CESS MONOGRAPH 39

Water and Sanitation Programmes and Health of the Communities: A Study of Three Indian States Madhya Pradesh, Odisha and Andhra Pradesh

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Foreword

The Centre for Economic and Social Studies (CESS) was established in 1980 to undertake research in the field of economic and social development in India. The Centre recognizes that a comprehensive study of economic and social development issues requires an interdisciplinary approach and tries to involve researchers from various disciplines. The centre's focus has been on policy relevant research through empirical investigation with sound methodology. In keeping with the interests of the faculty, CESS has made important contributions to social science research in several areas; viz., economic growth and equity, agriculture and livestock development, food security, poverty measurement, evaluation of poverty reduction programmes, environment, district planning, resettlement and rehabilitation, state finances, education, health and demography. It is important to recognize the need to reorient the priorities of research taking into account the contemporary and emerging problems. Social science research needs to respond to the challenges posed by the shifts in the development paradigms like economic reforms and globalization as well as emerging issues such as optimal use of environmental and natural resources, role of new technology and inclusive growth.

Dissemination of research findings to fellow researchers and policy thinkers is an important dimension of policy relevant research which directly or indirectly contributes to policy formulation and evaluation. CESS has published several books, journal articles, working papers and monographs over the years. The monographs are basically research studies and project reports done at the centre. They provide an opportunity for CESS faculty, visiting scholars and students to disseminate their research findings in an elaborate form.

The present Monograph titled "Water and Sanitation Programmes and Health of the Communities: A Study of Three Indian States - Madhya Pradesh, Odisha and Andhra Pradesh" was based on the premise that positive health outcomes, among others, depend on different interventions: direct health interventions and other institutional interventions. In particular, the study looked at the health outcomes of individuals and households and their linkage with access to water and sanitation facilities as well as their health and hygiene practices. Further, the study had also looked at the catalytic role of village level institutions such as Village Water and Sanitation Committees (VWSCs) and Village Health and Sanitation Committees (VHSCs) in improving the water and sanitation facilities of the communities.

The above study conducted in the three Indian States Viz., Madhya Pradesh, Odisha and Andhra Pradesh (prior to reorganization), has employed a multi state sampling

method for selecting the states, districts, blocks (mandals, villages and households). The three states were selected interms of high-focus and non-high focus as per the norms stipulated under NRHM guidelines. Besides, the criterion of NGP (Nirmal Gram Puraskar) awarded villages and Non NGP villages was applied in the selection of sample units. The major findings of the study are: the over all situation of water and sanitation status across the three states shows that the AP and Odisha states have a better access to safe drinking water as compared to villages in Madhya Pradesh. Further, across all the three states water and sanitation programmes do not seem to have had shown much of influence on the health status of communities. This can be partly explained in terms of the very selection of villages by the government for the Nirmal Gram Puraskar (NGP) award. This award is supposedly awarded to those villages which have achieved a total open defecation- free (ODF) status including schools and ICDS centres in the respective villages. Hence, in an ideal situation, Nirmal Gram Puraskar (NGP) villages are expected to be 'open defecation free' while maintaining very good sanitation and hygiene conditions along with an assured supply of protected water. But on the ground, as our study reveals, except in the case of a few villages, in all the three states, the selection of villages for NGP has not been based on objective criteria and the whole process may have been driven by extraneous factors (such as political/patronage etc.). Another important finding of the study is the very ineffective functioning of institutions like Village Water and Sanitation Committees (VWSC) and Village Health and Sanitation Committees (VHSC) in most of the villages in both NGP and Non NGP areas across all the three states. The study notes that in respect of all the three states, there is a long way to go before attaining a cent percent ODF status and better health and hygiene conditions. Few recommdations from the study are: Need for strengthening the community toilets is felt in all the States, as most of the individual toilets found are not in a usable condition due to maintenance problems; PRIs and VHSCs need to engage the sanitation staff in maintaining community toilets, on a regular basis; Sustainability of water and sanitation infrastructure is the key and this demands the allocation of committed financial resources; A transparent selection process of the NGP villages strictly adhering to TSP norms is needed; Developing adequate capacities of the local institutions (as it happens with SHGs) in handling water and sanitation issues on a continuous basis is a clear policy imperative.

I hope those recommendations from the study will be useful to the policy makers, CBOs working in this area and political executives in attaining 'Swachh Bharat' goals of the Government of India and State Governments.

S. Galab
Director, CESS

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Abbreviations

ANM	Auxiliary Nurse Midwife
ARI	Acute Respiratory Infection
ARWSP	Accelerated Rural Water Supply Program
ASHA	Accredited Social Health Activist
CBOs	Community Based Organizations
CHCs	Community Health Centers
CRSP	Central Rural Sanitation Program
CLTS	Community Led Total Sanitation
DH	District Health
EAG	Empowered Action Group
FGD	Focus Group Discussion
FWSP	Filtu Water and Sanitation Project
GDP	Gross Domestic Product
GoI	Government of India
GP	Gram Panchayat
GS	Gram Sabha
HHs	Households
IGOs	International Governmental Organizations
IHHL	Individual Household Latrines
IDWSSD	International Drinking Water Supply& Sanitation Decade
ILCS	Integrated Low Cost Sanitation
IPH	Irrigation and Public Health
IQ	Intelligence Quotient
JVWSC	Jamakunda Village Water and Sanitation Committee
MGNREGA	Mahatma Gandhi National Rural Employment Guarantee Act
MDG	Millennium Development Goals
MDI	Management Devolution Index
MoDWS	Ministry of Drinking Water and Sanitation
MPW	Multipurpose Worker
MVS	Multi Village Schemes
NBA	Nirmal Bharath Abihyan
NDWM	National Drinking Water Mission
NGOs	Non-Governmental Organizations
NG	Nirmal Gram

NGP	Nirmal Gram Puraskar
NHSRC	National Health System Resource Centre
NHM	National Health Mission
NRHM	National Rural Health Mission
NRDWP	National Rural Dinking Water Programme
NUHM	National Urban Health Mission
NSSO	National Sample Survey Organization
RCH	Reproductive and Child Health
ODF	Open Defecation Free
ORT	Oral Rehydration Therapy
PHCs	Primary Health Centres
PRIs	Panchyat Raj Institutions
PHED	Public Health Engineering Department
PSPs	Public Stand Posts
RNDWM	Rajiv Gandhi National Drinking Water Mission
RVWSC	Rajpur Village Water and Sanitation Committee
RWS	Rural Water Supply
SC	Sub Centre
SVS	Single Village Schemes
SHG	Self Help Group
SSA	Sarva Siksha Abhiyan
TDS	Total dissolved Solids
TSC	Total Sanitation Campaign
UNICEF	United Nations Children's Emergency Fund
VWSC	Village Water and Sanitation Committees
VHSC	Village Health and Sanitation Committee
WHO	World Health Organization
WSP	Water and Sanitation Program

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Authors

Executive Summary

CESS was entrusted by NHSRC (National Health System Resources Centre), New Delhi, with a study entitled" Water and Sanitation Programmes and Health of the Communities: A Study of Three Indian states. The following pages give an account of the summary findings emerging from Madhya Pradesh, Odisha and Andhra Pradesh respectively.

As part of a summary report, an attempt was made to analyse and understand the health outcomes of individuals and households since these are linked to their access to water and sanitation facilities as well as their health and hygiene practices both at the individual and household levels. In this context, the catalytic role of village level institutions such as PRIs and VWSCs created under NRHM with a view to enhancing water and sanitation facilities has also been examined. The state specific findings related to MP, Odisha and AP are presented below:

Madhya Pradesh

As discussed in the introduction chapter, positive health outcomes, among others, depend on different interventions: direct health interventions and other institutional interventions. An effective implementation of the health related programmes can result in a reduction in morbidity levels in the rural areas, high incidences of diarrhoea and an improvement in the nutrition absorption among children etc. However, health outcomes largely depend on how interactions take place among various institutions, processes and different programmes, such as the availability of quantity and quality water, and sanitation facilities (in this case, lavatories and their proper use by households), allied household level hygiene practices that are conducive to the promotion of health, personal hygiene such as defecation habits. This kind of an enabling environment can be made possible indirectly through a catalytic process involving various institutions, processes and different pro-people programmes at the local levels. In this context, the present study is basically explorative and analytical in nature.

Here an attempt is made to analyze and understand the health out comes of individuals and households as these are linked to their access to water and sanitation facilities as well as their health and hygiene awareness, and practices both at the individual and household levels.

Water: In Madhya Pradesh, 6 NGP villages and 6 Non-NGP villages were selected for the study. From these villages, altogether, data was collected from 240 households. A comparison between NGP villages and Non NGP villages indicates that pure water

availability is more satisfactory in NGP villages as compared to Non-NGP villages. The status of quantity of water availability to the respondents amounts to 76.2% for daily needs. The availability of water (both potable and non-portable) is a concern in both NGP and Non-NGP areas. Infact 61.5 % of the respondents have reported experiencing inadequate water supply for the last one year. There seem to be a number of quality related issues facing people, as more than half of the respondents in both NGP and Non-NGP villages have reported that water is pure,while the rest of them have reported facing problems with regard to the quality of water. While some people clean drinking water vessels daily, many of them do so once in 2 days. Hygiene maintenance practices relating to drinking water seem somewhat better in NGP areas. For example, those respondents using special tumblers attached with long handles(to draw water from drinking water containers) for avoiding contamination are more in NGP areas. Similarly, a large number of households in NGP areas treat drinking water (to make it safe) before drinking.

Drinking water status in schools:
With regard to the drinking water use status in government schools, out of 12 schools, 6 schools use hand pumps (50%) and bore wells (25.0%) as the main source of drinking water in both NGP and Non-NGP villages. Only one school each in Non-NGP and NGP villages have reported having tap connection for supplying of safe drinking water to children.

With regard to providing clean and safe drinking water to children, a majority of the respondents in both NGP (89.9%) and Non-NGP (82.2%) villages have responded that they clean water by straining through a cloth. There is only 7 percent difference between NGP and non NGP villages in this respect, while only 9 respondents in both NGP and Non-NGP villages have stated that they boil water before supplying to children.

An overwhelming number of the respondents in both NGP (99.2%) and Non-NGP (98.3%) villages have mentioned that covering cooked food with a lid as the safe way of maintaining hygiene and preventing occurrence of diseases.

More than half of the respondents help children take bath every day, especially in NGP villages. In both NGP and Non-NGP villages, children wash their hands before taking food, according to the respondents.

Housing: Most of the respondents in NGP and Non-NGP areas live in huts or kutcha houses. It is generally reported that people living in semi-pucca or pucca houses are relatively better off and can afford better sanitation facilities.

Sanitation: Perhaps due to the typology of housing, only 140 households in both NGP

and Non-NGP areas (96 households from NGP and 44 households from Non-NGP) have access to toilets.

A majority of the respondents have reported that toilets being used by their children in NGP villages are in-house toilets, whereas in Non-NGP villages, they use open spaces for defecation. A majority of the respondents are not aware of the type of diseases children may be vulnerable to, especially when toilets are not used by children and due to the prevalence of open defecation. The availability of water for sanitation purpose is a problem in both NGP (12.6%) and Non-NGP (17.4%) villages. Hence, only 38% of the respondents in both NGP and Non-NGP villages have reported cleaning toilets daily. About 12 percent of the respondents have stated that they clean toilets once in a month, because of an insufficient water supply which is unsafe to use for cleaning toilets. Those using toilets (96 in NGP and 44 in Non-NGP) have reported a number of problems like growing flies and mosquitoes, spreading of foul smell, super structures not ensuring privacy, over flowing of pits etc. Hence a mere accessibility to toilet facility does not in any way ensure better health. A great majority of respondents are affirmative regarding the availability of hand wash near toilets in both NGP and Non-NGP village households.

In Non-NGP villages, all 6 schools use pit latrines, while in NGP villages, 4 schools use pit latrines. Piped sewer system and septic type of latrines are used by NGP schools. However, in NGP villages, there are separate toilets for girls, boys and teachers. The school management is engaging/hiring the services of private individuals for cleaning the toilets, but services are not up to the mark, as the management has failed to pay the charges regularly for the services rendered by the individuals.

Here, an attempt is made to understand the role of institutions like VWSC, VHSC, CBOs etc., and the processes adopted for achieving Open Defecation Free (ODF) villages and provision of clean drinking water to all.

Institutions: There are some local level institutions to facilitate a better implementation of water and sanitation programmes at the grass roots level such as village water and sanitation committee (VWSC). Our field-based observations reveal that most of the committees do not meet regularly, especially in Non-NGP villages. Also, many times, minutes of the meetings are not recorded and the issues related to water supply are discussed orally, especially in Non-NGP villages. Similarly, many of the villagers are not aware of the existence of Village Health and Sanitation Committees (VHSC)/ constitution of VHSCs and their functioning at the village level.

Illnesses among children: In MP, relatively more number (139) of children are found suffering from various ailments in NGP areas as compared to Non-NGP areas (131), but the difference between the two is only marginal. In both the areas, a majority of the

suffering children were taken to private medical practitioners/private hospitals for treatment. In Non-NGP areas, 25 diarrheal cases had been reported as against 29 in NGP areas. In both the areas, all the child patients got treatment in private hospitals.

Illnesses among adults: Regarding the health problems of adults in MP, 126 cases in NGP areas and 104 cases in Non-NGP areas were reported. In both the areas, most of the patients went to private clinics for treatment. In Non-NGP areas, 50 adults were reported suffering from cough, cold and fever (multiple health problems) as compared to 51 adults in NGP areas. A majority of them approached private clinics for treatment. No dysentery case was reported in both the NGP and Non-NGP areas.

On the whole it appears that though in some respects things are better off in NGP villages, yet the overall conditions in NGP villages are not so different from Non-NGP villages. As a result, there seems to be no significant impact of these water and sanitation programmes on health outcomes as observed in terms of household level episodes of morbidity in the study villages of Madhya Pradesh.

Odisha

In Odisha state, 6 NGP and 6 Non-NGP villages were selected for the study. From these 12 villages, altogether, data was collected from 240 households. The study made an attempt to look for improved health conditions in view of the water and sanitation programmes being implemented in the study area. A majority of the respondents are literates. The educational levels of the respondents in NGP villages are relatively higher than those in Non-NGP villages.

Housing: A majority of the respondents reside in Kutcha houses and huts, while most of the respondents in Non-NGP villages live mostly in Kutcha houses and huts, indicating their poor economic conditions.

Sanitation: A majority of respondents practise open defection and or use pit latrine, especially those belonging to Non-NGP villages. More than half of the respondents use personal toilets for maintaining privacy, while another less than a quarter use personal toilets for maintaining good health and privacy. The educational levels of people make them more consciously to use toilets. More than half of the respondents use and another 41.3% of them use soap for washing hands after defecation.

Water: An overwhelming percentage of the respondents use water for domestic uses such as washing dishes and cloths for bath etc. While a negligible percentage of the respondents use water for toilet purpose. Regarding the quality of water, three fourths of the respondents maintain that it is pure, whereas some respondents (5) claim that water is impure, especially during the rainy season.

The analysis reveals a fair variability in the availability of water across NGP and Non-NGP villages; while in the former category of villages, there is an adequate water available as compared to the latter category of villages. When probed further about the availability of an adequate quantity of water to the people during the past one year, a great majority of the respondents have reported that it is not adequate. This response comes more from the respondents representing Non-NGP villages.

Nearly three fourths of the respondents have stated that they possess storage facility/ies up to 10-15 (1 tub= 20 litters) tubs of water. The data reveals that a little over one-fifth and less than 10 percent of the respondents use glass tumblers attached with long handles with taps attached to the containers for consuming water. An overwhelming percentage of respondents clean water containers every day. Those who clean containers everyday are more in members in Non-NGP villages, as compared to NGP villages. An insignificant percentage of the respondents, have expressed that they boil or strain water using a cloth before drinking. This indicates that the educational status of the household members plays a crucial role in treating water for consumption. Nearly two thirds of the respondents have pointed out that shortage of water is the main problem, while more than half of the respondents have stated that Anganwadi Centres supply water to children who go there.

Water supply in schools: In NGP villages, out of six schools, three get drinking water from bore wells, two from taps and one from other sources. Out of six schools in Non-NGP villages, three schools get drinking water from bore wells, and one each from taps, tanks and from other sources.

Sanitation facilities in schools: With regard to latrine facilities in schools, in NGP villages out of six schools, four have septic tank type of toilets for students' use, while another two schools have pit latrines. In Non-NGP villages, out of six schools, four have septic type of toilets and one each pit latrines and latrines with piped sewer system.

Out of six schools in NGP areas, three schools have separate toilets for boys and girls, whereas in Non-NGP villages, four schools out of six enjoy such facility. In NGP areas, only three schools have separate toilets for teachers, whereas in Non-NGP areas, all the six schools do not have separate toilets for teachers.

Water facility in ICDS centres in the study villages:
There are six ICDS centres in NGP villages and six in Non-NGP villages. In NGP, bore well is the main source of water for 4 ICDS followed by one each from tap and well. In Non-NGP, out of six ICDS, 4 centres get water from 'other sources' and a bore well in the case of one.

Hygienic practices: With respect to the disposal of waste (stools) especially of children,

two thirds of the respondents throw excreta of children on to the streets. Regarding hand wash facility near toilets, three fourths of the respondents do not have any facility to wash their hands near toilets and hence they do not wash their hands. This situation is more visible in Non-NGP villages as compared to NGP villages.

The analysis reveals that more than half of the respondents clean their toilets once a month. An overwhelming percentage of the respondents provide boiled water to their children or strained water. Three fourths of the respondents have reported that their children become prone to typhoid, malaria, cough and cold, diarrhoea, Chikungunya etc., if they do not use toilets. A few of the respondents have informed that their children's health is/was affected by vomiting, stomach ache, loose motion, communicable diseases, dengue, body pain etc.

A large majority of the respondents (92.1%) give bath to their children every day. More than three fourths of the respondents (76.2%) wash their hands both before and after taking food and after defecation. These trends indicate that they take appropriate measures to protect their children's health.

Institutions: Here, an attempt is made to understand the role of institutions like VWSC, VHSC, SHGs, CBOs etc. and the processes adopted for achieving Open Defecation Free (ODF) villages and provision of clean drinking water to all. An attempt is also made to understand the role of institutions and processes in terms of hindering achieving of ODF status of villages and supply of drinking water.

With regard to the awareness of the existence or constitution of VHSCs in study villages, two thirds of the villagers are aware of their presence, while the remaining one third of them are not. Although VWSCs have been constituted in certain villages, their functioning is very discouraging as the members are not aware of their duties and powers. This is true in the case of both NGP and Non-NGP villages.

Illness among Adults: In Odisha, 7 cases of dysentery in NGP villages, and 3 cases in Non-NGP villages were reported. In NGP villages, 15 cases of diarrhoea were reported while in Non-NGP villages none. In Non-NGP areas, 37 adults were reported suffering from cough, cold and fever (multiple health problems) as against 20 adults in NGP areas. A majority of them received treatment from CHCs and private clinics.

Illness among Children: In Odisha, in NGP villages, 74 children were reported ill due to various water related problems. Of 74 children, 34 suffered from various illnesses under the category of water borne diseases including 13 diarrhoea cases. In Non-NGP villages, not a single case of diarrhoea was reported. 7 cases of dysentery were found in NGP villages and in Non-NGP villages only 4 cases of dysentery were found. Only 1 case of

malaria in NGP villages was reported, while in Non-NGP villages, not a single case was reported. In Non-NGP areas, 9 children were reported suffering from cough, cold and fever (multiple health problems) and 13 children in NGP areas.

Interestingly, NGP areas have reported more health problems. This may be due to the difference in living and environmental conditions. In NGP areas, many houses have their own ponds (small) in front of their houses. These ponds are used for fishing and water for domestic purposes. There are many water logged areas in these villages which act as the breeding grounds for mosquitoes and insects. Those having toilets complain of problems like foul smell, super structure, overflowing of pits and growing of mosquitoes etc., Regarding health care, many people prefer to seek treatment from government health facilities. Although there are a few positive aspects like better literacy rates in the study areas there seems to be no significant positive impact of water and sanitation programmes or literacy levels on the health of families/ communities.

Andhra Pradesh

Here an attempt is made to analyse and understand the health conditions of individuals and households as these are linked to their access to water and sanitation facilities as well as their health and hygiene awareness, practices both at the individual and household levels.

Water: In Andhra Pradesh, 6 NGP and 6 Non-NGP villages were selected for the study. From these 12 villages, data was collected from 244 households. This study made an attempt to look for better health conditions in view of the ongoing implementation of water and sanitation programmes. A comparison of NGP villages and Non NGP villages indicates that pure water availability is more or less same. The availability of adequate quantity of water is also one of the parameters to understand the status of health and hygiene conditions of the households. At the aggregate level, a majority of the persons live in pucca houses followed by semi-pucca houses (10.2%). In NGP and Non-NGP villages also, the proportions remain nearly the same. Tap water is the main source of water in both the NGP and Non-NGP villages. As regards using the occasional source of water, out of 244 respondents, a majority of them use the water for domestic use only.

In NGP villages, out of six schools, two get drinking water from taps, and one each from tanks, cans and public taps. Out of eight schools in Non-NGP villages, three get drinking water from taps and another 3 from tanks.

At the aggregate level, a majority of the respondents have reported that the quantity of water supplied is fully sufficient. In NGP villages, 88.4% of the respondents share this response as against 82.1% in Non-Ngp villages. According to most of the respondents, water supply has been sufficient for the past one year. However, in NGP villages, such

positive responses are a tad higher (86.8%) than in Non-NGP villages (82.9%). Across the sampled areas of Andhra Pradesh, a majority of the households use earthen pots besides plastic/steel vessels for water storage. However in summer, household's face water problem mainly due to an erratic power supply.

At the aggregate level, out of 244 respondents, 98% drink water from containers using glass tumblers. The percentage of respondents who treat drinking water some times, is a little higher in respect of Non-NGP villages (46.3%) as compared to NGP villages (43.8%). Out of 125 respondents who take measures for making water safer to drink, 91.2% boil water followed by 7.2% who strain it using a cloth. In NGP villages boiling water accounts for a higher share (93.4%) as compared to Non-NGP villages (89.1%).In NGP villages, the percentage of respondents giving boiled water to their children is a notch higher (89.2%) than in Non-NGP villages (86.7%). In both NGP and Non-NGP areas, almost all the respondents always cover cooked food with plates.

Sanitation: In NGP areas, two-thirds of the respondents use septic latrines and one-third of the residents practise open defecation. In Non-NGP areas, half of the respondents practise open defecation, while nearly another half of them use septic latrines. In both NGP and Non-NGP villages, respondents use toilets for maintaining better health. The percentage of respondents washing hands (after defecation) with soap is slightly higher in NGP villages (37.2%) as compared to Non-NGP villages (30.9%), while the proportion of respondents washing with only plain water is higher in Non-NGP villages (60.2%) than in NGP villages (54.5%).

Sanitation facilities in schools: As regards latrine facilities in schools, all the six schools in NGP have septic latrines, whereas only seven out of eight schools in Non-NGP use septic latrines. All the six schools in NGP villages have separate toilets for boys, girls and teachers, whereas in Non-NGP, five out of eight villages having this facility. For cleaning toilets in schools, in NGP, a majority schools (four out of six), hire cleaners and sweepers. Whereas in Non-NGP, four out of eight schools hire sweepers and cleaners.In NGP villages, the toilets in a majority of schools are cleaned fortnightly (four out of six schools). In Non-NGP, in three out of eight schools, toilets are cleaned fortnightly, daily in one school and weekly in one school.

Water supply in schools: Water supply is sufficient in five out of six schools in NGP villages, while it is so only in four out of eight schools in Non-NGP villages.

About the type of toilet facilities provided (from among the respondents reporting toilet facility) for their children in households, at the aggregate level, a majority of them (97.9%) have reported using in-house toilets. In both NGP and Non-NGP villages the situation is more or less similar.

With regard to the disposal of children's stools, a majority of the respondents throw on to the street (73.8%), followed by 'thrown in latrine' (19.3%) and 'left there' (7.0%). In NGP villages, the percentage of respondents throwing it in the latrine is higher (24.0%) than in Non-NGP villages (14.6%). According to a majority of the respondents in both areas their children take the help of their parents in using toilets. On being asked when almost all the respondents in both NGP and Non-NGP that their children always wash their hands. More than half of the respondents (53.7% in NGP and 46.3% in Non-NGP) said that their children wash their hands using soap. During the dehydrated condition of child, 36.1% of the respondents would visit a doctor and another 32.4% of them would provide ORS. In NGP villages, relatively more number of respondents have reported taking bath daily (96.7% in NGP and 92.7% in Non-NGP). On being asked how often the respondents would give bath to their children, a majority of the respondents (86.5%) in both the areas have reported giving bath to their children twice a day.

Institutions: Here an attempt is made to understand the role of institutions like VWSC, VHSC, SHGs, CBOs etc. and the processes adopted for achieving Open Defecation Free (ODF) villages and provision of clean drinking water to all. An attempt is also made to understand the role of institutions and the processes that hinder the achieving of ODF status of villages and supply of drinking water.

There are VWSCs, in both types of villages. As regards the frequency of meetings, in 4 NGP villages, quarterly meetings are held in 2 villages, while monthly/half yearly meetings are held in other 2 villages. In all, 4 villages of NGP maintain records of meetings and only one village of Non-NGP keeps records of these meetings. As regards the frequency of VHSC meetings, mostly monthly meetings are held in both NGP and Non-NGP areas. Records of such meetings are maintained by all the villages of NGP and Non-NGP areas.

Illnesses among adults: In both NGP and Non-NGP areas, the maximum number of adults suffer from dysentery followed by malaria and typhoid. In all cases, treatment days last mostly less than 5. Adults suffering from any kind of illness in both NGP and Non-NGP areas, mostly visit private clinics for treatment. Compared to NGP areas, Non-NGP areas have reported more number of water related illness. This shows the positive impact of water and sanitation programmes being implemented and the working of village level institutions like VWSC and VHSC on the health of individuals.

Illnesses among children: In both NGP and Non-NGP areas, most of the children were found affected by dysentery followed by malaria. In both the cases, children were taken to private clinics for treatment, lasting less than 5 days. Like in the case of adults, it is

clear from the results that there is a clear advantage associated with water and sanitation programs in terms of reducing the number of water related diseases in NGP areas.

Summary: The Way forward

The overall water and sanitation status across three states shows that, in AP (both NGP and Non NGP) and Odisha states (NGP villages only) access to safe drinking water is better than in Madhya Pradesh. Even with regard to the quantity of water available, both AP and Odisha are better off when compared to MP, whereas when it comes to the quality (colourless and soft water) of water, AP state's position is better (pure water for drinking) when compared to Odisha and MP states. With regard to the provision of toilet facilities, AP and MP states have performed well when compared to Odisha state. Regarding VHSC committees, in terms of conducting meetings and maintenance of records, AP states' record is slightly better than MP and Odisha states. Coming to housing, the status of a majority of the households in AP (both NGP and Non- NGP villages) is better (with people living in pucca houses) compared to their counterparts in the other two states (MP and Odisha). As far as the habit of treating water before drinking is concerned, AP and MP states have fared well (both NGP and Non-NGP villages) as compared to Odisha.

The overall situation of the study villages across all the three states shows that the current status of water and sanitation programmes does not reveal a significantly differing impact in respect of both NGP and non-NGP villages. This can be partly explained in terms of the very selection process of villages by the government for the Nirmal Gram Puraskar award. This award is supposedly awarded to those villages which have achieved the total open defecation- free target including schools and ICDS in the respective villages. Hence, in an ideal situation, Nirmal Gram Puraskar (NGP) villages are expected to be'open defecation-free' (ODF) villages with a very good maintenance of sanitation and hygiene along with an assured supply of safe water. But our study reveals that (based on ground level observations) except in the case of a few villages, in all the three states, the selection of villages for NGP is not based on objective criteria and that the process may have been influenced by extraneous factors (such as political patronage etc.). In view of such an undesirable process of selection and award of puraskar to villages without verifying the 'achievement' of sanitation levels, problems persist in these study villages. And the association or influence of these on the overall household health conditions is not strikingly demonstrable in both NGP and Non NGP villages in the provision of water and sanitation facilities.

Another important finding of the study relates to the very ineffective functioning of institutions like Village Water and Sanitation Committees (VWSC) and Village Health and Sanitation Committees (VHSC) in most of the NGP and Non-NGP villages. In

spite of their presence in most of the villages, their actual working is not satisfactory, as is evident from the number of meetings held as against the specified norms and, even if held, the outcome of such discussions in the meetings is generally poor, as demonstrated by the records. This was also revealed during our household respondents' interviews in that they were mostly ignorant of the existence/working of these institutions. The emphasis given to the working of these institutions in the NRHM guidelines has not been effectively put into practice in all the three states studied.

Although NRHM guidelines stress the importance of involving Panchayat Raj Institutions (PRIs) in the water and sanitation management, in actuality, their involvement has been abysmal. Only a few enlightened sarpanches/pradhans of a few villages are actively involved. This is despite the 73rd & 74th Constitutional Amendment Acts which specify that the provision of water & sanitation facilities falls under the domain of PRIs & Urban Local Bodies. Therefore there is a need for an active involvement of PRIs in terms of putting the NRHM guidelines into practice.

It has been found by the present study that open defecation (OD) is still being practised which does not augur well for the well-being of both children and adults. This could be due to a number of reasons viz:- very poor quality of toilets constructed. An irregular supply of water is a major issue. In addition to these supply side factors, certain cultural beliefs and practices do come in the way of having toilets in the household premises (demand side factors). On the whole, the intensive awareness campaign by both Civil Society and Panchayat Raj Institutions (PRIs) must be accorded a high priority. Otherwise, poor health outcomes can mar children's future, despite state govt's investing huge amounts on public health care.

An institutional vacuum in terms of the poor working of VWSCs and VHSCs has its toll on the availability and maintenance of the quality of water and sanitation facilities and thereby their use which, in turn, can ultimately result in health conditions, as observed in the field. Thus, a mere formation of such administrative institutions is not sufficient in itself. Infact, what is extremely important is that these local structures/ institutions should be made accountable to the local people/community.

The study notes that in respect of all three states, there is a long way to go towards attaining a cent percent ODF status as also a better health and hygiene status. Policy pointers and lessons learnt:

- Need for strengthening community toilets in all the states as most of the individual toilets are unusable.

- PRIs and VHSC need to engage the sanitation staff in maintaining community toilets on a regular basis (similarly the case of water maintenance by PRIs).
- Sustainability of water and sanitation infrastructure is the key and this demands that allocation of committed financial resources.
- A transparent selection process of NGP villages strictly adhering to TSP norms is needed (a few model villages viz., Hajippally- Mahabunagar, Gangadevipally - Warangal districts in Telengana need to be emulated and scaled up)
- In NGP areas of Odisha, water table is low, while normal toilets keep over flowing during rainy season. Hence, the government needs to promote the construction of appropriate toilets.
- In all the surveyed states, the functioning of committees (VWSCs and VHSCs) is not satisfactory (i.e., wherever committees are found). These are not adequately funded and the available funds are mostly used for spraying bleaching powder.
- Enhancing of the financial allocations to these VWSCs and VHSCs is quite imperative since the current funding is just sufficient for providing very basic facilities.
- Excepting two NGP villages of Odisha, NGOs are not found involved in water and sanitation activities. NGOs may be encouraged to promote awareness among people regarding sanitation and hygienic practices along with line departments and PRIs.
- Capacity building of the local institutions like in the case of SHGs in terms of handling water and sanitation issues on a continuous basis is a clear policy imperative.

Chapter-1
Introduction

1.1 Rationale Underlying the Research Study

The development of rural India is very important from the view point of achieving inclusive and equitable growth. The analysis of incidence of poverty across Indian states indicates that poverty is very closely related to social infrastructure[1]. An adequate, need based good social infrastructure and effective government interventions through programmes like national drinking water and sanitation programme may result in positive health outcomes. Among the various flagship programmes of the Government of India, the National Rural Health Mission (NRHM) is a unique initiative oriented towards improving the health situation in all the states. NRHM is primarily aimed at strengthening the health infrastructure, increasing community access to the same and creating awareness regarding health related issues. The Programme's special focus is on 18 states identified by the Empowered Action Group (EAG) with weak public health indicators and health infrastructure facilities. Further, the macro level data related to morbidity and mortality profiles of the states in rural and urban India points to the underlying social determinants such as nutrition, water and sanitation, among many others. The strength of NRHM lies in working with line departments dealing with the social determinants of health, particularly water and sanitation, in order to achieve the overall objective of improving the health status and quality of life of rural population with an unequivocal and explicit emphasis on sustainable development measures. With this perspective in view, the NRHM promotes community involvement at the local level in association with VHSCs with a convergent role for facilitating the provisions of health facilities in rural areas.

In this context an attempt is made to review the relevant literature to identify issues related to water (especially drinking water) across different regions, besides the national drinking water and sanitation policies, problems encountered in grounding these programmes, impact of clean water and sanitation on the health of people and the importance of hygienic practices.

[1] Refers to community facilities like water and sanitation facilities, health facilities to the individuals, families and groups

1.2 Water and Sanitation

Ensuring drinking water and sanitation security to the people has emerged as a matter of great concern for the governments the world over in the recent times. International Governmental Organizations (IGOs), Non-Governmental Organizations (NGOs), policy makers, charitable foundations and the private sector are contributing substantially to the debates on what constitutes water and sanitation security and also how it can be achieved/realised at the global, national, state, community, household and individual levels.

The studies on water and sanitation, (health and hygiene aspects) concerning many countries reveal that the availability of and accessibility to protected drinking water, sanitation, personal hygiene, environment, control of diseases and health of the people are closely linked. Thus, an improvement in the health status of people, to a large extent, depends on the water and sanitation related policies, programmes and their effective implementation in terms of making these services readily accessible to the people.

The World Health Organization (WHO) defines the health status as "a state of complete physical, mental and social well-being and not merely an absence of disease or infirmity''. The realization of this goal depends not only on the availability of nutritional food to the people, but also on the health policies/programmes and water and sanitation programmes. The complex, integrated, overlapping social structures and economic systems are responsible for most health related inequities. These social structures and economic systems include the social environment, physical environment, health services, and structural and societal factors. Social determinants of health are shaped by income distribution, power, and resources across local communities, nations, and the world. Social determinants must be addressed in terms of achieving many disease-specific targets, including the health-related Millennium Development Goals, and controlling and eliminating epidemics that trends to endanger entire populations. Most priority public health conditions share key social determinants, including determinants of exposure to risks, disease vulnerability, access to care, and the consequences of disease (Chandrasekher, 2009).

It is pertinent to mention here that the success of water and sanitation programmes, to some extent, depends on the appropriate institutional, financial and regulatory (monitoring) support, active participation of communities at all levels- policy formulation, implementation, evaluation of programmes and sharing/utilization of schemes-as well as need based training and technical support or access to professional service providers.Thus, there is a need for undertaking an in-depth study on the issues related to water and sanitation programmes vis-à-vis health outcomes for deeper insights into the complex phenomena.

1.3 Review of Literature

In the research process, a review of literature helps the researcher understand better the identification and articulation of relationships among the existing / available literature which help the strengths and gaps in earlier studies. In this section, an attempt is made to present a review of the selected studies/ reports pertaining to the present study. An examination of the literature on the performance of the policies, programmes meant for the provision of drinking water and sanitation services reveals mixed views.

Under health outcomes, an attempt is made to discuss the studies examining the impact of poor drinking water and sanitation facilities on the health of populations.The impact of hygienic practices is also discussed.

Health Outcomes

Inadequate sanitation conditions continue to remain a leading cause behind a high diarrheal incidence among children in most of the developing countries. A study by World Bank points out that 15 percent of all the deaths under 5 years in low and middle income countries are directly attributable to diarrhoea. With respect to children's health, interventions with social pressure and usage of proper sanitation infrastructure can lead to positive health outcomes (Buttenheim, 2009).

A study carried out in Peru finds that diarrhoea explains 16% of stunting (Brown, 2011). Lin *et al* have shown that children in rural Bangladesh exposed to worse sanitation are more likely to show signs of Enteropathy and are notably shorter, on an average. A ten percent increase in open defecation is associated with about a 0.7 percentage point increase in both stunting and severe stunting (Spears, 2013).

Stunting afflicts 65 million children in India under the age of 5. This disconnect between wealth and malnutrition is so striking that economists have concluded that economic growth does almost nothing to lessen malnutrition (Harris, 2014).

Studies conducted in many countries, reveal that disease control, good health, hygiene and water are intrinsically linked. In Malwai, diarrhea ranks as the third highest cause of morbidity and fifth highest cause of mortality among children under 5 years of age, according to outpatient health facility and hospital data. Young and Briscoe conducted a case-control study to test: 1) the hypothesis that improved environmental sanitation would reduce diarrheal incidence; and 2) the feasibility of using a case-control design to evaluate health impacts of environmental interventions. The study shows that, where changes in both water supply and sanitation condition take place, there is a substantial reduction in diarrheal incidence (Young and Briscoe, 1988). This study carried out in

Malwai region informs that the use of good quality of water supplies and latrine facility results in a 20 percent reduction in diarrhoea in the warm and rainy seasons. Inadequate sanitation continues to be a leading cause of a high diarrheal incidence and mortality among children in most of the developing countries, particularly in urban slums. A study related to Bangladesh reveals that, increases in the proportion of households in the surrounding basti that use improved latrines are associated with improvements in child weight-for-height, an important measure of a short-term nutritional status (Buttenheim, 2009). Similarly, in Bangladesh, the water and sanitation intervention project has had a significant impact on diarrheal morbidity among children less than 5 years of age and also among children aged 2-23 months. It is recognized that a cleaner water supply is a necessary condition for reducing the incidence of diarrhoea. The identification of behavioural pattern (e.g. hand washing) relating to contamination might also give better insights into effective intervention strategies (Henry, Huttly, Patwary and Aziz, 1990)

Delays in interventions roll-out caused logistical problems especially for the planning of health outcome follow-up surveys. Latrine coverage at the end of the construct period (55%) remained below the target of 70%, a result that may, however, be in line with many other TSC interventions areas in India (Clasen, 2012).

Filtu Water and Sanitation Project (FWSP) (in Filtu Woreda of Somali regional state) has been implemented since 2002 in three phases 2002-05, 2006-08 and 2009-11. Water is a scarce resource in most parts of Filtu Woreda. Solving water problem is also solving other social and development problems. The provision of water is the central and core programme around which the other programme components of FWSP have revolved. Problems identified include water insecurity, poor hygiene, sanitation situation, crop production and others. Drinking water has been made available by harvesting rain water into partly underground Birkas, roof catchment and hand dug wells. Sand filters have been introduced as also the health posts. Piloting agricultural activity is done through water pumps. However, the evaluation team has observed that water projects (mainly Birkas) will remain sustainable and that the willingness on the part of beneficiaries to pay for operation and maintenance of the Birkas has been impressive (Matewos Tera Bussa, 2012).

The Millennium Development Goals have firmly established the issues of "water, sanitation, and hygiene" on the global agenda (Ray, Zaman and Laskar, 2010). Public health importance of hand washing as also of its importance in reducing of communicable diseases such as diarrhoea and acute respiratory infections (ARI) has been highlighted in many studies (Ray *et al.*, 2010). As per a study in respect of Tripura, a majority of the respondents

practised hand washing after defecation, but it was concerning to note that in both the areas, hand washing was not practised by a substantial proportion of the respondents in situations such as "after changing babies' nappies and disposing off their faeces", "before preparing food", "immediately after handling raw vegetables", and "after handling pets and domestic animals". The reason might be attributed to the similarity in socio-cultural and linguistic backgrounds of the study areas (Ray *et al.*, 2010). Hand washing was a neglected issue as far as the community and care-providers were concerned (including government). Its enormous importance in preventing and reducing the occurrence of diseases such as diarrhoea, ARI and skin infections, based on the evidence, was not properly understood and thus priority has not been given by the community and government to the same extent as given to other programs such as immunization, ORT, RCH, etc. (Ray *et al.*, 2010).

A study among primary school children in South Kolkata reveals that the commonest morbidity among boys as well as girls was clinical pallor. The study clearly shows that good personal hygienic practices are linked to better health among school children. History of worm infestation was elicited from 28.9% of the children in the Wardha study (Deb, Dutta, Dasgupta and Misra, 2010). One of the eight of Millennium Development goals, Targets agreed by all world governments to halve world poverty by 2015 and also to halve the proportion of people without access to sanitation. Water Aid Nigeria in its current strategic plan expects to contribute 2 percent annually to the achievement of MDG target (CLTS, 2007).

Water and Sanitation

The Government of India reports, the supporters/ advocates of the present policies applaud the Government's efforts in administering the programmes. The studies point out that prioritizing of difficult areas; identifying of watershed units; preparation of plan for recharging of groundwater; convergence of NRDWP (National Rural Drinking Water Programme) with MGNREGA (Mahatma Gandhi National Rural Employment Guarantee Act) and watershed programmes; strengthening of legal, institutional and regulatory issues; improving governance; providing of incentive funds and preparing a management devolution index for the grass-roots level institutions; priority to district planning coordination; participatory planning and implementation of the schemes; ensuring water quality management; sustainable service delivery system, decentralized governance and building professional capacity of the employees etc., would contribute towards a proper implementation of programmes (Planning Commission, 2003).

Despite the launching of several programmes and substantial investments in the rural water supply and sanitation sectors, all through the Plan periods, the problem of availability as well as quality in the distribution of drinking water is still rampant in various areas across the country. The studies point out commodification of water; high cost / charges for utilization of water (Wagner, 2012); slippage in rural water supply across the states (Ratna Reddy and Rama Mohan Rao, 2012); poor maintenance of environmental sanitation around water points (Rama Chandrudu and Subramanyam Naidu, 2012); a limited access to toilets in the rural areas (a few individuals or households) and variations across the states, regions, urban and rural areas (Kurian Baby, 2012); lack of interest on the part of household members in utilizing toilets provided by the Government and giving preference to open defecation system (Snehalatha and Venkataswamy and Sirisha, 2012); inadequate budgetary allocation for the construction of latrines; and cornering-off the ILCS schemes by the relatively better-off sections; (Alivelu and Ratna Reddy, 2012); lack of awareness among residents regarding the programmes, guidelines, allocation of budget and institutions devised for managing the programmes (Ganesh *et al,* 2013); lack of interest and cooperation on the part of individuals and institutions towards participation in the campaigning of programmes (Pardeshi *et al.*, 2008); non utilization or non-practice of hand washing by people due to a poor socio-cultural background (Ray *et al.,* 2010); over exploitation of ground water without adequate recharge leading to drying- up of sources or reduced yield; increase in the population; setting up of new habitations; contamination of drinking water sources due to over use of fertilizers, sewage and industrial effluents into ground water etc,(GOI, 2013);-as the major challenges/ issues which are collectively/ individually hampering the progress of water and sanitation programmes in India.

The Eleventh Plan document identifies key issues facing the sector: the main ones are deteriorating source's sustainability resulting from over-extraction of ground water in large parts due to irrigation demand for agriculture, water quality problems including arsenic and fluoride contamination and bacteriological contamination due to lack of sanitation which kills hundreds of children every day in the form of diarrhoea, and poor operation and maintenance including neglect of replacement and expansion resulting in a rapid deterioration in the quality of water services. The other major challenges are related to inter-sectoral coordination, continuous professional support to GPs (Gram Panchayats) / communities and emerging climate change challenges. Further, the studies on sanitation point to lack of awareness, established age-old practice, non-existence of community latrines and insufficient number of latrines, lack of finance/resources for the construction of latrines etc, as the major reasons for the continuance of the open defecation system (Planning Commission, 2003).

To accelerate the progress of sanitation in rural areas, the Government of India has designed a paradigm shift in Total Sanitation Campaign (TSC) which is now called the Nirmal Bharat Abhiyan (NBA), in the XIIth Five Year Plan. The objective of NBA is to achieve a sustainable behavioural change in the provision of sanitary facilities to entire communities in a phased, saturation mode with "Nirmal Grams' as outcomes. The implementation, therefore, needs to concentrate on lower project entities (block/gram panchayat).

Water:

Here an attempt is made to discuss the government initiated drinking water schemes/ programmes. Starting with the Eleventh Plan, the government's endeavour has been to achieve drinking water security at the household level. As per National Rural Drinking Water Programme (NRDWP)[2], Government of India, there is a paradigm shift from just providing water to village to household level with a convenient accessibility of adequate quality water to almost all in India. At the Gram Panchayat level, there is one Standing Committee called Village Water Supply and Sanitation committee[3] (VWSC) (except for 6th Schedule Areas).

Despite the presence of good water policies and programmes, slippage is a serious issue and in respect of rural water supply, it amounts to more than 30 percent at all India level, which is substantial by any standard. Across the states, the extent of slippage varies widely. Thirteen out of 25 states record slippage at rates higher than national average. Slippage ranges from less than 5 percent in Karnataka and Goa to more than 60 percent in Mizoram, Arunachal Pradesh and Bihar (Ratna Reddy and Rammohan Rao, 2010).

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[2] To achieve the objective, the state governments adopt appropriate structures depending on the local hydro-geo-morphological conditions suitable to rural drinking water schemes. According to swajaldhara project water can be defined as safe when it is free from biological contamination (guinea worm, cholera, typhoid etc.) and within permissible limits of chemical contamination excess fluoride, brackishness, iron , arsenic nitrates etc. as per IS -10500 standard of BIS. Priority for new drinking water schemes is to be given to habitations where none (0%) or part of the population has access to adequate and safe drinking water.

[3] Participation of representatives of SCs, STs and other backward classes in VWSC should be a priority (DDWS and GOI, 2010). National Drinking Water Mission ensure transfer of management and financial responsibilities to PRIs, particularly to village water supply and sanitation committees, prioritization of water usage by the community, protection of ground water from excessive abstraction and reaching safe drinking water to SC/ST dominant habitations. Women's association can provide a strong framework for community participation in water management, as women generally manage domestic water needs.

Although proper policies have been put in place, the actual ground reality is not encouraging which is evident from the study conducted in Nirmal Puraskar villages and non Nirmal Puraskar villages of Andhra Pradesh. According to the study, 78 percent of NGP villages and 57 percent of non-NGP villages provide adequate water to their citizens. 39 percent of NGP villages and 93 percent of non-NGP villages do not maintain environmental sanitation around water points (Rama Chandrudu and Subramanyam Naidu, 2012).

Statement of the Research Problem

One eighth of the world's population lacks access to safe drinking water (United Nations Children's Fund [UNICEF], 2008). Millions die every year of waterborne (bacteria-contaminated water) and water-washed (insufficient water for washing and personal hygiene) diseases (Prüss-Üstün et al., 2008). Diarrhoea alone, a life-threatening symptom of a number of waterborne diseases such as typhoid, cholera, and bacillary dysentery, kills 1.5 million people every year - most of them children under the age of five (Prüss-Üstün *et al*., 2008). Malnourished children are at greater risk. The WHO estimates that 10 percent of all the diseases that affect people in the world each year are related to water quality and access issues, which could be prevented (Prüss-Üstün *et al*., 2008).

More than 5 million people die each year of diseases caused by unsafe drinking water, lack of sanitation, and insufficient water for maintaining hygiene. In fact, over 2 million deaths occur each year due to water -related diarrhoea alone. At any given time, almost half of the people in the developing countries suffer from water-related diseases (Gleick, 2002). Worldwide, diarrhoea remains the second leading cause of deaths among children under 5 years of age, after pneumonia. It is responsible for an estimated 1.7 billion cases of diarrhoea, or on average, 2.9 episodes/child/year, and an estimated 1.87 million deaths among children under 5 years of age. The highest burden of disease is borne by children in the age range of 6-11 months: 4.5 episodes/child/year (Joe Brown *et.al,* 2007).

Studies published in 2009 and 2012 focus on the effects of access to safe water, hand washing facilities, and hygiene education on school-age children. A high incidence of diarrhoea contributes to the mortality of about 1.9 million while new diarrhoea cases to the extent of 4 billion (estimated) annually, especially among children under five years old. Diarrheal incidences among children during their first few years of life have been shown to limit their growth by 8 cm besides causing an IQ point reduction as they progress to about 7 or 8 years of age. However, hygiene and sanitation interventions have had a considerable impact in terms of reducing diarrhoea incidences and absenteeism rates among school-age children (Joshi, 2013).

An editorial published in the Indian journal of Public Health reveals that water supplies improve hand hygiene and reduce not only diarrhoea-related child mortality, but also respiratory infections. Yet another study conducted in Rangoon indicates that hand washing is effective in reducing the diarrhoea-related morbidity. The results emerging from studies conducted in Calcutta (Kolkata) reveal that, only a few use soap and water for hand washing before meals (13%), before serving food (1%), before cooking (1%) and after cleaning the child's faeces (5%), while 89% of the respondents in rural areas consider that diarrhoea and dysentery could be prevented by washing hands, but do not give importance to hand washing as a part of preventing incidences of diarrhoea over other methods like maintaining cleanliness, boiling and purifying water before use (Ray, 2009).

1.3.1 Programmes related to Water and Sanitation

In India, although the provision of rural water supply (RWS) is primarily the responsibility of the respective State Governments, the Central Government contributes a significant part of the program funds for this sector. Allthrough the Five Year Plans, the Central Government introduced a variety of policies and programs to address the issue of drinking water. The first national water supply and sanitation program was introduced during 1951- 56 as part of the Government's health policy. Subsequently the state govt's gradually built up their respective Public Health Engineering Department (PHED) for tackling the problem of rural water supply and sanitation.

The first major push to rural water supply came with the Accelerated Rural Water Supply Program (ARWSP) in the 1970s, with full grants to the State governments for implementing water supply schemes in problem villages. By March 1981, the coverage of rural water supply was 30.8 per cent. Following the International Drinking Water Supply & Sanitation Decade (IDWSSD) [1981-91], the second major push came with the establishment of the National Drinking Water Mission (NDWM).

NRDWP - National Rural Drinking Water Programme. This programme was launched in April 2009 by the then Department of Drinking Water and Sanitation (presently Ministry of Drinking Water and Sanitation), for assisting states in providing drinking water to the rural population in India. 'Drinking Water Security' refers to providing "every rural person with adequate safe water for drinking, cooking and other domestic needs on a sustainable basis", (NRDWP guidelines, 2010).The Government of India strategic plan for Rural Drinking Water goals are:

1. To ensure that every rural person has enough safe water for drinking, cooking and other domestic needs as well as livestock through out the year including during natural disasters.

2. By 2022 every rural person in the country will have access to 70 lpcd within their household premises or at a horizontal or vertical distance of not more than 50 meters from their household without barriers of social or financial discrimination. This indicates that the Government is committed to according a top priority to ensure water security to all the people. It must, therefore, include measures to address source sustainability, water quality and operation and maintenance.

1.3.2 Objectives of NRDWP

The main objectives of National Rural drinking Water programme are to:

a) Enable all households to have access water and use adequate and safe drinking water;

b) Enable communities to monitor and keep surveillance on their drinking water sources;

c) Provide an enabling support and environment for Panchayat Raj Institutions and local communities towards the management of their own drinking water sources and systems in the villages;

d) Ensure a combined approach with respect to rural water supply and rural sanitation so as to achieve saturation of habitations through both these services;

e) Promote participative planning and implementation of water resource management practices;

f) Move away from over dependence on single source to multiple sources through conjunctive use of surface water, groundwater and rainwater;

g) Incentivize states to hand over the management of schemes to Panchayat Raj Institutions (PRIs) through introducing a Management Devolution Index (MDI) based on specific indicators;

Sanitation

Total Sanitation Campaign (TSC) has been renamed as "Nirmal Bharat Abhiyan"(NBA). The objective is to accelerate the sanitation coverage in the rural areas so as to comprehensively cover the rural communities through renewed strategies and saturation approaches. Nirmal Bharat Abhiyan (NBA) envisages covering the entire communities for saturated outcomes.

The main objectives of the sanitation programme are to:

- Bring about an improvement in the general quality of life in the rural areas;
- Accelerate the sanitation coverage in rural areas with a view to achieving the vision of

'Nirmal Bharat' by 2022 with all gram Panchayats in the country attaining 'Nirmal' status;

- Motivate communities and Panchayat Raj Institutions in promoting sustainable sanitation facilities through organising awareness creation and health education programmes/ campaigns;
- To cover the remaining schools not covered under Sarva Shiksha Abhiyan (SSA) and Anganwadi Centres in the rural areas through providing proper sanitation facilities and undertake proactive promotion of hygiene education and sanitary habits among students;
- Encourage cost-effective and appropriate technologies for promoting ecologically safe and sustainable sanitation practices;
- Develop community based and managed environmental sanitation systems focusing on solid & liquid waste management for achieving an overall cleanliness in the rural areas.

The funds allocated by TSC towards the programme for the year 2007-08, in Odisha, amount to 47% while for 2009-10 to only 32%. In AP, the same amount to only 29% for 2007-08 and 24% for 2009-2010. In 2011, Odisha achieved 54% of its physical target of Individual Household Latrines (IHHL) by spending 28% of funds. The second largest component of TSC relates to the construction of school toilets (GOI, 2012).

Government of India (GOI) has been promoting sanitation coverage in a campaign mode to ensure better health and quality of life for people in rural India. To add vigour to its implementation, GOI launched an award based Incentive Scheme for fully sanitized and open-defecation free Gram Panchayats, Blocks, Districts and States called Nirmal Gram Puraskar (NGP) in October 2003 and gave away the first awards in 2005 as part of its flagship scheme, Total Sanitation Campaign (TSC). Nirmal Gram Puraskar till 2011 was given by Ministry of Drinking Water and Sanitation (MoDWS), Government of India, at all levels of PRIs, that is, Gram Panchayat, Block Panchayat and District Panchayat.

- The Nirmal Gram Puraskar Yojana, a central government scheme for rewards and incentives and recognition from president of India, was subsequently introduced in 2007, to increase the sanitation coverage in rural areas (Dobe *et al*., 2011).

Table 1.1 Incentive pattern under Nirmal Gram Puraskar : A unique experiment in sanitation coverage in India

Particulars	Gram Panchayat					Block		District	
Population Criteria	<1000	1000 -2000	2000-5000	5000-10000	10001 and above	Up to 50000	50001 and above	Up to 1 million	Above 1 million
PRIs(Rs.Lakhs)	0.5	1.00	2.00	4.00	5.00	10.00	20.00	30.00	50.00
Individuals (Rs. lakhs)	0.10					0.20		0.30	
Organizations (Rs.Lakhs)	0.20					0.35		0.50	

Source : NGP Brochure, 2007

Table 1.2 State-wise break up of award winning (NGP) Gram Panchayats

State	GPs 2006	GPs 2007	GPs 2008	GPs 2009	GPs 2010	GPs 2011
Andhra Pradesh	10	143	663	272	44	142
Madhya Pradesh	1	190	682	639	344	212
Odisha	8	33	94	20	81	48
Total	**19**	**366**	**1439**	**931**	**469**	**402**

Source: Department of Drinking Water Supply, GOI,2011-12)

In India, water supply and sanitation, added to the national agenda since the first five-year plan period (1951-56), continue to be an important component of planning even to date. Government of India and state Governments keep investing huge amounts on rural drinking water schemes. However, despite the government efforts, the sector continues to be beset with several problems such as deterioration of ground water sources, competing demands for water resources, poor institutional governance, lack of coordination between the government departments, lack of professional services to manage the water supply system, etc, which act as the major hindrances in the implementation of projects.

In spite of the implementation of several programmes, during the past six decades, as per Census 2011, only 30.8% of the rural households obtain drinking water from taps, while 22% of the rural households have to walk more than 500 meters for fetching drinking water. Thus, the major challenge before the Central and State governments, is to improve the accessibility of adequate and quality drinking water and sanitation to the people, especially rural communities and thereby, the health conditions of various communities. Access to clean water is a key factor in improving health as it provides scope for reducing poverty indirectly as well as achieving sustainable development. Freeing women and young girls from the back-breaking travelling long distances to collect water

can contribute to achieving gender equity besides improving economic possibilities for families, as women have more time for income-generating activities, while young girls can attend school (Watkins *et al*., 2006). Improved health resulting from contamination-free water promises not only a better quality life for people, but also eases pressure on health care systems, and can drastically reduce the number of work days lost due to ill health.

Almost 1/10th of the global burden of diseases can be attributed to water sanitation & hygiene. In India, 65% of its rural areas do not enjoy basic sanitation facilities. According to Census 2011, around 53.1% of the people in the country still do not have access to sanitation facilities. A sustainable behavioural change in people and prioritization of certain control strategies are important in terms of improving the sanitation status of the country (Ganesh *et al*.,2013). However, there exist variations across different states. A NSSO (2008-09) study shows that access to toilets in rural areas is as low as 8 percent in Jharkhand and as high as 93 percent in Kerala (Kurian Baby, 2012). According to Census 2011, India, amongst different states, Jharkhand and Odisha tops the list with as high as 78% of homes having no toilet facilities, while the figure is 76.9% for Bihar, 71.2% for Madhya Pradesh and 50.4% for Andhra Pradesh (Census, 2011).

Mean latrine coverage among the Odisha villages was 72% (compared to 10% in comparable villages in the same district where the Total Sanitation Campaign had not yet been implemented), though three of the villages had registered less than 50% of coverage. Among these households with latrines, more than a third of them (39%) were not being used by any member of the household. Over one third (37%) of the members of households with latrines reported never defecating in their latrines. Less than half (47%) of the members of such households reported using their latrines at all times for defecation. Combined with the 28% of households that did not have latrines, it appears that most of the people in these communities still practise open defecation (Barnard, 2013).

The implementing agencies trend to focus mainly on the creation of toilet facilities, ignoring sustenance and ecological safety aspects. According to Strategic Plan-2011-22, the local government institutions in charge of operating and maintaining the infrastructure are ineffective and also lack the required financial resources to carry out their development-related functions. The impact of poor sanitation and resultant episodes of illness invariably lead to the loss of man days of work. The household adult members have to either forego their productive labour, or have to stay at home to take care of sick members of the household. Due to a consistent loss of wages, they might as well find themselves trapped in a vicious cycle of poverty.

The new guidelines of NGP (GoI, 2012c) follow these principles in that 75% of the award money is kept as a fixed deposit in the respective Gram Panchayat's name to be released only after two years of maintaining the open defecation-free status (GoI, 2012c). However, the financial incentive in itself does not seem to be serving as a prime motivational factor and hence there should be an adequate staggered recognition for sustaining the ODF status. The sustainability should be monitored by employing water quality and health outcomes rather than merely going about constructing toilets for all the households (Kondepati, 2013). Most of the slum residents lacking in hygiene with diseases believe that most of the illnesses like fever that affect people, especially children, are caused by flies and mosquitoes which flourish in the unhygienic, dirty conditions surrounding the slums (Snehalatha, 2011).

The lack of adequate in- house sanitation can lead to significant economic losses for the country. As per a recent study carried out by Water and Sanitation Program (WSP), if the economic losses linked to poor sanitation are monetized, the results are staggering. The adverse economic impacts of inadequate sanitation in India due to a poor coverage child mortality etc amount to Rs. 2.4 lakh crore (US $ 53.8 billion), or Rs. 2,180 (US $ 48) per person as of 2006. This works out to 6.4% of Gross Domestic Product (WSP, Economics of Sanitation Initiative, 2010). While the country has come a long way since then and all these indices stand improved to a great extent, the linkage between an inadequate sanitation coverage and economic loss is of extreme significance (Strategic Plan, 2012)

Major policy initiatives with respect to water, sanitation and health:

The Union Cabinet vide its decision dated 1st May 2013 has approved the launch of National Urban Health Mission (NUHM) as a Sub-mission of an over-arching National Health Mission (NHM), with National Rural Health Mission (NRHM) being the other Sub-mission of National Health Mission. Process and outcome indicators are to be developed to reflect equity, quality, efficiency and responsiveness. Targets for communicable and non-communicable diseases will be set at the state level based on the local epidemiological patterns, while taking into account the funding available for each of these conditions. The endeavour towards ensuring the achievement of those indicators is:

1. Reduce IMR to 25/1000 live births;
2. Prevent and reduce mortality & morbidity due to communicable, non- communicable and emerging diseases;
3. Ensure annual Malaria Incidence to be <1/1000

4. Ensure less than 1 percent microfilaria prevalence in all districts
5. Eliminate Kala-azar by 2015; achieve <1 case per 10000 population in all blocks

The National Rural Health Mission is an initiative undertaken by the government of India to address the health needs of underserved rural and urban areas. The thrust of the NRHM is on establishing a fully functional, community owned, decentralized health delivery system with inter-sectoral convergence at all levels to ensure a simultaneous action on a wide range of determinants of health such as water, sanitation, education, nutrition, social and gender equity.

NRHM has provided community health volunteers called Accredited Social Health Activists (ASHAs) for establishing a link between the community and health system. Their activities include:

- To improve the health care system delivery in the rural areas.
- To supply adequate quantities of essential quality drugs and equipment to PHCs on a regular basis
- To envisage a major shift in the governance of public health by giving a leadership role to the Panchayati Raj Institutions in all matters at the district and sub district levels.
- District health plan would be a reflection of synergy between village health plans, state and national priorities of health, water supply, sanitation and nutrition.
- Visualize the provision of decentralized health care at the grass roots level and for this involvement of Panchayati Raj Institutions is considered to be important. An institutional arrangement for constituting Village Health and Sanitation Committees VHSCs) under the headship of Gram Panchayat (GP) is considered important by involving elected GP members of VHSCs for monitoring and implementing of health services at the village level and also for improving the health facility with the slogan "people health in their hands".
- Funds to the extent of 26.14% i.e. Rs. 1811.74 crore have been released under NRHM outlay.
- Untied fund of Rs. 10,000 to SHGs:
- Release of funds for upgradation of two CHCs per district to IPH Standards.

Village level Health and Sanitation Committees will be responsible for the Village Health Plans. ASHA, Aanganwadi Sevika, Panchayat representative, SHG leader, Community based Organisations like Parents Teachers Associations (PAT) Mother Teacher Association

(MTA) Secretary and local CBO representative will be key persons responsible for the household survey, the Village Health Register and the Village Health Plan. The Gram Panchayat Level Health Plans, comprising a group of villages in many states and a single village in a few, will be worked on at the Sub Health Centre Level. The Gram Panchayat Pradhan, Auxiliary Nurse Midwife (ANM), Multipurpose Worker (MPW), a few Village Health & Sanitation Committee representatives will be responsible for designing the Gram Panchayat Health Plan. They will also be responsible for overview and support for the household survey, preparation of Village Health Registers and village Health Plans-the Gram Panchayat /SHC level would also organize activities like health camps to facilitate the planning process (NRHM Frame Work, 2005-12).

1.3.3 Sanitation

Under sanitation, policies related to sanitation and rewards for good performing villages and ground level problems are discussed below.

Pandit Jawarharlal Nehru, the first prime minister of India once said in the early 1950s that "the day every one of us gets a toilet to use, I shall know that our country has reached the pinnacle of progress". Lack of sanitation and the failure to promote hygiene and behavioural change are responsible for the transmission of diarrhoea, sistosomiasis, cholera, typhoid and other infectious diseases affecting millions of human beings. It is estimated that one gram of human excreta contains 10,000,000 viruses, 1,000,000 bacteria, 1,000 parasite cysts and 100 parasite eggs. The sanitation facilities are extremely poor and require lot of improvement for controlling the prevailing waterborne diseases like gastro-enteritis, malaria, diarrhoea, cholera, typhoid, infections, hepatitis and many other diseases caused by various types of viruses/ bacteria in the body. Field observations and studies suggest that the sanitation problem is more severe in rural areas where a mere 3% of the population has access to sanitary toilets (Sharma, 2007).

Poor Sanitation is also one of the world's leading causes for the spread of diseases and infant mortality. Sanitation refers to the provision of facilities and services for the safe disposal of human waste. Many people lack access to sanitation facilities. Rural sanitation, in particular, came into focus in India during the World Water Decade of the1980s. The Central Rural Sanitation Programme (CRSP) was started in1986 to provide sanitation facilities in rural areas. It was a supply driven, infrastructure oriented programme that relied heavily on high levels of subsidies for latrine construction. This approach was subjected to criticism as the sanitation coverage progressed very slowly between 1990 and 2000. The Government has changed the strategy and adopted "Demand Driven and community-led Approach" replacing the high subsidy approach and launched the Total Sanitation Campaign (TSC) approach in 1999. It is a comprehensive programme

aimed at ensuring sanitation facilities in rural areas with a broader goal of eradicating the practice of open defecation. To add vigour to the TSC, in October 2003, Government of India initiated an incentive based scheme called 'Nirmal Gram Puraskar'(NGP). NGP is given to those "open defecation free" Nirmal Gram Panchayats, Blocks, and Districts which have become fully sanitized. The incentive provision is for Panchayati Raj Institutions (PRIs) as well as individuals and organizations as the drivers of sanitation movement. The 12th plan goal is to create an open- defecation free country by 2017 through providing adequate number of community and sanitary facilities.

Main Objectives of the TSC/NBA(Nirmal Bharat Abhiyan)

- Accelerating sanitation coverage in rural areas through providing access toilets to all by 2012.
- Motivating communities and Panchayati Raj Institutions towards promoting sustainable sanitation facilities through awareness creation and health education.
- Providing schools and anganwadis with sanitation facilities in rural areas by March 2013 and also promoting hygiene education and sanitary habits among students.
- Encouraging cost-effective and appropriate technologies for promoting ecologically safe and sustainable sanitation.
- Developing community-managed environmental sanitation systems focusing on solid & liquid waste management.

Sanitation facilities-related experiences in different states:

The main objective of the total sanitation campaign[4] in India is to accelerate the sanitation coverage in rural areas through facilitating access to toilets for all by 2012. This programme includes "Nirmal Gram Puraskar[5]" which has helped accelerate the pace of implementation of the programme.

Under Sanitation programme, Village Water and Sanitation Programme (VWSC) at the village level is a very important institution. However, according to a study carried out in

[4] For proper solid and liquid waste management, through PRIs, communities and schools, public has to be educated and motivated. TSC encourage use of cost effective and appropriate technologies for ecologically safe and sustainable sanitation for good health. TSC is part of Bharat Nirman and flagship programmes in India. The performance of the project TSC was very satisfactory in 2002-03, therefore the entire central rural sanitation programme has been converted into Total Sanitation Campaign (TSC). Under TSC the target is to achieve 100 percent coverage by the end of 11th five year plan (2012).

[5] Total sanitation drive include use and maintenance of hygienic latrines, hand wash, water points well managed, waste water disposal in hygienic way and clean public places.

Tamilnadu, awareness among residents regarding these committees is poor. Out of 15 local residents, who were interviewed,10 (66.7%) were aware of the number and details of members required for VWSC formation. However, all of them were not aware of the guidelines issued by NRHM with regards to VWSC formation nor did they have any idea about the process of receiving funds for VWSCs (Ganesh *et al.*, 2013).

A study in Maharastra shows how the awards motivated the villagers in improving sanitation in their villages. The Sanitation campaign in Yavatmal district of Maharastra was implemented based on the principles and guidelines of TSC with additional incentives and innovations. The interventions were successful in achieving an open defecation-free (ODF) status for the entire village in a short span of time and was expected to be replicated in other villages. Overall, the campaign aims at mainly achieving an ODF status (Pardeshi, Shirke & Jagtap, 2008). Once the goal of Nirmal Gram status is achieved, it will be challenging to sustain the interest, collaboration, and cooperation on a campaign mode (Pardeshi *et al.*, 2008).

Despite the government's serious efforts, by and large, the results are not satisfactory. According to the survey conducted in 107 villages across nine agro-climatic zones of Andhra Pradesh, only 12 percent of the households (all the family members) use toilets and only some family members of 22 percent households use toilets. While all the family members of 66 percent of the households practise open defecation (Snehalatha, Venkataswamy and Sirisha, 2012).

Sanitation also has socio-economic equity implications. Vulnerable groups (the poor, children, women, the disabled and elderly) tend to suffer the most from the economic impacts of poor sanitation. In fact, diseases associated with poor sanitation have been closely correlated to poverty and infancy which, by themselves, account for about 10% of the global burden of diseases (Minh, 2011).

Large variations in the construction activity of latrines have been noticed. For instance, the government of Andhra Pradesh has sanctioned 2.22 lakh Integrated Low Cost Sanitation (ILCS) units in 81 urban centres including Hyderabad city in stage III. The progress however, is low in Rayalaseema (54 percent) as compared to Coastal Andhra (90 percent) and Telengana (81 percent) (Rammohan Rao and Venkataswamy, 2012). According to another study conducted in Andhra Pradesh, subsidies given for the construction of toilets are not benefitting the deserving and intended beneficiaries (Alivelu and Ratna Reddy, 2012).

1.4 Relevance of the Study

Although several institutions and scholars have carried out studies as part of evaluating the performance of programmes/schemes meant for providing drinking water and sanitation in terms of households having access to adequate and safe drinking water and sanitation, not many studies have been carried out focusing on the impact of drinking water and sanitation on health conditions of communities, especially in cross-cultural context. The present study is a modest attempt in this direction. The study was undertaken in three states of India (Andhra Pradesh, Madhya Pradesh & Odisha).

1. Framework / design of the study:

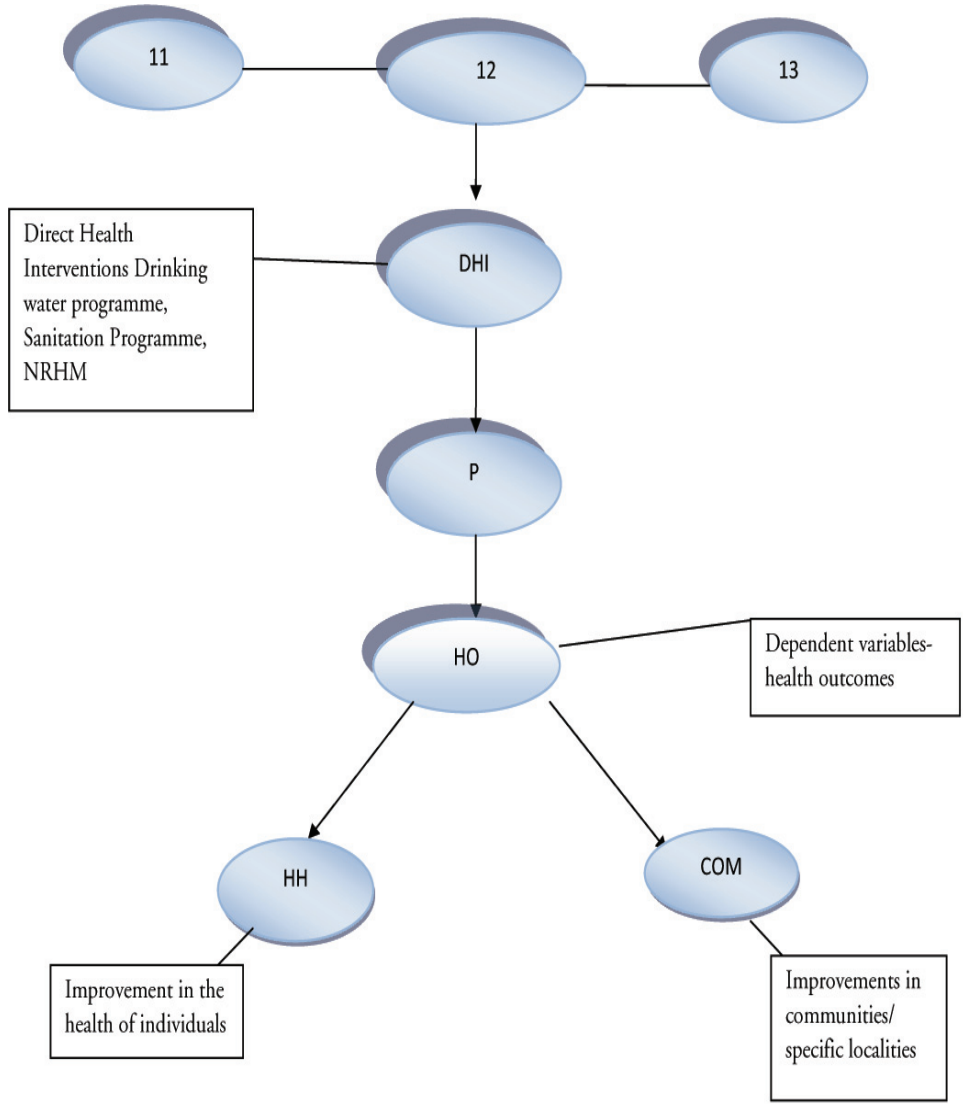
The study on effects of Drinking Water and Sanitation on Health of Communities has been designed/ conceptualized, keeping in view the fact that water and sanitation and health issues are closely interrelated and that any policy intervention in respect of water and sanitation affects the health status of people. The study aims at analysing the process of implementation of water and sanitation programmes as also identifying the factors that contribute to an effective implementation of policies and also hurdles that hamper progress of programmes. Further, unlike other studies, the present study focuses on the effects of Water and Sanitation programmes on the health status of people, especially in the rural context. Fig 1 describes the framework of the study.

As shown in figure 1, positive health outcomes can depend on different factors: direct health interventions and other institutional interventions. When health programmes are implemented properly, morbidity levels in the rural areas may come down as also episodes of diarrhoea and an improvement in nutrition absorption among children etc. However, positive health outcomes largely depend on how various institutions, processes and programmes interact with one another. The study is basically explorative and analytical in nature as it depends heavily on empirical work/field data.

1. Research questions:

- Whether the provision of sanitation facilities and protected water supply programs introduced, have paved the way for better health outcomes;
- Whether these programmes have led to any change in the health status of communities in terms of health epidemics (communicable diseases), if so in what way:
- Whether NGP villages with an open defecation- free status, experience a positive/ desirable behavioural a change in terms of hygiene practices, as compared to / differentiated from non- NGP villages practising open defecation;

Figure 1. 1 : A Broad Frame Work of the Study



HH – households COM - Community HO – Health Outcomes DHI – Direct Health Interventions Drinking water programme, Sanitation programme, NRHM etc	P - Processes The way different institutions interact achieve their goals I1,I2,I3 - Institutions Institutions like VWSC, VHSC, SHGs, other CBOs etc at different levels

- Whether institutions at the village level have positively impacted the health status of communities;
- What has been the role of the village level institutions /mechanisms such as VWSCs, VHSCs, CBOs etc in the implementation of water and sanitation programmes ?

2. The main objectives of the study are:

- To assess the effects of water and sanitation programs on the health status of families and health outcomes (including individuals) and to understand the inter-linkages involved in terms of impacting on people's health
- To understand the role of institutions like VWSCs, VHSCs, SHGs, CBOs etc.,in the processes adopted for achieving Open Defecation Free (ODF) villages and provision of clean drinking water to all and,
- To understand the role of institutions and processes coming in the way of achieving the ODF status of villages and supply of drinking water.

3. Hypothesis

- The presence of institutions and their interaction with PRIs and processes adopted in ODF villages for providing safe drinking water and sanitation may be more effective (in terms of fund allocation, utilization, meetings, decisions taken etc.) as compared to those in non-ODF villages.
- The availability of protected water/sanitation in ODF villages may have a significant impact on the episodes of morbidity at the household level and the incidence of health epidemics at the community level in relation to non-ODF villages.

Chapter- II

1. Methodology and Sampling Design

The study employed a multi-stage sampling method for selecting the states, districts, blocks/mandals, villages and households (The details are given in a table form - see table 2.1 The three states were selected in terms of high- focus and non-high focus, as per the norms stipulated under NHRM guidelines Fig 2.2. The states of MP and Odisha were selected under the high -focus category, while AP state under the non-high focus category. Following the same criterion/ method, i.e. high-focused districts and the number of villages identified/awarded with 'Nirmal Puraskar', one district each from MP (Dhar) and AP (Visakhapatnam) and two districts from Odisha (Baleswar and Kendujhar), were selected.While selecting the districts a due weightage was given to those districts where more number of villages have received Nirmal Puraskar awards (2011). A "Nirmal Gram"(NG) is an "Open Defecation Free" village where all houses, schools and anganwadi have access to sanitary toilets and with awareness amongst the community regarding the importance of personal and community hygiene and a clean environment.

Keeping in view the above frame work, a due attention was given in to the selection of Blocks/Mandals. From each of the selected districts (4 districts from 3 states), a total of 16 Blocks/Mandals were selected. Six villages from each of the selected districts were selected under Nirmal Pursakar villages. Similarly, six control villages (Non- NGP) from each of the selected districts were also selected. Thus, in all, the study covered three states, four districts, 16 Blocks/Mandals; 36 villages and 720 Households (see table 2.1). While selecting the households in villages, the criterion followed was that there be atleast one child aged between 0 to 5 years. The rationale being the evidenced/established correlation between infant/child health and consumption of safe/clean water and personal and household sanitation, as demonstrated by a number of studies.

The villages have got certain common characteristics like dependence on agriculture, economic inequalities, variations in drinking water and sanitation facilities, and, services

and access to different government programmes including water and sanitation programmes. However, these villages / households[6] are diversified in certain respects such as size, location, irrigation facilities, sources and quality of drinking water, sanitation, physical infrastructure facilities and human resources etc. These factors help us capture the ground realities and also the impact of water and sanitation programmes on the health status of the villagers.

Table 2.1 Selection and sample design

S.No		Sample unit description	Criteria followed for selection	Units	Remarks
1	Description of the stage of sampling	State	Purposive Sampling 2 states from high-focus category and 1 from non-high focus category	3	Madhya Pradesh (MP) and Odisha were selected from high-focus states and Andhra Pradesh from non-high focus states
2		District	Purposive High-focus District with more number of Nirmal Puraskar villages	3	In respect of MP, from among high focus districts with more number of Nirmal Puraskar villages- Rewa (33 villages), Dhar (22 villages), Sehore (20 villages), Shajapur (14 villages)etc - Dhar district was selected. In respect of AP, Visakhapatmam district was chosen because it is only the district with a large, number of NGP

Contd...

[6] There are no previous studies on morbidity in the three study states. Hence the sample is largely based on time and budget.

S.No		Sample unit description	Criteria followed for selection	Units	Remarks
	Description of the stage of sampling		Purposive High-focus District with under more number of Nirmal Puraskar villages	3	villages, while other high- focus districts do not have an adequate number of NGP villages for selection.
					In respect of Odisha, no other high-focus district has at least 6 Nirmal Puraskar villages. Baleswar district in Odisha was selected for Nirmal puraskar villages. While Kendujhar district in Odisha adjoining Baleswar and also a high-focus district was selected for choosing control villages.
3		Block/Mandal	Of Nirmal Puraskar villages spread over more than 3 blocks/ mandals, a maximum of 3 blocks/mandals were chosen (in order of the mandals with highest number of Nirmal Puraskar villages)	6 blocks in AP 4 blocks in MP 6 Blocks in Odisha Total=16	In case of selected blocks/mandals were contiguous, care was taken to see that the villages were not close to each other. If the sample villages were sparsely spread among many blacks/mandals, more than 3 blocks /mandals were selected to get the required number of villages.

Contd...

S.No		Sample unit description	Criteria followed for selection	Units	Remarks
4	Description of the stage of sampling	Villages	Among the total Nirmal Puraskar villages in the sampled district, 6 villages were selected randomly. Six control villages were selected randomly from the sampled blocks/ mandals. 36 (12 villages from each state)	36 (12 villages from each state)	
5		Households	Nirmal Puraskar villages: A total of 60 households were selected randomly from six villages with sanitation facility and similarly, 60 households from the same villages without sanitation facility. **Control villages:** A total of 60 households were selected randomly from six villages with sanitation facility and similarly, 60 households from the same villages without sanitation facility.	720	In the state, from each of the 2 types of households, 120 households were chosen from the sampled villages proportionate to the village population.

2.1 Rationale underlying the sample frame

In the present study, it is not intended to give estimates. The nature of the study necessitates an adequate sample to capture variations in behavioural change. Keeping in view the variation, availability of number of Nirmal Gram Puraskar (NGP) villages, time and resource constraints, it was decided to select 6 NGP villages and 6 Non NGP

villages from each study state. It is assumed that Non-NGP villages are comparable with NGP villages in the study area.

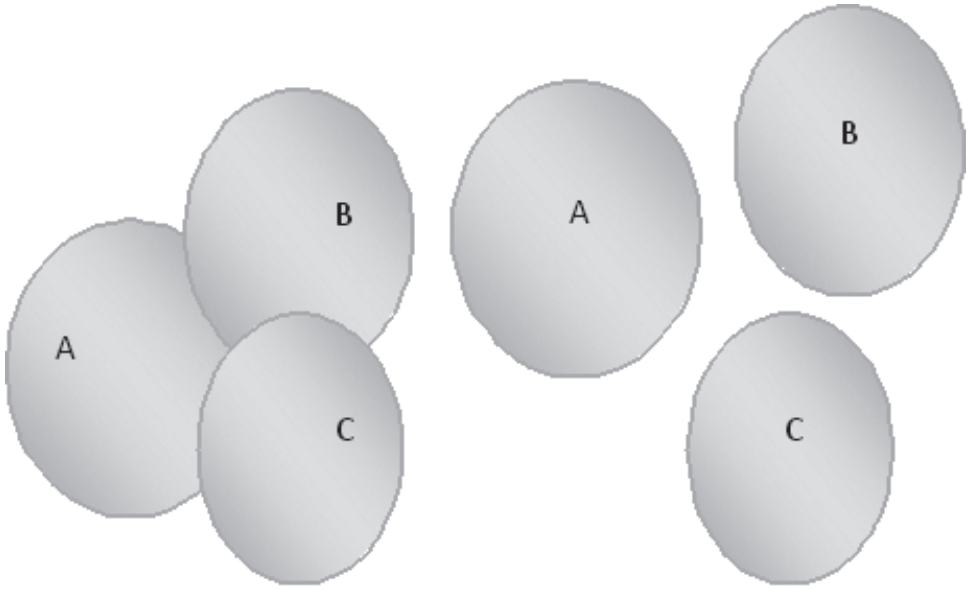
In respect of Andhra Pradesh (AP), from among six NRHM high focus districts, only Visakhapanam district has more than six 'Nirmal Gram Puraskar' awarded villages and, therefore, this district was chosen for the study. Out of 7 villages, 6 villages were selected for the study. Another 6 normal villages were chosen as control villages. On the same lines, in Madhya Pradesh, there are many high-focus districts with a high number of NGP villages (Rewa-33, Dhar-22, Sehore-20, Shajapur - 14). Dhar district with more number of NGP villages was chosen for the study. Following the same guidelines, 6 NGP villages chosen randomly. Following the same criteria as in the case of AP, 6 control villages were chosen from Dhar district. However, in respect of Odisha, identifying adequate Nirmal Puraskar villages from any of the high focus districts was found to be difficult. Therefore, Baleswar district was chosen for selecting programme villages and Kendujhar (adjacent to Baleswar district and also a high-focus district) was chosen for selecting control villages. Details of sampled villages and households are shown in Table 2.2.

Table 2.2 Sampled villages and households across the three states

S.No	State	District	NGP Villages		Non-NGP Villages		Total
			HHs with Sanitation facility for quite some time	HHs with Sanitation facility recently	HHs with Sanitation facility for quite some time	HHs with Sanitation facility recently	
1	Andhra Pradesh	Visakha patnam	6 villages 121 HHs		6 villages 123 HHs		12 villages 244 HHs
2	Odisha	Baleswar	Baleswar 6 villages 121 HHs		Kendujhar 6 villages 119 HHs		12 villages 240 HHs
3	Madhya Pradesh	Dhar	6 villages 120 HHs		6 villages 119 HHs		12 villages 239 HHs
	Total Households						723 HHs
	Total villages						36 villages

From among the Nirmal Puraskar villages spread over more than 3 blocks/mandals, 6 villages were chosen from three different blocks/mandals, two from each block/mandals. In case these blocks/mandals were found contiguous, care was taken to ensure these were not close to each other (Fig 2.1).

Figure 2. 1: Selection of villages in contiguous and widespread villages



Criterion followed for infant/child presence through house listing: While selecting households from the villages, care was taken to ensure that there was at least one child aged between 0-5 years in those households on the ground that children are more susceptible to diseases due to lack of sanitation and proper drinking water. For comparison the age of the children should be constant. For information on children aged between 0-5 years, house listing (enumeration of all the households in the village) was done in the study villages. In each category of NGP and control, sampled households from each state come to 240 and 720 from all the three states.

FGDs

In each state 12 FGDs were conducted (6 in NGP and 6 in Non-NGP villages). The Focus Group Discussions were conducted with mothers of children aged 0-5 years for collecting information regarding water and sanitation facilities, health & hygiene practices and working of committees in the villages. The pilot study was conducted in November and December, 2013 in all the three states. Field work commenced in January, 2014 and completed by May, 2014.

Figure 2. 2: Location of the study areas

Andhra Pradesh

Andhra Pradesh: The study was conducted in Visakhapatnam district of Andhra Pradesh. From the district, six mandals were chosen and from each mandal 6 NGP villages and 6 Non-NGP villages were chosen for the study (see table 2.3 and Visakhapatnam Mandal/ Tahsil Map) .

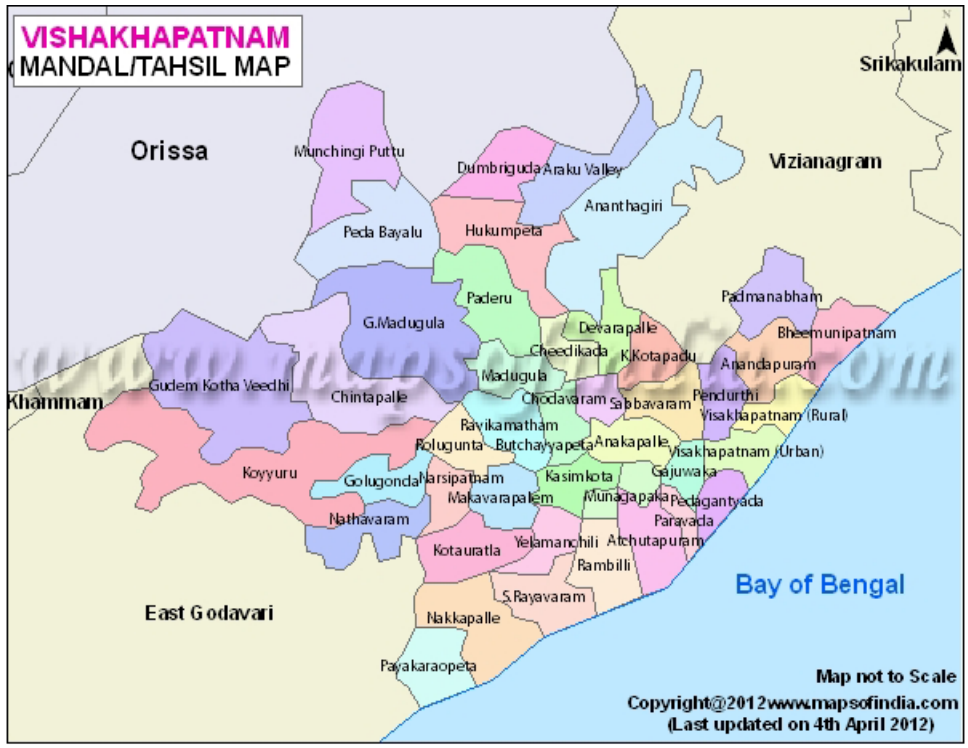


Table 2.3 Nirmal Gram Puraskar villages and Non-NGP villages in Visakhapatnam District in A.P

State	District	Block Name	NGP	Non-NGP
Andhra Pradesh	Visakhapatanam	Butchayyapeta	L.Singavaram	Turlapudi
		Choddavarm	Rayapurajupeta	Damunapalli
		Kotauratla	Rajupeta	Ramachandrapalem
		Madugula	VJ Puram	Gotivad Agraharam
		Ravikamatham	Kavagunta	Gompa
		Yelamanchili	Lakkavaram	Kothali

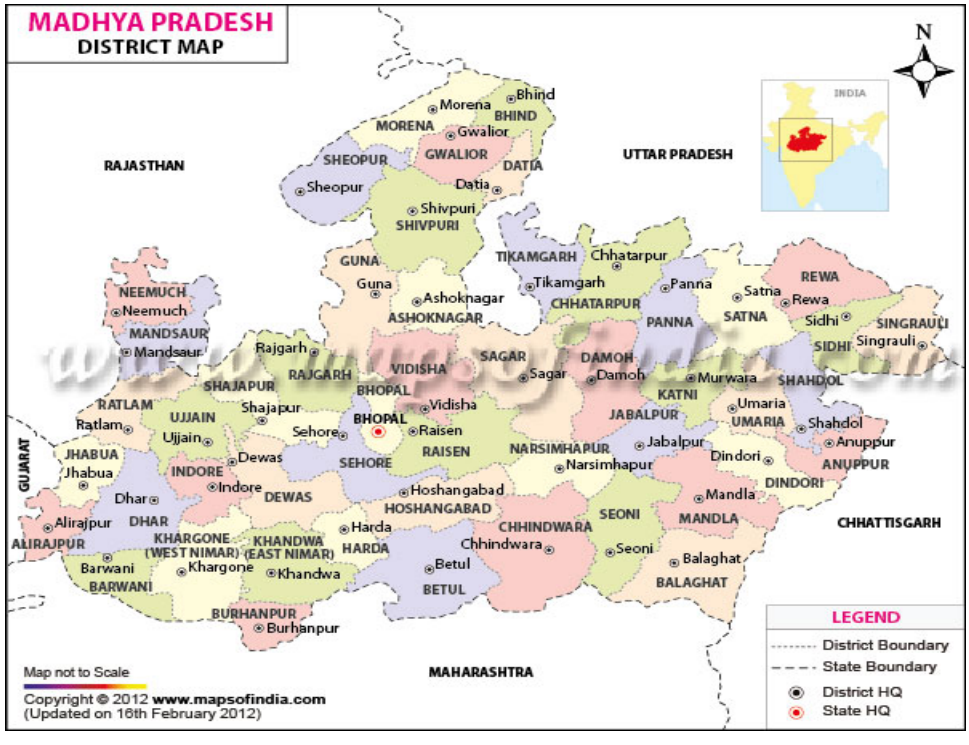
Madhya Pradesh:

Madhya Pradesh: In Madhya Pradesh, Dhar district was chosen for the study. And four blocks were chosen from the district (see table 2.4 and Madhya Pradesh District Map).

Table 2.4 Nirmal Gram Puraskar (NGP) villages and Non-NGP villages in Dhar district in Madhya Pradesh

State	District	Block Name	NGP	Non-NGP
Madhya Pradesh	Dhar District	Badnawar	Nagora	Kachhibaroda
		Badnawar	Pitgara	Hanumantya
		Dharampuri	Morgadhi	Rampura
		Dharampuri	Pedwi	Sala
		Gandhwani	Raipura	Bilda
		Nisarpur	Nawadpura	Amalijhuma

Out of four blocks, 6 NGP villages and 6 Non- NGP villages were chosen for our study. The names of the villages are given above.



Odisha: In Baleswar district, 5 blocks/mandals were chosen. From these Bolcks/mandals, only Nirmal Gram Puraskar (NGP) Villages were chosen,while in Kendujahar District, only Patana block was chosen and from this block, Non-NGP villages were selected for the study (see table 2.5 and Odisha Map).

Table 2.5 Nirmal Gram Puraskar (NGP) villages and Non-NGP villages in Odisha

Sno	State	District	Block/Mandal	NGP	District	Block/Mandal	non-NGP villages
1	Odisha	1. Baleswar (NGP)	Baliapal	Jamakunda	2.Kendujahar	Patana	1.Badhikapudi
2			Basta	Naikudi			2.Mushhakhar
3			Jaleswar	Rajpur			3. Rajanagar
4			Nilgiri	K.P. Lakharaj			4. Kendeiposi
5			Remuna	1.Mangalpur			5. Polanghats
				2.Patripal			6. Chinmaliposi


Odisha
Mayurbhanj
Baleshwar
Bhadrak
Kendrapara
Jagatsinghapur
Jajapur
Kendu-jhar
Dhen-kanal
Cuttack
Khordha
Puri
Sundargarh
Deba-garh
Anugul
Nayagarh
Ganjam
Sambal-pur
Sonapur
Baudh
Kandha-mal
Gajapati
Jharsuguda
Bargarh
Balangir
Kalahandi
Rayagada
Koraput
Nuapada
Nabarangapur
Malkangiri

Table 2.6 Study matrix

OBJECTIVES	RESEARCH QUESTIONS	VARIABLES
To assess the impact of water and sanitation programs on the health status of families including individuals and to understand the factors involved in creating an impact on health (ways in which the communities/ families are impacted).	Whether the implementation of provision of **protected water supply programs has** led to any positive changes (health behaviour) in the health of families (e.g. reduced illness episodes among family members).	**1. Water programs:** 1.1 Availability of water supply in the villages. 1.2. Frequency of water supply. 1.3. Quality of water. 1.4. Quantity of water. **2. Hygiene practices** 2.1 Cleaning of water tanks/water containers. 2.2 Purification of water. 2.3 usage of water in the households. **3. Sanitation programs:** 3.1 Availability of sanitation facility. 3.2 Availability of water for sanitary facilities. 3.3 Frequency of toilet cleaning. 3.4 Hand wash practices in the households. 3.5 Usage of toilets. **4. Hygiene Practices:** 4.1 Measures taken to keep cooked food safer. 4.2 Measures taken to keep personal hygiene.

Contd..Table 2. 6

OBJECTIVES	RESEARCH QUESTIONS	VARIABLES
To understand the inter linkages between the provision of safe drinking water and individual sanitation facilities and better health outcomes	Whether water and sanitation programmes have had a better effect on the health conditions of communities in terms of reduced epidemics (communicable diseases), if so in what way?	1. Incidence of diarrhoea, malaria etc
To understand the role of institutions like VWSC, VHSC, SHGs, CBOs etc. and processes adopted for achieving Open Defecation-Free (ODF) villages and provision of clean drinking water to all.	What is the role of local level institutions such as VWSC, VHSC, SHGs, CBOs etc and processes adopted for achieving Open Defecation Free (ODF) villages and provision of clean drinking water?	1. Functioning of local level institutions 2. Meetings conducted 3. Decisions taken in the meetings for improving water, sanitation facilities 3. Funds availability 4. Extent of utilization of funds 5. Maintenance of water and sanitation records. 6. Maintenance of cleaning of water tanks. 7. Deadlocks in utilization of funds
To understand the role of institutions and processes that hinders the achieving of the ODF status of villages and supply of drinking water	What is the role of institutions and processes that hinder the achieving of the ODF status of villages and supply of drinking water?	1. Poor water and sanitation facilities. 2. Poor functioning of institutions in the villages. 3. Deadlocks in the committees.

Table 2.7 Research tools developed and used for the study

Tools	Assessments
House listing	A household listing schedule was developed for gathering information from each household in the sample villages on sources of drinking water, sanitation facility and also about children between 0-5 years.
Household schedule	A household schedule was developed for gathering information from the head of the family/ mother of the child in the household to know about water, sanitation facilities and health conditions; Health seeking behaviour of households; perceptions of household members regarding the functioning of village level committees related to water and sanitation .
Child Schedule	A child schedule was developed for collecting information from the mother of the child in the household to know about the health and hygienic conditions; Health seeking behaviour of children aged 0-5 years.
Village schedule	A village schedule was used for collecting information about water, sanitation and health facilities, working of committees with respect to water, health and sanitation in the village from the village head / Sarpanch/Village Water and Sanitation Committee member/ Village Health and Sanitation Committee member/ School teacher/ICDS worker/ASHA/Self Help Group member/ NGO member.
Observation tool	This tool was used for assessing the actual situation in the village including water & sanitation practices in schools.
FGDs	Focus Group Discussion guidelines were developed for collecting information from mothers of children aged 0-5 years regarding water and sanitation facilities and health and hygiene practices and the working of committees in the village.

Pilot Study

After draft schedules were prepared, pilot tests were carried out in the 3 states of Andhra Pradesh, Madhya Pradesh and Odisha. In Andhra Pradesh, a pilot test was carried out in Hazipally, a NGP village in Mahabubnagar district on 27th November, 2013. Similarly, a pilot test was conducted in Sadalpur village (NGP) in Dhar district of Madhya Pradesh on 14th December, 2013. In Odisha also, a pilot test was carried out in December, 2013. On the completion of pilot test in the 3 states, the study tools were revised based

on the inputs received from the field in terms of rephrasing, changing the order of questions, additions and deletions and so on.

2.2 Limitations

- Although NGP villages identified were supposed to be fully equipped with toilet facilities both at the household and school levels in the village, we found during the survey, that the situation in the study villages was different.
- In the study villages of the three states, even though VHSCs were present, VWSCs had not been formed with respect to water and sanitation programmes for studying the impact of these programmes on the health status of communities every where.It is important to note that measuring behavioural change or health outcomes or health status is possible only when baseline information is available. This study could not access this information and hence, a major limitation of the study.
- Collection of information pertaining to health parameters at the block/mandal level was extremely difficult, tedious and time consuming as persons concerned were not available. Whatever meagre data was available, we found it too general in nature, not useful to our study objectives.
- In the study areas, though there are SHGs/CBOs (village education committees), it is clear from the FGDs that they are not actively taking up water and sanitation issues.
- In the study, we have covered VHSCs and VWSCs wherever present.
- The study was intended to collect information on the quality of water, mainly based on the perceptions of the household members. However, it was not possible to assess the quality of water in those areas in the absence of respective institutions.
- The study focus was more on programmes than on policy.
- Project budget, spread of study in the 3 states and time were also some of the main constraints faced by the study.

Chapter- III

3. Water and Sanitation Programs and their Effects on the Health Status of Communities in Madhya Pradesh

Madhya Pradesh state related report is presented in the following order: section 3.1 presents a brief description of the basic features of MP - such as population, educational levels, sex ratio etc; section 3.2 deals with drinking water and sanitation issues; section 3.3 provides a profile of the study villages; section 3.4 is all about an analysis of households and children followed by a summary in section 3.5.

3.1 Introduction

Madhya Pradesh, a central Indian state, is the second largest state in the country in terms of area. Like many other states in the country, it has a rich history and heritage. Bhopal is the capital city of Madhya Pradesh; while Ujjain city has a great importance due to its reputation as a major trade centre. The state comprises 50 districts in all.

3.1.1 A basic demographic profile of Madhya Pradesh

As per Census 2011, Madhya Pradesh has a population of about 7.27 crore, as against 6.03 Crore as per 2001 census. The actual total population of Madhya Pradesh, as per 2011 census, is 72,626,809 of which males account for 37,612,306 and female for 35,014,503 respectively. As per 2001 census, the total population was 60,348,023 of which males numbered 31,443,652, while females are 28,904,371.

The population growth over the decade accounts 20.35 percent, while for the previous decade to 24.34 percent. The population of Madhya Pradesh constitutes 6.00 percent of the total population of India as per 2011 census, whereas in 2001, it was 5.87 percent of the total population.

3.1.2 Literacy Rate 2011

The overall literacy rate in Madhya Pradesh has seen an upward trend at 69.32 percent as per 2011 census. Of that, male literacy stands at 78.73 percent, while female literacy at 54.49 percent. As against this in 2001, the overall literacy rate in Madhya Pradesh

stood at 63.74 percent of which males and females accounted for 75.35 per cent and 54.61 percent respectively.

In actual numbers, the total literates in Madhya Pradesh stand at 42,851,169 of which males number 25,174,328 and females 17,676,841.

3.1.3 Sex Ratio

Sex Ratio in Madhya Pradesh is 931 / 1000 males, which is below the national average of 940, as per 2011census. As against this, in 2001census, the sex ratio was 920 per 1000 males.

Table 3.1a A Demographic Profile of MP state

State	2001			2011		
MP	Male	Female	Total	Male	Female	Total
Population	31,443,652	28,904,371	60,348,023	37,612,306	35,014,503	72,626,809
Literacy Rate	75.35%	54.61%		78.73%	54.49%	

Source: 2011 census

3.1.4 Situation in the study district and villages

In Dhar district (selected for the study), 10% of the households are connected with tap water from treated source, while 9.5 percent of the households are connected with untreated tap water; 16 percent of the households depend on uncovered well, whereas more than half (53.3 %) of the households depend on hand pumps; 6 percent of the households depend on tube wells/bore hole and 2 percent of the households depend on rivers/ canals (Census 2011).

In Badnawar block, 9.3%, 10% and 8% of the households are connected with tap water from treated source, untreated tap water and uncovered wells, respectively. More than half (55.2 %) of the households are dependent on hand pumps, and another 14 percent on tube wells/bore holes and 1.8 percent on rivers/canals (Census, 2011).

In Dharampuri block, 15% of the households are connected with tap water from treated source and 25 percent of the households are connected with untreated tap water. More than one fifth of the households (21%) depend on uncovered wells, a little more than one third (34 %) of the families depend on hand pumps. 2 percent of the households depend on tube wells/bore holes and 2 percent on rivers/canals (Census ,2011).

3.2 Water and Sanitation

3.2.1 Sources of drinking water

As per Census 2011, the share of households connected with tap water from treated source in Madhya Pradesh rural areas amounts to 4.7%, while 5.3 % HHs are connected with untreated sources; about one fourth (24 %) of the households depend on uncovered wells, 58.3 percent with hand pumps; about 5% depend on tube wells/ bore wells. This indicates that a large number of households do not have access to safe drinking water and that it is, one of the biggest challenges for the state and local governments (Census 2011).

Fig 3.1 Stored water in a cemented tank in Nawadpura, MP

Table 3.1b Situation of drinking water and sanitation in Madhya Pradesh

Drinking water	Urban	Rural	Total
Within the household premises	2,130,473	1,446,764	3,577,237
Near the household premises	1,157,105	5,664,862	6,821,967
Away from the households	557,654	4,010,739	4,568,393
Total	**3,845,232**	**11,122,365**	**14,967,597**

Source: Census 2011

Sanitation facility	Urban	Rural	Total
Having facility	2,854,081	1,459,201	4,313,282
Not having facility	991,151	9,663,164	10,654,315
Total	**3,845,232**	**11,122,365**	**14,967,597**

Source: Census 2011

Fig 3.2 Drinking water facility in a school in Nawadpura

3.2.2 Sanitation

In rural areas of Madhya Pradesh, only 13 per cent of the households have access to in-house latrine facility, while the remaining 87 percent of the households don't have latrine facility. The type of latrine facilities, that the households have within the premises: 63.4 percent have septic tanks, 6 percent piped sewer system and another 9.6 percent other systems under flush/pour-flush latrines. Under pit latrine, 13.7 percent have slab/ ventilated improved pits; 6 percent have no slab/ open pits. Among the households without latrine facility, 99.5 percent practise open defecation and the remaining 0.5 percent depend on public latrines (Census, 2011).

In rural areas of Dhar district, only 22.2 per cent of the households have access to in-house latrine facility and 77.8 percent of the households go without latrine facility. The type of latrine facility within the premises among the households: 83 percent of the households have access to septic tanks, 5.4 percent have piped sewer system and another 4 percent have other systems under flush/pour-flush latrines. Under pit latrine, 5 percent of the households have access to with-slab/ventilated improved pits; 2.2 percent have without slab/ open pits. Among the households who don't have latrine facility, 99 percent opt for open defecation and the remaining one percent depend on public latrines (Census, 2011).

In rural areas of Dharampuri block, a little more than one third (34.4 per cent) of the households have latrine facility within the household, while two thirds (65.6 %) of the households don't have access to latrine facility. The type of latrine facilities available

within the household premises are: 47 percent of the households have septic tanks; 6 percent have piped sewer system and another 10.4 percent have other systems under flush/pour-flush latrines. Under pit latrine, 19.5 percent of the households have access to with-slab/ventilated improved pits, 16.6 percent without-slab/open pits. Among the households who do not have latrine facility, 98.4 percent practise open defecation and the remaining 1.6 percent depend on public latrines (Census,2011).

In rural areas of Badnawar block, more than one third (38.6%) of the households have in-house latrine facility within the household, while 61.4 percent of the households are without latrine facility. The type of latrine facilities within the premises among the households are: 64.8 percent have septic tanks; 4.7 percent piped sewer system and another 6.7 percent other systems under flush/pour-flush latrines. Under pit latrine facility, 16 percent have with- slab/ventilated improved pits, 6.8 percent without-slab/ open pits. Among the households without latrine facility, 98 percent use open spaces for defecation and the remaining 2 percent depend on public latrines (Census, 2011).

3.3 A Profile of the study villages in the district

For a better understanding of the public policies and governance structures, it is necessary to study the environmental factors like the location, socio-economic structure, infrastructural facilities, civil society bodies, etc., as they wield a considerable influence on the performance of the development programmes. The social development policies such as the provision of protected drinking water and sanitation have to operate in the context of geographical, socio-cultural and political configurations of the society or the areas where they are being operated. The interaction between the environment and administration devised for the implementation of policies is very important, especially at the grass-roots level. In this context, an attempt is made to examine some of the social determinants and infrastructural facilities available in the villages selected for the study. As mentioned earlier, the study was conducted in 12 villages (i.e. 6 NGP and 6 Non-NGP villages) in one district -Dhar of Madhya Pradesh state.

3.3.1 Location and demographic features of the study villages

The villages are situated at a distance ranging between 25 km to 90 km from the district headquarters. The villages are scattered and some of them do not have their own Gram Panchayats. The panchayats administration which play a crucial role in the implementation of safe drinking water and sanitation programmes are located away from the residential localities/habitations.

Agriculture is the main occupation of the villagers. The size of land holdings is economically unviable and the poor people tend to migrate to cities in search of employment. The major crops grown in the villages include wheat, jowar, cotton, soya and paddy etc.

The villages are connected by approach roads to gram panchayats' headquarters. The State Road Corporation operates buses to the headquarters of the Gram Panchayats'. However, many people depend upon private transport and autos managed by private individuals for travelling. The people residing in hamlets do not have proper transport facilities, especially during the rainy season. This causes inconvenience to the people in terms of having a close contact with urban centres, where better service facilities, especially medical facilities, are available. The situation of connectivity is relatively worse in Non-NGP villages, as compared to NGP villages. Most of the people in Non-NGP areas belong to the tribal communities.

The caste groups in these villages fall under four main categories viz, scheduled castes, schedule tribes, other backward classes and forward classes.

3.3.2 Sources of drinking water in the study villages

The villagers depend on hand pumps and bore wells, pipelines connected to bore wells and uncovered wells for drinking water. Among these, a majority of them make use of hand pumps and open wells for drinking water, especially in Non-NGP villages. In NGP villages, people depend on hand pumps, bore wells and protected water supply for consumption of water.

The field investigation reveals that gram panchayats in NGP villages, supply drinking water through tankers. The villagers also collect water from streams, irrigation tanks, which is not safe for direct consumption. They resort to these methods, as they cannot afford to purchase water from private agencies.

3.3.3 Village Water and Sanitation Committees (VWSCs)

As per NHM/ programme norms, in every village, there shall be a Village Water and Sanitation Committee (VWSC) to guide and monitor water and sanitation services at the grass-roots level. In MP, in 6 NGP villages, 5 VHSCs and 2 VWSCs have been formed. Whereas, in Non-NGP villages 4 VHSCs have been formed and there are no VWSCs formed in any of Non-NGP villages. The field based observations reveal that about one fifth of the committees do not meet regularly, especially in Non-NGP villages. The meetings are mostly held in Anganwadi centres and panchayat offices. As many of the households are scattered and are away from gram panchayat offices, meetings are held elsewhere, according to the authorities concerned. In many instances, minutes of the meetings are not recorded and the issues relating to water supply are discussed orally, especially in Non-NGP villages.

The VWSC (Village Water and Sanitation Committee) has maintained that they pay an adequate attention towards creating awareness among the public regarding waterborne

diseases and measures being taken to purify water or alternative methods to procure protected water for maintaining children's health. The data reveals that in nearly two thirds of the villages, especially Non-NGP villages, officials are not paying an adequate attention towards creating awareness among the public regarding the importance of safe drinking water.

Fig 3.3.Anganwadi centre in the school campus in Pedwi NGP Village, MP

It is remarkable to note that in a majority of the villages -both NGP and Non-NGP villages officials are not preparing health plans. In the absence of plans, the resources, money and time of the functionaries and villagers are being wasted. Further, people do not have a ready access to safe drinking water. FGDs with the sample respondents reveal that many of the villagers are not aware of the existence/ constitution of VHSC and their functioning at the village level. However, the village sarpanch/secretaries concerned maintain that they do distribute posters, hand-outs to the villagers as a part of creating awareness among them regarding the importance of safe drinking water and proper maintenance of sanitation both at the household and community levels.

3.3.4 State of water and sanitation facilities in government schools in the study villages

Regarding schools in MP, all the six NGP villages have 6 schools and 6 ICDS centres and similarly, all the 6 Non-NGP villages also have 6 schools and 6 ICDS centres. At the school level, observations and interviews with key authorities and teachers reveal that, out of 12 schools, 6 schools use hand pumps (50%) and 25% bore wells as the main source of drinking water in both the NGP and Non-NGP villages. There is one school each in Non-NGP and NGP villages which have tap connection for supply of safe drinking

water. During the field survey, it has been observed that, the school authorities are unable to provide safe drinking water for children during school hours.

In Non-NGP villages, all the 6 schools use pit latrines, whereas, in NGP villages, 4 schools use pit latrines. Piped sewer system and septic type of latrines are used by NGP schools. However, in NGP village schools, there are separate toilets for girls, boys and teachers. The school management engages/hires the services of private individuals for toilet cleaning, but services are not up to the mark, as the management has failed to pay the charges regularly for the service rendered by individuals. The budget allocation for this purpose is very meagre and, many times, the government does not release the amount on time. As a result, the toilets are cleaned once in a fortnight or a month or sometimes, once in 3 months. This in turn, invariably, cause inconvenience to students in the form of unhygienic or unhealthy conditions and as a result, they hesitate to use toilets. In the absence of adequate budget and proper management, toilets in most of the schools have become defunct.

3.4 A Profile of households and children's behaviour related to water, sanitation and hygiene

This section is based on the data gathered with the help of Household and child schedules. Here, an attempt is made to examine the perceptions of household members representing Nirmal Gram Puraskar and Non-Nirmal Gram Puraskar villages regarding the utilization of water and sanitation programmes and their impact on the health status of the rural communities. The present study drew on the programme (villages under NGP and control-group villages under Non-NGP) approach for covering both the NGP and Non-NGP village households and for juxtaposing the situation with a view to understanding the perceptions of people towards the programmes and their impact on the health of people.

An analysis of the experiences of those who are recipients of the scheme / Nirmal Gram Puraskar is intended to provide insights into the operational dynamics of the programmes. This would also bring out the gap between promise and performance besides highlighting the strengths and weaknesses of the programmes. Similarly, an understanding and assessment of the views of Non-NGP households would provide a clue to understanding the cause's underlying the non-availability of facilities provided by the government. Here, an attempt is made to analyse the socio- economic background of the respondents, representing NGP and Non-NGP villages.

In this section, an attempt is made to discuss water and sanitation issues and the prevalence of waterborne and other illnesses, based on the data collected from households and children (in the age group of below five years).

Fig 3.4 Condition of school toilet in NGP village Nawadpura, MP

Fig 3.5 Pit toilet in a household of NGP Village,Pedwi, MP

Fig 3.6 Water on roads in Pedwi, a NGP village, MP

The gender particulars of the sample households reveal that an overwhelming percentage of them (94.6%) are males, while an insignificant percentage of them are females. A similar situation is prevailing in both the NGP and Non-NGP villages (see Table 3.2). The educational status of the respondents unfolds that most of the female respondents are illiterate, even after the launching of several policies (during the past six and half decades) to improve the educational levels (in the hinterland). And an overwhelming percentage of females (84.62%) are illiterate, while a little over one third of males (39.82%) are illiterate. Among the educated, a majority of them are educated up to primary and secondary levels. A negligible percentage of the respondents (4.8%), especially male members, have completed graduation. It is pertinent to note that the educational levels among females are very low.

The aggregate data reveals that there are variations in the educational levels of the respondents in NGP and Non-NGP villages. Illiteracy is more among Non-NGP villages (46.22%), as compared to NGP villages (38.33%). These trends indicate that the respondents representing NGP villages have been exposed to a conducive environment (in terms of educational levels) in terms of improving the health status of household members considering that the educational levels of households and the use of protected water along side personal hygiene and sanitation have a positive co-relation. Thus, the education levels appear to be one of the preconditions for a proper utilization of water and sanitation programmes and there by the protection of health of individuals (Table 3.2).

Table 3.2 Gender & literacy profiles of the respondents in NGP & Non-NGP Villages

Level of schooling	NGP			Non-NGP			All		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Primary	20	0	20	23	1	24	43	1	44
Percent	17.5%	0%	16.67%	20.5%	14.3%	20.17%	19.03%	7.69%	18.4%
Secondary (6-12)	47	0	47	35	1	36	82	1	83
Percent	41.2%	0%	39.17%	31.2%	14.3%	30.25%	36.28%	7.69%	34.7%
Graduate	7	0	7	4	0	4	11	0	11
Percent	6.1%	0%	5.83%	3.6%	0%	3.36%	4.87%	0.00%	4.6%
Illiterate	40	6	46	50	5	55	90	11	101
Percent	35.1%	100%	38.33%	44.6%	71.4%	46.22%	39.82%	84.62%	42.3%
Total	114	6	120	112	7	119	226	13	239

Fig 3.7 Waste water in Nawadpura, a NGP village

Table 3.3 A Profile of households by type of house in NGP and Non-NGP villagers

Type of house	NGP	Non-NGP	Total
Pucca	33	23	56
	27.5	19.3	23.4
Semi pucca	28	15	43
	23.3	12.6	18.0
Kutcha	32	32	64
	26.7	26.9	26.8
Hut	27	49	76
	22.5	41.2	31.8
Total	**120**	**119**	**239**

An examination of the availability and type of toilets unfolds that a majority of the respondents use pit toilets (53.1%) and 41.4% of them practise open defecation, indicating the prevailing un-hygienic conditions in the residential localities. Open defecation is more visible in Non-NGP villages as compared to NGP villages. Only an insignificant percentage of the respondents are making use of flush latrines (0.8%), piped sewerage systems (0.8%) and septic tanks (3.8%). With regards to usage of toilets, Non NGP are going for open defecation and NGP for pit and septic latrine (table 3.4).

Table 3.4 Distribution of the sample households by type of toilet in NGP and Non-NGP villages

Toilet type	NGP	Non-NGP	Total
Pit latrine	91	36	127
	75.8	30.3	53.1
Flush latrine	2	0	2
	1.7	.0	.8
Piped sewer system	1	1	2
	.8	.8	.8
Septic latrine	2	7	9
	1.7	5.9	3.8
Open defecation	24	75	99
	20.0	63.0	41.4
Total	**120**	**119**	**239**

Chi-value = 54.866, P=O

Table 3.5 Respondent's perceptions related to the non- use of toilets in NGP and Non-NGP villages

Reasons not using toilets	NGP	NONNGP	Total
Water is not available for use /cleaning	3	1	4
	23.1	14.3	20.0
Super structure does not ensure privacy	7	1	8
	53.8	14.3	40.0
Others (specify)	3	5	8
	23.1	71.4	40.0
Total	**13**	7	**20**

An overall picture (both NGP and Non-NGP villages together) with respect to the reasons for not using toilets, the response of 20 percent of the households reveals the non-availability of water either for using toilets or for cleaning. In the case of 8 households (40%), the super structure of toilets does not ensure privacy, while it is 'others' with respect to the remaining 8 households (40%) who reported other maintenance related problems. Out of the total 20, 13 households are from NGP villages who reported the problem in using toilets (Table 3.5).

Regarding the reasons for using toilets 'privacy' is main reason in respect of more than two-thirds of the households (67.1%). A few of the respondents (9.3%) use toilets to maintain better health. Further, the data reveals that a few of the respondents use toilets due to the persuasion of NGOs /government officials and also to maintain their social status (5.7%).

Table 3.6 Respondents'perceptions related to the use of toilets, by educational level in NGP and Non-NGP villages

Educational level	NGP						Non-NGP					All					
	For better health	Privacy	Persuaded by NGOs/ GOVT/ others	Social status	Others (specify) health	Total	For better	Privacy status	Social (specify)	Others	Total	For better health	Privacy	Persuaded by NGOs/ GOVT/ others	Social `Status	Others Specify)	ALL
Primary	5	11	1	1	1	19	2	7	0	3	12	7	18	1	1	4	31
Percent (%)	26.30	58.00	5.26	5.26	5.26	61.29	16.66	58.33	0.00	25.00	38.70	22.58	58.06	3.22	3.22	12.90	100.00
Secondary(6-12) and Graduation	1	28	0	3	9	41	0	14	0	5	19	1	42	0	3	14	60
Percent (%)	2.43	68.29	0.00	7.31	22.00	68.33	0.00	73.68	0.00	26.31	31.66	1.66	70.00	0.00	5.00	23.33	100.00
Illiterate	4	27	1	3	1	36	1	7	1	4	13	5	34	1	4	5	49
Percent (%)	11.11	75.00	2.77	8.33	3.00	73.46	7.69	54.00	7.69	30.76	26.53	10.20	69.38	2.04	8.16	10.20	100.00
Total	**10**	**66**	**2**	**7**	**11**	**96**	**3**	**28**	**1**	**12**	**44**	**13**	**94**	**2**	**8**	**23**	**140**

A comparative picture of NGP and Non-NGP villages in utilizing toilet facility reveals that, a majority of NGP respondents (79.1%) avail themselves of the toilet facility for maintaining privacy and better health, as compared to Non-NGP respondents. This indicates that the respondents representing NGP villages are more informed regarding the use of toilet facility as compared to those representing Non -NGP villages (See Table 3.6).

The data on the type of housing conditions of the respondents reveals that most of them live either in huts (31.8%) or kutcha houses (26.8%), which according to them, are insufficient to accommodate all the family members and are temporary in nature. As the respondents are generally exposed to poor weather conditions during monsoon, winter and summer seasons, they are more likely to be vulnerable to various ailments.

The data unfolds that nearly one third and more than one fourth of the respondents reside in huts and kutcha houses respectively, which is indicative of their poor economic status. Besides, only one fourth of the respondents reside in pucca houses. The disaggregate data reveals that the respondents representing NGP villages enjoy a better housing accommodation (pucca and semi-pucca), while Non-NGP respondents have a poor housing accommodation (huts and kutcha houses). It is generally observed that people residing in pucca and semi-pucca houses are relatively better-off and can afford better sanitation facilities, as compared to those residing in huts and kutcha houses. This situation trends to affect the health status of people (Table 3.3).

Table 3.7 Details of hand wash habit after defecation in NGP and Non-NGP villages:

Type of hand wash	NGP	Non-NGP	Total
Soap	83	53	136
Per cent (%)	69.2	44.5	56.9
Sand /ash	14	36	50
Per cent (%)	11.7	30.3	20.9
Plain water	4	1	5
Per cent (%)	3.3	.8	2.1
None of the above	19	29	48
Per cent (%)	15.8	24.4	20.1
Total	**120**	**119**	**239**

The analysis reveals that overall, a great majority of the respondents (both NGP and non-NGP) wash their hands after defecation. The data shows that more than half of the respondents (56.9%) and another one fifth of them (20.9%) wash their hands either with soap or sand / ash respectively, while one fifth of the respondents are not aware of hand washing nor do they clean their hands after defecation. It is pertinent to point out

here that the respondents, who are not following hygienic methods are prone to diseases. Therefore, it is necessary to educate people and organize intensive campaigns as a part of sensitizing people hygiene related practices. This is more so in respect of Non-NGP villages where many of the respondents do not wash their hands after defecation as compared to those in NGP villages (see Table 3.7).

Table 3.8 Water availability and usage (by source) in NGP and non-NGP villages

Purpose for using the occasional source of water	NGP	Non-NGP	Total
Domestic use	50	37	87
Per cent (%)	41.7	41.2	36.4
Domestic andToilet use	69	81	150
Per cent (%)	57.5	68.1	62.8
Others	1	1	1
Per cent (%)	.8	.8	.4
Total	**120**	**119**	**239**

One of the criteria for assessing the performance of a project is its accessibility to the people. Regarding the availability of water and its usage, a majority of the respondents use water for domestic and toilet purpose (62.8%) (see Table 3.8).

Table 3.9 Perceptions of the respondents regarding the quality of water in NGP and Non-NGP villages

Quality of Water	NGP	Non-NGP	Total
Pure	72	59	131
Per cent (%)	60.0	49.6	54.8
Sometimes pure	4	1	5
Per cent (%)	3.3	.8	2.1
Impure	1	1	2
Per cent (%)	.8	.8	.8
Sometimes impure	40	57	97
Per cent (%)	33.3	47.9	40.6
Mostly pure	1	1	2
Per cent (%)	.8	.8	.8
Mostly impure	2	0	2
Per cent (%)	1.7	.0	.8
Total	**120**	**119**	**239**

Chi-value = 8.065, P=0.153

Generally, even if there is water supply in the villages, the quality of water may not be good and sometimes, it may contain mud or other dust particles. During the survey, the

respondents were asked to reveal their perceptions regarding the quality of drinking water. Overall, according to a majority of them, water is pure (54.8%) and occasionally impure going by some others (40.6%). An insignificant percentage of the respondents maintain that water is impure (0.8%). With respect to NGP and Non NGP villages, according to a majority of the respondents (60.0%) water is pure in NGP villages. In MP there is difference in mean and also there is a variation in the quality of water. Overall from T-test we can say that the NGP are more satisfied with the quality of water compared to Non-NGP (see Table 3.9).

Table 3.10 Details of adequacy/inadequacy of water availability for daily needs

Quantity of Water	NGP	Non-NGP	Total
Fully sufficient	90	92	182
Per cent (%)	75.0	77.3	76.2
Somewhat sufficient	27	15	42
Per cent (%)	22.5	12.6	17.6
In sufficient	3	11	14
Per cent (%)	2.5	9.2	5.9
Not at all sufficient	0	1	1
Per cent (%)	.0	.8	.4
Total	**120**	**119**	**239**

The availability of adequate quantity of water is also one of the important determinants of health and hygiene conditions of the people. It is also indicative of the performance of service delivery mechanisms of the government or other agencies. The data reveals that more than three fourths of the respondents have access to an adequate volume of water supply to meet their daily needs, while for only an insignificant percentage of the respondents, water supply is inadequate to meet their daily needs (see Table 3. 10).

Table 3.11 Perceptions of the respondents regarding the adequacy of water supply during the past one year in NGP and non-NGP villages

Adequacy of water supply	NGP	Non-NGP	Total
Yes	52	34	86
Per cent (%)	43.3	28.6	36.0
NO	65	82	147
Per cent (%)	54.2	68.9	61.5
Don't Know	3	3	6
Per cent (%)	2.5	2.5	2.5
Total	**120**	**119**	**239**

With regard to the adequacy (availability) of drinking water supply during the past one year in NGP villages, more than half of the respondents (54.2%) have maintained that

water supply is inadequate, while (43.3%) of the respondents claim that it is adequate (see Table 3.11).

Table 3.12 Particulars of season-wise water insufficiency (in terms of intensity)

Seasonal Insufficiency of water	NGP	Non-NGP	Total
Summer	57	66	106
Per cent (%)	83.8	77.6	69.3
Winter	5	8	13
Per cent (%)	7.4	9.4	8.5
Rainy	6	11	17
Per cent (%)	8.8	12.9	11.1
Total	**68**	**85**	**153**

Further, with respect to the seasonal inadequacy of water supply, the field data shows that, on the whole, it is insufficient during all the seasons, but the intensity of the problem is more in the summer season. The perception of NGP and Non NGP village respondents in this respect is, by and large, similar (see Table 3.12).

With respect to the type of drinking water storage facilities, the field data shows that, overall, more than three fourths of the respondents (80%) store water in drums,while some of them store it in pots and tubs(1 tub= 20 litters). The respondents, who use pots/tubs/buckets for storing drinking water, represent Non-NGP villages. During the field study, it has been observed that, the poor households do not have adequate storage facilities and that they face shortage of drinking water. Further it has also been observed that the drinking water supply is not on daily basis and at specified times. As a result, many a time, the poor households face shortage of drinking water. It may be noticed that hygienic practices are not possible because of the shortage of water. This can result in serious health problems (see table 3.13).

Table 3.13 Information on the storage capacity (drinking water) of water tanks/drums/vessels across the sample households in NGP and non-NGP villages

Storage capacity of drinking water	NGP	Non-NGP	Total
10 tubs	4	6	10
Per cent (%)	3.3	5.0	4.2
15 Tubs	17	16	33
Per cent (%)	14.2	13.4	13.8
1 Drum	96	93	189
Per cent (%)	80.0	78.2	79.1
10 Buckets	3	4	7
Per cent (%)	2.5	3.4	2.9
Total	**120**	**119**	**239**

Table 3.14 Information on practices of drawing drinking water from containers in NGP and non-NGP villages

Method of used for taking water from container	NGP	Non-NGP	Total
Container with a tap attached	1	0	1
Per cent (%)	.8	.0	.4
Tumblers / utensils	62	84	146
Per cent (%)	51.7	70.6	61.1
Tumblers / utensils attached to long handles	57	35	92
Per cent (%)	47.5	29.4	38.5
Total	120	119	239

The data on how drinking water is drawn from containers helps understand the hygiene practices of the respondents. Consumption of unsafe drinking water can cause severe health problems(viz) -These practices include drawing water from containers with unclean hands leading to waterborne diseases which are very frequent in some seasons. In order to know how the respondents handle drinking water, it was enquired whether (a)the drinking water container has a tap attached; (b) water is drawn with a glass/ utensil using hand; and (c) with a glass/ utensil attached to a long handle. To this query, almost all the respondents have mentioned that they always cover pots/drums/buckets, which are meant for drinking water. However, while drawing water from containers for drinking or any other purpose, `on the whole, a majority of the respondents (61.1%) use glass tumblers/ utensils not attached with long handles. During the field survey, it has been observed that the household members, especially children, draw water from containers without washing their hands leading to ill health of the family members. This situation is more visible in the Non-NGP villages as compared to NGP villages. The respondents, who use glass tumblers attached to long handles for drawing drinking water from containers, belong to NGP villages, more than Non NGP villages. Thus, the respondents in NGP villages are more conscious about the consumption of protected drinking water and protecting their health from water related diseases (See Table 3.14).

The field data shows that all the households clean water containers used for drinking water in both the NGP and Non-NGP villages. The data also reveals that a majority of the respondents clean water containers every day or once in 2 days. However, a few of the respondents (12%) wash containers once in five days. With respect to cleaning water containers daily, there is not much difference between NGP and Non-NGP villages (See Table 3.15).

Table 3.15 Distribution of households by, frequency of cleaning water containers used for drinking water in NGP and Non-NGP villages

Cleaning water container	NGP	Non-NGP	Total
No	0	0	0
Per cent (%)	0.0	0.0	0.0
Yes	120	119	239
Per cent (%)	100.0	100.0	100.0
Daily	55	54	109
Per cent (%)	45.8	45.4	45.6
Once in 2 Days	54	47	101
Per cent (%)	45.0	39.5	42.3
Once in 5 Days	11	18	29
Per cent (%)	9.2	15.1	12.1
Total	**120**	**119**	**239**

Chi-value 2.918, P=0.232

Table 3.16 gives information on water treatment before drinking. In NGP villages, out of 92 respondents, who always treat water before drinking, 43.4% are secondary and graduates, 35.9% are illiterates, 20.7% are primary educated. In contrast only 10 respondents have not at all treated water before drinking, of whom 50% are secondary educated, 30% are illiterates and 10% are primary educated.

In Non- NGP villages, out of 82 respondents, who always treat water before drinking, 39.0% are secondary educated, 39% are illiterates, 22% are primary educated. In contrast, only 11 respondents have not at all treated water before drinking, of whom 18.2% are secondary educated, 63.6% are illiterates and 18.2% and primary educated (Table 3.16).

Table 3.16 Information on Treatment of Drinking water before consumption, by educational level of the of respondents in NGP and non-NGP villages

	NGP					Non-NGP					All				
Educational levels	Always	Sometimes	Never	Not at all done	Total	Always	Sometimes	Never	Not at all done	Total	Always	Sometimes	Never	Not at all done	Total
Primary	19	0	0	1	20	18	4	0	2	24	37	4	0	3	44
Percent (%)	95.00	0	0	5	45.45	75	16.66	0	8.33	54.54	84.09	9.09	0.00	6.81	100.00
Secondary(6-12) and Graduate	40	5%	3	6	54	32	4	1	2	40	72	9	5	8	94
Percent (%)	74.07	9.25	33.33	11	57.44	80.00	10	2.50	5	42.55	76.59	9.57	5.31	8.50	100.00
Illiterate	33	7%	3	3	46	32	11	5	7	55	65	18	8	10	101
Percent (%)	71.70	15.21	7	7	45.54	58	20.00	9.09	12.72	54.45	64.35	17.82	7.92	9.90	100.00
Total	92	12%	6	10	120	82	19	7	11	119	174	31	13	21	239

Table 3.17 Details of measures taken for treating water before consumption by sample households in NGP and Non-NGP villages

Measures	NGP	Non-NGP	Total
Boil Water	3	1	4
Per cent (%)	2.9	1.0	2.0
Strain water, using a cloth	100	100	200
Per cent (%)	96.2	99.0	97.6
Use Water Filters	1	0	1
Per cent (%)	1.0	.0	.5
Total	**104**	**101**	**205**

Chi-value = 1.957, P= 0.376

The field based data shows that almost all of the respondents manually strain (filter) water using a cloth, while negligible percentages of them boil water before drinking. (Table 3.17).

Table 3.18 Information on the major problems related to water supply in the sample villages (NGP and non-NGP)

Problems	NGP	Non-NGP	Total
No problems	81	71	152
Per cent (%)	67.5	59.7	63.6
Bore wells not sunk	5	4	9
Per cent (%)	4.2	3.4	3.8
Shortage of water	0	2	2
Per cent (%)	.0	1.7	.8
Long distance involved in fetching water	12	18	30
Per cent (%)	10.0	15.1	12.6
Bore wells is not sunk & Shortage of water	5	0	5
Per cent (%)	4.2	.0	2.1
Bore wells not sunk & Long distance involved in fetching water	3	8	11
Per cent (%)	2.5	6.7	4.6
Shortage of water & Long distance involved in fetching water	3	11	14
Per cent (%)	2.5	9.2	5.9
Others (Specify)	2	1	3
Per cent (%)	1.7	.8	1.3
Bore wells not sunk are absent, Shortage of water, Long distance involved in fetching water	9	4	13
Per cent (%)	7.5	3.4	5.4
Total	**120**	**119**	**239**

During the field survey, it has been reported that, the non- availability/installation of bore wells in the nearby residential areas, travelling long distances for fetching the water from natural streams/old wells/tanks are the major problems faced by the respondents. Our field observation reveals that the villagers/respondents are not in a position to purchase water from private agencies, paying high amounts. These trends suggest that the government, especially the local governments need to pay more attention to provide safe, cost- free, and adequate quantity of water to the people. Further, according to the villagers, providing safe and adequate quantity of water to people is the responsibility of the local governments (Table 3.18).

Table 3.19 Distribution of respondents reporting major problems regarding water supply in NGP and non-NGP villages

Problems	NGP	Non-NGP	Total
Go to another place due to problematic bore wells	7	12	19
Per cent (%)	15.5	21.4	18.8
Get water thrice a weak	0	3	3
Per cent (%)	0.0	5.3	2.9
No public taps in the villages	0	2	2
Per cent (%)	0.0	3.5	1.98
No water piped water supply in the villages.	1	0	1
Per cent (%)	2.2	0.0	1
Pay money for getting water	1	3	4
Per cent (%)	2.2	5.3	3.9
Water level goes down during summer	18	9	27
Per cent (%)	40	16.0	26.7
Long distance involved in fetching water	17	25	42
Per cent (%)	37.7	44.6	41.5
Unprotected water	1	2	3
Per cent (%)	2.2	3.5	2.9
Total	**45**	**56**	**101**

Note: Multiple answers, percentages exceed 100

There are 45 categories of responses regarding water problems in NGP areas. Major problems reported are: water level goes down during summer (40%); travel long distances to fetch water (37.7%); and go to another place for getting water due to a faulty bore wells (15.5%). In Non-NGP areas, the respondents face similar problems like going to far away places for fetching water (44.6%) and going to some other places for fetching water due to faulty bore wells as bore well is not working (21.4%) (Table 3.19).

Table 3.20 Status of water supply in ICDS centres in NGP and Non-NGP villages

Water supply in Anganwadi centres	NGP	Non-NGP	Total
Yes	36	48	84
Per cent (%)	30.0	40.3	35.1
No	8	37	45
Per cent (%)	6.7	31.1	18.8
Don't Know	76	34	110
Per cent (%)	63.3	28.6	46.0
Total	**120**	**119**	**239**

Regarding water supply in ICDS centres (in the case of children attending them), the above tables reveals that, out of a total of 239 respondents from both the NGP and Non NGP villages, 84 have responded 'yes', 45'no' and 110 have no idea about water supply in ICDS centres (Table 3.20).

Table 3.21 Respondents' awareness regarding the advantages of using in-house latrine/ toilet/lavatory facility in NGP and Non-NGP villages

Advantages	NGP	Non-NGP	Total
Better health (Hygiene and	21	5	26
Disease prevention)	16.9	9.2	14.6
Privacy	86	42	128
Per cent (%)	69.3	77.7	71.9
Ease of use	14	6	20
Per cent (%)	11.2	7.4	11.2
Social status	3	1	4
Per cent (%)	2.4	1.8	2.2
Total	**124**	**54**	**178**

The data on the advantages of using in-house toilet facility shows that a great majority of respondents (69.3% in NGP and 77.7% in Non-NGP) use the facility for enjoying privacy; while some respondents (16.9% in NGP and 9.2% in Non-NGP) use the facility for maintaining better health. It is important to note here that most of the respondents prefer to use in-house toilet facility for 'privacy' rather than for maintaining good health. This indicates that the respondents are not fully aware of the advantages of using toilets. Further, as mentioned earlier, considerable proportion of the respondents (40%) does not have access to toilets and depends on open defecation. Therefore, there is a need for organizing awareness campaigns to sensitise people to the advantages of using toilets (see table 3.21).

Table 3.22 Respondents encounter problems regarding the use of toilets in NGP and Non-NGP villages

Problems	NGP	Non-NGP	Total
Yes	46	11	57
Per cent (%)	47.9	25.0	40.7
NO	50	33	83
Per cent (%)	52.0	75.0	59.2
Total	**96**	**44**	**140**

The field data shows that many respondents (57 respondents out of 140) encounter problems, while 59.2% of them do not face any problem with regard to the use of toilets (Table 3.22).

In respect of NGP villages, there are 182 multiple responses. Major problems in these villages are: foul smell (19.8%); over-flowing of pits (16.5%); flooding during rainy season (11.5%); mosquitoes /flies menace (16.5%); not availability of water for cleaning (12.6%); super structure does not ensure privacy (11.5%); and not convenient for children (11%). There are 46 responses in Non-NGP areas in the respect. Major problems in Non-NGP areas include: water not available for cleaning (17.4%); flies/mosquitoes menace (17.4%); and foul smell (15.2%).

Table 3.23 Problems encountered by the households relating to toilet use in NGP and Non-NGP villages

Problems	NGP	Non-NGP	Total
1. Water not available for use/cleaning	23	8	31
Per cent (%)	12.6	17.4	14.0
2. Flies/or Mosquitoes	30	8	38
	16.5	17.4	16.6
3. Super structure does not ensure privacy	21	5	26
	11.5	10.9	11.4
4. Foul smell	36	7	43
	19.8	15.2	18.8
5. Flooding during rainy seasons	21	6	27
	11.5	13.0	11.8
6. Difficulties for younger children to use	20	6	26
	11.0	13.0	11.4
7. Over flowing pits	30	6	36
	16.5	13.0	15.7
8. Unstable slabs (Fear of falling)	1	0	1
	0.5	0.0	0.4%
Total	**182**	**46**	**228**

Note: Multiple answers, percentages exceed 100.

The non-availability of an adequate quantity of water for cleaning toilets, an uncontrollable menace of mosquitoes in the household premise and residential localities, lack of privacy, bad smell due to an irregular maintenance of drainage canals, lack of connectivity of toilet pipes with the under drainage system, blockage of toilet pipes during rainy season, unloading or irregular cleaning of toilet pits, and unsafe toilets for usage due to weak walls / structures and others, are the major problems encountered by the respondents in using toilets. Some of these issues are related to the linkage of toilets to the main drainage system in the villages and general environment. The local governments' role, in this context, is of utmost importance in terms of controlling mosquitoes and properly maintaining the drainage system in the residential areas (see Table 3.23).

Table 3.24 Information on the practices of disposing of children's stools post defection in NGP non-NGP villages

Method of disposal	NGP	NONNGP	Total
Leave it where it is	1	1	2
Per cent (%)	.0.8	0.8	0.8
Throw it in the street	71	77	148
Per cent (%)	59.2	64.7	61.9
Throw it in the latrine	40	33	73
Per cent (%)	33.3	27.7	30.5
Others	8	8	16
Per cent (%)	6.7	6.7	6.7
Total	**120**	**119**	**239**

Chi-value = 0.91, P= 0.823

Regarding practices of disposing of child's stool post defecation, most of the respondents (61.9%) in both the areas throw it on the street, while 30.5% of the respondents throw into the latrine. In respect of NGP areas, 59.2% of the respondents and most of the respondents (64.7%) in Non-NGP villages throw it on the streets. Thus in both NGP and Non-NGP, most of the respondents dispose childs stool post defecation in the street (Table 3.24).

With regard to the availability of facilities for hand wash near the toilet at home, a great majority of respondents are affirmative (81.0%) in that they wash their hands with soap in both NGP and Non-NGP villages together, while another 7.3% of them use soap/ash for washing their hands after defecation (see Table 3.25).

Table 3.25 Information on hand wash facility and type of hand wash near toilets

Type of hand wash	NGP	Non-NGP	Total
Not having wash facility	3	0	3
Per cent (%)	3.1	.0	2.1
Having wash facility	93	44	137
Per cent (%)	96.9	100.0	97.9
Soap	74	37	111
Per cent (%)	79.6	84.1	81.0
Sand/Ash	7	3	10
Per cent (%)	7.5	6.8	7.3
Plain Water	6	3	9
Per cent (%)	6.5	6.8	6.6
Soap &Sand	6	1	7
Per cent (%)	6.5	2.3	5.1
Total	**93**	**44**	**137**

Table 3.26 Frequency of cleaning toilets in NGP and non-NGP villages

Frequency of cleaning toilet	NGP	Non-NGP	Total
Once or more in a day	36	17	53
Per cent (%)	37.5	38.6	37.9
At least once in a week	11	7	18
Per cent (%)	11.5	15.9	12.9
At least once in a fort night	2	3	5
Per cent (%)	2.1	6.8	3.6
At least once in a month	11	5	16
Per cent (%)	11.5	11.4	11.4
Others	36	12	48
Per cent (%)	37.5	27.3	34.3
Total	**96**	**44**	**140**

A proper maintenance of toilets is most important for keeping good health. The field data reveals that, overall, only a little over one third (37.9%) of the respondents clean their toilets every day, and the rest of them, especially the respondents representing Non-NGP villages trend to neglect cleaning their toilets. A considerable percentage of the respondents clean their toilets once in a month, which makes it unsafe to use such toilets (Table 3.26).

In this section, illnesses such as diarrhoea, dysentery and worm infections related to unsafe drinking water and unhygienic practices followed in the study villages resulting

in health problems for children are discussed. Further, methods followed by the households for treating dehydration of children are also presented here.

Table 3.27 Treatment seeking behaviour of the households with respect to dehydration among children in NGP and Non-NGP villages

Method followed in treating dehydration	NGP	Non-NGP	Total
Provide ORS	1	0	1
Per cent (%)	.8	.0	.4
Provide only hot water	1	0	1
Per cent (%)	.8	.0	.4
Visit Doctor/clinic	115	110	225
Per cent (%)	95.8	92.4	94.1
Get Medicine from Pharmacy	1	1	2
Per cent (%)	.8	.8	.8
Approach Quacks in the village	1	5	6
Per cent (%)	.8	4.2	2.5
Visit Asha/ANM	1	3	4
Per cent (%)	.8	2.5	1.7
Total	**120**	**119**	**239**

Majority of the respondents are not aware of information regarding using oral rehydration solution (ORS) whenever children suffer from dehydration. Only one respondent from NGP villages is aware of the usefulness of ORS. Overall, a majority of the respondents (94.1%) prefer to visit a doctor whenever their children suffer from dehydration. Interestingly, a very few households approach village quacks (2.5%) and ASHA/ANM (1.7%) (Table 3.27).

Table 3.28 Measures taken by households to keep cooked food safe in NGP and Non-NGP villages

Measures taken	NGP	Non-NGP	Total
Cover cooked food with a lid	119	117	236
Per cent (%)	99.2	98.3	98.7
Do not bother	1	2	3
Per cent (%)	.8	1.7	1.3
Total	**120**	**119**	**239**

Keeping the cooked food safe by covering the same with a lid is a safe way of maintaining hygiene and preventing occurrence of diseases. Interestingly enough, the field data shows that an overwhelming number of the respondents (NGP and Non-NGP villages taken together) (98.7%) cover cooked food with a lid, while only a very tiny percent (1.3%) of the respondents do not keep cooked food properly (Table3.28).

Table 3.29 Household level personal hygiene practices- taking bath in NGP and Non-NGP villages

Frequency of taking bath	NGP	Non-NGP	Total
Once or more a day	80	70	150
Per cent (%)	66.7	58.8	62.8
At least once in 2 days	36	41	77
Per cent (%)	30.0	34.5	32.2
Once in a week	4	8	12
Per cent (%)	3.3	6.7	5.0
Total	**120**	**119**	**239**

Regular bathing is considered as one of the hygiene practices for keeping good health. The field data shows that, overall, two thirds of the respondents (62.8%) take bath once in a day and another one third of them once in two days. A few of the respondents (5.0%) take bath once in a week, indicating their poor health consciousness(Table 3.29).

3.4.1 VWSCs and VHSCs in the study villages : Awarness levels regarding VWSC and VHSC among the local population.

Table 3.30 Respondents awareness about the existence of Village Water and Sanitation Committee (VWSC) and Village Health and Sanitation Committee (VHSC) in their villages

Existence of VWSC	NGP	Non-NGP	Total
Aware	1	0	1
Per cent (%)	.8	.0	.4
Not aware	119	119	238
Per cent (%)	99.2	100.0	99.6
Existence of VHSC			
Aware	1	0	1
Per cent (%)	.8	.0	.4
Not aware	119	119	238
Per cent (%)	99.2	100.0	99.6
Total	**120**	**119**	**239**

Awareness about VWSC: An attempt is also made to know the respondents' awareness level of the existence and working of Village Water and Sanitation Committee (VWSC) in their respective villages. It is pertinent to note that overall, except for one respondent, all the respondents (99.6%) are not aware of the existence of the local level committee, not to speak of its working. Similarly, almost all the respondents (99.6%) are also not aware of the existence of Village Health and Sanitation Committee (VHSC) and its working. These trends indicate that the government agencies/ machinery have failed to

create awareness among the public about the existence of functionary /committee. The elite, media and civil society bodies also have failed to notice the existence of the basic committees meant for the implementation of water and sanitation programs in the rural areas. It also indicates that there is a lack of community participation in the policy formulation, implementation, evaluation and sharing of benefits of the programmers at the local levels (Table 3.30).

3.4.2 An analysis of information based on child health and hygiene

As part of the study, an attempt has also been made to collect information on various dimensions of child health and hygiene. This was carried out by administering an interview schedule for mothers of children aged 0-5 years. The purpose of the study/ schedule is to identify health and hygiene practices followed by parents, especially mothers with respect to their children. The schedule covered various aspects such as practices treating drinking water; awareness about diseases/ailments children may be suffering from due to unsafe drinking water; the availability of toilet facility especially meant for children; diseases/ailments affecting children as a result of open defecation practice or non-use of toilets; personal hygiene practices; improper bathing and washing of hands and material used for washing. The child schedule also contained questions related to the status of immunization of children and maintenance of immunization card separately for each child and illness episodes underwent by children during the last one year. The data collected on these items is intended to help us have a better idea not only regarding the health status of our future generations, but also strengths and weaknesses of the policies meant for human development, especially an improvement in the health status of children.

With regard to providing drinking water for children's consumption, overall more than half of the respondents use clean and safe water. In addition to this, breast feeding and providing nutritious food and maintaining a healthy environment in and around the households and residential localities also play a crucial role in keeping children healthy, according to the respondents. Further, the respondents expect the government to give a priority to these issues, instead of leaving it to the households. Further, going by their perceptions, an effective implementation of ICDS schemes, water and sanitation schemes, food security programme, and environmental protection measures can go a long way in improving the health conditions of children in particular and, household members, in general. However, overall, a little over one fifth of the respondents (7.0 %) find themselves unable to treat drinking water before giving it to children.

Lack of awareness regarding child health care practices, poor economic conditions, inability to give a special attention to health care, especially treating drinking water before giving to children (due to their pre- occupation with their routine household activities and other activities), lack of availability of adequate and qualitative water in the villages, inability of local governments or agencies to supply treated water at ICDS centres or within the premises of households, etc, are the major reasons for this state of affairs in the rural areas, according to the respondents.

Table 3.31 Distribution of households treating water before consumption and methods of making water safer for children's consumption

Treatment of water	NGP	Non-NGP	Total
Yes	69	73	142
Per cent (%)	57.5	61.3	59.4
No	51	46	97
Per cent (%)	42.5	38.7	40.6
Total	**120**	**119**	**239**
Methods used for making water safer for children's consumption			
Boil water	5	4	9
Per cent (%)	7.2	5.5	6.3
Strain water using a cloth	62	60	122
Per cent (%)	89.9	82.2	85.9
Use water filters	0	1	1
Per cent (%)	.0	1.4	.7
Let water stand and settle	2	8	10
Per cent (%)	2.9	11.0	7.0
Total	**69**	**73**	**142**

The disaggregate level data reveals that the households/respondents, who give clean and safe drinking water to their children, are more in numbers in Non-NGP villages than NGP villages. It indicates that the local governments/public agencies' role in providing safe water to people is more important for maintaining the health of children. When it comes to the measures followed for making water more cleaner and safer for drinking, especially for children, overall, a majority of the respondents (85.9%) clean water by straining or filtering using a cloth. Some of them let water stand and settle (7%) while 6.3% of the respondents boil water to make it safer for children's consumption. Over all from T-test, in MP no significant difference in treating water for both NGP and Non-NGP (Table 3.31).

Coming to the availability of in-house toilet facility, especially for the use of children, overall, more than half of the respondents (56.9%) have expressed themselves in affirmative, while the remaining 43.1% do not have access to such in-house facility. The respondents, who do not have such in-house toilet facility number more in Non-NGP villages as compared to NGP villages. Three-fourths of the respondents (77.5%)in NGP and about one-third of the respondents (36.1%)in Non-NGP areas have access to in-house toilets facility (Table 3.32).

Table 3.32 Details of in-house toilet facility and type of toilets used for children in NGP and Non- NGP villages

Toilet facility	NGP	Non-NGP	Total
Yes	93	43	136
Per cent (%)	77.5	36.1	56.9
No	27	76	103
Per cent (%)	22.5	63.9	43.1
Type of toilets used for children in-house			
Toilet within the house	90	43	133
Per cent (%)	75.0	36.1	55.6
Open defecation	24	75	99
Per cent (%)	20.0	63.0	41.4
Others	6	1	7
Per cent (%)	5.05	.8	2.9
Total	**120**	**119**	**239**

Table 3.33 Distribution of children taking help for toilet use in NGP and Non-NGP villages

Children taking help for toilet use	NGP	Non-NGP	Total
By his /her own	12	9	21
Per cent (%)	10.0	7.6	8.8
With the help of mother/father	106	108	214
Per cent (%)	88.3	90.8	89.5
With the help of elder sibling/s	1	1	2
Per cent (%)	.8	.8	.8
With the help of others	1	1	2
Per cent (%)	.8	.8	.8
Total	**120**	**119**	**239**

The data unfolds that an overwhelming 89.5% of the respondents (mother/ father) help their children, especially those below 2 years, in using toilets, while an insignificant percentage of respondents (elder sibling/s and other members of the household) help children in this regard. However, according to less than ten percentages of the respondents, children use toilets on their own and do not require others' help as they are grown up (Table 3.33).

Table3.34 Awareness about toilet use and children's vulnerability to possible diseases in NGP and Non-NGP villages.

Type of diseases	NGP	Non-NGP	Total
Diarrhoea	5	12	17
Per cent (%)	4.2	10.1	7.1
Cold, cough, fever	0	2	2
Per cent (%)	.0	1.7	.8
Fever cold	5	3	8
Per cent (%)	4.2	2.5	3.3
Don't know	110	102	212
Per cent (%)	91.7	85.7	88.7
Total	**120**	**119**	**239**

The above table reveals that, overall, a majority of the respondents (88.7%) have no idea about the type of disease children may be vulnerable to due to open defecation and non-use of toilets on the part of children. Only 7 % of the respondents are aware that children may get diarrhoea if they do not use toilets. The level of awareness in this respect seems to be relatively much better in Non-NGP villages (Table 3.34).

Table 3.35 Distribution of respondents reporting frequency of bath given to children in NGP and Non-NGP villages

Frequency of bath given to children	NGP	Non-NGP	Total
Once a day	75	65	140
Per cent (%)	62.5	54.6	58.6
Twice a day	33	35	68
Per cent (%)	27.5	29.4	28.5
Once a week	12	18	30
Per cent (%)	10.0	15.1	12.6
Others (specify)	0	1	1
Per cent (%)	.0	.8	.4
Total	**120**	**119**	**239**

An analysis of the practice of personal hygiene reveals that, overall, more than half of the respondents (58.6%) help their children take bath every day, especially the respondents representing NGP villages (62.5%), while more than one fifth of the respondents (28.5%) give bath to their children twice a day. Some of the children (12.6%) take bath once in a week and they mostly belong to Non-NGP villages. Thus, children in Non-NGP villages are at a disadvantageous position as compared to NGP villages (Table 3.35).

Table 3.36 A Distribution of children with regard to washing their hands and type of hand wash used before taking food in NGP and Non- NGP villages

Children washing their hands	NGP	Non-NGP	Total
Yes	115	102	217
Per cent (%)	95.8	85.7	90.8
No	2	13	15
Per cent (%)	1.7	10.9	6.3
Don't know	3	4	7
Per cent (%)	2.5	3.4	2.9
Total	**120**	**119**	**239**
Type of hand wash used			
Water	22	37	59
Per cent (%)	19.1	36.3	27.2
Soap	85	51	136
Per cent (%)	73.9	50.0	62.7
Others	0	5	5
Per cent (%)	.0	4.9	2.3
Water Soap	8	9	17
Per cent (%)	7.0	8.8	7.8
Total	**115**	**102**	**217**

In both NGP and Non-NGP areas together, according to majority of the respondents (90.8%) their children wash their hands before taking food,while as per more than half of the respondents and over one fifth of the respondents, their children use soap and water for washing hands respectively. The respondents representing NGP villages are more conscious about washing hands with soap as compared to Non-NGP villages (Table 3.36).

Table 3.37 Distribution of households by Immunization service received by children in NGP and Non-NGP villages

Immunization	NGP	Non-NGP	Total
Received	69	52	121
Per cent (%)	57.5	43.7	50.6
Not received	10	16	26
Per cent (%)	8.3	13.4	10.9
Partly received	5	9	14
Per cent (%)	4.2	7.6	5.9
Yet to receive immunization	2	7	9
Per cent (%)	1.7	5.9	3.8
Don't Know	34	35	69
Per cent (%)	28.3	29.4	28.9
Total	**120**	**119**	**239**

The data reveals that half of the respondents in NGP villages and (43.7%) children in Non-NGP villages have got their children immunized for keeping good health, while as per a small percentage of respondents i.e. 1.7% in NGP and 5.9% in Non-NGP villages, their wards are yet to receive vaccination to protect their health (Table 3.37).

Out of 185 children, 139 in NGP areas and out of 169 children, 131 in Non-NGP areas have been found experiencing various illnesses.

Children affected by illnesses

In Non-NGP areas, 25 diarrheal cases and 29 cases in NGP areas have been reported.In Non-NGP areas, 5 malaria child cases and in NGP areas only 2 malaria cases have been reported. In Non-NGP areas, 8 children and 5 children in NGP areas have been reported affected by pneumonia.

In Non-NGP areas, 33 children have been reported suffering from cough, cold and fever together and 30 children in NGP areas. A few cases of jaundice and skin diseases have also been reported in Non-NGP areas.

Treatment

In both the areas, a majority of the child patients were taken to private medical practitioners or private hospitals for treatment,While a very few children were taken to SC, PHC and DH for treatment.

In both NGP and Non-NGP areas, majority of the child patients of diarrhoea received treatment from private hospitals and a few from PHC/DH. Three child patients from Non-NGP areas and only one patient from NGP areas received treatment for more than a day. In Non-NGP areas, more number of children had to seek treatment for cold, cough,fever for more than a day.

A disease-wise and length of treatment analysis shows that the severity of illnesses is more in Non-NGP areas.

Average expenditure

Regarding the length of treatment for children suffering from diarrhoea in NGP, out of 29 cases, 28 children have undergone treatment for one day, while in Non-NGP areas, out of 25 children, 22 have undergone treatment for one day. The average expenditure incurred for treating all diarrhoeal patients from Non-NGP villages amounts to Rs 886 and to Rs 679.3 for NGP areas.

In NGP areas, out of 5 pneumonia patients, 2 of them have undergone treatment for 3 days, whereas, in Non-NGP areas, out of 8 pneumonia cases, 4 of them have been

reported undergoing treatment for 1 day. The average expenditure for the treatment of pneumonia cases in Non-NGP comes to Rs 6550 and to Rs 8800 in respect of NGP areas.

In NGP areas, out of 2 malaria cases, one malaria affected child is reported to have undergone treatment for 4 days, while in Non-NGP areas, out of 5 children, 3 of them are reported to have received treatment for 3 days. The average expenditure incurred on malaria treatment in NGP villages amounts to Rs 5500 and in the case of Non-NGP areas to Rs 4460.

In NGP areas, out of 30 cases of cold, cough and fever, 28 are reported to have received treatment for one day, while in Non-NGP areas, out of 33 cases, 26 are reported to have received treatment for one day. The average expenditure incurred for treatment of cough, cold and fever together cases in NGP areas amount to Rs 876.7 and in the case of Non-NGP areas toRs 1318.

In Non-NGP areas, only one jaundice patients is reported to have undergone treatment for 4 days,with the treatment cost amounting to Rs 10,000. There is only one case of skin disease reported and the expenditure on treatment works outtoRs 2750. The severity of illnesses is found more in Non-NGP areas (Tables 3.38 & 3.39).

A Profile of household diseases

The field based information reveals various diseases prevailing in NGP and Non-NGP villages. The respondents are prone to multiple diseases mostly on account of their consuming unsafe water. The diseases are mostly non-chronic in nature and can be arrested through supplying of nutritional food, safe drinking water and sanitation and a conducive environment. The diseases like cold and cough, viral fever, body pain, vomiting, gastric enteritis, malaria, typhoid, loose motion, diarrhoea, jaundice, indigestion, can be overcome by, way of enabling people to have access to safe drinking water and sanitation and also organizing health campaigns on a regular basis. The prevalence of chronic diseases like cancer, sugar, blood pressure, cardiac/ heart, knee pain, spinal cord problems etc. is mostly common in both the areas and people also face problems due to lack of proper medical facilities in the hinterland and medical assistance at the appropriate time.

In this section, we have discussed illness episodes encountered, treatment sought and expenditure incurred by households in NGP and Non-NGP villages as follows.

Table 3.38 Number of children reported suffering from illnesses in NGP villages

				Treatment place				Length of treatment (days)				
	Type of Disease	Affected	Average episodes	SC	PHC	DH	Private	1	2	3	4	Average expenditure Rs
Water borne diseases	Diarrhoea	29	4.14	1	3	0	25	28	0	0	1	679.3
	Dysentery	2	5	0	0	0	2	2	0	0	0	5250
Worm infections	Amebiasis	2	2.5	0	1	0	1	1	0	0	1	7500
Mosquito bite infections	Fever	26	3.77	0	0	0	26	23	1	2	0	1819
	Malaria	2	1.5	0	0	0	2	0	1	0	1	5500
Others	Cold&Fever	15	2.93	2	2	0	12	14	1	0	0	1413
	Cough & Cold	27	3.56	0	1	1	25	20	6	0	1	888.9
	Cough, cold, fever	30	4	0	2	0	28	28	0	0	2	876.7
	Pneumonia	5	2.6	0	0	0	5	1	1	2	1	8800
	Others	1										
	Grand Total	**139**	**3.67**	**2**	**9**	**1**	**127**	**118**	**10**	**4**	**7**	**1619**

Table 3.39 Number of children reported suffering from illnesses in Non-NGP areas

	Type of Diseases	Affected	Average episodes	Type of treatment facility					Length of treatment (days)				Average expenditure Rs
				SC	PHC	DH	Private	PHC & Private	1	2	3	4	
Water borne diseases	Diarrhoea	25	2.8	0	5	1	18	1	22	1	1	1	886
	Dysentery	1	4	0	1	0	0	0	1	0	0	0	300
	Jaundice	1	2	0	0	0	1	0	0	0	0	1	10000
	Amoebas	1	2	0	0	0	1	0	1	0	0	0	400
Worm infections	0	0	0	0	0	0	0	0	0	0	0	0	0
Mosquito bite infections	Fever	37	3.16	0	8	0	28	1	35	1	0	1	710.8
	malaria	5	3	1	0	0	4	0	2	0	3	0	4460
Others	Cold and fever	5	3.2	0	0	0	4	1	4	1	0	0	1400
	Cough and cold	10	3.3	0	0	0	9	1	8	2	0	0	870
	Cough, cold, fever	33	3.61	0	2	0	29	2	26	5	1	1	1318
	Pneumonia	8	1.75	0	0	0	8	0	4	0	2	2	6550
	Skin disease	2	4	0	0	0	2	0	1	0	0	1	2750
	others	3											
	Total	**131**	**3.1**	**1**	**16**	**2**	**106**	**6**	**105**	**10**	**8**	**8**	**1604**

Table 3. 40 Illness episodes encountered, treatment sought and expenditures incurred by households in NGP area

	Type of Diseases	Affected	Average episodes	Type of treatment facility						Length of treatment (days)				Average expenditure Rs
				SC	PHC	CHC	DH	Private	PHC & Private	Less than 5	5-10	11-15	Above 15	
Water borne diseases	Typhoid	7	1	0	1	0	0	6	0	1	1	0	5	11285.7
	Diarrhoea	6	1	1	0	0	0	5	0	2	3	1	0	4883.33
	Jaundice	1	1	0	0	0	0	1	0	0	0	0	1	3000
	Cold & cough	11	1.45	0	0	0	0	11	0	7	3	0	1	2618.18
	Digestion problem	2	1.5	0	0	0	0	2	0	1	1	0	0	12500
	Vomiting	2	1.5	0	0	0	0	2	0	0	1	0	1	12500
Mosquito biterelated diseases	Fever	40	1.25	1	3	1	0	34	1	27	12	0	1	5595
	Body pains	2	1	0	0	0	0	2	0	2	0	0	0	2900
	Malaria	6	1.17	0	1	0	1	4	0	2	1	0	3	3750
	Pneumonia	4	1	0	0	0	0	4	0	1	0	0	3	75500
	Others	25												
	Fits	1	1	0	0	0	0	1	0	1	0	0	0	1000
	Stomach Pain	19	1.32	0	0	0	0	18	1	9	8	1	1	3200
	Grand Total	**126**	**1.25**	**2**	**6**	**1**	**1**	**114**	**2**	**59**	**40**	**3**	**24**	**9616.67**

Table 3.41: Illness episodes encountered, treatment sought and expenditures incurred by households Non-NGP area

	Type of Diseases	Affected	Average episodes	Type of treatment facility						Length of treatment (days)				Average expenditure Rs
				SC	PHC	CHC	DH	Private	PHC & Private	> 5	6-10	11-15	Above 15	
Water borne diseases	Typhoid	1	4	0	0	0	0	1	0	0	0	0	1	5000.00
	Jaundice	1	1	0	0	0	0	1	0	1	0	0	0	8000.00
	Fever	6	7.17	0	1	0	0	4	1	4	0	0	2	1416.67
	Motions	1	2	0	0	0	0	1	0	0	0	0	1	25000.00
	Cold & cough	5	3.2	0	0	0	0	4	1	4	1	0	0	460.00
	Diarrhoea	6	2	0	1	0	1	4	0	3	2	0	1	1383.33
Worm infection diseases	Amebiasis	0	0	0	0	0	0	0	0	0	0	0	0	
Mosquito bite related diseases	Fever	39	3.21	1	5	0	0	30	3	24	13	0	2	1846.15
	Fits	1	3	0	1	0	0	0	0	0	1	0	0	1000.00
	Malaria	6	1	1	1	0	0	4	0	1	4	0	1	2833.33
	Knee pain & Stomach Pain	15	4	0	1	0	0	13	1	11	3	0	1	2633.33
	Pneumonia	3	1.67	0	0	0	0	3	0	1	1	0	1	5833.33
	Others	18												
	Total	**104**	**3.35**	**3**	**11**	**1**	**1**	**82**	**6**	**55**	**30**	**1**	**18**	**3419.23**

Illness episodes: A total of 126 persons, out of a sample of 765 in NGP villages and 104 persons out of a sample of 653 in Non-NGP villages have reported facing illnesses in Non-NGP areas, only one person is reported to have suffered from typhoid, while 7 persons in NGP areas. Six diarrhoea cases in each of these areas have also been reported. Many persons have reported suffering from cough and cold in both the areas (5 in Non-NGP and 11 in NGP). Similarly, many persons are reported to have suffered from fever in both areas (39 Non-NGP and 40 NGP).

Treatment Source: Majority of those who had fallen ill are reported to have sought treatment from private hospitals with a very few approaching government health facilities.

Length of treatment and expenditure: In both NGP and Non-NGP areas, the length of treatment for typhoid has been reported exceeding 15 days for 6 persons. The average expenditure incurred in the case of typhoid patients in NGP as reported by respondents is as high as Rs 11285.71, whereas in non-NGP areas it is Rs 5000.

In NGP and Non-NGP areas, for cold and cough, less than 50 percent of all these persons are reported to have undergone treatment for more than 6 days. The average expenditure incurred for cold and cough treatment in NGP areas amounts Rs 2618, whereas in Non-NGP areas, it is Rs 460.

The length of treatment for diarrhoea as reported by the respondents in NGP, in case of 3 patients the length of treatment for diarrhoes is 5-10 days while in Non-NGP it is less than 5 days for 3 patients. The average expenditure incurred on diarrhoea patients in NGP areas amount toRs 4883.33, whereas in Non-NGP area toRs 1383.33.

In Non-NGP areas, the average number of episodes for fever is high (10.38) in Non-NGP and 1.25 in NGP) and comparatively more number (12 in NGP and 13 in non-NGP villages) of them are reported to have undergoing treatment for more than 6 days. The average expenditure incurred on fever in NGP areas amount to Rs. 5,595, whereas in Non-NGP areas, Rs 3,262.82.

Thus, there is not much of a difference between these two areas in terms of persons affected by different diseases (Tables 3.40 & 3.41).

Summary of FGDs held in both NGP and Non-NGP villages in Madhya Pradesh State

- Main source of water
- In Pitgara, Nagora, and Raipura NGP villages, the main source of water is hand pumps whereas in Morgadhi, Pedwi and Nawadpura villages the main source of water is taps.

- In Bilda, Amalijhuma and Hanumantya Non-NGP villages, the main source of water is hand pumps, whereas in Sala, Rampura and kachibaroda villages, it is taps.

▲ Adequacy of water supply

- There is an adequate water supply in Pitgara, Nagora, and Raipura (NGP) villages. Whenever public hand pumps go dry, people make use of neighbors hand pump for water. During summer season, people purchase water for both domestic and drinking purposes. There is no piped water supply from the panchayats concerned. During rainy season, water becomes yellowish and muddy and, therefore, will not besafe for drinking. Morgadhi village receives an adequate water supply through Narmada river line. Big farmers have their own personal tap connections and pay water charges at the rate of Rs 60 per month. In Nawadpura and Pedwi villages, people get a sufficient amount of water throughout the year.

- In Hanumantya, Bilda and Amalijhuma(Non-NGP) villages, every one has a ready access to water. However, they get water from unhygienic and unprotected wells and hand pumps. But, during the summer season, there is a problem of water supply experienced in Bilda, Amalijhuma and Hanumantya villages (NGP) as the hand pumps go dry, while in Sala, Rampura and kachhibaroda villages, there is an adequate water supply during all the seasons. However, in summer, if there is any problem of water supply for one or two days, they get water from hand pumps.

▲ Quality of Water

- In Pitgara, Nagora and Raipura NGP villages, the quality of drinking water is good through hard in nature. Some families (3-4 families in the villages) have water purifier facilities at home. In Nawadpura village, water quality is good in terms of taste and color as the Gram Panchayat has well sprayed with bleaching powder and chlorine.

- In Sala, Rampura and Kachhibaroda villages, water quality is good. But during the rainy season, water becomes yellowish in colour and hence, people strain water using a cloth.

▲ Water costs

- Whenever there is ashortage of water during the summer season in Pitgara, Nagora and Raipura NGP villages, villagers pay Rs 200 to the GP for arranging for water from outside. In Pedwiand Morgadhi villages, villagers pay Rs 50/- per person (including children) to the GP for getting water. Local authorities are not properly addressing this water issue. In Nawadpura village, till now, villagers have not paid any tariff for water supply. But recently, the villagers discussed and debated the water problem in the Gram sabha and agreed to pay a nominal amount to GP.

- In Bilda, Amalijhuma and Hanumantya Non-NGP villages, people not pay for water as there is no water supply from the panchayats. Only in Rampura village, each household pays water charges (Rs 70 per month) to the panchayat. In Sala village also, the panchayat collects some amount from each family.

▲ Health Problems due to Contaminated Water

- In Pitgara, Nagora and Raipura-NGP villages, some respondents have reported that they are prone to suffering from fever and vomiting, especially children (0-5 years).They take treatment from ASHA and, sometimes, they go to nearby hospitals for treatment. Health problems like cold, amebiasis and dysentery are faced by the children during rainy season. Due to unsafe water, people tend to suffer from diseases like fever, dysentery, stomach ache, vomiting etc. In Pedwi and Morgadhi villages, people tend to suffer from stomach ache due to unsafe drinking water during the rainy season, while children suffer from cold, cough, fever and stomach ache. In Nawadpura village, people get affected by diseases like fever, cold, coughs etc. They go to Nisarpur PHC and, sometimes, to Badwani on doctor's reference. PHC is very far from their village. ANM visits village and conducts meetings. During these visits, she advises people on various health issues.

- In Bilda, Amalijhuma and Hanumantya- Non-NGP villages, the main health problems are fever, cold and stomach ache. There are four Bengali doctors (quacks) in Bilda village and some people prefer to approach them. In Amalijhuma village, people go to doctors at Badwani, or Doganura village for treatment. They prefer private hospitals for treatment because, they think that in government hospitals, one has to run around for getting treatment. In Hanumantya village, ANM or ASHA does not visitthe village/locality regularly. In Sala, Rampura and Kachhi Baroda villages, people are prone to suffering from fever, jaundice and stomach ache and sometimes, children suffer from fever due to consumption of muddy water. For seeking treatment, people go to the doctor in Dharampuri or Sundrel, which is very far from their residence.

▲ Sanitation

- In Pitgara (Harijanamohallah), Nagora, Raipura and Morgadhi- NGP-villages, some households do not have in-house toilets. Even those who have toilets do not use them, due to their bad condition. Many households in Nawadpura and Pedwi villages have access to in-house toilets.

- In Bilda, Rampura, Amalijhumma and Hanumantya- Non-NGP-villages, people do not have in-house toilets facility. But, some rich households enjoy in-house toilet

facility with adequate water supply. However, most of the households prefer open defecation.

▲ Open Defecation

- A maximum number of people in NGP villages practice open defecation as they don't like the toilet infra-structure, and some people take recourse to open defecation whenever pits gets filled up.
- A majority of the households in Non-NGP villages go for open defecation.

▲ Problems due to open defecation

- People practicing on open defecation in NGP villages tend to face problems during night as they have to goto far off places. Moreover, there are wild animals in the villages. In some cases they feel shy. There is a problem of mosquitoes and flies over there. These problems are more during rainy season.
- In Amalijhumma-Non-NGP-village, people are used to open defecation. They do not agree that they might face health problems due to open defecation. In Hanumantya and Kachhibaroda villages, during rainy season, they have to search for safe places for open defecation. Children are more vulnerable to health problems like dysentery, fever, cold and cough, and suffer for 2-3 days.

▲ Working of Committees

- In Both NGP and Non-NGP villages, villagers have no idea about the presence of Village Water and Sanitation Committees (VWSC).
- In Pitgara, Nagora, Rajpura and Pedwi NGP villages, people are not aware of Village Health and Sanitation Committees (VWSC). ASHAs supply chlorine pills and bleaching powder for cleaning water. ASHAs conduct meetings at arogya kendras and counsel people on health issues during home visits. There is no ASHA worker in Nawadpura village.
- In Bilda, Amalijhuma, Sala and Kachhibarod Non-NGP villages, people are not aware of these committees. In Rampura village, there is no ASHA worker. Only ANM and MPW attend to the health issues of the villagers during immunization day; each ANM is responsible for three villages (including their village). Sometimes, they escape from work on the pretext that they have attended to work in other villages. In Hanumantya village, one ASHA worker has recently joined but many people do not know about her presence.

▲ Suggestions to improve the functioning of VWSCs and VHSCs in the villages (NGP and non- NGP):

- In NGP villages, participants in FGDs feel that there is a need for improving the functioning of Village Water and Sanitation committees and Village Health and Sanitation committees. In Pitgara village, participants expect the committees to ensure toilet facility to every house in the colony. In Nagora village, they have suggested that the SC (sub-centre)be restored which now remains abandoned that the doctor reside in the village for attending to critical health problems. In Raipur village, the distance to sub-center (SC) is 2 km (this SC is situated in another colony of the village). In Morgadhi village, some women who attended the FGDs have complained that the GP is not taking up the cleaning of streets and that drainage is in bad condition and also they have to clean the streets by themselves. FGD participants expect a sweeper tobe appointed for cleaning and the laying cement roads in the villageby the GP. The existing toilets should be repaired and new toilets should be constructed. In Pedwi village, there should be a clinic for children. The GP should take up cleaning of streets in the village to keep the surrounding clean on daily basis. They should provide hospital facility in the village. Every household should have tap connection. The GP should provide new wells. In Nawadpura village, toilets should be constructed in every household.

- In Bilda Non-NGP village, GP should take up the cleaning of drainage system and streets. S.C. should function regularly;toilet facility for every house should be provided as wild animals roam around in the village. In Kachhibaroda village, a worker should be appointed at thevillage level for cleaning streets and the drainage system should be maintained properly. In Sala village, toilets constructed by the government are in good condition. It would be better if the panchayat undertakes the responsibility of cleaning toilets by appointing workers. In Rampura village, the GP should construct roads and drainage system in the village besides providing tap connection for all thehouses. Surroundings of hand pumps should be kept clean. The sub-centre should be kept opened throughout the day. A doctor should be available always in the village. In Amalijhuma village, the water tank should be cleaned regularly to ensure clean and safe water to the people. The availability of transportation facilities to reach thenearby hospital needs to be ensured. In Hanumantya village, the GP should lay cement roads in each ward, construct a good drainage system, provide public toilets and individual toilets in the houses and establish sub centers in the village.

3.5 Summary

As discussed in the introduction chapter, positive health outcomes depend on different interventions: direct health interventions and other institutional interventions. An effective

implementation of the health programmes can lead to the low morbidity levels, reduced episodes of diarrhoea and a better nutrition absorption among children etcin the villages. However, positive health outcomes largely depend on how the interactions take place among various institutions, processes and different programmes. It is the social determinants considered in this study, such as the availability of quantity and quality water, and sanitation facilities (in this case lavatories and their proper use by households), allied household level hygiene practices conducive to promoting health, personal hygiene that ultimately shape the health outcomes. Providing such an enabling environment is possible indirectly through a catalytic process in terms of close interactions among various institutions, processes and different programmes at the local level. The study is basically explanatory and analytical in nature.

Here anattempt is made to analyze and understand the health outcomes of individuals and households as these are linked to their access to water and sanitation facilities as well as health and hygiene awareness, and practices at the individual and house hold levels.

Water: In Madhya Pradesh, 6 NGP villages and 6 Non-NGP villages were selected for the study. From these villages, altogether, data was collected from 240 households.A comparison of NGP villages and Non NGP villages indicates that the pure water availability is more in NGP villages. The status of volume of water availability to the respondents amounts to the extent of 76.2% for daily needs. The availability of water (both potable and non- portable) is a concern in both NGP and Non-NGP areas. However, 61.5 % of the respondents have been experiencing inadequacy of water supply during the past one year. As per more than half of the respondents in respect of both the NGP and Non-NGP villages, water is pure, but some respondents are not satisfied with the quality of water. Although some people clean drinking water vessels daily, many clean once in 2 days. Hygiene related practices relating to drinking water are somewhat better in NGP areas. For example, the respondents who use special tumblers attached with long handles (to draw water from drinking water containers) to avoid contamination through hand touching is more in NGP areas. Similarly, a large number of households in NGP areas treat drinking water before drinking as a safety measure.

Drinking water status in schools:

Regarding drinking water supply in government schools, out of 12 schools 6 use hand pumps (50%) and borewell (25.0%) as the main source in both NGP and Non-NGP villages. Only one school each in Non-NGP and NGP have tap connection for supplying of safe drinking water.

Regarding giving clean and safe drinking water to their children, according to a majority of the respondents in both NGP (89.9%) and Non-NGP (82.2%) villages, they strain water, using a cloth. There is only a 7 percent difference between the NGP and non

NGP villages in this respect, while only 9 of the respondents in both NGP and Non-NGP villages boil water before giving to children.

An overwhelming number of the respondents in both NGP (99.2%) and Non-NGP (98.3%) villages covercooked food with a lid as away of maintaining hygiene and preventing occurrence of diseases.

More than half of the respondents help children take bath every day, especially in NGP villages, while in both NGP and Non-NGP villages, children wash their hands before taking food.

Housing: Most of the respondents in NGP and Non-NGP areas live in huts or kutcha houses. The general perception is that people living in semi pucca or pucca houses are relatively better off and can afford better sanitation facilities.

Sanitation: Perhaps due to the typology of housing, only 140 households in both NGP and Non-NGP areas (96 from NGP and 44 from Non-NGP) have access to toilets.

A majority of the households have in-house toilet facility for their children use in NGP villages, whereas in Non-NGP villages, children practice open defecation. A majority of the respondents are not aware of diseases children may be vulnerable to, with open defecation habits and non-use of toilets by children.The availability of water for sanitation purpose is a problem in both NGP (12.6%) and Non-NGP (17.4%) villages. Hence, only 38% of the respondents in both NGP and Non-NGP villages clean toilets daily, while about 12 percent of the respondents clean their toilets once in a month, because of insufficient water supply which is unsafefor cleaning toilets. Those who are using toilets (96 in NGP and 44 in Non-NGP) face a number of problems like flies and mosquitoes, foul smell, super structure does not ensuring privacy, over flowing of pits etc. Therefore, a mere accessibility to toilet facility does not ensure better health outcomes. A great majority of respondents are affirmative regarding, the availability of hand wash near toilets in both NGP and Non-NGP villages,

In Non-NGP villages, all 6 schools use pit latrines, while in NGP villages, 4 schools use pit latrines. Piped sewer system and septic type of latrines are used by NGP schools. However, in NGP villages, there are separate toilets for girls, boys and teachers. The school management engages/hires the services of private individuals for cleaning toilets, but services are not up to the mark, as the management keeps failing to pay the charges regularly for the services rendered by individuals.

Here an attempt is made to understand the role of institutions like VWSC, VHSC, CBOs etc. and the processes that were adopted to achieve Open Defecation Free (ODF)

villages and provision of clean drinking water to all. An attempt is also made to understand the role of the institutions and the processes that hindered in achieving the ODF status of the villages and provision of clean drinking water to all.

The role of Institutions: There are some local level institutions for facilitating a better implementation of water and sanitation programmes at the grass roots level such as village water and sanitation committee (VWSC)and VHSC. However, most of the committees do not meet regularly, especially in Non-NGP villages. Many times, minutes of the meetings are not recorded and the issues related to water supply are discussed orally, especially in Non-NGP villages. Similarly, many of the villagers are not aware of the existence of Village Health and Sanitation Committees (VHSC)/ constitution of VHSC and their functioning at the village level.

Illnesses among children: In MP, a relatively more number (139) of children suffer from various ailments in NGP areas as compared to Non-NGP areas (131), although the difference is only marginal. In both the areas, a majority of the suffering children are taken to private medical practitioners/private hospitals for treatment. In Non-NGP areas, 25 diarrheal cases have been reported as against 29 in NGP areas. In both the areas, all the child patients are reported to have got treatment from private hospitals. In Non-NGP areas, 5 malaria cases and in NGP areas, only 2 malaria cases have been reported. In Non-NGP areas, 33 cases of children suffering from cough, cold and fever in comparison to 30 in NGP areas have been reported. In NGP areas, only 2 cases of dysentery, while only one case of dysentery in Non-NGP areas have been reported.

Illnesses among adults: Regarding health problems of adults in MP, 126 cases in NGP areas and 104 cases in Non-NGP areas have been reported. In both the areas, most of the patients are reported to have received treatment from private clinics. In Non-NGP areas, 50 casesof adults suffering from cough, cold and fever (multiple health problems)as compared to 51 in NGP areas have been reported. With a majority of them receiving treatment from private clinics. However, no dysentery cases have been reported from both NGP and Non-NGP areas.

On the whole, it appears that, though in some respects things are better off in NGP villages, the conditions in NGP villages are not so different from Non-NGP villages. As a result, there is not much of an impact of these water and sanitation programmes on better health outcomes in terms of household level episodes of morbidity in the study villages of Madhya Pradesh.

Chapter- IV

4. Water and Sanitation Programs and their Effects on the Health Status of Communities in Odisha

Odisha state report is presented in the following order; section 4.1provides, a brief description of the basic features of Odisha - such as population growth, educational levels, sex ratio etc; section 4.2 deals with drinking water and sanitation; section 4.3 presents a profile of the study villages; section 4.4 carries out analysis of households and children with respect to water and sanitation programmes followed by a summary in the last chapter (4.5).

4.1 Introduction:

The Population of Odisha, according to the 2011 census, stands at about 41 million, making it the 11th most populous state in India. The state makes up about 3.4% of the country's population, as against about 3% during the last census in 2001. The state is spread over an area of about 150,000 sq. km, making it the 9th largest state in the country in terms of area. The density of population per sq. km. is about 260, fairly below the national average.

The state has a growth rate of about 14% which is below the national average by a good three points. The over all literacy rate in the state is about 73%, a tremendous improvement in the last few years due to consistent efforts on the part of the government. The sex ratio in Odisha is a healthy 978 and the state has never witnessed a major fall in this figure. Bhubhaneshwar happens to be the capital city, and is also the largest city in the state of Odisha. In total, Odisha comprises 30 districts.

4.1.1 A basic demographic profile of Odisha

As per details from census 2011, Odisha has population of 4.2 crores, an increase from figure of 3.68 crore in 2001 census. Total population of Odisha as per 2011 census is 41,974,218 of which male and female are 21,212,136 and 20,762,082 respectively. In 2001, total population was 36,804,660 in which males were 18,660,570 while females were 18,144,090 (Census, 2011).

Total population growth in this decade was 14.05 percent. While in 2001 Census it was 15.94 percent. The population of Odisha forms 3.47 percent of India in 2011. In 2001, the figure was 3.58 percent.

4.1.2 Literacy Rate 2011

The overall literacy rate in Odisha has seen an upward trend at 72.87 percent, as per 2011 population census. Of that, male literacy rate stands at 81.59 percent, while female literacy rate at 62.46 percent. Comparatively, in 2001, the overall literacy rate in Odisha was 63.08 percent with males and females accounted for 71.28 percent and 50.51 percent respectively. In actual numbers, total literates in Odisha stand at 26,742,595 of which males are 15,089,681 and females 11,652,914 (see Table 4.1a)

4.1.3 Sex Ratio

The sex Ratio in Odisha is 979 i.e. for every 1000 males, much above the national average of 940, as per census 2011. In 2001, the sex ratio was slightly less at 972 per 1000 males in Odisha (Census, 2011).

4..1.4 Situation in the study districts and villages

In Remuna block, the share of households with tap water from treated source amounts to 7.3%; 1.0% of the households are connected with tap water from untreated source; 57.3% are dependent upon hand pumps, followed by 27.6% of the households that are dependent upon tube wells/bore wells, only 2.4% are dependent on rivers/ canals and 1.7% are dependent on uncovered wells (Census,2011).

In Nilagiri block, 4.3% of the households are connected with tap water from treated source; 4.8% of the households with untreated tap water source; a high percent of households (55.6%) are dependent on hand pumps, followed by 18.3% on tube wells/ boreholes and 10.7% of households upon uncovered wells; 1 % households on covered wells; 1.3% of households on rivers/canals and a less than one percent of households are dependent on springs (Census, 2011).

In Baliapal block, 8.2% of the households are connected with tap water from treated water source; 1.8% of the household are connected with tap water from untreated water source; a large number of households (79.0%) are dependent on hand pumps; 8% of the households on tube wells/ bore holes and only 0.4% are dependent on covered well (Census, 2011).

In Patana block, 1.7% of the households are connected with tap water from treated source, 3.6% with tap water from untreated source; a high percent of households (60.0%)

are dependent upon hand pumps, 6.5% on tube wells/bore holes and 2.1%, 1.4%,1.5% are dependent on springs, rivers/canals, tanks/ponds/lakes respectively (Census, 2011).

As per Census 2011, 6 per cent of the households are connected to tap water from treated source in Basta Mandal (rural areas) while 2.3 percent of the households to untreated source; 69 percent of the households are dependent on hand pumps, 19 percent on tube wells/bore wells (Census, 2011).

In Jaleswar block, the households that are connected to tap water from treated source come to 9 percent, while 0.7 percent of the households to untreated tap water; nearly three-fourth i.e.,73 % of the households depend on hand pumps; 13 percent on tube wells/bore holes and one percent depend on rivers/canals (Census, 2011).

Table 4.1a A Demographic profile of Odisha state

States	Odisha					
	2001			2011		
	Male	Female	Total	Male	Female	Total
Population	18,660,570	18,144,090	36,804,660	21,212,136	20,762,082	41,974,218
Literacy Rate	71.28%	50.51%		81.57%	62.48%	

Source: (Census, 2011)

4.2. Water and Sanitation

4.2.1 Sources of drinking water

As per Census 2011, the share of households connected with tap water from treated source in Odisha rural areas amounts to 3.9%, while 3.5% HHs are connected with untreated sources about (18%) of the households depend on uncovered wells, 446.8 percent with hand pumps; about 20.2% depend on tube wells/ bore wells (Census 2011).

4.2.2 Sanitation

In rural areas of Odisha , only 14.1% per cent of the households have access to in-house latrine facility, while the remaining 85.9% percent of the households don't have latrine facility. The type of latrine facilities, that the households have within the premises: 55.1 percent have septic tanks, 6.2 percent piped sewer system, under pit latrine, 13.7 percent have slab/ventilated improved pits; 10.2 percent have no slab/ open pits. Among the households without latrine facility, 98.6 percent practise open defecation and the remaining 1.4 percent depend on public latrines (Census, 2011).

Fig 4.1 The Main source of water in Odisha is from overhead tanks, directly to connected to pipelines.

In Baliapal block (in rural areas), 68.5% of the households have no toilet facility within the household premises, while only 31.5% of the households have access to in-house toilet facility. The details about the type of latrine facility within the premises among the households are: 5.6% of the households have access to septic tanks, while 0.8% of the households have piped sewer system and households having flush /pour-flush latrines account to 5.3%. Under pit latrine, 10.8% of the households have access to with-slab / ventilated improved pit latrines, while households having without- slab pit latrine constitute 8.6% and 68.2% of the households practise open defecation and the remaining 0.4% of the households are dependent on public toilets (Census, 2011).

In Remuna block (in rural areas), 80.3% of the households do not have access to in-house toilet facility, while only 19.7% of the households have in-house toilet facility. The details about the type of latrine facility available within the premises are households having septic tanks constitute 7.1%, those with piped sewer system constitute 1.7% and those with flush/pour flush latrines 3.0%.Under pit latrines, 4.6% of the households have with- slab ventilated improved pits, while households without-slab pit latrines make up 2.1% and 75.4% of the households practises open defecation and the remaining 4.9% of the households are dependent on public toilets (Census, 2011).

In Niligari block (in rural areas), 81.7% of the households do not have in-house toilet facility and only 18.3% of the households access to in-house toilets. The details about the type of latrine facility, available within the household premises are: septic tank having households amount to 6.3%; 0.7% of the households have piped sewer system and those flush /pour flush latrine are 1.7%. Under pit latrine, 6.1% of the households have with-slab ventilated improved pits; those with without-slab pit latrines make up 2.3% and 80.8% of the households practise open defecation and the remaining 1.7% of the households are dependent on public toilets (Census, 2011).

In Patana block (in rural areas), 90.5% of the households do not have in-house toilet facility and only 9.5% of the households have access to in-house toilet facility. The details about the type of latrine facility available within the households premises are: households having septic tank make up 6.6%; 0.1% of the households have piped sewer system and those with flush/pour- flush latrines constitute 0.5%. Under pit latrine, 1.2% of the households have with-slab ventilated improved pits; 90.4% of the households practises open defecation and the remaining 0.1% are dependent on public toilets (Census, 2011).

In Basta block (rural areas), 26.7 per cent of the households have in-house toilets and 73.3 percent of the households go without latrine facility. The details about the type of latrine facility available within the household premises are: 21.6 percent have latrines with septic tanks; 4.4 percent have piped sewer system and another 12 percent have other systems under flush/pour-flush latrines. Under pit latrine, 32.6 percent of the households have access to with-slab/ventilated improved pits, while, 27 percent have without-slab open pits. Among the households that don't have latrine facility, 97 percent practise open defecation and the remaining 3 percent depend on public latrines (Census 2011).

In Jaleswar block (rural areas), 30 per cent of the households have in-house latrine facility and 70 percent of the households go without latrine facility. The details about the type of latrine facility available within the household premises, are: 23.4 percent have latrines with septic tanks; 4.2 percent have piped sewer system and another 20 percent have other systems under flush/pour-flush latrines. Under pit latrine, 18.4 percent of the households have with-slab/ventilated improved pits; 31.6 percent have without-slab open pits. Among the households without latrine facility, 96 percent practises open defecation and the remaining 4 percent are dependent on public latrines (Census 2011).

Table 4.1b Situation of drinking water and Water and Sanitation in Odisha State

Water

Drinking water	Urban	Rural	Total
Within the premises	862,426	1,299,251	3,418,321
Near the premises	374,820	3,706,267	2,161,677
Away	279,827	3,138,494	4,081,087
Total	1,517,073	8,144,012	9,661,085

Source: Census, 2011

Sanitation

Sanitation facility	Urban	Rural	Total
Having facility	982,744	146,552	2,129,296
Not having facility	534,329	6,997,640	7,531,789
Total	1,517,073	8,144,012	9,661,085

Source: Census 2011

4.3 A Profile of the study villages in the district

To understand the public policies and governance structures, it is necessary to study the environmental factors like location, socio-economic structure, infrastructural facilities, civil society bodies, etc, for, they wield a considerable influence on the performance of the development programme. The social development policies such as provision of protected drinking water and sanitation have to operate in the context of geographical, socio-cultural and political configuration of the society or the areas where they are being operated. The interaction between the environment and administration devised for the implementation of policies is very important, especially at the grass-roots levels. In this context, an attempt is made to examine some of the social determinants and infrastructural facilities available in the villages which were selected for the study. As mentioned earlier, the study was conducted in 12 villages (i.e. 6 NGP and 6 Non-NGP villages) of two districts i.e., Balasore and Kendujhar in Odisha state.

4.3.1 Location and demographic features of the study villages

The data on the availability of transportation in villages reveals that two thirds of the villages depend on private agencies/transport i.e., private buses or autos and another one fifth of them depend on the state transport corporation. However, a few of them (8.3%) do not have access to any transport facility, especially in Non-NGP villages. With regard to availability of electricity 83.3% of the villages have electricity connection and only 16.7% of the villages go without electricity, mostly NGP villages.

4.3.2 Sources of drinking water in the study villages

Regarding the main source of drinking water, nearly three fourths of the villages depend on wells with overhead tanks/directly connected to pipelines for procuring drinking water. Some villagers (25%) depend on open wells for this purpose, especially in Non-NGP villages. Thus, the villagers in Non-NGP villages are deprived of protected drinking water, which affects in turn, the health of people.

Fig 4. 2 Main source of water is from open well in Odisha

4.3.3 Village Water and Sanitation Committees (VWSCs)

As per the NHM programme norms, in every village, there shall be a Village Water and Sanitation Committee (VWSC) to guide and monitor water and sanitation services at the village level. In Odisha state, in 6 NGP villages, 6 VHSCs and 6 VWSCs have been formed, whereas in Non-NGP areas, 6 VHSCs and 2 VWSCs have been formed. With regard to the awareness levels regarding the existence or constitution of Village Health and Sanitation Committees (VHSCs) in the villages, two-thirds of the villagers are aware of the presence of these committees, while the remaining one third of them are not aware of such committees. These committees have been constituted in all the NGP villages, while in Non-NGP villages, only two villages have these committees as against the remaining four villages. The meetings of VHSCs are held either at the GP office or ICDS centres. In the case of NGP villages, meetings are held at GP office, while in respect of Non-NGP villages they are held in Anganwadi centres.

The minutes of the committee meetings are recorded and preserved properly by the chairman of the committee or sarpanch of the GP and, sometimes, the employees of the

anganwadi centres or the committee members. Two thirds of committee members do not have knowledge or information about the budgetary allocation or grants by the higher authorities to VWSCs. Although the committees have been constituted in certain villages, their functioning is very discouraging as the members are not aware of their duties and powers. This is true in respects of both the NGP and Non-NGP villages. Further, many villagers (87.4%) are not aware of the existence/constitution of the VWSCs especially in Non-NGP villages, while in NGP villages, a majority of the people are aware of these committees.

The village sarpanch/ secretary concerned, especially in NGP villages, have disseminated information on water and sanitation programmes through posters, hand-outs/pamphlets/ wall writings/brochures etc., while in Non-NGP villages, such efforts are not visible.

Of the total villages (12), more than half of the villages i.e., 7 prepare the village health plans. From Non-NGP villages out of 6 only two villages prepare the plans. Further, the data reveals that in NGP villages issues/items, identified in the village plans, are brought to the notice of VHSC functionaries, whereas in in three Non-NGP villages, these issues are brought to the notice of the committee functionaries for resolving the problems. However, in more than three fourths of the villages (9), VHSC functionaries do not present the annual reports in the Gram Sabha of GP for discussion.

4.3.4 State of water and sanitation facilities in government schools in the study villages

In Odisha, in all 6 villages, 6 schools and 6 ICDS centres are covered, whereas in Non-NGP villages, 5 schools and 5 ICDS centres are covered. At the school level, observations and interviews with key authorities & teachers reveal that in NGP villages, out of six schools, three schools get drinking water from bore wells, two schools from taps and one from other sources. Out of six schools in Non-NGP, three schools get drinking water from bore wells, and one each from taps, tanks and other sources.

As regards latrine facilities in schools, in NGP villages, out of six schools, four schools have septic tank type of toilets and two schools pit latrines, whereas in Non-NGP villages, out of six schools, four schools have septic type of toilets and one each pit latrine and piped sewer system.

Out of six schools in NGP areas, three schools have separate toilets for boys and girls, whereas in Non-NGP villages, in four schools out of six there is such facility. In NGP areas, only three schools have separate toilets for teachers, while all six schools do not have separate toilets for teachers in Non-NGP areas.

Water facility in ICDS centres in the study villages:

As regards ICDS centres, there are six in NGP and six in Non-NGP villages. In NGP villages, 4 ICDS centres get water from bore wells followed by one each from taps and wells. In Non-NGP, out of six centres, 4 centres get water from 'other sources' followed by bore wells (1).

Fig 4. 3 Wells within household premises in Odisha State

4.4 A Profiles of households and children behaviour related to water, sanitation and hygiene

This section is based on the data collected through household and child schedules. In this section, an attempt is made to examine the perceptions of household members representing Nirmal Gram Puraskar and Non-Nirmal Gram Puraskar villages regarding the utilization of water and sanitation programmes and their impact on the health conditions of the rural communities. Unlike the other studies, the present study adopted the programme (NGP villages) and control -group (villages without NGP) approach, covering both NGP and Non-NGP village households in an attempt to juxtapose the situation for eliciting the response of people towards the programmes and their impact on the health conditions of people.

An analysis of the experiences of those who are recipients of the scheme /Nirmal Gram Puraskar provides insights into the operational dynamics of the programme. This also brings out the gap between promise and performance besides highlighting the strengths and weaknesses of the programmes. Similarly, an understanding and assessment of the

perceptions of the Non- NGP households provide a clue to identifying the causes for the non-availability of facilities offered by the government. Here, an attempt is made to analyse the socio- economic background of the respondents, representing NGP & Non-NGP villages.

Table 4.2 Gender and literacy profiles of the respondents in NGP & Non-NGP Villages

Level of	NGP			Non-NGP			All		
schooling	Male	Female	Total	Male	Female	Total	Male	Female	Total
Primary	48	7	55	49	18	67	97	25	122
Per cent (%)	42.9	77.8	45.5	50	85.7	56.3	46.2	83.3	50.8
Secondary (6-12)	42	1	43	30	0	30	72	1	73
Per cent (%)	37.5	11.1	35.5	30.6	0	25.2	34.3	3.3	30.4
Graduate	15	0	15	13	1	14	28	1	29
Per cent (%)	13.4	0	12.4	13.3	4.8	11.8	13.3	3.3	12.1
Post Graduate	1	0	1	2	0	2	3	0	3
Per cent (%)	0.9	0	0.8	2	0	1.7	1.4	0.0	1.3
Illiterate	6	1	7	4	2	6	10	3	13
Per cent (%)	5.4	11.1	5.8	4.1	9.5	5	4.8	10.0	5.4
Total	**112**	**9**	**121**	**98**	**21**	**119**	**210**	**30**	**240**

The distribution of the respondents reveals an overwhelming percentage of males (87.5%), while a negligible percentage of females. A similar trend, by and large, prevails in both NGP and Non-NGP villages. The representation of the respondents is also the same both in NGP (50.4%) and Non-NGP (49.6%) villages. The educational levels of the respondents unfold that a majority of them have completed their primary (50.8%) and secondary (30.4%) education, while a less percentage of them have pursued their graduation (12.1%) and post-graduation (1.3%). A few of the respondents (5.4%) are illiterate. However, the educational levels of the respondents representing NGP villages are relatively higher than Non-NGP villages. Thus, the respondents representing NGP villages appear to have better opportunities to avail water and sanitation programmes in view of their relatively higher educational levels, as compared to Non-NGP respondents (Table 4.2).

The analysis reveals that overall, a majority of the respondents reside in kutcha houses (50.4%) and huts (6.7%), and while less than one fourth and less than one fifth of the respondents reside in pucca and semi-pucca houses respectively. The data further reveals that the respondents living in pucca and semi-pucca houses belongs to NGP villages, while the respondents living in kutcha houses and huts come from Non-NGP villages, indicating their poor economic conditions (Table. 4.3).

Table 4.3 A Profile of households by type of house in NGP and Non-NGP villages

Type of House	NGP	Non-NGP	Total
Pucca	43	19	62
Per cent (%)	35.5	16.0	25.8
Sem-pucca	30	11	41
Per cent (%)	24.8	9.2	17.1
Kutcha	33	88	121
Per cent (%)	27.3	73.9	50.4
Hut	15	1	16
Per cent (%)	12.4	.8	6.7
Total	**121**	**119**	**240**

Table 4.4 Distribution of the sample households by type of toilet in NGP and Non-NGP villages

Type of toilet	NGP	Non-NGP	Total
Pit latrine	39	4	43
Per cent (%)	32.2	3.4	17.9
Flush toilet	5	4	9
Per cent (%)	4.1	3.4	3.8
Piped sewer System	1	0	1
Per cent (%)	.8	.0	.4
Septic latrine	22	1	23
Per cent (%)	18.2	.8	9.6
Open defecation	54	110	164
Per cent (%)	44.6	92.4	68.3
Total	**121**	**119**	**240**

Chi-value = 57.883, P= 0

With regard to toilet facilities, the field data reveals that,overall, more than two-thirds of the respondents (68.3%) still practise open defecation and less than one-fifth (17.9%) depend on pit latrines followed by septic latrines (9.6%) in both NGP and Non-NGP areas. As it is evidenced from Che-square test, open defecation is being practised more in Non-NGP areas (92.4%) than in NGP villages (44.6%)(Table 4.4).

Regarding the reasons for using personal toilets, more than half of them do so for having privacy and another 18.5 % of the respondents for maintaining good health and privacy It is interesting to note that these responses have come mostly from the respondents with relatively higher educational qualifications. A similar trend is observed in both NGP and Non-NGP villages. This also further confirms the fact that the education levels of people make them more conscious of practising hygienic methods (Table 4.5).

Table 4.5 Respondents perceptions related to the use of toilets, by the level of education in NGP and non-NGP villages

Education	NGP					Non-NGP				All				
	For better health	Privacy	Persuaded by NGOs/ GOVT/ others	For better health & privacy	Total	For better health	Privacy	For better health & privacy	Total	For better health	Privacy	Persuaded by NGOs/ GOVT/ others	for better health & privacy	Total
Primary	5	14	1	3	23	0	0	1	1	5	14	1	4	24
Per cent (%)	22	60.80	4	13	95.83	0	0	100	4.16	20.83	58.33	4	16.66	100.00
Secondary (6-12)	15	19	0	7	41	1	4	3	8	16	23	0	10	49
	37	46.34	0	17	83.67	13	50	38	16.32	32.65	46.93	0	20.40	100.00
Illiterate	0	3	0	0	3	0	0	0	0	0	3	0	0	3
	0	100.00	0	0	100.00	0.00	0.00	0.00	0.00	0.00	100.00	0	0.00	100.00
Total	**20**	**36**	**1**	**10**	**67**	**1**	**4**	**4**	**9**	**21**	**40**	**1**	**14**	**76**

Table 4.6 Details of hand wash habits after defecation in NGP and Non-NGP villages

Type of hand wash	NGP	NON-NGP	Total
Soap	60	39	99
Per cent (%)	32.8	41.2	41.2
Sand/ash	46	76	122
Per cent (%)	38.0	63.9	50.8
Plain water	15	4	19
Per cent (%)	12.4	3.4	7.9
Total	**121**	**119**	**240**

Regarding washing of hands after defecation and the material used for it, more than half of the respondents use sand and another 41.2% of them use soap for washing hands, while a less percentage of respondents (7.9%) use water for washing hands. There is not much of a variation between NGP and Non-NGP village, in this regard (Table 4.6)

Table 4.7 Water availability and usage (by source) in NGP and Non-NGP villages

Purpose of using occasional source of water	NGP	Non-NGP	Total
Don't Know	3	21	24
	2.5	17.6	9.6
Domestic use	105	94	199
	86.8	79.0	82.9
Toilet use	13	4	17
	10.7	3.4	7.1
Total	**121**	**119**	**240**

An over whelming percentage of the respondents (82.9%) use water for domestic purpose, such as washing dishes, clothes and for bath etc, while a less percentage of the respondents (7.1%) use water for toilet purpose. This indicates that villagers (particularly in Non-NGP) tend to give less priority to cleaning of toilets. This is partly due to their practice of open defecation (Table 4.7).

Table 4. 8 Perceptions of the respondents regarding the quality of water in NGP and Non-NGP villages

Quality of water	NGP	Non-NGP	Total
Pure	89	87	176
Per cent (%)	73.6	73.1	73.3
Sometimes pure	24	32	56
Per cent (%)	19.8	26.9	23.3
impure	2	0	2
Per cent (%)	1.7	.0	.8
Sometimes impure	2	0	2
Per cent (%)	1.7	.0	.8
Mostly pure	3	0	3
Per cent (%)	2.5	.0	1.2
Mostly impure	1	0	1
Per cent (%)	.8	.0	.4
Total	**121**	**119**	**240**

Chi-value =9.15, P=0.103

With regard to the quality of water, three fourths of the respondents have mentioned that it is pure and another one fourth of them have replied that water is pure only during a certain period. The difference between NGP and Non-NGP with regard to quality of water is not significant (Table 4.8). A few of the respondents (2.08%) have reported that water is impure, especially during the rainy season.

Table 4.9 Details of adequacy/inadequacy of water availability for daily needs

Quantity of water	NGP	Non-NGP	Total
Fully Sufficient	53	6	59
Per cent (%)	43.8	5.0	24.6
Somewhat sufficient	29	39	68
Per cent (%)	24.0	32.8	28.3
Insufficient	33	68	101
Per cent (%)	27.3	57.1	42.1
Not at all sufficient	6	6	12
Per cent (%)	5.0	5.0	5.0
Total	**121**	**119**	**240**

Regarding whether water is adequate to meet the daily needs, i.e.,both domestic and drinking purposes, nearly half of the respondents have reported that water is insufficient, while one fourth of the respondents have replied that water availability is not adequate. However, one fifth of the respondents have expressed that they are happy with the

availability of water and able to meet their daily needs. These, respondents mostly hail from NGP villages.

Thus, the analysis reveals that there is a variation in the availability of water between NGP and Non-NGP villages, with the former category of villages having adequate water as compared to the later category of villages. The policy makers have to provide an adequate attention to addressing the issue of water supply to the people living in Non-NGP villages (Table 4.9).

Table 4.10 Perceptions of the respondents regarding the adequacy of water supply during the past one year

Adequacy of water supply	NGP	Non-NGP	Total
Yes	34	8	42
Per cent (%)	28.1	6.7	17.5
No	87	111	198
Per cent (%)	71.9	93.3	82.5
Total	**121**	**119**	**240**

When probed further about the availability of adequate quality water during the past one year, overall, a great majority of the respondents (82.5%) have reported that it is not adequate. This response is more from the respondents representing Non-NGP villages. This indicates that the authorities concerned have neglected certain villages in terms of initiating measures to supply an adequate volume of water to the people. This is partly due to the non-functioning of GPs and the committees (VWSC and VHSC) villages in specially working for this purpose (Table 4.10).

Table 4.11 Particulars of season-wise water insufficiency (interms of intensity)

Seasonal water insufficiency	NGP	Non-NGP	Total
Summer	34	8	42
Per cent (%)	100.0	100.0	100.0
Winter	0	0	0
Per cent (%)	0.0	0.0	0.0
Total	**34**	**8**	**42**

Further, the respondents who have reported that the availability of water is adequate also experience water problem during summer in both NGP and non- NGP areas (Table 4.11).

With regard to the storage capacity of containers, especially for drinking water, nearly one fourths of the respondents have mentioned that they possess storage facility/ies which can preserve 10-15 tubs of water. These responses, as observed earlier also, have come more from Non-NGP villages as compared to NGP villages. The respondents who use buckets for storing water mostly belong to NGP villages. This could be, as pointed out earlier, due to a regular supply of water by the GP to people (Table 4.12).

Table 4.12 Information on the storage capacity (drinking water) of water tanks/drums/ vessels in the sample households in NGP and Non-NGP villages

Storage capacity of drinking water	NGP	Non-NGP	Total
10 Tubs	41	15	56
Per cent (%)	33.9	12.6	23.3
15 pots	34	83	117
Per cent (%)	28.1	69.7	48.8
1 drum	16	16	32
Per cent (%)	13.2	13.4	13.3
10 Bucket	30	5	35
	24.8	4.2	14.6
Total	**121**	**119**	**240**

Table 4.13 Information on practices of drawing drinking water from containers

Method used fortaking water from container	NGP	Non-NGP	Total
Container has a tap attached	15	7	22
Per cent (%)	12.4	5.9	9.2
with a tumbler/utensil using hand	89	74	163
Per cent (%)	73.6	62.2	67.9
With a tumbler/utensil attached to a long handle	16	38	54
Per cent (%)	13.2	31.9	22.5
Others	1	0	1
Per cent (%)	.8	.0	.4
Total	**121**	**119**	**240**

With regard to the use of methods for taking water from containers for drinking purpose, about three-fourths have mentioned that they draw water with a glass tumbler or other utensil using hand. Sometimes, this could cause the contamination of water and ill-health of household members. This situation is more visible in NGP villages. The data reveals that a little over one fifth and less than 9.2 % of the respondents use glass tumblers attached with long handles and a tap attached to the container for consuming water respectively. These methods are considered as appropriate methods for consuming drinking water and for keeping good health (Table 4.13).

Almost all the respondents in both the areas have reported that they clean drinking water containers to a question on, how many times they have cleaned water containers during the past one month, an overwhelming percentage of the respondents (80%) have replied that they have been cleaning every day, while, some others have mentioned that they do so once in two days (11.2% of the respondents), and once in five days (5.0% of the respondents). However, an insignificant percentage of the respondents (1.2%) have

replied that they clean them once in a month. As it is evidenced from Chi-square test the percentages of respondents, who clean containers every day, come more from Non-NGP villages, as compared to NGP villages (Table 4.14).

Table 4.14 Distribution of households by frequency of cleaning water containers used for drinking water in NGP and Non-NGP villages

Cleaning drinking water container	NGP	Non-NGP	Total
NO	0	0	0
Per cent (%)	0.0	0.0	0.0
Yes	121	119	240
Per cent (%)	100.0	100.0	100.0
Daily	90	104	194
Per cent (%)	74.4	87.4	80.8
Once in 2 days	19	8	27
Per cent (%)	15.7	6.7	11.2
Once in 5 days	8	4	12
Per cent (%)	6.6	3.4	5.0
Once in Two weeks	2	2	4
Per cent (%)	1.7	1.7	1.7
Once a month	2	1	3
Per cent (%)	1.7	.8	1.2
Total	**121**	**119**	**240**

Chi-value =7.142, P=0.129

A less percentage of the respondents (16%) have expressed that they boil water or strain water using a cloth and that they take precautionary measures to clean water before drinking. Another one fourth of them have mentioned that, only sometimes, they go through this exercise. More than half of the respondents have expressed that they do not go through this exercise. This response is relatively more from the respondents (57.9%) representing Non-NGP villages and illiterates. This indicates that the educational levels of the household members play a crucial role in treating water before consumption (Table 4.15).

Further, the respondents who have mentioned that they treat water were asked to indicate which method was mostly used for treating water. Nearly three fourths of them (in both NGP and Non-NGP) have replied that they boil water, while a little over one fifth of them strain water using a cloth. Non-NGP villages found better in treating water. A few of them (5.6%) have mentioned that they wait till sand or any other particle settle at the bottom of the pot/container. This is some what unsafe for drinking purpose (Table 4.16).

Table 4.15 Information on treatment of drinking water before consumption, by level of education of the respondents

Educational level	NGP					Non-NGP					All				
	Always	Some times	Never	Not at all done	Total	Always	Some times	Never	Not at all done	Total	Always	Some times	Never	Not at all done	Total
Primary	8	17	26	4	55	14	19	32	2	67	22	36	58	6	122
Per cent (%)	14.54	30.90	47.27	7.27	45.08	20.89	28.35	47.76	2.98	54.91	18.03	29.50	47.54	4.91	100.00
Secondary (6-12) and Graduate	12	17	28	1	58	4	11	25	4	44	16	28	53	5	102
Per cent (%)	20.68	29.31	48.27	1.72	56.86	9.09	25.00	56.81	9.09	65.68	15.68	27.45	51.96	4.90	100.00
Post Graduate	0	0	1	0	1	0	0	2	0	2	0	0	3	0	3
Per cent (%)	0.00	0.00	100.00	0.00	33.33	0.00	0.00	100.00	0.00	66.66	0.00	0.00	100.00	0.00	100.00
Illiterate	0	3	4	0	7	0	2	4	0	6	0	5	8	0	13
Per cent (%)	0.00	42.85	57.14	0.00	53.84	0.00	33.33	66.66	0.00	46.15	0.00	38.46	61.5%	0.00	100.00
Total	20	37	59	5	121	18	32	63	6	119	38	69	122	11	240

Table 4.16 Details of measures taken for treating water before consumption by the sample households in NGP and Non-NGP villages.

Measures	NGP	Non-NGP	Total
Boil water	37	39	76
Per cent (%)	64.9	78.0	71.0
Strain water, using a cloth	14	11	25
Per cent (%)	24.6	22.0	23.4
Let water stand and settle	6	0	6
Per cent (%)	10.5	.0	5.6
Total	**57**	**50**	**107**

Chi-value=5.98, P=0.05

Table 4.17 Information on the major problems related to water supply in the sample in NGP and Non-NGP villages

Major problem	NGP	Non-NGP	Total
No problem	50	4	54
Per cent (%)	41.3	3.4	22.5
Bore wells is not available	11	5	16
Per cent (%)	9.1	4.2	6.7
Shortage of water	53	100	153
Per cent (%)	43.8	84.0	63.8
Long distance involved in fetching water	5	10	15
Per cent (%)	4.1	8.4	6.2
Don't know	2	0	2
Per cent (%)	1.7	.0	.8
Total	**121**	**119**	**240**

The respondents were asked to indicate the major problems encountered by them in accessing adequate water supply regularly in their residential /local areas. According to nearly two thirds of the respondents, the shortage of water is the main problem, a few of (6.2%) them have mentioned that they have to travel long distances for fetching water and as per some others (6.7%) adequate number of bore wells are not available in their locality. However, a little over one fifth of the respondents have expressed that they have no problems in getting water in their respective wards/localities (Table 4.17).

Regarding major problems of drinking water faced, there are 299 multiple responses. The main problems reported are: water problem is acute during the summer season (23.74%) (Water level goes down during summer) and there are no adequate number of bore wells/tube wells (20.4%). The main problem reported mostly in Non-NGP villages is no water supply (piped water supply) in the sample villages (18.68%). Similarly, the main problem reported in NGP villages is poor electricity supply/power cut (20 %). This is relevant here, as many households are connected to tap water (Table 4.18).

Fig 4.4. Posters on how to make drinking water safer

Table 4.18 Distribution of respondents reporting major problems regarding water supply in NGP and Non-NGP villages

Problems	NGP	Non-NGP	Total
Going to Another Place due to non-working of bore wells	0	1	1
Per cent (%)	0	0.5	0.3
Paying Money to Get Water	4	1	5
Per cent (%)	3.4	0.5	1.6
Long Distance involved infetching water	4	4	8
Per cent (%)	3.4	2.19	2.6
During Summer Season, water Level goes down	31	40	71
Per cent (%)	26.4	21.9	23.74
Unprotected Wells	0	2	2
Per cent (%)	0	1.09	0.66
No Public Taps in the Villages	0	12	12
Per cent (%)	0	6.5	4.0
Untimely water supply	9	18	27
Per cent (%)	7.7	9.89	9.0
Inadequate number of Tube-Wells/Bore Wells	25	36	61
Per cent (%)	21.3	19.7	20.4
No Water Supply(Piped Water Supply) Available in our Village	1	34	35
Per cent (%)	0.85	18.68	11.7
All Parts of our village are not connected to Piped Water Supply	9	7	16
Per cent (%)	7.7	3.8	5.35
All HHs are not connected to Piped Water Supply	6	6	12
Per cent (%)	5.1	3.29	4.01
Poor electricity supply/power cuts	24	7	31
Per cent (%)	20.5	3.8	10.36
Water storage facility not available in our village	0	5	5
Per cent (%)	0	2.7	1.67
Water storage facility not available in poor families	0	1	1
Per cent (%)	0	0.54	0.33
Contaminated cater	1	2	3
Per cent (%)	0.85	1.09	1.0
Total	**117**	**182**	**299**

Table 4.19 Status of water supply in ICDS Centres in NGP and Non-NGP villages

Water supply in ICDS centre	NGP	Non-NGP	Total
Yes	63	79	142
Per cent (%)	52.1	66.4	59.2
No	47	33	80
Per cent (%)	38.8	27.7	33.3
others	11	7	18
Per cent (%)	9.1	5.9	7.5
Total	**121**	**119**	**240**

According to more than half of the respondents, anganwadi Centres supply water to children attending the centres, while one third of the respondents have replied negatively (Table 4.19).

Table 4.20 Respondents awareness regarding the advantages of using in house latrine/ toilet/lavatory facility in NGP and Non- NGP villages

Advantages	NGP	Non-NGP	Total
Better health	23	3	26
Per cent (%)	14.3	1.9	16.1
Privacy	13	4	17
Per cent (%)	8.1	2.5	10.6
Ease of use	4		4
Per cent (%)	2.5		2.5
Social status	3		3
Per cent (%)	1.9		1.9
Better health& Privacy	9	3	12
Per cent (%)	5.6	1.9	7.5
Privacy and Social status	4		4
Per cent (%)	2.5		2.5
No toilet	23		23
Per cent (%)	14.3		14.28
Better health & ease of use	10		10
Per cent (%)	6.2		6.2
Others		62	62
Per cent (%)		38.5	38.50
Total	**89**	**72**	**161**

The respondents were asked to reveal the advantages of having toilets within the household premises. As per some of the respondents, it is to prevent diseases and to maintain hygiene conditions, primary and social status, while more than one-third of the respondents have mentioned other advantages (Table 4.20).

Table 4.21 Respondents encounter problems regarding the use of toilets in NGP and Non-NGP villages

problem	NGP	Non-NGP	Total
Yes	22	1	23
Per cent (%)	32.8	11.1	30.3
No	45	8	53
Per cent (%)	67.2	88.9	69.7
Total	**67**	**9**	**76**

The respondents, using toilets were asked a question, "Were they facing any problem in using and maintaining toilets ?". Many respondents (23) have replied that they encounter problems,while others have expressed that they do not have any problem with the maintenance of toilets (Table 4.21).

Table 4.22 Problems encountered by the sample households relating to toilet use in NGP and Non-NGP villages

Toilets problems	NGP	Non-NGP	Total
Water not available for use/cleaning	8	1	9
Per cent (%)	21.62	100	23.68
Flies/or Mosquitoes	10	0	10
Per cent (%)	27.02	0	26.31
Superstructure not ensuring privacy	2	0	2
Per cent (%)	5.40	0	5.26
Foul smell	4	0	4
Per cent (%)	10.81	0	10.52
Flooding duringrainy seasons	8	0	8
Per cent (%)	21.62	0	21.05
Difficulties for younger children to use	3	0	3
Per cent (%)	8.10	0	7.89
Filled up pits	2	0	2
Per cent (%)	5.40	0	5.26
Total	**37**	**1**	**38**

Some of the problems faced in using toilets are: mosquitoes and flies menace (26.31 % of households), water not available (23.68% of households), flooding during rainy season (21% of households) and foul smell from toilets (10.52% of households). The non-availability of adequate quantity of water for cleaning toilets, an uncontrollable mosquito menace in the premise and locality, lack of privacy, bad smell due to irregular maintenance of the drainage canals, lack of connectivity of toilet pipes with drainage, blockage of toilet pipes during rainy season, unloading or irregular cleaning of toilet pits, and unsafe

toilet structures are the major problems encountered by the respondents in using toilets. Some of these issues are related to the linkage of the toilets to the main drainage system in the villages and the general environment. The local government's role, in this context, is of utmost importance in controlling mosquitoes and proper maintaining the drainage system in the locality (Table 4.22).

Table 4.23 Information on the practices of disposing of children stools post defecation in NGP and Non-NGP villages

Methods of disposal of child's stools	NGP	Non-NGP	Total
Leave it where it is	3	9	12
Per cent (%)	1.3	3.8	5.0
Throw it in the street	80	77	157
Per cent (%)	33.3	32.1	65.4
Throw it in the latrine	11	2	13
Per cent (%)	4.6	0.8	5.4
Others	27	31	58
Per cent (%)	11.3	12.9	24.16
Total	**121**	**119**	**240**

Chi-value=49.55, P=0

Regarding the practices of disposing of children's stools after open defecation, nearly two-thirds of the respondents throw children's excreta in the street (significantly more in NGP areas) while some of them leave it where it is or throw it in the latrine. The overall situation is that the methods used by the respondents in disposing of getting children's excreta are not desirable and might cause ill-health of household members and also neighbours (Table 4.23).

Fig 4. 5. Kutcha house in Odisha

Fig 4.6 Household toilet in a non-NGP village Odisha

Fig 4. 7.Household toilet in a NGP village of Odisha

Table 4.24 Information on hand wash facility and type of hand wash near toilets

Hand wash facility and Type of hand wash	NGP	Non-NGP	Total
Without wash facility	66	110	176
Per cent (%)	54.5	92.4	73.3
With wash facility	55	9	64
Per cent (%)	45.5	7.65	26.7
Soap	44	6	50
Per cent (%)	80.0	66.7	78.1
sand/ash	9	3	12
Per cent (%)	16.4	33.3	18.8
Plain water	2	0	2
Per cent (%)	3.6	.0	3.1
Total	**55**	**9**	**64**

Having hand wash facility near toilets indicate the importance given by the households to hygienic practices. With regard to the availability of hand wash facility near toilets, three fourths of the respondents do not have any facility to wash their hands near toilet nor do they wash hands. This situation is more visible in Non-NGP villages as compared to NGP villages. We have 64 responses regarding type of hand wash post defecation (55 in NGP and 9 in Non-NGP). In NGP areas, a majority of the respondents use soap (80% in NGP and 66.7 % in Non-NGP villages) and the remaining use plain water (Table 4.24).

Table 4.25 Frequency of cleaning toilets in NGP and Non-NGP villages

Frequency of cleaning toilets	NGP	Non-NGP	Total
Once or more in a day	6	1	7
Per cent (%)	9.0	11.1	9.2
At least once in a week	1	1	2
Per cent (%)	1.	11.1	2.6
At least once a fortnight	8	1	9
Per cent (%)	11.9	11.1	11.8
At least once a month	31	2	33
Per cent (%)	46.3	22.2	43.4
Others	21	4	25
Per cent (%)	31.3	44.4	32.9
Total	**67**	**9**	**76**

The analysis reveals that a considerable percentage (43.4%) of respondents in both NGP and Non-NGP areas, have reported cleaning their toilets once in a month which makes it unsafe to use such toilets (Table 4.25).

In this section, illnesses related to unsafe drinking water and unhygienic practices followed in the study villages resulting in health problems for children such as diarrhoea, dysentery and worm infections are discussed. Further, methods followed by households for treating dehydration of children are also presented here.

Table 4.26 Treatment seeking behaviour of the households with respect to dehydration among children in NGP and Non-NGP villages

Methods followed	NGP	Non-NGP	Total
Provide ORS	58	45	103
Per cent (%)	47.9	37.8	42.9
Provide only hot water	6	7	13
Per cent (%)	5.0	5.9	5.4
Visit Doctor/s	16	46	62
Per cent (%)	13.2	38.7	25.8
Get medicines directly from Pharmacy	0	1	1
Per cent (%)	.0	.8	.4
ApproachVillage Quacks	15	0	15
Per cent (%)	12.4	.0	6.2
ASHA/ANM	8	0	8
Per cent (%)	6.6	.0	3.3
Others	18	20	38
Per cent (%)	14.8	16.8	15.9
Total	**121**	**119**	**240**

Nearly half of the respondents in NGP areas and more than one-third of the respondents in Non-NGP areas give ORS to children during dehydration. In Non-NGP areas, nearly 38.7 % of the respondents prefer to visit a doctor for treatment of dehydration, while about 19 % of the respondents in NGP areas prefer to visit Quacks or ANMs (Table 4.26)

Table 4.27 Measures taken by the households to keep cooked food safe in NGP and Non-NGP villages

Measures	NGP	Non-NGP	Total
Cover cooked food	118	118	236
Per cent (%)	97.5	99.2	98.3
Not done anything	3	0	3
Per cent (%)	2.5	.0	1.2
Others (specify)	0	1	1
Per cent (%)	.0	.8	.4
Total	**121**	**119**	**240**

The analysis of data unfolds that overall, a majority of the respondents (98.3%) both in NGP and Non-NGP villages cover cooked food with a lid, while, just 1.2% of the respondents do not maintain cooked food properly (Table 4.27).

Fig 4.8 ICDS center in odisha

Fig 4.9 Washing clothes near a hand pump in Odisha

Fig 4.10 An open drainage canal in a NGP village in Odisha

Table 4.28 Household level personal hygiene practices - taking bath in NGP and Non-NGP villages

Frequency of taking bath	NGP	Non-NGP	Total
Once or more a day	80	70	150
Per cent (%)	66.7	58.8	62.8
At least once in 2 days	36	41	77
Per cent (%)	30.0	34.5	32.2
Once in a week	4	8	12
Per cent (%)	3.3	6.7	5.0
Total	**120**	**119**	**239**

With regard to taking bath, more than half of respondents take bath every day i.e., (66.7% in NGP and 58.8% in Non-NGP) villages, while the remaining one-third of them take bath once in two days. This shows that the respondents are very keen on maintaining personal hygiene (Table 4.28).

4.4.1 VWSC and VHSC in the study villages: Awareness level regarding VWSC and VHSC among the local population

Table 4.29 Respondents awareness about the existence of village water and sanitation committee (VWSC) and Village Health and Sanitation (VHSC) in their villages

Existence of VWSC	NGP	Non-NGP	Total
Aware(VWSC)	74	15	89
Per cent (%)	61.2	12.6	37.1
Not aware(VWSC)	47	104	151
Per cent (%)	38.8	87.4	62.9
Aware (VHSC)	74	117	191
Per cent (%)	61.2	98.3	79.6
Not aware(VHSC)	47	2	49
Per cent (%)	38.8	1.7	20.4
Total	**121**	**119**	**240**

More than one-third of the respondents i.e., 61.2% in NGP and 12.6% in Non-NGP villages are aware of Village Water and Sanitation Committee. Compared to this, many respondents i.e., 98.3 % in Non-NGP and 61.2 % in NGP villages are aware of Village Health and Sanitation Committee (Tables 4.29).

4.4.2 An Analysis of information based on child health and hygiene

As part of the study, an attempt was also made to collect information on thevarious dimensions of the child health and hygiene related practices. This was done by administering an interview schedule to mothers of children aged 0-5 years. The purpose

of the study/ schedule was to find out health and hygiene practices followed by parents, especially mothers. The schedule covered various aspects such as practices treating drinking water, awareness about diseases/ailments children are vulnerable due to unsafe drinking water, the availability of toilet facility, especially for children; diseases/ailments affecting children as a result of the practice of open defecation or non-use of toilets, personal hygiene practices, improper bathing and washing of hands and material used for washing. The child schedule also contained questions regarding the status of immunization of children and the maintenance of immunization card separately for each child and illness episodes undergone by children during the last one year. The data collected on these aspects helped us have an idea about not only the health status of our future generations, but also the strengths and weaknesses of the policies meant for human development, especially an improvement in the health standards of children

Table 4.30 Distribution of households treating water before consumption and methods of making water safer for children's consumption

Treatment of water	NGP	Non-NGP	Total
Yes	117	104	221
Per cent (%)	96.7	87.4	92.1
NO	4	15	19
Per cent (%)	3.3	12.6	7.9
Total	**121**	**119**	**240**
Practices used for making water safer for consumption			
Boil water	45	25	70
Per cent (%)	38.5	24.0	31.7
Strain water, using a cloth	14	44	58
Per cent (%)	12.0	42.3	26.2
Use water filters	0	1	1
Per cent (%)	.0	1.0	.5
Let water stand and settle	55	34	89
Per cent (%)	47.0	32.7	40.3
Others (specify)	3	0	3
Per cent (%)	2.6	.0	1.4
Total	**117**	**104**	**221**

Regarding using drinking water for children, a majority of the respondents try to give clean water using one or the other method. In NGP areas, nearly half of the respondents let water stand and settle for some time before giving it to their children for drinking. In Non-NGP areas, 42.3 % of them strain water, using a cloth before giving it to their children. In both the areas one-third of the respondents boil water. Overall from T.test. NGP areas found statistically significant in treating of water before drinking (Table 4.30).

Table 4.31 Details of in-house toilet facility and type of toilets used for children in NGP and Non-NGP villages

Toilet facility	NGP	Non-NGP	Total
Yes	61	10	71
Per cent (%)	50.4	8.4	29.6
NO	60	109	169
Per cent (%)	49.6	91.6	70.4
Type of Toilet used for children			
Open defecation	44	109	152
Per cent (%)	37.5	91.6	63.3
Toilet within the household	41	5	46
Per cent (%)	33.9	4.2	19.2
Community/public toilet	5	4	9
Per cent (%)	4.1	3.4	3.8
Others	31	1	32
Per cent (%)	25.6	.8	13.3
Total	**121**	**119**	**240**

Regarding the availability of toilet facility for children within the house, nearly one-third of the respondents i.e., 50.4% in NGP and 8.4% in Non-NGP villages have replied that they have in-house toilet facility in affirmation. Regarding the type of toilet facilities used (respondents who have reported having toilet facility) for their children, the field data reveals that at the aggregate level, a majority of them (91.6%) in Non-NGP villages while 37.5% of the respondents in NGP villages practise open defecation and 4.2% of them in Non-NGP and 33.9% in NGP use toilets within the house (Table 4.31).

Table 4.32 Distribution of children taking help for toilet use in NGP and Non-NGP villages

Children taking help for toilet use	NGP	Non-NGP	Total
By his/ her own	3	1	4
Per cent (%)	2.5	.8	1.7
With the help of mother/father	54	44	98
Per cent (%)	44.6	37.0	40.8
With the help of elder sibling/s	25	49	74
Per cent (%)	20.7	41.2	30.8
With the help of others	3	1	4
Per cent (%)	2.5	.8	1.7
Others	6	1	7
Per cent (%)	5.0	.8	2.9
With the help of mother/father with the help of elder sibling/s	30	23	53
Per cent (%)	24.8	19.3	22.1
Total	**121**	**119**	**240**

Regarding taking help for toilet use, a very few children (1.7%) go on their own. In both the areas, 41 percent of the children take the help of parents, while one-third of them take the help of siblings. Another one-fifth of the children take the help of parents, siblings and other elder members in the family (Table 4.32).

With respect to a question on what type of diseases children encounter/experience if they do not use toilets and practise open defecation, three fourths of them have replied that children are prone to typhoid, malaria, diarrhoea, chikungunya etc. A few of the respondents have mentioned that children's health is/was affected by vomiting, stomach ache, loose motion, communicable diseases, dengue, and body pain, whereas an insignificant percentage of the respondents (1.6%) have expressed that they do not have any knowledge about this matter (Table 4.33).

Table 4.33 Awareness about toilet use and children's vulnerability to possible diseases in NGP and Non-NGP villages

Type of Diseases	NGP	Non-NGP	Total
Not aware	9	6	15
Per cent (%)	1.4	2.3	1.6
Vomiting	6	16	22
Per cent (%)	0.91	6.1	2.4
Loose motion	6	16	22
Per cent (%)	0.91	6.1	2.4
Communicable diseases	6	16	22
Per cent (%)	0.91	6.1	2.4
Typhoid	104	29	133
Per cent (%)	15.8	11	14.4
Malaria	104	29	133
Per cent (%)	15.8	11	14.4
Cough	104	29	133
Per cent (%)	15.8	11	14.4
Cold	104	29	133
Per cent (%)	15.8	11	14.4
Diarrhoea	104	29	133
Per cent (%)	15.8	11	14.4
Chikungunya	104	29	133
Per cent (%)	15.8	11	14.4
Dengue	3	18	22
Per cent (%)	0.46	6.8	2.4
Stomach pain	3	18	22
Per cent (%)	0.46	6.8	2.4
Total	**657**	**264**	**921**

Table 4.34 Distribution of respondents reporting frequency of bath given to children in NGP and Non-NGP villages

Frequency of bathgiven to children	NGP	Non-NGP	Total
Once a day	111	110	221
Per cent (%)	91.7	92.4	92.1
Twice a day	5	8	13
Per cent (%)	4.1	6.7	5.4
Once in a week	5	1	6
Per cent (%)	4.1	.8	2.5
Total	**121**	**119**	**240**

An analysis of the practice of personal hygiene reveals that a large majority of the respondents (92.1%) give bath to their children every day. Only 5.4% of the respondents both in NGP and Non-NGP villages give bath to their children twice a day. However, a few of them (2.5%) give bath to their children once in a week (Table 4.34).

Table 4.35 Distribution of children with regard to washing their hands and type of hand wash used before taking food in NGP and Non-NGP villages

Children washing their hands	NGP	Non-NGP	Total
Yes	112	111	223
Per cent (%)	92.6	93.3	92.9
NO	9	8	17
Per cent (%)	7.4	6.7	7.1
Type of hand wash used			
Water	46	66	112
Per cent (%)	41.1	59.5	50.2
Soap	61	44	105
Per cent (%)	54.5	39.6	47.1
Liquid soap	2	0	2
Per cent (%)	1.8	.0	.9
Detergent soap	0	1	1
Per cent (%)	.0	.9	.4
Others (specify)	3	0	3
Per cent (%)	2.7	.0	1.3
Total	**112**	**111**	**223**

The data reveals that an overwhelming 93% of the children in both the NGP and Non-NGP villages, wash their hands before taking their food. Regarding the use of material/ method for hand washing, half of the respondents use soap, while the remaining of them wash their hands with water. This method is used mostly in Non-NGP villages. This practice is considered unsafe for children's health (Table 4.35).

Table 4.36 Distribution of households by immunization service received by children in NGP and Non-NGP villages

Immunization	NGP	Non-NGP	Total
Received	110	109	219
Per cent (%)	90.9	91.6	91.2
Not received	11	10	21
Per cent (%)	9.1	8.4	8.8
Total	**121**	**119**	**240**

More than 90% of the respondents have mentioned that their children have undergone immunization, which is a positive measure for keeping good health of children (Table 4.36).

Table 4.37 Number of children reported suffering from illnesses in NGP area

	Disease name	Affected	Average episodes	Source of treatment						Length of treatment (days)				Average expenditure Rs
				SC	PHC	CHC	DH	Private	PHC & Private	> 5	5-10	10-15 15	Above	
Water borne	Cold & cough	6	1.83	0	2	1	0	3	0	1	2	1	2	816.67
	Cold &cough and Dysentery	1	3.00	0	0	0	0	1	0	0	0	0	1	2000.00
	Fever and Diarrhoea	1	4.00	0	0	1	0	0	0	0	0	0	1	1600.00
	Diarrhoea and fever and leg pain	1	2.00	0	0	1	0	0	0	0	0	0	1	10000.00
	Dysentery ,fever and leg pain	4	3.50	0	1	1	0	1	1	0	0	1	3	2175.00
	Diarrhoea and dysentery	1	2.00	0	0	0	1	0	0	0	1	0	0	1500.00
	Diarrhoea	13	1.69	4	2	1	2	4	0	1	9	1	2	834.62
	Dysentery	7	1.29	0	2	2	0	3	0	0	6	0	1	751.43
Worm infection	(nulipurugulu)	4	1.25	1	1	0	0	2	0	1	3	0	0	150.00
	Dysentery and Nulipurugulu	2	2.50	0	0	0	0	0	2	0	0	1	1	1150.00
	Nulipurugulu , fever and leg pain	4	3.50	1	0	0	0	1	2	0	1	1	2	762.50
	Cold &cough , Nilipurugulu and dysentery	1	4.00	0	0	0	0	1	0	0	0	0	1	4500.00
	Nulipurugulu, dysentery, feverand leg pain.	1	5.00	0	0	0	0	1	0	0	0	0	1	1500.00
	Cold & cough and (nulipurugulu)	1	4.00	0	0	0	0	0	1	0	0	0	1	900.00
Mosquito bite	fever	7	2.00	1	0	5	0	1	0	1	4	0	2	2071.43
	Body pain	1	2.00	0	0	0	1	0	0	0	1	0	0	700.00
	Malaria	1	1.00	0	0	0	0	1	0	0	0	1	0	1500.00
	Fever and leg pain	17	2.47	0	3	4	0	10	0	2	10	1	4	904.71
	Others	1	3.00	0	0	0	0	1	0	0	0	0	1	2500.00
	Grand Total	**74**	**2.24**	**7**	**11**	**16**	**4**	**30**	**6**	**6**	**37**	**7**	**24**	**1246.49**

Table 4.38 Number of children reported suffering from illnesses in Non-NGP villages

	Disease name	Affected	Average episodes	Source of treatment						Length of treatment (days)				Average expenditure Rs
				SC	PHC	CHC	DH	Private	PHC & Private	> 5	5-10	10-15 15	Above	
Water borne	Cold &cough	5	1.80	0	1	0	0	4	0	1	4	0	0	680.00
	Dysentery	4	1.50	0	1	2	0	1	0	0	3	0	1	662.50
	Fever and Dysentery	1	3.00	0	0	0	0	0	1	0	0	0	1	600.00
	Dysentery and fever and leg pain	5	3.20	0	0	0	0	5	0	0	1	0	4	1860.00
	Cold &cough and Dysentery	4	3.25	0	1	0	0	2	1	1	0	0	3	1625.00
	Typhoid	1	3.00	0	0	0	0	1	0	0	0	0	1	2500.00
Worm infection	Amebiasis	1	1.00	0	0	1	0	0	0	0	1	0	0	500.00
	Nulipurugulu and Fever and leg pain	2	3.00	0	0	0	0	2	0	0	0	0	2	1000.00
	Fever and (nulipurugulu)	2	3.50	0	0	0	0	2	0	0	0	0	2	1250.00
Mosquito bite	Fever	4	1.75	0	1	0	0	3	0	0	3	1	0	1050.00
	Fever and leg pain	17	2.12	1	2	1	2	11	0	2	10	1	4	752.94
	Viral fever	1	1.00	0	0	0	0	1	0	0	1	0	0	2700.00
	Grand Total	**47**	**2.36**	**1**	**6**	**4**	**2**	**32**	**2**	**4**	**23**	**2**	**18**	**1065.00**

Children's illness details in Odisha:

In NGP villages, out of 133 children, 74 children are reported to have fallen ill from various water related problems. Among them, one child is reported to have suffered from paralysis which may not be related to water and sanitation. Out of the 74 in NGP, 34 children are reported to have suffered from various illnesses under the category of water borne diseases which includes 13 diarrhoea cases, 7 dysentery cases and 3 diarrhoea cases along with one or more other health problems, while 6 children are reported to have suffered from just cold and cough. 13 cases in NGP villages infected with worms have been reported. Out of them, 4 are reported to have suffered from just worms. One malaria case in NGP area, has also been reported.

In Non-NGP villages, out of 136, 47 children are reported to have suffered from various water borne illnesses, while nearly half of the children are reported to have suffered from fever/fever with leg pain. There are 25 children reported suffering from fever with leg pain and fever. Nearly half of the children in non NGP villages are reported to have suffered from fever/fever with leg pain. There is one viral fever case reported in Non-NGP area. There are 20 cases reported in non-NGP villages under water borne diseases. Five of them are reported to have suffered from cold and cough. There are 14 dysentery cases reported in combination with other problems like fever, leg pain, cold cough etc. (Tables 4.37 & 4.38).

Source of treatment:

In all these cases (Diarrhoea, dysentery and one or more health problems) in NGP villages around two-thirds of these children are reported to have been taken to government facilities for treatment (SC, PHC, CHC and DH) and the remaining one-third to private health facilities for treatment. In NGP areas, most of the children suffering from fever and leg pain and fever are reported to have been taken to government health facilities for treatment. In Non-NGP areas, in respect of all these cases (cold and cough, diarrhoea, fever, leg pain, cold cough etc), most of these children 32 out of 50 are reported to have approached private health facilities for treatment. Out of 47, half of them have undergone treatment for 5 to 10 days.

Length of treatment and expenditure:

In NGP area, in all the cases of diarrhoea, dysentery and other health problems, the average number of episodes comes to 2, .a majority of the children are reported to have undergone treatment for more than a week, while the average health expenditure amounts to around Rs 1,246.49.

In NGP area, the average number of episodes comes to 1.25 for children with worm infection. The remaining children, along with worm infestation, are reported to have

suffered from other problems like fever, dysentery, cold, cough etc. The average number of episodes for these ailments is more than 2. In NGP villages, the health expenditure on malaria amounts to Rs 1500.

In NGP areas, among children suffering from fever and leg pain and fever, many of them have undergone treatment for more than a week. The average health expenditure incurred on fever/fever with leg pain cases for treatment in non-NGP area amounts to around Rs 1,000. The average health expenditure in respect of viral fever in non-NGP areas amounts to Rs 2700. In respect of these cases (cold and cough, diarrhoea, fever, leg pain, cold cough etc) in non-NGP areas, the average number of episodes works out to 3. In non-NGP areas for typhoid, 3 episodes have been reported, while expenditure for treatment amounts to Rs 2500.

In NGP area, a maximum number of children are reported to have suffered from fever and leg pain and diarrhoea, whereas in Non-NGP areas, a maximum number of children are reported to have suffering from fever and leg pain and cold and cough. In NGP areas the treatment is reported to have lasted for 5-10 days and in Non-NGP areas above 15 days. Children suffering from illnesses go to private clinics for treatment in Non-NGP villages and in NGP villages, patients go to public and private hospitals for treatment.

A Profile of illness episodes reported by households

In this section, we have discussed illness episodes encountered, treatment sought and expenditure incurred by households in NGP and Non-NGP areas as follows.

Illness Episodes:

In NGP areas, out of 520 respondents, 72 have reported experiencing water related illnesses during last one year.

However, some illnesses reported in the case of 10 persons may not be directly related to water (cancer, kidney problem, heart problem etc). Under the category of water borne diseases, in NGP areas, 40 persons are reported to have experienced illnesses like cold, cough, diarrhoea etc., and out of 40, 22 persons are reported to have suffered from diarrhoea/dysentery. In NGP villages, 2 people are reported, to have been affected by chickengunya and fever.

The health expenditure is found high in the following cases of illnesses: stomach pain (1- expenditure Rs 50000), gastric problem (3 - average expenditure Rs 12,166).

The length of treatment for Jaundice in non-NGP areas is reported to be lasting for 5-10 days, while the average expenditure incurred on jaundice treatment amounts to Rs 20,000. The average health expenditure incurred on cold and cough in non-NGP areas

Table 4. 39 Illness episodes encountered, treatment sought and expenditures incurred by households in NGP areas, during last one year

	Disease name	Affected	Average episodes	Source of treatment						Length of treatment (days)				Average expenditure Rs
				SC	PHC	CHC	DH	Private	PHC & Private	> 5	5-10	10-15 15	Above	
Water borne	Cold& cough	10	1.80	0	0	4	2	4	0	0	5	2	3	2320.00
	Cold& cough and diarrhoea	3	2.33	0	0	1	1	1	0	0	0	0	3	1766.67
	Dysentery, fever and cold & cough	1	3.00	1	0	0	0	0	0	1	0	0	0	1500.00
	Cold& cough and Dysentery	2	2.50	0	0	0	0	0	2	0	0	0	2	2750.00
	Diarrhoea	15	2.00	5	2	0	6	2	0	4	5	1	5	5723.08
	Dysentery	7	1.57	0	2	3	0	2	0	2	3	0	2	985.71
	Digestion problem	2	1.00	0	0	0	0	2	0	0	0	0	2	12000.00
Worm infection	Amebiasis	5	2.00	0	1	1	1	2	0	0	2	0	3	660.00
Mosquito bite	Fever	8	1.38	1	0	7	0	0	0	2	4	1	1	1585.71
	Fever and cold &cough	2	3.00	0	1	1	0	0	0	1	0	0	1	3100.00
	Fever and Chikungunya	2	1.50	1	0	1	0	0	0	2	0	0	0	8000.00
	Knee pain and stomach pain, fever and leg pain	1	2.00	0	0	0	0	1	0	0	1	0	0	500.00
	Stomach pain	1	1.00	0	0	0	0	1	0	0	0	0	1	50000.00
	Gastric problem	3	2.67	0	1	2	0	0	0	0	0	0	3	12166.67
	Others	10												
	Total	**72**	**1.83**	**8**	**7**	**20**	**10**	**15**	**2**	**12**	**20**	**4**	**26**	**8683.09**

Table 4.40 Illness episodes encountered, treatment sought and expenditures incurred by households in Non-NGP villages

				Treatment place				Length of treatment (days)				
	Disease Name	Affected	Average episodes	SC	PHC	CHC	Private	<5	5 to 10	10 to 15	Above 15	Average expenditure Rs
Water borne	Cold & cough	26	1.23	2	4	14	6	1	18	2	5	2222.00
	Jaundice	1	2.00	0	0	0	1	0	1	0	0	20000.00
	Dysentery	3	1.00	0	0	1	2	0	2	0	1	2433.33
Worm	Amebiasis	1	1.00	0	0	1	0	0	1	0	0	500.00
Mosquito bite	fever	7	1.29	1	0	1	5	1	3	1	2	1000.00
	Fever and Chikungunya	1	1.00	0	0	1	0	0	1	0	0	8000.00
	Fever and cold and cough	4	1.25	0	0	2	2	0	2	0	2	3050.00
	Stomach operation	1	2.00	0	0	1	0	1	0	0	0	20000.00
	Others	5	-	-	-	-	-	-	-	-	-	-
	Total	**49**	**1.22**	**3**	**6**	**21**	**19**	**4**	**30**	**3**	**12**	**6198.94**

works out to Rs 2,222. In most of the cases in non-NGP villages, the length of treatment is more than a week.

In NGP areas, more number of water related cases in respect of adults have been reported as compared to Non-NGP areas. In NGP areas, a maximum number of adults have been found suffering from cold, cough and diarrhoea, whereas in Non-NGP areas, a maximum number of adults have been observed suffering from cold, cough and fever. In both NGP and Non-NGP areas, treatment days range from 5-10 days. Further, adults suffering from illnesses tend to approach CHC and private clinics in Non-NGP villages, while in NGP villages, patients tend to visit public and private hospitals for treatment (Table 4.39 & 4.40).

A Summary of FGDs conducted in both the NGP and Non-NGP villages in Odisha

▲ **Main sources of water**

- In Mangalpur, Mukundapur, KP Lakharaj, Jamakunda, Rajpur and Naikudi NGP villages, there is a piped water supply through public taps / tap connections to some individual houses, while the main source of water in Badhikapudi, Mushhakhar, Rajanagar, Kendejposi, Polanghats, Chinmaliposi Non-NGP villages, is tube wells/ bore wells. There is no piped water supply.

▲ **Adequacy of water supply**

- In respect of Mangalpur, Mukundapur, KP Lakharaj, Jamakunda, Rajpur and Naikudi NGP villages, there is an adequate water supply i.e., water supply is adequate for 10 months in a year. During the rainy season, there is a problem of contamination of water due to floods. During summer, the ground water level goes down and an erratic power supply also affects the water supply. On the other side, in Non-NGP villages, such as Badhikapudi, Mushhakhar, Rajanagar, Kendejposi, Polanghats and Chinmaliposi villages, water availability is inadequate and especially during summer, the water level goes down. A proper maintenance of tube wells is also a challenge and hence, the villagers depend on open well/dug well for drinking water.

▲ **Quality of Water**

- In Mangalpur and Mukundapur NGP villages, drinking water gets contaminated with dust and fluoride during the rainy season. Sometimes, contaminated water flows through the piped water supply as there is a stone mine near the villages. Traditionally, people boil water before using in KP Lakharaj, Jamakunda, Rajpur and Naikudi villages.

▲ In all Non-NGP and NGP villages, water gets contaminated during the rainy season,

while iron dust is found in water during summer.

▲ **Water costs**

- In Mangalpur NGP village, each household pays Rs.50 per month, whereas from ST community, each household pays Rs.30 per month as water charges. However, some households do not pay water charges on time. In Mukundapur village, every household pays Rs 50 per month, whereas in KP Lakharaj, Jamakunda, Rajpur and Naikudi villages, people pay Rs 30 per month. The operation and maintenance (O&M) in Mangalpur and Mukundapur villages is done by one Self-Employed Mechanic (SEM) and one machine operator and both take care of the maintenance work. In KP Lakharaj, Jamakunda, Rajpur and Naikudi villages, Gram Panchayats, with the help of the local water and sanitation department, maintain water supply. No money/fund is available with the local panchayat office and the panchayat only submit the requirements to the water and sanitation department for repair and maintenance. SEMs are appointed to look after the repair and maintenance work.
- In Badhikapudi, Mushhakhar, Rajanagar, Kendejposi, Polanghats, Chinmaliposi Non-NGP villages, water charges are collected. The operation and maintenance of tube wells is done by the village gram panchayats. However, they face fund constraints in managing and maintaining tube wells during summer.

▲ **Health Problems:**

- In all NGP villages, unsafe drinking water tends to cause dysentery, fever, diarrhea and malaria.
- In all Non NGP villages, people tend to suffer from dysentery, fever, diarrhea etc. During summer, dysentery is common.

▲ **Sanitation**

- In Mangalpur and Jamakunda NGP villages, most of the houses don't have toilet facility, particularly the BPL (Below Poverty Line) families, while around 25% of the households have toilet facility. In Mukundapur village, a majority of the households have toilet facility, but due to the low quality of construction work, 30 to 40% of the toilets have become defunct. The remaining households have toilet facility. In K P Lakharaj, Naikudi and Rajpur villages, only a few households have toilet facility (30%).
- In all Non-NGP villages, a maximum number of people do not have toilets (90%), while only around 10% of the households have toilet facility.

▲ **Open Defecation**

- In all NGP villages, 25% to 30% of the people practise open defecation.
- In all Non-NGP villages, open defecation is a common practice among a majority of the people (70% to 80%).

▲ **Problems associated with open defecation**

- In Mangalpur village, villagers opine that open defecation causes diarrhea. Besides, in this village, inadequate water supply is a problem when it comes to using of toilets. During rainy season, toilets pits get filled up with water. In Mukundapur, KP Lakharaj, Jamakunda, Rajpur and Naikudi villages, people tend to suffer from dysentery, diarrhea, fever, cold, cough, typhoid, dengue and itching as a result of not using toilets.
- In all non-NGP villages, FGD participants have opined that they may get dysentery, diarrhea, fever, cold, cough and typhoid etc.

▲ **Functioning of Committees:**

- Village Water and Sanitation Committees (VWSC) - In Mangalpur (NGP villages), people are aware of the Village Water and Sanitation Committee. In Mukundapur, KP Lakharaj villages, these committees are found working. In Jamakunda village, they have a VWSC known as 'Jamakunda Village Water and Sanitation Committee' (Jamkunda Gramya Jala Parimala Samiti). In Rajpur village, they have a VWSC known as 'Rajpur Village Water and Sanitation Committee' (Rajpur Gramya Jala o Parimala Samiti) managed by a NGO, namely, LIFE. There are 12 members (6 males and 6 females) on the committee. The earlier committee structure has been modified as per the guideline of Rural Water Supply and Sanitation (RWSS). User Groups have been formed under the committee. In Naikudi village, they have a VWSC known as 'Naikudi Village Water and Sanitation Committee' (Naikudi Gramya Jala o Parimala samiti).
- There are no VWSCs formed in all non-NGP villages. However, at the GP level, there is a committee.
- Village Health and Sanitation Committee (VHSC) has been formed in all NGP villages and the committee maintains health and sanitation conditions of the respective village. In all NGP villages, the recent activities taken up by VHSC are road and drain cleaning and creation of health awareness among people. In Mangalpur village, the recent activities include distributing of essential medicines during floods, water purification and cleaning of roads.
- In Non-NGP villages, the committees maintain health and sanitation conditions of

the villages. In all non-NGP villages, the recent activities undertaken by VHSCs are road cleaning and water purification.

▲ **Suggestions for improving the performance of VWSCs and VHSCs:**

- In all NGP villages, regular meetings of the VHSC should be held related to health, water and sanitation matters.
- In all non-NGP villages, VHSC should play a more pro-active role during floods. VHSCs should conduct regular meetings.

4.5 Summary

As discussed in the introduction chapter, good health outcomes depend on different interventions: income related interventions, direct health interventions and other institutional interventions. When the health programmes are formulated and implemented effectively, morbidity levels in the villages may come down and there may be reduced episodes of diarrhoea and an improvement in the better nutrition absorption among children etc. However, the health outcomes largely depend on social determinants, considered in this study, such as the availability of quantity and quality water, and sanitation facilities (in this case lavatories and their proper use by households), allied household level hygiene practices conducive to promoting health, personal hygiene such as defecation habits. This kind of enabling environment is made possible indirectly through a catalytic process by the governing institutions, processes and different programmes at the local level. The study is basically explanatory and analytical in nature.

In Odisha state, 6 NGP and 6 Non-NGP villages were selected for the study. From these 12 villages, altogether, data was collected from 240 households. In this study, an attempt is made to examine health conditions of people as water and sanitation programmes are being implemented in the study villages. A Majority of the respondents are literates. The educational levels of the respondents in NGP villages are relatively higher as compared to Non-NGP villages.

Housing: A Majority of the respondents reside in kutcha houses and huts and most of the respondents belonging to Non-NGP villages live mostly in kutcha houses and huts, indicating their poor economic conditions.

Sanitation: A majority of the respondents practise open defection and use pit latrines, especially the respondents belonging to Non-NGP villages. The respondents, having personal toilets (more than half of them) use them to have privacy and another less than a quarter for maintaining good health and privacy. More than half the respondents use sand and another 41.3% of them use soap for washing hands after defecation.

Water: An overwhelming number of the respondents use water for domestic use such as washing dishes, clothes and for bath etc, and a negligible percentage of the respondents use water for toilet purpose. As regard the quality of water, according to three fourths of the respondents water is pure. But as per some of the respondents (5) water is impure, especially during the rainy season.

The analysis reveals that there is a variation in the availability of water between NGP and Non-NGP villages and in the former category of villages, adequate water is available as compared to the latter category of villages. When probed further about the availability of adequate quantity of water during the past one year, a great majority of the respondents have reported that it is not adequate. This response has come more from the respondents representing Non-NGP villages.

Nearly three fourths of the respondents possess water storage facility/ies at home up to 10-15 tubs. The data reveals that a little over one-fifth and less than 10 percent of the respondents use glass tumblers attached with long handles and taps attached to containers for consuming water. An overwhelming percentage of the respondents clean water containers every day. Those who clean containers everyday are more in number in Non-NGP villages, as compared to NGP villages. A less percentage of the respondents, boil water or strain using a cloth before drinking. This indicates that the educational levels of the household members play a crucial role in treating water before consumption. As per nearly two thirds of the respondents, water shortage is the main problem. More than half of the respondents have mentioned that anganwadi centres supply water to children who go there.

Water supply in schools: In NGP villages, out of six schools, three get drinking water from bore wells, two schools from taps and one from other sources. Out of six schools in Non-NGP villages, three schools get drinking water from bore wells, and one each from taps, tanks and other sources.

Sanitation facilities in schools: With regard to latrine facilities available in schools, in NGP villages, out of six schools, four have septic tank type of toilets being used by students. Another two schools have pit latrines, whereas in Non-NGP villages, out of six schools, four schools have septic type of toilets and one each have pit latrines and latrines with a piped sewer system.

Out of six schools in NGP areas, three schools have separate toilets for boys and girls, whereas in Non-NGP areas, in four schools out of six, there is such facility. In NGP areas, only three schools have separate toilets for teachers. Whereas in Non-NGP areas, all six schools do not have separate toilets for teachers.

Water facility in ICDS centres in the study villages

There are six ICDS centres in NGP and six in Non-NGP villages. In NGP villages, bore well is the main source of water for 4 ICDS centres followed by one each from taps and wells. In Non-NGP villages, out of six ICDS centres, 4 get water from 'other sources' and a bore well in the case of one.

Hygienic practices: As regards the disposal of human waste (stools) of children, two thirds of the respondents throw it in the streets. As a regards the availability of hand wash facility near the toilets, three fourths of the respondents do not have any facility to wash their hands near toilets nor do they wash their hands. This situation is more visible in Non-NGP villages as compared to NGP villages.

The analysis reveals that more than half of the respondents clean their toilets once a month. An overwhelming percentage of the respondents provide water to their children after boiling or straining using a cloth. In the case of children not using toilets, according to three fourths of them, children are prone to typhoid, malaria, cough and cold, diarrhoea, chikungunya etc. As per a few of the respondents, their children's health is/was affected by vomiting, stomach ache, loose motion, communicable diseases, dengue, body pain etc.

A large majority of the respondents (92.1%) give bath to their children every day. More than three fourths of the respondents (76.2%) wash their hands both before and after taking food and after defecation. These trends indicate that they take appropriate measures for protecting their children's health.

Institutions: Here an attempt is made to understand the role of institutions like VWSC, VHSC, SHGs, CBOs etc. and processes adopted for achieving Open Defecation Free (ODF) villages and provision of clean drinking water to all. An attempt is also made to understand the role of institutions and processes that hinder the achieving of the ODF status of villages and supply of drinking water.

With regard to the level of awareness among people of the existence or constitution of VHSCs in the villages, two thirds of the villagers are aware of these committees, while the remaining one third of them are not aware of such committees. Although VWSCs have been constituted in some villages, their functioning is very discouraging as the members are not aware of their duties and powers. This is true in both the NGP and Non-NGP villages.

Illness among Adults: In Odisha, 7 cases in NGP villages and 3 cases of dysentery in Non-NGP villages have been reported. In NGP villages, 15 cases of diarrhoea have been reported, but in Non-NGP villages no such cases have been reported. In Non-NGP

areas, 37 adults are reported to have suffered from cough, cold and fever (multiple health problems) in comparison to 20 adults in NGP areas. A majority of them are reported to have approached to CHC and private clinics for treatment.

Illness among Children: In Odisha, in NGP villages, 74 children are reported to have fallen ill from various water related problems. Among 74, 34 children are said to have suffered from various illnesses under the category of waterborne diseases including 13 diarrhoea cases. However, in Non-NGP villages, not a single case of diarrhoea has been reported. 7 cases in NGP villages and only 4 cases of dysentery in Non-NGP villages have been reported. Only 1 case of malaria in NGP villages has been reported, while in Non-NGP villages, not a single case has been reported. In Non-NGP areas, 9 children are reported to have suffered from cough, cold and fever (multiple health problems) while 13 children in NGP areas.

Interestingly, NGP areas reported more health problems. This may be due to the difference in living and environmental conditions. In NGP areas, many houses have their own ponds (small) in front of the house and are used for water for domestic purposes and fishing. These villages with many water logged areas happen to be the breeding grounds for mosquitoes and insects. Those with toilets of their own tend to face problems such as foul smell, super structure not ensuring privacy, pits filled up, mosquitoes etc. Regarding health care, many of the respondents' prefer to avail treatment from government health facilities. Although there are a few positive aspects like better literacy rates in the study areas, there is not much of a positive impact of water and sanitation programmes or literacy levels on the health of families/communities.

Chapter- V
Water and Sanitation Programs and their Effects on the Health Status of Communities in Andhra Pradesh

Andhra Pradesh state (prior to reorganization) report is presented in the following order: section 5.1 provides a brief description of the basic features of AP - such as population growth, educational levels, sex ratio etc; section 5.2 deals with drinking water and sanitation issues; section 5.3 presents a profile of the study villages; section 5.4 provides a field based profile/ analysis of households and children related to water, sanitation and hygiene, followed by a summary in section5.5.

5.1 Introduction

Andhra Pradesh is one of the most highly populated states in India mainly due to a high level of development and its location near the sea coast. The state has grown in terms of its technological infrastructure and is among the major states that house sectors like IT and Telecom. The state is spread over an approximate area of 2,75,000 Sq. km. The capital city which is also the largest city in the state of Andhra Pradesh happens to be Hyderabad. In total, Andhra Pradesh (AP) state comprises 23 districts.

5.1.1 A Basic demographic profile of Andhra Pradesh

As per Census 2011, Andhra Pradesh is home to a population of 8.46 crore, as against 7.62 crore as per 2001 census. In absolute numbers, the total population of Andhra Pradesh as per 2011 census, stands at 84,580,777 of which males and females are 42,442,146 and 42,138,631 respectively. In 2001, the total population was 76,210,007 of which males were 38,527,413 while females were 37,682,594.

Andhra Pradesh has a population density of 308 which is below the national average and thus, the population is spread well over the entire area of the state. According to Andhra Pradesh Census 2011, the overall literacy rate in the state is about 67% and is a cause for concern. The overall literacy rate in the state has gone up in recent years, but is still below the national average of about 74%, while the sex ratio is way above the national average at about 990.

5.1.2 Literacy Rate 2011

The overall literacy rate in Andhra Pradesh has seen an upward trend at 67.02 percent as per 2011 population census. Of that, male literacy stands at 74.88 percent, while female literacy at 58.68 percent. Comparatively, in 2001, the overall literacy rate in Andhra Pradesh was 60.47 percent of which male literacy was 71.16 percent and female literacy was 50.29 percent.

In actual numbers, the total literates in Andhra Pradesh come to 50,556,760 of which males were 28,251,243 and females 22,305,517.

5.1.3 Sex Ratio

The sex Ratio in Andhra Pradesh is 993 per 1000 males, which is below the national average of 940 as per census 2011. In 2001, the sex ratio was 978 per 1000 males.

Table 5.1a A Demographic profile of Andhra Pradesh

State	Andhra Pradesh					
	2001			2011		
	Male	Female	Total	Male	Female	Total
Population	38,527,413	37,682,594	76,210,007	42,138,631	42,442,146	84,580,777
Literacy Rate	71.16%	50.29%		74.88%	58.68%	

5.1.4 Situation in the Study districts and villages

As per Census 2011, the percent of households connected to tap water from treated sources in Visakhapatnam district (both rural and urban) accounts to 48.2 percent, while 8 percent of the households are connected to untreated source; 7 percent depend on uncovered wells, 15.5 percent on bore wells, and 13 percent on tube wells/ bore wells.

In the case of rural areas of Visakhapatnam, only 31.6 percent households are connected to tap water from treated sources, while 11.5 percent households are connected to untreated tap water; 11.4 percent depend on uncovered wells, 24 percent on hand pumps, 8.4 percent depend on tube wells/bore holes and 10.5 percent on springs (Census, 2011).

In G.Madugula mandal, the households connected to tap water from treated sources account to a mere 1.5 percent, 3.6 percent of the households are connected to untreated tap water; 18 percent depend on uncovered wells, 1.2 percent on hand pumps, 2 percent on tube wells/bore holes and 70 percent on springs and 3 percent on rivers/canals (Census ,2011).

Table 5.1b Situation of drinking water and sanitation in Andhra Pradesh

Water:

Drinking water	Urban	Rural	Total
Within the household premises	4,602,652	4,486,906	9,089,558
Near the premises	1,475,858	6,358,607	7,834,465
Away	699,715	3,400,796	4,100,511
Total	**6,778,225**	**14,246,309**	**21,024,534**

Sanitation:

Sanitation facility	Urban	Rural	Total
With facility	5838383	4,585,620	10,424,003
Without facility	939,842	9,660,689	10,600,531
Total	**6778225**	**14246309**	**21024534**

Source: Census, 2011

In Chodavaram mandal, households that are connected to tap water from treated sources account for 60 percent, while 15.6 percent of the households are connected to untreated tap water; 1.6 percent of the households depend on uncovered wells, 16.6 percent on hand pumps, 6.2 percent on tube wells/bore holes and only 0.6 percent on springs (Census, 2011).

In Butchayyapeta mandal, households that are connected to tap water from treated sources constitute 33 percent, while 9 percent of the households are connected to untreated tap water; 2.8 percent of the households depend on uncovered well, 44.4 percent on hand pumps, 8.8 percent on tube wells/bore holes and only 0.1 percent on springs (Census, 2011).

In Kotauratla mandal, households that are connected to tap water from treated sources accounts for 44.3 percent, whereas 15.3 percent of the households are connected to untreated tap water; 8.7 percent of the households depend on uncovered well, 24.6 percent on hand pumps and 6.6 percent on tube wells/bore holes (Census, 2011).

In Yelamanchili mandal, households that are connected to tap water from treated sources account for 60.7 percent, while 6.4 percent of the households are connected to untreated tap water; 5.8 percent of the households depend on uncovered wells and 24.8 percent on hand pumps (Census, 2011).

5.2 Water and Sanitation

5.2.1 Sources of drinking water

In Andhra Pradesh, about 78 percent of the rural population has access to piped water for meeting drinking and domestic water needs. Others use water from hand pumps, (fitted with tube wells or open wells), while a small section of the population uses village tanks and springs. There is a high dependence on groundwater for drinking and other domestic purposes. In most of the villages, water is distributed through Public Stand Posts (PSPs). During the year 2008, about 60 % of the water supply was ground water based, 38% surface sources based and 2% other sources-based like rainwater storages, etc., Further, as on 1.04.2009, about 1,097 habitations were without any safe source, out of which 979 were fluoride affected habitations and 118 salinity affected habitations. Apart from providing treated surface water to fluoride/salinity affected habitations, RWSS (Rural Water Supply Schemes) is also implementing latest technologies for de-fluoridation/de-salination of ground water/excess TDS (Total Dissolved Solids) surface water such as reverse osmosis technique through treatment plants for supplying safe drinking water to the rural people (CESS, 2012).

In Andhra Pradesh, almost 80% of the habitations are served through Single Village Scheme (SVS) and Mini Piped Water Supply Schemes. SVS is the most preferred option for the RWSS department, provided the source is sustainable in terms of implementation and management. Multi Village Schemes (MVS) are predominantly dependent on surface water source. In terms of habitation coverage, out of a total of 72,147 habitations, 80% (57,718 habitations) are covered through SVS and 7,936 habitations (11%) through MVS (CESS 2012).

Fig 5. 1 Main source of water is over head tank in Gompa (non-NGP) village

5.2.2 Sanitation

The present level of sanitation coverage in the state is around 50%, while the rural household coverage is about 30% (and only half of the rural households with latrines use them regularly). This implies that still more than 80% of the rural population resorts to open defecation with its associated risks relating to public health and also pollution of water supply sources. This problem is more acute in densely populated settlements. In addition to the unscientific/improper disposal of human waste, the sanitation situation in rural areas becomes more acute, as waste water generated by households including cattle sheds flows into open surface drains that often get choked, leading to stagnation of waste water in the lanes and by-lanes; facilities for a safe disposal of enormous amounts of animal, agricultural and household solid waste are absent; construction of dry pits to discharge siltage is done without any consideration to sanitary aspects; discharge of septic tank effluents into open drains creates un-healthy conditions (Department of RWSS, GoAP).

In Chodavaram mandal, 26.2 per cent of the households have in-house latrine facility, while 73.8 percent of the households go without latrine facility. A description of the type of latrine facility available shows that, 78 percent of the households have access to septic tanks, 7.4 percent to piped sewer system and another 2.5 percent to other systems under flush/pour-flush latrines. Under pit latrine, 11.3 percent have access to with-slab/ventilated improved pits, 0.4 percent to without -slab / open pits. Among the households with no latrine facility, 94 percent practise open defecation and the remaining 6 percent depend on public latrines (Census, 2011).

In Butchayyapeta mandal, 14.8 per cent of the households have in-house latrine facility and 85.2 percent of the households carry on without latrine facility. A description of the type of latrine facility available in-house, among the households having latrine facility reveals that 71.3 percent of the households have access to septic tank, 7.6 percent to a piped sewer system and another 5.2 percent to other systems under flush/pour- flush latrines. Under pit latrine, 13.1 percent of the households have access to with -slab/ ventilated improved pits, 1.4 percent to without-slab/ open pits. Among the households with no latrine facility, 97 percent practise open defecation and the remaining 3 percent are dependent on public latrines (Census, 2011).

In Kotauratla mandal, 27 per cent of the households have access to in -house toilet facility, while 73 percent of the households are without latrine facility. A description of the type of latrine facility within the households premise among the households having latrine facility shows that, 77.2 percent have access to septic tanks, 5.7 percent to piped

sewer system and another 2.3 percent to other systems under flush/pour- flush latrines. Under pit latrine, 13.8 percent have access to with -slab ventilated improved pits, while 0.6 percent to without-slab open pits. Among the households with no in-house latrine facility, 98.6 percent practise open defecation with the remaining 1.4 percent being dependent on public latrines (Census, 2011).

In Yelamanchili mandal rural areas, 36.7 per cent of the households have access to in-house latrine facility, whereas 63.3 percent of the households carry on without latrine facility. A description of the type of latrine facility available in-house among the households having latrine facility, indicates that, 81.2 percent have access to septic tanks, while 5.2 percent to piped sewer system and another 2.2 percent to other systems under flush/ pour- flush latrines. Under pit latrine, 10.4 percent of the households have access to with- slab/ventilated improved pits, whereas, 0.5 percent to without -slab / open pits. Among the households having no latrine facility, 98.5 percent practise open defecation and the remaining 10.5 percent depend on public latrines (Census, 2011).

5.3 A Profile of the study villages in the district

For a better understanding of the public policies and the governance structures, it is necessary to study the environmental factors like the location, socio-economic structure, infrastructural facilities, civil society bodies, etc, for they wield a considerable influence on the performance of the development programmes. The social development policies such as provision of protected drinking water and sanitation have to operate in the context of the geographical, socio-cultural and political configurations of the society or the areas where they are being operated. The interaction between the environment and administration devised for the implementation of policies is very important, especially at the grass-roots levels. In this context, an attempt is made to examine some of the social determinants and infrastructural facilities available in the villages selected for the study. As mentioned earlier, the study was conducted across 12 villages (i.e. 6 NGP and 6 Non-NGP villages) in one district i.e., Visakhapatnam, Andhra Pradesh state.

5.3.1 Location and demographic features of the study villages

In NGP and Non-NGP areas, the number of villages selected for the study comes to twelve- six in each area. Transport in NGP villages is covered by both RTC and auto services to the extent of 50% and another 1/6th of the needs are met by auto services. But in Non-NGP villages, 2/3rds of the transport needs are met through /by RTC and auto services. Thus at the aggregate level, 2/3rds of the transport needs are met by autos and RTC. All the villages in both NGP and Non-NGP areas have electricity facility.

5.3.2 Sources of drinking water in the study villages

In all the villages in both NGP and Non-NGP areas, drinking water supply is made available through bore wells with overhead tanks. For meeting additional water requirements, people depend on lakes/tanks in NGP villages and protected wells in Non-NGP villages. Water tanks in the villages are cleaned weekly in one village in NGP and two of the villages in Non-NGP. In NGP villages, water tanks are cleaned fortnightly in half of the villages; whereas in Non-NGP villages, it is done in two villages.

5.3.3 Village Water and Sanitation Committees (VWSCs)

As per the NHM/ programme norms, in every village, there shall be a Village Water and Sanitation Committee (VWSC) to guide and monitor the water and sanitation services at the grass-root level. In AP, out of 6 NGP villages, all 6 villages' have VHSCs formed and 4 villages have VWSCs formed. In Non-NGP villages, all 6 villages have VHSCs formed and only in 2 villages VWSCs have been formed. Thus, in both the types of villages, there are VWSCs. VWSCs conduct meetings in four villages in NGP areas and two villages in Non-NGP areas. As regards the frequency of meetings, out of four VWSCs in NGP, two villages conduct quarterly meetings and in the remaining villages either monthly (or) half yearly meetings are held. In Non-NGP, out of two villages conducting meetings, one holds monthly and the other holds half yearly meeting. Thus, at the aggregate level- (i.e., NGP and Non-NGP villages taken together) monthly, quarterly and half-yearly meetings are held in two villages each. Only 41.7% of the village committees maintain records/minutes of meetings. In NGP areas, all the four villages that conduct meetings (i.e., committees - VHSC/VWSC), maintain records, whereas in Non-NGP villages, out of two villages, only one village (i.e., committees VHSC/VWSC) maintains records.

In NGP areas, schools and panchayats are equally important as venue (33.3% each), for conducting meetings, whereas, in Non-NGP areas, schools are mostly prefered for conducting meetings (50%) followed by panchayat offices. As regards the frequency of VHSC meetings, mostly monthly meetings are held in both the NGP (66.7%) and Non-NGP (83.3%) villages. Maintenance of records of VHSC meetings is done in all the villages of NGP and Non-NGP areas. In NGP villages, records are maintained mostly by the village sarpanch and other committee members concerned (VHSC/VWSC together in four villages). But in Non-NGP areas, other committee members maintain records in all the villages.

Village level health plans are prepared in half of the villages of NGP category, while in Non-NGP category, plans prepared in five villages (83.3%). The VHSC bring the health issues mentioned in the plan documents to the notice of the relevant health functionaries in five villages in NGP category (83.3%) and all the villages in Non-NGP category (100%).The respective VHSC presents the Village health plan in the gramsabha of the village panchayat in both NGP and Non-NGP villages (four villages in each area). VHSC members are aware of grants received by VHSCs in all the villages belonging to both the NGP and Non-NGP. All VHSC members involve themselves in the maintenance of records in all the villages of NGP and Non-NGP. VHSCs do not get any additional financial resources in all the villages of NGP and Non-NGP. In all the villages of NGP and Non-NGP, people are aware of the existence of VHSCs. IEC (Information Education and Communication) material is made available in the form of posters in half of the villages of NGP, followed by hand-outs/pamphlets in 1/6th of the villages.

5.3.4 State of water and sanitation facilities in government schools in the study villages

In AP, in NGP villages, there are 6 schools and 6 ICDS centres, where as, in Non-NGP villages, there are 8 schools and 8 ICDS centres. In NGP, out of six schools, two get drinking water from taps, and one each from tanks, cans and public taps. Similarly, out of eight schools in Non-NGP, three get drinking water from taps and another 3 schools from tanks. As regards the availability of latrine facilities in schools, all the six schools in NGP villages, have access to septic latrines.

All the six schools in NGP villages, have separate toilets for boys, girls and teachers, whereas in Non-NGP villages, in five out of eight villages, there is such facility available. Regarding cleaning of toilets in schools, in NGP villages, in a majority of schools (four out of six), cleaners are hired, followed by sweepers (in one village). In Non-NGP villages, in half of the schools (four out of eight schools), sweepers and hired cleaners are there. Four out of six schools in NGP villages and three out of eight schools in Non-NGP villages have their toilets cleaned fortnightly, followed by daily in one school and weekly in one school. Water supply is sufficient in five out of six schools in NGP villages, while water is sufficient in half of the schools (four out of eight schools), in non-NGP villages.

Fig 5.2 Pucca houses and huts in Turakalapudi non-NGP village

Water facility in ICDS centres in the study villages

As regards ICDS centres, there are five in NGP villages and ten in Non-NGP villages. In NGP, drinking water in ICDS centres is supplied through taps (60.0%) followed by bore wells (20%). In Non-NGP villages, half of the centres get water from taps, followed by tanks (10%). As regards the supply of water for general use, in NGP villages, three centres get water from taps, one gets from wells and the other gets through can supply. But in Non-NGP villages, only three out of ten centres get water from taps, and do not depend on wells and can supply.

5.4 A Profile of households and children behaviour related to water, sanitation and hygiene

This section is based on the data collected using Household and child schedules. In this section, an attempt is made to examine the perceptions of household members representing Nirmal Gram Puraskar and Non-Nirmal Gram Puraskar villages regarding the utilization of water and sanitation programmes and their impact on the health conditions of the rural communities. Unlike the other studies, the present study adopted the programmes (villages with NGP) and control -group (villages without NGP) approach, covering

both NGP and Non-NGP village households with a view to juxtaposing the situation and to see the response of the people towards the programmes and their impact on the health conditions of the people.

An analysis of the experiences of those who are recipients of the scheme, Nirmal Gram Puraskar provides insights into the operational dynamics of the programme. This also brings out the gap between promise and performance, highlighting the strengths and weaknesses of the programmes. Similarly, an understanding and assessment of the perceptions of the non- NGP households could provide a clue to identifying the causes behind the non-availability of facilities offered by the government. Here, an attempt is made to analyse the socio- economic background of the respondents, representing NGP &Non-NGP villages.

Table 5.2 Gender and literacy profiles of the respondents in NGP & Non-NGP Villages

Education	NGP Villages			Non-NGP Villages			All		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Primary	16	2	18	21	2	23	37	4	41
Percent	15.1	13.3	14.9	18.6	20.0	18.7	16.9	16.0	16.8
Secondary (6-12)	34	0	34	32	0	32	66	0	66
Percent	32.1	0.0	28.1	28.3	0.0	26.0	30.1	0.0	27.0
Graduate	5	0	5	8	0	8	13	0	13
Percent	4.7	0.0	4.1	7.1	0.0	6.5	5.9	0.0	5.3
Illiterate	40	13	53	42	7	49	82	20	102
Percent	37.7	86.7	43.8	37.2	70.0	39.8	37.4	80.0	41.8
Literate	11	0	11	10	1	11	21	1	22
Percent	10.4	0.0	9.1	8.8	10.0	8.9	9.6	4.0	9.0
Total	**106**	**15**	**121**	**113**	**10**	**123**	**219**	**25**	**244**

The gender particulars of the sample respondent households point to a large number of male members (89.8%) out of 244 households covered by the study. At the overall level (NGP and Non-NGP), a majority of the persons are illiterate (41.8%), while illiteracy is only 37.4% among males as against 80.0% among females. With regard to primary level of education, the percentage share is nearly equal among males and females (16-17%), and no female members fall under secondary and above levels of education (Table 5.2).

In Non-NGP villages, the illiteracy rate is less among females in comparison to their counterparts in NGP villages. Similarly, in respect of primary level of education also, Non-NGP village respondents are a little better off, whereas NGP category respondents show a little better performance with regard to secondary level of education (only males are there in the both groups).

Table 5.3 A Profile of the households by type of house in NGP and Non-NGP villages

Type of House	NGP villages	Non-NGP villages	Total
Pucca	101	101	202
Per cent (%)	83.5	82.1	82.8
Sem-pucca	12	13	25
Per cent (%)	9.9	10.6	10.2
Kutcha	6	7	13
Per cent (%)	5.0	5.7	5.3
Hut	2	2	4
Per cent (%)	1.7	1.6	1.6
Total	**121**	**123**	**244**

At the aggregate level, a majority of the respondents live in pucca houses (82.8%) followed by semi-pucca houses (10.2%). In NGP and Non-NGP villages also, the proportions remain nearly the same in this respect (Table 5. 3).

Table 5.4 Distribution of the sample households by type of toilet in NGP and Non-NGP villages

Toilet type	NGP villages	Non-NGP villages	Total
Flush toilet	1	0	1
Per cent (%)	.8	.0	.4
Septic latrine	76	59	135
Per cent (%)	62.8	48.0	55.3
Open defecation	43	61	104
Per cent (%)	35.5	49.6	42.6
Septic tank and OD	1	3	4
Per cent (%)	.8	2.4	1.6
Total	**121**	**123**	**244**

Chi-value=5.157, P=0.076

The field data shows that at the aggregate level, a majority of the respondents use septic latrines (55.3%), followed by open defecation (42.6%). In Non-NGP areas, half of the respondents practise open defecation, while nearly another half of them use septic latrines. In NGP areas, one-third of the residents practise open defecation and the remaining two-thirds of the respondents use septic latrines. At the aggregate level as well as category-wise, only one household uses flush toilet. In the usage of septic latrines, NGP villages are better compared to Non-NGP villages (Table 5. 4).

At the aggregate level, regarding the reasons for not using toilets, two households in Non-NGP have reported that "Super structure does not ensure privacy" and 1 from NGP has responded that the latrine has got filled up (Table 5. 5).

Table 5.5 Respondents' perceptions related to non-use of toilets in NGP and Non-NGP villages

Reason for not using toilet	NGP villages	Non-NGP villages	Total
Superstructure does not ensure privacy	0	2	2
Per cent (%)	.0	100.0	66.7
Latrine filled up	1	0	1
Per cent (%)	100.0	.0	33.3
Total	**1**	**2**	**3**

At the aggregate level, regarding the reasons for using toilets, 97.1% of the respondents use them "for better health", whereas 2.1% of the respondents use toilets for maintaining privacy and better health. In Both NGP and Non-NGP villages also, the predominant response for using toilets is better health with 96.2% and 98.4 % respectively. As regards the educational level, illiteracy is higher among NGP village respondents (61.53%), as compared to those in Non-NGP villages (38.4%). Irrespective of the level of education, by and large, majority of respondents in both NGP and Non-NGP villages, use toilets for better health (Table 5. 6).

At the aggregate level, 57.4% of the respondents wash hands with plain water after defecation followed by 34% of the respondents' who wash their hands with soap and only 8.6% of the respondents with both soap and plain water. Washing hands with soap is slightly higher in respect of NGP villages (37.2%) as compared to Non-NGP villages (30.9%). Washing hands with only plain water is higher in Non-NGP villages (60.2%) as compared to NGP villages (54.5%). In respect of washing hands with both soap and plain water, the situation in both NGP and Non-NGP villages is more or less the same (Table 5. 7).

As regards using the occasional source of water, at the aggregate level, out of 244 respondents, a majority (84%) have reported that they use water for domestic use only, while some respondents (14.8%) use it for both domestic and toilet purpose and 1.2% of them use water for toilet purposes only. This trend is seen in both NGP and Non-NGP villages. In Non-NGP villages, a little higher percentage i.e., 87.8% of them uses water for domestic use only as compared to NGP villages (80.2%). In respect of using water for both domestic and toilet purpose a higher percentage is seen in respect of NGP villages (18.2%) than Non-NGP villages (11.4%) (Table 5. 8).

Table 5. 6 Respondents' perceptions regarding the use of toilets, by level of education in NGP and non-NGP villages

	Reasons for using toilets									
	NGP villages			Non-NGP villages			All			
Education	For better health	For better health and Privacy	Total	For better health	Privacy	Total	For better health	For better health and Privacy	Privacy	Total
Primary	13	1	14	14	0	14	27	1	0	28
Percent (%)	92.85	7.14	50.00	100.00	0.00	50.00	96.42	3.57	0.00	100.00
Secondary (6-12) and graduation	26	1	27	23	0	23	49	1	0	50
Percent (%)	96.29	3.70	54.00	100.00	0.00	46.00	98.00	2.00	0.00	100.00
Illiterate	31	1	32	19	1	20	50	1	1	52
Percent (%)	96.87	3.12	61.53	95.00	5.00	38.46	96.15	1.92	1.92	100.00
Literate	5	0	5	5	0	5	10	0	0	10
Percent (%)	100.00	0.00	50.00	100.00	0.00	50.00	100.00	0.00	0.00	100.00
Total	75	3	78	61	1	62	136	3	1	140

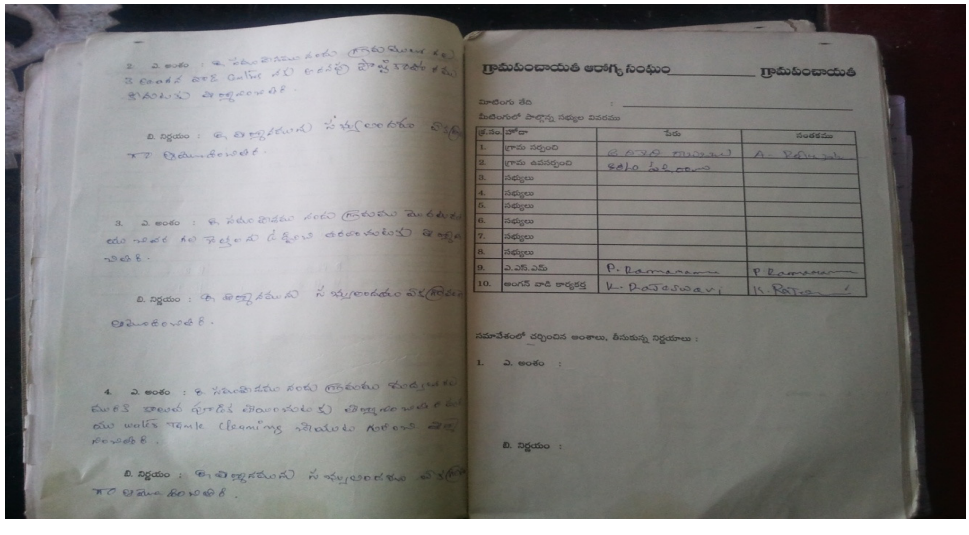
Table 5.7 Details of hand wash habit after defecation in NGP and Non-NGP villages

Washing hands after defecation	NGP	Non-NGP	Total
Soap	45	38	83
Per cent (%)	37.2	30.9	34.0
Plain water	66	74	140
Per cent (%)	54.5	60.2	57.4
Soap and plain water	10	11	21
Per cent (%)	8.3	8.9	8.6
Total	**121**	**123**	**244**

Table 5.8 Water availability and usage (by source) in NGP and non-NGP villages

Purpose of using the occasional source of water	NGP	Non-NGP	Total
Domestic use	97	108	205
Per cent (%)	80.2	87.8	84.0
Domestic use and Toilet facility	22	14	36
Per cent (%)	18.2	11.4	14.8
Toilet use	2	1	3
Per cent (%)	1.7	.8	1.2
Total	**121**	**123**	**244**

Fig 5.3 Village Health committee Minutes Register in Gompa a non-NGP village



Hazipalli Village - A Struggle Beyond Development and NGP Award

Hazipalli village, situated on the west side of Shadnagar town, comes under Farooqnagar Mandal of Mahaboobnagar district in Telangana State. The village is heterogeneous and is inhabited by Other Backward Caste (OBC) and Schedule Caste (SC) communities. The total population of the village stands at 872 and that comprises 242 households of which OBC households come to 172 and SC households to 70. The main economic activity of the village is agriculture and allied activities, while some people are engaged in government jobs and some of the people in business as well. Smt. Jangamma (a dalit), a former Panchayat President observes that when they came to know about the NGP Award and the criterion to become eligible to get NGP Award, the Panchayat convened a Gram Sabha meeting in which it was decided not to practise open defecation and to maintain good hygiene practices at the household and village levels. To prevent open defecation practice in the village, all the women from SHGs played a vital role besides giving full support to the Panchayat President. The Panchayat president had tried to get a latrine scheme from the sanitation department and she succeeded. All the households utilized this scheme and they constructed individual toilets at their houses and started using them. Smt. Jangamma is happy to say that she passed a resolution in the Gram Sabha with the support of all the villagers to the effect that if any person practised open defecation, he/she would be punished at the Panchayat Office by keeping them whole day at the office and also imposing a fine of Rs. 500. To implement this resolution she had undergone lot of struggle, but with the help of SHG women and other men, she succeeded. Mr. Srinivas who is the present Panchayat President from the village has given a great support to prevent open defecation in addition to supporting the ex president in all the developmental activities.

As regards the processes followed, Smt. Jangamma mentioned that she conducted a massive rally; handouts were distributed; slogans were written on walls and conducted meetings in the village to create awareness regarding open defecation problems and the importance of personal hygiene. The other villagers have endorsed that today their village practises cent percent ODF and have the facilities of a completely protected water supply and underground drainage system. As result of this huge success, because of the collective efforts of the Panchayat President, SHG members and villagers in general, Hazipalli village case study as a 'Success Case' has been introduced in the 6th class Social Studies syllabus by the AP Government. Not only at household level, the village school and ICDS centre are provided with toilets and protected water supply. The committee viz., VHSC functions well. Today Hazipalli village stands as a proud village attracting a number of visitors (both from India and Abroad) to have a glimpse of the village achievements in the sanitation and water sector.

Table 5.9 Perceptions of the respondents regarding the quality of water in NGP and non-NGP villages

Quality of water	NGP	Non-NGP	Total
Pure	120	123	243
Per cent (%)	99.2	100.0	99.6
Others	1	0	1
Per cent (%)	.8	.0	.4
Total	**121**	**123**	**244**

Chi-value=1.021, P=0.312

According to almost all the respondents in both NGP and Non-NGP villages water is pure. There is not much difference between NGP and Non-NGP villages (Table 5. 9).

Table 5.10 Details of adequacy/inadequacy of water availability for daily needs

Quantity of water	NGP	Non-NGP	Total
Fully Sufficient	107	101	208
Per cent (%)	88.4	82.1	85.2
Somewhat sufficient	13	21	34
Per cent (%)	10.7	17.1	13.9
Insufficient	1	1	2
Per cent (%)	.8	.8	.8
Total	**121**	**123**	**244**

At the aggregate level, a majority of the respondents (85.2%) have reported that the quantity of water supplied is fully sufficient followed by 13.9% of the respondents who have reported that water availability is somewhat sufficient. In NGP villages, an overwhelming number of respondents (88.4%) have responded that water availability is fully sufficient as against 82.1% of the respondents in non-NGP villages (Table 5. 10).

Table 5.11 Perceptions of the respondents regarding adequacy of water supply during the past one year in NGP and Non- NGP villages

Adequate of water supply	NGP	Non-NGP	Total
Yes	105	102	207
Per cent (%)	86.8	82.9	84.8
No	16	21	37
Per cent (%)	13.2	17.1	15.2
Total	**121**	**123**	**244**

At the aggregate level, most of the respondents (84.8%) have reported that water supply has been sufficient during past one year. However, in NGP villages, such a positive response is found a tad higher (86.8%) than in Non-NGP villages (82.9%) (Table 5.11).

Table 5.12 Particulars of season- wise water insufficiency (in terms of intensity)

Seasonal water insufficiency	NGP	Non-NGP	Total
In summer season	16	21	37
Per cent (%)	100.0	100.0	100.0
In Winter season	0	0	0
Per cent (%)	0.0	0.0	0.0
Total	**16**	**21**	**37**

In both NGP and Non-NGP areas, 37 (15.2% of the total sample households) respondents have stated that there has been a problem with water supply during the last one year. When we asked them to mention the season during which they face water problem, all of them have reported that they face problem during summer (Table 5. 12).

Table 5.13 Information on the storage capacity (drinking water) of water tanks/drums/ vessels in the sample households in NGP and non-NGP villages

Storage capacity of drinking water	NGP	Non-NGP	Total
15 pots	121	123	244
Per cent (%)	100.0	100.0	100.0
1 drum	0	0	0
Per cent (%)	0.0	0.0	0.0
10 buckets	0	0	0
Per cent (%)	0.0	0.0	0.0
Total	**121**	**123**	**244**

In both NGP and non-NGP villages, a majority of the households use earthen pots besides plastic/steel vessels for water storage; they do not use drums for storing water. Almost all the respondents in both NGP and Non-NGP villages use pots (about 15) for storing water (see Table 5. 13).

Table 5. 14 Information on practices of drawing drinking water from containers in NGP and Non-NGP villages

Method of using to take water from container	NGP	Non-NGP	Total
Containers attached with taps	3	2	5
Per cent (%)	2.5	1.6	2.0
Using tumblers /utensils with hands	118	121	239
Per cent (%)	97.5	98.4	98.0
Total	**121**	**123**	**244**

At the aggregate level, out of 244 respondents, 98% take water from containers with glass/ tumblers/utensils using hand, whereas, only 2% of them take water from containers with taps attached. Taking out water with glass/tumblers /utensils using hand is higher in Non-NGP villages (98.4%) than in NGP villages (97.5%), whereas, taking water from containers with taps attached is higher in NGP villages (2.5%) than in Non-NGP villages (1.6%) (Table 5.14).

Table 5. 15 Distribution of households by, frequency of cleaning water containers used for drinking water in NGP and Non-NGP villages

Frequency of cleaning water containers	NGP	Non-NGP	Total
No	0	0	0
Per cent (%)	0.0	0.0	0.0
Yes	121	123	244
Per cent (%)	100.0	100.0	100.0
Daily	118	121	239
Per cent (%)	97.5	98.4	98.0
Once in 2 days	3	2	5
Per cent (%)	2.5	1.6	2.0
Total	**121**	**123**	**244**

Chi-value=0.221, P=0.638

Regarding cleaning of drinking water containers, in both NGP and Non-NGP villages, all the 244 respondents do clean drinking water containers. At the aggregate level, 98.0% of respondents clean containers daily and only 2.0% respondents once in 2 days. However, in Non-NGP villages, 98.4% of the respondents clean water containers daily as against 97.5% in NGP villages. There is not much difference between NGP and Non-NGP villages, in respect to cleaning water containers daily (Table 5. 15).

Fig 5.4 Posters displayed containing information on medicine for night blindness and Hand wash practicies in Rajupeta

Fig 5.5 School children collecting water from hand pumps in VJ Puram

At the aggregate level, the respondents who treated water "sometimes" before drinking constitute 45.1%, whereas only 6.1% of them treat water always. Interestingly, the respondents who sometimes treat drinking water account for a tad higher share in Non-NGP villages (46.3%) in comparison to those in NGP villages (43.8%), while the percentage of respondents treating water always is higher in respect of NGP villages (6.6%) than in Non-NGP villages (5.7%). The percentage of respondents who never treat drinking water is the same in both NGP and Non-NGP villages (46.3%) (Table 5. 16).

At the aggregate level, out of 125 respondents, 91.2% boil water so as to make it safer for drinking followed by 7.2% who strain water, using a cloth, while 1.6% use water filters. In NGP villages, respondents boiling water before drinking constitute a higher share (93.4%) than those in Non-NGP villages (89.1%) as it is evidence by Chi-square test. The percentage of respondents straining water, using a cloth is higher in respect of (10.9%) Non-NGP villages relative to NGP villages (3.3%). And only 3.3% of the respondents in NGP villages use water filters. (Table 5. 17).

With regard to water supply, according to a majority of the respondents (82.4%) there is no problem. The rest of them have reported facing various problems regarding water supply. The respondents reporting water shortage in non-NGP village's account for 10.6%, and those reporting the involvement of long distances in fetching water for 3.3% and those reporting the non-availability of borewells in their locality for 2.4%. In

Table 5. 16 Information on treatment of drinking water before consumption, by level of education of respondents in NGP and non-NGP villages

Treatment of drinking water															
	NGP					Non-NGP					All				
Educational levels	Always	Sometimes	Never	Not at all done	Total	Always	Sometimes	Never	Not at all done	Total	Always	Sometimes	Never	Not at all done	Total
Primary	1	12	5	0	18	1	11	10	1	23	2	23	15	1	41
Percent (%)	5.55	66.66	27.77	0.00	43.90	4.34	47.82	43.47	4.34	56.09	4.87	56.09	36.58	2.43	100.00
Secondary (6-12) and Graduate	4	23	12	0	39	3	26	10	1	40	7	49	22	1	79
Percent (%)	10.25	58.97	30.76	0.00	49.36	7.50	65.00	25.00	2.50	50.63	8.86	62.02	27.84	1.26	100.00
Illiterate	3	14	32	0	53	2	16	31	0	49	5	30	63	4	102
Percent (%)t	5.60	26.41	60.37	0.00	52.47	4.08	32.65	63.26	0.00	48.03	4.90	29.41	61.76	3.92	100.00
Literate	0	4	7	0	11	1	4	6	0	11	1	8	13	0	22
Percent (%)	0.00	36.36	63.63	0.00	50.00	9.09	36.36	54.54	0.00	50.00	4.54	36.36	59.09	0.00	100.00
Total	8	53	56	4	121	7	57	57	2	123	15	110	113	6	244

NGP areas also, the respondents reporting water shortage account for 8.3%, while those reporting the involvement of long distances in fetching water for 4.1% (Table 5. 18).

Table 5.17 Details of measures taken for treating water before consumption by the sample households in NGP and non-NGP villages

Measures taken	NGP	Non-NGP	Total
Boil water	57	57	114
Per cent (%)	93.4	89.1	91.2
Strain water, using a cloth	2	7	9
Per cent (%)	3.3	10.9	7.2
Use water filters	2	0	2
Per cent (%)	3.3	.0	1.6
Total	**61**	**64**	**125**

Chi-value=4.708, P=0.095

Table 5.18 Information on the major problems related to water supply in the sample villages (NGP and non-NGP)

Major problem	NGP	Non-NGP	Total
No problem	101	100	201
Per cent (%)	83.5	81.3	82.4
Bore-wells not available	3	3	6
Per cent (%)	2.5	2.4	2.5
Shortage of water	10	13	23
Per cent (%)	8.3	10.6	9.4
Long distance involved in fetching water	5	1	6
Per cent (%)	4.1	.8%	2.5
Bore- wells not available& shortage of water	1	2	3
Per cent (%)	.8	1.6	1.2
Shortage of water and long distance involved in fetching water	1	4	5
Per cent (%)	.8	3.3	2.0
Total	**121**	**123**	**244**

Table 5.19 Distribution of the respondents reporting major problems with regarding water supply in NGP and non-NGP villages

Problems	NGP	Non-NGP	Total
Water Level goes down during summer	17	19	36
Per cent (%)	85.0	82.6	83.7
Water Level goes down during summer&			
No other source available for drinking water	3	4	7
Per cent (%)	15.0	17.4	16.3
Total	**20**	**23**	**43**

At aggregate level, 43 respondents (from both NGP and Non-NGP areas) face drinking water problem, especially during summer mainly because the water level goes down and hence, they do not get sufficient water from wells/borewells (Table 5. 19).

Table 5.20 Status of water supply in ICDS centres in NGP and Non-NGP villages

Water supply in ICD Scentre	NGP	Non-NGP	Total
Yes	54	51	105
Per cent (%)	44.6	41.5	43.0
Others	67	72	139
Per cent (%)	55.4	58.5	57.0
Total	**121**	**123**	**244**

At the aggregate level, two thirds of the respondents have reported that there is water supply in anganwadi centres. In respect of NGP villages, 44.6% of the respondents have reported that ICDS centres have access to water supply, while in Non-NGP only 41.5% of respondents have reported the availability of water in ICDS centres (Table 5. 20).

Table 5.21 Respondents' awareness regarding the advantages of using in-house latrine/ toilet/lavatory facility in NGP and non-NGP villages.

Advantages	NGP	Non-NGP	Total
Better health	44	39	83
Per cent (%)	56.4	62.9	59.3
Privacy	4	2	6
Per cent (%)	5.1	3.2	4.3
Ease of use	2	0	2
Per cent (%)	2.6	.0	1.4
Social status	1	0	1
Per cent (%)	1.3	.0	.7
Better health and Privacy	23	16	39
Per cent (%)	29.5	25.8	27.9
Better health and Ease of use	0	1	1
Per cent (%)	.0	1.6	.7
Better health and Social status	4	3	7
Per cent (%)	5.1	4.8	5.0
Privacy and Ease of use	0	1	1
Per cent (%)	.0	1.6	.7
Total	**78**	**62**	**140**

Regarding the advantages of using toilets within the house, at the aggregate level, more than half of the respondents (59.3%) have reported that they use toilets for "better health", followed by 27.9% of the respondents for "better health and privacy". In respect of NGP villages, 56.4% of the respondents use toilets for "better health as against 62.9% of the respondents using toilets for the same reason in non-NGP villages. "Better health and privacy" receives a little higher response 29.5% in NGP villages than in non- NGP villages (25.8%). In both NGP and in Non-NGP villages together, "better health and social status" has received only 5% response. (Table 5. 21).

Table 5. 22 Respondents encountered problems by the households relating to toilet use in NGP and Non-NGP villages

Problems	NGP	Non-NGP	Total
Yes	3	3	6
Per cent (%)	3.8	4.8	4.3
No	75	59	134
Per cent (%)	96.2	95.2	95.7
Total	**78**	**62**	**140**

Regarding toilet-use problems at home, at the aggregate level, 95.7% of responds do not face any problem. There is only a 1.0% difference in this respect between NGP and non NGP villages (96.2% in NGP villages). (Table 5. 22).

Table 5. 23 Problems encountered by households relating to toilet use in NGP and Non-NGP villages

Problems	NGP	Non-NGP	Total
Water not available for use/cleaning	2	1	3
Per cent (%)	66.6	33.3	50.0
Superstructure does not ensure privacy	0	1	1
Per cent (%)	0.0	33.3	16.6
Superstructure does not ensure privacy& Filled up pit and unstable slabs (fFear of falling)	0	1	1
Per cent (%)	0.0	33.3	16.6
Filled up Pits	1	0	1
Per cent (%)	33.3	0.0	16.6
Total	**3**	**3**	**6**

With regard to problems faced by respondents related to toilets use at home,1 respondent has reported non-availability of water and super structure not ensuring privacy as the reasons for not using toilet facility and 1 respondent because of unstable slab in non-NGP villages At the aggregate level, out of 6 respondents both in NGP and in Non-NGP villages, 3 respondents have reported "water not available for use/cleaning", while 1 respondents "filled up pit" in NGP villages (Table 5. 23).

Table 5. 24 Information on the practices of disposing children's stools post defection in NGP and Non-NGP villages

Method of disposal of children's excreta	NGP	Non-NGP	Total
Leave it where it is	8	9	17
Per cent (%)	6.6	7.3	7.0
Throw it in the street	84	96	180
Per cent (%)	69.4	78.0	73.8
Throw it in the latrine	29	18	47
Per cent (%)	24.0	14.6	19.3
Total	**121**	**123**	**244**

Chi-value=3.417, P=0.121

With regard to disposing of children's stools, at the aggregate level, a majority of the respondents (73.8%) "throw in the street", followed by 19.3% of respondents "thrown it in the latrine" and another 7% of the respondents "leave it where it is ". In NGP villages, 24% of the respondents dispose of children's excreta in the latrine as against 14.6% of the respondents in non-NGP villages. As against this, 78.10% of the respondents in non-NGP villages dispose of children's waste on to the street as compared to 69.4% of the respondents in NGP villages (Table 5. 24).

Table 5. 25 Information on hand wash facility and type of hand wash near toilets

Type of hand Wash	NGP	Non-NGP	Total
Not having wash facility	1	1	2
Per cent (%)	1.3	1.6	1.4
Having wash facility	77	61	138
Per cent (%)	98.7	98.4	98.6
Soap	54	43	97
Per cent (%)	70.1	70.5	70.3
Plain water	8	4	12
Per cent (%)	10.4	6.6	8.7
1Soap& Water	15	14	29
Per cent (%)	19.5	23.0	21.0
Total	**77**	**61**	**138**

Regarding hand wash facilities near the toilets, at overall level, 98.6% of the respondents have reported that they have access to hand wash facility near toilets at home. However, the respondents having this are more in number in NGP villages. The number of respondents having hand wash facility near toilets is marginally higher in NGP villages (98.7%) as compared to Non-NGP village (98.4%) (Table 5. 25).

Fig 5. 6 School having toilets for boys and girls in Rajupeta

Fig 5.7 Toilet facility in Rayapurajupet schools:

Regarding the frequency of cleaning of toilets, at aggregate level, 49.3% of the respondents clean their toilets at least once in a week, followed by 46.4% of the respondents who clean toilets once or more in a day. Cleaning of toilets once or more in a day is a little higher in NGP villages (48.7%) as compared to Non-NGP villages (43.5%). But, cleaning of toilets at least once in a week is higher in Non-NGP villages (51.6%) as compared to

Fig 5.8 In-house septic latrines in Gompa, a Non-NGP village

NGP villages (47.4%). As far as cleaning of toilets at least once in a fortnight is concerned, there is not much of a difference between NGP and Non-NGP villages (i.e., 3.8% and 3.2% respectively) (Table 5. 26).

Table 5. 26 Frequency of cleaning toilets in NGP and Non- NGP villages

Frequency of cleaning toilets	NGP	Non-NGP	Total
Once or more in a day	38	27	65
Per cent (%)	48.7	43.5	46.4
At least once in week	37	32	69
Per cent (%)	47.4	51.6	49.3
At least once a fortnight	3	2	5
Per cent (%)	3.8	3.2	3.6
At least once a month	0	1	1
Per cent (%)	.0	1.6	.7
Total	**78**	**62**	**140**

In this section, illnesses related to unsafe drinking water and unhygienic practices followed in the study villages resulting in health problems for children such as diarrhoea, dysentery and worm infection are discussed. Further, methods followed by the households for treating dehydration among children are also presented here.

Table 5.27 Treatment seeking behaviour of the households with respect to dehydration among children in NGP and Non-NGP villages

Measures adopted	NGP	Non-NGP	Total
Provide ORS	40	39	79
Per cent (%)	33.1	31.7	32.4
Provide only hot water	1	1	2
Per cent (%)	.8	.8	.8
Visit a doctor/s	43	45	88
Per cent (%)	35.5	36.6	36.1
Get the medicine directly from Pharmacy	3	1	4
Per cent (%)	2.5	.8	1.6
Approach Village Quacks	0	1	1
Per cent (%)	.0	.8	.4
Provide ORS & Provide only hot water	1	2	3
Per cent (%)	.8	1.6	1.2
Provide ORS & Visit a doctor/s	33	34	67
Per cent (%)	27.3	27.6	27.5
Total	**121**	**123**	**244**

With regards to seeking treatment for dehydration among children, 36.1% of the respondents approach a doctor/s, followed by 32.4% of the respondents who provide ORS, and 27.5% of the respondents provide ORS and also visit a doctors. The percentage of the respondents visiting a doctor is more or less the same in respect of both NGP and Non-NGP villages. A similar trend has been observed in both NGP and Non-NGP villages with regard to providing ORS (Table 5. 27).

Table 5.28 Measures taken by households to keep cooked food safe in NGP and Non-NGP villages

Measures	NGP	Non-NGP	Total
Cover cooked food	121	123	244
Per cent (%)	100.0	100.0	100.0
Total	**121**	**123**	**244**

In respect of both NGP and Non-NGP areas, almost all the respondents always cover the cooked food with a plate (Table 5. 28).

Table 5.29 Household level personal hygiene practices- taking bath in NGP and Non-NGP villages

Frequency of taking bath	NGP	Non-NGP	Total
Once or more a day	117	114	231
Per cent (%)	96.7	92.7	94.7
At least once in 2 days	4	9	13
Per cent (%)	3.3	7.3	5.3
Total	**121**	**123**	**244**

Regarding the frequency of taking bath by family members, at the aggregate level, in both NGP and Non-NGP areas, a majority of the respondents (94.7%) have reported that they take bath once or more a day. In respect of NGP villages 96.7% of the respondents take bath daily as against 92.7% of the respondents in Non-NGP villages (Table 5. 29).

5.4.1 VWSC and VHSC in the study villages: Awareness level regarding VWSC and VHSC among the local population

Table 5. 30 Respondents awareness regarding the existence of village water and sanitation committee (VWSC) and Village Health and Sanitation Committee (VHSC) in their villages

Existence of VWSC	NGP	Non-NGP	Total
Aware (VWSC)	18	4	22
Per cent (%)	14.9	3.3	9.0
Not aware(VWSC)	103	119	222
Per cent (%)	85.1	96.7	91.0
Existence of VHSC			
Aware(VHSC)	24	24	48
Per cent (%)	19.8	19.5	19.7
Not aware(VHSC)	97	99	196
Per cent (%)	80.2	80.5	80.3
Total	**121**	**123**	**244**

When enquired about the awareness of the existence of VWSC, in both areas together (NGP and Non-NGP), only 9.0% of the respondents have reported being aware of it. In NGP villages, about 15 % of the respondents are aware of VWSC, while in Non-NGP villages, only 3.3% of the respondents are aware of it. With regard to awareness of existence of the VHSC in their villages, 19.7% of the respondents (at the aggregate level) have given a positive response. In respect of both NGP and non NGP villages, the awareness level is the same in this respect (Table 5.30).

5.4.2 An analysis of information based on child health and hygiene

As part of the study, an attempt was also made to collect information on various dimensions of child health and hygiene through administering an interview schedule to mothers of children aged 0-5 years. The purpose of the study/ schedule was to find out health and hygiene practices followed by parents, especially mothers. The schedule covered various aspects such as practices of treating drinking water, awareness about diseases/ ailments children may be vulnerable to due to unsafe drinking water, availability of toilet facility, especially for children, diseases/ailments affecting children due to practising of open defecation or non-use of toilets, personal hygiene practices, improper bathing and washing of hands and material used for washing etc. The child schedules also contain questions related to the status of immunization of children and maintenance of immunization card separately for each child and illness episodes undergone by children during the last one year. The data on these aspects helped us have an idea not only about the health status of our future generations, but also the strengths and weaknesses of the policies meant for human development, especially improvements in respect of the health standards of children.

Table 5. 31 Distribution of households treating water before consumption and methods making water safer for children's consumption

Treating Water	NGP	Non-NGP	Total
Yes	65	60	125
Per cent (%)	53.7	48.8	51.2
No	56	63	119
Per cent (%)	46.3	51.2	8.8
Total	**121**	**123**	**244**
Practices to make water safer to drink			
Boil water	58	52	110
Per cent (%)	89.2	86.7	88
Strain water, using a cloth	5	5	10
Per cent (%)	7.7	8.3	8.0
Use water filters	2	2	4
Per cent (%)	3.1	3.3	3.2
Boil & Strain water, using a cloth	0	1	1
Per cent (%)	.0	1.7	.8
Total	**65**	**60**	**125**

On being asked whether they treated drinking water before giving to their children, at the aggregate level, 51.2% of the respondents have reported that they do treat water, whereas the remaining 48.8% of the respondents do not treat water. In respect of NGP villages, the positive response is a tad higher (53.7%) as compared to Non-NGP villages

(48.8%). Among those who treat water before giving it to their children for drinking, at the aggregate level (out of 125), 88.0% of the respondents have reported that they boil water followed by 8.0% of the respondents who strain water using a cloth and 3.2% of the respondents use water filters. In both NGP and Non-NGP, water treatment measures are in the same proportion as at the overall level. (Table 5.31)

Table 5.32 Details of in-house toilet facility and type of toilets used for children in NGP and Non-NGP villages.

Toilet facility	NGP	Non-NGP	Total
Yes	78	63	141
Per cent (%)	64.5	51.2	57.8
No	43	60	103
Per cent (%)	35.5	48.8	42.2
Total	121	123	244
Type of Toilet used for children			
Toilet with in the household	76	62	138
Per cent (%)	97.4	98.4	97.9
Others	2	1	3
Per cent (%)	2.6	1.6	2.1
Total	**78**	**63**	**141**

The field data shows that at the aggregate level, 57.8% of the respondents have access to in-house toilet facility and also gave positive response. In respect of NGP villages, 64.5% of the respondents enjoy in-house toilet facility as against 51.2% of the respondents in non-NGP villages. On being asked about the type of toilet facilities used (from among the respondents reporting having toilet facility) for their children, at the aggregate level, majority of them (97.9%) have reported the use of toilets. A similar trend has been observed, in both NGP and Non-NGP villages, in this respect (Table No. 5.32)

Table 5. 33 Distribution children taking help for toilet use in NGP and Non-NGP villages

Children taking help for toilet use	NGP	Non-NGP	Total
By his/ her own	2	1	3
Per cent (%)	1.7	.8	1.2
with the help of mother/father	119	122	241
Per cent (%)	98.3	99.2	98.8
Total	**121**	**123**	**244**

With regard to the help of family members in the use of toilets by children at home, a majority of the respondents (NGP -98.3% and Non-NGP - 99.2%) have reported that their children take the help of parents in using toilets, while at the aggregate level it is 98.8% (Table 5. 33).

Table 5.34 Awareness about toilet use and children's vulnerability to possible diseases in NGP and Non-NGP villages

Type of Diseases	NGP	Non-NGP	Total
Fever	5	18	23
Per cent (%)	4.1	14.6	9.4
Fever& Body pains	102	88	190
Per cent (%)	84.3	71.5	77.9
Fever &Chikungunya	1	0	1
Per cent (%)	.8	.0	.4
Fever& Body pains& Chikungunya	13	17	30
Per cent (%)	10.7	13.8	12.3
Total	**121**	**123**	**244**

With regard to the possibility of exposure of children to disease in the event of their not using toilets facility, at the aggregate level, a majority of the respondents (77.9%) have reported that their children are prone to 'fever and body pain' followed by fever, body pains and chikungunya (12.3%). The percentage of respondents reporting fever and body pain is a tad higher in NGP villages (84.3%) as compared to 71.5% that of the respondents in Non-NGP villages (Table 5. 34).

Fig 5.9 Health awareness meeting conducted in ICDS center at Gompa village

Fig 5.10 Distributing eggs to children in ICDS center in Gompa village

Table 5.35 Distribution of respondents reporting frequency of bath given to children in NGP and Non-NGP villages

Frequency of giving bath to children	NGP	Non-NGP	Total
Once a day	11	22	33
Per cent (%)	9.1	17.9	13.5
Twice a day	110	101	211
Per cent (%)	90.9	82.1	86.5
Total	**121**	**123**	**244**

Regarding the frequency of bath given to the children, the field data shows that, at the aggregate level, a majority of the respondents (86.5%) give bath to their children twice a day, while the remaining 13.5 % percent of the respondents once daily (Table 5. 35).

Table 5.36: Distribution of children with regard to washing their hands and type of hand wash used before taking food in NGP and Non-NGP villages

Children washing their hands	NGP	Non-NGP	Total
Yes	121	123	244
Per cent (%)	100.0	100.0	100.0
No	0	0	0
Per cent (%)	0.0	0.0	0.0
Type of hand wash used for children			
Water	53	59	112
Per cent (%)	43.8	48.0	45.9
Soap	65	57	122
Per cent (%)	53.7	46.3	50.0
Liquid soap	0	2	2
Per cent (%)	.0	1.6	.8
water and soap	3	5	8
Per cent (%)	2.5	4.1	3.3
Total	**121**	**123**	**244**

Almost all the respondents in both NGP and Non-NGP areas have responded that their children always wash their hands, while according to more than half of the respondents (53.7% in NGP and 46.3% in Non-NGP), their children wash their hands using soap. Close to another half of the respondents (45.9%) in both the areas have reported children washing their hands only with water (Table 5.36)

Table 5.37: Distribution of households by immunization services received by children in NGP and Non-NGP villages

Immunization status	NGP	Non-NGP	Total
Received	121	123	244
Per cent (%)	100.0	100.0	100.0
Not received	0	0	0
Per cent (%)	0.0	0.0	0.0
Total	**121**	**123**	**244**

According to almost all the respondents, their children have received immunization (Table 5.37)

Illnesses among children in NGP villages

In NGP areas, out of 164 children, 66 have been reported ill with water borne diseases, 77 with other diseases which may be related to water and another 12 with other diseases not related to water.

Fig 5.11 Hand wash practices in ICDS in Gompa village

Fig 5.12 Administering vaccines to children in Rajupeta village

Out of a total of 66 children reported suffering from water borne diseases, 61 are dysentery cases, 9 malaria, and only 2 cases each of typhoid and diarrhoea and 1 case of jaundice. Out of 77 diseases-affected children (mostly related to water), 53 are reported suffering from fever and cold and 9 malaria cases (Tables 5.38 & 5.39).

Illnesses among children in Non-NGP villages

In Non-NGP villages, out of a total of 187 children, 95 children have been reported suffering from water borne diseases; of them, 77 children suffering from dysentery, three children from diarrhoea, six children from malaria, while 2 each from cold and cough, jaundice and loose motion.

Out of 79 children afflicted with other diseases which may be related to water, 46 are reported to have suffered from fever and cold and cough, 28 from only fever and only 5 children from other diseases not related to water such as brain problem, snake bite etc.

Source of treatment:

In NGP villages, out of 61 dysentery cases, 38 patients are reported to have received treatment from private clinics, 8 each from SCs and CHCs;. 7 malaria patients, from private clinics, and out of 53 fever with cold and cough affected patients, 42 from private clinics and 6 from CHCs.

In Non-NGP villages, a majority i.e., 58 dysentery- affected patients are reported to have taken treatment from private clinics; only 8 from PHCs and all the 3 diarrhoea affected patients from private clinics and out of 79, 35 fever and cold and cough affected and 24 fever affected patients from private clinics.

Treatment duration and expenditure:

In NGP villages, a majority of 53 dysentery patients are reported to have undergone treatment for less than 5 days, with an average expenditure of Rs 635.45, while in a few cases of malaria the length of treatment is reported to have lasted for more than 5 days, with an average treatment expenditure of Rs 3188.89. The treatment duration in the case of 44 cases (fever with cold) is reported to have lasted for less than 5 days with an average expenditure of Rs 473.58.

In respect of Non-NGP villages, the treatment days in the case of dysentery patients is reported to have lasted for less than 5 days with an average expenditure of Rs 435.7 while the average expenditure in respect of diarrhoea cases amounting to Rs. 1,166.67, and the average expenditure in the case of jaundice patients to as high as Rs. 7,000, while the average expenditure for amebiasis to around Rs 1000. The average number of episodes for amebiasis is 1.

In both NGP and Non-NGP areas, most of the children are reported to have been affected by dysentery followed by fever, cold and cough with children in both the cases taken to private clinics for treatment lasting for less than 5 days. It is clear from the results that there is clear advantage associated with water and sanitation programs in terms of reducing the incidences of water related diseases in NGP areas (tables 5.38 & 3.39).

Table 5.38: Number of children reported suffering from illeness in NGP villages

	Disease name	Affected	Average episodes	Treatment source					Treatment duration (days)				Average expenditure Rs
				SC	PHC	CHC	Private	SC & Private	< 5 Days	5 to 10	10 to 15	Above 15 Days	
Water borne	Typhoid	2	1	0	2	0	0	0	0	1	0	1	1500
	Diarrhoea	2	1	0	0	0	1	1	2	0	0	0	1050
	Dysentery	61	1.31	8	2	8	38	5	53	8	0	0	635.45
	Jaundice	1	2	0	0	0	1	0	1	0	0	0	1500
Worm	0	0	0	0	0	0	0	0	0	0	0	0	0
Mosquito bite	Malaria	9	1.22	0	1	0	7	1	4	2	0	3	3188.89
others (may be related)	fever	13	1.69	0	0	1	11	1	11	2	0	0	561.54
	Viral fever	1	2	0	0	0	1	0	1	0	0	0	1000
	Fever and loose motion	3	1.67	0	0	0	3	0	3	0	0	0	1000
	Fever and fits	4	2	0	0	0	4	0	2	1	0	1	1625
	Fever and cold and cough	53	1.45	0	3	6	42	2	44	7	2	0	473.58
	Fever and cold and cough and infection	1	1	0	0	0	0	1	1	0	0	0	1000
	Fever and knee pain and stomach pain	2	2	0	0	0	2	0	1	1	0	0	1750
	others	12											
	Total	**164**	**1.45**	**8**	**8**	**15**	**110**	**11**	**123**	**22**	**2**	**5**	**2085.67**

Table 5.39 : Number of children reported suffering from illeness in Non-NGP Villages

	Disease name	Affected	Average episodes	Treatment source					Treatment duration (days)				Average expenditure Rs
				SC	PHC	CHC	Private	SC & Private	< 5 Days	5 to 10	10 to 15	Above 15 Days	
Water borne	Cold and cough	2	1	2	0	0	0	0	2	0	0	0	1500
	Jaundice	2	1	0	0	0	2	0	0	0	0	2	7000
	Chikungunya	5	???	0	1	0	3	1	0	4	0	1	1000
	Typhoid	4	3.25	0	1	0	3	0	3	1	0	0	1175
	Dysentery	77	1.27	3	8	2	58	6	67	8	0	2	435.71
	Loose mMotions	2	4	0	0	0	2	0	1	1	0	0	1750
	Diarrhoea	3	1	0	0	0	3	0	2	0	1	0	1166.67
Worm	Amebiasis	1	1	0	0	0	1	0	0	0	0	1	1000
	Nulipurugulu	1	2	1	0	0	0	0	1	0	0	0	1000
	Malaria	6	2	0	1	0	5	0	1	4	0	1	733.33
Other (related)	fever	28	1.25	1	2	0	24	1	25	3	0	0	407.69
	Fever and Head ache	1	1	0	0	0	1	0	1	0	0	0	200
	Fever and cold and cough	46	1.43	2	3	3	35	3	26	19	0	1	773.86
	Fever and cold and cough and head ache	1	1	0	0	0	0	1	1	0	0	0	400
	Fever ,cold and cough , Knee pain and stomach pain and vomitings	1	1	0	0	0	1	0	0	1	0	0	600
	Fever and knee pain and stomach pain	2	3	0	0	0	2	0	1	1	0	0	850
	Others	5	1	0	0	0	1	0	0	0	0	1	20000
	Grand Total	**187**	**1.42**	**9**	**16**	**5**	**145**	**12**	**132**	**88**	**3**	**40**	**2425.29**

A profile of diseases among adults:

In NGP areas, 182 out of 652 adults reported being affected by some water borne diseases, 42 are stated to have suffered from other diseases which may be related to water, while the remaining 56 from other diseases such as TB, BP, eye problem, kidney problem etc., which are not at all related to water and sanitation. Out of 84 adults reported with water borne diseases in NGP villages, 47 come under dysentery, 16 under malaria, 10 under typhoid, one case under loose motion and digestion problem, 5 under diarrhoea, and 2 cases each under jaundice and amebiasis. Out of 42 adults reported suffering from other diseases which may be related to water, 25 come under fever.

In non-NGP areas, out of a total of 224 adults suffering from some kind of diseases, 104 have been reported afflicted with waterborne diseases, 34 with other diseases which may be related to water and 65 with other diseases such as cancer, heart problem, HIV, kidney, etc., which are not at all related to water and sanitation. Out of the 104 adults affected by waterborne diseases, 56 are reported having dysentery, 19 case of typhoid, while only one case each of loose motion and jaundice and three cases of diarrhea have been reported. Out of the 34 adults with other diseases which may be related to water, all have had fever-23 only fever and the remaining 11 having fever with other diseases like kidney problem (Table 5.41).

Source of treatment:

In NGP villages, out of 47 dysentery patients, 11 are reported to have approached SC for treatment and 26 private clinics; out of 16 malaria cases, 9 are reported to have received treatment from private clinics; out of 10 typhoid patients, 6 from private clinics; out of 25 cases of fever, 16 from private clinics.

In non-NGP areas, out of 56 dysentery-affected adults, 38 went to private clinic while 9 went to PHC, 5 to SC, 1 to CHC and 3 to both SC and private. Out of 19 adults down with typhoid, 12 are reported to have received treatment from private clinics, 5 from PHCs, and 2 from both PHCs and private clinics. (Tables 5.40&5.41).

Details of treatment duration and expenditure:

In NGP areas, the treatment of 44 dysentery cases is reported to have lasted for less than 5 days, while in only 3 cases of malaria for less than 5 days with an average expenditure of Rs. 328.38 and Rs.2900 respectively. The average expenditure incurred on typhoid amounts to Rs. 2800 and in most of the fever cases, the treatment is reported to have lasted for less than 5 days, with an average expenditure of Rs. 422.73.

In Non-NGP areas, the number of treatment days for dysentery cases is reported to have lasted for less than 5 days with an average expenditure of Rs 318.33. The average

Table 5. 40: Illness episodes encountered, treatment sought and expenditures incurred by households in NGP area

	Disease name	Affected	Average episodes	Treatment source					Treatment duration (days)				Average expenditure Rs
				SC	PHC	CHC	DH	Private	SC & Private	< 5 Days	5 to 10	Above 15 Days	
Water born	Typhoid	10	1.7	0	2	0	1	6	1	3	4	3	2800
	Dysentery	47	1.06	11	2	6	0	26	2	44	3	0	328.38
	Diarrhoea	5	1.4	0	0	0	0	4	1	5	0	0	1110
	Motions	1	3	0	0	0	0	1	0	1	0	0	2000
	Jaundice	2	2	0	0	0	0	2	0	0	0	2	7500
	Digestion problem	1	1	0	0	0	0	0	1	0	0	1	1500
Worm infections	Amebiasis	2	1	0	0	0	0	0	2	1	1	0	200
Mosquito bite	Malaria	16	1.56	0	4	0	0	9	3	3	10	3	2900
Others but related to water	Chikungunya	1	1	0	0	0	0	1	0	1	0	0	2000
	Fever and leg pain	2	2	0	0	0	0	1	1	0	1	1	11000
	Knee pain & Stomach Pain	8	1.5	0	0	0	0	3	5	2	1	5	18400
	Fever	25	1.44	3	4	1	0	16	1	21	4	0	422.73
	Viral fever	3	1.67	0	0	0	0	3	0	0	3	0	1166.67
	Fever and cold and cough	2	1	0	0	0	0	0	2	0	0	2	15750
	Fits	1	2	0	0	0	0	1	0	0	0	1	25000
	Others	56											
	Grand Total	**182**	**1.46**	**14**	**12**	**7**	**1**	**73**	**19**	**81**	**27**	**18**	**3553.24**

Table 5.41: Illness episodes encountered, treatment sought and expenditures incurred by households Non-NGP area

	Disease name	Affected	Average episodes	Treatment source						Treatment duration (days)				Average expenditure Rs
				SC	PHC	CHC	DH	Private	1&5	> 5	5-10	10-15	Above 15 days	
Water borne	Cold& cough	10	1.80	0	0	4	2	4	0	0	5	2	3	2320.00
	Typhoid	19	2.05	0	5	0	0	12	2	6	7	1	5	1805.26
	Motions	1	2	0	0	0	0	1	0	0	1	0	0	1000
	Dysentery	56	1.07	5	9	1	0	38	3	53	6	0	0	318.33
	Chikungunya	14	1.29	0	1	0	0	13	0	1	5	2	6	1984.62
	Diarrhoea	3	2	1	2	0	0	0	0	2	0	1	0	1025
	Jaundice	1	3	0	1	0	0	0	0	0	0	0	1	6000
Worm	Amebiasis	2	1	0	1	0	0	0	1	2	0	0	0	225
Mosquito bite	Malaria	19	1.63	0	2	1	0	13	3	6	6	4	3	1565.79
others - may	fever	23	1.22	1	6	0	0	14	2	17	6	0	0	481.58
be related	Fever and kidney problem	2	1	0	0	0	0	2	0	2	0	0	0	400
	Fever and knee pain and stomach pain	1	4	0	0	0	0	1	0	1	0	0	0	700
	Fever and knee pain and stomach pain& head ache	1	1	0	0	0	0	1	0	1	0	0	0	700
	Fever and leg pain	2	1.5	0	0	0	0	1	1	0	2	0	0	700
	Fever and cold & cough and													
	stomach pain & knee pain	2	1.5	0	0	0	0	2	0	1	1	0	0	325
	Fever and body pains	2	1.5	0	0	0	0	2	0	0	2	0	0	1250
	Fits	1	4	0	0	0	0	1	0	0	1	0	0	20000
	others	65												
	Grand Total	**224**	**1.49**	**7**	**27**	**6**	**2**	**105**	**12**	**92**	**42**	**10**	**18**	**3054.67**

expenditure incurred on typhoid patients amounts to Rs 1805.26. In the case of jaundice, the child experienced 3 episodes with the health expenditure being as high as Rs 6000. Out of 23 reported with fever, 14 are reported to have treatment from private clinics and 6 from PHCs. In most of the fever cases, the number of days for treatment has been reported less than 5 with the average expenditure being Rs 481.58. The treatment days for malaria patients have been reported lasting between 5-10 days.

In both NGP and non NGP areas, a maximum number of adults are reported to have suffered from dysentery followed by malaria and typhoid, with the treatment in all the cases lasting mostly for less than 5 days. Adults suffering from any kind of diseases in both NGP and Non-NGP areas, mostly visit private clinics. Compared to NGP areas, Non -NGP areas have reported more number of water related illnesses. It shows the positive impact of water and sanitation programmes on the health of individuals.

In this section, we have discussed illness episodes encountered, treatment sought and expenditure incurred by the households in NGP and Non-NGP areas as follows.

A Summary of Discussions based on FGDs in both NGP and Non-NGP villages in Andhra Pradesh

▲ **Main source of water supply**

- In all NGP villages, the main source of water supply is tap water supplied by the panchayat concerned. All the households have access to water supply in the villages.
- In four Non-NGP villages (Turlapudi, Gotivad Agraharam, Gompa, and Ramachandrapalem), tap water is the main source of water. In Kothali and Damunapalle villages, the main source of water supply is from panchayat water taps.

▲ **Adequacy of water**

- In all the NGP villages there is a sufficient water supply. Only during summer, water supply gets disrupted due to an erratic power supply.
- In all non-NGP villages, water supply is sufficient during all seasons. However, during summer, villagers face water problem due to frequent power cuts. During rainy season, water turns to red colour.

▲ **Quality of water:**

- In all NGP villages water is clean and good and once in a month, water tanks are cleaned with bleaching powder.
- In all non-NGP villages, water tanks are cleaned with bleaching powder.

▲ **Water Costs**

- In Rayapurajupeta, L.Singavaram, Lakkavaram, Kavagunta and Rajupeta NGP villages, people do not pay for water consumption/supply, while in V J Puram village, people pay a nominal amount for water used.
- In all non-NGP villages, people do not pay money for water supply.

▲ **Health Problems**

- In Rayapurajupeta NGP village, most of the people suffer from fever during rainy season and in L.Singavaram village, they suffer from fever and cough. In V.J.Puram village, people tend to get fever, cold and cough.
- In Damunapalle, people suffered from diarrhea, fever and other diseases. In Gotivad Agraharam village, a majority of people suffer from fever. In Gompa village, people have reported malaria, typhoid, stomach pain, motions and 'nulipurugulu'(worms).

▲ **Sanitation**

- In kavagunta and Rayapurajupeta NGP villages, some houses have toilet facility. In Lakkavaram (80%) and in Rajupeta (95%) villages, a maximum number of households haves access to toilet facility. In V.J.Puram village, half of the houses have toilet facility, whereas in L.Singavaram village, only 20 houses have toilet facility.
- In Turlapudi, Damunapalle and Gotivad Agraharam Non-NGP villages, most of the households do not have access to toilet facility, while in Gompa village, 100 houses have toilets. In Kothali and Ramachandrapalem villages, 20%- 30% of the houses have toilet facility.

▲ **Open defecation**

- In Rayapurajupeta, L Singavaram, V J Puram and Lakavaram villages, 30-50 percent of the people, in kavagunta village, 95 % of the people, and in Rajupeta village (all NGP villages), 5% of the people practise open defecation. People tend to face problems using toilets in Rayapurajupeta village, as tanks over flow during rainy season, while in Kavagunta village, there are problems in using toilets during summer season due to an inadequate water supply.
- In all the non-NGP villages, 80% to 95 % of the people practice open defecation. Those having toilets in villages like Turalapudi and Gompa, face problems in using toilets due to an inadequate water supply in the villages during summer. In Gompa village, as they do not have toilets within households, people face problems during rainy season. They also face problems at night, as they need walk long distances.

▲ **Problems due to open defecation**

- In L.Singavaram NGP village, according to people fever, diarrhea and communicable diseases are common; Malaria, dengue, cholera, chikungunya are common among children aged 0-5 years in V.J Puram village; in Lakkavaram village, children tend to face health problems like vomiting, cholera, diarrhea and typhoid, mainly because of the prevalence of open defecation; In Kavagunta village, children are prone to face cold, cough, fever, malaria, dengue, typhoid, and itching; in Rajupeta village, according to people, children are suffering from communicable diseases, respiratory problems, vomiting and diarrhea.
- In Turlapudi and Ramachandrapalem Non-NGP villages, children suffer from cold, cough, fever, malaria, dengue, typhoid and itching; in Gompa village, children suffer from fever, skin infections etc; In kothali village, health problems faced by children include cholera, communicable diseases, itching and rashes.

▲ **Functioning of Committees -Village Water and Sanitation Committee(VWSC)**

- In Rayapurajupeta and Rajupeta NGP villages, people are not aware of Village Water and Sanitation Committee (VWSC). The committees in L.Singavaram and V.J.Puram villages supervise activities like cleaning of water tanks and garbage disposal. The VWSC in Lakkavaram village takes up works like mixing bleaching powder with water, maintaining taps and cleaning streets. In Kavagunta village, pouring of bleaching powder on the sides of streets and water tanks is taken up on a regular basis.
- In Turlapudi, Gotivad Agraharam, and Ramachandrapalem Non-NGP villages, people are not aware of these committees. In Turlapudi village, committees have taken up works like pouring bleaching powder on the sides of streets and water tank cleaning. The committee in Gotivad Agraharam village has taken up works like cleaning of water tanks with bleaching powder and repairing of water taps; streets are cleaned on time and regular spraying of bleaching powder in the village is done.

▲ **Village Health and Sanitation Committee(VHSC)**

- In all NGP villages, VHSC are working. In L.Singavaram village, the committee creates awareness among people regarding health issues. In Rajupeta village, the VHSC creates awareness regarding diseases besides educating people about personal hygiene. In L.Singavaram village, ASHA worker educates people regarding personal hygiene and measures to be taken to prevent diseases. In V.J.Puram village, ASHA advises every individual household to have toilet facility at home. In Lakkavaram village, ASHA worker creates awareness among people regarding hygiene and measures to be taken to prevent diseases. In Kavagunta village, ASHA worker creates awareness regarding personal hygiene and measures to be taken to prevent diseases.

- In all non-NGP villages, the health committees are functioning. In Gotivad Agraharam and Gompa villages, VHSCs are very useful in creating awareness among people regarding personal hygiene.

▲ **Suggestions to improve the performance of VWSC and VHSC**

- In Rayapurajupeta NGP village, the committees have to be formed. In V.J.Puram village, roads should be cleaned. Everyone in the village should use toilets. In Lakkavaram and Kavagunta villages, training needs to be given to the committee members. In Rajupta village, spraying of bleaching powder should be taken up besides creating awareness among people regarding hygiene.
- In Turlapudi, Gotivad Agraharam and Kothali Non-NGP villages, training and regular meetings should be conducted and the committees should educate people about hygiene conditions. In Damunapalle village, committees should keep the village clean besides conducting awareness camps.

5.5 Summary

As discussed in the introduction chapter, good health outcomes depend on various interventions. When the health programmes are formulated and implemented effectively, morbidity levels in the villages may come down and diarrhoea episodes may get reduced and there may be better nutrition absorption among children etc. Social determinants considered in this study, included the availability of adequate quantity and quality water, and sanitation facilities (in this case, lavatories and their proper use by households), allied household level hygiene practices conducive to promoting health, personal hygiene such as defecation habits. This kind of enabling environment is made possible indirectly through a catalytic process involving interactions among various institutions, processes and different programmes at the local level. The study is basically explanatory and analytical in nature.

Here an attempt is made to analyse and understand health conditions of individuals and households as these are linked to access to water and sanitation facilities as well as their health and hygiene awareness, practices at the individual and household levels.

Water: In Andhra Pradesh, 6 NGP and 6 Non-NGP villages were selected for the study. From these 12 villages, data was collected from 244 households. In this study, an attempt is made to see better health conditions due to the implementation of water and sanitation programmes. A comparison of NGP and Non NGP villages indicates that pure water availability is more in NGP villages. The availability of an adequate quantity of water to the people is also one of the parameters to understand the determinants of health and hygiene conditions of the sample households. At the aggregate level, a majority of the persons live in pucca houses followed by semi-pucca houses (10.2%). In NGP and Non-

NGP also, the proportions remain nearly the same. Tap water is the main source of water in both NGP and Non-NGP villages. As regards using the occasional source of water, out of 244 respondents, a majority of the respondents use water for domestic purposes only.

In NGP villages, out of six schools, two schools get drinking water from taps, and one each from tanks, cans and public taps. Out of eight schools in Non-NGP villages, three schools get drinking water from taps and another 3 from tanks.

At the aggregate level, a majority of the respondents have reported that the quantity of water is fully sufficient. In respect of NGP villages, the 'fully sufficient' response is higher (88.4%) than in Non-NGP villages (82.1%). At the aggregate level, most of the respondents have reported that water supply has been sufficient during the past one year. However, in NGP villages, such a positive response is a little higher (86.8%) as compared to Non-NGP villages (82.9%). In the sample areas of Andhra Pradesh, a majority of the households use earthen pots besides plastic/steel vessels for water storage. In summer, water problem arises mainly due to an erratic power supply.

At the aggregate level, out of 244 respondents, 98% take water from containers with glass tumblers/utensils using hand. The respondents who 'sometimes' treat drinking water are slightly more in number in Non-NGP (46.3%) relative to NGP villages (43.8%). Out of 125 respondents who take measures to make water safer for drinking, 91.2% boil water, followed by 7.2% who strain water using a cloth. In NGP villages the percentage of respondents boiling water is higher (93.4%) as compared to those in Non-NGP villages (89.1%). In NGP villages, the percentage of respondents giving boiled water to their children is a little higher (89.2%) than those in Non-NGP villages (86.7%). In both NGP and Non-NGP areas, almost all the respondents cover cooked food with a plate.

Sanitation: In NGP areas, two-thirds of the respondents use septic latrines and one-third of the residents practise open defecation. In Non-NGP areas, half of the respondent's practise open defecation, while nearly another half of them uses septic latrines. In both NGP and Non-NGP villages, respondents use toilets for maintaining better health. The percentage of respondents washing hands (after defecation) with soap is slightly higher in respect of NGP villages (37.2%) as compared to Non-NGP villages (30.9%). Washing hands with only plain water is more visible in Non-NGP villages (60.2%) as compared NGP villages (54.5%).

As regards the availability of latrine facilities in schools, all the six schools in NGP have septic latrines, whereas only seven out of eight schools in Non-NGP villages have septic

latrines. All the six schools in NGP villages have separate toilets for boys, girls and teachers, whereas in Non-NGP villages, in five out of eight schools there is such a facility.

Fig 5.13 Proverbs written on walls about the importance of toilet use in Hazipalli

Fig 5.14 Every household has toilet facility in Hazipalli (NGP) in AP state:

For cleaning toilets in schools, in NGP villages, a majority of the schools (four out of six), hire cleaners and sweepers. In Non-NGP villages, half of the schools (four out of eight schools), hire sweepers and cleaners for cleaning toilets. In NGP, in a majority of schools toilets are cleaned fortnightly (four out of six schools), while in Non-NGP villages, in three out of eight schools toilets are cleaned fortnightly and followed by daily in one school and weekly in one school.

Water supply in schools: Water supply is sufficient in five out of six schools in NGP, while it is so only in half of the villages (four out of eight schools) in Non-NGP villages.

Sanitation in schools: About the type of toilets facilities used (from among the respondents reporting the availability of toilet facility) for their children, at the aggregate level, a majority of them (97.9%) have reported the use of toilets within the household premises. In respect of both NGP and Non-NGP villages the situation is more or less similar in this respect.

About disposing of children's stools, a majority of the respondents throw in the street (73.8%), followed by 'thrown in latrine' (19.3%) and 'left there' (7.0%). In NGP villages, the percentage of the respondents throwing stools in the latrine is higher (24.0%) as compared to those in Non-NGP villages (14.6%). A majority of the respondents in both the areas have reported that their children get the help of parents in using toilets. As regards washing hands, nearly two-thirds of the respondents have stated that children wash their hands both before and after taking food (64% in Non-NGP and 62.8% in NGP villages). According to more than half of the respondents (53.7% in NGP and 46.3% in Non-NGP), their children wash their hands using soap. With regard to seeking treatment for dehydration among children, 36.1% of the respondents visit a doctor and another 32.4% of them administer ORS. In NGP villages, relatively more number of respondents takes bath daily (96.7% in NGP and 92.7% in Non-NGP). A majority of the respondents (86.5%) in both the areas give bath to their children twice a day.

Institutions: Here an attempt is made to understand the role of institutions like VWSC, VHSC, SHGs, CBOs etc. and the processes adopted for achieving Open Defecation Free (ODF) villages and the provision of clean drinking water to all. An attempt is also made to understand the role of institutions and processes that tend to hinder the achieving of ODF status of villages and supply of drinking water.

In both the types of villages, there are VWSCs. As regards the frequency of meetings, in 4 NGP villages, quarterly meetings are held in 2 villages and monthly/half yearly meetings are held in other 2 villages. In all, 4 villages in NGP, maintain records of the meetings

and only one village in Non-NGP keeps records of those meetings. As regards the frequency of VHSC meetings, mostly monthly meetings are held in both NGP and Non-NGP areas. Records of such meetings are maintained in all the villages of NGP and Non-NGP areas.

Illnesses among adults: In both NGP and non NGP areas, a maximum number of adults have been reported suffering from dysentery followed by malaria and typhoid. In all the cases, treatment days are mostly less than 5. Adults suffering from any kind of diseases in both NGP and Non-NGP areas, mostly visit private clinics for treatment. Compared to NGP areas, Non-NGP areas have reported more number of water related illnesses. It shows the positive impact of water and sanitation programmes and working of village level institutions like VWSC and VHSC on the health of individuals.

Illnesses among children: In both NGP and Non-NGP areas, most of the children have been reported down with dysentery followed by malaria. In both the cases, children are reported to have been taken to private clinics for treatment, lasting for less than 5 days. As in the case of health of adults, it is clear from the results that there is a clear advantage of water and sanitation program in terms of reducing the incidences of water related diseases in NGP areas.

Chapter - VI

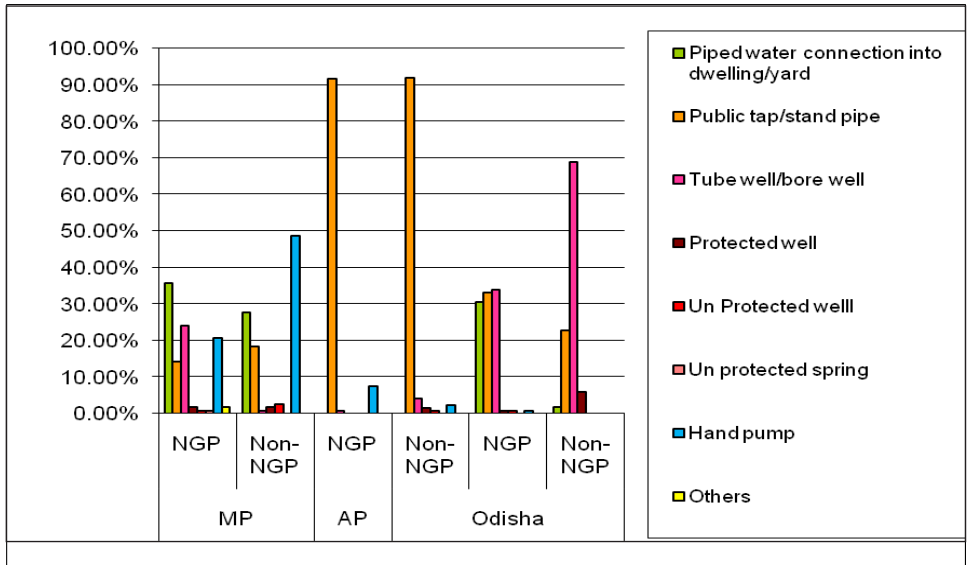
6. A Comparison of Findings Across the States of MP, AP and Odisha

As discussed in the introduction chapter, good health outcomes, in a broad sense, depend on different interventions - direct health interventions and other institutional interventions like VWSC, VHSC, SHGs and other CBOs at different levels. When the health programmes are formulated and implemented effectively, morbidity levels in the villages may come down and may reduce episodes of diarrhoea and other related diseases and may lead to better nutrition absorption among children etc. Further, the health outcomes largely depend on how the interactions take place among various institutions, such as VWSC, VHSC, SHGs and other CBOs, the processes and different programmes. Having analyzed the State- wise (MP, AP and Odisha) situation in the previous chapters, the present chapter attempts to draw a comparative perspective of all the three states, especially with respect to water and sanitation facilities influencing the health outcomes in the three states. The essential focus in this chapter will be on access issues regarding water and sanitation and its utilization pattern as well as the reasons for non-utilization; the presence and absence of the local level water and sanitation committees, the processes adopted for their working and their implications for the health outcomes of communities.

6.1 Main sources of water across the three states

Regarding the main sources of water, comparatively both NGP and Non-NGP villages in AP and NGP villages in Odisha have a better access to safe drinking water. The sources of water, to a large extent, decide to what extent people have a ready access to safe and potable drinking water. Across the three states studied, in Madhya Pradesh, in a majority of the villages coming under both NGP and Non-NGP villages, the main source of water is hand pumps, whereas in Odisha, a majority of the villages have piped water connection to the public taps and tap connection to houses in NGP villages. In Non-NGP areas, the main source of water is tube well/bore hole. In AP, in a majority of the villages, tap water is the main source of water in both NGP and Non-NGP villages. On the whole, it shows that in AP (both NGP & Non NGP) and NGP villages in Odisha, access to safe drinking water is better relative to villages in Madhya Pradesh (Figure 6. 1).

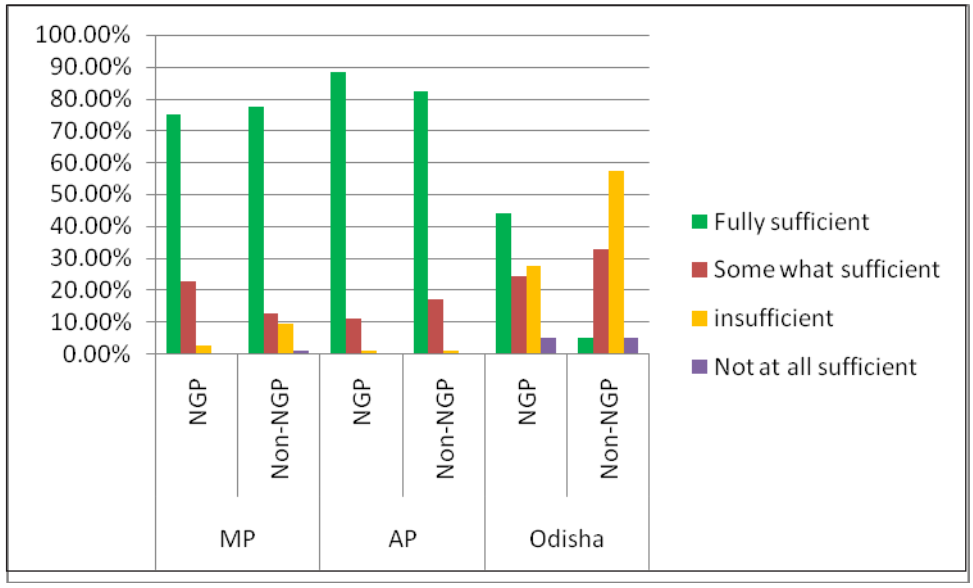
Figure 6.1: Main sources of water in three states



6.2 Quantity of water supply

The quantity of water supply is sufficient for many households in both NGP and Non-NGP villages of MP and AP, whereas its availability is a problem in Non-NGP villages of Odisha.

Figure 6.2: Perceptions of the respondents regarding the quantity of water available across the three states



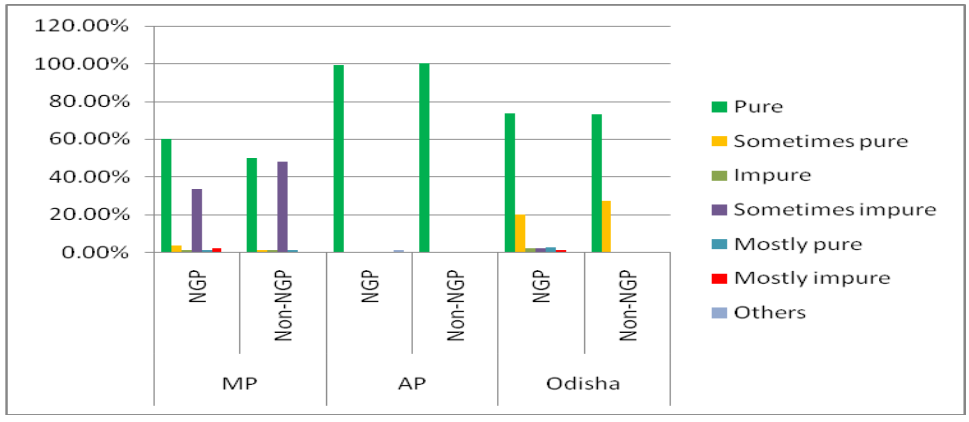
The availability of water is sufficient in both NGP (75.0%) and Non-NGP areas (77.3%) in MP. In Odisha state, a majority of the respondents in NGP villages (43.8%) have reported that the quantity of water is fully sufficient, whereas in Non-NGP villages, it is only 5.0%. A large numbers of respondents in NGP villages have access to an adequate water as compared to those in Non-NGP villages. Only 24.6% in NGP and 32.80% of the respondents in Non-NGP areas have stated that water supply is somewhat sufficient.

In Andhra Pradesh, a majority of the respondents (85.2%) have reported that the quantity of water is fully sufficient. In respect of NGP villages, the 'fully sufficient' response is higher (88.4%) than in Non-NGP (82.1%) areas. At the aggregate level, most of the respondents have reported that water supply has been sufficient during the past one year. However, in NGP villages, this response is a little higher (86.8%) relative to Non-NGP villages (82.9%) (Figure 6.2).

6.3 Quality of water

As far as quality of water[7] is concerned, a majority of the households in AP (both NGP and Non-NGP villages) have reported that water is pure as compared to those in Odisha (both NGP and Non-NGP villages),whereas in MP, households have reported problems regarding the quality of water. Besides the quantity of water available, the quality of water is also an important issue, considering that consuming impure water can causes a series of health problems. There are a number of water quality issues in MP like 'hard' water and water being yellowish in colour, while in Odisha three fourths of the respondents in both NGP and Non-NGP have stated that water is pure. Some respondents (2.08%) have reported that water is impure, especially during the rainy season. In AP, almost all the respondents in both NGP and Non-NGP areas have reported that water is pure (Figure 6. 3).

Figure 6.3: Quality of water across the three states

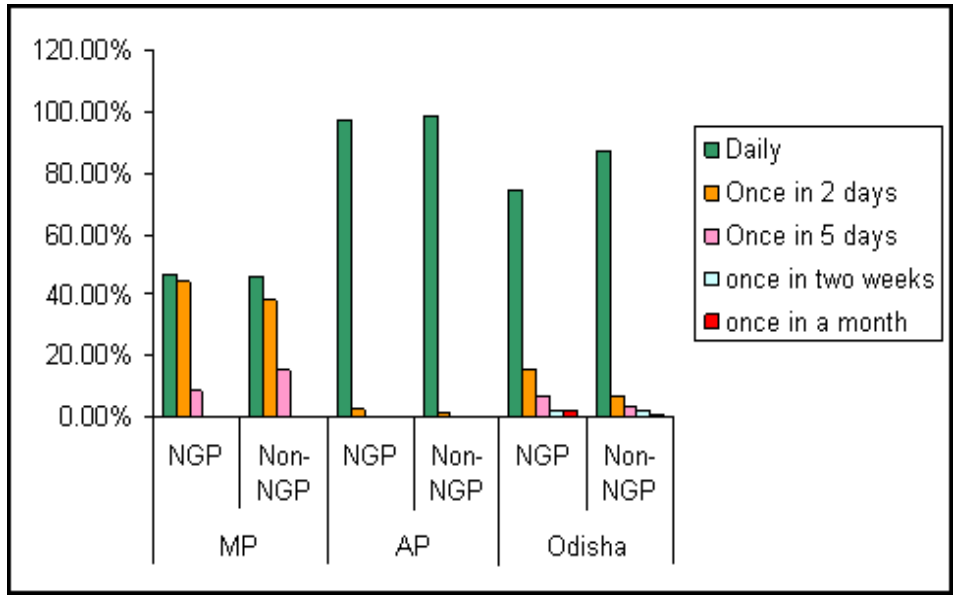


[7] Purely based on physical appearance and the perception of respondents.

6.4 Water related hygiene practices

Compared to Odisha and MP, almost all the households in AP have reported cleaning of water containers daily. Keeping drinking water containers clean is quite important as using unclean containers for storing water can cause a number of diseases among people. An analysis across the three states reveals that, in MP, 45.4% of the respondents in Non-NGP villages clean drinking water containers daily. In NGP villages, 45.8% of the respondent's clean containers daily, whereas in Odisha, those who clean containers every day, are more in number in Non-NGP villages (87.4%), as compared to NGP villages (74.4%). In AP, a majority of respondents clean water containers daily. In Non-NGP villages, 98.4% of the respondents clean water containers daily as against 97.5% of the respondents in NGP villages (Figure 6. 4).

Figure 6.4: Frequency of cleaning water containers:



6.5 Practices of Hygiene maintenance

Hygiene maintenance practices relating to drinking water are relatively better in NGP areas of MP. For example, the respondents who use glass tumblers attached with long handles (to draw water from drinking water container) to avoid contamination are more in number in NGP areas.

In Odisha state, a little over one-fifth in NGP areas and less than 10 percent of the respondents use glass tumblers attached with long handles and taps attached to containers for consuming water respectively.

In AP, at the aggregate level, out of 244 respondents, 98% take water from containers with glass tumblers /utensils, using hand. It is to be noted that in AP - both in rural and urban areas -the common practice is using glass tumblers /utensils with hand instead of glass tumblers attached with long handles.

6.6 Treating of drinking water

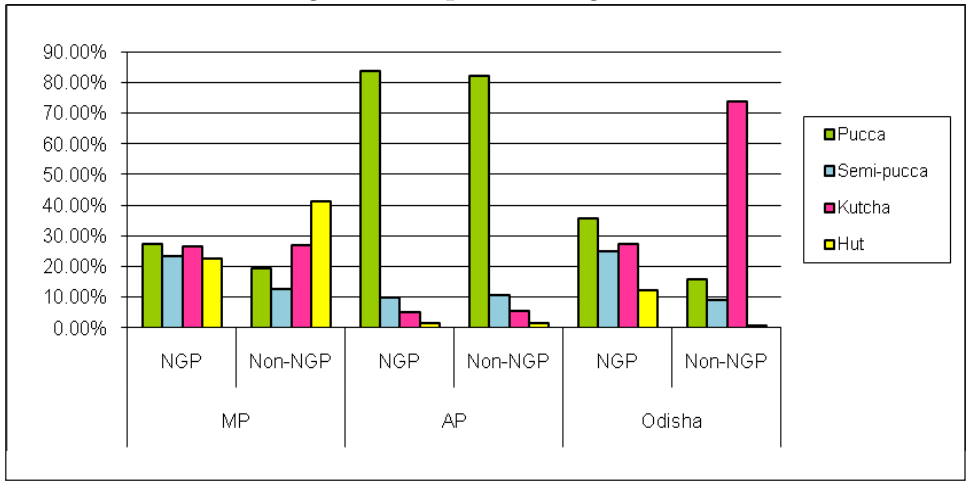
Regarding treating water before drinking, a large number of households in both NGP and Non-NGP villages of AP and MP treat drinking water as compared to households in Odisha. In MP, a majority (92) of the respondents in NGP areas always treat water before drinking. In Non-NGP villages, 82 respondents have told that they always treat water before drinking. In Odisha, nearly three forth of them have replied that they boil water, while a little over one fifth of them strain water using a cloth.

In AP state, the percentage of respondents who 'sometimes' treat drinking water is a little higher in Non-NGP villages (46.3%) than those in NGP villages (43.8%). Out of 125 respondents, who take measures to make water safer before drinking, 91.2% boil water followed by 7.2% of the respondents who strain water, using a cloth. In NGP villages, 'boil water' response is higher (93.4%) as compared to Non-NGP villages (89.1%).

6.7 Type of housing facility

Regarding housing, a majority of the households in AP (both NGP and Non- NGP villages) live in pucca houses relative to their counterparts in the other two states (MP and Odisha), whereas, most of the respondents in both the areas of MP live in huts or kutcha houses. It is generally perceived that people living in semi-pucca or pucca houses are relatively better off and that they can afford better sanitation facilities.

Figure 6.5: Type of housing facility



In Odisha state, many respondents reside in kutcha houses and huts, while most of the respondents belonging to Non-NGP villages, and live mostly in kutcha houses and huts, indicating their poor economic conditions. In AP, a majority of the persons have pucca houses. In NGP and Non-NGP villages also, the proportions remain nearly the same (Figure 6.7).

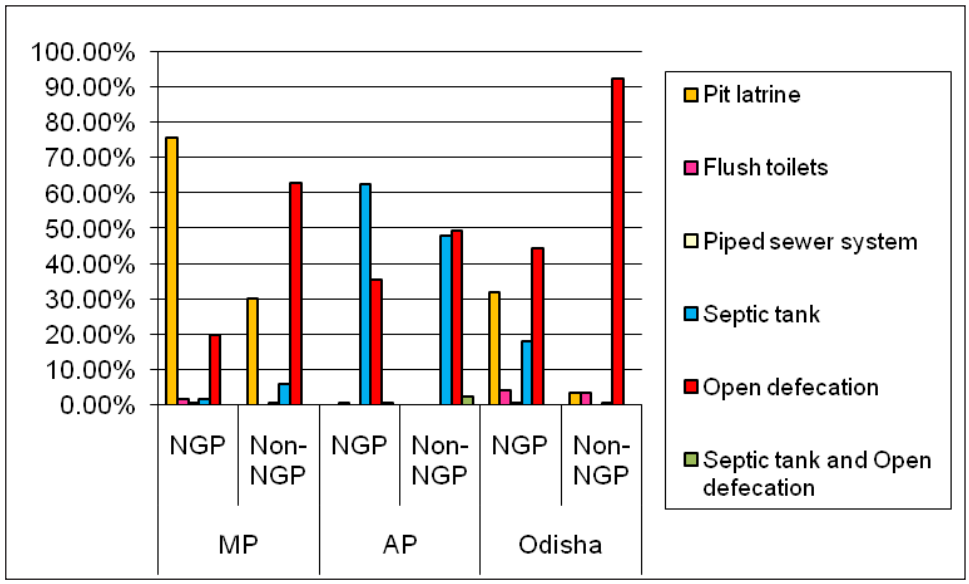
6.8 Sanitation facility

Having toilet facilities within the household premises, go a long way in maintaining a proper health of the household members. Overall, the availability of toilet facility is better in- AP and MP states, when compared to Odisha state. The state-wise breakup of data regarding the availability of toilets facility and its usage is given as follows.

In MP, out of 239, 140 households in both NGP and Non-NGP areas (96 from NGP and 44 from Non-NGP) reported having in-house toilets. Whereas in Odisha, both in NGP and Non-NGP villages, out of 240 households, 164 (68.3%) households practise open defecation and 76 (31.7%) have access to toilet facility.

In NGP areas of AP, two-thirds of the households use septic latrines and one-third practise open defecation. In Non-NGP areas, half of the respondents practise open defecation and nearly another half of them use septic latrines. More than half (57.4%) of the respondents have access to in- house toilet facility, while the rest of them (42.6%) use open spaces for open defecation (Figure 6. 6).

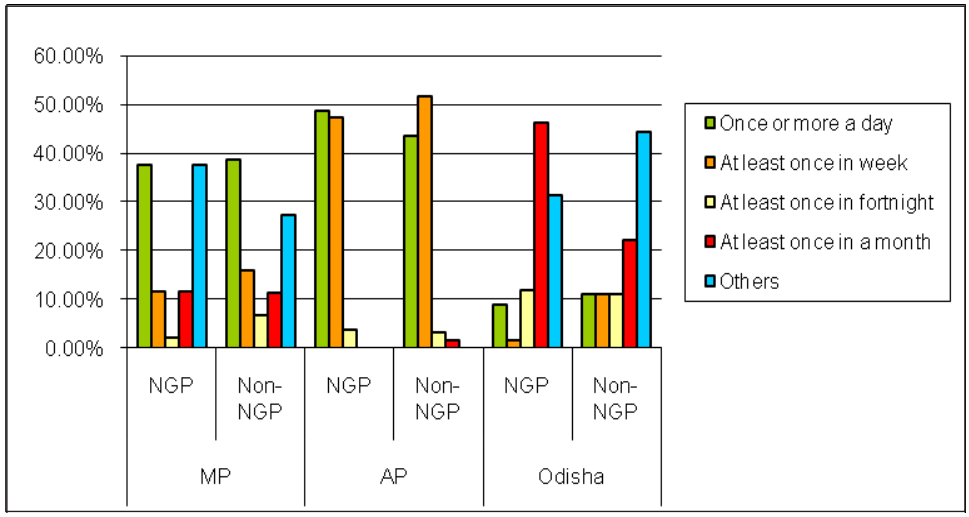
Figure6.6: Sanitation facility



6.9 Frequency of cleaning toilets

Regarding cleaning of toilets, a majority of the households (with toilets) in AP and MP, clean their toilets regularly as compared to their counterparts in Odisha. Improper maintenance of toilets can lead to a number of diseases besides an unhealthy environment. In MP, only 37.9% of the respondents clean toilets daily. In Odisha, nearly half of the respondent's clean toilets once in a month and only 9.2% of the people clean toilets daily. In AP, all most half of respondents clean toilets at least once in a week, and 46.4% daily (Figure 6.7).

Fig 6.7: Frequency of cleaning toilets



6.10 Constraints related to the use of in-house toilet facility

There are various problems reported regarding the use of toilets within the premises of households. Regarding problems in the use of toilets, more number of respondents have reported problems in MP as compared to Odisha and AP. In MP, the respondents have reported a number of problems like flies and mosquitoes, foul smell, filled up pits etc. Hence, merely having a ready access to toilet facility does not explain the wellness of sanitation facilities. In Odisha, those having in-house toilet facility have reported problems like foul smell, super structure not ensuring privacy, filled up pits (particularly during rainy season in NGP villages), mosquitoes etc., whereas in AP, the problems cited are inadequate water supply, super structure not ensuring privacy, unstable slabs etc.

6.11 Practices related to the disposal of children's excreta

Overall, as far as children's excreta disposal practices are concerned, it can be stated that un-hygienic practices are observed more or less in all the three states, with no thought given to the public health consequences. This can be attributed either to the lack of

awareness or sheer indifferent attitude on the part of households which needs to be confirmed with a further investigation. A further data break up on this aspect is given as follows.

In MP, regarding the disposal of children's excreta after open defecation, most of the respondents (61.9%) in both NGP and Non-NGP areas have mentioned that they throw it in the street. Similarly, in NGP areas, 59.2% of the respondents and most of the respondents (64.7%) in Non-NGP villages throw it in the street. In Odisha state, two thirds of the respondents throw children's waste in the street.

While in AP, a majority of the respondents throw children's excreta in the street (73.8%), followed by 'throw in the latrine' (19.3%) and 'left there where it is' (7.0%). In NGP areas, the percentage of respondents throwing children's waste in the latrine is higher (24.0%) as compared to Non-NGP (14.6%) areas.

6.12 Personal hygiene practices

With regard to personal hygiene practices like hand wash facility near toilets; the situation is better in AP and MP when compared to Odisha. A majority of respondents have hand wash facility near toilets at home in MP. Further, some of them use soap/ash for washing their hands after defecation. In Odisha state, three fourths of the respondents do not have any facility to wash their hands near toilets and as such do not wash hands. This situation is prevalent more in Non-NGP villages than in NGP villages. In AP, at the overall level, 98.6% of the respondents have come out with positive responses. However, most of them belong to NGP villages. The respondents having hand wash facilities near toilets are a little higher in NGP villages (98.7%) than those in Non-NGP villages (98.4%).

6.13 Functioning of the local level Institutions

Efficient functioning of the intermediary institutions like VWSC and VHSC is critical to a proper availability and utilization of water and sanitation facilities among communities and there by improved health conditions of the household members. In AP, although not many respondents are aware of these committees, in some villages, these committees are working through their periodic meetings. In Odisha, one-third of the respondents are not aware of the committees and their functioning in both NGP and Non-NGP areas. In MP, most of them are not aware of the existence of these committees and their functioning.

In MP, Village Water and Sanitation Committees do not hold meetings regularly, especially in Non-NGP villages, as compared to NGP villages. Many times, minutes of the meetings are not recorded and the issues related to water supply are discussed orally (as revealed during interviews), especially in Non-NGP villages. Similarly, many of the villagers are

not aware of the existence of Village Health and Sanitation Committee (VHSC)/ and its functioning at the village level.

In Odisha state, two thirds of the villages have these committees formed and in one third of the villages, respondents are not aware of such committees. Although VWSCs have been constituted in some villages, their functioning is very discouraging as the members are not aware of their duties and powers. This is true in respect of both the NGP and Non-NGP villages.

In AP, in both the areas (NGP and Non-NGP), only 9.0% of the respondents are aware of VWSC. In NGP about 15%, and in non NGP villages, 3.3% of the respondents are aware of this committee. As regards the frequency of VHSC meetings, mostly monthly meetings are held in both NGP (66.7%) and Non-NGP (83.3%) villages. Maintenance of records of VHSC meetings is done in all the villages of NGP and Non-NGP. In NGP villages, the records are maintained mostly by the village sarpanch and other committee members (both together in four villages). But in Non-NGP villages, other committee members maintain records in all the villages. VHSCs brings the health issues mentioned in the report to the notice of the relevant health functionaries in five villages in NGP (83.3%) and all the villages in Non-NGP (100%).

Conditions of water and sanitation in schools: a comparative status across the three states.

In AP, the source of water in most of the schools in Non-NGP villages is tap and tank, whereas in NGP villages, schools depend on different sources like tap, tank, public tap, can water and other sources. In MP, the source of water in schools across both the NGP and Non-NGP villages is hand pump. In Odisha, bore well is the important source of water in all the schools across both the NGP and Non-NGP areas.

In AP, most of the schools have septic tank type latrines in both the NGP and Non-NGP areas. Similarly, all the schools in Non-NGP villages in MP and also most of the schools in NGP villages have pit latrine. Besides, here piped and septic tank type latrines are also reported. In Odisha, most of the schools in both NGP and Non-NGP villages have septic tank type latrines, whereas, a few schools have pit latrines and piped sewerage system.

6.14 Morbidity among children

With the help of a child schedule, the illness data (during the last 12 months) regarding children was collected from the sample households. In AP, more than 77 of the children are reported to have suffered from one or other ailment, while in Non-NGP villages, slightly more number of children 79 are reported to have suffered from illnesses. In MP also, more than half of the children from the surveyed households are reported to have

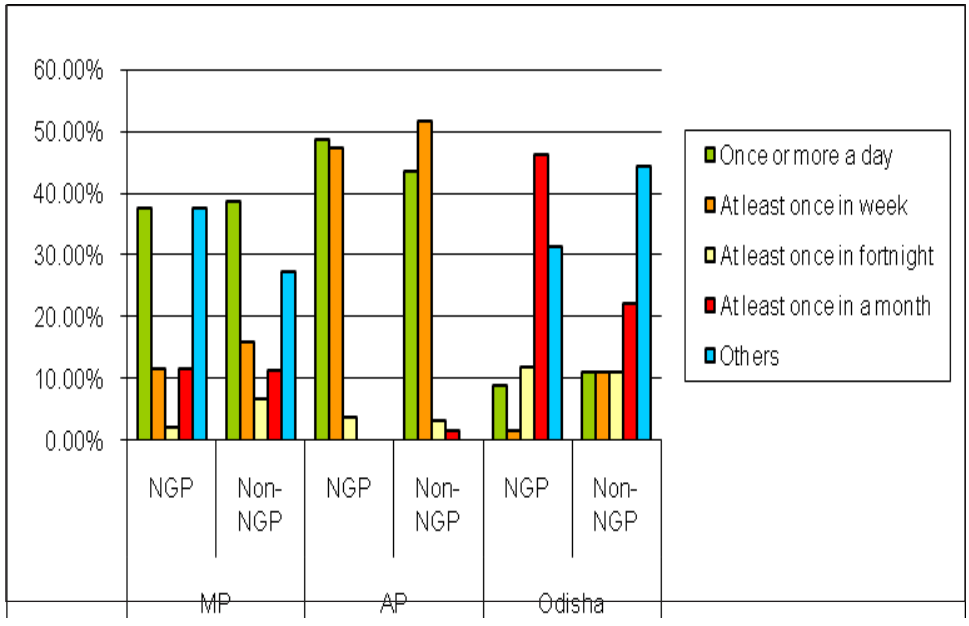
been afflicted with ailments, while slightly more number of children (53.5%) in NGP villages are reported to have been afflicted with ailments. In Odisha, a comparatively less number of children (more than one-fourth) are reported to have suffered from health ailments. As observed in respect of MP and in Odisha also, NGP villages have reported with more number of children with health ailments (37%).

In MP, a relatively more number (139) of children suffering from ailments in NGP areas have been reported as compared to Non-NGP areas (131), although the difference is only marginal. In both the areas, a majority of the suffering children are reported to have been taken to private medical practitioners / private hospitals for treatment. In Non-NGP areas, 25 diarrheal cases as against 29 in NGP areas have been reported. In both the areas, all the child patients are reported to have got treatment from private hospitals. In Non-NGP areas, 5 malaria child patients, and in NGP areas only 2 malaria patients have been reported. In Non-NGP areas, 33 children are reported to have suffered from cough, cold and fever as against 30 children in NGP areas. In NGP areas, only 2 cases of dysentery, while only one case of dysentery in Non-NGP areas have been reported.

In Odisha, in NGP villages, 74 children are reported to have fallen ill from various water related problems. Among 74 children, 34 are reported to have suffered from various illnesses under the category of waterborne diseases including 13 diarrhoea cases. In Non-NGP villages not a single case of diarrhoea, while 7 cases of dysentery in NGP villages and only 4 cases of dysentery in Non-NGP villages, have been reported. Only 1 case of malaria in NGP villages and in Non-NGP villages not a single case have been reported. In Non-NGP areas, 9 children and 13 children in NGP areas are reported to have suffered from cough, cold and fever (multiple health problems).

In AP, in NGP areas, out of 164 children, 75 are reported to have been affected by water borne diseases, 77 by other diseases which may/ may not be related to water and another 12 by other diseases not related to water at all. Out of a total of 75 cases reported suffering from waterborne diseases, 61 come under dysentery, of which 38 are reported to have taken treatment from private clinics. In Non-NGP areas, 95 children out of a total of 187 are reported to have suffered from waterborne diseases, 77 children from dysentery and a majority (58) of them are reported to have approached private clinics for treatment. Three cases of diarrhoea in Non-NGP areas and 2 cases in NGP areas of which all the patients are reported to have taken treatment from private clinics. In Non-NGP areas, six children and 9 children in NGP areas are reported to have suffered from malaria. In Non-NGP areas and NGP areas, 46 and 53 children respectively are reported to have suffered from cough, cold and fever (multiple health problems). A majority of them went to private clinics for treatment (Figure 6. 8).

Figure 6.8: Health problems among children



6.15 Morbidity among adults

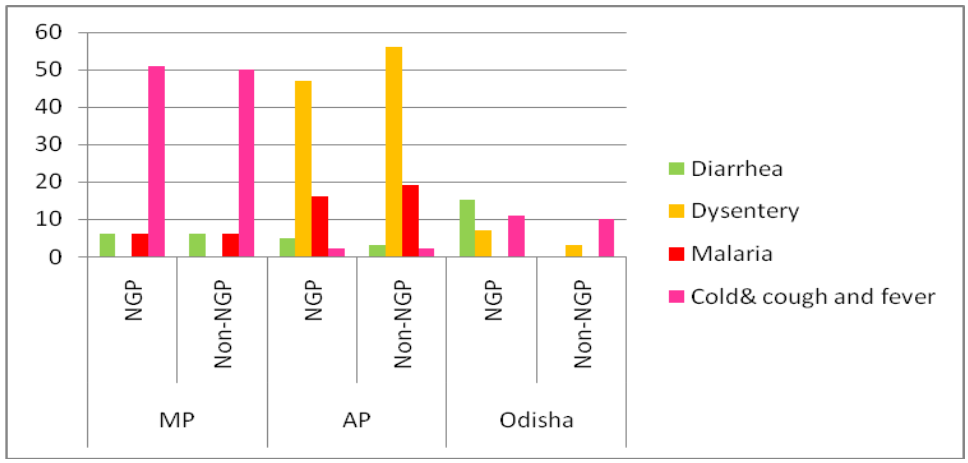
With the help of a household schedule, the illness data (during last 12 months) regarding adults was collected from the sample households. In AP, around half of the surveyed adults have reported health problems. In Non-NGP villages, a slightly more number of adults (51.4%) have reported these problems. In MP, only one-fourth of the surveyed adults have reported health ailments. Proportions of persons with ailments are more or less the same in both NGP and Non-NGP areas. In Odisha, comparatively, a less number of adults (around one-fifth) have reported health problems and comparatively NGP villages have reported more number of disease affected persons (22.5%).

Regarding health problems among adults in MP, 6 cases in NGP areas and 6 cases diarrhoea in Non-NGP areas have been reported. In both the areas, most of the patients are reported to have visited private clinics for treatment. In Non-NGP areas, 50 adults are reported to have suffered from cough, cold and fever (multiple health problems) as compared to 51 adults in NGP areas, with a majority of them taking treatment from private clinics. No dysentery cases have been reported in both NGP and Non-NGP areas.

In Odisha, 7 cases of dysentery in NGP and 3 cases of dysentery in Non-NGP have been reported. In NGP areas, 15 cases of diarrhoea have been reported, while in Non-NGP none. In Non-NGP areas, 37 adults are reported to have to have suffered from cough, cold and fever (multiple health problems) as against 20 adults in NGP areas, with a majority of them receiving treatment from CHCs and private clinics.

In AP, 47 cases of dysentery in NGP areas and 56 cases of dysentery in Non-NGP areas have been reported with most of them in both the areas receiving treatment from private clinics. In NGP, 5 cases of diarrhoea, while only 3 cases in Non-NGP areas have been reported. 16 cases of malaria in NGP areas, while 19 cases of malaria in Non-NGP areas have been reported. In Non-NGP areas, 2 adults are reported to have suffered from cough, cold and fever (multiple health problems) as compared to 2 adults in NGP areas with a majority of them receiving treatment from private clinics (Figure 6. 9).

Figure 6.9: Morbidity among adults:



6.16 Summary and the way forward

The overall situation of water and sanitation status across the three states shows that AP (both NGP and Non NGP) and Odisha states (NGP villages only) have a better access to safe drinking water as compared to villages in Madhya Pradesh. Even with regard to the quantity of water available both AP and Odisha fare better when compared to MP, whereas when it comes to the quality (colourless and no hard water) of water, AP state's position is better (pure water for drinking) as compared to Odisha and MP states. As regards the availability of toilet facility, AP and MP states have performed well when compared to Odisha state. Regarding VHSC committees, in terms of conducting of meetings and maintenance of records, the performance of AP state is slightly better than MP and Odisha states. Regarding housing, the position of a majority of the households in AP (both NGP and Non- NGP villages) is better (people living in pucca houses) compared to their counterparts in the other two states (MP and Odisha). Regarding treating of water before drinking, in AP and MP states, the situation is better (both NGP and Non-NGP villages) as compared to Odisha.

The overall situation in the study villages across all the three states shows that water and sanitation programmes do not seem to have shown much of influence on the health

status of communities. This can be partly explained in terms of the very selection of villages by the government for the Nirmal Gram Puraskar award. This award is supposedly awarded to those villages which have achieved a total open defecation- free status including schools and ICDS centres in the respective villages. Hence, in an ideal situation, Nirmal Gram Puraskar (NGP) villages are expected to be 'open defecation free' (ODF) while maintaining very good sanitation and hygiene conditions along with an assured supply of protected water. But on the ground, as our study reveals, except in the case of a few villages, in all the three states, the selection of villages for NGP has not been based on objective criteria and the whole process may have been driven by extraneous factors (such as political/patronage etc.). As a result of this undesirable process of selection and award of Puraskar to villages without properly verifying the achievement of sanitation levels, problems continue to persist in these study villages. And the association or influence of these water and sanitation facilities on the health conditions of households is not strikingly demonstrable in NGP and Non NGP villages across all the three states.

Another important finding of the study is the very ineffective functioning of institutions like Village Water and Sanitation Committees (VWSCs) and Village Health and Sanitation Committees (VHSCs) in most of the villages in both NGP and Non NGP areas across all the three states. In spite of their presence in most of the villages, their actual functioning is not satisfactory. This is amply evident from the number of meetings held as against the specified norms and even if held, the effectiveness of discussions held in the meetings seems to be poor as demonstrated by the records. Our discussions/ interviews held with the household respondents during the field work also reveal that in all the villages, many of them are mostly ignorant of the existence/working of these village level institutions. The emphasis given to the working of these institutions in the NRHM guidelines has not been effectively translated into practice in all the three study states.

Although NRHM guidelines stress the importance of involving Panchayat Raj Institutions (PRIs) in the management of water and sanitation, in actuality, the involvement is abysmal. Only a few informed sarpanches/pradhans in a few villages are actively involved. This despite the 73rd & 74th Constitutional Amendment Acts which make it clear that the provision of water & sanitation facilities falls under the jurisdiction of PRIs & Urban Local Bodies. Hence, there is a need for involving PRIs actively in putting this into practice.

It has been found by the present study that ODF is still being practised which does not augur well for the well-being of children and adults. This could be due to a number of reasons viz:- very poor quality of toilets constructed and hence, using them is not reportedly feasible. An irregular supply of water is a major issue. In addition to these supply side factors, certain cultural beliefs and practices do come in the way of having toilets within the household premises (demand side factors). On the whole, the intensive

awareness campaign both by Civil Society Organisation and Panchayat Raj Institutions (PRIs) must be accorded a high priority. Otherwise, the poor health outcomes can certainly mar children's future and states need to spend sufficient resources on public healthcare.

An institutional vacuum in terms of a poor functioning of VWSCs and VHSCs can have its toll on the availability and maintenance of the quality of water and sanitation facilities besides ultimately resulting in poor health conditions as observed in the field. A mere formation of these administrative institutions is not a sufficient condition in itself, but making these local structures/ institutions accountable to the local people/community.

The study notes that in respect of all the three states, there is a long way to go before attaining a cent percent ODF status and better health and hygiene conditions. Policy pointers and lessons learnt:

- Need for strengthening the community toilets is felt in all the States, as most of the individual toilets found are not in a usable condition.
- PRIs and VHSCs need to engage the sanitation staff in maintaining community toilets, on a regular basis (as is the case with the water staff maintenance by PRIs).
- Sustainability of water and sanitation infrastructure is the key and this demands the allocation of committed financial resources.
- A transparent selection process of the NGP villages strictly adhering to TSP norms is needed (a few model villages viz., Hajippally- Mahabunagar, Gangadevipally - Warangal district in Telengana, need to be emulated and scaled up)
- In NGP areas of Odisha, the water table is low; normal toilets have over flowing problem during rainy season. Hence, the government may promote appropriate toilets.
- In all the surveyed states, the functioning of committees (VWSCs and VHSCs) is not satisfactory even wherever committees are found. These are not adequately funded and whatever funds are available are mostly used for spraying bleaching powder and nothing else.
- Except in two NGP villages of Odisha, NGOs are not found involved in water and sanitation activities. NGOs may be encouraged to promote awareness among people regarding sanitation and hygienic practices along with line departments and PRIs.
- Developing adequate capacities of the local institutions (as it happens with SHGs) in handling water and sanitation issues on a continuous basis is a clear policy imperative.

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