borrow from… (fraction) (more than one answer possible)							
…bank	0.55	0.5	0	1	0.56	0.53	0.44
…MFI	0.10	0.31	0	1	0.11	0.09	0.484
…NGO	0.08	0.27	0	1	0.08	0.09	0.585
…Cooperative	0.44	0.5	0	1	0.45	0.43	0.613
…SHG	0.52	0.5	0	1	0.54	0.51	0.443
…moneylender	0.42	0.49	0	1	0.41	0.42	0.723
…relative	0.42	0.49	0	1	0.41	0.42	0.885
…friends	0.38	0.48	0	1	0.38	0.37	0.76
…work	0.11	0.31	0	1	0.14	0.08	0.017
…pawnbroker	0.57	0.5	0	1	0.58	0.55	0.583
…local shop	0.05	0.22	0	1	0.06	0.05	0.55
…insurance company	0.05	0.22	0	1	0.06	0.04	0.162

Table 3 - 20 gives details on the sample of households that did have debt outstanding at the time of the survey. The average amount a household with debt had to repay at that point in time was Rs. 32,401 (~USD 709). To recapture – this is about 51% of the average household's yearly income.

Table 3 - 20 Credit – Actual

Variable		Conditional on having debt			
	%	mean	sd	min	max
Amount of debt outstanding	57.6	32,401	53,611	100	525,000
Amount outstanding to…					
…a bank	16.1	48,935	71,105	300	525,000
…an mfi	0.6	22,086	17,544	10,000	60,000
…a shg	29.3	8,023	10,877	300	100,000
…a cooperative	7.3	25,911	32,645	1,500	250,000
…a pawnbroker	11.5	19,514	28,590	500	200,000
…a money lender	26.8	22,980	43,327	200	300,000
…a relative	8.8	27,776	32,772	500	200,000
…a friend	16.4	27,269	42,398	100	300,000
Original amount borrowed from…					
…a bank	18.1	61,325	89,724	3,000	600,000
…an mfi	0.7	28,125	29,488	10,000	100,000
…a shg	31.2	14,235	60,461	500	1,100,000
…a cooperative	8.5	29,853	36,372	2,000	250,000
…a pawnbroker	12.6	23,115	37,386	600	200,000
…a money lender	28.6	28,142	60,116	100	500,000
…a relative	9.0	33,002	39,756	500	200,000
…a friend	17.5	29,586	42,867	200	300,000

Note that percentages for "Amount outstanding to…" and "Original amount borrowed from" reported in the second column are conditional percentages on having actually borrowed money from any source.

We see further from Table 3 - 20 that most households are indebted to SHGs, while at the same time this is the lowest amount owned. The lowest panel of Table 3 - 20 confirms that also the original amount borrowed is lowest from this source of credit, with Rs. 28,125 (~USD 615). By far the biggest amounts are borrowed from banks (Rs. 61,325 on average), this is followed by relatives with Rs. 33,002 on average.

3.8.2. Savings

About 45% of the households in the sample have savings – on average Rs. 4,443 (~USD 97), as displayed in Table 3 - 21. From Table 3 - 22 we see further that the average amount of savings for households that actually have savings is Rs. 9,996 (~USD 219). The greatest amount of savings (about 62%) are savings of the husband, whereas 32% are savings of the wife and remaining savings are attributed to the couple. Again, we see no significant differences in means of these variables for the treatment and control group on a conventional significance level of 5%.

Table 3 - 21 Savings

Variable	Whole sample				Mean		p-value
	mean	sd	min	max	C	T	T vs C
has savings (fraction)	0.45	0.5	0	1	0.49	0.4	0.065
Amount savings - total (Rs.)	4,443	31,091	0	1,000,000	4,483	4,399	0.957
Amount savings - husband (Rs.)	2,747	30,481	0	1,000,000	2,560	2,958	0.791
Amount savings – husband & wife (Rs.)	240	2,684	0	60,000	296	177	0.444
Amount savings - wife (Rs.)	1,456	5,728	0	100,000	1,626	1,264	0.251

Table 3 - 22 Savings - conditional

Variable	Conditional on having savings			
	mean	sd	min	max
Amount savings - total (Rs.)	9,996	46,050	50	1,000,000
Amount savings - husband (Rs.)	16,126	72,463	71	1,000,000
Amount savings – husband & wife (Rs.)	8,028	13,459	100	60,000
Amount savings - wife (Rs.)	4,391	9,283	50	100,000

3.8.3. Insurance

Finally, we look at whether households have insurance and if so, which type. Table 3 - 23 provides this information: 79% of households have some type of insurance. The most common one is health insurance (65% of sampled households have this type of insurance). The second most popular type of insurance is life insurance and 9% of the sample households have crop insurances – these statistics are again comparable between the two groups.

Table 3 - 23 Insurance

Variable	Whole sample				Mean		p-value
	mean	sd	min	max	C	T	T vs C
INSURANCE (fraction)							
Has insurance	0.79	0.41	0	1	0.78	0.79	0.831
Has crop insurance	0.09	0.28	0	1	0.08	0.1	0.444
Has life insurance	0.25	0.43	0	1	0.27	0.24	0.25
Has health insurance	0.65	0.48	0	1	0.65	0.66	0.938

3.9. Shocks

We now turn to shocks the households experienced over the last year. These are mainly negative shocks but we also consider shocks that could result in an income gain to households. Results are displayed in Table 3 - 24.

The most common shock was a bad harvest – 15% of all households report to have experienced this shock. Further 5% suffered from a natural disaster such as a drought.

In terms of positive shocks, 1% of households experienced a job gain. An additional 8% state to have experienced some other positive shock than a job gain – examples are a daughter's marriage.

The treatment and control samples are again nicely balanced.

Table 3 - 24 Shocks experienced

Variable	Whole sample				Mean		p-value
	mean	sd	min	max	C	T	T vs C
Household experienced shock in last year (fraction)**:**							
Job loss	0.01	0.11	0	1	0.02	0.01	0.154
Job gain	0.01	0.1	0	1	0.01	0.01	0.66
Serious robbery/theft	0.01	0.1	0	1	0.01	0.01	0.457
Natural disaster (sa draught)	0.05	0.21	0	1	0.04	0.05	0.647
Bad harvest	0.15	0.36	0	1	0.15	0.15	0.872
Death of a household member	0.03	0.17	0	1	0.03	0.03	0.751
Any other loss	0.03	0.18	0	1	0.03	0.04	0.682
Any other gain	0.08	0.27	0	1	0.06	0.1	0.155
Had to cut meal of adult	0.02	0.14	0	1	0.02	0.02	0.59
Had to cut meal of children	0.00	0.07	0	1	0.01	0.00	0.118

3.10. Health

The final section of the household questionnaire we discuss is concerned with the health of the household. We look at how the household perceives its own health and provide information on the households' health seeking behaviour, including health expenditures and distances covered to access health services.

Table 3 - 25 Perceived Health

Variable	Whole sample				Mean		p-value
	mean	sd	min	max	C	T	T vs C
Perceived Health (fraction)							
Own health better than peers'	0.45	0.5	0	1	0.47	0.43	0.226
Own health same as peers'	0.4	0.49	0	1	0.38	0.41	0.298
Own health lower than peers'	0.13	0.33	0	1	0.12	0.13	0.809
Families' health better than peers'	0.43	0.49	0	1	0.43	0.42	0.746
Families' health same as peers'	0.43	0.5	0	1	0.44	0.43	0.978
Families' health lower than peers'	0.1	0.3	0	1	0.09	0.11	0.411

From Table 3 - 25 we can learn that respondents overestimate their health as well as their household's health status when comparing themselves to their peers: 45% of respondents think they are themselves more health and 40% think they have approximately the same health status as their peers. This implies that 85% of respondents think they are at least as healthy as their peers. The statistics for perceived health of the family are comparable.

With respect to frequency of health visits we can see from Table 3 - 26 that 51% of households had at least one household member visit a health provider (or be visited by one) within the last 4 weeks and 15% of households had at least one household member hospitalized within the last year.

Table 3 - 26 Health seeking

Variable	Whole sample				Mean		p-value
	mean	sd	min	max	C	T	T vs C
Outpatient care, last month (fraction)							
Any household member outpatient care	0.51	0.50	0	1	0.52	0.51	0.699
Hospitalization, last year (fraction)							
Any household member hospitalized	0.15	0.35	0	1	0.15	0.14	0.334

Table 3 - 27 Reason for seeking health service

Variable	Conditional on having had visit	
	Frequ	%
Outpatient care - reason		
Medical visit/check-up	326	38.4
Treatment/therapy	169	19.9
Immunization/vaccination	98	11.5
Preventive medical exam	82	9.7
Acute pain	62	7.3
Receive medication/ prescription	55	6.5
Other	25	2.9
Accident	16	1.9
dental visit	10	1.2
Hospitalization – reason		
Illness	128	48.9
Surgery	41	15.7
Childbirth/Caesarean	34	13.0
Accident	26	9.9
Medical analysis or studies	21	8.0
Other (specify)	8	3.1
Physical aggression (violence)	3	1.15
Abortion	1	0.38

Table 3 - 27 gives us the main reason for the most recent visit to a health provider in the upper panel and to a hospital in the lower panel. The most common reason to seek health care was a general medical visit/check-up – 40% of those households that sought health services went for this reason. A further 20% sought treatment and/or therapy, 12% immunization/vaccination and further 10% went for a preventive medical exam.

The main reason that was stated for hospitalization is general illness (49%). 16% of households that had a member being hospitalized had so because of surgery and 13% because of childbirth or caesarean, 10% of household had an accident within the family which resulted in hospitalization.

Information on health expenditures and distances travelled to receive health services are provided in Table 3 - 28. These statistics are averages for the whole sample.

The upper panel of Table 3 - 28 gives information on outpatient care while the lower panel concentrates on visits that resulted in hospitalization.

On average, a household had to pay Rs. 327 (~USD 7.16 or 0.5% of yearly household income) for a visit categorized as outpatient care. The main cost driver was medical expenditures (73% of all costs) and the remaining 27% are transportation costs. A household had to travel on average 7km to reach the chosen health care provider.

The average costs for a hospital visit were Rs. 701 (~USD 15.36 or 1.1% of yearly household income). For such a visit, 95% of total costs came from the medical expenditures and only 7% from transportation costs – possibly due to the hospital being on average closer than the provider visited otherwise (note that we might deal here with selection problem, that only households who live relatively close to a hospital decide to go and stay).

Table 3 - 28 Health expenditures

Variable	Whole sample				Mean		p-value
	mean	sd	min	max	C	T	T vs C
Outpatient care, last month							
Any hh member outpatient care (fraction)	0.51	0.50	0	1	0.52	0.51	0.699
Transportation cost (Rs.), avg. last 5 visits	88	386	0	10,000	94	80	0.503
Medical costs (Rs.), avg.last 5 visits	239	825	0	13,607	243	235	0.861
Total costs (Rs.), avg. last 5 visits	327	1034	0	20,000	337	315	0.705
Distance travelled (km), avg. last 5 visits	7	29	0	580	8	6	0.186
Hospitalization, last year							
Any hh member hospitalized (fraction)	0.15	0.35	0	1	0.15	0.14	0.334
Transportation cost (Rs.)	43	256	0	5,518	47	38	0.458
Medical costs (Rs.)	659	4,634	0	100,000	719	590	0.587
Total costs (Rs.)	701	4,709	0	100,000	767	628	0.567
Distance travelled (km)	4.72	26.8	0	500	4.78	4.66	0.918

4. Findings – Women

In this chapter we look at the information collected from the main woman of the household. The rationale for having a special focus on women as part of the survey is due to the assumption that it is especially women who will benefit from (improved) household sanitation. This holds especially in view of effects on privacy and safety but also status and prestige.

As mentioned in the section on survey instruments, the woman questionnaire was exclusively administered by female interviewers due to the sensitivity of some of the questions. Emphasis was put that the interview was conducted in private.

4.1. Background and Status

We first look at the background and the status of the main woman in the household, such as her and her parents' education, her marital status and her control over financial and other decisions in the household.

Table 4 - 1 provides information on the age and the educational background of the main woman, as well as her parents. The typical main woman in our sample is almost 39 years of age and does not have more education than up to grade VIII. 23% of women have no formal education, 26% up to grade V and 22% between grade VI and VIII. A further 16% completed grade IX or X.

Table 4 - 1 Educational attainment, woman and her parents

Variable	Whole sample				Mean		p-value
	mean	sd	min	max	C	T	T vs C
Age of Woman	38.7	11.2	15	90	38.9	38.5	0.469
Educational Attainment of main woman (fraction)							
No formal education	0.23	0.42	0	1	0.24	0.22	0.289
Up to grade V	0.26	0.44	0	1	0.23	0.28	0.094
Grade VI-VIII	0.22	0.42	0	1	0.22	0.22	0.94
Grade IX-X	0.16	0.37	0	1	0.17	0.16	0.853
Grade XI-XII	0.06	0.24	0	1	0.07	0.05	0.167
Higher education (> grade XII or vocational training)	0.03	0.17	0	1	0.03	0.03	0.901
Educational Attainment of father of main woman (fraction)							
No formal education	0.55	0.5	0	1	0.56	0.55	0.806
Up to grade V	0.15	0.35	0	1	0.14	0.16	0.325
Grade VI-VIII	0.11	0.31	0	1	0.11	0.1	0.464
Grade IX-X	0.08	0.27	0	1	0.08	0.07	0.401
Grade XI-XII	0.02	0.13	0	1	0.02	0.01	0.398
Higher education (> grade XII or vocational training)	0.01	0.1	0	1	0.01	0.01	0.347
Educational Attainment of mother of main woman (fraction)							
No formal education	0.70	0.46	0	1	0.71	0.7	0.712
Up to grade V	0.13	0.33	0	1	0.13	0.13	0.942
Grade VI-VIII	0.06	0.24	0	1	0.06	0.06	0.543
Grade IX-X	0.02	0.14	0	1	0.02	0.01	0.194
Grade XI-XII	0.00	0.06	0	1	0.01	0.00	0.092
Higher education (> grade XII or vocational training)	0.00	0.00	0	0	0.00	0.00	.

It is interesting to see that the main woman has on average a higher educational status than her parents – especially than her mother. 55% of the fathers and 70% of the mothers have no formal education at all. In fact 70% of the fathers and 83% of the mothers stayed at max in school until grade V. None of these educational attainments for women or her parents differ significantly between the treatment and the control group as can be seen from the last column.

From Table 4 - 2 we can see that (in line with information on the household head from section 3.2) the great majority, namely 89%, of the main women are married. Only 4% have never been married, the remaining 7% are widowed. Note that we do find the marital status to differ between our two evaluation groups: IN control areas, 92% of the main women are married and in treatment areas 86%, correspondingly, more women in treatment areas have never been married or are widowed.

Table 4 - 2 Marital status of main woman

Variable	Whole sample				mean		p-value
	mean	sd	min	max	C	T	T vs C
Marital status of main woman (fraction)							
Never married	0.04	0.19	0	1	0.03	0.05	0.05
Married	0.89	0.31	0	1	0.92	0.86	0.01
Widowed (%)	0.07	0.25	0	1	0.05	0.09	0.02

The next area of interest is how much freedom the main woman has to move around on her own. The upper panel of Table 4 - 3 shows the fraction of women that has permission to go to certain places without being accompanied. We can see that most women have no restrictions: 83% of women are permitted to go alone to the local market and to the health centre or doctor. 89% can go alone to neighbours, 88% to a religious institution, 93% to collect water. The greatest restriction seems to be in places that are further away – 20% of women are not allowed to go alone to friends or relatives who live further away.

Table 4 - 3 Permission to move around

Variable	Whole sample				Mean		p-value
	mean	sd	min	max	C	T	T vs C
Permitted to go alone to... (fraction)							
... Local market	0.83	0.38	0	1	0.84	0.82	0.544
... Health Centre or doctor	0.83	0.37	0	1	0.85	0.81	0.21
... Neighbours	0.89	0.32	0	1	0.90	0.88	0.388
... Friends/Relatives living further away	0.80	0.40	0	1	0.80	0.79	0.686
... Shrine/Mosque/Temple	0.88	0.33	0	1	0.89	0.86	0.169
... Collect water	0.93	0.26	0	1	0.94	0.91	0.102
... To house of family	0.84	0.37	0	1	0.86	0.82	0.18
In case medical treatment is needed: No problem to... (fraction)							
... Get permission to go	0.82	0.38	0	1	0.84	0.81	0.44
... Get money for the treatment	0.49	0.5	0	1	0.5	0.48	0.602
... Cover the distance to the health facility	0.36	0.48	0	1	0.39	0.33	0.293
... Take the transport	0.41	0.49	0	1	0.44	0.36	0.16
... Find someone to go with	0.73	0.44	0	1	0.75	0.71	0.31
... Concern there may be no female health worker	0.33	0.47	0	1	0.36	0.29	0.26
... Concern there might not be a health provider	0.34	0.47	0	1	0.37	0.3	0.209
... Concern not to get the needed drugs	0.33	0.47	0	1	0.36	0.3	0.276

The lower panel of Table 4 - 3 gives more detailed information on the main woman's health visits. As before, more than 80% of women state to have no problem to get permission to go to a health service provider. Nevertheless, getting there, the treatment itself and the payment pose problems for many of the women. 36% of women state that they have no problem covering the distance to a health service provider, meaning that 64% have wither some or big problems to do so. 67% of women are concerned that there will be no female health worker to attend her and 66% are concerned that there might be no health provider at all available. 66% are also concerned that they will not get the needed drugs and 51% worry about getting the money for the potential treatment. No differences are found between treatment and control areas.

We next look at the main woman's financial access and control. The upper panel of Table 4 - 4 gives information the women's perception with respect to their control over money to buy certain items. 80% of women state that they have control over money to buy fruits and vegetables, 78% to buy other food items. 73% state they have control over money to buy themselves clothes, 74% for medicine for herself, 60% for toiletries for herself and 70% for medicine and clothes for her kids.

Table 4 - 4 Financial control

Variable	Whole sample				mean		p-value
	mean	sd	min	max	C	T	T vs C
Control over money to buy... (fraction)							
... Fruits or vegetables	0.80	0.40	0	1	0.81	0.79	0.695
... Other food items	0.78	0.41	0	1	0.79	0.77	0.679
... Clothes for herself	0.73	0.45	0	1	0.72	0.73	0.816
... Medicine for herself	0.74	0.44	0	1	0.74	0.75	0.757
... Toiletries for herself	0.60	0.49	0	1	0.57	0.63	0.153
... Clothes or medicine for the kids	0.70	0.46	0	1	0.69	0.71	0.592
Financial access (fraction)							
Has money of her own, under her control	0.52	0.5	0	1	0.52	0.51	0.791
Has bank/savings account in her name (with bank)	0.42	0.49	0	1	0.44	0.40	0.364
Knows of lending/saving groups	0.80	0.40	0	1	0.80	0.80	0.997
Is member of a lending/saving group	0.56	0.50	0	1	0.58	0.54	0.357
Took a loan at some point	0.53	0.50	0	1	0.54	0.52	0.589

From the lower panel of Table 4 - 4 we learn that 52% of the main women state that they have their own money, which is under their control. 42% state to have a savings account with a bank in her name. 56% are a member of a savings group and 80% do know about such groups. 53% of women say that they took a loan at some point.

4.2. Hygiene Practices

In this section we discuss some of the hygiene practices of the main women – a very brief discussion about food hygiene practices and a somewhat more elaborate section on bathing and toilet use.

4.2.1. Personal Hygiene- bathing

We start by analysing data collected in bathing practices, of which the information is displayed in Table 4 - 5. 29% of all main women state that they bathe in their own bathroom – inside or outside the dwelling. Note that this statistics is in line with the information collected through the household questionnaire where 30% of all households report to have their own bathing facility (as displayed in Table 3 - 7). The slight discrepancy might stem from the fact that we do not have women questionnaires for all households but only for 90%. Most of these owned bathing facilities are outside the dwelling (22%).

For those women that do not have their own bathing facility an open bathing space outside the dwelling is the most common space sued (40%), followed by a shielded/thatched structure in the open (20%)

In most cases, women bathe during midday (57%) or otherwise in the afternoon (24%) or evening (33%). Note that women could give more than just one answer which is why percentages add up to more than 100%.

61% of women feel that the place they use for bathing is convenient and clean, but only 53% believe that it is safe. 42% believe that it is an unhealthy place to wash themselves in and 29% even state that it is smelly.

Again, all these variables are well balanced between treatment and control.

Table 4 - 5 Personal hygiene - bathing

Variable	Whole sample				mean		p-value
	mean	sd	min	max	C	T	T vs C
Where do you typically bathe? (fraction)							
Closed bathroom inside the house	0.03	0.17	0	1	0.02	0.04	0.057
Bathroom enclosure inside the house	0.04	0.2	0	1	0.04	0.04	0.761
Closed bathroom outside the house	0.11	0.31	0	1	0.11	0.1	0.655
Bathroom enclosure outside the house	0.11	0.32	0	1	0.12	0.1	0.397
Shielded/thatched structure, outside the house	0.20	0.4	0	1	0.19	0.2	0.705
Public bathing facilities	0.02	0.12	0	1	0.02	0.01	0.651
Open bathing space outside the house	0.40	0.49	0	1	0.4	0.39	0.829
River/open tanks/canals/ponds/etc.	0.09	0.29	0	1	0.09	0.09	0.856
Usual bathing time (fraction)							
Morning	0.14	0.35	0	1	0.12	0.15	0.278
Midday	0.57	0.49	0	1	0.57	0.58	0.763
Afternoon	0.24	0.43	0	1	0.27	0.21	0.151
Evening	0.33	0.47	0	1	0.34	0.32	0.57
Other	0.02	0.13	0	1	0.01	0.02	0.271
Do you feel this place is... (fraction)							
Convenient	0.61	0.49	0	1	0.63	0.59	0.303
Safe	0.53	0.5	0	1	0.52	0.53	0.909
Clean	0.61	0.49	0	1	0.6	0.61	0.64
Healthy	0.58	0.49	0	1	0.57	0.58	0.82
Smelly	0.29	0.46	0	1	0.28	0.32	0.319

4.2.2. Personal Hygiene - toilet

In this section we discuss the main woman's practices with regard to going to the toilet. All statistics discussed are presented in Table 4 - 6. In line with statistics from the household questionnaire, 25% of women state to have and use their private toilet. The majority (70%) on the other hand uses open fields.

This leads to a very negative perception of the toilet space used: 61% of women believe it to be unsafe and 66% as dangerous. 52% of women have fear of animals such as snakes every time they go to relieve themselves. Only 32% believe the place to be clean and healthy (30%) – 62% complain that it smells and that there are flies and a further 12% reports either smell or flies. Nevertheless, only 20% of women find the place uncomfortable and 14% are embarrassed when using the facility.

In terms of usage we can see that most women go in the morning (53%) and 38% go anytime they need to.

Almost all women (99%) take water when they go to wash themselves after the toilet – not quite as many (91%) wash their hands with water afterwards. Only 80% of women that do not have their own toilet always wear footwear when going to relieve themselves.

Table 4 - 6 Personal hygiene - toilet

Variable	Whole sample				mean		p-value
	mean	sd	min	max	C	T	T vs C
Main toilet-space used (fraction)							
Own toilet	0.25	0.43	0	1	0.25	0.24	0.868
Public toilet	0.02	0.13	0	1	0.01	0.02	0.495
neighbour's toilet	0.00	0.05	0	1	0.01	0	0.04
outside, near the dwelling	0.03	0.17	0	1	0.03	0.03	0.754
open fields	0.70	0.46	0	1	0.7	0.71	0.821
feels this place is... (fraction)							
...safe	0.39	0.49	0	1	0.4	0.38	0.742
...clean	0.32	0.47	0	1	0.32	0.32	0.864
...healthy	0.3	0.46	0	1	0.29	0.31	0.725
...smelly	0.29	0.45	0	1	0.29	0.29	0.899
...embarrassing	0.14	0.35	0	1	0.14	0.14	0.875
...uncomfortable	0.20	0.4	0	1	0.19	0.21	0.646
...fear of snakes,...	0.52	0.5	0	1	0.52	0.52	0.991
...dangerous	0.66	0.47	0	1	0.66	0.66	0.903
This place... (fraction)							
...smells	0.07	0.26	0	1	0.07	0.07	0.99
...has flies	0.05	0.21	0	1	0.05	0.04	0.69
...smells and has flies	0.62	0.49	0	1	0.64	0.61	0.61
Goes to use the 'toilet' (fraction)							
Anytime	0.38	0.49	0	1	0.38	0.38	0.946
in the morning	0.53	0.5	0	1	0.53	0.52	0.871
in the evening	0.04	0.19	0	1	0.04	0.03	0.53
at night	0.03	0.18	0	1	0.03	0.04	0.346
during the day	0.1	0.29	0	1	0.1	0.09	0.873

4.2.3. Personal Hygiene – menstruation

In terms of personal hygiene we finally discuss menstruation. We can see from Table 4 - 7. That in control as well as in treatment areas, 70% of the main women still have menstruation.

Table 4 - 7 Menstruation

Variable	Whole sample				mean		p-value
	mean	sd	min	max	C	T	T vs C
Menstruation (fraction)							
still has menstruation	0.7	0.46	0	1	0.71	0.7	0.802

More detailed information on how women deal with their menstruation is given in Table 4 - 8.

Table 4 - 8 Menstruation practices

Women who still have their menstruation	Frequ	%
Protection used		
Cloth	1,018	85.3
Cotton	28	2.35
Sanitary napkin	148	12.4
Frequency of changing protection used		
More than 5 times a day	79	7.33
3-5 times a day	330	30.6
1-2 times a day	649	60.2
Less than once a day	20	1.86
Means of cleaning protection used		
With water only	157	14.9
By using soap/soap powder	893	84.6
Disposal of protection used		
Throw it in the toilet pit	61	5.66
Throws it away in the field	508	47.1
Burns it	302	28
Other	207	19.2
Frequency of changing protection used		
Every month	284	25.8
once in 2-3 months	769	69.7
Once in a year	20	1.81
Other	30	2.72

85% of those women that still get their period use a simple cloth for protection; only 12% use specific sanitary napkins. More or less all women (98%) change the protection at least once in a day, most (60%) 1-2 times a day.

The most common method of cleaning the protection used is to wash it using soap or soap powder (85%), 14% wash it with water only.

70% of women change the material of protection they use once in 2-3 months, otherwise it is changed once a month.

They most common way to dispose of it is to throw it away in the fields (47% of women do so), 28% burn it and 20 use other means (many of which is throwing it away in different places than in the fields). 6% throw it in the toilet pit.

4.2.4. Food Hygiene

Most of the main women in our sample are the ones who prepare all meals in the house (88%) or who prepare the meals sometimes (7%). Only less than five percent prepare meals rarely or never.

If they do prepare meals, 91% of all main women wash their hand before doing so as can be seen in Table 4 - 9. Most of the women also prepare meals in the morning that are then later consumed for lunch or dinner. If they prepare meals before they are consumed, 99% of the women store them in a closed container.

Table 4 - 9 **Food hygiene**

Variable (fraction)	Whole sample				mean		p-value
	mean	sd	min	max	C	T	T vs C
Washes hands before preparing meals	0.91	0.29	0	1	0.9	0.93	0.195
Prepares meals in the morning for lunch or dinner	0.76	0.43	0	1	0.76	0.75	0.788

4.3. Children

We now turn to whether the main women have any babies and/or children and discuss a few practices regarding these. Table 4 - 10 displays general information regarding children of the main women. We can see that almost half of the sampled women have one or more children. On average, each woman has one child younger than 17 years. Conditional on having a child, each woman has on average two children.

Table 4 - 10 **Children**

Variable	Whole sample				mean		p-value
	mean	sd	min	max	C	T	T vs C
She has children (fraction)	0.49	0.5	0	1	0.51	0.48	0.324
Number of children (<17yrs)	0.98	1.18	0	5	1.01	0.95	0.409
She has babies (<1.5yrs) (fraction)	0.05	0.21	0	1	0.05	0.04	0.346
She has children (1.5<years<17) (fraction)	0.48	0.5	0	1	0.49	0.46	0.232

4.3.1. Babies (0-18 months)

Only 5 percent of all women in our sample state to have a baby in the age range 0 to 15 months. More specifically, 80 of the main women have a baby 0-15 months and 5 report to have two within this age range.

Most of the women (72%) who have a baby do breastfeed it, as displayed in Table 4 - 11.

In terms of other liquids given to the infants, we can see that 83% give their children plain water, 35% commercially produced infant formula, 41% other milk, 13% fruit juice and 37% of the babies get tea or coffee.

As with the protection for menstrual bleeding, most women (87%) use cloth also as diapers for their babies; 7% use special sanitary nappies. The main reason for using the diapers they do is being accustomed to it (31%) and that it is easily available (28%).

Table 4 - 11 **Babies**

Women with a baby	%
breastfeeding	
mother breastfeeds	72.0
Liquid drunk by baby	
plain water	83.0
commercial infant formula	35.0
other milk	41.0
fruit juice	13.0
tea or coffee	37.0
Material used for diaper	
Cloth	86.8
Sanitary napkin	6.58
Other (specify	6.58
Reason for using this type of diaper	
Accustomed to it	30.9
Easily available	27.9
More than one reason	19.1
Easy to dispose of	14.7
Cheap	5.88

4.3.2. Children (1.5-16 years)

As mentioned, almost half of the sample of main women has a child, 48% have at least one in the age range 1.5-16 years.

Table 4 - 12 Children (1.5-16 years)

Variable	Whole sample				mean		p-value
	mean	sd	min	max	C	T	T vs C
She has children (1.5<years<17) (fraction)	0.48	0.5	0	1	0.49	0.46	0.232
Any child had diarrhoea in last week (fraction)	0.17	0.38	0	1	0.16	0.19	0.377

To be more specific, 287 (16%) women have one child in this age range, 365 (31%) have two, 160 (9%) have three, 43 (2%) have four children and the remaining ones have five or more. This can be seen in Table 4 - 13.

Table 4 - 12 also informs about how many of the children had diarrhoea in the last week, which is 17% of all children in the sample. On average, the diarrhoea spell lasted almost 3 days.

We ask the mothers about some of the practices that were followed by the mothers when their kid had diarrhoea.

Table 4 - 13 Number of children

Number of children	Frequ	%
breastfeeding		
no children	883	50.54
1 child	287	16.43
2 children	365	20.89
3 children	160	9.16
4 children	43	2.46
5 or more children	9	0.52

Table 4 - 14 Practices when child had diarrhoea

Women with a child	%
Drinking during diarrhoea	
Much less	22.2
Somewhat less	20.2
About the same	6.06
More	15.2
Nothing to drink	2.02
Don't know	34.3
Eating during diarrhoea	
Much less	36.5
Somewhat less	15.6
About the same	14.6
More	2.08
Nothing to eat	3.13
Don't know	28.1

More specifically, we ask the mother how much the affected child was given to drink and to eat during the diarrhoea, whether it was given less than usual, about the same amount, or more than usual. The results are displayed in Table 4 - 14.

Only 15% of the women gave their children more to drink than usual; 2% gave nothing to drink at all, 22% gave much less to drink, 20% somewhat less and 6% about the same. About 34% of women are not sure so it is possible that more children drank less than usual during a spell of diarrhoea.

In terms of food, 3% of children were given no food at all, 37% got less food, 16% somewhat less and 15% about the same. 2% were given more food than usual.

4.4. Knowledge

We saw in the previous section that about half of the sample gives their children less to drink when they have diarrhoea. The final questions we ask the main women relate more specifically to their knowledge with respect to water born diseases.

Women were first asked about diseases that can be carried by water. Table 4 - 15 displays first results of the question whether water can carry diseases and then whether it can carry specific diseases. Women could answer yes, no or don't know. We display here how many women answered with yes. (note that all women were then asked about specific diseases and still answered yes to some questions although having said that water in general cannot carry diseases).

72% of woman said yes, water can carry diseases. Most (74%) said that it can carry a cold (or cold-like symptoms) and fever (72%); 40% believe it can carry diarrhoea and 24% worms. 33% are aware that one can get skin diseases (such as rashes and irritation) through contaminated water.

Table 4 - 15 Diseases carried by water

Variable	Whole sample				mean		p-value
	mean	sd	min	max	C	T	T vs C
Water can carry diseases (fraction)	0.72	0.45	0	1	0.76	0.68	0.062
She thinks water can carry the following disease (fraction yes)							
Respiratory problems	0.02	0.15	0	1	0.02	0.03	0.083
Diarrhoea	0.40	0.49	0	1	0.41	0.4	0.921
Fever	0.72	0.45	0	1	0.76	0.68	0.082
Worms	0.24	0.43	0	1	0.24	0.25	0.662
Skin disease	0.33	0.47	0	1	0.34	0.32	0.604
Cold (or cold-like symptoms)	0.74	0.44	0	1	0.77	0.7	0.047

Women were then asked more specifically about diarrhoea, how it is caused and how it can be prevented. These results are displayed in Table 4 - 16. Statistics refer again to the percentage of women that answered with 'yes'.

We can see that the majority of women is aware of the different ways in which diarrhoea can spread – such as contaminated water (84%), flies (78%), unwashed food (86%). Nevertheless, there is still a knowledge gap and especially when considering that only 35% of women are aware that diarrhoea can be caused by eating raw fruit and only 66% are aware that open defecation can be a cause.

The majority of women is also not aware that diarrhoea can harm other household members and that also the faeces from babies can be harmful. Only 305 of women answer 'yes' when they are asked whether diarrhoea can harm other household members, 24% don't know, implying that 46% are not aware at all.

And, the last row of Table 4 - 16 confirm the practices observed in the previous section: Only 48% of women are aware that one should drink more when having diarrhoea and 78% answer yes to eating less.

Table 4 - 16 Diarrhoea – causes, prevention and action

Variable	Whole sample				Mean		p-value
	mean	sd	min	max	C	T	T vs C
She thinks diarrhoea can be caused by any of the following (fraction yes)							
dirty water	0.84	0.37	0	1	0.84	0.85	0.771
flies	0.78	0.42	0	1	0.79	0.77	0.598
unbalanced diet	0.78	0.42	0	1	0.79	0.77	0.584
poor hygiene	0.78	0.42	0	1	0.77	0.78	0.763
unwashed food	0.86	0.35	0	1	0.85	0.87	0.65
changing weather	0.41	0.49	0	1	0.39	0.42	0.564
bottle feeding	0.67	0.47	0	1	0.68	0.66	0.704
eating raw food	0.35	0.48	0	1	0.35	0.36	0.881
open defecation	0.66	0.47	0	1	0.68	0.65	0.515
Preventing diarrhoea (fraction yes)							
protect environment	0.91	0.28	0	1	0.92	0.91	0.624
protect food	0.95	0.23	0	1	0.95	0.94	0.379
protect water	0.93	0.25	0	1	0.94	0.92	0.587
good personal hygiene	0.93	0.26	0	1	0.93	0.92	0.52
wash hands before eating	0.92	0.27	0	1	0.92	0.92	0.762
wash hands before cooking	0.92	0.28	0	1	0.92	0.91	0.798
wash hands before serving	0.91	0.29	0	1	0.92	0.90	0.63
wash hands after defecation	0.91	0.29	0	1	0.91	0.90	0.69
wash hands after removing faeces	0.80	0.40	0	1	0.80	0.81	0.878
eat less	0.30	0.46	0	1	0.28	0.31	0.414
avoid raw fruit	0.22	0.42	0	1	0.21	0.24	0.596
Harmful for others (fraction yes)							
diarrhoea can harm other hh members	0.30	0.46	0	1	0.28	0.32	0.274
faeces of 3month-old can cause diarrhoea - don't know	0.24	0.43	0	1	0.22	0.27	0.265
faeces of 3month-old can cause diarrhoea - yes	0.17	0.38	0	1	0.16	0.18	0.795
Food & drink during diarrhoea (fraction yes)							
One should drink more	0.48	0.5	0	1	0.45	0.51	0.135
One should eat less	0.78	0.41	0	1	0.79	0.77	0.747

A similar set of questions as for diarrhoea was asked for worms and answers are displayed in Table 4 - 17. Percentage distributions are quite similar as for the diarrhoea questions.

To note in this as well as in previous Tables is that the level of knowledge is evenly distributed between the treatment and control group, we do not find any significant differences between the means of the two groups for all variables looked at.

Table 4 - 17 Worms – causes & prevention

Variable	Whole sample				mean		p-value
	mean	sd	min	max	C	T	T vs C
She thinks worms can be caused by any of the following (fraction yes)							
dirty water	0.92	0.27	0	1	0.91	0.93	0.538
old food	0.57	0.49	0	1	0.56	0.58	0.627
eating sweet things	0.84	0.37	0	1	0.82	0.86	0.221
unbalanced diet	0.75	0.43	0	1	0.75	0.74	0.826
flies	0.83	0.38	0	1	0.84	0.81	0.505
unclean environment	0.87	0.33	0	1	0.87	0.88	0.904
unclean hands	0.89	0.31	0	1	0.89	0.89	0.994
germs	0.89	0.31	0	1	0.9	0.88	0.414
open defecation	0.83	0.37	0	1	0.84	0.83	0.746
an unclean bottle used for feeding	0.79	0.41	0	1	0.8	0.79	0.883
walking barefoot	0.84	0.37	0	1	0.83	0.85	0.649
eating unwashed fruits and vegetables	0.84	0.36	0	1	0.83	0.85	0.594
keeping food open	0.86	0.35	0	1	0.85	0.86	0.823
Prevention of worms (fraction yes)							
protect environment	0.94	0.23	0	1	0.95	0.94	0.524
protect food	0.94	0.23	0	1	0.94	0.94	0.901
protect water	0.95	0.23	0	1	0.94	0.95	0.678
good personal hygiene	0.94	0.23	0	1	0.94	0.94	0.895
wash hands before eating	0.94	0.23	0	1	0.94	0.94	0.796
wash hands before cooking	0.94	0.24	0	1	0.93	0.94	0.726
wash hands after defecation	0.93	0.25	0	1	0.93	0.94	0.633
avoid raw fruit	0.27	0.45	0	1	0.28	0.26	0.78

5. Findings – Anthropometrics & Medical Tests

Poor sanitation leads to a number of well documented adverse health impacts. To be able to measure the impact of the FINISH intervention of a subset of these health impacts, the decision was taken to collect information that gives us a picture of the health status in the project evaluation area.

The collected data are anthropometrics (height and weight) as well as stool and blood samples. As described in Section 2.5 of this report, anthropometrics were taken from 2,840 women and children out of 1,238 households, blood tests were taken from 1,206 women in 1,205 households, and stool tests from 911 women and children in 589 households.

The overall achievement of especially the stool samples was very low due to unwillingness of the respondents to give the stool sample. Household members were most receptive to the anthropometrics.

Before discussing this data and the outcomes of the medical analysis, we need to see whether there are any structural difference in households' responsiveness to provide stool and blood samples and anthropological measure between the treatment and control group.

Table 5 - 1 shows summary statistics for the fraction of households having provided a certain instrument. It can be seen that 61% of households provided anthropometrics, 62% blood-tests and only 30% stool tests. Most importantly, the last column confirms that we do not need to worry that households in the treatment group were significantly less or more likely to provide any of these measures or samples.

Table 5 - 1 Anthropometrics & Medical tests

Variable	Whole sample				mean		p-value
	mean	sd	min	max	C	T	T vs C
Household gave... (fraction)							
...Anthropometrics	0.61	0.49	0	1	0.59	0.63	0.379
...Blood test	0.62	0.49	0	1	0.59	0.65	0.411
...Stool test	0.30	0.46	0	1	0.30	0.31	0.828

We will proceed by first discussing the anthropometrics of children age 0 through 5, following common WHO standards. We then discuss the weight status of women in our sample and finally turn to the results of the blood analysis, which provides us an insight on the level of anaemia in our female population.

5.1. Anthropometrics – Children age 0-5

In this section we look at measures that assess the health and nutritional status of children age 0-5. We collected anthropometric data to construct these measures or indices, including weight and height, the currently most frequently used tools.

We will look at the following measures:

Weight for age (Underweight). This is probably the most common assessment of child nutrition status. It represents a suitable combination of both linear growth and body proportion and thus can be used for the diagnosis of underweight children.

Weight for Height (Wasting). This is a measure of current body mass. It is generally seen as a measure of acute or short-term inadequate nutrition and/or poor health status. It is the best index to use to reflect wasting malnutrition, when it is difficult to determine the exact ages of the children being measured.

Height for age (Stunting). This is a measure of linear growth. Stunting refers to shortness. A deficit in height for age is generally assumed to indicate exposure to an unhealthy environment, such as poor nutrition, unhygienic environment or disease in the past and hence captures long-term, cumulative effects.

More specifically, we at z-scores of these measures. A z-score describes how much a point (such as the weight for height for a specific child) deviates from a reference point. The reference point is in this case the WHO Child Growth Standards. Details on these standards and how they were constructed can be found in WHO Multicentre Growth Reference Study Group (2006, 2007).

We will start by looking at summary statistics of the z-scores of the variables. This has two purposes. For one, as and in the line with the main purpose of this report, we can at the same time look at whether the sample is balanced between treatment and control with respect to these measures. Second, the summary statistics give us an idea of the nutritional status of the entire population we are considering.

We can see from Table 5 - 2 below that the mean of the distributions for weight for age as well as weight for height is below zero. This implies that for our population most children are affected by health and nutrition problems to a certain extent. Note also that the standard deviation lies above 1.3, which suggests inaccurate data due to measurement error. This can be mainly related to inadequate age reporting. In our baseline survey, we did not ask for the exact month of birth, which makes the age be somewhat inaccurate. We need to keep this in mind when looking at remaining statistics.

Table 5 - 2 Anthropometric measures – z-score summary statistics

Variable	Whole sample				mean		p-value
	mean	sd	min	max	C	T	T vs C
Weight for age (underweight)	-0.50	2.03	-5.69	4.22	-0.22	-0.84	0.095
Height for age (stunting)	0.61	2.56	-4.62	5.85	0.65	0.56	0.876
Weight for Height (wasting)	-0.88	2.30	-4.99	4.58	-0.73	-1.08	0.422

We next look at prevalence. Prevalence based reporting is done using a cut-off point, which is consistent with clinical screening. Prevalence of malnutrition (measured by weight for age) is for example the percentage of children in the age range 0-5 years whose weight for age measure is more than two standard deviations below the median of the international reference population for the same age group. For the measure weight for age, the WHO Global Database on Child Growth and Malnutrition uses values of less than three standard deviations below the norm (<-3SD) as severe undernutrition and a value of less than two standard deviations below the norm (<-2SD) as low weight for age. Values of less than two standard deviations for height for age and weight for age are considered as moderate to severe. We also present figures for a deviation of more than two standard deviations, which gives indication about overweight.

Table 5 - 3 shows summary statistics of weight for age z-scores. The first row gives information on all children age 0-5 years, the columns below split the aggregate into different age ranges. The first block of results is for all approximately 271 children age 0-5 years we collected anthropometric data for, the second and third block give results for male and female children respectively.

Table 5 - 3 Prevalence Weight for age (underweight)

Age (months)	Whole Sample				Male			Female		
	# kids	%<-3SD	%<-2SD>3	%>2SD	%<-3SD	%<-2SD>3	%>2SD	%<-3SD	%<-2SD>3	%>2SD
Age 0-60	271	12.2	11.1	11.4	16.8	13.1	10.9	7.5	9	11.9
By cohort										
Age 0-11	7	0	28.6	28.6	0	33.3	33.3	0	0	0
Age 12-23	39	23.1	12.8	15.4	30.4	13	13	12.5	12.5	18.8
Age 24-35	61	9.8	19.7	16.4	8.8	23.5	8.8	11.1	14.8	25.9
Age 36-47	52	19.2	9.6	3.8	45	0	5	3.1	15.6	3.1
Age 48-60	112	7.1	5.4	9.8	7.4	9.3	11.1	6.9	1.7	8.6

It can be seen that a about a quarter of children in the survey areas in Tamil Nadu slums we surveyed are underweight. About 12% suffer severe underweight and an additional 11% are moderately underweight. We find that male children are much more likely to be underweight. A breakdown by age cohorts is provided but the number of children within each sample is very small so that we do not discuss these results further.

We next look at height for age as displayed in Table 5 - 4. We can see that about 17% of the children ages 0-5 are moderately to severely stunt.[18] This puts our population at the lower end of the range observed among less developed countries. According to the WHO, this range is from 5% to 65%. We again find male children to be more stunted than females.

The final measure we analyse is weight for height, or wasting. Summary statistics are displayed in Table 5 - 5. This is probably the most short-term measure in the sense that it captures a recent (and severe) incidence of weight loss. This could be induced due to starvation or a severe disease.

[18] Note that for the process of stunting generally slows down after the age of three. Measures in the last two rows (children age 3-5) reflect failure of having grown up to the year of age rather than still failing to grow.

Table 5 - 4 Prevalence Height for age (stunting)

Age (months)	Whole Sample				Male			Female		
	# kids	%<-3SD	%<-2SD>3	%>2SD	%<-3SD	%<-2SD>3	%>2SD	%<-3SD	%<-2SD>3	%>2SD
Age 0-60	253	5.1	11.5	30.4	4.7	14.7	34.1	5.6	8.1	26.6
By cohort										
Age 0-11	4	0	0	50	0	0	50	.	.	.
Age 12-23	26	0	19.2	53.8	0	17.6	52.9	0	22.2	55.6
Age 24-35	59	6.8	8.5	37.3	11.8	11.8	47.1	0	4	24
Age 36-47	52	7.7	9.6	25	0	15	25	12.5	6.3	25
Age 48-60	112	4.5	12.5	23.2	3.7	16.7	22.2	5.2	8.6	24.1

In our sample, we find a prevalence of almost 37% of wasting in our sample of children aged 0-5 years.

Table 5 - 5 Prevalence Weight for height (wasting)

Age (months)	Whole Sample				Male			Female		
	# kids	%<-3SD	%<-2SD>3	%>2SD	%<-3SD	%<-2SD>3	%>2SD	%<-3SD	%<-2SD>3	%>2SD
Age 0-60	221	19.5	17.2	11.8	21.6	13.7	9.8	17.6	20.2	13.4
By cohort										
Age 0-11	7	57.1	14.3	0	50	16.7	0	100	0	0
Age 12-23	24	33.3	16.7	8.3	41.7	0	8.3	25	33.3	8.3
Age 24-35	53	22.6	18.9	17	23.1	15.4	23.1	22.2	22.2	11.1
Age 36-47	46	28.3	19.6	6.5	40	20	6.7	22.6	19.4	6.5
Age 48-59	91	6.6	15.4	13.2	4.7	14	4.7	8.3	16.7	20.8

The prevalence of wasting we find is extremely high. Prevalence between 10-14% are usually indicative of a serious to critical situation.

The question arises in how far these extremely high means for underweight, stunting and wasting are due to measurement error or really reflect the situation in the FINISH intervention slums.

According to the third National Family Health survey (NFHS-3), which was collected in 2005-2006 and covers almost 110,000 households in 29 states of India, prevalence of underweight, stunting and wasting in Tamil Nadu were in 2005-2006 as follows: 29.8% of children under 5 were found to be underweight, 30.9% stunted and 22.2% wasted. These statistics are presented in Table 5 - 6.

Table 5 - 6 Comparison of results

	Underweight			Stunting			Wasting		
	%<-3SD	%<-2SD	Total	%<-3SD	%<-2SD	Total	%<-3SD	%<-2SD	Total
NFHS-3	6.4	23.4	29.8	10.9	20.0	30.9	8.9	13.3	22.2
FINISH Tamil Nadu data	12.2	11.1	23.3	5.1	11.5	16.6	19.5	17.2	36.7

According to Baru (2008) "[...] in Tamil Nadu there has been a decline in the underweight and stunted category but an increase in the wasted category."[19]The authors are referring here to the time period between the NFHS-3 and NFHS-2, the latter one having been collected in 1998-99.

According to our data, this trend seems to continue: Comparing results from our survey to NFHS-3 results we find a decline in the prevalence of underweight and stunting and an increase in the wasted category. This latter increase is substantial at 14.5 per cent.

5.2. Anthropometrics – Women

We now turn to the weight status of women in our sample, concentrating on those in the age range 15 through 59. Altogether, we have data on 1,284 women within this age range.

We discuss their body mass index, a simple measure of whether an adult is over or underweight, overweight or obese. It is defined as the weight (in kilograms) divided by the square of the height (in metres), i.e. kg/(m^2). It is seen as a proxy measure for the fat percentage in the body. Following WHO standards, the definitions for under-weight, overweight and obesity are:

Underweight: BMI smaller than 18.5.

Normal: BMI between 18.5 and 24.99.

Overweight: BMI 25 or above. This category is further divided into pre-obese (BMI between 25 and 29.99) and obese (BMI of 30 or above).

Note that this measure is independent of gender and of age. The latter is an advantage given that older people in India are not necessarily aware of their exact age, which means that some of our data might be estimates provided by the respondent.

We can see from Table 5 - 7 that the average body mass index for women aged 15-59 falls within the 'normal' category with a value of 24.2. There is no significant difference between treatment and control areas.

Table 5 - 7 Body Mass Index – females age 15-59

Variable	Whole sample				mean		p-value
	mean	sd	min	max	C	T	T vs C
Body Mass Index (BMI)	24.2	4.4	14.3	41.2	24.2	24.1	0.563

In Table 5 - 8 we show the fraction of women that are underweight, normal, and overweight (pre-obese and obese). The first column takes all women together and the latter columns split the age range into smaller sections. The BMI is normal for 54% of women, 8% are categorized as underweight and 38% as overweight. Most of these overweight women are pre-obese (74%).

[19] Baru, Rama V., Rajib Dasgupta, Mita Deshpande, Aparna Mohanty (2008). Full meal or package deal?. *Economic Political Weekly*, June 14, 2008.

Table 5 - 8 Body Mass Index – females, by age group

Category		Total 15-59	Age ranges				
			15-19	20-29	30-39	40-49	50-59
% of women in the sample		100	6	17	32	30	14
Underweight	(BMI<18.5)	0.08	0.05	0.07	0.08	0.08	0.09
Normal	(BMI 18.5-24.99)	0.54	0.84	0.58	0.52	0.46	0.53
Overweight	(BMI>=25)	0.38	0.11	0.35	0.40	0.46	0.38
Pre-Obese	(BMI 25-29.99)	0.28	0.09	0.27	0.30	0.33	0.27
Obese	(BMI>=30)	0.1	0.02	0.08	0.1	0.13	0.11

We can further see that it is rather older women (especially those in the age range 40-49) that are overweight. For females age 15-19, 84% are found to be normal and 11% overweight. We also find for thinness (underweight) a slighter lower percentage for female age 15-19.

We finally compare these statistics from our sample again to findings from the 2005-2006 NFHS-3 data, displayed in Table 5 - 9. We look here at women age 15-49.

We find a big shift from underweight to overweight, especially when comparing the Tamil Nadu FINISH sample to Tamil Nadu as a whole. In 2005-06, 28.4% of women in Tamil Nadu age 15-49 were underweight and in our sample, only 8% are. On the other hand, in 2005-06, 20.9% of women in Tamil Nadu were overweight, whereas we find 38% of women in our sample too fat.

Again, our data confirms a trend that has been observed in India, and is even referred to as the 'obesity epidemic'. Yajnik (2004)[20] for example talks about the obesity epidemic in India, which is especially serious in urban areas but also to be found in rural areas.

Table 5 - 9 Comparison FINISH TN data (BMI) to NFHS-3

Age range		FINISH (2010)	NFHS-3 (2005-06)		
			Tamil Nadu	India	
				rural	urban
		15-49			
Underweight	(BMI<18.5)	7.8	28.4	40.6	25.0
Normal	(BMI 18.5-24.99)	54.1	50.6	51.9	51.5
Overweight	(BMI>=25)	38.3	20.9	7.4	23.5
Pre-Obese	(BMI 25-29.99)	28.4	15.8	6.2	17.4
Obese	(BMI>=30)	9.9	5.1	1.3	6.1

[20] C.S.Yajnik (2004). Obesity epidemic in India: intrauterine origins? Proceedings of the Nutrition Society (2004), 63, 387-396.

5.3. Stool samples

As described in section 2.3 on outcome indicators, we collected stool test (faecal matter) for analysis to diagnose the presence or absence of a medical condition that have previously been linked to sanitation. A stool analysis is a series of tests done on a stool (faeces) sample to help diagnose certain conditions affecting the digestive tract. These conditions can include infection (such as from parasites, viruses, or bacteria), or poor nutrient absorption.

The stool samples also underwent a complete examination, including testing for Ova, Cyst, Trophozoite, RBC, Pus, reaction and colour.

A stool sample is usually considered as 'normal' if it appears brown, soft and well-formed in consistency (neither liquid nor very hard), and if it does not contain blood, mucus, pus and any harmful bacteria, viruses or parasites. Furthermore, the pH of the stool should be about 6. A pH of 6 is considered slightly acid. Any substance with a pH above 7.0 is considered alkaline.

We can see from Table 5 - 10 that the average sample cannot be classified as normal according to these criteria. In fact, none of the samples does meet them perfectly – and this finding holds for treatment as well as control areas.

Most of the stool samples (69%) are yellow and only about a third is brown. Most are solid (47%) and 42% are semi-solid; 11% are liquid.

About 31% of the samples are alkaline (a value of above 7), hence (slightly) too acidy.

The last block of Table 5 - 10 gives results of the tests for mucus, rbc and pus cells. None of the stools examined displayed any ova, cyst, trophozoite, or flagellates. 4% are found to have mucus in the stool, which is a common symptom of irritable bowel syndrome (IBS) or can also be caused by a bacterial infection, anal fissure, or a bowel obstruction. 19% of the samples display red blood cells occasionally[21].

Table 5 - 10 Medical tests - Stool

Variable	Whole sample				mean		p-value
	mean	sd	min	max	C	T	
Stool - colour							
Brown	0.31	0.46	0	1	0.28	0.33	0.134
Brown/Brown Yellow	0.01	0.08	0	1	0.01	0	0.549
Yellow	0.69	0.46	0	1	0.71	0.66	0.145
Stool - appearance							
Liquid	0.11	0.31	0	1	0.1	0.12	0.502
Semi-Solid	0.42	0.49	0	1	0.43	0.41	0.727
Solid	0.47	0.5	0	1	0.47	0.47	0.971
Stool - reaction							
Acid	0.69	0.46	0	1	0.69	0.68	0.71
Alkaline	0.31	0.46	0	1	0.31	0.32	0.749
Stool - other							
Mucus	0.04	0.21	0	1	0.04	0.05	0.796
RBC	0.19	0.4	0	1	0.19	0.19	0.961
Pus cells	3.46	1.91	0	14	3.34	3.58	0.421

[21] The Thiruvarur Medical Centre defined 'occasional RBC' as 4-5 RBC in 100 fields.

We finally look at the presence of pus cells in stool. A high pus cell count can be suggestive of intestinal inflammation, but it is not diagnostic of infection. It can for example be seen with infections caused by various bacteria. It is normal to find a small amount of pus cells in stool, and it is said that the presence of 10 to 11 cells can still be considered as normal. As can be seen, the average number of pus cells lies much below this level with on average 3.46 cells. Only 9 samples exhibit a count of 11 or above. Nevertheless, the Thiruvarur Medical Centre informed us that the normal range of pus cells they work with is usually 2-4. This implies that on average, people in our sample lie within this normal range, but that 201 tests (22%) are above the normal range.

5.4. Blood samples

In this section we look at haemoglobin levels in the blood of the main woman in a household. The normal range of haemoglobin levels for the general population is 11.1-15.0 g/dL. A low haemoglobin level means a person has anaemia. It is usually said that women should have a minimum level of 11.5 g/dL, pregnant women 11.0 g/dL

We can see from Table 5 - 11 that the average haemoglobin level falls just below the recommended minimum level of 11.5 g/dL (with no significant difference between treatment and control areas). In fact, the *median* level of haemoglobin in the sample is 11.4 g/dL, implying that almost half of all tested women are below the minimum level, and can therefore be considered as anaemic.

Table 5 - 11 Medical tests - Blood

Variable	Whole sample				mean		p-value
	mean	sd	min	max	C	T	
Blood samples							
Haemoglobin	11.1	1.85	3.5	17	11.2	11.1	0.41

We find that women that are found to be anaemic are on average significantly smaller than those that are not anaemic (147.7cm compared to 148.55cm), they are significantly lighter (51.7kg compared to 55.2) and as a result, their BMI is significantly lower (23.6 compared to 25.0).

6. Findings – Communities

In this final section we analyse the data collected about the communities. More specifically, information was collected about villages in which interviews were done. In each gram panchayat (the unit of analysis of our study) interviews were conducted in on average 2.8 villages.

Unfortunately, data is not available for all 242 villages our respondents live in. We were able to get data on 168 villages (70%), spread over 60 GPs in our survey area (out of 76). The data presented below will therefore be on these 6168 villages.

6.1. Population & Transportation

We start by looking at the population and transportation situation in these villages. Table 6 - 1provides all information we will discuss next.

On average, these villages have a population of just over 1,000 people, divided over 209 households. This gives an average of 4.54 household members per household according to the community data. Comparing this to the household survey (which is representative for the village and gram panchayat level), we find the difference to be small: In Table 3 - 3 we reported that the average number of people per household is 4.42.

Information on caste structure is not as comparable. According to the community data, scheduled castes make up 42% of the village population and other backward castes 39%. From the household questionnaires on the other hand, we find that scheduled castes make up 35% of the population, backward caste 43% and most backward caste 21%. While we would assume that the household survey is more accurate in capturing this information, we cannot be sure about this. As per the 2001 Census, the schedule caste population in rural villages of Tamil Nadu is 37%. Nevertheless, our villages are not necessarily representative of Tamil Nadu given that they were chosen by Bharathi specifically for FINISH implementation.

Next to information on the population, Table 3 - 3 reports on the location of the villages. On average, they are 2.5km away from the gram panchayat office, 11km from the nearest town and 28km from the district headquarter, the furthest being 90km away and the closest 10km.

In terms of the type of roads, most main roads in the survey villages are asphalt roads (63%), cement (34%) or simply soil (28%) or stone (18%) (multiple answers were allowed to answer this question).

About 56% of villages have bus services available within their village and 54% have auto rickshaws they can make use of. The distance to the nearest bus stop with connection to bigger towns is on average 3.3km and villagers have to travel about 11km to reach a railway station. 30% of villages report to have experiences an increase in the transportation fares over the last year.

Table 6 - 1 Population & Transportation

Variable	Whole sample				mean		p-value
	mean	sd	min	max	C	T	T vs C
Population							
current population	1079	1093	20	5650	1104	1049	0.779
current nr of households	209	198	6	925	183	239	0.165
SC	0.42	0.29	0	1	0.36	0.49	0.121
ST	0	0	0	0.05	0	0	0.302
OBC	0.39	0.33	0	1	0.42	0.35	0.469
Minority	0.02	0.13	0	1	0.02	0.02	0.968
Distances							
Distance to panchayat HQ (km)	2.46	4.5	0	30	2.82	2.02	0.29
Distance to nearest town (km)	11.22	9.74	1	40	12.0	10.1	0.521
Distance to district headquarter (km)	28.27	10.13	10	90	28.6	27.8	0.81
Main road material							
cement	0.34	0.47	0	1	0.28	0.41	0.322
asphalt	0.63	0.48	0	1	0.67	0.59	0.499
soil	0.28	0.45	0	1	0.25	0.33	0.521
stone	0.18	0.38	0	1	0.14	0.23	0.291
Public transport							
Auto available (%)	0.54	0.5	0	1	0.59	0.47	0.465
shared auto/minibus available (%)	0.12	0.32	0	1	0.14	0.09	0.685
bus available (%)	0.56	0.5	0	1	0.58	0.53	0.712
Transport costs increased in last year	0.29	0.45	0	1	0.2	0.41	0.104
Distance to bus station with connection to other towns (km)	3.3	3.81	0.1	38	3.2	3.45	0.676
Distance to nearest railway station (km)	11.02	7.51	1	36	11.72	9.98	0.43

We next look at the availability of different public services and their distances to the village if not available within the village. This information is presented in Table 6 - 2. From the first set of columns (under the title of 'Availability') we can see that hardly any of our survey villages has a police station, market, post office, telephone services, higher education facilities, or any type of formal health service centre (private or public) available in their village. 60% do have a primary school and 26% report to have a secondary school.

All of these public services are around 4-8km away from the village as can be seen in the second set of columns in Table 6 - 2. Furthest away is a market with on average 8-9km, followed by a police station and a government hospital.

In line with previous findings, none of these village characteristics display structural differences between the treatment and the control group.

Table 6 - 2 Availability & Distance – public services

Variable	Availability (fraction yes)			Distance (km)		
	mean	sd	T vs C	mean	sd	T vs C
Nearest Police station	0.01	0.08	0.312	7.3	5.03	0.504
Nearest Market	0	0	.	8.74	9.82	0.841
Nearest Post office	0.23	0.42	0.463	3.06	2.91	0.554
Nearest Telephone office	0.11	0.32	0.673	5.06	3.5	0.421
Nearest STD Booth	0.18	0.39	0.485	2.96	3.03	0.282
Nearest Bank	0.05	0.23	0.075	5.23	3.15	0.877
Nearest Primary school	0.59	0.49	0.784	3	9.65	0.242
Nearest Middle school	0.26	0.44	0.916	2.78	2.36	0.528
Nearest Secondary School	0.04	0.2	0.609	4.8	3.29	0.988
Nearest Higher Secondary school	0.05	0.21	0.462	5.05	3.04	0.842
Nearest Sub Centre	0.07	0.25	0.384	4.98	2.94	0.704
Nearest Primary Health Centre	0.03	0.18	0.436	4.08	2.54	0.971
Nearest Community Health Centre / Rural Hospital	0.02	0.14	0.706	5.72	9.63	0.377
Nearest Government Dispensary	0.02	0.14	0.08	7.53	9.74	0.269
Nearest Government Hospital	0.01	0.12	0.147	7.96	7.15	0.865
Nearest Private Clinic	0.02	0.13	0.696	5.29	4.86	0.99
Nearest Private Hospital	0.03	0.17	0.872	6.96	6.83	0.98
Nearest Private Doctor/quacks	0.02	0.13	0.446	5.58	3.84	0.661
Nearest Village Health Guide	0.07	0.25	0.848	4.97	4.96	0.861
Nearest Traditional birth attendant (dai)	0.05	0.22	0.254	5.52	5.24	0.471

Of the villages that have schools and anganwadi centre, we asked whether these have sanitation facilities available. We present in Table 6 - 3 the fraction of schools government primary and middle school with toilets as well as anganwadi centres. It can be seen that a very high fraction is reported to have sanitation facilities: 92% of primary schools, 95% of middle schools and 70% of anganwadi centres.

Table 6 - 3 Availability – sanitation

Variable (fraction)	Whole sample				mean	
	mean	sd	min	max	C	T
primary school - government	0.92	0.28	0	1	0.92	0.91
middle school - government	0.95	0.21	0	1	1	0.92
Anganwadi centre	0.7	0.47	0	1	0.67	0.8

We also inquire about availability of other services available in the villages, all of which are presented in Table 6 - 4.

Almost every village in our sample has SHGs (95%) and a playground for children (83%), as well as an Anganwadi centre (71%). Relatively common are tailoring shops (60%) Kirana shops (50%), youth centres (52%), village administrative offices (49%) and panchayat offices (83%).

Table 6 - 4 Availability – other services

Variable	Whole sample				mean		p-value
	mean	sd	min	max	C	T	T vs C
Available within the village (fraction)							
Credit Cooperative Society	0.09	0.29	0	1	0.05	0.14	0.248
Agricultural Cooperative Society	0.11	0.31	0	1	0.07	0.15	0.295
Fishermen's Cooperative Society	0.00	0	0	0	0	0	.
Milk Cooperative Society	0.01	0.11	0	1	0.02	0	0.149
Kirana / General Market Shop	0.50	0.5	0	1	0.44	0.58	0.303
Weekly market	0.00	0	0	0	0	0	.
Wine Shop	0.04	0.2	0	1	0.05	0.03	0.586
Tailoring Shop	0.60	0.49	0	1	0.54	0.67	0.34
Fair Price Shop	0.44	0.5	0	1	0.36	0.55	0.098
Paan Shop	0.11	0.31	0	1	0.11	0.11	0.962
Pharmacy / Medical Shop	0.06	0.24	0	1	0.05	0.07	0.68
Sanitation Products manufacturing unit	0.01	0.11	0	1	0	0.03	0.159
Mahila Mandal	0.30	0.46	0	1	0.24	0.38	0.187
Self-Help Groups	0.95	0.21	0	1	0.95	0.96	0.968
Youth Centre	0.52	0.5	0	1	0.48	0.56	0.615
Anganwadi Centre	0.72	0.45	0	1	0.68	0.77	0.418
Community Centre	0.31	0.47	0	1	0.28	0.36	0.512
Adult education centre	0.01	0.08	0	1	0	0.01	0.282
community television set	0.22	0.41	0	1	0.19	0.25	0.53
Library	0.39	0.49	0	1	0.33	0.47	0.2
Village Administrative Office	0.49	0.5	0	1	0.43	0.58	0.175
Panchayat Office	0.48	0.5	0	1	0.41	0.56	0.213
Fans Associations	0.31	0.46	0	1	0.25	0.39	0.188
Playground	0.83	0.37	0	1	0.81	0.86	0.703
Sanitation & Water projects (fraction)							
Microfinance Institution (general)	0.25	0.44	0	1	0.28	0.22	0.623
Microfinance Institution offering credit for sanitation / home improvement	0.05	0.21	0	1	0.03	0.07	0.328
NGO offering water projects	0.01	0.11	0	1	0.02	0	0.158
NGO offering sanitation projects	0.01	0.08	0	1	0	0.01	0.312
Government's scheme to partially bear the cost of sanitation projects	0.30	0.46	0	1	0.32	0.29	0.824

The bottom panel of Table 6 - 4 provides further information on whether the villages are subject to any sanitation or water interventions. What we find is that in 25% of the villages households have access to microfinance services.

In 5% of the villages, these institutions are reported to provide loans for home improvements and/or sanitation. The Primary Agricultural Cooperative Bank (*PACB*) is reported to provide such loans.[22]

Basically none of the villages is covered by any water or sanitation projects undertaken by NGOs. The NGO reported to provide a sanitation project is NYK in Serupuliyur, Nannilam.

Finally, 30% of villages report to receive support from the government for the cost of sanitation.

[22] This issue was discussed with the FINISH implementing agency in the area and according to them, no MFI, nor PACB provide loans for sanitation in these areas. It might be possible though that a loan was availed and used for toilet construction instead of the original purpose.

6.2. Waste

In this section we discuss briefly how households typically dispose of their waste in our survey villages. Results are displayed in Table 6 - 5.

The most common way of disposing kitchen rubbish is to throw it into the street or other public spaces. This might seem inappropriate at first, but considering the number of livestock roaming in the streets, one can assume that this type of rubbish will then quickly be removed from the streets. 50% of households leave their kitchen on their own land (presumably for fertilizer) and 43% of households burn their kitchen rubbish on their own land, 41% bury it.

While we expect kitchen rubbish to be eaten by livestock, also other rubbish is most commonly thrown into the streets, drainage or other public spaces. If households have their own land, as with kitchen rubbish, they do tend to bury or burn it.

Table 6 - 5 Waste disposal

Variable	Whole sample				mean		p-value
	mean	sd	min	max	C	T	T vs C
Kitchen rubbish (fraction)							
Throw it into waste baskets	0.18	0.39	0	1	0.15	0.23	0.307
Burn on own land	0.43	0.5	0	1	0.4	0.48	0.574
Burn somewhere else	0.13	0.34	0	1	0.17	0.08	0.456
Leave it on own land	0.5	0.5	0	1	0.48	0.53	0.723
Throw into river	0.19	0.39	0	1	0.18	0.21	0.852
Throw into street/drainage/other public space	0.61	0.49	0	1	0.63	0.59	0.734
Bury it on own land	0.41	0.49	0	1	0.38	0.47	0.551
Bury it somewhere else	0	0	0	0	0	0	.
Other	0.06	0.24	0	1	0.06	0.05	0.857
Other rubbish (fraction)							
Throw it into waste baskets	0.17	0.38	0	1	0.1	0.26	0.079
Burn on own land	0.5	0.5	0	1	0.47	0.53	0.668
Burn somewhere else	0.13	0.34	0	1	0.17	0.08	0.425
Leave it on own land	0.56	0.5	0	1	0.54	0.59	0.748
Throw into river	0.24	0.43	0	1	0.21	0.29	0.58
Throw into street/drainage/other public space	0.54	0.5	0	1	0.58	0.48	0.409
Bury it on own land	0.4	0.49	0	1	0.38	0.42	0.761
Bury it somewhere else	0.03	0.17	0	1	0.04	0.01	0.29
Other	0.04	0.2	0	1	0.05	0.03	0.554

7. Conclusion

The previous sections provided an in-depth look at the baseline data collected for the FINISH randomised field experiment on extending microfinance loans to for the purpose of investing in building sanitation facilities. Formal tests were carried out comparing a wide range of characteristics across the treatment and the control group. This is an important exercise because it allows us to see just how successful the randomisation procedure has been. In principle randomisation ensures that treatment and control units are similar in expectation but testing baseline data on 'pre-treatment' variables provides evidence that the randomisation has indeed been conducted appropriately.

The results from this exercise are very encouraging: we find very few significant differences in variables across treatment and control units, despite considering a very large range of detailed variables. In the few cases where differences do exist, they are generally small and do not provide any evidence of systematic differences between treatment and control units along any particular dimension. Indeed the differences are not jointly significant. We are therefore confident that the randomisation and sampling of gram panchayats has been carried out appropriately and has laid down the best possible foundation for analysing the impacts of FINISH in these areas.

8. Future Directions

The data presented in this report provide an overview of a subsample of the Tamil population. This subsample resides in rural areas and in villages specifically identified by Bharathi, the FINISH implementing institution, for delivery of the FINISH project.

These data will be used in conjunction with follow-up data to assess the impact of the FINISH intervention within these areas.

As explained in the section on methodology, the impact evaluation comprises of a series of surveys, including the here discussed baseline data as well as a follow-up survey about 1.5 years after the implementation has started and a second one approximately another year later.

At the time of this report's publication the implementation of the intervention is ongoing in the survey areas. Implementation turned out slower than expected by the programme partners, mainly driven by the global financial crisis followed by the Andhra Pradesh microfinance crisis. Some of the commitments made by MFIs for sanitation loan financing using their existing portfolios could not materialise as all MFIs faced serious difficulties in refinancing their regular loan portfolio, let alone a new product such as a sanitation loan.

This shortfall in financial resources slowed implementation by MFIs. Yet MFIs faced other genuine bottlenecks too. In Rajasthan a severe drought caused migration of people and as a result IIRD, the implementing agency there, could not proceed with the implementation. In the case of BISWA and to a lesser extent BWDC, the sanitation requirements under FINISH were more elaborate and expensive (going from single to double pit system) as compared to those under the Total Sanitation Campaign. As a consequence their sanitation loan product needed to be modified.

Based on this backdrop, the first follow-up survey is with Bharathi is currently planned for the spring of 2012. If this timetable is kept, a full impact evaluation report will be published by the end of 2012.

9. Annex

Table A1a: Survey Sampling List and Randomization Outcome – district of Nannilam

Outcome 1 = to be covered in Phase 2 0=to be covered only after follow-up survey	**Name of the Panchayat**	**No of Households**	**Total Population**
1	Nadagudi	97	529
1	Paruthiyur	330	1110
1	Kaliyagudi	920	2920
1	Thaliyur	125	2110
1	Thuthugudi	212	2896
1	Thirukottaram	356	1542
1	Moolangudi	268	1589
1	Kollapuram	799	2963
1	Senganur	562	1974
1	Annathanapuram	876	3030
1	Seruvalur	481	1645
1	Kottur	325	1260
1	Thirukandeeswaram	282	1742
1	Srivanjiyam	710	2391
1	Keelgudi	378	2730
1	Veethividangan	518	1697
1	Polagudi	506	1709
1	Pillur	1470	4660
1	Saliperri	532	1607
1	Achuthamangalam	792	2552
1	Rettakkudi	226	1850
1	Mahilancherry	261	915
1	Kothavasal	350	1284
1	Ubayavedandapuram	252	1582
1	Keeranur	650	1605
0	Moongilkudi	382	1165
0	Alangudi	552	2772
0	Menangudi	1200	4800
0	Mudikondan	903	3907
0	Sembiyanallur	283	486
0	Agarathirumalam	1472	5891
0	Anaikuppam	1255	4307
0	Kaduvangudi	710	2284
0	Visalur	124	1574
0	Koilthirumalam	739	2872
0	Panandaravadai	327	1720
0	Thirumeichur	729	2788
0	Serupuliyur	542	2540
0	Maharajapuram	352	1342
0	Sorakkudi	210	1581
0	Panangudi	450	1419
0	Kurungulam	412	1875
0	Thattathimoolai	356	1872
0	Velangudi	430	2465
0	Pavattakudi	470	1683
0	Vadakudi	125	1286
0	Kuvalaikkal	264	1227
0	Kadagam	195	625
0	Valkai	845	2622

Table A1b: Survey Sampling List and Randomization Outcome – district of Kudavasal

Outcome 1 = to be covered in Phase 2 0=to be covered only after follow-up survey	**Name of the Panchayat**	**No of Households**	**Total Population**
1	Kadakagudi	227	907
1	Kandaramanickam	508	2020
1	Vaduvakudi	414	1057
1	Neikuppai	241	964
1	Sarhuneshwaram	297	1186
1	Thethiyur	514	2054
1	Seethakkamangalam	637	2546
1	Manavalanallur	995	3983
1	Vayalur	724	2894
1	Nemmeli	475	1383
1	Neduncherry	288	1122
1	Kadalangudi	366	1305
0	Thirupambaram	405	1607
0	Vikkarapandiyam	314	1255
0	Naranamangalam	353	1275
0	Perumbanaiyur	694	2773
0	Sarabojirajapuram	883	3530
0	Thiruvizhimizhalai	731	2946
0	Karaikkayur	564	2245
0	Thiruvidacherry	528	1896
0	Prathabaramapuram	231	922
0	Anniyur	668	1857
0	Paravakarai	508	1927
0	Vishnupuram	777	2906
0	Vilagam	258	1024
0	Serugudi	214	210