

Chapter 9

Conclusions and Suggestions

Environmental problems occur due to non-optimal pricing and misallocation of resources. The presence of complete markets is essential for the optimal distribution of resources in the economy and the lack of it will result in the inefficient distribution of resources. For environmental goods there is either the complete absence of markets or they are incomplete. Environmental degradation and pollution occur when the market fails to take into account the true value of environmental quality. This has led to the unregulated use of the environment and its wide spread degradation. Externalities create MSC, which even a competitive economy fails to consider during pricing. The exclusion of the externality induced social costs will result in non-optimal production of goods. The absence of complete markets makes the use of alternative methods essential to find out the value of environmental quality.

The living environment is an important factor that determines the quality of life. The quality of life depends significantly, on the condition of surroundings of their houses and also on the availability of various essential facilities including proper and scientific management of solid wastes. Rapid urbanization has given rise to overcrowding that has adversely affected the quality of life. Unsanitary conditions and the absence of other basic facilities have made living conditions miserable in the urban areas. Population growth, economic development, changing lifestyles and social attitudes, the long-term impacts of past human interventions are all contributing to increasing problems of environmental health. SWM problem in Alappuzha continues to grow exponentially.

The study highlighted the various impacts of the improper SWM in the municipal area. It can be found that waterborne diseases and vector borne diseases are quite common. This indicates the level of environmental

degradation that has occurred in the area. Analysis of the health impacts show that regarding the different signs and symptoms, 41.7% were affected with diarrhea, 34.6% with skin infection and 33.6% with fever. 18.2% had persistent headache. The respondents mainly attribute physical environmental factors as the cause for disease symptoms and for the occurrence of diseases. Regarding the occurrence of diseases among the respondents, 44.4% of the respondents were affected by acute respiratory infection followed by cholera 42.4%. 29.3% of the respondents were affected by Chicken guinea.

Children are very often the victims of the various diseases with 72.1% of the respondents agreeing that children are getting affected by the diseases. The survey also highlights the seasonal occurrence of diseases and finds that monsoon season as the most disease prone season with 48% of the respondents agreeing to it. About the expenses for treatment of an episode of a disease the survey finds that the average outpatient expense is slightly less than the average inpatient expense. 96.1% of the respondents had an average outpatient expense of less than of Rs.500 while 75% of the respondents had average inpatient expenses of less than of Rs.500. 14.3% had an inpatient expense between Rs.500 and Rs.1000 and 10.7% had expenses above Rs.1000. 86% of the respondents agreed that the occurrence of diseases in the municipal area has increased in the last few years. 78.6% of the respondents consider solid waste pollution as the main reason for the increase in the occurrence of diseases. Another important finding was that 62.9% of the respondents had no insurance cover.

Regarding the impacts on residential land values, it seems that being a densely populated state, solid waste pollution has not impacted the residential land values. 88.8% of the respondents are of the opinion that pollution hasn't reduced residential land value in the municipality. The current value of the residential land is high with 74.4% of the respondents being of the opinion that the value of one cent of land in the municipal area is above Rs.1 lakh while 25.6

% consider it as below Rs.1 lakh. In addition, 68.9% of the respondents are of the opinion that the land value will not increase in the absence of solid waste pollution. Pollution in the area seems to having some effect with about 48.1% of the respondents ready to relocate to place with less pollution. The survey found that 73.2% depend on municipal water as the main source for drinking water while 18.7% depend on bore well and 8.1% of the respondents use well water. The water quality in the area seems to have deteriorated with 86.7% being of the opinion that the quality of water available has deteriorated over the years. Solid waste pollution is seen as the main cause for the deteriorated water quality with 70.2% of the respondents giving their response in the affirmative.

On the disamenities created by solid waste pollution, mosquito and flies were considered as the main disamenity due to sold waste. 29% were of the opinion that all the given disamenities are present in the municipal area due to solid waste. About 75.1% has ranked the disamenity of mosquito and flies as number one. Regarding solid waste disposal habits of the respondents, 77.2% depend on municipal waste bin for disposing solid waste. Burning solid waste is an option for almost 22.8% of the respondents. This gives an idea regarding the dependence of the households on the municipality for the solid waste disposal. Only 16% of the respondents segregate the solid waste into bio degradable and non- bio degradable before disposal. On the frequency of solid waste collection by the municipality, 63.2% of the respondents put the frequency of collection as once in a week while 32.5% gave it as once in three days. The comparison of the waste collection efficiency of the Kudumbasree and municipality comparison showed that about 63.5% of the respondents rated the performance of Kudumbasree as better than the municipality. 66.7% of the respondents rated the municipality's solid waste management system as bad. On the performance of Kudumbasree, 75.5% of the respondents use the services of Kudumbasree for solid waste disposal. About 75.9% rated the performance of Kudumbasree as good .The performance of Kudumbasree was rated as bad only

by 22.6%. Regarding the awareness of the respondents about various environmental issues, 89.2% of them were aware of the issues. On the environmental condition of the Alappuzha municipal area, 73.6% of the respondents rated the environment of the municipal area as bad. An overwhelming 91.1% of the respondents cited solid waste pollution as the main reason behind the environmental degradation of the municipal area.

Regarding the attitude of the respondents towards solving the environmental issues in the municipal area, 88.4% of the respondents were of the opinion that solid waste pollution must be solved without considering the cost involved. An overwhelming 85.3% of the respondents were of the opinion that there is a need for projects solving environmental issues which reflected their environmental ethic. The survey analysis shows that the respondents are generally willing to pay for an improved solid waste management system irrespective of public- private initiative. On the WTP for the first solid waste management project to be done by the municipality and the private agency, only 8.9% and 11.9% of the respondents were unwilling to pay any amount for the projects respectively. Regarding the WTP for the second solid waste management project to be done by the municipality and the private agency, only 14.8% and 13.9% of the respondents were unwilling to pay any amount for the projects respectively. The respondents have good faith in the private agency than the municipality for carrying out such projects. Health issues followed by disamenity concerns dominate the reasons for the willingness to pay for the projects. Regarding the unwillingness to pay for the projects, financial problems and the feeling that municipality should bear the expenses for the projects are the main reasons. Some of the respondents stated as their WTP amount the initial bid values given to them which reflect the initial bid bias.

The parameter estimates shows that the variables average monthly income and house ownership show consistent positive relationship with the WTP supporting the hypothesis. Variables like environment ethic and children,

shows a positive relationship with WTP and the variable gender shows a negative relationship with WTP generally. Education did not show the expected relation with WTP and it showed a negative relationship generally.

Suggestions

1. Risk perception studies and impact assessment studies must be conducted on a regular basis so that community values can be incorporated in the environmental management policies.
2. Solid waste management activities can be a success only through an integrated and well-planned programme with the active participation of all the stakeholders. A holistic approach is the need of the hour which can be attained through decentralization process.
3. The willingness to pay of the public to pay for improved solid waste management programmes must be used for developing economically feasible programme strategies for solid waste management.
4. Information, Education and communication (IEC) campaign should be intensified and to focus more on knowledge and behavioral change. Based on the survey findings, the people have a high level of knowledge and perception concerning health and the environment but they are still exposed to health risks. So a more comprehensive understanding of the relationship between our environment and health should be emphasized in the IEC campaign. Awareness campaigns can bring about considerable changes in the attitude and perception of the people towards solid waste management. Public awareness about existing programs and policies and projects so the appropriate action can be made to address specific environmental and health issues.
5. The minimization of the negative impacts of solid wastes on health, environment can be attained through the 3 R's of reuse, recycle and reduce. Waste minimization by reducing the volume of waste

generated and increasing recovery and reuse of waste must be encouraged at all levels.

6. Social Engineering through proper networking of the various stakeholders is an important factor for the success of any sanitation activity. The Residents Associations and the voluntary organizations can play a major role in this context. The activities of kudumbasree should be encouraged. Proper Institutional structure, infrastructure, and technology must be provided.

In the modern hi-tech age the problem of USWM is to be addressed in a larger dimension. E-waste and plastic pose a great threat to the urban environment and a great menace to the urbanites. Region specific and problem specific strategies and approaches are to be introduced to deal with the emerging issues. Waste can be converted to wealth provided the three R's are effectively implemented.