CHAPTER-III

HEALTH AND ENVIRONMENT

During recent years more and more anthropologists interested in biocultural environmental health problems that are best studied from 'ecological point view' as described by Bates (cited in Foster 1978). As Foster and Anderson point out 'it is not surprising that the environmental point of view has proven congenial to anthropologists since in reality it is nothing more than the extension to all environments and their biotic communities of anthropology's fundamental approach: concern with systems' (1978:11).

In ecological anthropology the focus is the interacting groups of plants, animals, and non living environment. Medical anthropologists are concerned with interrelationships between man's natural and social environments, his behavior, his diseases, and the ways in which his behavior and diseases have influenced his evolution and culture through feedback process (Foster and Anderson 1978). The key issue here for the understanding of the public health in the given context is the influences of the environment on health.

Environment is the beginning point. In so far as man is concerned, environment is both natural and socio-cultural. Where disease is concerned as Foster points out, it is a part of human environment. Disease involves pathology and at one level it is obviously biological. Yet, socio-cultural factors often play roles in triggering disease. However the way in which the patient's environment is altered while he is undergoing treatment is purely cultural.
Further environment in terms of ‘sanitation’ is an important factor affecting the health of a community, though it does not sometimes cover the whole range of cultural factors affecting health of that community (Rizvi 1991). Environmental conditions directly influence the health of the people.

Adequate, wholesome and safe community water supply coupled with its surveillance, waste water treatment, water pollution control, proper disposal of domestic sewage and other wastes (waste management), control of rodents and other alternative hosts of disease, control/prevention of soil pollution by excreta and other substances, come under the purview of environmental factors affecting health (Chaturvedi 1977 cited in Rizvi 1991).

Public health services have consisted of some form of environmental sanitation in a few big cities. For the rest, selected public health services were provided only when there was a massive outbreak of epidemic diseases like plague, small-pox and cholera. As a result there has been a wide spread prevalence of easily preventable diseases viz, malaria, TB, leprosy, gastrointestinal infections.

National programs for the promotion of sanitation, public health, nutrition, housing, have been accorded high priority but a comprehensive and integrated view of environmental protection has not received significant attention. One of the main reasons for lack of disease control (ex: malaria) is inadequate sanitation (Nangia 1997).

Sanitation includes water supply, safe disposal of human waste, waste-vectors of diseases, domestic and personal hygiene, food, sanitation and
housing. The US National Sanitation Foundation defines sanitation as the quality of living expressed in clean homes, clean farms, clean neighborhoods and clean community. Being a way of life, it must come from people, nourished as it is by knowledge and it grows as obligation and ideal in human relations. Accordingly, environmental sanitation is viewed as control of all those factors in man’s physical environment which exercise a deleterious effect on his physical development, health and survival (WHO, 1992). Environmental sanitation is vital for protecting the environment, improving health, alleviating poverty, enhancing quality of life and raising productivity all of which are essential for sustainable development. Sanitation is not only maintaining cleanliness but also protecting those sources of the environment which support and promote sustainable development. The development programmes, however innovative they may be, are not likely to yield desired results unless the environmental sanitation is improved and protected (WHO, 1992).

Keeping Rizvi’s study (1991) as the framework the factors which are considered here under environment and health include: water and sanitation (domestication of animals, disposal of house sewage water, disposal of domestic refuse), toilet facilities, personal hygiene and nutrition.

3.1 Water and Sanitation:

As a basic life requirement water is one of the sources of disease causation. Attention to supply of potable water is indispensable for good health and prevention of some of the common preventable diseases. There are various
instances which prove that provision of adequate potable water can (and has) eradicated many of the common diseases like dysentery, worms, diarrhoea etc. Therefore safe drinking water and sanitation have enormous implications for human health and well-being. About 1.1 billion people globally lacked access to safe drinking water, and 2.4 billion people lacked access to sanitation in 2002 (UN report 2005).

In Britain, since 1854 state and local boards of health have been given authority to control the purity of water supply. The result has been virtual elimination of water borne infections. Studies on water supply reveal that in India, water available from all sources namely wells, rivers, canals, and so on, is used for multi-purposes that is washing clothes and utensils, bathing, drinking, and washing animals, vehicles. Water is used indiscriminately from these sources (Rizvi 1991). Thus the sources of water supply are often polluted leading to water borne infections.

In India, National Rural Health Mission (NRHM) provides a good opportunity to converge and integration of water, sanitation and health. This convergence is critical if one wants to ensure that all are provided with safe drinking water. Of the 18 states where NRHM is operational, 10 have serious fluoride and arsenic problems. The lives of 66 million people, including 6 million children, are severely affected by Fluorosis in India, a disease resulting in bone deformation, stunted growth and mental retardation. Studies and experience show that these conditions could have been averted had the mothers and caretakers known about the source of fluoride from water and food and
alternatives provided. Children and adults can recover from fluorosis if detected early and if adequate dietary supplementation is provided with safe drinking water (UNICEF 2008).

In the village Mallapur, there are three sources of water namely open-wells (*bhavi*), bore-wells (*bore*) and a canal (*bandar*), which gets water from the river Krishna. There are seven open wells and six bore wells located in different localities of the village. Out of seven, five open-wells are located in the locality of *ooru* and one is in *holageri* and the remaining open-well is located near Mallaya temple. Out of six bore-wells, two are situated in *ooru*, one in *holageri*, one in *horatti*, one in *janata-plot* and another one in *hosa-plot*. The canal passes through the village near the area where the bus-stand is situated.

Majority of people use open-well water for drinking because it is considered to be safer than the bore-well water. People feel that drinking water from bore-well leads to problems like formation of kidney stones (*kalla*) and also cause dental problems (*hallunovu*), because the bore-well water is hard water (*vajje*). As an elderly key informant points out “*bore nira kudadara hotyaga kalla agathavu matta hallu bada agathavu, adaka bhavi niru kudyodu chalodu adarinda sarirak yenu badak agudilla*”. (That is, drinking bore-water causes problems like stones and dental problems, but drinking water from well does not harm the body).

Water is drawn from the open-wells with the help of a pot (*kodapana*) and a rope (*hagga*). People use the water from the well which is situated near
their street (oni). This makes it convenient for them to fetch water and they need not go far.

The water of well near Mallayana gudi mundina bhavi was earlier used only for performing the worship (pooja) of the deity (Mallayya). But after establishment of gram-panchayath in village, the members of the panchayath decided more water was required to supply adequate water to all the streets (oni) through taps to the people of the village. Therefore, the water from this well began to be used for public purposes (sarwajanikarige). The water from this well is pumped using electrically operated pump (motar) and then it is stored in a tank (tank) and then it is supplied to the people’s house front (mani bagilige) through pipeline. The supply of tap-water is helpful to people as they can get water easily (sarallavagi) compared to earlier days. The duration of water supply during summer (besige) is 15 to 20 minutes everyday and during winter (challigala) and rainy season (malligala) it is 30 to 40 minutes for each street.

The duration of water supply depends on the availability of water in the well. During summer, the water level in the well becomes less (kadime) compared to winter and rainy seasons. Therefore apart from tap-water, people use water from wells and bore-wells, for drinking (kudiyalu) and cooking (adagi) purpose particularly during summer.

People use tap-water (chavi niru) generally for all their daily requirements. In case of shortage of tap-water, people use well water from the wells near to their houses. People of holageri use only water from the well in
their locality holiyaru galli bhavi for household work (mani kelasa) since they are not allowed to use water from the open-wells of the village (ooru) as they are considered to be untouchables (ashprasharu). These people use bore-well water for drinking as well as for domestic work. The people of horatti, janata-plot and hosa-plot depend only on bore-well water in case of shortage of tap-water because they do not have any open-wells near their locality.

Another source of water is canal (bandar). The canal gets water through rains during the rainy season (malligala). The canal also gets water during the fair of Mallayya temple (Mallayyana jatre) generally in the month of April. During this fair, gram panchayath makes arrangement to release water (niru biduvadu) from the neighboring village through canal because people from different villages viz; Athani, Uagara, Ainapur, Molle and Kagwada gather to see the fair of Mallayya temple and they stay for three days in the village. As such more water is required.

People of Mallapur consider pure drinking water (swachha kudiyuva niru) as important and indispensable to lead a healthy life (aram eruvadu). They believe that water available from all the sources in village is clean therefore it does not cause for their health. Because they say that the wells keep getting fresh water and the well in the village are widely used and there is no scope for stagnation. According to them if the water in a well is not used for over a time, then that water is not safe for drinking.

According to doctors and health workers of PHC of Mallapur if person drink unclean water (holasu niru) it causes illness (roga) viz., cold (negadi),
cough (*kemmu*) and dysentery (*sandask-hattudu*). According to doctors, unclean water is one which is turbid (*holasu*) and they consider water with waste particles and insects (*hullagalu*) also as unclean water.

Mala is a 21 years old girl, she belong to Brahmanaru caste. She goes to college in a nearby village. She would often suffer from intestinal infections, and the doctor told her to avoid drinking water from here and there (*alli-elli niru kudiyavadu*). She says water may be stored for long or the vessels may not be clean and if people have dipped hands in the container, it may have become dirty. So she started to take a bottle of water along with her and has not had any incidences of infections.

When such instances were discussed with doctor, he says because they are educated, they are able to understand the relationship between the cause and effect. They also take the advice seriously and therefore it is easier to bring about a behavioral change. Further he says, those who are not economically well-off give priority to work and do not consider other issues and advices. Because earning the daily bread is their main concern. So whenever they feel unwell they take treatment and as soon as they feel a little better, they stop thinking about it. Further sometimes they do not even take complete treatment. They do not give much importance to preventive aspects of health.

In another instance, Laxmi belongs to Lingayatharu caste. She has not gone to school. She is 35 years old, and goes from village to village selling vegetables (*kayeepalye*). Since she has to keep traveling all day long she drinks water wherever she feels thirsty (*niradiki*). She constantly suffers from cold
(negadi) and cough (kemmu). The doctor told her that it is due to change of drinking water. She says she takes tablets (gullagi) whenever she suffers from cold and cough and carries on because, she cannot carry so much water for drinking as to last all day long, along with all the load (gantu) she has to carry for selling vegetables.

Water, which has been used for washing utensils (bande), clothes (aribe) and bathing (jallaka) purposes, is termed as house sewerage water (bachhal niru) (human and domestic waste matter from buildings, especially houses, that is carried away through sewers). Women of the household usually wash clothes and utensils in a corner of the front-door (tholabagilu) of the house or in the bathroom (bachhal). Each house has a bathroom inside the house where usually people take bath, and sometimes wash household utensils and clothes. Because of congested space in the bathrooms, people say they do not feel comfortable to wash clothes and household utensils in the bathroom and hence they wash them in front of their houses.

The sewage water runs to the public drainage (gutter) through a small drain, which has an outlet in the bathroom in all the houses. There are open drains (gutter) through which waste water runs in the village. The waste water from bathroom runs to the public drainage through a connecting small-hole (mori) for an outlet. Some houses have toilet (payeekani) facility and the water from the toilet also seeps to public drainage. These drainages also serve drains for the rain water during rainy season.
Health educators and doctors opinioned that, the house sewage water usually contains some organic contents such as food remains and it provides a suitable breeding place for mosquitoes (gungada) and other pathogenic bacteria. During summer season majority of men take their bath at the public bore-wells and at open-wells (bhavi) and people also wash clothes and household utensils (bande) at these places. Because of shortage of tap-water during summer season people have to fetch water from open-wells (bhavi) and bore-wells (bore) for household work, and to make their work easier, they wash their clothes and household utensils at bore-wells and wells. Further utilizing the space surrounding the public water sources for washing and cleaning also creates water logging in the proximity of wells and bore-wells. According to anganwadi workers and health works water lodging surrounding well, bore-well and street becomes a breeding place for mosquitoes (gungada) and flies (nonna).

The indiscriminate disposal of the house sewage water reflects the lack of understanding of the role of hygiene and sanitation (swachhaerudu), knowledge of disease causation among the people. It does not however mean that people do not have their notions of what is hygienic and what is not. There are notions regarding hygiene and sanitation among people. Keeping the environment in and around (suttamuttalu) the house clean, sweeping the houses (mani kasaudagudu), swabbing (varasudu) with the use of water, throwing away the rubbish, cleaning the cattle shed regularly, spring cleaning during certain festivals, by washing all utensils and clothes in the house are the aspects
related to sanitation. However they differ from those held by the health-care providers and general notions of hygiene which are often influenced by the notions in the bio-medical practices and often also by western notions.

People in the village who are educated and having awareness about health and hygiene, say that, improper maintenance of sewage water (kollachi niru) creates unhygienic conditions which in turn cause diseases (roga). People think that proper maintenance of drainage (gatar) system is the duty of village panchayath, but not of individuals. As one of the informants says, the people who are sitting in the panchayath (meaning in administrative position) should concern themselves with all such work. It is their work to look into such matters. However the public drainage system in the village is not maintained properly by panchayath. Therefore, there is blaming and counter blaming. Panchayath says people do not take responsibility of maintaining cleanliness and people say panchayath should take care of such things.

Even though the gram panchayath has constructed drainage system in the village to provide outlet for the waste water from the village habitation, during rainy water lodging in the streets (oni) is commonly observed. The pits (tippi) and holes (thaggu) that are there generally surrounding the houses also fill with water and this water overflows when the pit overflows and spills over to the streets.

People use these pits to throw wastes like plastic (plyastic), papers (kagada) and household refuse (mani kasa) and such. During rains along with water the wastes also flow on to the streets.
In case drainage near someone's house is blocked, the houses in the same lane find it problematic. Because of the block (*muhchu*), water overflows with all the sewage material into road. So often people quarrel (*jagalladu*) and say something should be done about the block. But the person residing near the block, says it is the duty of the panchayath to take care of such things. Men discuss that water lodging thus in front of their houses causes diseases and panchayath does not do anything. They feel concerned about the condition of the drainages which in turn also spoil the streets in case of rain or blockages.

Further the streets are non-metalled (*kachha*) and as such streets become muddy, and grimy (*dhulla*). Hence the people who are *anganwadi* works and health works say because of continued moisture and the wastes lying around without drying is said to provide scope for growth of bacteria and virus and as such become a source of infections. According to the doctors also water lodging in the streets and drains and also, around wells and bore wells, creates unhygienic environment and provides scope for pathogenic bacteria and mosquito breeding.

There is an open-space (*khulla-jaga*) near the bus-stand and the immediate residential area surrounding the village. This is dumping ground where the household refuse (*kaza*) and other wastes are thrown. House refuse consists of ash, rubbish and garbage. The ash (*budi*) is the residue of the fuel (*katagi*) used for cooking and heating water. Dust (*dullu*), dirt (*holasu*), waste paper (*bada-kagada*), plastic (*plyastic*), clothes (*aribi*), metal (*kabbanna*), wood (*katagi*) and glass (*khaj*) comprises of rubbish whereas garbage includes
waste products such as waste food (hallachida-adagi), vegetable peelings (kayeepayle-shippi) and other organic matter. According to the health personnel, the disposal of the house refuse is indiscriminate in the village. Usually, houses are swept (udugu) twice a day and refuse is thrown into the manure pit (tippi) where the cattle dung (saganni) is stored. Some people throw the house refuse either in the peripheral areas of the house or in the open space nearby their houses. As such the process of cleaning the houses creates polluting of the community environment. As the ANM observes, the concern regarding the cleanliness of the immediate environment seems to be lacking. The immediate personal environment is paid attention to but not the community environment.

The domestication of animals has a role to play in environmental sanitation and also it is an important and influential factor affecting the health status of the people. The domestic animals (danagallu) in the village are buffaloes (yamme), oxen (yattu), cows (aakallu), goats (kuri), sheep (aadu), dogs (nayee) and cats (bekku). All these animals have utilitarian aspect. Oxen are used for ploughing fields (holla) and also pulling carts (gaddi). Cows and buffaloes have commercial value as these are milk producing animals. Goats and sheep are also domesticated in some families of particularly people belonging to Kurubar caste for meat and particular kinds of sheep are also reared for wool (uni). Goat milk is considered as nutritious and is used as medicine (ausadi) by the people for its medicinal value. Dogs and cats are kept to protect the crops and grains.
During the day, buffaloes and cows are usually taken out for grazing (meyallu) in the field and in the evening they are brought back to the house. Most of the people have cattle shed (daddi) in front of their house where they tie their cattle. This is done so, in order to take care of them properly. Also there is fear of cattle being stolen (kallatana). So they want the cattle to be near, where an eye can be kept for their safety. People remove cattle-dung and clean the cattle shed once in a day and they collect cattle dung along with waste fodder (radi) in the manure pit (tippi) which is situated in the backyard (hittala) of the house.

According to the doctors, people tie cattle near to their living room, because of the dung (shagani) and urine (uchhi) there is an increase in the number of flies (nonna) and mosquitoes (gungad), which are responsible for causing communicable diseases viz., cholera (sandasa-vanti) and malaria (urithandi). According to the doctors and educated people, they also suffer from skin diseases because of infection caused by some parasites such as louse (henu), mite (unni) and rat flea (chikkada) which come inside the house through cattle. But those who have cattle they say that cattle are like members of the family. And also it is convenient to keep them near the house. And if they are not tied near the house where else can they be tied? It is not only convince but concern over their safe-keeping and lack of any other alternative that makes people to tie cattle near the house.

Research conducted by the UN shows that people lack knowledge that 80 percent of the diseases are related to lack of safe water and sanitation. Five
of the 10 top killer diseases—Diarrhoea, Typhoid, Jaundice, Malaria and Schistosomiasis—are caused by unhygienic conditions. Campaign for water and sanitation was launched in India to promote hygienic behavior and for overall improvement of health of the rural population. More than Rs.13,500 crore investment has been committed to reach full sanitation by 2012, which is also one of the Millennium Development Goal, though India could achieve only by 2016. And, massive awareness campaigns have yielded results with the National Family and Health Survey-III reporting 26 percent rural sanitation coverage during 2005-06 that has now gone up to 54 percent (UN Report 2005).

3.2 Toilet Facility:

Another important aspect regarding sanitation is the toilet facility. Studies carried out in India and abroad indicate that, human excreta is the cause of many enteric diseases: like cholera, dysentery, typhoid, paratyphoid, infectious hepatitis, hookworm and diarrhoea. Studies conducted UNICEF (2005) show that over 50 infections can be transferred from a diseased person to a healthy one by various direct or indirect routes from human excreta and it causes nearly 80 percent of the sickness. Therefore, appropriate human waste management should be the primary objective of improved sanitation to build a healthy nation and provide a cleaner environment.

Proper disposal of human fecal matter is an important aspect in maintaining the hygienic environment in the villages. Of 1.2 billion people practicing open defecation, India’s share is a huge 665 million with 35 percent
rural schools not having toilets and 20 percent lacking drinking water facilities (UNICEF 2005).

There are few houses in the village Mallapur (145) which have toilet facility (payeekani). People who are economically well-off (srimataru) among Brahmanaru, Maratharu, Lingayatharu, Jainaru and other castes in the village use toilets. Generally people, who do not have toilet facility in their houses, go to open space or at the roadside for defecation (charagi-toganda-hogudu). Usually the children relieve sitting stone slabs of the public drains. Women say they find it convenient to send children to the drains because they need not worry that children have gone very far. Further if they defecate in the premises of the house, lots of water is needed to clean and generally water is scarce.

As illustrated in the case of Somayya who is a three year old child. He belongs to Samgar caste. Both his parents have not attended school. His mother sends him everyday to the public drainage for defecation. His mother says he goes alone since it is just in front of their house, defecates and comes home. Since his mother is a daily wage-laborers, she has to leave home early in the morning and so she says, she has taught him to go alone and come back.

People go for defecation either in the morning (harevatta) or in the evening (sanjeek). Generally they do not go very far from their houses, they go about a distance of a furlong from their houses and in the night (ratri) they sit somewhere near the house since there will be no lights. In case of serious illness when a person cannot move from the bed (hasige), he relieves himself inside the house and then the feces is disposed off. During the rainy season,
some people go out for the purpose of defecation with the help of umbrella (chatri) and some people cover their body with a gunny bag (gonni-cheela). As the public drains are near the houses, people send their children to public drains defecation every day. Children as young as three go on their own to defecate along the drainages. Older children go either early in the morning or late at night to defecate.

There are six public toilets (sarwajanik payeekani) situated in the village which are provided through panchayath. Out of six public toilets, one is for men and remaining five for women. Out of the five ladies public toilets, one toilet is situated in the horatti area, one in holageri, one in janata-plot, one in hosa-plot and two in ooru. Since the population in the main village locality is more compared to the other localities in the village, village panchayath has provided two public toilets for the people of ooru. Near the bus-stand, there is a men’s toilet, which is used by the men of the village.

All the public toilets are constructed under the programme of ‘gram nairmallya yojane’ (village sanitation program). Among the people who do not have toilet facility in their houses, very few people use these toilets. Whereas most of the people go for defecation in open spaces because there is a general feeling in the village that the public toilets are not maintained properly by the people and by the village panchayath. The people say that, public toilets have foul smell (holasu-vasani) and they are breeding places for flies. If they go for defecation in public toilets, they feel a vomiting sensation and sometimes people also vomit (vanti) because of the foul smell.
People also say that instead of improving the community environment, public toilets are polluting it by creating unhygienic condition near the living space and also cause communicable diseases through flies. Educated people and doctors also opinioned that, flies are one of the most important carriers of communicable diseases like cholera because flies from toilets could also sit on food and water. As a result, when people consume such infected food and water, they suffer from different diseases. They say that because the number of toilets are less and people are more, and because there is no sufficient water, the maintenance of toilets is difficult.

People in the village were using the place near the anganwadi for defecating. The anganwadi teacher tried to the people saying that it pollutes the environment, children run around in bare feet and since the ground is soiled by feces it puts their health at risk. But no one paid heed to her. And one day people found that there was a stone in the ground smeared with paste of lime stone, it was applied vermillion and turmeric and as a result the place became a worshipping area and people stopped defecating in the ground. However after some time somehow people came to know that this was done by the anganwadi teacher and resumed their original practice of using the ground for defecation.

People say that, since there are no pigs (handi) in the village, there is so much muck in the village. If there are pigs they generally eat feces and other remains and this helps the village to be clean. They also say that the village panchayath should bring a few pigs and leave them in the village which can help in keeping the village clean.
Increase in the awareness as well as education can influence people’s way of thinking and also bring about a behavioral change about hygiene and sanitation. The following case study illustrates such a behavior.

Shanti is 15 year old. She belongs to Maratharu caste and studying in tenth standard. Like the rest of girls in the village she used to go to the outskirts of the village for defecation (sandasaka). At school, she learnt that such a practice can lead to many diseases. She also learnt that there are government programs in the village which help (sahaya) families to construct (kattalu) toilets in their houses to promote hygienic behavior. She came to know that the village panchayath itself provides funds for construction of toilets. She pondered about these various things, and then spoke to her parents. Her father is educated and mother is illiterate. She explained various things she had learned and made them understand the benefits of having a toilet at home. Her father, convinced by her, decided to have a toilet constructed with the help of the funding from panchayath. He is proud that he has taken advantage of the facility provided and says that the women of the household are benefited by the decision. He feels that others are lacking awareness and are not making use of the opportunity provided. Earlier his economic condition did not allow him to spend money to have a toilet construction. Since he obtained funding from panchayath, he was convinced by his daughter to have a toilet built at home.

Such cases illustrate that education and effective awareness creation have an important role to play and IEC (Information, Education and Communication) which is effective can bring about a sustainable behavioral change about hygiene and sanitation.
A major cause of environmental pollution therefore in the village as substantiated by various research studies by UNICEF and WHO (ibid) is defecation practice by the people open spaces and also a major source of fecal-borne diseases as per doctors and other health personnel. For example if a sick person goes to field for the purpose of defecation, the disease agent present in his fecal matter transmits to the others through the various channels such as water (niru), flies (nonna), soil (mannu) and food (adagi). Therefore, soil pollution, water pollution, contamination of food and propagation of flies are the major health hazards due to improper human excreta disposal and the resulting diseases are typhoid (typord), dysentery (sandask-hattudu) and cholera (sandasa-vanti).

Therefore, proper disposal of human excreta plays an important role in the improvement of public health. According to the health personnel, the practice of defecation of the people reveals that, the existing practices of defecation are responsible for the creation of unhygienic condition, which causes morbidity and various health problems among the people. The main diseases such as, cholera, typhoid, fever and dysentery spread through the indiscriminate defecation. Experience in the public health sector from various developing countries has proved this time and again.

According to a survey conducted by UNICEF (2005) that provided technical support and capacity building facilities to the Panchayath Raj Institutions to promote sanitation, a large number of “Nirmal Gram Award” winning villages have slipped back to open defecation after receiving the
award. Though 85 percent households have access to individual, community or shared toilets, only around 66 percent are using it as toilet. The reasons for non-use of toilets are largely marred with poor or unfinished installations, no super structure and no behavioral change among the people.

West Bengal for instance is well on its way to be the first State in the country to achieve open defecation free status by 2010 followed by Andhra Pradesh that is likely to achieve the target by 2013. Chhattisgarh is at the bottom of the list with the target year being 2022. Almost 80 percent of the households in rural areas in West Bengal have been provided with toilets under the Total Sanitation Campaign of the Union Rural Development Ministry being implemented by the three-tier panchayath, non-government organizations and women self help groups (UNICEF 2005).

Although development initiatives tend to prioritize access to drinking water over sanitation, there is an increasing recognition of the imperative for safe sanitation in several countries. The global attempts at financing the development of this sector through multilateral aid can be seen with recent targets for water and sanitation access in the Millennium Development Goals (UN report 2005).

One of the other sources of threat to health in the environment in the village is fuel (katagi) cooking which use for cooking (adagi). Majority of the people belonging to middle (madyamma vargadavaru) and poor economic condition (badavaru) use fuel kattagi for cooking whereas people who are economically rich (srimanttaru), LP gas (barshan) for cooking. Poor and
middle economic condition people are not able to afford gas cylinders because of the cost. Therefore, they use fuel which is available free of cost in the surrounding area of where they go for agriculture or non-agriculture labor in the village. But the people who use fuel say that, while cooking they inhale smoke because of this they suffer from health problems like burning sensation in the eyes (kammu-uriuvadu) and respiratory problems (usiru-gattuvadu). This is illustrated in the case of Mahadevi.

Mahadevi is a 35 year old woman, she belongs to Samagaru caste. She living with her husband and young child. Her husband is a daily wage laborer. She has been suffering from problems related to eyes (kammu-uriuvadu) for the past seven years. She complains of swelling of eyes (kammu-ubbuvadu) and also constant welling up of water in her eyes (kannalli-nirubarudu). She has visited a number of doctors. The doctors say, she has an allergy to smoke (hogi). The problem is smoke emitted by the cooking fuel. Mahadevi says her problem is unavoidable since she has to cook sitting in front of the hearth (vali). Further she is the only person in the house who has to take care of cooking, and that their financial position does not allow them to go in for any-other alternative. Since fuel is available in the proximity of the house she collects fire wood and uses it for cooking. So she gets temporary relief from medication whenever her problem intensifies and again faces the same symptoms over and over again.

3.3 Personal Hygiene:

Along with environment, personal hygiene (vayaktik-swachhate) also has been discussed in this section. The people who are educated they say that,
hygiene means general care of the body (sharir) and personal parts (angangagallu). The practices with regard to personal hygiene include oral hygiene (halltikudu, bathing habits (jallaka-maduvadu), cleanliness of hair (yarakolludu), face (mukatolliyudu), hands (kaitolliyudu) and feet (kalutolliyudu), and changing of clothes (arabi badalasuvadu).

According to doctors and educated people, oral hygiene is one of the most important aspects of personal hygiene, which includes cleanliness of tongue and teeth. Healthy teeth and healthy tongue are necessary for a person because they play an important role in digestion food and all. Further bacterial growth in the absence of proper oral hygiene can cause various ailments. Therefore, doctors say that, taking care of the teeth and tongue is important in daily life of human beings. Oral hygiene depends on the method and frequency of cleaning as well as on the material used for this purpose.

Majority of people in the village clean their teeth once in a day and few people clean their teeth twice in a week while taking bath. The people belonging to middle and lower castes as well as economic condition go to neighboring villages for labor (cooli), therefore they leave home early morning and come home late in the evening. Because of this reason they do not have sufficient time to spend for taking bath, cleaning teeth. Hence these people take bath twice in a week and while taking bath they also wash their teeth.

Generally people use tooth paste (hallatikku-toob), tooth powder (halltikku-powder), salt (uppu), charcoal (eddali), ash (budi) and neem stick (bevina-kaddi) as cleaning agent. Depending on the spending ability people use either tooth paste and tooth powder or indigenous materials to clean their teeth.
People eat betel-leaves (eli) and areca-nut (adaki) along with lime (sunna) after consumption of food, it is said that it helps in digestion of food. But doctors say that most people who belong to middle and lower castes and economic condition chew betel-leaves (eli) areca-nut (adaki), along with tobacco (tambaku) and tobacco products which cause for their health.

People also say they know that chewing of tobacco and tobacco products causes various oral diseases such as mouth-ulcers (bayee-novu) but we could not leave it because we have addicted to it. Some people say that, consumption of tobacco helps them to control their tensions and also some other say to avoid teeth pain (hallu novu).

Doctors say people suffer from many dental problems like cavities (hullukku) and pains (novu) due to lack of oral hygiene and chewing of tobacco. Both men and women chew tobacco especially those who are engaged in physical labor. Tobacco is also used by people as a medication for tooth pain, and for some people it gradually becomes a habit. It also causes respiratory problems in many people.

Further PHC doctor says, ‘people can avoid going to the doctor and spending money by following simple oral hygiene and not chewing tobacco and tobacco products. But they do not listen. And those who are engaged in strenuous physical work say that it takes their mind-off the strain, so it is difficult to convince them’.

The ANM observes that it is generally people belonging to middle and lower economic category that consume tobacco and tobacco products more.
They are generally agricultural laborers. Whenever they take a break, they sit around talking and start chewing tobacco. Men belonging to higher economic status consume but not much and women do not consume such things at all.

Regarding bath, generally all people among upper castes, among whom majority of people are economically well-off and are aware of health and hygiene bath everyday. Few people among middle, whereas majority among lower castes and economic condition take their bath twice in a week especially on Mondays and Fridays. Because most of the people among middle and lower castes depend on agricultural or non-agriculture labor and they go for work everyday early in the morning and come home late in the evening. Therefore, they do not find time to take bath. They take bath on Mondays and Fridays because people believe that, these are the auspicious days and also they get relaxation on these days from work. Religious beliefs, concepts of purity and pollution are found to play a role in bathing.

For instance Mallayya who is a 35 year old male from Waddar caste says that he is a daily wage construction worker (goundikelasa) and leaves home at 6 o’clock in the morning. He has to go to a neighboring village which is quite far. Further he comes late in the evening. Therefore he says that he hardly has any time to bath everyday. Further he say, ‘however I do not miss bathing on Mondays and Fridays lest I bring upon me the wrath of deity. These two days are days of deity and I have to bath in order to worship’.

It signifies that religious beliefs take priority over hygiene observances. It also indicates that even if it is seen from religious perspective, health figures
into the picture because people believe that wrath of deity can affect one’s health status. Irrespective of caste and economic condition, all the people of Mallapur take bath including washing the hair (yarakolluvadu) on new-moon days (amasi), full-moon days (hoonnime) and also days of festivals. This is so as the priest points out, ‘because the religious rituals need to be performed only after the purification of the whole body from head to toe. Since all caste people worship deities on such days everybody takes care about bathing and then worshipping’.

Bore-wells, open-wells and canal are the main sources of water in Mallapur village. During summer due to hot climate, men take their bath in the surrounding areas of bore-well and open-wells and also in the canal. During rainy and winter season, due to cold climate, people take hot water bath in their houses.

Generally the sick (aaram-elladavaru), elderly (vayasadavaru), puerperal women (bannanti) and children always take hot water bath. People believe that using cold water for bathing by this category of people makes them susceptible for illness.

People use soap (saboon), flour of jowar (jollada-hittu) and bengal gram (kadale-hittu), and soap-nut (shigekayee) to clean their body while bathing. Those who can afford, use soap (saboon) as well as soap-nut, whereas most of the people belonging middle and lower economic condition use flour of jowar and Bengal gram and some of them use only water to clean their body. Since soap and soap-nut are expensive, people of middle and lower economic
condition are not able to afford them. People apply coconut oil on their head before taking head-bath. For washing hair shampoo (shampoo), soap-nut (shigekayee), or soap (saboon) are used.

The bathing habit of the villagers reveals that there are mainly two types of groups; a group of people who take bath daily and a second group of people who take bath twice in a week. According to the doctors, people complain of a number of skin diseases. This is so according to them especially among the people who do not use soap while taking bath and also among the people who do not take their bath regularly. Scabies (huruku) / eczema (esabu) and itch (kerisuvadu) are the common skin diseases found among the people.

Parashu is a two and a half year old boy suffering from itching (kerasudu). He belongs to holeyer caste. Both his parents have not attended school. The doctor prescribed medicines (davayee) and strictly advised the parents to bath the child regularly using oil (enni) and soap (saboon). Because of regular bathing he is not suffering from any problem of itching now. Since giving bath everyday helped the child the mother bathes the child everyday without fail.

The Doctors advice them to bath regularly and to use soap in order to prevent skin infections. Doctor at the PHC says the skin infections are preventable and there is no need for seeking treatment, if only people see the importance of bathing properly and following simple personal hygiene. One need not spend on medicated soaps, if they spend a little on ordinary bathing soap and bathe everyday without fail. Doctor says ‘when we advise people say
yes and agree to whatever we say because they will be facing problems, for few days they also follow what we say, but gradually slip back to their original behavior’.

Ramappa is a 40 year old man. He belongs to Samagaru caste is an agricultural laborer and has not attended school. He started suffering from itching (kerasudu) sensation all over her body. He felt it must be due to deity and fasted (upavasa) for five weeks. However, his condition did not get better. Then other friends working with him advised him to go to doctor. He visited the primary health center (PHC) and the doctor tolled him it is a skin disease called eczema (esabu/huraku). Then doctor prescribed him medicine with and soap for bathing and ointment (malaam) for relief, to be applied after bath. He also advised him to bath everyday using soap. He says that he gets relief when he applies ointment and again after a few days the problem recurs, and her financial condition is such that she cannot afford the medication.

Hygienic practices with regard to people, it not only includes bathing, but also washing their face (mukha), hands (kai) and feet (kalu) twice a day, that is usually in the early morning and evening. In addition to this, people wash their hands and feet after defecation, and also they wash their hands before as well as after eating food. As discussed in bathing habits, most of the people who are capable of spending use soap to wash their face, hands and feet. Those who cannot afford to spend especially like those belonging to middle and lower economic conditions use water to clean their face, hands and feet. Most of these people use mud or ash along with water to clean their hands after
defecation and very few people among middle economic conditions use soap for the same. People wash their feet after defecation without fail irrespective of caste and class background. Practices of washing face, hands and feet reveals that, people are concerned about their health because they believe that unclean feet (holas kalu) and hands kai) can cause diseases. Because the dust and grime on the hands and feet can enter into stomach (hotte) along with food and cause diseases.

Usually, majority of men who are economically better-off, shave beard (gadda) and moustache (meesi) thrice in a week by themselves in their house. Those who belong to middle and poor economic condition shave their beards and moustache once in a week or a fortnight. They generally go to barber (navaliga) for a shave because they say it is not possible for them to spend money to buy shaving materials [blade (rejar), shaving cream (cream), brush (bresh) and scissors (kathari)] needed for shaving. Some people among middle economic condition who have got higher education shave themselves. Because the people who have shaving kit say ‘we shave thrice to keep ourselves clean shaven as it appears neat, those belonging to middle and poor economic condition also feel they should clean themselves shaven but their economic condition will not allow them to do the same’. Those who cannot afford say, the barber in the village charges Rs.10/- shave moustache and beard and shaving twice or thrice a week means spending Rs. 30/-and also some say ‘as we are busy with work we do not give much heed to this so we get a shave and a trim once in a fortnight.
In Mallapur, usually barbers shave many people with a single razor (*katti*) and they wash the razor with water. Barbers say ‘we take only Rs 10/- from a person to shave if we change razor for each person we have to spend money which is not cost effective for us. So we do not change razor but we wash it every time after shaving a person therefore there is no harm. But if some body asks to change the razor we do change it, because we have to listen to their demands. Very rarely barbers use blades to shave. According to doctors and educated people, lack of awareness about communicable diseases viz, HIV/AIDS and various skin diseases, sterilization of razor is not taken into consideration by the people in the village. Those who are aware of mode of transmission of communicable diseases shave by themselves because of these fears. In case they go to barber, they ask him to use new blade to avoid the transmission of communicable diseases.

Another important aspect of hygiene is washing of clothes (*aribe*). The frequency of change and washing of clothes varies from person to person and it depends on economic condition of the individual. Most of the people who belong to upper castes and people belonging to economically well-off bathe everyday change their clothes daily after a bath, whereas the people belonging to lower economic condition change their clothes twice in a week after taking bath on Mondays and Fridays and also on festivals. The people wash their clothes after their bath. The use soap and soap powder to wash clothes again depends on the person’s spending ability most people use soap or soap powder to wash clothes. People who cannot afford to spend on soap use only water to wash their clothes.
After washing the clothes, people dry (onagisu) them either inside the house or outside the house depending on the season. Usually during rainy season people dry their clothes inside (vallage) the house, whereas in winter and summer season, people dry their clothes outside (horage) the house.

According to the ANM, many skin diseases are seen among the people belonging to middle and lower economic condition, because she says, these people put their clothes on grass (hullu), on pit (tippe) and also near to drainage where many of insects and pathogenic bacteria are present. And hence people are prone to infection from fungi formed on the clothes, as a result people suffer from many skin diseases.

Thus different environmental aspects affect public health. Some are in the form of personal practices and some in the form of public behavior. However both have implications for health and result is different kinds of diseases.

Research shows that such incidences of diseases can be brought under control and can even be prevented through creating awareness among people particularly among middle and lower economic condition. A multi-country study (Esrey1996) suggests that a mean reduction in diarrhea of 37.5% is possible following the introduction of improved water supply and sanitation in developing country environments. Ensuring access to safe drinking water and sanitation could therefore drastically reduce the incidence of water-borne diseases, which contribute significantly to the mortality rate in developing countries (UN 2005).
Recent studies convey that there is a paucity of documented evidence on what works for success in rural water and sanitation sector. Therefore, there is a need to carefully understand the nature of demand for sanitation services to address the hindrances to full coverage in the water and sanitation sector in developing countries (Mukherjee 2001).

Jenkins (1999) examines the decision of poor households in rural Benin in installing a pit latrine and draws lessons for developing countries. His findings for successful rural sanitation include the feasibility of technology, availability of traditional defecation sites and familiarity with benefits of improved sanitation.

The official coverage for rural sanitation is 26% in India (NFHS 2005-06). The overall sanitation coverage as recently announced by the government is 48%. These figures are figures of infrastructure and do not tell us the access and use of latrine by individuals\families. Independent assessments of latrine use show a much lower coverage.

Given the federal character of India and the large number of states, no single central or state government scheme can be credited with boosting coverage. “Nirmal Gram Puraskar Yojana”, a central government scheme for rewards and incentives and recognition from the President of India, is seen as a promising scheme to increase sanitation coverage in rural areas (ibid).

There is an urgent need to integration of water and sanitation access in the rural areas as experiences show that availability of water is one of the major drivers of safe sanitation apart from issues of behavior change. The strategy
should be multi pronged for pooling in resources from all quarters. They may include supporting local groups, SHGs and NGOs to take up the promotion of hygiene and sanitation behavior change, in place of an infrastructure driven toilet coverage promotion in rural areas. In rural areas, the subsidy driven sanitation efforts have had a limited coverage impact on account of some serious physical limitations (water availability not there for assured flushing), resistance to adopt and use toilets where this is seen as a cultural and behavior change barrier, corruption in toilet construction with subsidies—are some of the major barriers in sanitation coverage as well as usage improvement in rural areas.

Proper sanitation is important to stay away from diseases at both personal and community levels. A number of diseases in India occur due to lack of proper sanitary facilities, especially among poor and rural people. By providing therefore proper sanitary facilities to people, these diseases can be controlled and a number of deaths can be avoided. While the responsibility of proper sanitation lies with the government, it’s equally important that every community and its inhabitants also take steps for personal sanitation.

3.4 Nutrition:

Health is to a great extent influenced by nutrition and nutrition in turn is linked to environment. Nutritional deficiencies lead to high rate of mortality and increased vulnerability of diseases. Nutritional surveys in the third world countries like India are quite difficult and different from those of the developed countries, especially in tribal and rural areas. Majority of the rural population
are peasant agriculturists and the larger part of their diet is obtained from locally produced items. Food habits of people of different castes differ. Further, it is also a well known fact that adaptation to climate involves an altered dietary regime (Rizvi 1991).

Hasan (1967 cited Rizvi 1991) has brought out numerous social-cultural factors involved in the food habits of north Indian villages and has shown differences in the methods of preservation and storage of food, methods of cooking, eating habits, food concepts and taboos, beliefs, values and customs. It is an accepted fact that health depends on nutritious food consumption in adequate amounts.

The factors of cultural value assigned to food items and religion must also be taken into consideration when availability of food is investigated. Rizvi says one third of the total number of cattle of the world is found in India, it does not mean that beef is a common food item here. Only 25% of the people eat non vegetarian food and that is mainly in the form of mutton, fowl, fish. Because of the strong religious feeling against killing and in many sections against eating cattle, the presence of cattle actually means less food for the people since cows compete for the available agriculture products (Spielman 1950 cited in Rizvi 1991)

In Mallapur, variety of crops such as groundnut (shenga) wheat (godhi), jowar (jwalla) and green gram (hesaru) are grown for consumption as well as sale. People grow crops according to the seasons and the major crops are jowar (jwola), wheat (godhi), green gram (hesaru) and bengal gram (kadale). People modify their diet according to the seasonal variations.
In Mallapur people of both vegetarian (sasyahari) and non-vegetarian (mamsahari) category are found. The people belonging to Brahmanaru, Lingayatharu, Vishwakarma and Jainaru castes are vegetarians, where as those belonging to Kurubaru, Maratharu, Muslyaru, Korvi, Waddaru, Nayakaru, Samagaru and Holiyaru castes are non-vegetarians.

Vegetarian diet consists of bread of jowar flour (rotti), bread of wheat flour (chapati), cooked rice (anna) and spicy chilly powder (masali kara) and vegetables that are available in the market as well as those that are locally grown. Vegetables are consumed raw as well as cooked. Egg (tatti), mutton (kuri mamsa), chicken (kolli mamsa), pork (handi mamsa) and beef (danada mamsa) are part of non-vegetarian diet. Non-vegetarian food is part of the diet. Along with vegetarian food meat or fish is consumed. The frequency of consumption of non-vegetarian food varies according to the family’s economic status.

Generally, both adults and children consume food thrice in a day. Breakfast (nasta) is consumed in the morning before leaving to school or work as is the case and the afternoon meal may be consumed at home or lunch box may be carried to the place of work and the evening meal (oota) is at home. A meal generally consists of bread of jowar flour (rotti), bread of wheat flour (chapati), rice (anna), curry and cooked vegetables (kayeepalye). According to people food has the quality of creating heat and cold. Food stuff is categorized as hot and cold. For instance rotti is considered as cold (tampu) food and chapatti as hot (kavu) food and rice neither hot nor cold.
Families who are economically well-off (srimantharu) consume gruel like food made of wheat granules (uppittu) and puffed rice (awalakki) for breakfast and the people who belong to middle (madyam vargadavaru) and poor economic (badavaru) group consume (rotti) and chapatti for breakfast. On new-moon day’s amasi and full-moon days (hoonnime) and during festivals, people consume special food like (hollige) and (kadabu) (sweets made from wheat flour, jaggery and flour of bengal gram).

It is believed by people that non-vegetarian food produces more heat in the body compared to vegetarian food. People say excess of heat causes health problems like mouth-ulcer (bayi novu) and boils (kuru). Since the village is located in the plains (bayalu simi), the climate of the village is generally hot and so, the majority of the people in this area consumes vegetarian food. Patwardhan (1952) says that cold weather stimulates appetite and hot weather depresses it. There are however few observations of either food intakes or energy expenditures under comparable conditions to support this. Any effect of climate is mainly due to changes in physical activity, as many studies have shown, the basal metabolism in the tropics is 10% lower than in temperate climates (cited Rizvi 1991).

Nutrition being a prime factor in the health of a community, public health-care system is involved in the betterment of nutritional status especially of the vulnerable groups. With regard to nutrition program “Integrated Child Development Services” (ICDS), is the largest nutrition program implemented by the government of India. It caters to 22.36 million beneficiaries with
supplementary nutrition. This includes 18.2 million children and 3.8 million expectant and nursing mothers from poor socio-economic groups. This scheme was launched in 1975 in pursuit of national policy for children in 33 experimental blocks (NFHS 1999). Through anganwadi’s, nutritional food is provided to the vulnerable groups in the village.

There are eight anganwadi is locate the village (these are located in different localities viz, there are 4 anganwadi’s in ooru, one is in the locality of Horatti, one is in near Mallayya temple, one is in janata-plot and reaming one anganwadi is located in the locality of hosa-plot). The information about pregnant women who belong to below poverty line is collected once in a month by the anganwadi teacher while collecting the family particulars of the people residing in the village which includes their annual income. Based on the annual income of the family of the pregnant women, anganwadi workers distribute nutritious food. This list also helps her locate children under the age of 6 years, girls under thirteen years of age, and puerperal women. These are the groups that are considered as vulnerable.

As the anganwadi teacher explains these pregnant women and puerperal women need extra nutrition and adolescent girls need more nutrition so that they become healthy mothers in the future. Children under six especially need nutritious food because their brains (medulu) is developing and if proper nutrition is not given they do not develop to the optimum level.

The nutritious food, is called poushtika ahara (meaning nutritious food). It consists of energy food (shakti ahara). It includes jaggery (bella), wheat
flour (*godhi hittu*) and flour of ragi (*ragihittu*) and also grains viz., rice (*akki*),
green gram (*hesara*), bengal gram (*kadale*) and black gram (*uddu*). The food is
distributed through the *anganwadi*.

Earlier, the *anganwadi* was distributing prepared food consisting of
boiled rice (*anna*). Later on rice was begun to be distributed to the pregnant
women (*hotti edavaru*) and puerperal women (*bannanti*). The reason for this
change was that the women refused to eat the prepared food. The reason for the
rejection of prepared food was that the food was not cooked properly and as
such spoiled their health and created several health problems like indigestion
and vomiting. All these problems of the pregnant and puerperal women were
taken into consideration by the health department and it began to supply food
grains in order to enhance nutritional status. The nutritious food which is
supplied to the children consists of boiled rice (*anna*), spicy rice (*chitranna*),
egg (*tatti*) and energy food (*shakthi ahara*).

Nutrition status is one major influencing factor for health. Malnutrition
is one of the greatest barriers to improve health in most countries of the third
world it leads to chronic illnesses of many kinds and lowers the body’s ability
to resist infections (Foster 1978). Thus there exists a vicious circle wherein
environment, nutrition, and illnesses are key factors, one leading to another
affect individual’s as well as community’s health.

Thus this chapter has made an effort to understand the different
influencing factors in the environment. The role of polity, economics, as well
as socio cultural practices is seen to play a role in the environmental factors.
With this understanding the next chapter looks into the various programs
launched by the public health system in the village.