HDI Project Report – David Nefs, Summer 2009

Contents

I Background to HDI

I.i HDI and the United Nations

The Human Development Index (HDI) was first released as part of the United Nation's Human Development Report 1990. It signalled a move towards a more holistic view of development which had previously focused almost exclusively on income per capita. The report stated:

> "development is much more than just the expansion of income and wealth… it is the process of enlarging people's choices"

<div align="right">(UNDP, 1990, p. 10)</div>

As such a capabilities based approach to development focusing on health and education as well as income was formed with the aim of expanding people's choices. In its present format, the HDI consists of three composite indices, for health, education and standard of living, each with equal weight as explained fully in II.1.
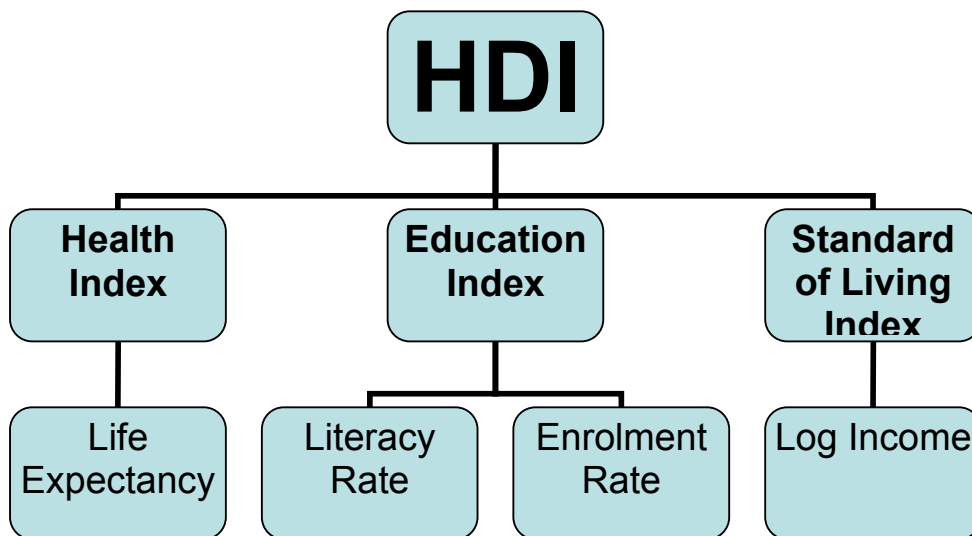
HDI intends to shift the focus of development towards the three factors seen as key in expanding the opportunities available to people, the 'ends' of development. These three factors are difficult to measure precisely and so 'proxies' deemed to be the best indicators of the level of these targets are chosen to form the indices instead. Furthermore, the proxies chosen are relevant and available indicators in *every* potential region of study, *enabling international comparison.*

I.ii HDI and Tata Chemicals Society for Rural Development

Tata Chemicals Society for Rural Development (TCSRD) has undergone a similar shift in focus to that of the UN. From initially concentrating on improving the availability of water, which as the scarce resource of the area was the primary concern, the group has now broadened its field of interest to include issues such as female empowerment, health and education.

There have been some growing pains resulting from this process evident from the first measure of HDI formed by the group which included water availability as a key component in the standard of living index. Improving the availability of water and TCSRD's watershed management programme must now be viewed as part of an integrated effort to improve the development of the region. It is important to emphasise the shift of watershed management from being the final product and purpose of TCSRD to becoming an integral part of a broader approach towards increasing the standard of living in the area. There must be a shift in the thought process of the group. Whereas before the thinking was along the lines of;

water = development

this should now be;

water => income ≈ standard of living = development

In other words, improved water management leads to increased income which is our best indicator of the standard of living which is a component of development. This subtle but important shift in thinking does not render water management unimportant; in fact it is likely to still be that main area of work for TCSRD. What it does mean is that water management is no longer the reason for the group's existence but part of an integrated development plan.

II A Guide to Calculating HDI

As already stated HDI is composed of three equally weighted indices for health education and income each of which is composed through measurement of various proxies for these factors.

HDI = 1/3 Health Index + 1/3 Education Index + 1/3 Standard of Living Index

In turn these three component indices are composed as follows.

II.i Health Index

The Health Index represents the extent to which life expectancy (LE) in the region analysed is greater than minimum life expectancy (Min LE) as a proportion of the maximum difference between possible life expectancies. Here Min LE is determined by the UN to be 25 and the maximum life expectancy (Max LE) in the world is set at 85 (roughly the life expectancy in Japan).

Health Index = (LE – Min LE) / (Max LE – Min LE)
              (LE – 25) / (85 – 25)

EXAMPLE
So, if life expectancy in the region analysed is 64 years then the Health Index would be 0.65 as using the above formula we see (64-25)/(85-25) = 39/60 = 0.65. Were the life expectancy of the region analysed to increase to 67 years then the Health Index would increase to 0.7.

Note: Calculating life expectancy is a complicated mathematical process but spreadsheets are provided online which conduct the process automatically provided you have the data;
1. Number of deaths in each age group over last 5 years.
2. Number of people in that age group over last 5 years.

II.ii Education Index

The Education Index has two component parts. The first is the literacy rate of the region analysed (given a weight of two-thirds) and the second is the enrolment rate of the region (given a weight of one-third)

Education Index = 2/3 Literacy Rate + 1/3 Enrolment Rate

The literacy rate is defined as the percentage of people of the age 16 or over who are literate (can read and understand a simple statement regarding their day-to-day life). The enrolment rate is defined as the percentage of children of school-going age (primary, secondary and tertiary) who go to school.

Literacy Rate = Number of Literates (16+) / Number of People (16+)
Enrolment Rate = Number attending school / Number of school-going age

EXAMPLE

If the literacy rate of the region analysed were 45% and the enrolment rate were 60% then the Education Index would be 0.5 as 2/3 X 0.45 + 1/3 X 0.6 = 0.5. Were the enrolment rate in the area to increase to 90% the Education Index would increase to 0.6 = 2/3 X 0.45 + 1/3 X 0.9.

II.iii The Standard of Living Index

The SoL Index is the most complicated index and requires three pieces of information in order to express the income of the region studied in terms of US dollars at purchasing power parity (PPP US$). These three pieces of data are;
1. the income of the region analysed.
2. the exchange rate between the region's currency and the US$.
3. the price level index of the region in comparison to the US price level = 100.

Income PPPUS$ = Income Rp X $:Rp Exchange Rate X 100/Region Price Level

EXAMPLE
Step 1: Using the first two pieces of information we know that an annual income of Rp 45,000 equates to US$ 1,000 at the exchange rate of Rp 1 = $ 45.
Step 2: Using the third piece of information, that the price index of India is 33 (meaning prices are 100/33 = 3 times higher in the US). Presuming that prices in the region studies are similar to India as a whole, we know that Rp 45,000 would have three times the purchasing power (could buy three times as much) in India as US$ 1,000 could purchase in the US. As this is the case an income of Rp 45,000 equates to PPPUS$ 3,000.

The Standard of Living Index is calculated using log income as the reference point. 'Log' is a mathematical function which simply transforms one number to another. For example log 1000 = 6.91 meaning the log function simply changes the number 1,000 to 6.91.

Finally, the Standard of Living Index is calculated in much the same way as the Health Index. The UN has set a minimum annual income per capita (Min Income) at PPPUS$100 and a maximum (Max Income) at PPPUS$40,000.

SoL Index =   (log Income – log Min Income) / (log Max Income – log Min Income)
               (log Income – log 100) / (log 40,000 – log 100)

EXAMPLE
If annual per capita income of the region studied is Rp45,000 we know from earlier calculations that this equates to PPPUS$3,000 and we calculate the Standard of Living Index as:

SoL Index =   (log 3,000 – log 100) / (log 40,000 – log 100)
               (8.01 – 4.61) / (10.60 – 4.61)
               0.57

Were the income of the area to increase to Rp60,000 equivalent to PPPUS$4,000 the SoL Index would increase to 0.62.

II.iv log Income Explained

Log income is used rather than income as it means that changes in income have greater impact on the SoL Index at lower levels of income which intuitively makes sense.
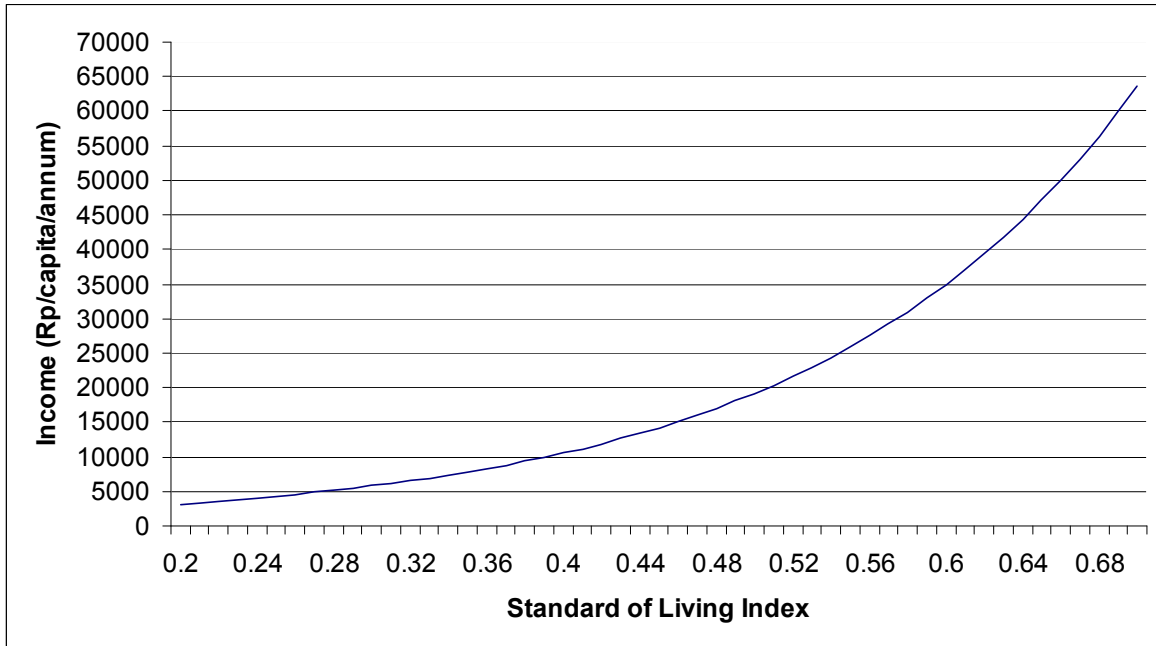
Here we see that the log curve becomes steeper at higher levels of income. At income level Rp100,000 the SoL Index is 0.70 whereas at income level Rp10,000 the SoL Index is 0.31. To increase the SoL Index by 0.1 at income level Rp100,000 income must increase by Rp5,573 whereas to increase the same index by 0.1 at income level Rp10,000 income must only increase by Rp204. Because of the curved shape of log income, the same change in income will change the Standard of Living Index more at lower levels of income. This represents the fact that a change in income has a greater effect on your standard of living the poorer you are. For example, an extra Rp1,000 will effect your standard of living much more if you earn Rp10,000 than if your income is Rp100,000.

III Information Sources

The sources of information for my study of HDI and the development of the development blueprint are described below.

- **HDI Study, March 2008**

The raw data from the initial HDI study conducted in March 2008 was used for the education and income indices as the data collected was suitable and the collection of income, education and health data for all 18 villages would have been impossible over the 6 week project period.

- **Census Data**

Quantitative data was used from the most recent census. As this is now a little dated it was primarily useful to give an impression of the relative sizes of the villages.

- **Case Study Questionnaire**

A case study for a sample of villages was conducted to attempt to validate the information attained from the HDI Study of March 2008 and assess key areas for development for the blueprint.

- **Participatory Rural Appraisal (PRA)**

The main source of qualitative data was PRA. Numerous informal meetings were held with cross sections of the village community to discuss issues primarily concerning the state of health and education in the village.

- **TCSRD Team**

The TCSRD team have been working in the fields of natural resource management (NRM), female empowerment and health and education, all relevant to my study, for many years. They have a deep knowledge of the issues relevant to my project and how they relate to the region surrounding Mithapur which my study was concerned with.

- **TCSRD Workshop**

A whole day workshop with all the team was conducted to discuss HDI as a concept and most importantly to pull together my work from the previous 5 weeks and ascertain which of the potential health and education projects should be taken forward and included into the blueprint.

IV HDI Measurements

IV.i Health Index

It was not possible to calculate life expectancy for each village so a sample of 8 villages were taken and a region life expectancy was calculated (see appendix for details).

The life expectancy of the region was calculated as 60.84 years resulting in a Health Index of 0.597, less than the Indian average of 0.645 which equates to a life expectancy of 63.7 years.

IV.ii Education Index

Using the data collected in March 2008 on literacy and enrolment rates an Education Index was constructed for each village.

Literacy ranged from 26.5% (Mulvel) to 54.3% (Bhimrana) whilst enrolment ranged from 42.1% (Mulvel) to 91.8% (Pindara). Overall Mulvel had the lowest Education Index score at 0.317 whilst Pindara's was the highest at 0.586. The average for the villages was 0.479 which is lower than the Indian average of 0.620.

IV.iii Standard of Living Index

The Standard of Living Index was calculated using income data collected in March 2008. However, in conducting my survey of households it was apparent that incomes appear to be typically much higher (as much as 2 to 2.5 times higher) that those reported from 2008. This highlights the difficulties associated with acquiring accurate income data and perhaps suggests villagers have previously under reported income when they have thought it would result in more assistance from TCSRD. The typical US$:Rp exchange rate was taken to be 44.1 and the difference in price levels between the US and India used was 4.69 (meaning India has a price level of 21.3) as that was the price level used in the 2007/08 UN Human Development Report.

The lowest average per capita income recorded was Rp4,944 (Aniyari) whilst the highest was Rp11,875 (Tupni). These values converted into PPPUS$526 and PPPUS$1,263 respectively delivering a minimum Standard of Living Index score of 0.277 and a maximum of 0.423. The village average income per capita was Rp7,350 (PPPUS$771) resulting in an Index score of 0.341. The average Indian income per capita recorded in the UN HDR is PPPUS$3,452 or Rp32,900. Clearly incomes are below the Indian average in this area but perhaps not by 4.5 times. I question the current income data and believe it should be measured again. My surveys suggested the average income to be closer to Rp12,000 resulting in a Standard of Living Index of 0.425 instead of 0.341. Average income for the villages should be re-measured before the start of the 5 year period.


IV.iv Human Development Index

Overall, the HDI of the area is low, averaging 0.471 in comparison to India's average of 0.619 which ranks India 128th of the 177 countries in the report and classifies India as a 'medium

human development' country. This area's HDI value of 0.471 means the development of the region is similar to that of Nigeria which scores 0.470 and ranks 158th of all countries in the latest UN report. The UN categorizes all countries with a HDI less than 0.5 as being of 'low human development' therefore a short term and attainable ambition for TCSRD should be to raise the HDI of the area above this important threshold value of 0.5.

The most developed village (Tupni) has a HDI of 0.529 whilst the worst (Mulvel) has a score of 0.411 as can be seen from Table 1 below. It is interesting to note from the table below that this region follows the Indian trend of ranking strongest in Health and worst in Standard of Living which suggests the area does not lag behind excessively on any one index. In fact a lower index value is expected for income which varies more widely internationally as opposed to health for which the variation is lower.

Table 1	Education	Health	SoL	HDI	Rank
Aniyari	0.394	0.597	0.277	0.423	17
Bhimrana	0.530	0.597	0.357	0.495	5
Charakala	0.515	0.597	0.335	0.482	8
Gaga	0.455	0.597	0.349	0.467	11
Ghadechi	0.523	0.597	0.326	0.482	9
Goriali	0.456	0.597	0.352	0.468	10
Gurgad	0.527	0.597	0.336	0.487	6
Hamusar	0.440	0.597	0.316	0.451	13
Khatumba	0.516	0.597	0.344	0.486	7
Mojap	0.456	0.597	0.291	0.448	14
Mulvel	0.317	0.597	0.320	0.411	18
Okhamadhi	0.501	0.597	0.403	0.501	4
Padli	0.585	0.597	0.354	0.512	3
Pindara	0.586	0.597	0.356	0.513	2
Rajpara	0.494	0.597	0.299	0.463	12
Samlasar	0.369	0.597	0.329	0.432	15
Tupni	0.567	0.597	0.423	0.529	1
Vasai	0.389	0.597	0.296	0.428	16
Village Average	0.479	0.597	0.337	0.471	
India	0.620	0.645	0.591	0.619	
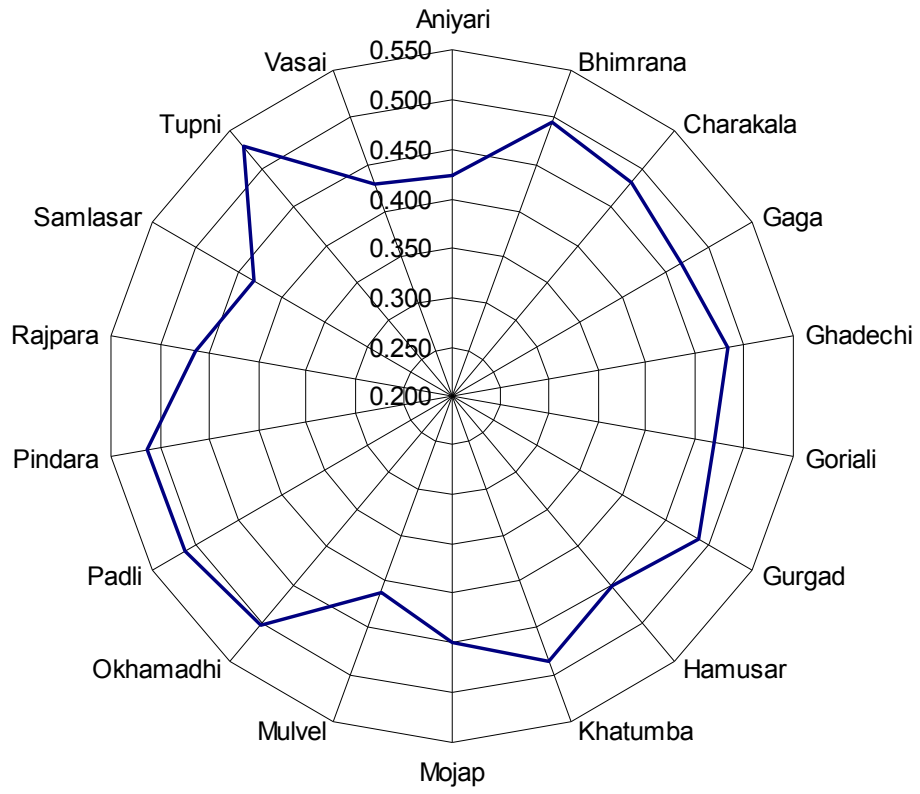
V Structure of Health and Education

By 2011 a Health and Education committee should be established in every village. This committee will replace the current drinking water committee established in around 50% of all villages. As a result the committee structure of each village should be as follows.
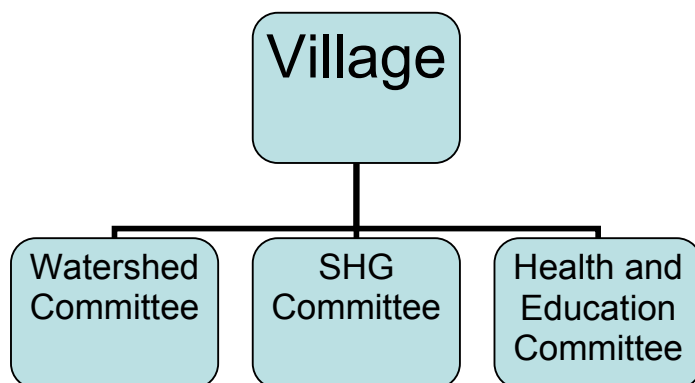
It has been decided to replace the current drinking water committee rather than form a separate committee as drinking water is a health related issue meaning it is open for discussion by the new committee and the drinking water committees are not yet widely established. It is proposed that the new Health and Education committee contains the following individuals.

> Sarpanch
> 2 Primary Health Officials
> 2 Teachers
> 2 Villagers (1 man and 1 woman)

The two most fundamental aspects retraining the development of health and education in the area are attitudes and facilities. For example;

	Health	Education
Attitudes	Eight people died due to snakebites in the last year. Some of these deaths would have been preventable had the villages approached doctors rather than religious healers	The literacy and enrolment rates of the region are very low particularly amongst females due to the belief that education is too costly for girls as they are needed to assist in housework.
Facilities	For many villages the nearest health facilities are the hospitals in Dwarka or Mithapur, with no provision at the village level.	The enrolment rates of the children in migratory communities are very low as many are pulled away from school when the family migrates.

The Health and Education committees will play a key role in facilitating the change in attitudes and monitoring the improvement in facilities towards certain **targets for development** to be established by TCSRD in conjunction with the committees. Random inspections and monitoring of health (dispensaries) and education (schools) facilities should be conducted by the H&E committee. Finally, the committees (through the teachers) should control the village level efforts to ensure enrolment and reduce dropout.

<u>VI Health Blueprint</u>

- Creation of a Dispensary in every village

It is proposed that each village should have at the very least a small medical dispensary in the short run with the long term aim being that each village should contain a primary health centre (PHC). Such a facility will reduce the cost of medical care incurred by the villagers as transport costs to the nearest hospital will be removed. The dispensary should be operated by the village PHOs who will receive medicines from the government and sell them to the villagers at the market rate. In this way the dispensaries will be self financing.

- Primary Health Officials (PHOs)

It is proposed that within each village 4 PHOs (2 male and 2 female) are trained by Tata in basic health and first aid. The hope is that these officials will become the first port of call for villagers in need of healthcare to avoid the problem of religious healers giving medical advice. The PHOs will create a link to the PHCs and will be obliged to refer any serious or repeat illness on to the PHC so the sufferer can receive treatment from a doctor.

- Healthcare Loans

In a system similar to that run by the NGO Swayam Shikshan Prayog (SSP) in Maharashtra a system of healthcare loans should be established to make funds available for medical emergencies. Under this system a bank account in the name of a Community Based Health Fund is created into which each SHG member contributes Rp100 per annum. Loans of Rp2,000-5,000 are then available at a rate of 1% per month.

- Health Camps

Health camps for key groups such as pregnant women should be run 5 times a year to provide the women with prenatal care and the correct nutrition (iron). There are already NGOs working specifically on this issue so it may be worth investigating a partnership.

- Health and Education Awareness Camps

With respect to health these camps should be focused on issues such as AIDs and focused on the villages (such as Bhimrana) with the highest floating population (contact labour and truck drivers) who are most at risk.

- Sanitation Drive

We have budgeted for 1000 W/C units to be built across the villages along with sanitation awareness programmes at both the village and school level. This is with the aim of 50% of households having access to improved sanitary facilities within 5 years. Sanitation awareness will also be run 6 times per year in schools.

- Provision of Clean Drinking Water

A further 1,500 roof rainwater harvesting structures are to be constructed along with well, check dam and pond repairing and 5 R.O. plants. The provision of clean drinking water is important for health but also for the reduction of female drudgery. Improved water provision can save women up to 3 hours per day which can be used towards other economic activities.

- Monitoring and Inspection

An important role to be fulfilled by the H&E committee is the monitoring of the practices of the PHOs and the inspection of healthcare facilities in the village such as the dispensary or PHC.

VII Education Blueprint

Box. Top 5 reasons for non-attendance by tribal children

1. Parents have no interest in the study of their children (23%)
2. For doing household work (22.5%)
3. Engaged in wages/earning activities (18.5%)
4. Engaged in economic activity with family or outside it (14.5%)
5. To look after siblings (11%)

Source: Hirway and Thakar, 2003, in Gujarat Development Report 2004.

▪ Adult Education

To be targeted specifically at people in their 20s and 30s who have received some formal education but are still lacking in literacy. This programme is designed to improve the literacy of the adult population of the village by 20% over 5 years and to do so will have to educate 40 adults per year in a village with an adult population of 1000. Small financial incentives of Rp100 could be provided.

▪ Education Scholarships

Tata currently provides 90 children with SCSD scholarships to study in 8th, 9th and 10th standards at a cost of Rp 4500. This scholarship scheme should be extended and focused towards the villages with the poorest standards of enrolment (such as Gaga, Mulvel and Samlasar). A separate TCSRD scholarship scheme could access a wider community with awareness promoted through the health and education awareness camps. A 'TCSRD Scholarship' could be emphasised as a prestigious award and perhaps linked to the Balutsav scheme which has been running successfully.

▪ Monitoring and Inspection

The practices of teachers should be monitored and school facilities inspected to ensure they meet a fit standard for education.

▪ Health and Education Awareness Camps

With respect to education the awareness camps should focus on the benefits of education, especially to girls. There is an appreciation amongst villagers that education up to 10th standard can provide genuine employment opportunities but a lack of appreciation of the importance of basic education. Efforts must be made to highlight the importance of basic education for their children as well as the potential for study at a higher level provided by high school expansion and Tata Scholarships.

VIII Health and Education of Migrant Communities

Education
There are approximately 15,000 people belonging to the Rabari caste of shepherds of which two-thirds or 10,000 people migrate. From this population roughly 1,000 children are of school going age and it is estimated only 20-30% of these children are enrolled. A **target** to increase this figure to 50% over the next 5 years has been set and to achieve this target it is necessary to improve both the attitudes of these people and the facilities available to them.

- **Attitudes**: education is given a low priority by migratory people who prefer to have all members of the household assisting with their herds. Attempts should be made to improve the Rabari's attitudes to education (especially with respect to girls for whom school attendance is very low amongst this group) and establish practices, for example, where a mother of a large family with 5 or 6 children stays at home during the migratory period so that children can attend school. Although school is free, education is not and attempts should be made to break down the attitude that education is too costly by emphasising the incentive schemes in place such as free school meals, book and uniform especially for girls.
- **Facilities**: a second boarding house is required in the area on top of the one currently situated in Gurgad. This facility has only 4 rooms and despite initially housing 140 children this number is now around 40. This decline has occurred because of a lack of awareness promotion and because of political friction within the community – many of whom preferred the school to be located in Dwarka.
    - A new boarding house is proposed for the town of Baradia (8km from Dwarka) which already has primary and secondary education facilities. The target date for the facility to be established is 2012. Until this point efforts should be made to fund raise for the boarding house (already 20-30 lahks have been raised by the Rabari community) and establish a partnership with an education focused district NGO.

Health
- **Attitudes**: the primary need with regards to the health of this community is awareness. TB is a major health problem yet many remain unaware of the successfully and well functioning government TB programme and so fail to take advantage of it.
- **Infrastructure**: with regards to the health infrastructure of the migratory community it will be more difficult for them to benefit from the system of health officials and dispensaries being placed in each village. It is therefore proposed to train one member of each group of migratory households (of approximately 20 people) in basic first aid.

IX Income Blueprint

- **Rural Economic Development Programmes (REDPs)**

REDPs continue to be an important step towards diversifying income and creating income sources for the village population separate from agriculture. 33 REDP programmes are planned in the 18 core villages for the next 5 years. Each programme trains 25 people and with a typical success rate of 50-60%, 400-500 new sources of non-agricultural income can be expected to be generated in the next 5 years. Currently, 5-10% of village income is non agricultural but it is targeted for this figure to reach 15% in 5 years.

- **Self Help Groups (SHGs)**

Play an important role in the continued economic independence and empowerment of women. A further 57 are planned for the coming 5 years.

- **Natural Resource Management (NRM)**

NRM continues to be key in the drive to improve the income of the area which is predominantly agricultural and still heavily dependent on rainfall. As such three prime areas have been identified for future development;
1. Water harvesting structures: over 900 of varying sizes.
2. Irrigation: of 420 acres of already productive land.
3. Land reclamation: of 825 acres of potentially productive acres.

- **Agricultural Insurance**

Insurance is a very good idea with respect to HDI as stable income will result in higher Standard of Living Index scores on average than income that varies between being high and low. For the communities TCSRD are involved with rainfall is the main determinant of agricultural output. ICICI offer an agricultural insurance programme under which a premium of Rp600 is paid per acre and compensation is then paid in stages dependent on the level of rainfall.

X The Budget

Sr No	Name of Activity	#Vills	Units	Unit Cost	Approximate Budget
	Health				
1	Health Awareness Programme (per Year Nos 5*)	18	25	30000	750,000
2	General Health Camp (per Year Nos 2*)	18	10	75000	750,000
3	Village Level Health committee (per Vill. Nos 1*)	18	18	20000	360,000
4	Village Level Health Both center (per Vill Nos 1*))	18	18	10000	180,000
5	Trained Health worker (per vill 4,*(2 male 2 Female)	18	72	5000	360,000
6	Training for Health worker & village Committee	18	72	2500	180,000
					2,580,000
	Education				
1	Education awareness program (per Year Nos 2*)	18	180	3500	630,000
2	Education Camps (Per year 1*)	18	5	25000	125,000
3	Adult Education Class (Per Vill Nos 50* Adults)	18	200	350	70,000
4	Training of Capacity Building (per Year Nos 1*)	18	5	15000	75,000
5	Boys & Girls Boding(Nos 2*)	18	2	6000000	12,000,000
			Total :-		**12,900,000**
	Drinking facility				
1	Roof Rain water harvesting structure	18	1500	30000	45,000,000
2	Well & Check dam Repairing	18	60	100000	6,000,000
3	Pond Repairing	18	30	75000	2,250,000
4	Pumping Machinery	18	18	30000	540,000
5	Storage Tank / Sump	5	5	225000	1,125,000
6	RO Plant	5	5	900000	4,500,000
7	Pipe Line Networking	18	18	125000	2,250,000
8	Sock pit	18	1500	5000	7,500,000
9	RO Plant in Primary School & High school	12	12	300000	3,600,000
			Total :-		**72,765,000**
	Sanitation Facility				
1	W/C Unit	18	1000	9000	9,000,000
2	Sanitation Awareness Program (per Year Nos 6*)	18	540	3000	1,620,000
3	Gram Safai (Per Year Nos 4*)	18	360	500	180,000
4	School Sanitation Awareness Program (per Yr Nos 3*)	18	270	1500	405,000
			Total :-		**11,205,000**
	Income Generation				
1	REDP programme (25 people each)	17	33	80000	2,640,000
2	Water Harvesting Structures - Small	18	845	15000	12,675,000
3	Water Harvesting Structures - Medium	18	63	300000	18,900,000
4	Water Harvesting Structures - Large	14	12	(Variable)	10,750,000
5	Irrigation	18	420	30000	12,600,000
6	Land Reclamation	18	825	5000	4,125,000
			Total :-		**61,690,000**

Total 5 year HDI Budget   161,140,000

XI Blueprint Impact and Conclusions

A large improvement in the Health Index cannot be expected in the short term as improvements in healthcare will need many years to fully filter through. However, better access to medical services and the health loans scheme facilitating access to healthcare will lead to some small improvements in the short term. We can expect the life expectancy of the area to improve by slightly over 3 years and a life expectancy of 64 years would result in a Health Index of 0.65.

Improvements in the Education Index can be expected in the short term. The extensive adult literacy programme along with continued improvement in the literacy rates of children mean an increase in the literacy rate of 20% or so is not unrealistic. Likewise, enrolment drives focused through village health and education committees along with improved enrolment of the Rabari through boarding houses and girls through awareness camps mean a similar increase of 20% in enrolment (up to 85% is possible) as evident through the fact that there are already village achieving enrolment rates over 90%.

Finally, through improved water management and farming techniques, along with greater income through non-agricultural sources facilitated by the REDP programmes income can be expected to rise by 50% in the next 5 years (approximately 8.5% per annum). If income is starting from the initial village average identified in March 2008 or around Rp7,500 per capita an increase in the Standard of Living Index from its current level of 0.341 to 0.409 would result. If, as seems likely, average income currently stands closer to Rp12,000 the change would be from 0.425 to 0.493.

Overall, these changes would shift HDI from its current standing of 0.472 to 0.580, a level of development similar to that of Bhutan which ranks 133rd in the UN HDI standings. If income is found to be higher then the shift would be from 0.500 to 0.608.

	2009	2014
Health	0.597	0.650
Education	0.479	0.680
Standard of Living	0.341	0.409
HDI	**0.472**	**0.580**

Conclusions – To take away

1. The TWO main obstacles to health and education are **attitudes** and **facilities**. TCSRD must make it their goal to change attitudes and improve facilities.
2. This is a **long term process**. TCSRD must make it their aim to improve attitudes and facilities as quickly and efficiently as possible but must not expect the HDI indices for health and education to improve dramatically over the short term.

Health

8 villages (Vasai, Murkampur, Juni Dhrewad, Shivrajeur, Mojap, Gorinja, Bardiyer and Varvala) were surveyed and the age of each death in the last 5 years was recorded. Across the 8 villages for 5 years the aggregate deaths within the age groups were calculated as shown below.

Village Years	Total 5
<1	3
1-4	4
5-9	7
10-14	2
15-19	11
20-24	19
25-29	19
30-34	19
35-39	14
40-44	29
45-49	18
50-54	32
55-59	33
60-64	39
65-69	30
70-74	25
75-79	31
80-85	26
85+	53
Total	**414**

Population statistics were then taken from the 2001 census data for the 8 villages as shown below. Where the census data did not match the age groups exactly the age group was divided in two. For example, 310 people were said to lie in the age bands 40-44 and 45-49.

0-4	1198
5-9	1311
10-14	1211
15-19	996
20-29	1700
30-39	1166
40-49	620
50-59	480
60+	511
Total	9194

Education

	Literacy Rate	Enrolment	Education Index
Aniyari	0.273	0.635	0.394
Bhimrana	0.543	0.503	0.530
Charakala	0.419	0.708	0.515
Gaga	0.467	0.43	0.455
Ghadechi	0.391	0.787	0.523
Goriali	0.298	0.771	0.456
Gurgad	0.464	0.652	0.527
Hamusar	0.363	0.595	0.440
Khatumba	0.406	0.735	0.516
Mojap	0.325	0.719	0.456
Mulvel	0.265	0.421	0.317
Okhamadhi	0.377	0.75	0.501
Padli	0.506	0.743	0.585
Pindara	0.42	0.918	0.586
Rajpara	0.445	0.591	0.494
Samlasar	0.338	0.43	0.369
Tupni	0.445	0.81	0.567
Vasai	0.269	0.63	0.389
Village Average	0.390	0.657	0.479
India	0.610	0.638	0.620

Standard of Living

	pc income	PPPUS $	SoL Index	
Aniyari	4944	526	**0.277**	**$:Rp Ex Rate = 44.1**
Bhimrana	7974	848	0.357	
Charakala	6978	742	0.335	**Indian PPP = 100/4.69 = 21.32**
Gaga	7612	810	0.349	
Ghadechi	6614	703	0.326	
Goriali	7763	826	0.352	
Gurgad	7048	750	0.336	
Hamusar	6258	666	0.316	
Khatumba	7368	784	0.344	
Mojap	5388	573	0.291	
Mulvel	6397	680	0.320	
Okhamadhi	10536	1120	0.403	
Padli	7843	834	0.354	
Pindara	7951	846	0.356	
Rajpara	5633	599	0.299	
Samlasar	6751	718	0.329	
Tupni	11875	1263	**0.423**	
Vasai	5536	589	0.296	
Average	7248.278	771	0.341	

NRM

Village	Water harvesting structures				Infrastructure facility	Agriculture development
	Small	Med	Big	Micro irrigation		Land reclamation (Acre)
Aniyari	40	4	1	25	Drinking water facilty	75
Bhimrana	75	4		20	-------	100
Charakala	75	3	1	15		100
Gaga	50	3	1	25	1 pipeline, hand pump	150
Ghadechi	40	3		30	Drinking water facilty	75
Goriyali	45	3	1	30	Drinking water facilty	75
Gurgadh	35	4		20	Well, hand pump, pipeline	100
Hamusar	75	4		30	Drinking water facilty	75
Khatumba	50	5	1	25	Comm well, pond	75
Mojap/Lalpur	25	3	1	25		75
Mulvel	40	4		20	Drinking water facilty	50
Okhamadhi	75	5	1	10	Drinking water facilty	75
Padli	50	2		15	Community pond, Community diversion channel	75
Pindara	50	3	1	20	Well, pipeline	100
Rajpara	40	4	1	25	Comm well, pond	75
Samlasar	25	3	1	25		75
Tupni	25	2	1	30		75
Vasai	30	4	1	30		100
	845	63	12	420		825

Unit Cost (lahk)

WHS - small	0.15
WHS - medium	3
WHS - big	5.5-22
Irrigation	0.3
Land Reclamation	0.05

NRM Costs

Village	Water harvesting structures cost (lakhs)				Agriculture development Land reclamation (Acre)
	small	Medium	Big	Micro irrigation	
Aniyari	6	12	7.5	7.5	3.75
Bhimrana	11.25	12		6	5.00
Charakala	11.25	9	10.5	4.5	5
Gaga	7.5	9	9	7.5	7.5
Ghadechi	6	9	0	9	3.75
Goriyali	6.75	9	5.5	9	3.75
Gurgadh	5.25	12	10.00	6	5
Hamusar	11.25	12	0	9	3.75
Khatumba	7.5	15	9.5	7.5	3.75
Mojap/Lalpur	3.75	9	6.5	7.5	3.75
Mulvel	6	12	8.50	6	2.50
Okhamadhi	11.25	15	22	3	3.75
Padli	7.5	6	0	4.5	3.75
Pindara	7.5	9	8.50	6	5
Rajpara	6	12	7.5	7.5	3.75
Samlasar	3.75	9	8.5	7.5	3.75
Tupni	3.75	6	10	9	3.75
Vasai	4.5	12	11	9	5.00

SHGs and REDPs

Village	SHGs 2009	2010	2011	2012	2013	2014	Total	**Total REDPs 2014**
Aniyari	1	1	1	1	0	0	4	2
Bhimrana	16	2	2	1	1	1	23	6
Charakala	0	1	1	1	0	0	3	2
Gaga	0	1	1	1	1	1	5	2
Ghadechi	4	1	1	1	0	0	7	2
Goriali	1	1	1	1	0	0	4	2
Gurgad	0	1	1	1	1	0	4	2
Hamusar	3	1	1	0	0	0	5	1
Khatumba	2	1	1	0	0	0	4	2
Mojap	5	1	0	0	0	0	6	2
Mulvel	1	1	1	0	0	0	3	0
Okhamadhi	1	1	1	1	1	0	5	2
Padli	2	0	0	0	0	0	2	1
Pindara	0	1	1	1	1	1	5	2
Rajpara	2	1	1	0	0	0	4	1
Samlasar	1	1	1	0	0	0	3	1
Tupni	2	2	2	1	1	1	9	2
Vasai	6	1	1	0	0	0	8	1
Total	47	19	18	10	6	4	104	33

Per SHG Expence Rs.2000 X Formation Self Help Group 100 = 2,00,000/-
Per field worker One Year expence Rs.60,000/-X 72,00,000/-
Total Expence =Rs.74,00,000/-