CHAPTER-VI

Lymphatic Filariasis in Sample Area:
Cultural Dimension
Knowledge, Attitude and Socio-cultural Beliefs in Relation to the Disease

Knowledge refers to people's "knowing" about modern bio-medical information, such as the role of the mosquito in causing malaria, LF, the importance of good nutrition, or the risk of acquiring HIV infection from unprotected sex, etc. The term knowledge contains the implicit assumption that the information is "scientific fact", based on universal, cross culturally valid "truths". The term belief, in contrast, usually refers to traditional ideas or "folk model". Often belief is used to connote ideas that are erroneous from the perspective of biomedicine and that constitute obstacle to appropriate behaviour (Pelto and Pelto, 1997). The word attitude is closely related to belief but carries some additional meaning. Petty and Acaciopo (1989) have stated, "there is now wide spread agreement among social psychologists that the term attitude should be used to refer to general and enduring positive or negative feeling about some person, object or issue". Thus attitudes are generally thought to have emotional valevence, whereas knowledge is usually seen as the emotionally neutral background to attitude (Pelto & Pelto, 1997).

For the control of any infectious disease it is necessary to understand the target population knowledge and perceptions with respect to transmission and control of the disease. In LF, poor knowledge, indigenous traditional belief systems contribute to high-risk behaviour, and inappropriate preventive, illness and treatment choice behaviour (Ranyajin et al.1995). To prepare an acceptable and practicable control strategy planners and researchers must be aware of the knowledge and belief of the people regarding disease and its treatment and control. World Health Organisation (WHO) advocated that the endemic communities themselves are clearly the key to effective control. Also, it stated that, it is important to create better awareness on the disabling tropical diseases in the target communities. It should ensure more effective control and enable the community to exert pressure from below in priority setting and delivery of intervention thus contributing to the empowerment of endemic communities themselves (WHO, 1998). Hence it is necessary to develop group and region specific messages incorporating basic knowledge on the disease vital points
leading to internalization and practice of new knowledge acquired (Nayak et al., 2001).

In our study area there is no specific term in local language to denote LF. However, filarial fever is locally known as bata jwara. The term batajwara or batajaora refers to fever associated with swelling in the inguinal region, a classic symptom of acute ADL episode (Manson-Bahr and Bell, 1987). For the ADL symptoms people also use the local term bagi or pichhili. The most commonly used term for swelling of lower limbs (elephantiasis) is godhara, and for hydrocele it is eksira, which means majority of scrotum. It is interesting to note that majority of the people in this endemic area do not relate hydrocele with filariasis.

**Perception about elephantiasis and hydrocele**

With regard to knowledge on spread, about 19 per cent of males and 14.09 per cent of females know that elephantiasis can spread from one person to another (Table-9). Regarding cure of elephantiasis, 51.17 per cent males and 46.31 per cent females have the knowledge that elephantiasis can be cured completely. The ways of prevention of elephantiasis are known to 52.58 per cent males and 57.65 per cent females. Regarding removal of elephantiasis from the community, 56.33 per cent males and 45.63 per cent females stated that elephantiasis could totally be removed from the community. As regard to the spread of hydrocele, 5.16 per cent males and 3.35 per cent females opined that hydrocele could spread from one person to another. 88.73 per cent males and 72.50 per cent females believed that hydrocele could be cured completely. Similarly, 76.06 per cent males and 60.40 per cent females felt that hydrocele could totally be removed from the community. With regard to male-female differences, chi-square value indicates significant differences for a few issues.

**Cause of Elephantiasis and Hydrocele**

37.08 per cent males and 29.53 per cent females opined that mosquito bite is the cause of elephantiasis (Table-10). About 5 per cent males and 3 per cent females thought that poor personnel hygiene is the cause of elephantiasis. About 10 per cent males and 6 per cent females felt that unsatisfactory environment is the
cause of elephantiasis. About 16 per cent males and females thought elephantiasis as hereditary. A small proportion of males (3.28%) and females (0.70%) believed that poor nutrition is the cause of elephantiasis, 6.10 per cent of males and 8.05 per cent females said that elephantiasis occurs due to accumulation of bad fluids and 8.45 per cent males and 6.71 per cent of females stated other reasons for the cause of elephantiasis. About 36 per cent of males and 43 per cent females could not tell us any reason for elephantiasis. The chi-square indicates that the difference between both sexes is not significant.

Regarding cause of hydrocele only about 8 per cent of males and 5 per cent of females thought mosquito bite is the cause of hydrocele (Table-11). However, 21.12 per cent of males and 16.77 per cent of females felt that external injury is the cause, and 34.30 per cent of males and 22.81 per cent of females opined that cycling is the cause of hydrocele. A small proportion of males (5.16%) and females (4.02%) thought hydrocele as hereditary. A very small proportion stated that hydrocele is caused due to accumulation of bad fluids. It is remarkable to note that 30.04 per cent of males and 53.02 per cent of females have no idea about the cause of hydrocele. The chi-square indicates that the difference between male and female is significant. The males possessed relatively better knowledge with regard to cause of hydrocele when compared with females.

The KAP survey is undertaken among LF patients to know the differences among the patients. The study is conducted on case-control mode. About 24 per cent of chronic patients (vs. 23% of controls) and 36 per cent of acute cases (vs. 29% of controls) knew that elephantiasis is caused due to mosquitoes (Table-12). The other ways of spread of elephantiasis, cited by the respondents are: fate or evil spirits; hereditary; impure drinking water; heavy physical work; climate; etc. It is to be mentioned that remarkably 42 per cent of males of chronic and 24.7 per cent of acute cases do not know the cause of elephantiasis. The chi-squares indicate that the differences between LF patients and controls are not significant.

In the case-control study, it was found that 44 per cent of chronic cases (vs. 50% of controls) and 27.4 per cent acute cases (vs. 42.5% controls) did not know
the cause of hydrocele (Table-13). Only 19.35 per cent chronic cases (vs. 17.7% control) 13.7 per cent of acute cases (vs. 4.1% of controls) had the knowledge that hydrocele is caused due to mosquito bites. Interestingly enough, 38.4 per cent of acute cases and 39.7 per cent of acute controls stated that cycling and hard works are the causes of hydrocele. The chi-square values indicate that the difference between chronic cases and controls, as well as difference between acute cases and controls are not significant.

**Cure of the Disease**

In our sample, 49.30 per cent of males and 40.94 per cent of females stated that elephantiasis could be cured by taking modern medicine, whereas 5.63 per cent of males and 3.35 per cent of females thought that elephantiasis could be cured by keeping surroundings clean (Table-14). A very small proportion of males (5.16%) and females (2.01%) stated that preventing mosquito bites could cure elephantiasis. But 47.9 per cent of males and 53.7 per cent of females could not tell us any specific method of curing elephantiasis. The chi-square test indicates that the difference between males and females is not significant.

In the case of control study, 27 per cent chronic cases (vs. 27% of controls) and 49.3 per cent acute cases (vs. 49.3% of controls) stated that elephantiasis can be cured by modern medicine, whereas 33 per cent chronic cases (vs. 19% of controls) and 20.5 per cent acute cases (vs. 17.8% of controls) stated that elephantiasis could never be cured (Table-15). However, 35.5 per cent of chronic cases (vs. 49.2% of controls) and 26.0 per cent of acute cases (vs. 32.9% of controls) do not have any knowledge about the cure of the disease. The chi-square values indicate that the difference between chronic and acute cases, and the corresponding controls are not significant.

Regarding cure of hydrocele, 41.3 per cent of males and 30.20 per cent of females are of the opinion that hydrocele can be cured by modern medicine (Table-16). Whereas, 65.25 per cent of males and 51.00 per cent of females stated that hydrocele could be cured by surgery. None of the respondents spelt about the role of mosquitoes, but 11.27 per cent of males and 27.52 per cent of females do not know about cure of hydrocele. The chi-square indicates that the
difference between males and females is significant ($p<0.01$). The details of responses about knowledge on cure of hydrocele among chronic and acute cases and corresponding controls are presented in Table-17. 10 per cent of chronic cases (vs. 16% of controls) and 1.4 per cent of acute cases stated that hydrocele could not be cured. Whereas 23 per cent of acute cases (vs. 21.9% of acute controls) stated that hydrocele could be cured by surgery. On the other hand 31.5 per cent of acute cases and 37.0 per cent of their controls thought that hydrocele could be cured by modern medicine. But 55 per cent of chronic cases (vs. 55.6% of controls) and 21.9 per cent of acute cases (vs. 28.8% of controls) did not have any knowledge about the cure of hydrocele. The differences between the cases and their controls are not statistically significant.

**Prevention of the Disease**

Regarding prevention of elephantiasis 92.25 per cent males and 42.95 per cent females believed that taking medicine could prevent elephantiasis (Table-18). About 9 per cent of males and 4 per cent of females reported that elephantiasis could be prevented by keeping surrounding clean. Remarkably very low proportion of respondents only (14% of males and 6% of females) thought that controlling mosquito bite could prevent elephantiasis. Around 48 per cent of males and 52 per cent of females did not know any method of prevention of elephantiasis. The chi-square indicates that the difference between males and females is not significant. In the case of control study, about 14.5 per cent of chronic cases (vs. 6% of controls) and 4 per cent of acute cases (vs. 1.4% controls) said that elephantiasis could never be prevented (Table-19). About 8 per cent of chronic cases (vs.10% of controls) and 22 per cent of acute cases (vs. 22% of controls) had the knowledge that avoiding mosquitoes could prevent elephantiasis. A majority of respondents (63% of chronic and 43% of acute patients) did not know any specific way to prevent elephantiasis and small proportion of respondents reported that by good diet elephantiasis could be prevented. The differences between cases and controls are not significant.
Eradication of Disease

About 54 per cent of males and 44 per cent of females thought that elephantiasis could be eradicated by taking treatment (Table-20). On the other hand about 9 per cent of males and 3 per cent of females thought that elephantiasis could be eradicated by preventing mosquito bite. As many as 43 per cent of males and 54 per cent of females did not know any method of eradication of elephantiasis. The chi-square indicates a significant difference on knowledge about eradication of elephantiasis between males and females. Regarding eradication of hydrocele 60 per cent of males and 48 per cent of females thought that hydrocele could be cured by taking modern medicine (Table-21). On the other hand, about 28 per cent of males and 24 per cent of females felt that hydrocele could be completely cured by surgery. However, 24 per cent of males and 40 per cent of females had no idea about cure of hydrocele. The chi-square indicates that the difference between males and females is not significant with regard to knowledge on cure of hydrocele.

From our investigation it is found that LF is a common disease in the study area. Majority of people of this endemic area are familiar with various manifestations of LF along with their local names. Almost in all endemic areas, some local terms exist for these clinical manifestations. For instance, in Ghana, there are well-recognized words for various forms of the disease. The word for elephantiasis of the leg is atintim or napimpim. Similarly elephantiasis of arm is called jitintim or jipimpi. The elephantiasis of breast is known as yilpimpin or btintin. The word for acute ADL of the leg is nasaana and nassare. Hydrocele is called manchale or lani. paa or pua is the word for fever (Gyapong et al., 1996). Most of the villagers in Thailand, know a person who has enlarge legs and the local term for this condition is teen-to (Rauyajin et al., 1995). In South India lymphoedema/elephantiasis of the lower limb is called yanaikkal (Ramaiah et al., 1996). Lymphoedema of the upper limbs has no particular local term. The most commonly used name for hydrocele is veravekkam or veravadam, which refers to swelling of the scrotum. The local term for filarial fever is nerikatti juram. It has been found that though people are aware of hydrocele, they are unable to link
to filariasis. It is known that about half to two-third of hydrocele cases could be of definitely filarial etiology in endemic areas in India (Pani and Lall, 1999). In some endemic countries like Haiti, none related hydrocele to filariasis or mosquitoes (Eberhard et al., 1996). The knowledge on the spread of disease is poor in our study area and very small group of respondents could able to link these conditions to mosquito bite. Studies from other endemic countries like Thailand (Panvisavas and Ithijarukul, 1988; Rauyajin et al., 1995), Ghana (Ahorlu et al., 1999), Haiti (Everhard et al., 1996), Malaysia (Riji, 1983 and 1986), Philippines (Lu et al., 1998), French Polynesia (Carme et al., 1979), etc. reported that the poor knowledge of people on the role of mosquitoes. In Malaysia, more people believed that walking bare foot on dirty ground or consuming contaminated food or drinks is responsible for filariasis. There is a general feeling that strong, dark-skinned people are less likely to develop filariasis than others (Haliza, 1986).

In Tanzania people are aware of hydrocele, a predominate chronic sign in East-Africa, though filariasis per se, for which there is no local name (Muhondwa, 1983). Some people associate hydrocele specifically with mosquito bites, but they do not protect themselves from bites to avoid hydrocele. People generally know that mosquitoes transmit malaria, but not filariasis. Most people do not believe that mosquito transmit the disease. In Haiti, too, relatively few people believe that filariasis is transmitted by mosquitoes, despite education campaigns to explain the relationship. Ankle injury, aggravated by bathing in the sea, is most frequently mentioned as the cause of filariasis in this community. Some credence continue to be given to the traditional believe that elephantiasis is transmitted through urine or through food or drink (Carme et al. 1997; Kessel, 1957). In the Philipines filariasis is attributed to having contact with cold water after heavy work and only few educated people think mosquito bites as the cause. Others feel that taking long walk or squatting (especially fisherman while mending nets) can lead to elephantiasis and that among women, promiscuity or washing during menstruation can cause vaginal complications. People do not know the science behind the disease but they are able to identify adult males
particularly farmers, abaca strippers and fisherman, as being at high risk of developing chronic disease (Lu et al., 1988; Schulth, 1988).

In rural communities of South India less than 20 per cent of people know that filariasis is caused by mosquito bites (Ramaiah et al., 1996). People in endemic area generally conceptualize the cause or spread of elephantiasis or hydrocele in a manner related to their reasoning. For instance, some respondents believe that the disease is hereditary as these conditions are seen across generations of a same family. Some people believe that hydrocele is caused due to hard physical work or heavy cycling. Studies from other endemic areas reveal a variety of reasons for elephantiasis such as drinking water from ponds or wells, accumulation of bad fluids, poor nutrition in South India (Ramaiah et al., 1996); walking on bare foot on dirty ground, taking contaminated food and drinks in Malaysia (Riji, 1986); spiritual and supernatural, hereditary in Ghana (Gyapong et al., 1996, Ahorlu et al., 1999); walking bare foot, stepping on a bug, worm or microbe in Haiti (Eberhard et al., 1996), etc. In Ghana, hydrocele is believed to be caused by fever. It is believed that whenever a man gets a fever it usually settle in his scrotum, if not properly treated. So by the time he is a teenager he could have several episodes, which could cause the scrotum to swell and thus cause hydrocele. The same is true for the female breast, which is believed to be the equivalent of the male scrotum. Thus people believe that recurrent fevers lead to elephantiasis of the breast (Gyapong et al., 1996). But, above all there is almost universal absence of recognition of the role of mosquitoes play in transmitting this disease (Nayak et al., 2001). The explanation on knowledge with clear-cut categories of cause of disease has one major limitation in that it blends out the complex interactions of different knowledge sources in shaping local illness understanding. Many scientists have pointed out that illness/diseases are not always exclusively classified into one or another category. Lewis (1975) in his study among East Sepik society concluded that single cause could lead to different symptomatologies and a same symptomatology could be provoked by different causes.
Majority of our respondents did not relate mosquito bites with elephantiasis and hydrocele. An old man remarked:

“We do not know the reason behind filariasis, but we think that salty climate of coastal Orissa is responsible for elephantiasis.” (Madhav Chhuala Singh, Male, Age-70, Gothapada village)

Another young respondent stated:

“The mankada stone of this region causes filariasis. If you walk on that stone, you will be affected with filariasis”. (Bijoy Kumar Mishra, Male, Age-46, Badatota village).

But few educated respondents know about Culex mosquito. One young college student commented:

“I have read in the book that the Culex mosquito is responsible for the cause of filariasis”. (Rama Chandra Mishra, Male, Age-26, Mallipada village)

But, majority of people do not know the science behind filariasis transmission. They do not have adequate knowledge about the breeding sites of mosquitoes. People are not conscious about environmental degradation leading the conducive condition for the spread of the disease. They even fail to correlate rain with mosquito breeding.

**Socio-cultural Beliefs**

Man is unique in having cultural environment. This includes all the conditions in which men are born, live, work, procreate and die. Culture as an environment is deeply related to the health of human beings (Nagla, 1997). Every culture irrespective of its simplicity and complexity has its own beliefs and practices concerning diseases. No culture works in a meaningless fashion in the context of cure/treatment or prevention of diseases. Every culture evolves its own way (Choudhuri, 2004). Human beings correlate the disease to different cultural conditions. The environment, social milieu, indigenous knowledge, belief system determine the cultural explanations for various diseases. In spite of all biological and scientific explanations, people in the rural India still perceive the cause of the disease from a cultural viewpoint. The religious explanations or non-medical
knowledge are the by-products of culture and perpetuate from generation to
generation. The cure of filariasis is also homologous. The concepts of *karma*
(deeds/act) and *parinama* (consequences) reflect the regeneration and genesis of
divine in the mind of people. In case of filariasis, it is also believed that the
disease occurs due to *papa karma* (evil deeds). Generally, they relate the cause
for the disease to affect of the evil deeds. So, a person is believed to suffer from
disease due to the curse of the God, which is *parinama* of the evil deeds. In rural
Orissa, there is also classification of *karma* (deeds) and *parinama* (consequence).
For all types of *karmas* (deeds) the *parinama* (consequence) are not similar.
Different *karmas* (deeds) have different *parinamas* (consequences) and all
*parinamas* (consequences) are determined by *daiba* (supernatural power). The
consequences are prefixed but those are always regulated by *daiba* (supernatural
power). People think that a person will definitely suffer or bear the
consequences unless until he/she performs the *prayaschita* (atonement). So,
different *karmas* have different *parinamas* and also to get away from those
*parinamas* he/she has to perform different *prayaschitas*. For instance, if a person
steals gold from anybody’s house, he/she has to suffer from leprosy. Similarly, if
a person consumes the meat of wild parrot, then he will suffer from leprosy. Like
that, if a person insults his/her mother, then he/she will suffer from
elephantiasis. The other reasons of elephantiasis are also related to culture. If a
person cuts the Bara (*Ficus bengelinesis*) or Pipalla (*Ficus religiosa*) trees, he has
to suffer from elephantiasis. They think that these sacred trees are the abode of
lord Siva. Therefore, anyone who cuts these trees has to bear the curse of Lord
Siva. However, people do not relate hydrocele to any specific cultural belief.
They think that hydrocele is hereditary and sometime it occurs due to external
injury or cycling. Generally people do not think hydrocele as a serious disease
compared to elephantiasis. Interestingly enough people do not link hydrocele
with filariasis. They think that hydrocele is different from filariasis that’s why
they do not think mosquito is the vector for the transmission of hydrocele. In
case of elephantiasis maximum people even do not think that filariasis occurs
due to mosquito bite. They think that salty climate and red stone soil (*mankada*
stone) of costal Orissa are responsible for filariasis. People told that
accumulation of bad fluid is the reason for causing elephantiasis. The accumulation of bad fluids in case of hydrocele occurs due to hard work, excessive physical labour, long walks and prolonged standing. They also think that people who take salty fish, dry fish, pumpkin, stale watered rice, saru, sun fried rice, potato and sure items, etc. have greater chances of getting filariasis. It is believed that these food items enhance the severity of the disease. ADL episodes occur due to these food items. People also relate the drinking water of costal Orissa to the cause of the disease. People in the study area also believe that those persons who keep sexual relationship with elephantiasis patients have greater chances of getting affected with filariasis. They also think that spending sleepless night lead to filarial fever (ADL). People also think that an ADL fever occurs during purnima (full moon day) and amabaishya (new moon day) of course. There is no scientific reason behind this perception, but people correlates ADL fever to particular days. They think that elephantiasis is accumulation of bad fluid and the moon has magnetic power to attract the fluid and that attraction creates ADL episodes. Regarding hydrocele, people believe that those who drink water in standing position will suffer from hydrocele. They also believe that excessive physical labour is the cause behind the hydrocele. We have classified the causes of filariasis into the following six categories, which is shown below graphically.

- Disease caused due to hereditary factor (Hereditary Factor)
- Disease caused due to climate, water, soil, etc. (Environmental Factor)
- Disease caused due to diet, food habits, etc. (Nutritional Factor)
- Disease caused due to hard work, sexual intercourse and external injury (Behavioural Factor)
- Disease caused due to mosquito bite and filariasis worm (Pathogenic or Scientific Factor)
- Disease caused due to luck, karma (deed/act) or supernatural power (Supernatural Factor)
As it is mentioned earlier, some illness or symptoms could be provoked by different causes. Janzen (1978) in his work "the quest for therapy in Lower Zaire" showed how in people's illness narratives, viruses and bacteria interact with witchcraft. In another ethnographic study, Hausmann-Muele et al. (1998) described how malaria and witchcraft could be interrelated in illness interpretations. All these indicate as to how concepts from different sources amalgamate and give rise to new syncretistic interpretations.

As per people's perception, the disease is a consequence of evil deeds and regulated by supernatural power. To get away from the disease people perform specific puja (worship), fasting and vows in front of different gods and goddess. But mainly people perform puja in front of Lord Siva. Though people believe that disease occurs due to papa (evil deeds) and misfortune, they believe that by worshiping Lord Siva, they will get away from the disease and good fortune will come to them. They perform puja on Monday near Lord Siva and observe fasting on that day. Some of the patients observe this type of fasting for years together for the cure of filariasis. They offer coconut and wood apple leaves to Lord Siva.
Some of the victims visit to the Lokanath\(^{28}\) temple of Puri, where they make vow not to eat a particular fruit throughout life for an expected cure. They also present metal made legs and hands artifacts to the Lord Lokanath to get relief from leg and hand swelling. So, it is evident that people relate occurrence of the disease with the wish of the supernatural power, i.e. daiba. People in the study area told us that "bidhira Likhana, ke kariba ana" which means, "if something is pre-destined no human being can change its course". Therefore, they try to please the god by different means like prayer, worship, fasting, etc.

People relate the story of the God of death yama to filariasis. According to that mythological belief the God of death yama had suffered from elephantiasis due to his misbehaviour with his mother. They also relate the story of Trijata rushi (sage) to elephantiasis. Trijata rushi was suffering from elephantiasis. One day a sage came to him. He paid his respect to Trijata rushi by closing his eyes because he was unwilling to see the elephantoid leg. When that came to the notice of Trijata rushi, he cursed him that in the next incarnation he would be a blind person because of his hatredness towards elephantoid leg. Some people in this endemic area believe that those people who avail the benefits of landed property of Lord Jagannath of Puri without giving any share or offering to Lord Jagannath suffer from elephantiasis. All these beliefs related to filariasis give a picture of "religious explanation" of the disease. In other endemic communities also, people perceive filariasis having spiritual and supernatural causes (Gyapong et al., 1996; Rauyajin et al., 1995). People of Ghana and Thailand correlate the cause of elephantiasis with diet. In our study area people believe elephantiasis and hydrocele as hereditary disease. Such findings were also reported from Ghana. For some people in that country, elephantiasis could be hereditary because the disease was found across generations in particular households. It is also believed that hydrocele runs in the family because it is transferred from father to son through the semen during sexual intercourse (Gyapong et al., 1996). In Ghana it is believed that during "war dances," which are normally performed at funerals, juju men from different clan display their spiritual powers

\(^{28}\) Lokanath temple is the worship place of Lord Lokanath who is an incarnation of Lord Siva.
by throwing "spiritual medicines" on the ground. Any unsuspecting person who steps on these could get elephantiasis of the leg. Others also think it is possible to get elephantiasis of the leg by walking on herbs that have been thrown on the ground by herbalists, who are also thought to be powerful people. It is also believed that dwarfs inhabit certain places in the forest, which are very soft. If someone walks on such ground and feels the prick of a thorn, he should stand still for a few minutes to allow the dwarfs to remove the thorn. If he walks away immediately, and removes the thorn himself, he could get the disease (Gyapong et al., 1996).

The foregoing analysis shows that people's knowledge and awareness on filariasis is very poor. The information available on the knowledge, beliefs and perceptions on the disease amongst various communities indicated the need to develop health education and advocate strategies for the control of LF. It is generally recognized that the unsuccessful control of LF requires a package of interventions, many of which depend on their compatibility with local socio-cultural factors to be meaningful and promote active community involvement (Evans et al., 1993). An indisputable element among interventions is the health education. A member of important issues may immediately be identified as a target for health education (Ahorlu et al., 1999). Therefore to establish "scientific knowledge" regarding the disease it is essential to spread health education through cultural media to do away with the blind beliefs and superstitions. Unless and until the people realize the cause and effect of filariasis, the government activities towards control of LF will go in vain. Without determination of scientific knowledge on the disease cure and prevention, the community prevention strategy cannot be established effectively. Therefore the role of information on knowledge, attitude and beliefs of the people in the disease control strategies has greater importance and applied value. However, it is important to mention here that, one of the major unsolved questions in studies on health seeking behaviour is how far knowledge on disease actually determines practice with regard to treatment and prevention. Generally it is assumed that changing knowledge entails behaviour change. Hence, many studies conclude with recommending the education of the people.
about cause, treatment and prevention as the key factor for success in behavioural change. It is also recognized that improving knowledge, for example with health education campaigns, will not automatically lead to improved health seeking behaviour. It is because, apart from behaviour, there are many other factors relevant for health seeking behaviour such as unavailability and inaccessibility of health facilities, lack of drugs, lack of money for treatment cost, etc.

The two scarcely discussed points to consider while linking knowledge and behaviour are uncertainties of illness and non-reasoned behaviour (Hansmann-Muella et al., 2003). Often disease symptoms are diffuse and ambiguous, and disease course or treatment outcomes are unexpected. Facing uncertainty, people follow a trial and error search for relief and meaning on such circumstances, good knowledge would not affect behaviour (Whyte, 1997; Ryam, 1998).

Health-seeking Behaviour

Man has gained a vast complex of knowledge, belief, techniques, roles, norms, values, ideology, attitudes, customs, rituals and symbols that interlock to form a mutually reinforcing and supporting system. This constitutes a medical system, which includes all the clinical and non-clinical activities, the formal and non-formal institutions, and any other activities, that however tangentially bear on the health levels of the people and promote optimum functioning of the society. To be more specific, every society gives a theory of disease and also provides effective (if there is enough knowledge) treatment for the disease. This is carried out by a medical system, which is vary much a part of practices, methods, techniques and substances, embedded in a matrix of values, tradition, believes and pattern of ecological adaptation that provides the mean for maintaining health and preventing or ameliorating disease and injury in its members (Landy, 1977). However, diseases and cure system are universal phenomena. Every society, irrespective of its technical knowledge over the centuries, has devised methods of meeting the challenge of the disease (Mehta and Lamba, 1990). It is also a fact that every culture irrespective of its simplicity and complexity, has its
own believes and practices concerning diseases. No culture works in a meaningless fashion in its treatment of disease. Every culture evolves its own systems of medicine in order to treat diseases in its own way. This treatment varies from group to group (Choudhary, 2004). Here, the health seeking behaviour of LF patients varies from one pathological group to another. The patients having different manifestations of filariasis get treatment on the basis of hit and trial methods. They adopt different health coping mechanisms according to the time and space. It has been found that most of the chronic and ADL patients go for allopathic treatment instead of traditional treatment. The result shows that out of the 58 chronic filariasis patients, only 43 (74.14%) sought treatment and spent money during one-year study period. It is found that patients do not receive any greater benefits from these treatments. A respondent reported: “Batajawaraku chikisha nahi, Jahakuhela she charipanjiru gala!” (Batajwara has no treatment, anyone who suffers from filariasis goes out of his/her fortune!). So many chronic patients loose faith upon all kinds of treatments. Still some patients spend money and seek treatment to get rid of chronic elephantiasis. In our study they incur a geometric mean (n=58) of INR 396 (approximately US $ 8.7).

These patients seeking treatment from traditional healers or vaidyas receive a wide range of treatments. The results are interesting and astonishing. In our study we came across with various indigenous treatments.

**Patterns of Morbidity Management Adopted by our Sample Respondents**

- Leaves powder of kadamba (*Neolamarkia cadamba*) tree and caster oil as a paste/ointment.

- Honey and stale water mixture as lotion for the elephantoid leg.

- Boiled water of basanga (*Adhatoda vasica*) leaves.

- Sunthi powder once daily in empty stomach.

- Extract of the root of the Dhabalamukhi (*Datura fastousa*) along with garlic (*Allium sativum*) and leaf extract of coral trees (*Erythrina indica*) with black pepper (*Piper nigrum*).
- Wet clothes as bandage.
- River sand and powder of bricks as paste in the lymphodema leg.
- Massage of caster oil.
- Massage of ghee of black cow.
- Massage of paste of caster oil and leaves of palash (*Butea monosperma*).
- Massage of paste of til oil and leaves of *Tamarindus indica*.
- Bandage of roasted papaya at nighttime.
- Washing of legs in *kanjipani* water of stale rice.
- Use of sap of banyan tree (*Ficus bengalensis*).
- *Hingu* and *golmaricha* (black paper) powder in empty stomach.
- Use of turmeric powder as paste.
- Leaf extract of *nirgundi* plant (*Vitex nirgundo*) as an ointment.

Though some hydrocele patients avail indigenous treatment, majority undertakes allopathic or homeopathic treatment. Some respondents use the juice of *bara* (*Ficus bengalensis*) tree as a lotion to reduce the swelling of hydrocele. One respondent reported that he uses the juice of the leaves of *baramali* (*Agave americana*) to reduce the swelling. Some of the hydrocele patients reported that if tobaccos leaves would be used as bandage during nighttime, then the swelling will be reduced drastically in the morning. Some patients are found availing acupressure treatment. Other use extract of crabs' eye plant (*Abrus precatorius*), leaves of chinarose (*Hibiscus rosasinesis*), flower and pathora (*Cocculus hirsutus*) oil, extract of banana (*Musa sapientum*) leaves, blood drawn from buffalo horn. Non-consumption of pickle, curd, watered rice, etc. are other forms of treatment for reducing swelling.

With regard to ADL acute attack in our study, of the seventy-three episodes (64.6%) in 47 patients, 65.3 per cent sought treatments. Besides allopathic and homeopathic treatments, a small number of patients have undergone home
remedies and religious treatment. These home remedies also vary from patient to patient. One patient reported that he takes enough raw garlic to check the ADL fever. One patient stated that he takes *Sunthi* (one type of herbal root) regularly in an empty stomach to check the ADL fever. Another respondent takes the leaves of *bel* tree (*Agele marmalous*) in empty stomach regularly. Yet another patient reported that he takes seven leaves of neem (*Azadirachta indica*) along with 7 black peppers in empty stomach to avoid ADL fever. Some said that they use the paste of nirgundi (*Vitex nirgundo*) plant in the “bagi” or “pichhli” swelling area to avoid acute attack. Besides indigenous treatment they also avoid certain food items like sun-fried rice, salty fish, dry-fish and stale watered rice, pumpkin and *saru*. But the respondents could not tell us in clear-cut terms the benefits they derive from these home remedies and herbal treatment.

Besides these herbal and home remedies some respondents seek “religious treatment”. Generally those patients make vow to perform some kinds of *puja* (worship) in honour of lord Siva. Various other terms of vows are: fasting, special type of *puja* or worship, chanting of any specific mantra daily, observance of celibacy, offering of any specific flower or fruit to lord Siva, avoidance of taking some specific food items or fruits, etc. Some female respondents take sun-fried rice daily to avoid ADL fever and further progression of lymphoedema. Some people also offer silver or gold made hand or limb artifacts to lord Siva to get rid of filariasis. Some use fetish or *dauria* to prevent filariasis. These religious beliefs are deep-rooted in the minds of filariasis patients. However, none of the patient could tell us the exact benefit they derive from these types of treatment and observance. The traditional healers and *vaidyas* also do not have knowledge about any specific mode or method of treatment for the LF. One old *vaidya* told us that “*Sabu rogaku kali barana, batajwara ku napaili karana*” (I could prevent all major forms of diseases but I have no specific treatment for filariasis). Similar feelings and views are shared by all traditional healers in the region.

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29 *Dauria* is the fetish used by filariasis patients to get rid of the disease. It is made by silver.

30 *Vaidya* is the traditional herbal healer.
Earlier studies undertaken in Ghana give a picture of traditional treatment of elephantiasis. People go to herbalist and soothsayer for the treatment of elephantiasis, hydrocele and breast swelling. They do herbal treatment and even use cow-dung as ointment to get rid from elephantiasis. But, due to unfruitful result they also take shelter of supernatural power because they also do not know what to do more for its treatment (Gyapong et al., 1996). In our study majorities of patients avail of treatment from Government sources. It was also found from recent studies in South-India that majority of the chronic patients take treatment from Government health institution, but in case of ADL, majority of patients take treatment from private clinics. Credibility (confidence) and satisfaction with the attitude of the provider and perceived benefits of the treatment as well as accessibility of clinics are the factors that promoted patients to seek treatment for ADL for private clinics (Nanda and Krishnamorty, 2003). The socio-behavioural as Andersen model of health care utilization (Andersen and Newman, 1973) listed out three clutters of factors namely predisposing (such as patients characteristics, prior experiences with illness, knowledge on disease, attitude towards health services etc.), enabling factors (availability of services, financial resources, etc.) and need factors (perception of severity, total sick days, loss of work, etc.). These factors give explanation for differential health care utilization across different symptoms.

For LF presents with various chronic manifestations, i.e. lymphoedema and hydrocele, acute ADL attacks etc. repeated acute episodes have a greater short-term disability and subsequent economic loss (Gyapong et al., 1996; Ramaiah et al., 1998) and it leads the progression from lymphoedema to elephantiasis (Pani et al., 1995). The lymphoedema and other chronic forms of LF have also significant impact on various aspects of patient’s life (Gyapong et al., 1996; Ramaiah et al., 1997, 1999). Two types of acute attack are recognized by Dreyer et al., (1999): acute filarial lymphangitis (AFL) caused by the death of adult filarial worms and acute dermeto lymphangioadentitis (ADLA), the result of secondary bacterial infections. The role of bacteria in the pathogenesis of ADLA has been well-established (Olszewski et al., 1994; Shenoy et al., 1995). Olszewski (1997) conducted bacteriological studies on skin, tissue fluid, lymph and
lymphanodes from cases of filarial lymphoedema, and explained the episodes of
dermatolymphangioadenitis (DLA) and their aetiology. Stagnation of lymph in
the affected limb tends to occur due to incompetence of the unidirectional
valves in these vessels and this is aggravated by acute bacterial infections of the
limb, prolonged standing or strenuous exertion. Stagnation of lymph encourages
growth of bacteria invading the region. Injuries, even minor ones, resulting in
wounds or obstruction, fungal and bacterial infections; fissuring of skin
paronychia and eczema are the lesions of the skin that favour entry of such
bacterial into the tissue (Shynoy et al., 1995, 1999). Also studies have
implicated pathogenic bacteria mainly streptococci and occasionally other
pathogens as the secondary infection and result inflammation also seem to play
major roles in the skin changes in the limbs affected by the lymphoedema
including the development elephantiasis (Olszewski et al., 1992; 1993). Olszewski
(1996) demonstrated that simple hygienic measures supplemented with
antibiotic treatment have profound effect in preventing these acute episodes.
Shenoy et al., (1999) reported how well-designed programmes of footcare could
significantly decreased the frequency of ADL attacks and also promote to elevate
the disability of LF. For that reason, in our study footcare measures among
lymphoedema patients have studied as part of health seeking behaviour. The
socio-demographic charasteristics of those patients are shown in Table-22. Of the
total hundred lymphoedema patients, 38 per cent are males and 62 per cent are
females. About 9 per cent are between 31 and 40 years of age and 26 per cent
are between 41 and 50 years of age. However, majority of the patients are above
50 years of age. So far education is concerned, 54 per cent patients are illiterate
and 44 per cent have education up-to 10\textsuperscript{th} standard and only 2 per cent patients
have higher education. Most of the patients are from lower socio-economic
group. About 83 per cent of patients had annual family income below
Rs.\text{20,000}/. Only 10 per cent had annual income between Rs.\text{20,000}/ and
Rs.\text{40,000}/ and 7 per cent have income above Rs.\text{40,000}/. In terms of clinical
features, 37 per cent of patients have right lower limb elephantiasis and 26 per
cent have left lower limb oedema whereas 37 per cent have oedema of both the
lower limbs (Table-23). Regarding lymphoedema gradation, 18 per cent have
Grade-1 lymphoedema and 16 per cent, 63 per cent, 3 per cent have Grade-2, Grade-3 and Grade-4 lymphoedema respectively. With regard to duration of lymphoedema, 3 per cent have lymphoedema for about a year and 34 per cent had lymphoedema between 1 and 10 years. However, majority of the patients (63%) have lymphoedema for more than 10 years. The results reveal that out of 100 patients, 60 patients clean the affected area regularly besides bath (Table-24). 20 patients massage the affected area, 60 use comfortable footwear. But nobody use any specially made footwear. Out of 100 patients, 19 (19.0%) patients do the elevation of affected leg regularly and 2 (2.0%) do exercise of affected leg. 16 patients (16.0%) use bandage. Table-25 and 26 show the association between some demographic and clinical characteristics of the patients with footcare practices. The means of footcare score practices among various groups of patients show that education of the patients has a direct bearing, however gender and age have no significant affect. The clinical features, i.e. lymphoedema grade and duration have no effect on mean number footcare practices.

The present results on footcare practices among filarial lymphoedema patients are not surprising, but disappointing. Most of the patients use ordinary footwear, which certainly prevent external injury while moving. Similarly cleaning of affected limb is reported by considerable proportion of patients. It is uncertain to link these two practices to lymphoedema footcare, as many of the people in this area use footcare while they go out-door and wash their limbs before going to bed. However, it is confirmed from the patients that they wash their affected limb specifically and carefully. As no specially designed footwear is available commercially, many patients do not use bigger size footwear. This detoriates the foot hygiene by increasing the chances of injuries and infections when they go for outdoors work. Washing of affected limb on regular basis is important. Attention should be given to the skin between the toes, skin folds and wounds, if any. And it should be ensured to make them dry. Minimum foot hygiene is key in the lymphoedema management. Dreyer et al. (2002) recommended washing the affected limb regularly with soap and clean water to avoid the progression of lymphoedema to elephantiasis. In our study area,
people use different oils, such as coconut oils, mustard oil, etc. for massaging. However, that oil facilitates the accumulation of dust when they go out. So necessary care should be taken when oil is used for massaging. Elevation of the affected limb during sleep and leisure time is recommended as it prevents the accumulation of the fluid in the affected part, and brings considerable relief (Dreyer et al., 2000). Some patients in this study, follow it when they sleep and they thought that limb elevation causes reduction of oedema. But exercising of affected limb is seen very rarely. Moment of exercise of affected limb increases the flow of blood and limb through limb (Bingham, 2002). Many patients perceive the advantage of use of bandage and among them around 15 per cent of patient use some sort of bandage, usually a simple cloth strip rather than a commercially available pressure bandage. It is well-established that each acute episode among lymphoedema patients may cause considerable economic loss to the concerned family and increase the risk of more episodes and further worsening of the condition. The hypothesis that bacterial and fungal infection contributes to the progression of filarial morbidity is supported by the isolation of bacteria from limb of the patients. It is proved well by experiencing the acute attacks and by the prevention of such attacks by improving skin hygiene and treatment with tropical antibiotics and anti-fungal cream (Shenoy et al., 1995, 1999; Olszewski et al., 1999; Suma et al., 2002). The main stay in the prevention of acute episodes is local care of the affected limbs (Shenoy et al., 1998, 1999). The available information indicates that the levels of footcare practices are very low in endemic areas of Andhra Pradesh (Babu and Nayak, 2003b) and Tamil Nadu (Nanda and Ramaiah, 2003). There is need to assess the knowledge and practice of footcare among lymphoedema patients of the various endemic areas of the world, which enables to develop the strategies towards the promotion of footcare in the management of filarial lymphoedema. The study area is covered by the mass drug administration of Diethylcarbamazine and Albendazole under GPELF. Though the elevation of disability and control of morbidity is one of the two components of GPELF, no attempt is made in this direction. The filarial patients visit to the institutions of primary health canters in rural areas for treatment of various forms of LF. The medical and para-medical staff of the
Peripheral institutions are not educated enough about recent developments in the clinical management of LF. The peripheral health workers should advocate for the promotion of the footcare practices, such as regular cleaning of affected parts with soap and water, the use of antibiotics/antiseptics, limb elevation and exercising. Optimal disease prevention at the community level requires the development of simple, reliable and effective strategies to control secondary infections, as these infections are essential co-factors in the development of filarial lymphoedema and further progression of elephantiasis (Dreyer et al., 2000). Though many people living in endemic areas are aware of elephantiasis, they fail to recognize early stages of lymphoedema and subsequent treatment. Appropriate care at early stage can help in prevention or reversal of the progression of the disease. Though this home-based footcare relies on patients and the family, it should be integrated into the primary health care system. Hence, peripheral level health institutions should take lead in encouraging the patients to modify their behaviour with new footcare practices. Also the operational issues to provide appropriate services at peripheral health institutions including transfer of available technology of lymphoedema management should be understood to optimise their utility and outreach.

**Economic Burden**

**Chronic Cases**

The present part of results and discussion deals with economic burden of chronic filariasis. Due to chronic manifestation of the disease patients loose many working days and they also spent money for the treatment of those chronic conditions. The global burden of LF and infectious diseases is estimated (World Bank, 1993). This has been recognized as a serious underestimate (WHO, 1994), as the disability, social and economic burden caused by LF is poorly understood and remains un-quantified (Evans et al., 1993). There are some studies on social and economic burden of the LF from a few endemic areas in the world (Gyapong et al., 1996; Dreyer et al., 1997; Ahorlu et al., 1999, etc.) including South India (Ramu et al., 1996; Ramaiah et al., 1997, 1998, 1999, 2000). However, the information on the economic loss in terms of loss of work time due to LF from
different endemic areas is scanty. In our study, both direct (costs of treatment) and indirect costs (loss of work time) to patients suffering from chronic forms of LF i.e. elephantiasis and hydrocele are examined. Case control mode is adopted to study the cost due to chronic filariasis. Various characteristics of both patients and controls are given (Table-27). Of the total 62 patients, 40 (64.5%) are males and 22 (35.5%) are females. Regarding clinical condition, 34 (54.8%) are with lymphoedema, 21 (33.9%) are with hydrocele and 7 (11.3%) are with both hydrocele and elephantiasis. Of these patients, 18 (29.0%), 11 (17.7%) and 33 (52.2%) are "agriculturists", "labourers" and with "other occupations" respectively. Also, 40 (64.5%) and 22 (35.5%) belong to nuclear and joint family respectively. Around 85 per cent of patients have thatched houses and remaining patients have other types of houses like pucca and mixed. As regard to electrification of houses, 29 (41.9%) houses of the patients are electrified. Out of 62 houses of patients, 44 (71.0%) houses are with cattle shed, and the rest 18 (29.0%) have no cattle shed. Regarding water logging, 28 (45.2%) patients house possess logged water and 34 (54.8%) patients houses do not have water-logging problem. With regard to the use of bed net, 25 patients (40.3%) and 27 controls (43.5%) use bed net. Similarly 16 (25.8%) patients and 23 (37.1%) controls use repellent. The mean age of patients and controls are 46.22 and 45.60 years respectively. As our study area, agriculture is the prime occupation of the people, women are housewives, engaged in domestic works such as cooking and cleaning household things and cattle shed. With regard to educational status, a higher proportion of both patients and controls are illiterate. Very insignificant number of people are with more than 10 years of education. Of the 62 patient families, 40 (64.5%) are of nuclear type and the remaining 22 (35.5%) are joint families.

**Treatment Costs**

Out of total 62 patients, 58 patients are covered during all the three follow-up of the study. Out of 58 patients, 36 are males and 22 are females. Out of total 36 male patients, 24 (66.67%) and out of 22 female patients, 19 (86.36%) have sought treatment during the course of our study. Out of 58 patients, a total number of 43 (74.14%) patients have taken treatment (Table-28). The chi-square
indicates that the difference between both the sexes in relation to treatment is not significant (P>0.05). Regarding pathological groups, of the 12 lymphodema male patients, 10 (8.33%) have taken treatment and out of 22 females lymphodema patients, 20 (90.91%) have sought treatment. Similarly out of total 17 hydrocele patients, 7 (41.18%) have taken treatment and of the 7 patients possessing both elephantiasis and hydrocele, 6 (85.71%) have taken treatment (Table-29). The chi-square indicates that the difference between different pathological groups is not significant.

Regarding treatment cost the expenditure range among the male patients varies from Rs.5 to Rs.6313 and among female patients the range is between Rs.60 and Rs.8600. The geometric mean cost among the male and female patients are Rs.401 and Rs.390, respectively (Table-30). Regarding treatment costs among different pathological groups, there is a variation from one pathological group to another. The details are shown in Table-31. The range of treatment cost is Rs.20 to Rs.5540 among male lymphodema patients and the range is Rs.60 to Rs.8600 among female lymphodema patients. The range is Rs.5 to Rs.880 among hydrocele patients and it is Rs.53 to Rs.6313 among patients having both lymphodema and hydrocele. The geometric mean cost among male lymphodema patients is Rs.576 and the corresponding figure for the females is Rs.425. It is Rs.195 among hydrocele patients and Rs.381 among patients suffering from both lymphodema and hydrocele.

A total of 43 patients had sought treatment for 74 times during a period of 1 year of our study. Of these 74 times, 32 (43.2%) times are from government hospitals, 18 (24.3%) are from private pharmacists or medical shops and 17 (23%) times are from private practitioners. A small proportion of patients undertake treatment from homeopathic practitioner (5/74) and traditional healers (2/74). On an average the patients (n=58) incur a geometric mean of INR 396 (approximately US $ 8.7).

The total expenditure per patient varies widely i.e. INR 5 to 8600 (US $ 0.11 to 189.2). Relatively, male elephantiasis patients spend more than the remaining patient groups. The details of various components of the expenditure on
treatment reveal that out of the total amount spent, Rs.30816.00 (63%) is spent on purchase of medicines (Table-32). It is followed by expenditure on stay and food i.e. Rs.8806.00 (18%). The expenditure on travels is Rs.3914 (8%), on escorted person with the patients is Rs.3914 (8%) and for consultation, it is Rs.1468 (3%) which is relatively less. These details are also illustrated in Figure-6.

**Loss of Productive Time**

The data on daily activities of patients and controls reveal that the total absenteeism or total loss of work is recorded in 22.6 per cent of visits among chronic patients. However, among controls also, the total absenteeism is reported in case of 13.4 per cent of visits. The difference between patients and controls is statistically significant ($\chi^2 = 5.26$, P<0.05). In 120 numbers of visits during a year, it is found that the number of work hours per male patient is 4.65 (S.D. 3.29) and among controls it is 5.48 (S.D. 3.17). The mean difference is 0.83 (S.D. 2.95). During 66 visits among the female elephantiasis patients the number of work hours per patients is 5.45 (S.D. 3.37) and it is 7.12 (S.D. 3.07) among the corresponding controls (Figure-7). Considering both male and female patients together in 186 numbers of visit the mean number of working hour is 4.94 (S.D. 3.33) among patients and 6.06 (S.D. 3.22) among controls. The mean difference in working hours among female patients is 1.67 (S.D. 3.37) and 1.13 (S.D. 3.13) among all the patients. The number of working hours and the mean difference varies from one pathological group to the other, and these details are shown in Table-34. In a total of 42 visits of male elephantiasis patients, the mean working hours is 4.45 (S.D. 3.52) and among its control, it is 5.26 (S.D. 3.21). The mean difference between male elephantiasis patients and their controls is 0.81 (S.D. 3.50). The mean working hours is 5.45 (S.D. 3.37) among female elephantiasis patients and it is 7.12 (S.D. 3.07) among their controls. The mean difference is 1.67 (S.D. 3.37), which is highly significant. During 63 visits among the hydrocele patients, the number of working hours among the patients is 4.98 (S.D. 3.00) and it is 5.78 (S.D. 2.84) among their controls. The mean difference is 0.80 (S.D. 2.83), which is also statistically significant. During 15 visits among the patients with both elephantiasis and hydrocele, the number of
working hours is 3.87 (S.D. 3.83) among patients and 4.87 (S.D. 4.32) among the controls. The mean difference is 1.00 (S.D. 1.70). The differences between number of working hours between chronic patients and corresponding controls are significant for both the sexes as well as among all pathological groups, except among the male elephantiasis patients. The loss of mean working time is slightly more among women than men; however, this difference is not significant (t = 1.70, p>0.05). Among different pathological groups, the loss of working time is more among female elephantiasis patients followed by men with both elephantiasis and hydrocele. Men with either elephantiasis or hydrocele record loss of lesser working time. These differences are not significant (F=1.05; P>0.05).

The logistic regression analysis reveals that the disease condition has significant impact on complete absenteeism from productive work. The patient’s characteristics, i.e. sex, age and family types also influence the absenteeism (Table-35). Similarity, an attempt is made to examine the influence of these variables on number of productive hours (Table-36). The disease condition has a significant affect on the number of productive hours per day. The number of productive hours per day is also affected significantly by sex, age and family type of the individual. The R², the measure of goodness of fit indicates that 16 per cent of the variation in the number of working hours per day is explained by these variables.

The present information on economic loss due to chronic forms of filariasis forms an important component of the total socio-economic burden of the disease from this endemic region. The treatment expenditure is an important economic burden to the patients and their families. In our study site, relatively higher number of chronic patients (74%) have sought treatment with the belief that it gives some relief. It is observed that 65 per cent of these chronic patients are not aware that the condition is irreversible and incurable. Similarly higher number of chronic patients (75%) sought treatment in South India rural communities (Ramaiah et al.,
1999), but in Ghana (Gyapong et al., 1996), chronic patients in less percentage seek treatment (44.5%). These patients seek treatment for relief due to social (Lu et al., 1998; Dreyer et al., 1997) and economic impact of the disease (Gyapong et al., 1996; Ramu et al., 1996; Ramaiah et al., 2000). The hydrocele patients know that corrective surgery is available for a permanent cure but they generally do not avail of this because of the cost and loss of work and income during recuperation period. In this study area, the cost of single hydrocelectomy is around INR 2000 (US$ 44). Majority of patients with hydrocele in Philippines (Lu et al., 1988) and Ghana (Gyapong et al., 1996) are also reported not to go for surgery because of the cost involved. In our study, the average cost of treatment of chronic condition, i.e. INR 396 (approximately US$ 8.7) is considerable for poorer families, who mainly depend on minor farming and daily labouring. The per capita of this population is INR 5648 (Government of Orissa, 2000). It indicates that about 7 per cent of the per capita income is spent for seeking treatment of their chronic condition due to LF. Also, the mean expenditure per year is equivalent to the wage of 8-10 days. Along with treatment expenditure, the patients have the burden of loss of work by total absenteeism from the work and lessening of working time than the healthy people. The people with advanced stage of hydrocele and elephantiasis confine themselves to home. It leads to reduction of productivity and income, as reported in many studies (Kessel, 1957; Wijers and Kinyanjhi, 1979; Wegela et al., 1979; Muhondwa, 1983; Ramaiah et al., 1999). In our study, 23 per cent of patients compared to 13 per cent healthy individuals reported total absenteeism to the productive work. These results reveal that 77 per cent of chronic patients go normally to the work, though the total work time is lesser than healthy people. It is largely because of low socio-economic status that leads to adoption of coping mechanisms and most of these patients depend on the daily earnings. Gyapong et al. (1996) based on a study on filarial patients from
a farming community of Ghana conclude that the chronic patients adopt coping mechanisms to do some productive work. Muhondwa (1983) reported that those with hydrocele, change occupation to cope with advanced disease in Tanzania. In our study population each chronic patient loses 1.13 productive hours per day compared to normal individuals. It means the chronic patients lose a total of 68 days of work per year, which is equivalent to around 19 per cent of the total productivity workdays. From a study in South India, Ramaiah et al. (1999) reported that chronic patients lost about 17 per cent of total workdays. The results reveal that the productivity of chronic patients is also influenced by age, sex and family type of the patient. In addition to the disease condition, increasing age with the progression of the disease further worsens the situation by lessening the working time. Along with the social agony and psychological impairment with the chronic forms of the disease, most of the patients find themselves burden to the family. Besides this, the qualitative data also supports the findings of our quantitative data in relation to the economic burden of chronic filariasis patients. The chronic condition makes hindrance to productivity and it creates work loss and it becomes barrier to development. The chronic patients lose working hours and wage. A young elephantiasis patient explained:

"Due to elephantiasis, I am unable to work, plough my land and I cannot also lift heavy weight. If I do hard labour than I am likely to suffer from fever (Bagi padiba, pichhili padiba). So elephantiasis obstructs my work performance and indirectly affect my earnings." (Harihara Martha, Male, Age-55, Podapada village)

Elephantiasis condition is not only a major problem in relation to economy but also creates other socio-economic problems. Another hydrocele patient described:

"Hydrocele has restricted my work preference and choice of profession. I am unable to ride bicycle, earlier I was going to Jatani (nearby town about 12kms away from
the village) to do house construction work. I was then receiving better wage there. However, now due to hydrocele, I am working inside the village for lesser wage.” (Nabakrushna Moharana, Male, Age-44, Kansapada village)

The chronic patients spend a lot of money for their treatment without any fruitful result. One old elephantiasis informant commented:

“For the treatment of elephantiasis I sold away my cattle, first I sold a cow than two oxen and later on all my hens to bear the treatment cost, but, all my efforts went in vain. I could not get relieve from elephantiasis condition.” (Sukanti Jena, Female, Age-65, Mallipara village)

Thus, it is evident that the treatment of lymphoedema condition is a big problem for the poor people and poor people are becoming poorer due to this un-fruitful condition. The economic loss due to hydrocele condition is also enormous. Another old hydrocele patient complained:

“For a permanent cure of hydrocele, I went for a surgery by spending Rs.2000 about 10 years ago. But the unfortunate thing is that after 10 years again the hydrocele has appeared. Now for another surgery, I need Rs.3000 to Rs.4000. I am a poor man, how can I arrange such a big amount again? What is the solution? Government should provide surgery of hydrocele free of cost.” (Ganesh Routray, Male, Age-65, Badatota village)

Though established elephantiasis and hydrocele have no clear treatment for complete cure, people spend a lot of money to get rid of that condition by using different methods of treatment. In case studies it is found that people spend money by adopting different methods of treatment due to ignorance. Though people have heard about the surgery methods of treatment for both elephantiasis and hydrocele, still they are reluctant to adopt that method due to poverty and fear. The surgery for lymphoedema/elephantiasis costs around INR 25,000. In the present study area, people have no strength to bear the cost of elephantiasis surgery and it is also not possible in the local hospitals. From in-depth interviews and case studies it is evident that people sell their landed property, domestic animals, birds and other household property in a distress conditions. Along with this, they also lose wage, choice of occupation, choice of place of occupation and their professional environment. The present results
along with the studies on effect of chronic LF on economic burden (Gyapong et al., 1996; Dreyer et al.; 1997; Ramaiah et al., 1997) indicate that the chronic conditions of LF pose a considerable burden on the patient, family and community. In the study population, about 7 per cent of the population are affected by different chronic forms of LF (Babu et al., 2001). Similarly in many endemic areas, the prevalence of chronic disease is more (Michael et al., 1996).

**Acute Cases**

This part of result and discussion deals with economic loss in terms of treatment costs and work loss due to acute form of the disease, i.e. adenolymphangitis episodes from the study population. A total of 72 individuals (52 males and 20 females) of the study population (5.42%) are affected with 113 ADL episodes during the one-year surveillance period. The annual incidence per 1000 individuals is 91.97, i.e. 77.64 among men and women respectively, and the overall incidence is 85.03 per 1000 individuals. These patients are studied to assess both treatment costs and loss of productive time.

**Treatment Source and Details of Expenditure**

Out of 72 numbers of patients in 113 episodes, 42 patients have paid for their treatment (Table-37). This table illustrates the distribution of patients by the number of episodes they have experienced, and the number of patients paid money for treatment of ADL episodes. Half of the patients, who suffer from acute episodes, spend money for treatment of ADL. The descriptive statistics of these expenditures are shown in Table-38. Twenty-six numbers of patients (who experienced only one episode in a year) spend in a range of Rs.1 to Rs.442 and eight numbers of patients (who reported two episodes in a year) spend in a range of Rs.6 to Rs.334. Only 2 numbers of patients (with three episodes) spend in a range of Rs.40 to Rs.108 and four patients (who experienced four episodes) spend in a range of Rs.10 to Rs.183. Taking altogether, of the 42 patients, the treatment expenditure ranges from Rs.1 to Rs.442. Among 42 patients, the arithmetic mean is INR 92.30 and geometric mean is INR 38.05. Of the 113 episodes in 72 patients, 73 episodes (64.6%) in 47 patients (65.3%) are treated for relief. Out of 73, 18 episodes (24.7%) are treated by self-medication, 34
(46.6%) by local healers, 11 (15.1%) by private practitioners and 10 (13.7%) at local primary health center (PHC). Out of the 73 episodes receiving treatment, expenditure is made for 63 (86.3%) episodes that occurred in 42 patients. For the remaining episodes (13.7%), patients spend nothing on the treatment. The overall geometric mean for all 113 episodes in 72 patients is INR 8.71 (approximately US$ 0.17). The individuals who experienced more episodes during a year spent more on treatment than those who suffered only once. The geometric mean total expenditure indicates that treatment by private practitioner is more expensive (INR 104.06 or US$ 2.08) than by PHC (INR 20.09 or US$ 0.40), local healers (INR 4.35 or US$ 0.09) or self medication (INR 0.54 or US$ 0.01). The details of various components of the expenditure on treatment are given in Figure-8. It reveals that out of the total amount, 68.7 per cent is spent on purchase of medicines. It is followed by travel for treatment (10.9%) and on consultation fee (8.6%). The expenditure on other components, i.e. self-medication, stay and food and escort are relatively less.

Loss of Productive Time

The paired data on activity pattern during 112 episodes, among patients and corresponding sex, age and occupation matched controls are collected. The cases and controls are closed matched in terms of education, occupation, family income and housing type. Data on daily activities of patients and control as well as the total absenteeism or total loss of work from economic activity is recorded. Out of total 112 episodes among ADL patients, in 98 (87.5%) of episodes, the patients are totally absents from economic activity (Table-39). The difference between patients and controls is significant (P<0.001). Similar observation is made among the corresponding controls and it is observed that among 98 controls (87.5%), the absenteeism from economic activity is recorded. The absenteeism is recorded in 50 (79.44%) male patients and 18 (28.6%) of corresponding controls. Among the female patients, of the 49 episodes, during 48 episodes (98.0%), the absenteeism is recorded whereas this is only in 35 (71.4%) of the control groups. The mean age (in years) of cases and controls is 40.99 years (S.D 16.42) and 40-15 years (S.D 16-48) respectively. Similarly
among females, absenteeism from domestic activity is recorded during 27 (55.1%) episodes and 4 (8.2%) corresponding visits of controls with a significant difference between patients and controls (p<0.001). The absenteeism from the productive work is high in this community, which is due to low availability of seasonal employment. Also 23.7 per cent of respondents (in both cases or controls groups) are dependent on the family. Hence, there is high absenteeism. The details of number of hours spent on work per day per patient along with corresponding figures for controls are shown in Table-40. The data indicate that patients spend 0.81 ± 2.31 (S.D.) hours per day on economic activity during one day of the period when they are affected, compared to 3.50 ± 3.74 (S.D.) hours by the controls. The difference is statistically significant (p<0.001). The trend is similar for both sexes considered separately. The mean number of hours spend on economic activities by male and female patients are 1.43 ± 2.94 (S.D.) and 0.02 ± 0.14 (S.D.), which are significantly lower then their controls (5.12 ± 3.77 S.D and 1.43±2.48 S.D.). The mean hours lost from economic activity is more among men than women (t=3.34, p<0.001) (Figure-9). There is a significant difference, in mean hours spent on domestic activity between female patients (2.43±3.04 S.D. hours) and their controls (5.69 ± 3.02 S.D. hours) (p<0.001).

Logistic regression analysis is conducted to examine the influence of respondents characteristics namely sex, age, annual income, education, family type and disease status on the absenteeism from economic activity during acute episode of ADL. The results reveals that the presence of disease (ADL episode), sex and age have significant impact on complete absenteeism from economic activity (Table-41). Similarly, an attempt is made to examine the influence of these variables on number of productive hours and its results are shown in Table-42. Of all the variables, disease condition and sex have significantly affected the number of productive hours per day. These variables contribute 29 per cent to the total variability in the total number of working hours. Similarly among women, the disease, age and family type have significantly impacted on the total number of hours spent on domestic activity in a day (Table-48). The $R^2$, the measure of goodness of fit, indicates that 36 per cent of the variance, in the
number of working hours on domestic activity spend in a day by women is explained by these variables.

LF is associated with a wide range of clinical signs and symptoms. Acute clinical manifestations, commonly known as filarial fever are characterized by recurrent attacks of fever associated with inflammation of the lymph glands and or lymph vessels, termed as adenolymphangitis (Kumaraswami, 2000). The present part of the results reveals economic loss in terms of cost of treatment of acute episodes and loss of working hours due to acute ADL episodes among a rural community of eastern Orissa. Similar information on chronic form of the disease is presented previously. The economic loss to individuals due to LF includes direct and indirect economic loss caused by both acute and chronic forms of the disease. The treatments cost to individuals suffering from ADL episodes are substantial. In our sample communities, 58 per cent of ADL patients sought treatment and incurred an average expenditure of INR 38.05 (approximately US$ 0.76). People do not perceive the government health services as effective and their utilization is low (Babu et al., 2001). Hence, the majorities seek treatment from local healers and private practitioners. The average expenditure per episode is considerable, i.e. INR 92.3 in this population which contains mostly agriculturalists and agricultural labour. It is approximately equivalent to one-day wages. On average each patient suffers from 1.6 episodes per year giving an average expenditure of about INR 60 (US$ 1.20). This amount is considerable among the rural communities, whose average monthly income is around INR 1150 (US$ 23). The monthly income of more than 70 per cent of inhabitants of these study villages is INR 1000 (US$ 20). In South Indian rural community, 68 per cent of acute episodes seek treatment and incur a mean expenditure of US$ 0.9 per episode (Ramaiah et al., 1998). Similarly in other endemic areas like Ghana (Gyapong et al., 1996a), only 55 per cent of ADL patients seek treatment. The majority of the ADL patients (73.6%) suffer in our study from overt chronic filarial symptoms. The average expenditure shown above is merely to treat acute episodes.
In addition to loss of money for treatment, patients also lose productive working time as ADL episodes last up to 11 days with an average of 3.9 days. In our sample population during 87.5 per cent of ADL episodes, patients remain away from productive work. Based on the annual incidence (85 per 1000 population) and mean duration of ADL episodes (3.9 days), 0.09 per cent of the total potential working days of this community are lost due to acute LF. Though they involve themselves in productive activity, the total working time during ADL episodes is also significantly low among the patients. It is clear from the data that the affect is more prominent among men, who are the main bread earners of the family. The study also reveals that sex and age have significant influence on total absenteeism from economic activity and number of working hours on economic activity. Among women, the total time spend on domestic activities is influenced by disease, age and family. The studies from other LF endemic areas report that acute form of LF impairs the economic activity of patients (Kessel et al., 1957; Sabesan et al., 1992; Ramaiah et al., 1997; 1998; Krishnamoorthy, 1999). Impairment of economic activity among chronic patients, exclusively for their chronic condition, is also noticed. In the present study, most of the acute cases also have chronic filariasis but the control group is not a group with chronic filariasis. Hence, there may be influence of chronic disease of the patients on the loss of work time due to acute episodes.

In this study, 35 per cent of episodes are left untreated. Patients do not repeat treatment due to recurrence of episodes though they are treated earlier. The etiology of ADL episodes is not clear and has been the subject of considerable debate (Dreyer and Piessens, 2000) and no definite treatment is prescribed except the supportive and symptomatic treatment (Addis and Dreyer, 2000). Lack of faith on treatment, poorer performance of local government health institutions, economic factors and ignorance are the reasons for ignoring or not repeating the treatment. Gyapong et al., (1996a) reasoned that many ADL patients might not have found the treatment options available as very useful, and most knew that episodes would be over in a week or less. Non-treatment of ADL episodes may progress towards chronic filariasis, which has high impact on various factors of life including social and economic and functional impairment.
and disability burden. The present study as well as many studies (Gyapong et al., 1996a; Ramaiah et al., 1998;) (Ramu et al., 1996; Dreyer et al., 1997; Ramaiah et al., 1997) reported the same. Majority of the present study ADL patients (73.6%) are found to suffer from either lymphoedema or hydrocele or both. This study area (Khurda district) is included for implementing the programme to eliminate LF and mass drug administration of DEC and albendazole has been implemented in January 2002. But the drug compliance rate (32.8%) is far below the optimal level needed to interrupt the disease transmission (Babu and Kar, 2004). Though the elevation of disability and control of morbidity are essential pillars of programme to LF (Seim et al., 1999), no such attempt has been made either by local health authorities or national filariasis control programme. The component of elevation of disability and control of morbidity focuses on decreasing secondary infection of effected limbs or genitals whose lymphatic function has already been compromised by filarial infection, since secondary infection is the primary pathogenic determinant of worsening lymphoedema and recurrence of acute episodes. Hence, the programme to eliminate LF should be strengthened and its activities should be intensified by appropriate advocacy strategies by highlighting the impact of the disease on human life. Those who work for government health system, including peripheral health care personnel, should be educated about recent developments in the management of LF and they should advocate the practice of footcare measures for prevention of acute episodes.

In qualitative investigation, it is found that the ADL manifestation of LF is poses greater economic loss not only to individuals but also to their family members. The ADL episode starts suddenly and it creates problem for the work performance of that individual. It prevents the patients to do work due to high fever and other associated symptoms. Therefore, the patient looses his earning for those days. Most of the families in the study area belong to lower economic group. They are either daily wage earners and agriculturist. Therefore, they lose their wage for at least three days on each ADL attack. The researcher's diary noted the voices of one ADL patient as follows:
One day I was working in a crop field and all of a sudden, I felt feverish and became unconscious. I could not even manage to come out of the field. With the support of my co-workers, I returned back home and in that episode I lost five days of wage." (Ganesh Routroy, Male, Age-29, Sandhapur village)

An elephantiasis patient having hydrocele remarked:

"On an average, I work for 20 days in a month, the remaining 10 days I do not work due to filarial fever."

To look after the ADL patient, some family members also cancel their work. For the treatment, one or the other family member escorts the patient to health center or provides him proper care during illness. Thus the caregiver fails to go to his/her work place. This indirectly hampers the family earning during that period. The field notes recorded one female respondent's remark as follows:

"Batajwara... You don't tell anything! My husband suffers from this fever and during that period I am the worst sufferer. I escort my husband to the doctor and I provide him food and all possible care. So, I fail to attend to other domestic work during that period. My workload increases beyond my physical capacity." (Keshari Muduli, Female, Age-45, Kansapada village)

The frequent ADL fever not only disturbs the work of the patients, but also the work of other family members. It creates substantial economic loss to the family. Due to ignorance, they consult different health care practices and healers. They also spend money for seeking religious treatment. They visit to different sacred places in the nearby areas to perform puja. They make vow to offer gold and silver artifacts to god and goddess to get rid of this disease. A female respondent narrated:

"To get rid of batajwara, I took all sorts of treatment like herbal, homeopathic and allopathic. But, I did not get any relief. Finally I went to Puri Lokanath temple (a sacred place of Hindus) and offered a gold-made leg to lord Lokanath, but all went in vain ... my money... all my efforts....". (Sukanti Jena, Female, Age-40, Badatota village)

This shows that the ADL manifestation of filariasis creates economic loss directly or indirectly. It not only causes loose to the patients but also to their family members. ADL fever has greater impact on rural household economy as a whole.
Economic Loss due to LF Extrapolated to Khurda District

Estimates of health burden suggest that LF is responsible for over 1 per cent of all disability adjusted life years (DALYs) lost due to infectious and parasitic diseases and that 44 per cent of DALYs lost, worldwide, because of this disease, occur in India (Murry et al., 1996). However, underlying all these estimates is a poor understanding of the epidemiology and burden of this disease (Evans et al., 1993). Using the results of the present studies both treatment expenditures by patients (direct costs) and work time lost (indirect costs) among both chronic and acute LF patients, the economic burden of LF in Khurda district of Orissa India is estimated. The prevalence of various forms of LF is also taken from the present study for this purpose. The details of estimates are shown in table-44.

The annual economic burden is estimated on the basis of prevalence of chronic and acute disease, costs of treatment to the patient, loss of working days because of illness, and the prevailing wage rates. In all cases, these variables are differentiated by sex. In the present study district, the total population of the district is 187,4405 (986,003 males and 888,402 females). As per the study, the proportion of acute LF cases among males is 0.076 and among females it is 0.031. The estimated number of cases among males is 74,936 and among females it is 27,540. Hence, the total ADLs are 90,673 among males and 68,850 among females. Out of total ADL cases, 64.6 per cent of males and females spend money for treatment. Therefore the total ADLs spent treatment costs is Rs.58,575/- among males and Rs.44,477/- among females. The treatment costs per ADL attack among both males and females is Rs.92.30. With reference to the earlier findings, it is found that due to acute LF the total treatment costs per year are Rs.54,06,472/- and Rs.4,10,52,271/- among males and females respectively.

So far chronic LF is concerned, the proportion of chronic LF cases among males and females are 8.49 and 5.06 respectively. The total estimated chronic cases are 83,712 among males and 44,953 among females. The proportion of chronic LF patients with treatment costs is 74.14 among both males and females. With reference to the above proportion the total number of chronic LF with costs is
Rs.62,064/- among males and Rs.33,328/- among females. The treatment costs per chronic LF male person is Rs.401/- and chronic LF female person is Rs.390/-.
The total chronic LF treatment costs among males and female are Rs.2,48,87,664/- and Rs.1,29,97,920/- respectively.

Labour-time loss because of both acute and chronic disease was investigated through case-control studies. The number of working days lost because of filariasis was estimated using data combining the average hours worked per day (from control data), the average hours of work-time lost, and data on the number of cases of the disease. The estimated number of ADL per annum is 90,673 in case of males and 68,850 in case of females. The mean (days) duration of ADL among males and females are 3.95 and 3.90 respectively. Among males the mean loss of work hours per day is 2.69 and it is 3.69 among females. The estimates loss of work hours per ADL case is 10.63 in males and 14.39 in females. The mean days lost per ADL attack among males and females are 5.12 and 1.43 respectively. With reference to the estimation total work days lost because of all ADLs is 18,8172 among males and 69,2881 among females. Through wages per day among males is Rs.50/- and it is Rs.40/- among females, it is calculated that the total wages lost due to acute attack among males is Rs.94,08,600/- and the corresponding figure for females is Rs.2,77,15,240/-.

With regard to chronic LF, the total number of chronic cases in the district is 1,28,665 out of which 83,712 are males and 44,953 are females. Regarding loss of working hours per day, it is 0.83 among males and 1.67 among females. The loss of working hours per year per patient is Rs.295.50 in case of males and Rs.609.55/- in case of females. With reference to the above estimation the working days lost per patient per year is Rs.53.9/- in case of males and Rs.85.6/- in case of females. Due to chronic LF it is found that a total number of 45,12,077 and 38,47,977 working days have been lost among males and females in a year respectively. Through the wages per day for male and female are is Rs.50/- and Rs.40/- respectively, the total wages lost due to chronic LF per year among males and females are Rs.22,56,03,850/- and Rs.15,39,19,080/- respectively.
Overall, it is estimated that Rs.466.35/- lacs are lost due to acute LF and Rs.4174.08/- lacs are lost due to chronic LF. The per capita loss due to acute LF is Rs.24.88/- and per capita loss due to chronic LF is Rs.222.88/-. This loss is 0.44 per cent of their per capita income in case of acute LF and in case of chronic LF it is 3.9 per cent of their per capita income. The per capita income of this population is Rs.5648/- (Government of Orissa, 2000). With reference to these estimations overall, Rs.4640.30 lacs have lost due to LF in a district and per capita loss is Rs.247.57/-. This loss is 4.38 per cent of their per capita income. However, these estimations have a few limitations. The data collected from some villages are extrapolated for the entire district. Hence, it is believed that, this economic loss shown here represents the minimum and is likely to be much higher, if similar data are obtained from urban areas also. Also these estimates do not include the free treatment sought by patients from government institutions, as substantial proportion of LF patients sought treatment from government institutions.

**Social Burden and Social Realities of the Disease**

Disease is always a burden to the patient, his/her family members as well as the society. But there are certain diseases, which are related to social stigma. Though the social stigma of filariasis is not like leprosy, still people believe that disease occurs due to the karma (deed/act) of the patient. In our study area, people correlate the mythological belief where in yama (God of death) suffered from elephantiasis due to curse of his mother. So, the common people view the elephantiasis patients as papis (social culprits/sinful). Therefore the general attitude of people towards an elephantiasis patient is not very sympathetic. They think that they are being punished due to their evil deeds. So, nobody can help them to get away from the present state. Teasing to the elephantiasis as well as the hydrocele patients is a common phenomenon in the study area. The patients are often treated as laughing stock. From children to aged persons all tease them. In situation of quarrel, they tell the patient as godara and godari. The term godara or godari is a very derogatory terminology in the local language. They call the elephantiasis patient as hati (elephant); and in case of hydrocele
the patient is described as *batua* (traditional coin purse). When a person picks up a quarrel with an elephantiasis patient, he satiricaly tells that "godara pana hataka, kun kulaku nohu" (You elephantiasis patient, like untouchable you don't belong to any group). People also underestimate the work performance of the elephantiasis patient. They tell "godara kode jete, made sete" (that means, whatever soil an elephantiasis patient digs, he refills major portion of it by his elephantoid foot). Thus his output ultimately becomes zero. In an interview some elephantiasis patients reported us that nobody prefers to engage them as wage labourers. The first preference is always for a normal person, only when they fail to engage a normal individual; they call upon the filarial patient under a compulsive situation. So the filarial patients are "second choice" in the wage market. If the patient is untouchable and female, the situation is still worse compared to upper caste and male patients. Generally the upper caste people do not prefer to engage the untouchables due to social stigma. Again they do not prefer to engage female workers due to their low output. So the untouchable and female filarial patients even do not come under the second option.

The wives of 19 hydrocele patients (n=35) told us that their husbands' activities have been adversely affected due to hydrocele. Sometime they get severe pain in the genitals (scrotum) feeling weak to perform hard work. Some of the patients reported that they are not able to ride bicycle or motorcycle, jump or climb. They do not feel fit to lift heavy weight. Most of the respondents reported that the disease has affected the economic condition of their family. Their husbands are unable to work hard to earn money. Secondly some female respondents reported that their husbands consume alcohol to get rid of the pain and other problems associated with hydrocele. It has also worsened their economic condition. So the disease condition causes impairment which progress towards disability and finally it makes the patient handicap.

**Flow Chart-3: Representation of Filariasis on Disability**

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Disease —> Impairment —> Disability —> Handicap
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With regard to marriage alliances, the filarial patient is the "last choice". People do not prefer to give in their daughters to a filaria patient. Though filarial is not fatal, still due to associated disabilities, people think that a patient cannot earn more or lead a descent life. So male filarial patients face distress during settlement of marriage. A young elephantiasis patient told us:

"I did not get any dowry because of elephantiasis, even I could not get a suitable match from the same socio-economic strata." (Nabagana Routroy, Male, Age-30, Panichhatra village)

Therefore, the elephantiasis or hydrocele patients marry with little or no dowry under compulsive situation. Often they marry girls from lower socio-economic strata. In some cases elephantiasis male patients get married to elephantiasis females.

A person narrated us:

"It is difficult for a filariasis patient to get a choicable girl for marriage. Normally he gets married to a girl of lower economic status. Even for hydrocele patients, people do not prefer to give in their girls. Parents offer their daughter to such a patient only under compulsive situations." (Dinabandhu Khaiya, Male, Age-86, Taraboi village)

The girls also show their reluctance to marry elephantiasis as well as hydrocele patients. One hydrocele patient’s wife reported:

"I think hydrocele is a problem for marital life. Had I known about the hydrocele of my husband, I would have refused to marry him." (Gauri Dalai, Female, Age-30, Barapada village)

The demand of a person suffering from LF comes down considerably in the matrimonial market. In case of girls, the situation is still worse. People prefer to marry illiterate and ugly looking girls, but they do not prefer to marry an elephantiasis female patient. One unmarried young female respondent described:

"The relatives of the prospective groom once visited our house to see me. They asked me to show my feet. I was bit reluctant to show them my feet. However, finally I had to fulfill their wishes. Seeing my elephantoid legs, ultimately they rejected me". (Gurubari Moharana, Female, Age-34, Badatota village)
Even today in rural India women is considered as a commodity. People of this area do not hesitate to crosscheck the body parts of a prospective bride before finalizing a marriage negotiation. Therefore, here an elephantiasis girl is considered as a "rejected commodity" in the marriage market. As a result, many elephantiasis girls remain unmarried. If the parents of the girl are too rich then they manage to find a groom by offering more dowry to a person of low economic class. When such a girl remains unmarried, the suffering continues. Her parents and brothers think her as burden to the family. An unmarried girl is considered as such a burden but in case of elephantiasis the burden gets doubled. After the death of her parents the girl’s brothers do not want to shoulder up her responsibility. As a result, many of them live like orphans in the society. Wherever the family members bear the burden of an elephantiasis girl, they humiliate and mistreat the girl.

Flow Chart-4: Representation of Different Chronic Forms of Filariasis as a Burden

One unmarried female respondent reported us the way her parents scolded her:

"Godari! male bhuta hebul!" (You elephantiasis girl! You will be a ghost after your death). (Kamala Jena, Female, Age-33, Gothapoda village)

Generally in Hindu religion people think that after the death of an unmarried person, he or she will be a ghost, because he has not completed his or her grahastha31 (family) life. So, his/her life is incomplete. Hence, the community members including her family members think that after her death an unmarried LF girl will be a ghost. The interesting thing is that people even don’t want to

31 Grahasta is family life; one of the varnashramas of Hindu life.
marry the daughter of elephantiasis patient. Because, they think filariasis is a hereditary disease. One elephantiasis patient reported:

"I anticipate a problem in finding groom for my grown-up daughter. Here people believe filariasis as a hereditary disease. Although it is not true, people do not want to accept medical explanation of the disease. Hence I am very much concerned with this matter." (Madhu Rout, Male, Age-50, Kansapada village)

In the present study the hydrocele as well as elephantiasis patients anticipate problem in getting their children married due to their disease condition. These diseases are considered as hereditary and people think that the diseases get transmitted to the next generation. Especially when their children suffer from filariasis, then it becomes increasingly difficult for the parents to get spouses for their children.

The elephantiasis patients normally avoid going to feasts and festivals for two reasons: first they feel shame due to their disease condition; secondly the people do not feel like sitting next to the elephantiasis patients in a feast. The respondents reported that this stigma is less visible in their own village, but when they go outside their own village, they experience this stigma more. At the time of marriage negotiation people from either side avoid the inclusion of elephantiasis patient in the party. They think that said inclusion may lead to the formation of a negative perception in the minds of the members of the other party. Therefore, an elephantiasis patient is forced to lead a socially "rejected life".

Majority of the filarial affected couple do not maintain a happy and smooth life. When the husband is an elephantiasis patient, the wife normally does not prefer to accompany her husband in a social gathering. She feels shame due to the disease condition of her husband. When a wife is a filarial patient, she feels that she is no more attractive for the husband due to her deformity. The wives of the hydrocele patients reported their dissatisfaction in their sexual life. A few complained that failure of erection, penetration and premature ejaculation occurred during intercourse due to hydrocele. They say that hydrocele patients have lesser sexual potentialities than normal man and they think that hydrocele
is responsible for male impotency. In the voice of the wife of a hydrocele patient:

"When the disease becomes chronic, the front portion of male genital becomes very small and the scrotum gets unusually large. Eventually that leads to male impotency." (Bhabini Banik, Female, Age-60, Podapada village)

The wife of another hydrocele patient complained:

"My husband has big hydrocele. He is not able to move and work freely. He feels ashamed to make his appearance in public places. He is now not even fit for a conjugal life." (Reba Moharana, Female, Age-40, Gothapara village)

The researcher’s diary noted the agony of a female married informant:

“Yes, there is problem. How there shall be no problem. But I do not want to share these problems with unknown people. There is a major problem at the time of intercourse. But I do not like to reveal it to everybody. For instance, when we are served food by our guests, we normally accept it irrespective of our likeingness for the food. Certain things I cannot tell to my husband, he may feel bad about that. As it takes less time, I manage it without showing sense of dissatisfaction.” (Swati Dash, Female, Age-28, Mallipada village)

The wives of hydrocele patients always persuade their husbands to get operated. In one case it was found that the wife of a hydrocele patient is no more interested to sleep with her husband. In another case a wife has left her husband and gone back to her parents’ house out of frustration. During the course of discussion, a housewife reported:

“A newly married girl of our village recently left her husband and went back to her parents’ house due to this problem. We stay with our husbands because we are old and have children. The younger generation girls are not that much adjustable.” (Rebati Muduli, Female, Age-48, Kansapada village)

The hydrocele patients also show their frustration. One of such young respondent expressed:

“The hydrocele has affected my sexual life. My wife is now not interested to keep sexual relation with me. She hates me and advises me to go for hydrocele surgery.
I am bit reluctant to go for surgery thinking that it may lead to other forms of complicacy." (Kishore Moharana, Male, Age-35, Badatota village)

Another respondent narrated:

"My spouse has no complain, rather she is very cooperative in this matter. However, my sexual desire has declined drastically over the years. I develop an acute pain on the scrotum immediately after the intercourse." (Jayachandra Sabara, Male, Age-33, Podapada village)

The disease free people of our study area also reported that the hydrocele patients feel pain during sexual intercourse. As the penis of hydrocele patients get shorter they fail to satisfy their wives during sexual intercourse.

Generally filariasis is a disease of poor people. These poor people are not able to bear the cost of the hydrocelectomy of hydrocele. In the voice of one of our respondents:

"Everybody who suffers from hydrocele is somewhat interested for a surgery. But the poor economic condition of the patients is a real obstacle to the surgery. The patients find it really difficult to get Rs.2000-3000/- at a time for the hydrocele operation." (Raghu Rout, Male, Age-48, Panichhatra village)

The elephantiasis also creates dislocation in the household economy. In one case it was found that a joint family get disintegrated due to filariasis. The brothers of an elephantiasis patient did not prefer to bear the cost of treatment of the patient. That patient was earning less compared to the other earning members of the family. The normal family members did not want to share their earning for his frequent treatment. Therefore, finally there was a disintegration of joint family leading to a separation of the elephantiasis patient and his family members.

One clinical manifestation of LF is ADL fever. During the period of ADL fever, the patients as well as their family members suffer a lot. Generally in the rural coastal Orissa the total responsibility of household work falls on the fragile shoulders of females. So, when those adult female members suffer from ADL fever, the domestic works are performed by the girl-child. Therefore, even at a very tender
age the girl-child suffers a lot especially during the fever period of her mother. This forces her to remain out of school during that period and she manages the domestic work under a compulsive situation. In case of the suffering of a male member, the family looses economically, as discussed earlier.

The religious life of the filarial patients is very interesting. The patients perform rituals to get rid of filariasis. They worship Lord Siva for the cure of filariasis. They believe that Lord Siva is the only God who can offer them strength to overcome the situation. They call him "akarma karma dani" (the fortune giver to the unfortunates). In the months of Chaitra, they worship Lord Siva, do fasting and perform dandanrutya (a type of folk dance) to please lord Siva.

The social relationship of family members of filariasis patient is interesting. If the bread earner of the family suffers from elephantiasis or hydrocele, then other family members show somewhat sympathetic attitude towards him. If the wife suffers, she is treated by her husband as an "unwanted object". If the children suffer from filariasis, that becomes a headache for the parents. They immediately start the treatment of the children. However, if adult member suffers from filariasis, less importance is given to that matter thinking that treatment of such elderly people would be a resource drain of the family. Generally, the children and the wives of the elephantiasis patient avoid eating the left out food of the patient. However, the mother shows no hesitation in eating eat the left out food of her children suffering from LF. It is found in three cases that the elephantiasis patients do not sleep with their wives and children inside the home. They use to sleep in the Bhagabat Mandir (religious cottage of the village), as other family members are afraid of infection or transmission of the disease.

At the initial stage, people try to hide the disease. They do treatment secretly. In case of girls, hiding of the disease is a common phenomenon, as people do not prefer to marry filariasis patients. Such girls try to cover their elephantiasis leg by sari and males usually cover it by lungi or full trousers. In an interview, a young respondent explained:
"Whenever I go out of my house, I try to hide my hydrocele. In case that comes to the notice of people, they tease me by cutting vulgar jokes." (Subhendu Rout, Male, Age-27, Barapada village)

In the beginning people do not admit that they suffer from acute filarial fever. In case of acute filarial fever, they take analgesic treating it as common fever. Very few people go to hospital for the treatment of filariasis. Hiding the disease is very common due to fear of "social rejection". People think that a diseased person cannot achieve an equal occupational output like a normal person due to his/her disease condition. Thus, culture determines the social status, social image and personality of a disease affected person. The disease condition like hydrocele damages the male identity, sexual potentialities and masculine features of male. Male in the family is the support provider and the key person for procreation therefore hydrocele distorates both the positive social identities of a male. In case of disfiguring of an organ, female elephantiasis or breast swelling, the patient may be treated as ugly, unwanted and burden. So, the disease has damaged the concepts of manliness and womanhood. The reproductive choice and reproductive health of the patients get affected due to damage of genitals. The disease condition causes hindrance to personal development, saving and investment, worker productivity, absenteeism and medical costs.

The mat that people offers to a filarial patient to sit is normally washed for reuse. They think that the disease may get transmitted through the articles used by the patient. This explains the lack of scientific knowledge about the transmission of the disease among the people of our study area.

In case of the death of a filarial patient, people do not perform any special ritual. When the lymphoedema is septic having foul order, people even hesitate to participate in the cremation of that person.

Many filarial patients feel themselves as burden to their family and the community. An elderly elephantiasis patient remarked:
“Amara kana rahila, khali maribhku bakirahila” (Nothing remains stored for us, we are only destined to die). (Ajay Kumar Mishra, Male, Age-71, Badatota village)

The statement indicates the level of frustration of a patient towards life. Particularly the female persons affected with filariasis think themselves more burden to the family. In the voice of a young lady informant “Jahaku batajwara hela, se chari panjiru gala” (whoever gets affected by filariasis, she goes out of fortune). Once a person gets affected with filariasis, his/her socio-economic life gets ruined. So filariasis as a disease has affected the social, economic and psychological life of an individual. From this study it is also evident that the disease condition also influences a lot the interpersonal relationships. For instance, the husband-wife and mother-son and father-son, brother-brother and brother-sister relationships have assumed a new shapes with the advent of this disease. All family members feel the patient as a burden. Due to frequent ADL attacks they do not want to bear the treatment costs of the patient. In joint families the brothers and sisters of the patient do not share their earning with the patients. The disease condition destabilizes the social harmony inside the family and community.

No clear picture is obtained from the literature concerning how filarial symptoms affect the behaviour of infected people or how are they accepted by society, mainly because few people have studied this question. Indeed, the literature that is available deals solely with chronic disease where reports suggest that local perceptions of filariasis vary not only from place to place, but also within the same communities (Evans et al., 1993). However, social stigmatization is commonly associated with the symptoms of filariasis (Rauyajin et al., 1995; Gyapong et al., 1996b; Ramaiah et al., 1996; Dreyer et al., 1997; Coreil et al., 1998), and for instance according to Ghanaian customs a person with clinical manifestations of filariasis cannot become a chief although he may be next-of-kin (Gyapong et al., 1996b). Study from Ghana reports that patients with chronic manifestation are subject to teasing, and individuals with a family history of these conditions or an early onset (both males and females) are considered undesirable for marriage. Divorces are reported to have occurred where the
partners have very large hydrocele or elephantiasis, and divorce generally worsens the poverty condition of the affected individuals. This is partly because the children are left in the care of patient, as the "healthy" partner moves out of the community to avoid social sanctions and scorn. The patient work performance and income get adversely affected without the assistance of a spouse and the children become the worst victims. However, due to social sanctions and the general abhorrence of divorce in the communities most spouses, specially among the elders, prefer to stay with their afflicted partners (Ahorlu et al., 1999).

In Philippines, people with hydrocele are not excluded from social functions, they go to school, work, marry, have children and live with their families. Cases are considered serious only when they reached the size of a sack: hydrocele the size of a coconut is apparently considered unremarkable. However, such people with unusually large hydrocele are the subject of considerable teasing (Lu et al., 1988).

The impact of filariasis on sexual activity and fertility does not seem to be of great social significance among affected population (Evans et al., 1993). In sorsgn, Lul et al. (1988) reported that filariasis is not seen as affecting sexual intercourse, except by younger respondents, while inconclusive results are obtained in Kenya (Wijers and Kaleli, 1984).

Muhndwa (1983) states that LF is considered socially unacceptable and very shameful in an area of Tanzania. People with hydrocele are embarrassed about them and lead restricted social lives. Similarly in Polynesia, at least in the 1950s, people suffering from filariasis hide to the background because they are the laughing stock of the community (Kessel, 1957). Kessel (1957) also reported that women with elephantiasis are considered "undesirable as wives" and men with elephantiasis of the scrotum exhibit an obvious social and procreative handicap. In India also it has been reported that women with elephantiasis are considered as ugly and unwanted (Bandyopadhyay, 1996). The impact of LF upon patients is not only confined to their biological deformity but also it has a greater influence on the socio-economic life of the patients and the community as a
whole. The nature of life of a patient determines his identity in the society. So social recognition of a patient under existing cultural norms should not be overlooked. A patient’s disease free condition should not be the only objective of the health programme managers. A healthy socially accepted member of the community should be the target of the health planners.