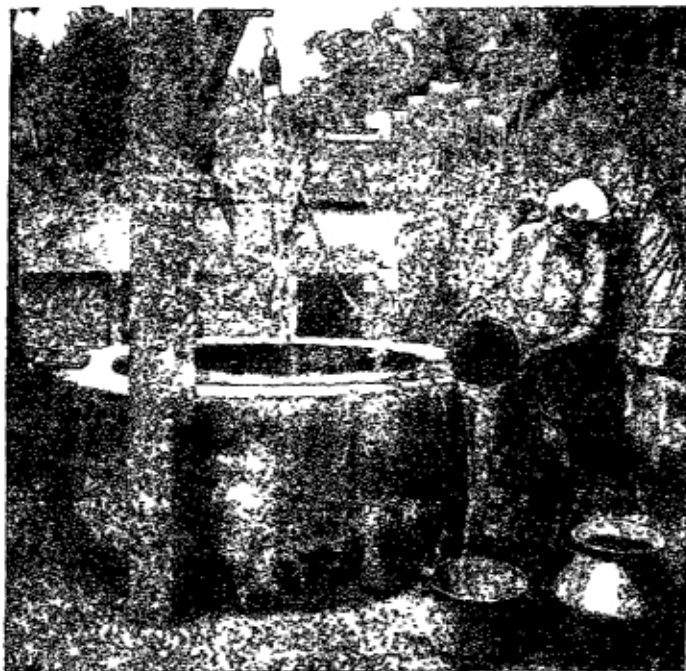
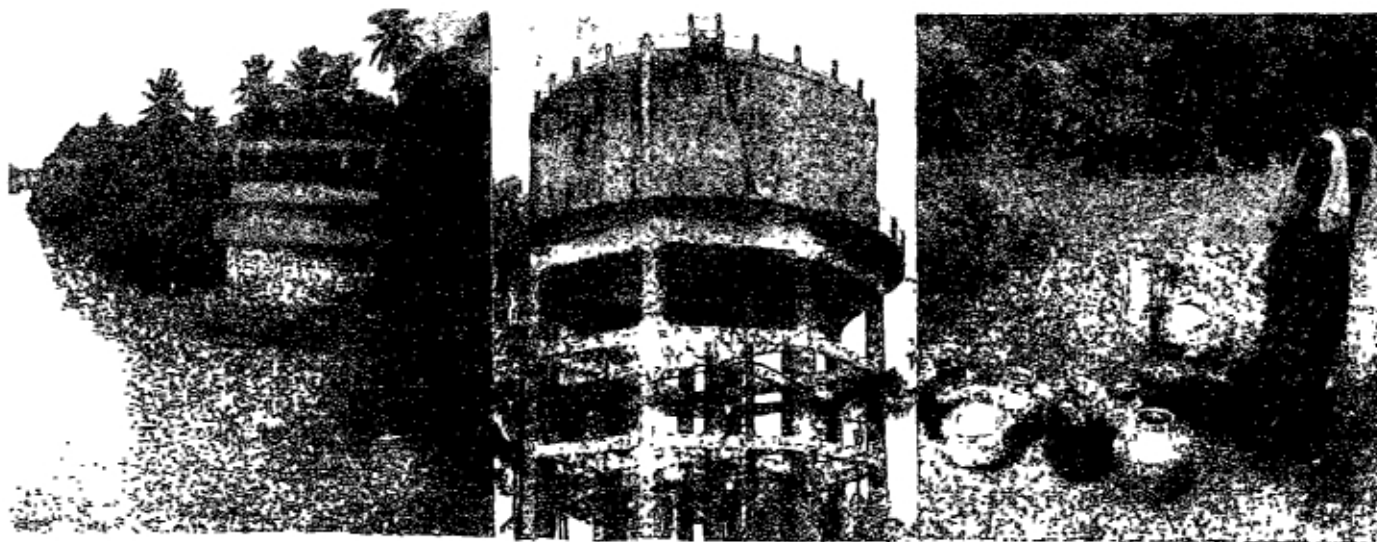


A WATER USE SURVEY OF THE SIX NETHERLANDS ASSISTED WATER SUPPLY SCHEMES



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CHANGING PATTERN OF WATER USE IN RURAL KERALA



A.M. KURUP
R. ASWANIKUMAR

SOCIETY FOR PSYCHO-SOCIAL RESEARCH AND REHABILITATION
THIRUVANANTHAPURAM 695 004
KERALA, INDIA

1997

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AVOWAL

Water, they say, is the nectar of life. People strive to reach it any how. It is reflected in their actions.

The successful completion of this Water Use Survey, within a incredibly short period, speaks volumes about the co-operation and encouragement extended by individuals and institutions.

At the outset, we are grateful to the Royal Netherlands Embassy for providing necessary funds for the felicitous accomplishment of this survey.

The enthusiastic and emotional participation of the respondents, largely arising out of their concern for safe water, was almost spontaneous. Many offered even to forgo their callings for the sake of the survey. We are indebted to them.

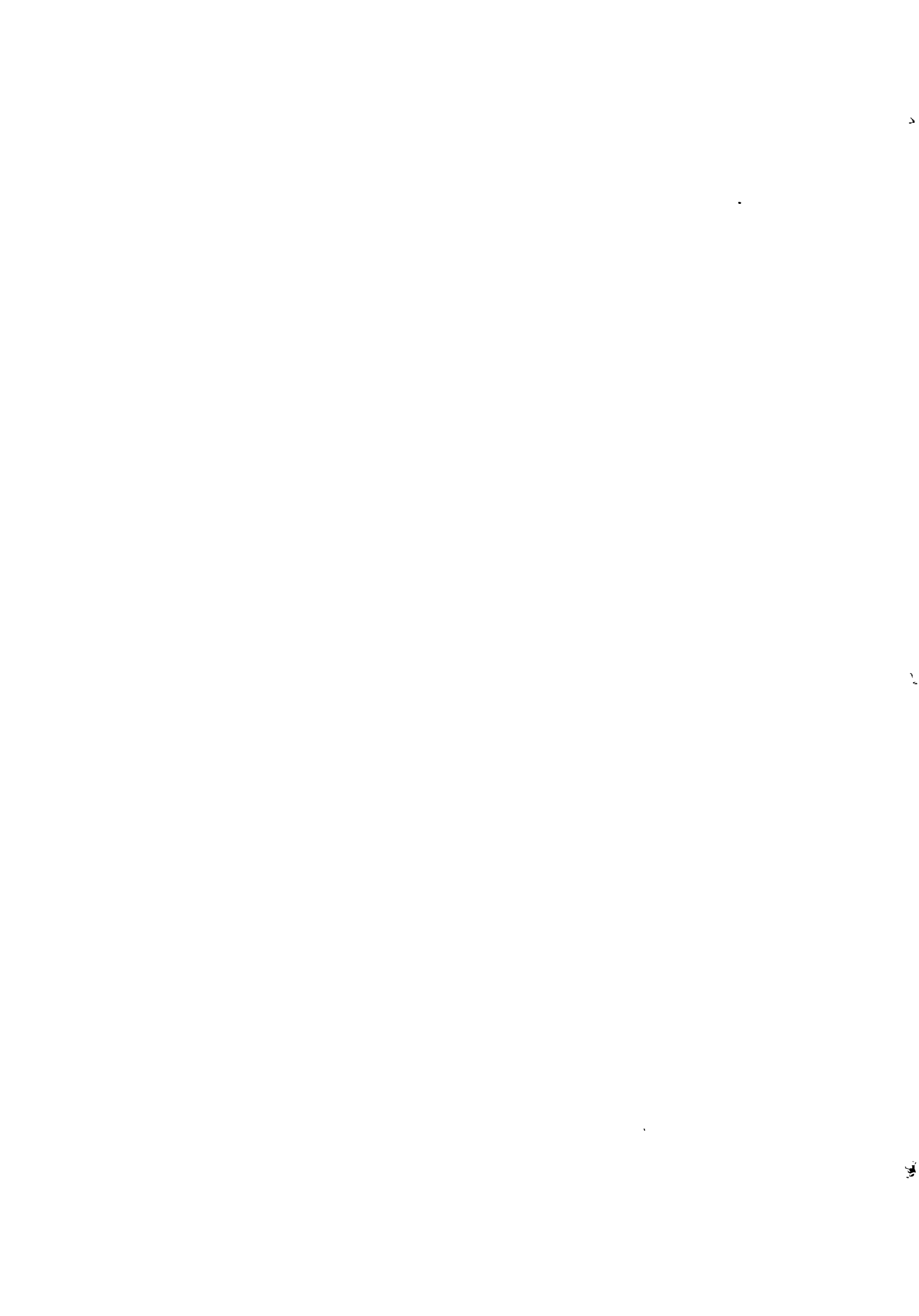
But for the impassioned support and assistance cordially extended by the Chairpersons and Members of the 25 Panchayats, our survey findings could not have seen the light of the day. To each one of them, we owe our thanks.

From day one, the Technical Liaison office was a source of stimulation and cheer. Suggestions and guidance from Mr. Stuart P. Pearson, Mr. John Abbott and Mr. K. Surendran were particularly useful. We are thankful to them.

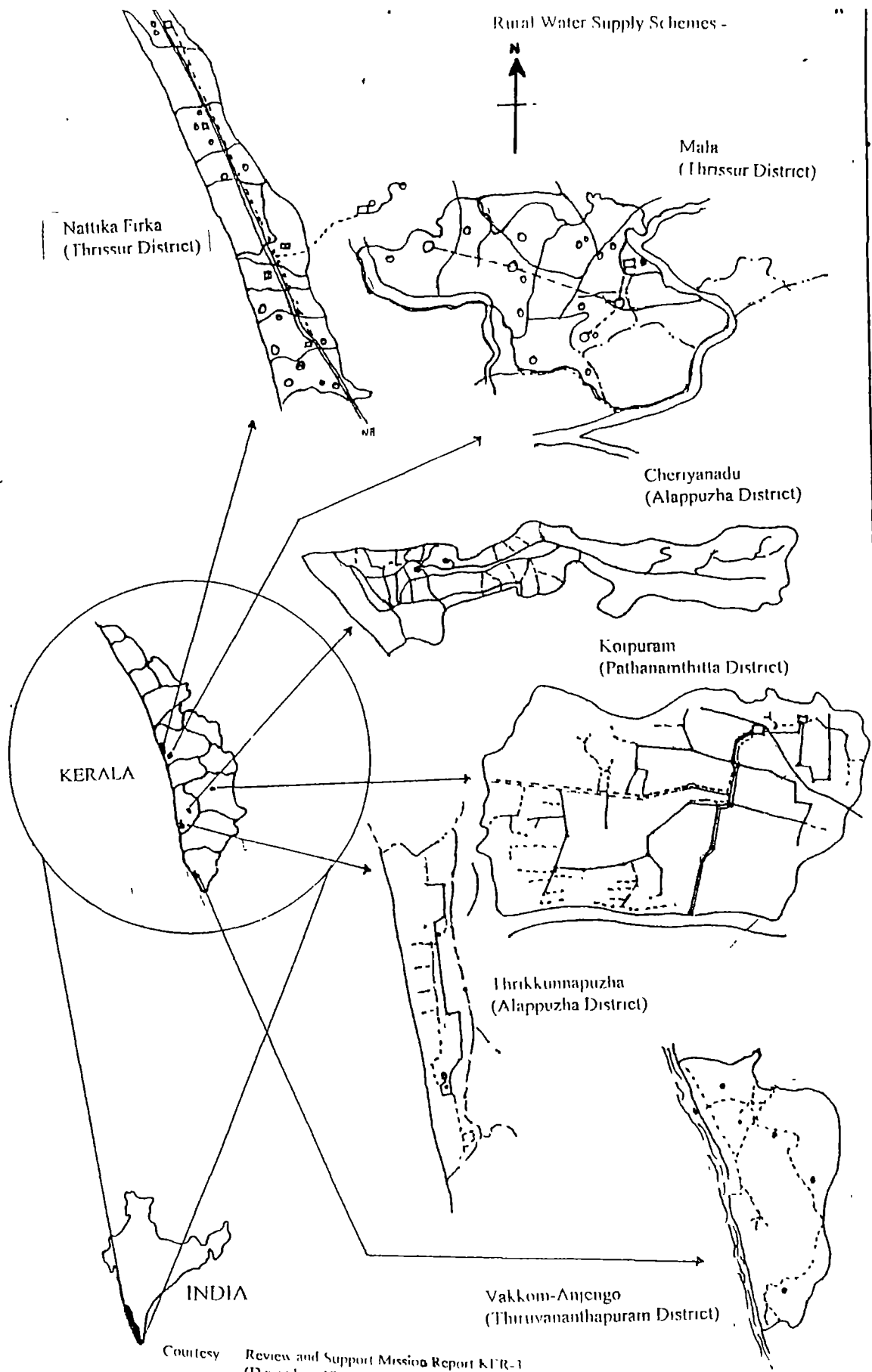
The support and assistance offered by the Kerala Water Authority and Socio-Economic Units Foundation deserve a special mention.

Last but not the least important, was the sincere painstaking inputs of our project colleagues. But for their contributions this document would not have enriched itself. Our thanks are due to them.

Dr. A. M. Kurup



Rural Water Supply Schemes -



Nattika Firka
(Thrissur District)

Mala
(Thrissur District)

Cheriyannadu
(Alappuzha District)

Koipuram
(Pathanamthitta District)

KERALA

Thirikkunnapuzha
(Alappuzha District)

INDIA

Vakkom-Anjengo
(Thiruvananthapuram District)

Courtesy Review and Support Mission Report KFR-1
(December, 1993)



LIST OF ABBREVIATIONS

A	Animals
B	Bathing
BC	Backward Caste
C	Cooking
Ch	Children
C/U W	Clothes/Utensils Washing
D	Drinking
F	Female
G	Garden
HC	House Cleaning
HH	Household
HP	Hand Pump
HW	Hand Washing
M	Men/Male
N	Neighbour's
No.	Number
O	Owners
Ots	Others
P	Public
Pd	Pond
PC	House having Private Piped Water Connection
PM	Post Monsoon
PSRR	Society For Psycho-Social Research And Rehabilitation
R	Retting
S	Summer
SC	Scheduled Caste
SP	Stand Post
SR	Stream/River
ST	Scheduled Tribe
Tt	Toilet
T	Total
TLO	Technical Liaison Office/Officer
Tno.	Total Number of Households Surveyed
UMO	Number of Households Using more than One Source
W	Women



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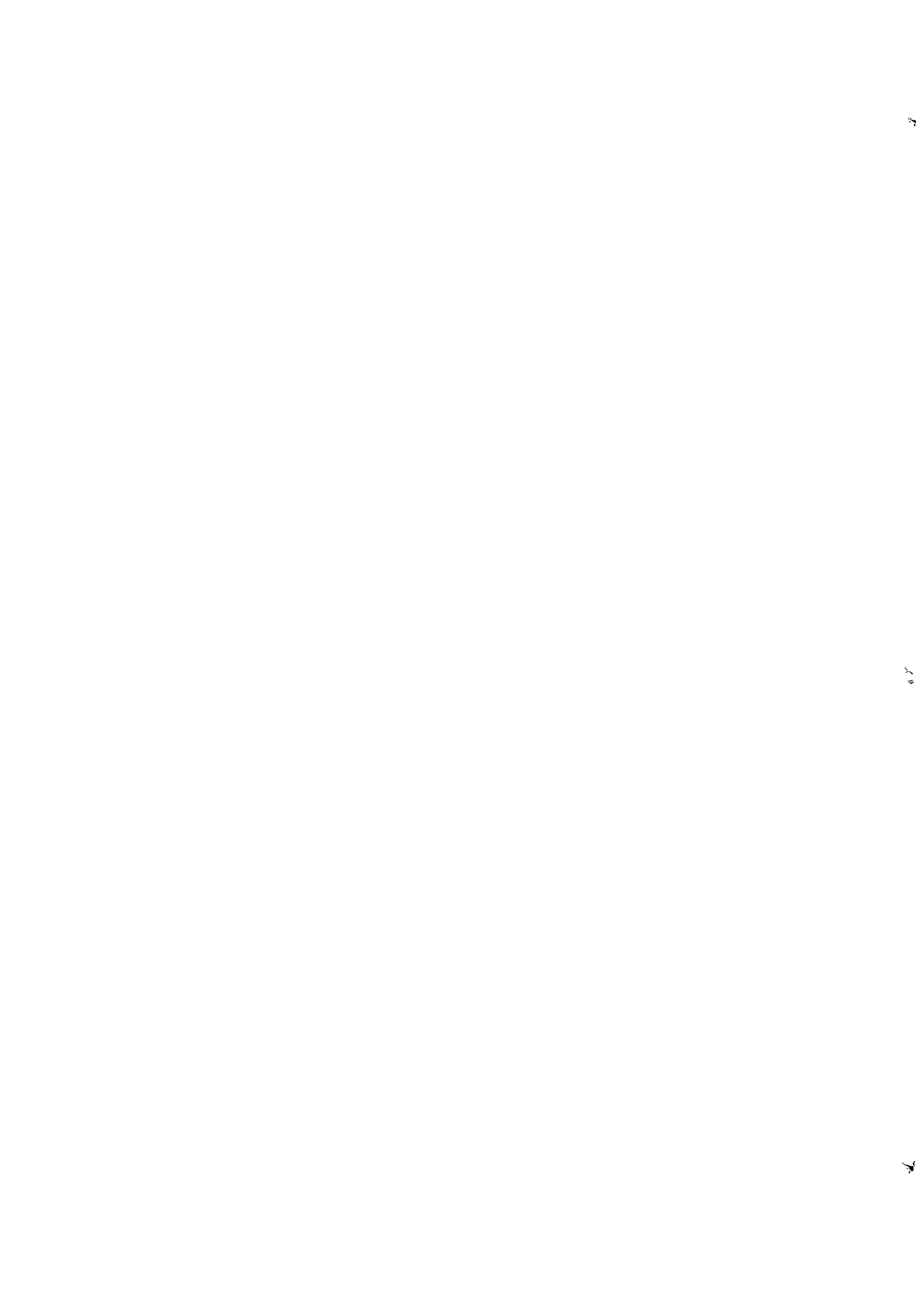
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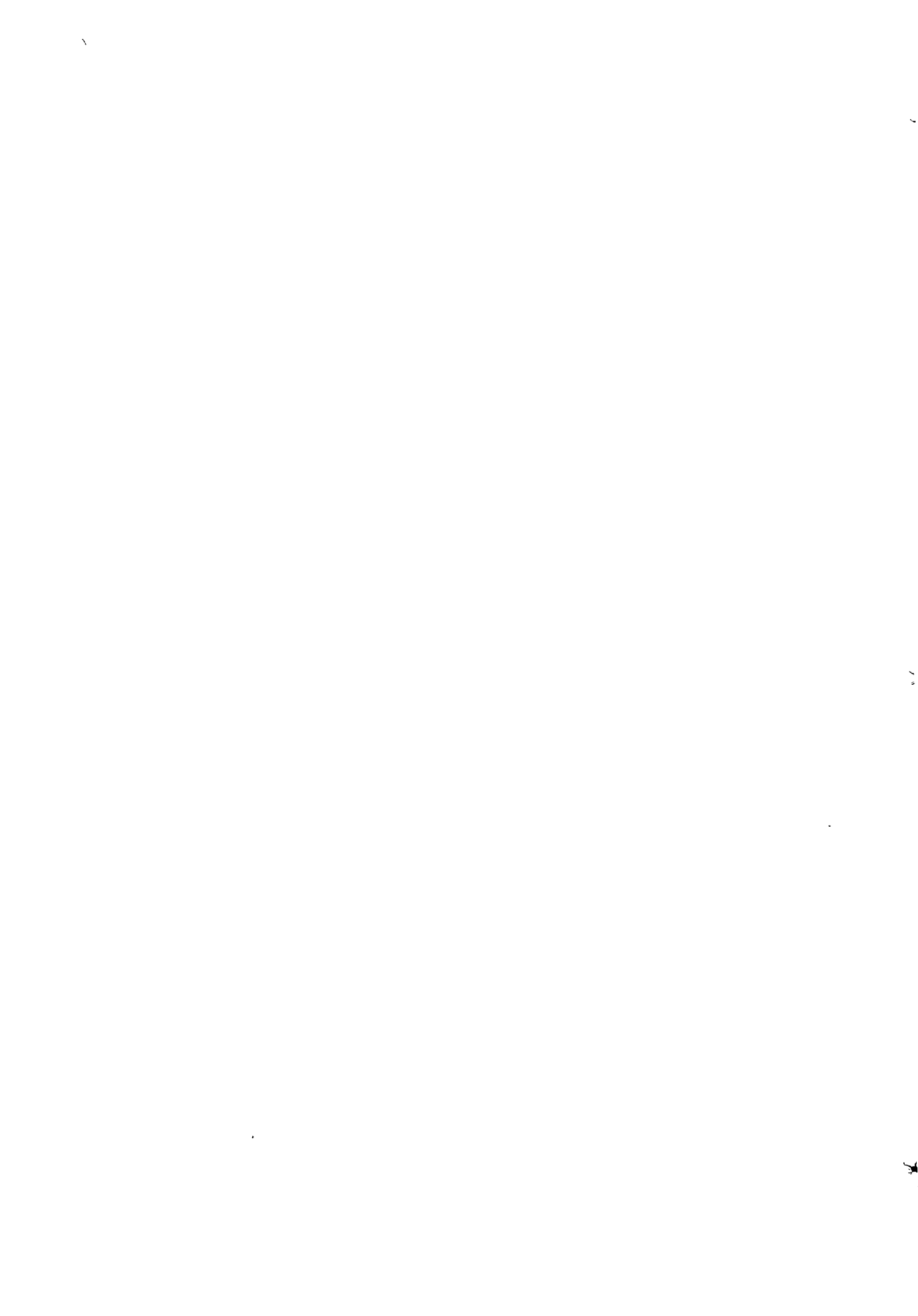
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THE INTRODUCTORY

Improvements in water supply and sanitation conditions, it has generally been assumed, have a pivotal role to play in reducing the high levels of morbidity and mortality that prevail in many Third world countries. This presumed impact on health was the main impetus behind the United Nation's "International Drinking Water Supply and Sanitation Decade" and the "inclusion of basic water supply and sanitation facilities in the Primary Health Care" package defined at Alma Atta in 1978.

1.2 Availability of safe drinking water is but one among the many paradoxes haunting Kerala, a small Indian state with an area of 38863 sq. kms. situated at the south western tip of the Indian peninsula. Despite its average annual rainfall of over 3000 mm, spread over two monsoons, the per-capita availability of drinking water is lower than many other states in the country. Even though the state is endowed with 44 major and minor rivers, nine of them having been declared as national assets, water scarcity, especially in summer months, is experienced almost throughout the state (Kurup 1994). Kerala is also endowed with innumerable water sources like springs, ponds, tanks and



streams, besides the extensive net-work of backwaters and lagoons. Added to these natural water resources are the high density of dug wells spread throughout the length and breadth of the state. Yet, the State suffers from drinking water scarcity of a high magnitude, particularly in the dry season.

WATER SUPPLY POLICY OF THE GOVERNMENT OF INDIA

1.3 Water and sanitation related diseases account for most of the morbidity and mortality in developing countries. Therefore, water supply and sanitation programmes aim to reduce these diseases and thus to contribute to improving public health, to reducing curative health costs and to decreasing production losses due to poor health and illness (Burgers et. al: 1988: ix). India, as such, attaches great importance to safe drinking water supply and recognises its vital role in health and efficiency. Water supply and sanitation have been a specific national development objective of the country, since the first Five year development plan. Starting from rural pipe water schemes for population upto 5000, the scope and coverage gradually increased to cover communities of 20,000 population and priorities to "problem villages". In the 1970s specific programmes were started to provide minimum basic water supply requirements to all rural population. International Drinking Water and Sanitation Decade saw accelerated development in the sector in the 1980s (Government of India. 1997.)

1.4. The National Water Policy enunciated in 1987 gives the highest priority to drinking water supply (Govt of India :1992: 375). Drinking Water Supply is the responsibility of the State Governments and it formed an important constituent of the State sector Minimum Needs Programme (MNP) during the Seventh National Five Year Plan. The National Drinking Water Mission, to provide "scientific and cost effective content" to the Accelerated Rural Water Supply Programme, was launched in 1986.

1.5. The "New Delhi Declaration" which was adopted by the United Nations in December, 1990 formed the basic approach of water supply and sanitation in the country which, *inter-alia*, emphasises integrated management of water resources, full participation of women at all levels, community management of services and extensive use of appropriate technologies (Ibid 379). It is estimated that an investment of around Rs.30,000 crores (at current prices) have already been made over the successive Five



Year Plans in the water supply and sanitation sector of the country, as a result of which (it is claimed - author's) about 82 % of rural population and 85 % of urban population have access to safe drinking water supply facility (Govt of India: 1996 90) The Ninth Five year plan envisages to "provide access to safe drinking water facility to the entire population in urban and rural areas, during the next five years" (Ibid)

POLICY AND PROGRAMMES OF THE GOVERNMENT OF KERALA

1.6. Though community managed traditional water supplies in the form of open dug wells and ponds have been in existence for generations, the first pipe water system in rural Kerala was started in the 1930s by the erstwhile Travancore State. After the formation of the Kerala State, during 1960s and 70s, emphasis was on urban piped water supply schemes although a sprinkling of rural schemes were also in operation. In the 1970s a number of rural piped water supply projects were initiated with the financial assistance from the Life Insurance Corporation of India. It was augmented during late 1970s and early 1980s with the support of the Central Government and donor countries like the Netherlands.

1.7 In tune with the national thinking, Kerala has adopted a comprehensive State Water Policy, in 1992, the first of its kind in any State in the country. The Policy envisages "optimum conservation and judicious use of water". Accordingly, a twelve point programme has also been adopted which include:

- Collection and conservation of rain water.
- Construction of check-dams and contour bunds to arrest run-away water
- Protection of forests, check their destruction and encourage afforestation.
- Water in reservoirs to be used for water supply schemes.
- Unused traditional ponds and springs to be re-commissioned for irrigation and drinking purposes.
- Conservation and judicious use of ground water to be ensured.
- Water supply schemes to be commissioned in water scarce areas.
- Dug wells to be protected and deepened for use and will not be allowed to be filled.
- Drip irrigation to be encouraged to avoid wastage of water.



- Water conservation by constructing check-dams, tanks and ponds
- Encouraging use of hand pumps and
- Wastage of water to be avoided.

1.8. As per the 1991 population census Kerala has 1384 villages. Of these, 1343 problem-villages have been covered with protected drinking water supply by 1995 through 1462 rural water supply schemes. Around 89.87 lakh rural population, forming nearly 42 % of the state's rural population, has been covered by the protected water supply schemes, claims the Economic Review, 1995 of the State Planning Board, (pp 155 &156). District wise, the problem villages covered by the end of 1995 are as below:

Sl. No.	District	No. of Villages
1	Thiruvananthapuram	89
2	Kollam	90
3	Pathanamthitta	62
4	Alappuzha	71
5	Kottayam	89
6	Idukki	62
7	Ernakulam	87
8	Thrissur	193
9	Palakkad	155
10	Malappuram	116
11	Kozhikode	87
12	Wayanad	48
13	Kannur	78
14	Kasargod	116
	Total	1343

1.9 In other words, out of the 7795 problem habitations, 1673 have 50 % to 100 % coverage, 1876 have a coverage between 25 % and 50 %, 2161 habitations have 10 to 25 % coverage and the rest (2085) have only below 10 % coverage (ibid)



NETHERLANDS ASSISTED WATER SUPPLY PROJECTS

The Background

1.10. Under the Indo-Dutch bilateral co-operation Agreement, the Netherlands Government supports the development of eight rural water supply schemes as well as sanitation projects in Kerala. The primary objective of all Netherlands assisted water supply projects is to provide drinking water to households covered by the schemes. The schemes consist of abstraction of water from surface or ground water sources, distribution and supply through public stand posts and individual house connections to a target population of 1.7 million. The Indo-Dutch collaboration covers the entire project cycle from inception through implementation to operation and maintenance and evaluation. The projects are executed in an integrated manner involving both technical and socio-economic aspects of rural water supply and sanitation. The implementing agency of the Indo-Dutch projects is the Kerala Water Authority (KWA) which is a semi-autonomous corporation set up by the government of Kerala.

1.11. The Government of Netherlands and Government of India agreed to establish an external support structure for the project to assist KWA with project implementation. The structure includes a Socio-Economic Units and a Technical Liaison Officer, both based in Kerala, and a Netherlands based Review and Support Mission which pays regular visits to the projects in Kerala.

1.12. The Netherlands Government has been supporting the First Netherlands Assisted Rural Water Supply and Sanitation Programme in Kerala for the last fifteen years, from 1982 to 1997. There are eight water supply projects aided by the Dutch Government. They are Vakkom-Anjengo in Thiruvananthapuram district, Thrikunnapuzha and Cheriyanad in Alappuzha, Koipuram in the Pathanamthitta district, Nattika Firka and Mala in Thrissur, Pavaratty covering parts of Thrissur and Palakkad districts and Kundara in Kollam district. Of the 8 projects the first 6 have been completed. The details of the scheme features are given below:



Scheme Features :

1. Comprehensive Water Supply Scheme to Vakkom Anjengo :

1.13. The scheme area covers 6 Panchayats of Vakkom, Anjengo, Kadakkavoor, Chirayinkil, Kizhuvillam and Azhoor (1 ward only) in Thiruvananthapuram District. A considerable portion of these Panchayats consists of islands and low lying lands surrounded by sea and backwaters and the water available is brackish. This scheme with Vamanapuram river as source was started in 1982 to cover 90% of the population. The ultimate population to benefit is expected to be 1,94,000, in 2011. The design capacity of the scheme is 9.7 mld at 50 litres per capita per day. The scheme at a cost of Rs 537 lakhs was completed in 1996.

2. Rural Water Supply Scheme to Koipuram :

1.14. This scheme started in 1984 with Pamba river as source covers the Koipuram Panchayat of the Pathanamthitta district. The Panchayat experiences acute water scarcity especially during summer. The scheme was designed to provide piped water to 90 % of the population and the ultimate population to benefit is 44,000 in 2011. The design capacity is 2.4 mld at 50 litres per-capita per day. The scheme was completed in 1994 at a cost of Rs 149 lakhs.

3. Rural Water Supply Scheme to Cherianad .

1.15. The scheme covers the Cherianad Panchayat in Alappuzha District. It was started in 1985 with Achancoil river as source. It covers an area of 13.20 sq km and was designed to cover 90 % of the population. The ultimate population to benefit is 34750 in the year 2011. The design capacity is 1.7 mld at 50 litres per capita per-day. The scheme was completed in 1994, at a cost of Rs.134 lakhs.

4. Rural water Supply Scheme to Thrikunnapuzha :

1.16. This scheme covers ward nos. VIII, IX And X of Thrikunnapuzha Panchayat in Alappuzha District with an area of 6.5 sq. Km. The scheme was started execution in 1984 with a tube well as source. The ultimate population to benefit will be about 11,000 in the year 2011. The design capacity is 0.5 mld at 50 litres per-capita per day. The scheme was completed in 1994 with a cost of Rs 34 lakhs.

5. Comprehensive Water Supply Scheme to Nattika-Firka.

1.17 This scheme covers 10 Panchayats viz. Engandiyoor, Vadanapally, Thalikulam, Nattika, Valappad, Edathuruthy, Kaipamangalam, Perinjalam, Mathilakam and Sree Narayanapuram Panchayats along the Arabian Sea coast in Chavakkad Taluk of Thrissur District. The scheme was taken up for execution in 1982 with Karuvannor River as the source. The Nattika scheme covers an area of 140.50 sq.km. and the ultimate population to benefit by the scheme is 4,00,000 in 2011. The design capacity of the scheme is 20 mld at 50 litres per-capita per day. The scheme was completed in early 1997 at a cost of Rs 1876 lakhs.

6. Comprehensive Water Supply Scheme to Mala and Adjoining Panchayats.

1.18. This scheme covers the Panchayats of Mala, Annamanada, Kuzhoor, Poyya, Puthenchira and Vellangallur in Mukundapuram and Kodungalloor Taluks of Thrissur District. The scheme extending 147 Sq.Km was taken up for execution in 1984 with Chalakkudy River as source. The ultimate population to benefit by the scheme is 2,04,000 in the year 2011. The design capacity is 11.2 mld at the rate of 50 litres per-capita per day. The scheme was completed in 1996 at a cost of Rs 586 lakhs (TLO:1997)

THE SETTING

1.19. This Water use survey of the Netherlands assisted, Drinking Water Supply and Sanitation Projects was made in the 25 Panchayats spread over four districts of Kerala. A bird's eye-view of Kerala would be helpful in recognising the water problem of the state.

1.20. Kerala, one of the small states of the Indian Union has an area of 38,863 Sq. km and a population of 29.1 million in 1991 (Samuel :1993 :5)which formed 3.44 % of the total population of India. For administrative purposes, the state is divided into 14 districts with Thiruvananthapuram as its administrative nerve centre. Bounded on the north by Karnataka state, on the east and south by Tamil Nadu and Lakshadweep sea on the west, it has a length of 560 Kms and a minimum and maximum breadth of 13 Kms and 120 Kms respectively. Physiographically the state is divided into three longitudinal divisions of alluvial coastal lowlands, low laterite plateau and foothills known as midlands and the gneissic highlands. The coastal region has a network of backwaters, besides the drainage areas of 44 rivers, 41 of them flowing westwards from the state's eastern boundary of Western Ghats and three east flowing (Govt of Kerala: 1989 :3). Endowed with a salubrious maritime tropical climate, the temperature ranging between 20 to 35 degrees celsius, rain is available almost throughout the year though its

precipitation varies considerably from season to season. The maximum rainfall (67% of the total rainfall of Kerala) is recorded during the south west monsoon period of June to September called *Kalavarsham* and about 17% during the north-east monsoon, called *Thulavarsham*, of October-November The summer rains account for almost 13% spread over March to May and the rest 3%, forms the cold season showers during December to February. The average annual rain fall is 3003 mm (Mathew 1994 :228).

1.21. Kerala, in many ways, is different, from the rest of the country. Malayalam is the *lingua franca* of the state and it is a melting pot of ethnic diversities, comprising Hindus (58%) and Christians and Muslims (21% each). There is also a sprinkling of Jews, Jains and Budhists. About 10% of the total population belongs to the Scheduled Castes* and a little over 1 % are Scheduled Tribes* (Samuel : 1993 : 10)

1.22. Kerala is the most thickly populated state in the country with a density of 749 persons per sq. km, as against the national average of 267, in 1991, living in dispersed rural habitations. The average size of a Kerala household is 5.3 persons (national 5.6) and the only state in the country which has a preponderance of females, with 1036 females per 1000 males. In the matter of literacy too, the state stands first with 90% (Male 94%, Female 86 %) as against a national average of 52% (Male 64% and female 39%). According to a Paper Placed on the Table of the Kerala Legislature, about 31% of the 55,13,200 households enumerated in the 1991 population census falls below the poverty line[®]. As in education, the state is far ahead of other states in the matter of health parameters. The average expectation of life for males is 69 and that of females 72 years. The mortality rate is 5.8 per 1000 population and Infant Mortality 13 per thousand in 1995. The state has a well developed health-care infrastructure. The cumulative and synergetic effect of all these different variables contributed to the improvement of the quality of life of the Keralite. The latest available data (1985) indicate that Kerala tops the states in PQLI (Physical Quality of Life Index) with 93.7 for males and 89.9 for females (Kurup : 1992 :29)

* Scheduled Castes and Scheduled Tribes are communities listed in the schedule to the Constitution of India, for special care and protection

[®] For official purposes those households with an income below Rs 11,000/- per annum are categorised under this group



SURVEY METHODOLOGY

The primary objective of all Netherlands Assisted Water Supply Projects in Kerala, as mentioned elsewhere, is to provide drinking water to all households, the poor in particular, covered by the scheme. Effectiveness of these projects is judged by the fact that the intended beneficiaries get enough water and use it mainly for the basic household use of drinking and cooking. The instant survey has, therefore, been designed keeping in mind the under-mentioned objectives.

Objectives of the Survey :

2.2.

1. To survey the household use of water in the areas covered by the six Netherlands assisted water supply schemes.
2. To determine the extent of use of piped tap water for each basic household need.
3. To assess the extent and use of alternate water sources for each basic household use.
4. To find out the difference in use pattern between dry and post monsoon period of the year.
5. To identify the reasons for using alternate water sources.
6. To ascertain the likes and dislikes of the piped water supply service and
7. To gauge the extent of misuse, if any, of piped water.

2.3. The survey was designed keeping in mind the above objectives as well as the time frame available at our disposal. The idea of undertaking a survey before the onset of South West monsoon in early June was put across in April. The planning, for the survey and its execution was necessarily to be completed in a couple of months. It was felt that only a co-operative venture, between the Society for Psycho-social Research and Rehabilitation (PSRR) and the Technical Liaison Office (TLO), can help in undertaking the survey in time. And it succeeded.

Preparation for Survey

2.4 The first step, in finding the necessary field surveyors and supervisors - a total of ten right people for the task - and to undertake the survey being very short a period, gave us a few sleepless nights. Thanks to PSRR's networking with academic institutions and scholars, the necessary manpower could be arranged almost instantly. In the mean time, a tentative structured format for data gathering had been drawn up in co-operation with the TLO. It covered, besides background information reflecting the socio-economic characteristics of surveyed households, data on household use of water for different purposes, use of water at source outside the household compound, sources of water for different household needs, both in dry season and post-monsoon period, the reasons for using water from different sources and the household's perception about the piped water supply services.

Pre-Test of Format

2.5. This structured survey instrument was field-tested by undertaking a pre-test in a few rural households in the Chirayinkil and Kizhuvillam Panchayats falling under the Vakkom-Anjengo water supply scheme. A few changes have been incorporated in the survey format in the light of the pre-test experience, before it was finalised. The inbuilt cross checks in the format helped in avoiding incorrect data gathering at the initial stage itself. In data collection the structured instrument was supplemented and reinforced using anthropological techniques of observation, wherever possible and Focus Group



Discussions and in-depth interviews, techniques usually adopted in such scientific surveys (Boot:1993)

Training of Surveyors

2.6. Once the structured survey instrument was finalised and manpower recruited, it was the turn for the training of the surveyors. Time constraints did not permit a very elaborate drill. Yet a training capsule extending a week with a balanced mix of class room lecture and field practice, put them in good stead. It was also buttressed with local visits of the project Director and the supervisors in the initial stages itself of data gathering. Deployment of the supervisors was done according to the number of households to be covered as pre-planned. Five surveyors three at Nattika scheme, and two at Mala and one supervisor were posted in the Central Zone. In the South Zone, two surveyors were posted at Vakkom-Anjengo and another one took care of the three schemes of Koipuram, Cheriyanad and Thrikunnapuzha, along with one supervisor.

2.7. The success of the survey, and that too in a short period, was made possible owing to the co-operation and assistance of the people and the establishment. The TLO and his colleagues, the members and presidents of all the survey Panchayats, the field formation of the Kerala Water Authority and the Socio-Economic Units Foundation, extended possible assistance. The co-operation of the people of both the sample households and others in the survey areas was spontaneous, reflecting their intense concern for drinking water on the one hand, and the extent of rapport established by the surveyors and supervisors among the respondents, on the other.

The Universe of the Survey

2.8. As per the list made available by the TLO, a total of 24 Panchayats (one more Panchayat was added later) covering six schemes in the Central and South Zones of the Netherlands assisted Water Supply Projects were to be surveyed. Since a census survey of the entire universe of the schemes was not practical at such a short period, a suitable sample frame was adopted to identify the water-use households. The sample frame was a combination of multi-stage systematic, coupled with stratified random sampling. The details of the universe and the sample are as below:



The Sample Frame

Sl. No.	Zone/ Scheme/Panchayat	No of wards in the Panchayat	No. of wards in the Sample	Total No. of SPs	No of SPs in Sample	No. of HH Surveyed
	CENTRAL ZONE					
I	Nattika Scheme					
1	Engadiyoor	11	3	58	29	82
2	Mathilakom	11	4	52	26	78
3	SN Puram	13	4	85	42	116
4	Vadanapally	11	3	27	13	41
5	Kaipamangalam	12	4	67	34	106
6	Valappad	12	4	32	16	45
7	Perinjanam	9	3	45	23	70
8	Thalikulam	10	4	68	34	95
9	Nattika	9	3	55	28	79
10	Edathuruthy*	11	3	195	24	70
II	Mala Scheme					
11	Mala	12	4	174	87	263
12	Poyya	9	3	103	51	139
13	Kuzhoor	9	3	47	23	63
14	Annamanada	11	3	20	10	28
15	Puthenchira	9	3	79	39	121
16	Vellangallur	12	4	112	56	140
	SOUTH ZONE					
III	Vakkom- Anjengo Scheme					
17	Anjengo	9	3	71	35	109
18	Chirayinkil	12	4	89	44	135
19	Kadakkavoor	10	3	83	41	125
20	Kizhuvillam	11	3	78	39	103
21	Vakkom	9	3	49	24	75
22	Azhoor	11	1	24	12	36
IV	Thrikkunnapuzha Scheme					
23	Thrikkunnapuzha	10	3	90	44	119
V	Cheriyamad Scheme					
24	Cheriyamad	10	3	52	26	73
VI	Koipuram Scheme					
25	Koipuram	11	4	61	31	83
	Total	264	82	1816	831	2394

* Was not included in the initial list



Sampling Procedure

2.9. At the first stage, every third ward from the list of total wards of all the 25 Panchayats was selected, which formed the sample wards. At the second stage half of the total stand posts in each sample ward was chosen by selecting every second stand post which formed the sample stand posts. The third step in the sampling process was the selection of sample households. The ideal procedure in selecting the sample households would have been choosing at random the required number from the list of the beneficiaries of each sample stand post. Since such a list was not readily available it was decided to choose randomly three households falling within the ambit of each sample stand post. The three households were selected in such a way that one of them was situated at the farthest end, one nearest and the third in between.

2.10. Although this was the general principle adopted in drawing the sample, certain deviations had to be made in the field because of unforeseen circumstances. For example, the total number of stand posts indicated in the list did not always tally with the number actually available in the field; many have since been closed, many are damaged or become non-functional, and so on. Depending on the availability, efforts were made to cover the originally planned number of stand posts. Similarly all the sample households did not necessarily were pipe water users, or for that matter stand post users. They belonged to stand post users, those owning private house connection or even solely well water users.

2.11. Thus 82 wards were selected from the total of 264 wards of 25 Panchayats as sample wards. Similarly 831 stand posts were chosen out of a total of 1816. The total number of households in the sample was 2394. Scheme wise, 782 households in Nattika, 754 in Mala, 583 in Vakkom Anjengo, 119 in Thrakkunnappuzha, 73 in Cheriyanad and 83 in Koipuram were chosen.

The Respondents

2.12. A word about choosing the respondents. Since the women of the household, by and large, are responsible for procuring water for the house and choosing





Thorough training yielded good results



Surveyor in action



the water source, as far as possible adult women of the household were chosen as respondents. Children and very old people were avoided.

Objectivity in Data Collection

2.13. To ensure objectivity in the collected data, cross-checking of information, unstructured observation of water sources, water use activities and interview of knowledgeable people were made an integral part of the techniques adopted, besides canvassing the structured survey format. The surveyors were also asked to record a general note on the location, terrain, different water sources and water problems in general in different seasons of the sample ward and also the Panchayat. This helped in appreciating the general and global picture of water use pattern.

Supervision And Checking

2.14. Yet another technique adopted to ensure correctness of the data was periodic and surprise field visits and checking of the data by the Project Director, besides the frequent visits of the Supervisors. The Supervisor who stationed in the field was also required to check each filled in format and authenticate it for the correctness. In short, every possible care was taken to see that the sample was carefully drawn, objectivity and correctness of the data were maintained and necessary supplementary information was collected.

Field Problem

2.15. So hectic and tight was the field work that most of the Surveyors had to forgo their weekly off. All the Surveyors and the Supervisors remained in the field itself throughout the data collection period. Intra and inter-ward communication facilities were meagre and wherever available, it was expensive. Many a times they had to walk long distances to locate sample stand posts as they are, in most cases located haphazardly. They had also to visit a household more than once either because of the absence of respondents at the first call or to suit their convenience. Water being the most sought after and precious commodity and since it was the peak of summer, almost every household was critical about the water supply service. Little knowing the actual identity of the Surveyor all the complaints were showered on him which he had to silently bear



They bore it cheerfully as they were cautioned about such eventualities in advance during the training itself. At least on two occasions the Project Director too had to face angry crowds of villagers. In fact the Project Director was moved by the tales of woes of people in many parts of the project areas were to undergo. In areas like Anjengo people are to spend sleepless nights for the arrival of the 'precious commodity' in the absence of any fixed time for water supply.

Collation of Data

2 16. Collation of data, in the field itself was not envisaged in the first instance. As such enough manpower deployment could not be ensured. Collation work had to be undertaken, in most of the cases, after the survey work was over, resulting in a bit of delay in data processing and documentation, and at extra cost.

The Workshop

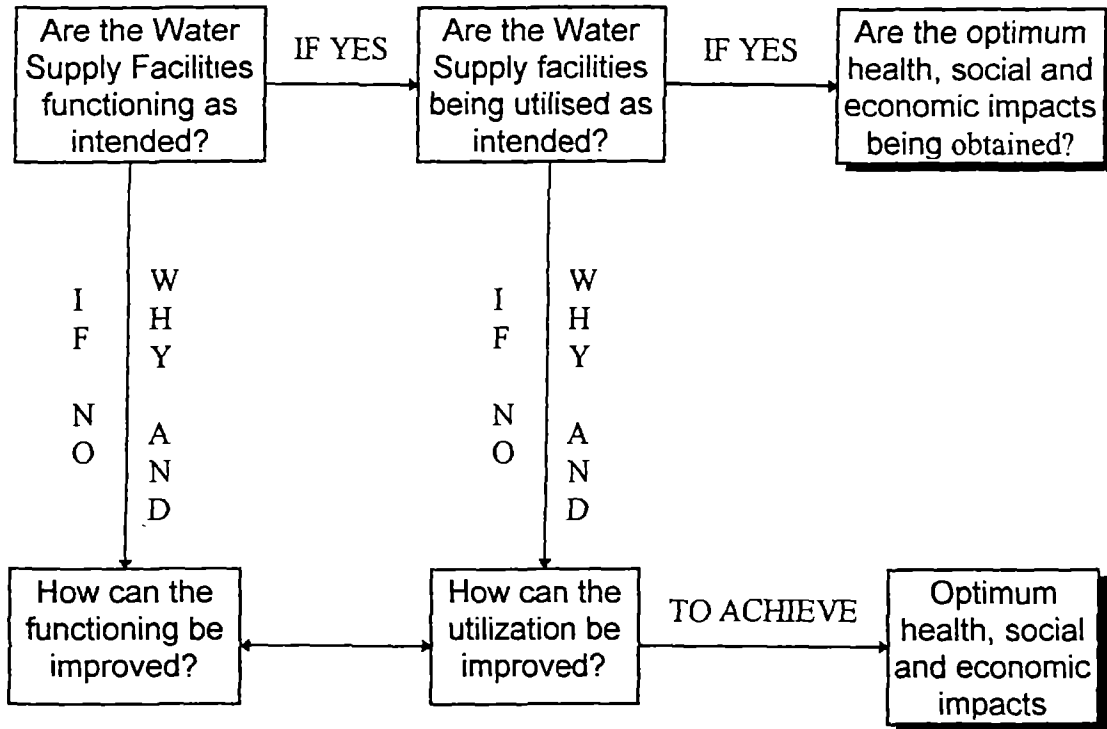
2 17. Yet another useful rewarding exercise undertaken was the organisation of a one-day workshop in which all the Surveyors, both the Supervisors, the Project Director, representative of the TLO and a couple of academics participated. Many of the Surveyors articulated their general observations through written and verbal presentations. The discussions and interactions in the workshop threw up a lot of useful information helpful in preparing the Report.

Need for an In-depth Study

2 18. The survey, no doubt, provides useful quantitative data on various aspects of water use patterns like extent of alternative sources used, extent of water used, and likes and dislikes of water supply service, etc. It may also indicate whether the project has been able to achieve its stated objectives. In other words 'What' the malady is may be partially known. But the more important aspect, 'Why' the malady and 'How' such a malady can be rectified, remain almost unanswered. The scope of this survey falls short of even the Minimum Evaluation Procedure (MEP) developed by the WHO (1983) in water supply and sanitation facilities as indicated below.



**Adapted from the Minimum Evaluation Procedure (MEP)
Developed by the WHO**



2.19. This survey does not throw any light on the basic objective of piped water supply and sanitation programmes which ultimately aims at improving the health status leading to social well-being and economic development. The components of such a health impact study should among others, include sanitation practices, hygiene behaviour, productivity improvement, cultural context, social dynamics and other co-relations. In other words economic, social and health implications of water supply and sanitation programmes must not be overlooked. It is hoped that the donor organisation would be interested to undertake such an assessment.



SOCIO-ECONOMIC PROFILE OF HOUSEHOLDS

Socio-economic context of water use and sanitation has been well documented. Mukherjee (1990) discusses about folk beliefs regarding "good" and "bad" water. On the basis of a country-wide Indian study she concludes that the popular definition of "good water" is water that is visually clear, tastes sweet (free of unpleasant flavours and odours) and cooks food well and quickly. Conversely, bad water is one unfit for drinking, which is visually unclear, has a tinge of colour, salty or metallic taste or smell, and water in which grains and pulses take a long time to cook. "Thus, the criteria people presently used to distinguish 'good' water from 'bad' can at times cause people to reject safe sources as 'unfit for drinking' ". The study also reveals that 88-95% of the people believe that bad drinking water causes health problems. Similarly Chandpur community of Bangladesh never bathe in water from tube wells because it is more cooling, mothers avoid drinking well water lest her breast milk becomes too cool for the baby and so on (Zeitlyn : 1991 :259-264).

3.2. Access to water is another constraint related to resources not only to money but also to availability of land, time, materials and technical and management skills for achieving improved facilities (Boot et al .1993 : 27). Where public/community facilities are present, socio-economic criteria may, sometimes, determine whether people are allowed and can afford to use them. Sometimes, particular socio-economic groups are excluded from access, notably by local elites or political or religious power groups (Burgers et al : 1988).

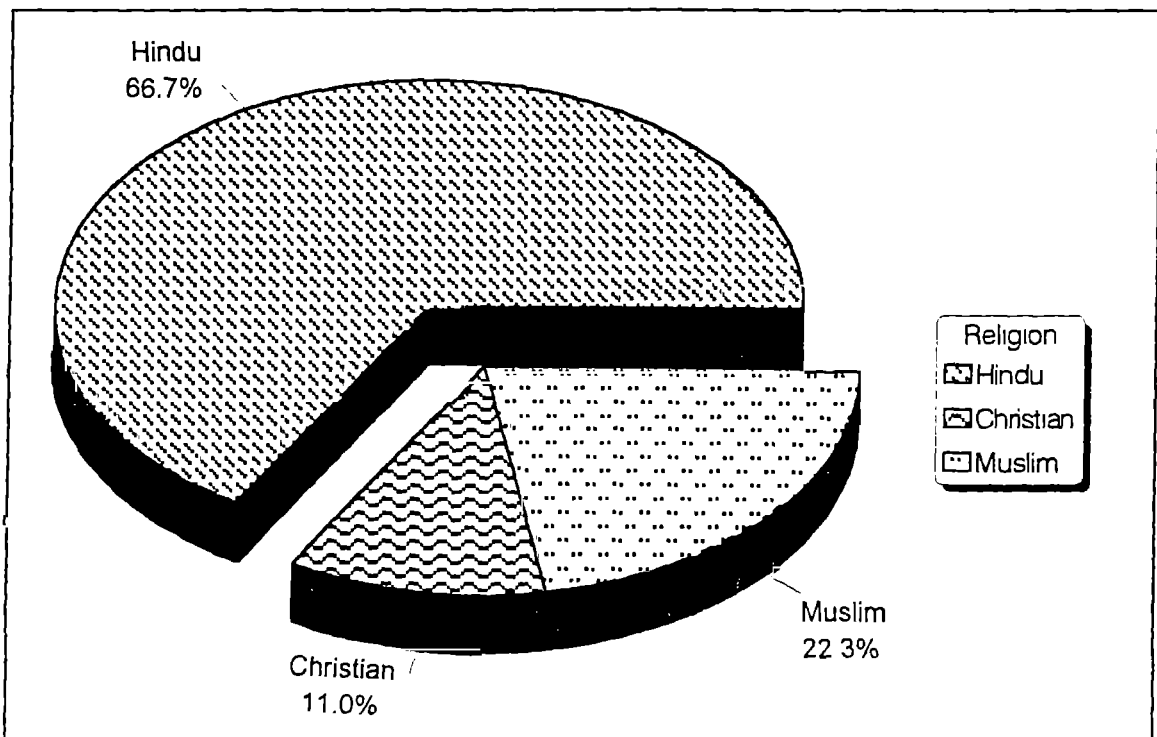


3.3 Detailed analysis of the interplay between socio-economic factors and water use has not been attempted in the survey. However, in view of its importance an overview of the socio-economic profile of the surveyed households is sketched here.

Social Profile

3.4. All the three major religions in Kerala, the Hindus, Christians and the Muslims are found in the surveyed area though not in the same proportions. While Hindus formed two thirds (66.8%) of the sample households, the Christian and Muslim households accounted for 11% and 22.3% respectively as could be seen in the Diagram III.1.

Diagram III. 1 Showing Religion-wise Distribution of Sample Households



3.5 Major sub-groups under the Hindu religion are also represented in the area under survey. They are the Forward caste group, the Backward caste group, the Scheduled Castes and Scheduled Tribes. While the Forward Castes account for 8.5%, the Backward Castes form the majority of 40.6% among the Hindus. Scheduled Castes constitute another 17.5% and the rest (0.2%) the Scheduled Tribes as could be seen in Table III.1. Scheme wise and Panchayat wise details are at Appendix III.1

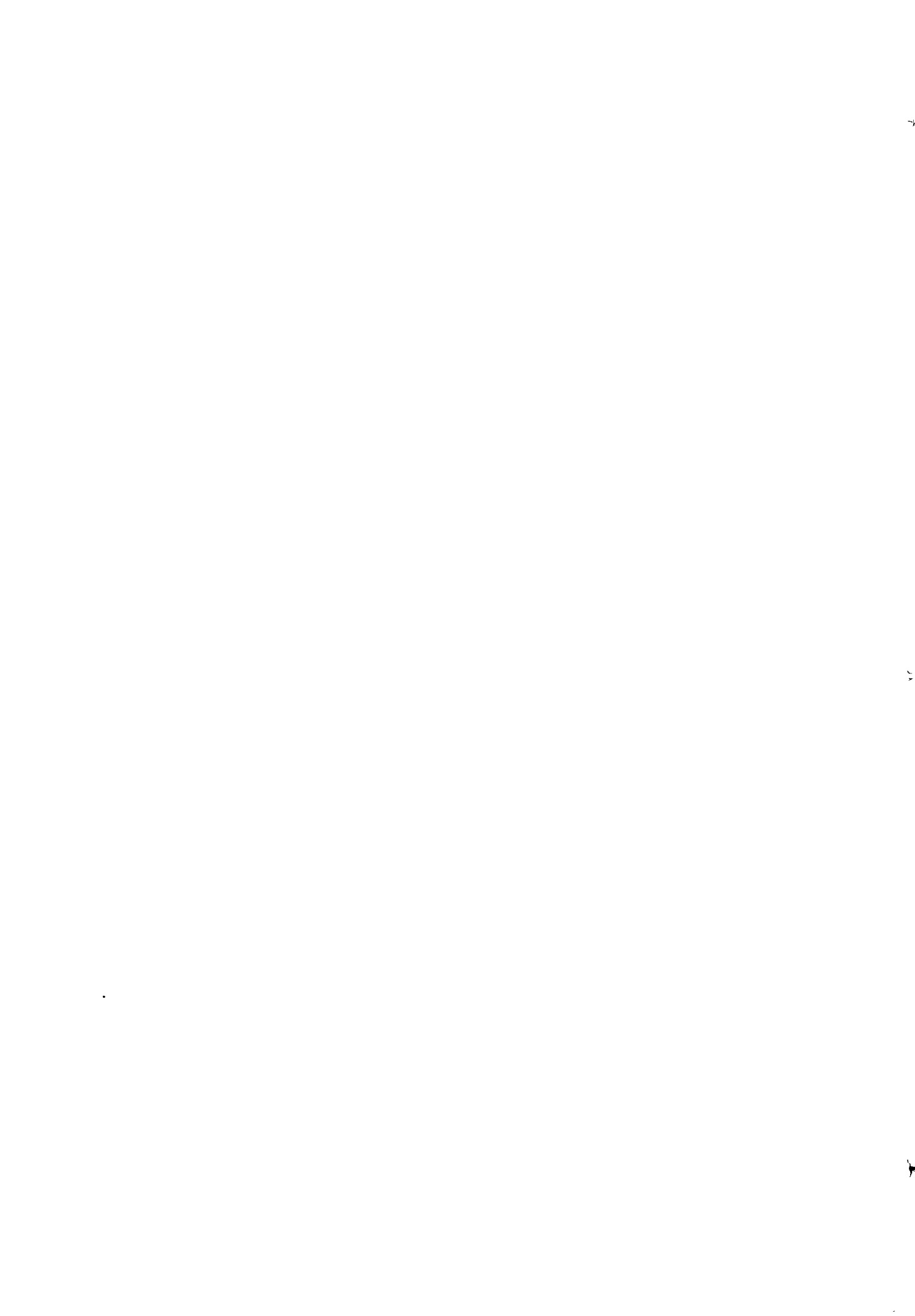


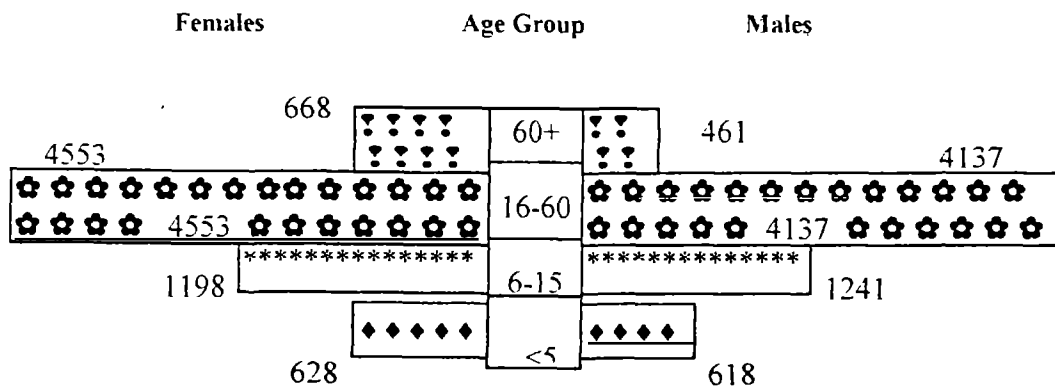
Table III. 1 Social Profile of Households

Scheme		Natt- ika	Mala	Vakkom- Anjengo	Thrikk unnapu zha	Cheri- yanad	Koip- uram	Total	Per- cent- age
Forward Castes	No	25	24	133	-	13	8	203	8.5
	%	3.2	3.2	22.8	-	17.8	9.6		
Backward Castes	No	332	324	229	62	9	15	971	40.6
	%	42.6	43.0	39.3	52.1	12.3	18.1		
Schedule Castes	No	176	114	69	15	18	26	418	17.5
	%	22.5	15.1	11.8	12.6	24.7	31.3		
Schedule Tribes	No	-	-	1	-	-	4	5	0.2
	%	-	-	0.2	-	-	4.8		
Hindu (Total)	No	533	462	432	77	40	53	1597	66.7
	%	68.2	61.3	74.1	64.7	54.8	63.9		
Christian	No	36	165	22	-	11	30	264	11.0
	%	4.6	21.9	3.8	-	15.1	36.1		
Muslim	No	213	127	129	42	22	-	533	22.3
	%	27.2	16.8	22.1	35.3	30.1	-		
Total	No	782	754	583	119	73	83	2394	100
	%	100	100	100	100	100	100		

Age Structure

3.6. The total population of the surveyed sample households, covering all the six schemes, comes to 13,504, consisting of 6457 males (47.8%) and 7,047 females (52.2%). The sex ratio works out to 1091 females per 1000 males, a phenomenon common to the State. Adults of 16-60 age group form almost 65% of the total population and 18% are children between 6 and 15 years of age. Children under 5 and elderly people above 60 years constitute 9.2% and 8.4% respectively. Diagram III.2 provides a clear picture of the age structure.

Diagram III. 2 Age Structure of Sample Population



3.7. The predominance of females over the males is seen in all the age groups except among 6 to 15 group of children. The proportion of the population, sex-wise and age group-wise remains almost the same in different schemes as is discernible in Table III.2.

Table III. 2 Age Distribution of Sample Households in Different Schemes

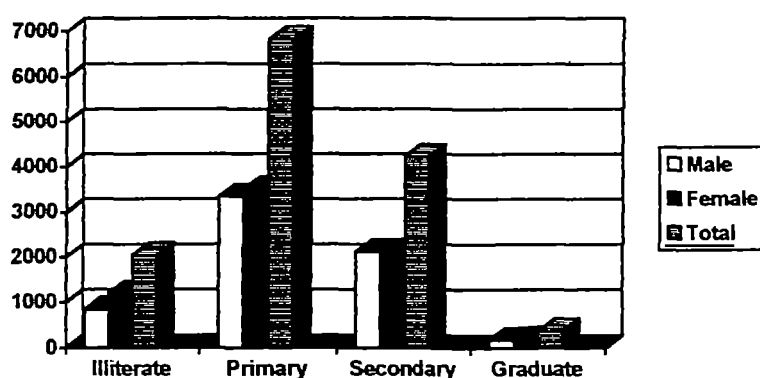
Scheme \ Age		Nattika	Mala	Vak kom-Anjengo	Thrikkunnappuzha	Che-riyanad	Koi-puram	Total	%
Children <5	Male	157	225	181	24	15	16	618	4.6
	%	3.6	5.6	5.0	3.6	3.6	3.8		
	Female	169	226	178	19	21	15	628	4.7
	%	3.9	5.6	4.9	2.8	5.1	3.6		
	Total	326	451	359	43	36	31	1246	9.2
	%	7.6	11.1	9.9	6.4	8.8	7.4		
Children 6-15	Male	396	305	377	73	48	42	1241	9.2
	%	9.2	7.5	10.3	10.9	11.7	10.0		
	Female	376	253	386	19	52	41	1198	8.9
	%	8.7	6.2	10.6	13.5	12.7	9.7		
	Total	772	558	763	163	100	83	2439	18.1
	%	17.9	13.8	20.9	24.4	24.3	19.7		
Adults 16-60	Male	1368	1267	1032	208	120	142	4137	30.6
	%	31.8	31.3	28.3	31.1	29.2	33.7		
	Female	1496	1395	1181	215	130	136	4553	33.7
	%	34.7	34.4	32.4	32.2	31.6	32.3		
	Total	2864	2662	2213	423	250	278	8690	64.4
	%	66.5	65.7	60.7	63.3	60.8	66.0		
Adults 60+	Male	139	163	122	13	9	15	461	3.4
	%	3.2	4.0	3.3	1.9	2.2	3.6		
	Female	205	220	187	26	16	14	668	4.9
	%	4.8	5.4	5.1	3.9	3.9	3.3		
	Total	344	383	309	39	25	29	1129	8.4
	%	8.0	9.4	8.5	5.8	6.1	6.9		
G. Total		4306	4054	3644	668	411	421	13504	100
%		100	100	100	100	100	100		

3.8. For scheme-wise and Panchayat wise age group distribution details, Appendix III.2 may be referred to.

Literacy and Levels of Education

3.9. Except about 15% (6.2% males and 8.9% females) all the people in the sample are literate. The average literacy rate works out to around 85% (including the under 5 population), below that of the state average (excluding the under 5). Sex-wise, it is 86.9% for males and 82.5% for females. More than half of the literates (59.8%) studied up to primary level, 37% up to secondary level and the rest (2.8%) are graduates and (0.4%) Post Graduates. In levels of education, the females outnumber males as could be seen from Diagram III.3.

Diagram III. 3 Literacy & Levels of Education



3.10. Details of the literacy and levels of education, scheme-wise and Panchayat wise are given in Appendix III.3. Table III.3 gives the scheme-wise details.

Table III. 3 Scheme-wise Literacy and Levels of Education

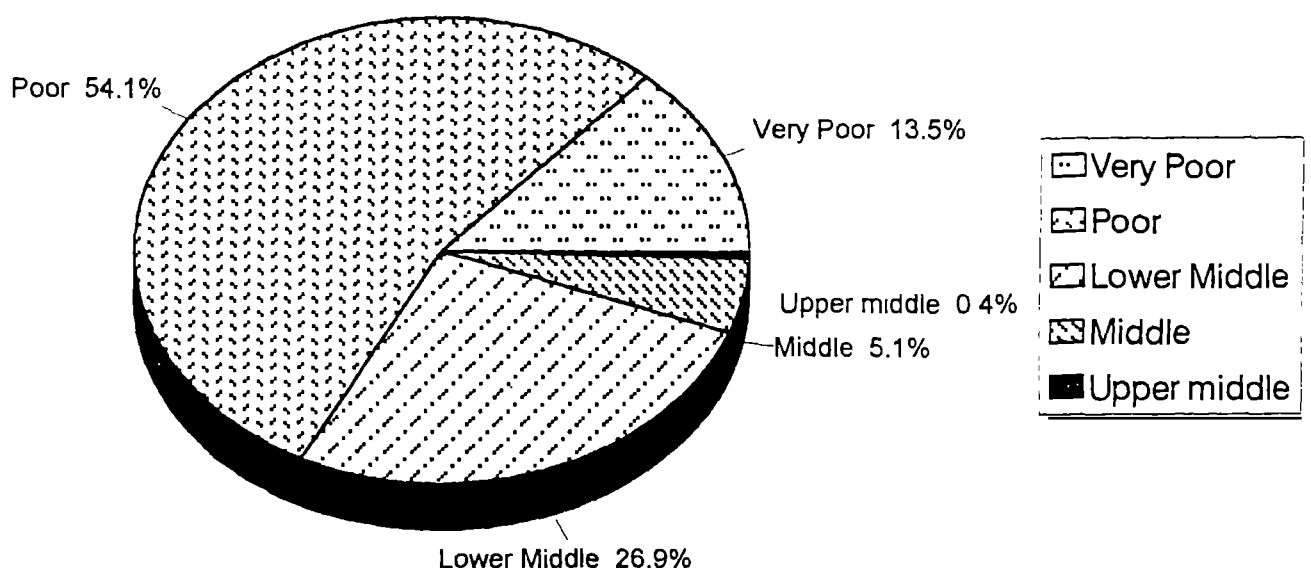
Scheme	Illiterate			Primary			Secondary			Graduates		
	M	F	T	M	F	T	M	F	T	M	F	T
Nattika	279	390	669	1213	1255	2468	531	516	1047	41	63	104
Mala	215	394	609	837	868	1705	825	814	1639	40	56	96
Vakkom-Anjengo	242	335	577	968	1013	1981	430	486	916	72	73	145
Thrikkunna-puzha	42	18	60	168	194	362	124	110	234	10	2	12
Cheriyana	21	38	59	63	74	137	102	103	205	6	4	10
Koipuram	36	26	62	80	91	171	96	85	181	4	3	7
Total	835	1201	2036	3329	3495	6824	2108	2114	4222	173	201	374
Percentage	6.2	8.9	15.1	24.7	25.9	50.5	15.6	15.7	31.3	1.3	1.5	2.8

Economic Status

3.11 In a short survey of this kind, collection of data to provide an accurate picture of economic status of the respondent households was not practical. At the same time it was necessary to have a general picture of the comparative economic position of the households. This was done on the basis of a general assessment by the Surveyor. Taking into account the size of the homestead, quality of the structure of the house (Katcha thached, tiled, pakka RCC), space in the house (1, 2, 3 etc. rooms), possession of a conveyance (none, bicycle, two-wheeler, motor car), dress and life style, household durables (fan, furniture, clock and other gadgets), type of occupation (daily wager, agriculture, white collar job, business, trade etc.), the Surveyor was asked to place each household under an appropriate category - very poor, poor, lower middle, middle, upper middle and rich. By far this classification was found to be good enough to judge the relative economic status of the households.

3.12. According to this assessment it was found that there was no 'rich household' in the sample and majority of the households (54.2%) belonged to the 'poor' category. Those below the poverty line or the very poor accounted for 13.5% of the households, 26.9% belong to the lower middle class category, 5.1% in the middle class category and the rest 0.4% upper middle class. Diagram III.4 gives a clearer picture.

Diagram III. 4 Economic Status of Households.







Coir related activities predominate in coastal areas

3.13. Households of various schemes present, more or less, a uniform picture of their economic status. The poor remains the dominant group. It is almost around 60% in all the scheme areas except Mala, which accounts for only 44%. The following Table III.4 gives the scheme-wise picture.

Table III. 4 Scheme-wise Economic Status of Households

Schemes	Very Poor		Poor		Lower Middle		Middle		Upper Middle		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Nattika	122	15.6	459	58.7	148	18.9	45	5.8	8	1.0	782	100
Mala	65	8.6	334	44.3	307	40.7	48	6.4	0	0	754	100
Vakkom-Anjengo	73	12.5	341	58.5	148	25.4	20	3.4	1	0.2	583	100
Thrikkunnapuzha	31	26.1	72	60.5	15	12.6	1	0.8	0	0	119	100
Cheriyamad	10	13.7	43	58.9	16	21.9	4	5.5	0	0	73	100
Koipuram	23	27.7	48	57.8	9	10.8	3	3.6	0	0	83	100
Total	324	13.5	1297	54.2	643	26.9	121	5.1	9	0.4	2394	100

3.14. Scheme-wise and Panchayat-wise details of the relative economic status of households covered in the sample survey are presented in Appendix III.4.

3.15. To sum, the areas covered by the schemes, except for their geographical and physical variations, are a microcosm of Kerala State. The people belonging to the sample households present a near homogenous picture. The proportion of the three religious groups in the different schemes is by far the same; the proportion of caste groups are by and large similar; there is a high degree of similarity in the demographic characteristics of sex-ratio and age structure; educationally there is a lot in common - both in literacy and levels of education of males and females; and there is not much variation in the economic status of the households in different schemes.

WATER USE BEHAVIOUR

Water use behaviour of a people, depends on many factors. Availability of water sources, their reliability, social accessibility, perceived water quality, personal preference, cultural context, environmental factors, ecology and socialisation pattern are but some key factors influencing water use behaviour. Traditionally, in general, Keralites prefer well water to other sources for drinking, food processing and cooking needs. When it comes to bathing and washing, depending upon availability, they opt for natural sources like ponds, streams, rivers which are available in plenty. A general characteristic is that people make a reasoned choice of a particular water source for a specific water need (Sophal et al :1986). An overview of common water sources, choice factors, and water uses can be shown diagrammatically as below

→ Kampuchea
not Kerala

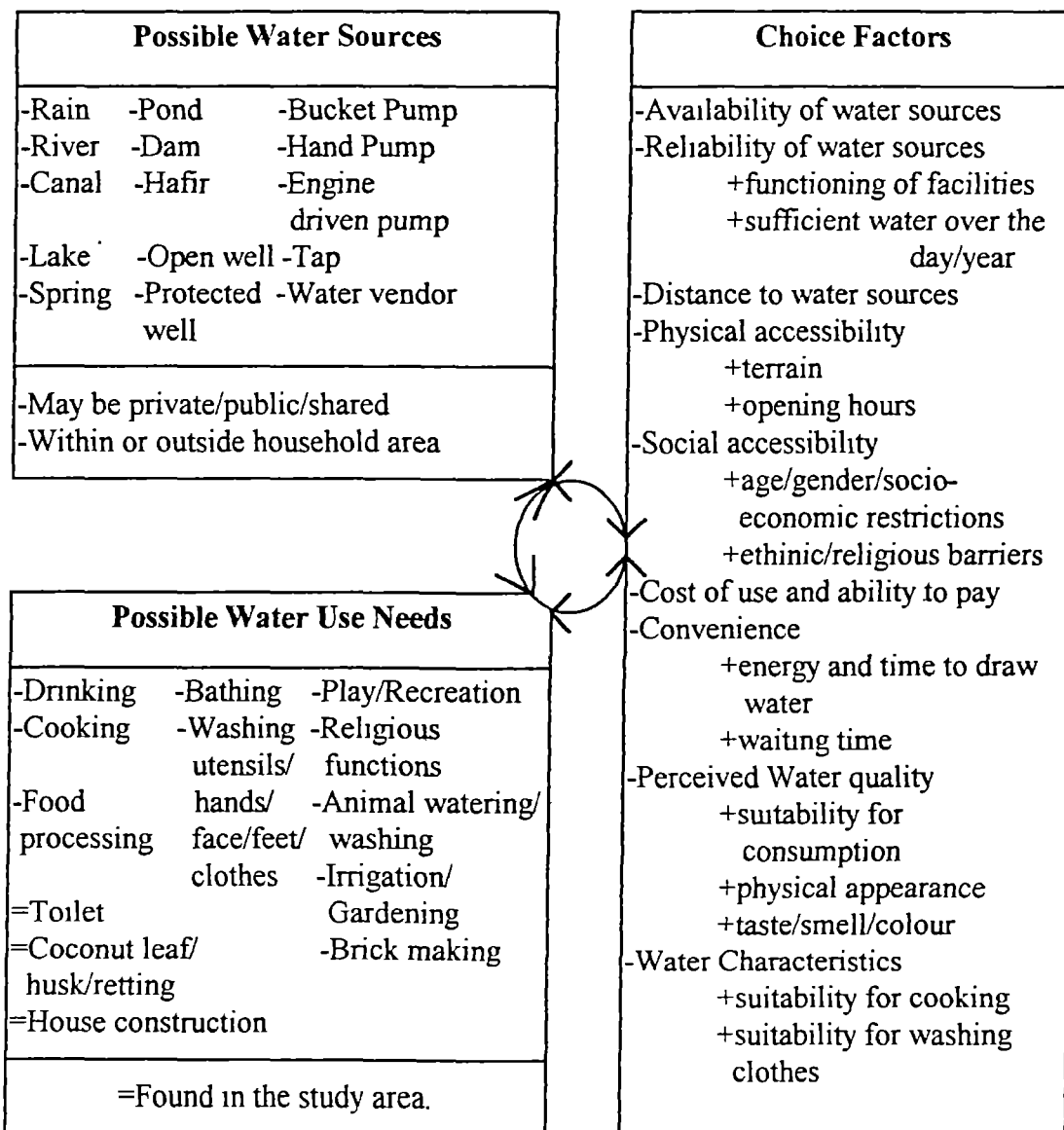




Water, water everywhere but not enough to drink



Diagram IV. 1 Choice Factors Related to Water Source and Water Use (adapted from Boot et. al)



Water Use Needs

4.2. In the different Netherlands Assisted Water Supply Schemes surveyed, the water use needs observed are drinking, cooking, bathing, toilet, hand/face/feet washing, clothes/utensils washing, house cleaning, garden watering, animal watering/washing and retting of coconut leaves/husks. All the surveyed households (2394) reported that they needed water for drinking, cooking, bathing, toilet use, hand washing (including face and feet), and clothes/utensils washing. Those needing water for other purposes vary from 15.4% in the case of animal watering/washing to 77% in the case of house cleaning. Water for gardening is needed by 34% households and



about 17% needed for retting of coconut leaves. Scheme-wise and Panchayat-wise water use needs as reported by the households are in the Appendix IV.1. A Scheme-wise summary of water use needs is given in Table IV.1.

Table IV. 1 Water Use Needs in Different Schemes

Scheme	Water Use Needs (Percent) Households- N 2394										
	D	C	B	Tt	HW	C/UW	HC	G	A	R	Ots
Nattika	100	100	100	100	100	100	92.2	66.2	13.0	26.9	-
Mala	100	100	100	100	100	100	81.4	8.62	14.5	8.6	-
Vakkom-Anjengo	100	100	100	100	100	100	50.4	14.1	9.1	10.3	-
Thrikkunnapuzha	100	100	100	100	100	100	86.6	52.1	37.8	55.5	-
Cheriyanaad	100	100	100	100	100	100	79.5	57.5	38.4	1.4	-
Koipuram	100	100	100	100	100	100	63.9	53.0	38.6	-	-
Total	100	100	100	100	100	100	77.0	34.0	15.4	16.8	-

4.3 The above table brings out the variations in water use needs in the different schemes. In the case of all the basic domestic uses (like D,C,B,Tt,HW &C/U.W) all the households (100%) in different schemes affirmed the need. In other cases the response depended upon the actual water use need, they felt. They depended upon various factors. For example, only those owning houses with cement flooring needed water for house cleaning/washing. Water is needed for gardening only by those having garden trees/plants. Similarly only animal (cow, buffalo, goat, bullocks) owners needed water for animal watering/washing. Retting of coconut leaves is undertaken either by those needed it for thatching of own houses or for selling to others. Number of households, accordingly, needing water for these purposes also vary.

Water Use at Source

4.4. Information on water use at source outside the household compound by male members, female members and children was gathered. It gives a glimpse of water use behaviour pattern of different members. This, in conjunction with the data on sources, will also provide the extent of wrong use, if any, of different water sources.



4.5. It can be observed that water use at source varies from scheme to scheme. There are also variations in the case of family members. Detailed information on water use at source outside the household compound by different members of the households, scheme-wise and Panchayat-wise, may be referred to at Appendix IV.2. The summary table IV.2, is self explanatory

Table IV. 2 Water Use at Source Outside Household Compound by Different Members of the Household (Percent)

Scheme \ Purpose		Nattika	Mala	Vakkom Anjengo	Thrikk unnap uzha	Cheriy anad	Koipur am	Total
Drinking	M	0.3	0.5	0.9	-	-	-	0.5
	W	0.4	-	0.2	0.8	0	1.2	0.3
	Ch	0.3	-	0.2	3.4	0	8.4	0.6
Bathing	M	4.7	1.3	13.4	32.0	11.0	9.6	7.5
	W	5.4	0.3	10.5	30.3	14.0	12.1	6.7
	Ch	3.3	0.5	5.5	17.0	5.5	10.8	4.0
Toilet Purposes	M	0.1	-	1.4	26.1	-	-	1.7
	W	0.1	-	0.3	25.2	-	-	1.4
	Ch	-	-	0.5	13.4	-	-	0.8
Hand washing	M	0.6	-	4.3	18.5	1.4	6.0	2.4
	W	0.9	-	3.6	19.3	1.4	3.6	2.3
	Ch	0.4	0.1	2.2	15.1	0	4.8	1.6
Clothes/ Utensils washing	M	4.3	0.5	11.2	28.6	12.3	8.4	6.4
	W	4.9	1.7	9.8	35.3	16.4	16.9	7.4
	Ch	2.0	0.3	3.6	12.6	5.5	10.8	2.8
Animals Watering	M	0.9	0.5	1.5	-	2.7	-	0.9
	W	0.9	1.3	0.7	5.1	6.9	-	1.3
	Ch	0.1	0.1	0.2	0	0	-	0.1
Retting	M	7.3	2.5	10.1	4.3	1.4	-	6.4
	W	14.2	6.5	5.0	45.4	1.4	-	10.2
	Ch	2.2	0.1	-	-	-	-	0.8

4.6. By far, use of water at source outside the household compound is common. Men, women and children resort to this though it varies from scheme to scheme. The sources include public well, public tap, ponds streams and river. During post monsoons when the density of salt in water is minimum, even backwaters are also used. The most important water-use activity undertaken is for bathing, followed by clothes/utensils washing, toilet and hand washing. Retting of coconut



Timely repair can avoid waste



Water use at source outside compound

leaves is yet another activity undertaken at the source outside the compound. Both adult, male and female members are found to be the major users at source, compared to children. Areas where acute water problem exist, like Vakkom-Anjengo and Thrikkunnappuzha, the incidence of water use at source was found to be more common. More meaningful deductions can be had if Table IV.2 is seen in conjunction with IV.3, 4 and 5.

Use of Well Water at Source

4.7. As expected households using well water at source outside the compound are extremely rare. Wells outside the compound may either be Panchayat public wells or wells belonging to the neighbour. In either case, use at source seems to be only in unavoidable extreme cases as could be seen from the summary Table IV.3. Scheme-wise and Panchayat-wise details are at appendix IV.3.

Table IV. 3 Households Using Well Water at Source Outside the Compound

Scheme \ Usages		Natti ka	Mala	Vakkom Anjengo	Thrik kunna puzha	Cheri yanad	Koipu ram	Total	%
Drinking	N	-	-	2	-	-	-	2	0.09
	P	-	-	-	-	-	-	-	-
Bathing	N	-	-	23	-	-	-	23	1.0
	P	1	1	9	-	-	-	11	0.48
Toilet Purposes	N	-	-	4	-	-	-	4	0.17
	P	-	-	-	-	-	-	-	-
Hand Washing	N	-	-	6	-	-	-	6	0.26
	P	1	-	1	-	-	-	2	0.09
Clothes/Utensil Washing	N	-	-	18	-	-	-	18	0.78
	P	1	-	8	-	-	-	9	0.39
Animals Watering	N	-	1	-	-	-	-	1	0.04
	P	-	-	-	-	-	-	-	-
Retting	N	-	-	-	-	-	-	-	-
	P	-	-	-	-	-	-	-	-
Others	N	-	-	-	-	-	-	-	-
	P	-	-	-	-	-	-	-	-

4.8. Thus a total of 76 households or 3.2% of the total households from the six schemes reported using well water at source, mostly for either bathing or clothes-washing and they, by and large, are from the Vakkom-Anjengo Scheme.

Use of Tap Water at Source

4.9 Outside the compound, piped tap water is found either at the neighbour's house or at the public stand post. Only 4 out of the total of 2394 surveyed households have reported using the neighbour's taps at their source. That too, 3 for toilet purposes and one for retting coconut leaves.

4.10 Even in the case of public stand posts, water use at source is comparatively very little. A total of 153 households reported using water at the stand post for various purposes. They form just 6.16% of the total households. Needwise, among the 153 households, over 30% of the households use for washing clothes and another 23% each for bathing and hand/face washing purposes. Yet another 14% reported using water at the stand post for drinking. Only 4 households use it for animal watering/washing, and 2 reported using for retting coconut leaves as could be noticed from Table IV.4 Panchayat-wise details may be seen at Appendix IV.4.

4.11 Even among tap water users at source, majority has been reported from the Vakkom-Anjengo scheme, as was in the case of well water users. It reflects the intensity of water scarcity at this place.

4.12. The data on tap water use at source amply disproves the criticisms of large scale wrong use/misuse of stand post water. Bathing, hand washing and clothes washing at source, though are wrong uses, cannot be construed as misuse. Real misuse of gardening, animal watering/washing and retting of coconut leaves are done by an insignificant number who could be rather exceptions. Those using water from the stand post for bathing and washing clothes, it may be appreciated, are those poorest of the poor who, by far, have no relevant facilities at their homes. Another criticism of misuse of tap water relates to gardening. The instant table does not provide any material to substantiate this criticism as none has reported using stand post water for the purpose. This does not mean that none is misusing it for garden use as could be seen from Table IV.20 and also from the photograph given on page 56.

Table IV. 4 Use of Tap Water at Source

Scheme \ Usages		Nattika	Mala	Vakkom Anjengo	Thrikkunnappuzha	Cheriyamad	Koipuram	Total	%
Drinking	N	-	-	-	-	-	-	-	-
	P	4	-	6	4	1	7	22	1.0
Bathing	N	-	-	-	-	-	-	-	-
	P	3	1	19	1	1	10	35	1.6
Toilet Purposes	N	-	-	3	-	-	-	3	0.1
	P	1	1	1	-	-	-	3	0.1
Hand Washing	N	-	-	-	-	-	-	-	-
	P	4	2	19	6	-	5	36	1.6
Clothes/Utensil Washing	N	-	-	-	-	-	-	-	-
	P	2	2	23	5	2	13	47	2.2
Animals	N	-	-	-	-	-	-	-	-
	P	-	3	1	-	-	-	4	0.2
Garden*	N	-	-	-	-	-	-	-	-
	P	-	-	-	-	-	-	-	-
Retting	N	-	-	1	-	-	-	1	0.04
	P	-	1	1	-	-	-	2	0.09

*See Para IV.12

Use of Other Sources

4.13. Except for one exception, in the SN Puram Panchayat, no household has reported using other sources, like pond/streams/river water for drinking at the source. As mentioned elsewhere, the large number of ponds, streams, and rivers, wherever available, are made use of for bathing, cloth washing, animal washing and retting of coconut leaves, though not universal. The maximum use of these sources are reported from Nattika and Thrikkunnappuzha schemes. Mala and Vakkom-Anjengo areas also reported a good number of users. Cheriyamad and Koipuram have returned very few users. Scheme-wise use of other sources for various needs at their source may be clear from Table IV.5. Panchayat-wise data is at Appendix IV.5

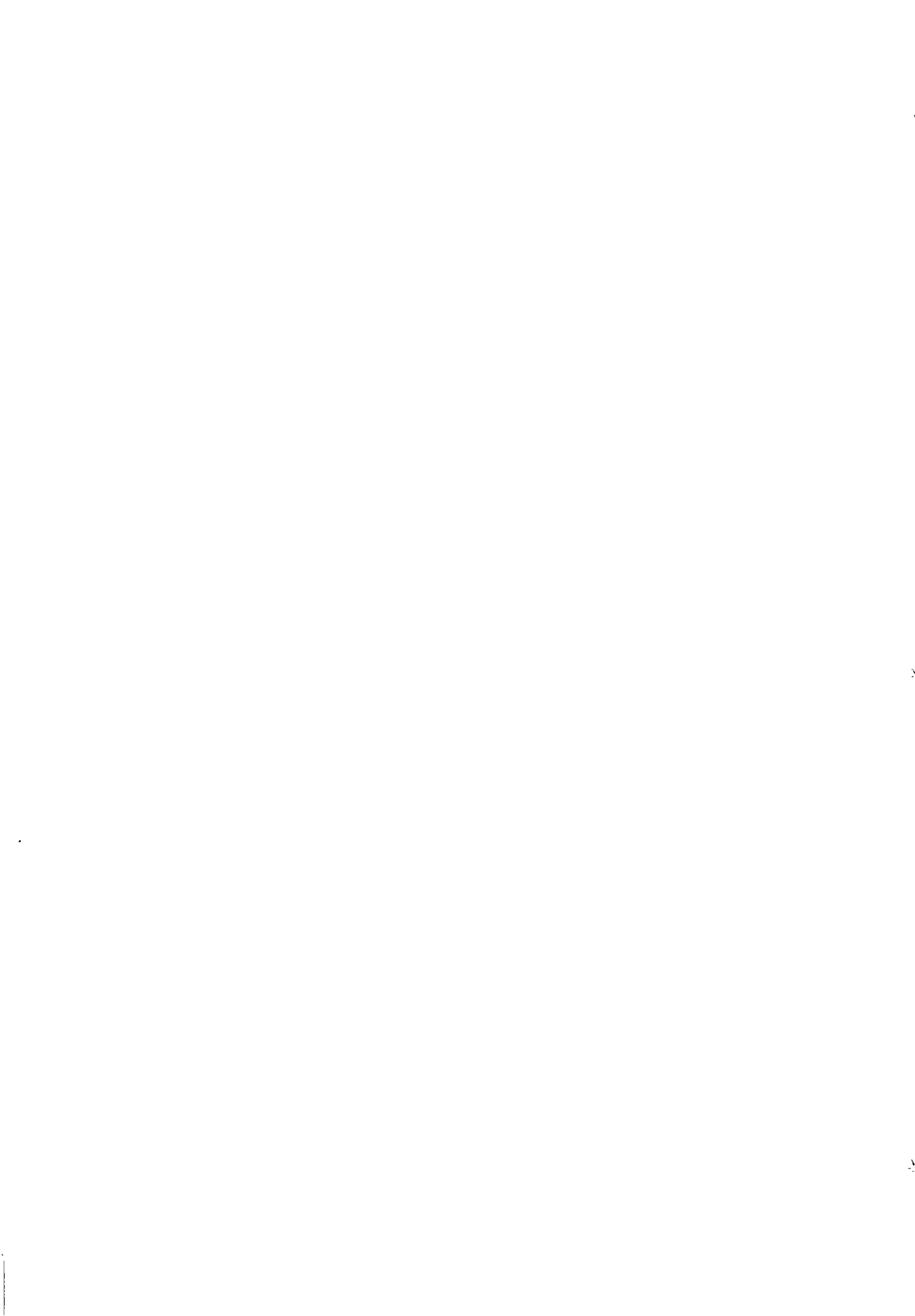


Table IV. 5 Use of Other sources at their Source

Scheme \ Usages		Nattika	Mala	Vakkom Anjengo	Thrikkunnappuzha	Cheriyannad	Koipuram	Total	%
Drinking	Pd	1	-	-	-	-	-	1	0.04
	SR	-	-	-	-	-	-	-	-
Bathing	Pd	41	9	5	15	-	-	70	3.03
	SR	13	2	24	28	8	1	76	3.30
Toilet Purposes	Pd	-	-	-	7	-	-	7	0.30
	SR	1	-	1	28	-	-	30	1.30
Hand Washing	Pd	2	-	-	9	-	-	11	0.48
	SR	1	-	1	18	-	-	20	0.87
Clothes/Utensil Washing	Pd	32	6	5	13	-	-	56	2.42
	SR	12	8	15	29	9	1	74	3.21
Animals	Pd	9	8	-	6	-	-	23	1.00
	SR	1	3	9	8	5	-	26	1.13
Retting	Pd	80	36	10	29	-	-	155	6.71
	SR	10	29	56	29	1	-	125	5.42

4.14. A total of 674 households reported that they used other sources (Pond/stream or river) for some purpose or the other except drinking (with one exception in Nattika scheme). It works out to 28.2% of the total surveyed households. The maximum of 219 households are reported from Thrikkunnappuzha, followed by Nattika (203) and Vakkom Anjengo (126). Mala reported 101 households, Cheriyannad 23 and Koipuram 2. Needwise, 280 households use these sources for retting of coconut leaves/husks, followed by bathing 146, cloth washing 130 and animal watering 49. A few households use the sources for hand washing (31) and toilet (37).

Sources Used for Drinking and Cooking

4.15. The water sources used to satisfy the basic household needs of drinking and cooking are the piped tap water/hand pumps and open or covered dug wells. While use of piped water and well water is wide spread, use of hand pump is almost limited to the area covered by the Nattika scheme. All the three sources are used in both dry and post monsoon seasons with varying incidence. The number of households using different sources, by and large, are the same for the drinking and cooking.

4.16. Before the details of the sources and the uses are discussed, a general picture sketched with the help of Table IV.6 may be rewarding.

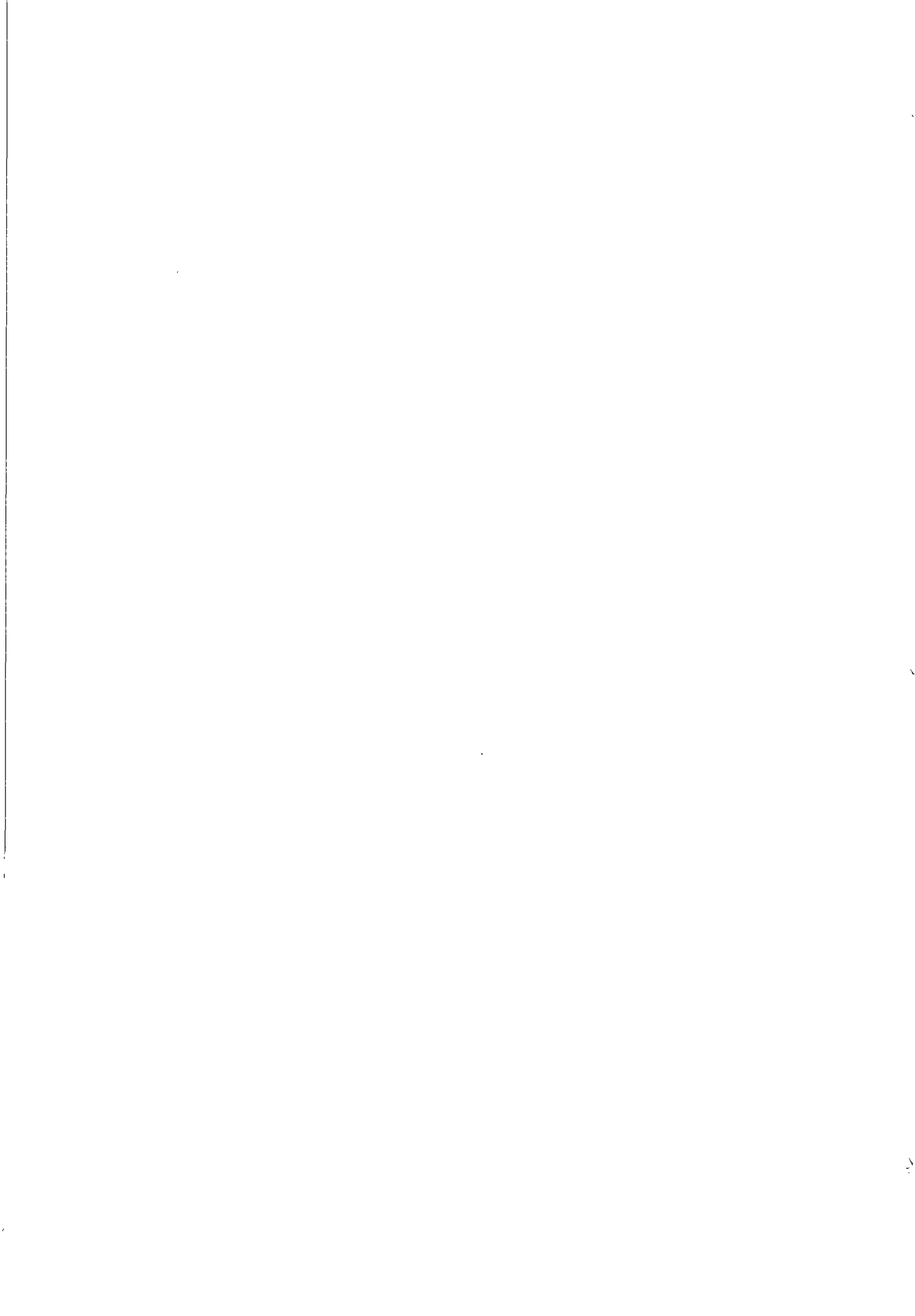


Table IV. 6 Sources Used for Drinking and Cooking in Different Seasons

Sl No	Schemes	Seasons	DRINKING						COOKING					
			Sources						Sources					
			Tap		Well		HP		Tap		Well		HP	
		No	%	No.	%	No.	%	No.	%	No.	%	No.	%	
1	Nattika*	Dry	615	63.4	194	20.0	159	16.4	599	62.5	196	20.4	162	16.9
		PM	602	61.6	207	21.2	166	17.0	592	61.2	206	21.3	167	17.3
2	Mala	Dry	484	52.9	431	47.1	-	-	484	52.9	431	47.1	-	-
		PM	365	40.0	548	60.0	-	-	365	40.0	547	60.0	-	-
3	Vakkom-Anjengo	Dry	242	40.3	359	59.7	-	-	246	40.4	362	59.4	1	0.2
		PM	221	37.6	367	62.4	-	-	224	37.8	368	62.2	-	-
4	Thrikkunnappuzha†	Dry	119	90.8	2	1.5	-	-	118	96.7	1	0.8	-	-
		PM	118	95.9	1	0.8	-	-	118	95.2	1	0.8	-	-
5	Cheriyamad	Dry	66	66.7	32	32.3	1	1.01	52	61.9	31	36.9	1	1.2
		PM	40	51.3	38	48.7	-	-	39	50.6	38	49.4	-	-
6	Koipuram	Dry	63	54.3	53	45.7	-	-	63	54.4	53	45.7	-	-
		PM	40	41.2	57	58.8	-	-	40	41.2	57	58.8	-	-
	Total	Dry	1589	56.1	1071	37.8	160	5.65	1562	55.7	1074	38.3	164	5.85
		PM	1386	49.9	1218	43.9	166	5.98	1379	49.7	1217	43.9	167	6.03

* Nattika has in addition, returned 2 households using pond water for drinking and cooking in the dry and post monsoon seasons and 3 for cooking in the post monsoon period

† Thrikkunnappuzha returned 10 households using pond water for drinking and three households for cooking in the dry season. Another family has been returned using river water for cooking in the post monsoon period

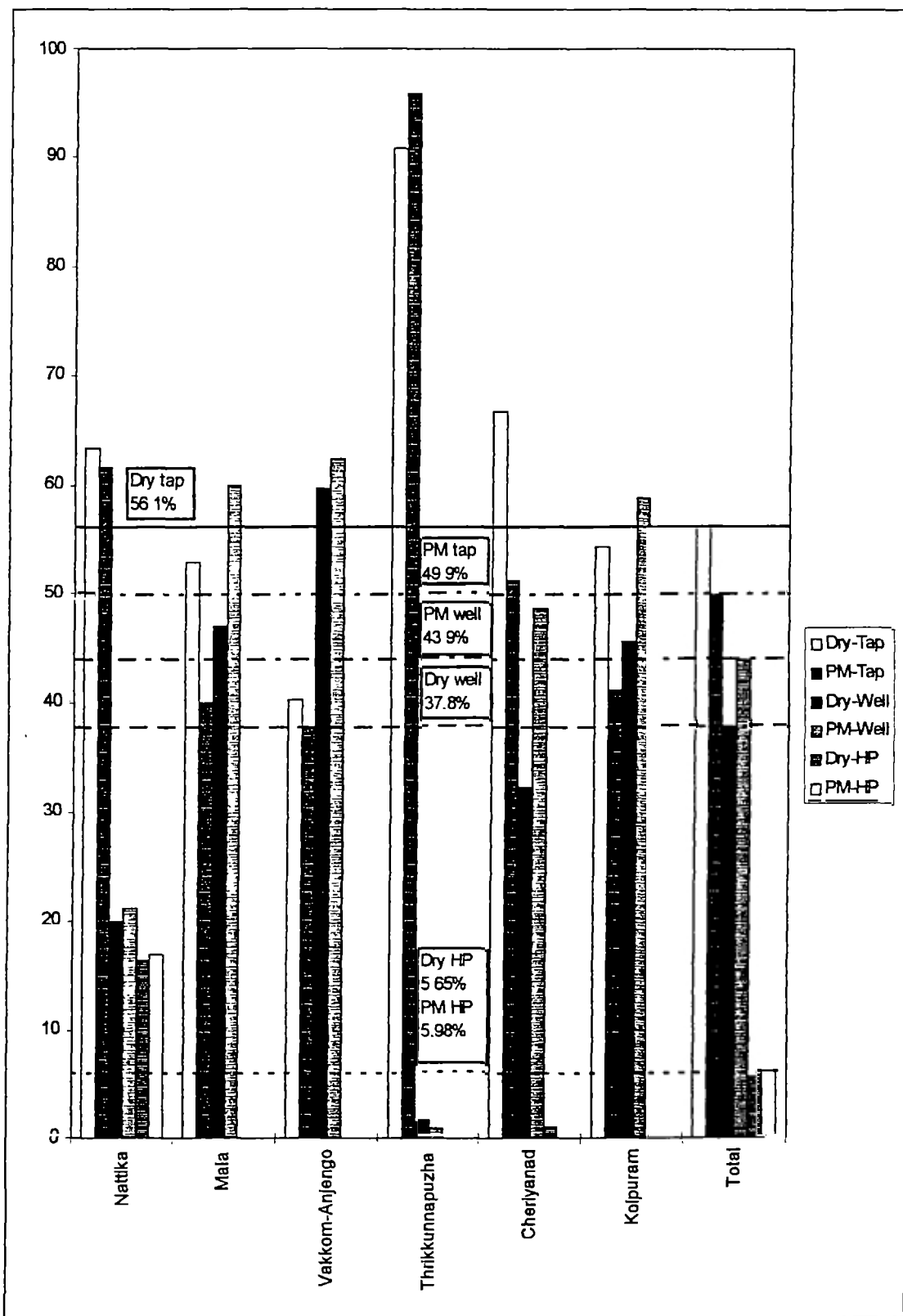
4.16. Piped water with an average of 56% and 50% in dry season and post monsoon season respectively, remains the main source of drinking and cooking water. Alternate sources of dug-well account for 38% and 44% respectively during the two seasons for drinking and cooking. Hand pump users are mainly from Nattika and form 6% in both the seasons for drinking and cooking. Just one household in Thrikkunnappuzha (rather an exception) reported using river water and 10 households using pond water in the summer. It may be mentioned that in Thrikkunnappuzha, due to its nearness to the estuary, shallow ponds are very common which normally are used for purposes other than drinking and cooking.

4.17. The incidence of use of different sources vary from area to area in different seasons as could be seen from the Table IV.6. In general, piped water is more in use during the dry season and well water in the post monsoon season. The wells dry up in summer resulting in the increased use of piped water during that period. Area-wise, Thrikkunnappuzha, being a coastal belt with very little dug well population, most of the households (91% in summer and 96% in post monsoon) depend on piped water. Over 60% tap users are found in Nattika and Cheriyanad during dry season. Mala, Vakkom-Anjengo and Koipuram report 40% to 54% in the dry season and 38% to 41% in the post monsoon period. Diagram IV.2 gives the comparative picture.

4.18. Next in importance comes the alternate source of dug wells for drinking and cooking purposes. A total average of 38% of the households are found using well water during the summer dry season. This number increases to 44% during the post-monsoon period. The wells used are either their own private ones or belonging to the immediate neighbour or even public wells belonging to the local body administration, the Panchayat.

4.19. Well users as a source of drinking and cooking, vary from scheme to scheme and from season to season. Even in the dry summer, 60% of the households in some of the areas covered by the Vakkom-Anjengo scheme uses wells. Mala and Koipuram scheme areas, on the other hand, reported 47% and 46%, respectively. Cheriyanad reported 32% users of well water whereas 20% are reported from Nattika scheme area in dry summer. As indicated above Thrikkunnappuzha using the maximum piped water (91% in summer), has only 1.5% of households using wells in the summer for drinking and cooking.

Diagram IV. 2 Pattern of Sources Used in Different Seasons for Drinking and Cooking





4 20 Unlike reduced piped water use in post monsoon period, in the case of well, post monsoon users are on the increase. As against an average total of 44% households using well water for drinking and cooking during the post monsoon period, it is over 60% in Mala and 62% in Vakkom Anjengo. Koipuram and Cheriyanad reported 59% and 49% respectively. Nattika registered 21.2% and the lowest percentage of less than 1% in Thrikkunnapuzha. Use of hand pumps as a source of water for drinking and cooking both in the summer and during the post monsoon period is limited to the Nattika area. Known locally as *Champ*, the hand pump users here form 16.4% in summer and 17% in the post monsoon period. Cheriyanad has one hand pump user among the sample households. Alternate sources of water used for drinking and cooking, needs some detailed examination.

Dug Well

4.21. Habits seldom die-hard. This is amply demonstrated in the case of water use in the 25 Panchayats of the Netherlands assisted rural water supply and sanitation scheme in Kerala. For centuries Keralites, as in many other parts of India, have been traditionally using open dug-well water for most of their basic household needs - drinking, cooking, food processing, bathing, washing, and so on. To them well water from the properly maintained source, is "good" - ritually pure, clear like 'tear drops', sweet without any odour and cooks food faster. Well to them is sacred, so much so that, right from the choosing of its location, digging and upkeep, are all undertaken, in an atmosphere of piety and reverence. It is also an asset. Possession of a well is often proudly announced.

4.22. "The state of Kerala has the highest density of open, hand-dug wells in India and perhaps in the world. This is a reflection of high population density and the hydrological condition of the State. During the dry season when the wells tend to run dry and in areas where ground water becomes brackish, the demand for piped water is high. With the advent of rains this demand drops as the rural population continues to use largely unprotected well water for drinking as well as bathing and cleaning", says a study by the Socio Economic Units of the Kerala Water Authority (1991 :1), on the choice of well water.

4.23. An analysis of the data from the six different schemes relating to the use of well water for drinking and cooking indicates considerable variations. Nature of the physical terrain and hydrological conditions of each area are responsible for such a variation. In Nattika, for example, while the average well water users for drinking and cooking is 20% in summer and 21% after monsoon, in the Thalikulam Panchayat it is as low as 7% and 9% for the corresponding period. In Edathuruthy Panchayat, another area surrounded by backwaters it is 10% and 11%, while it is slightly higher (13% and 14%) in Valappad. Mala area presents a more cohesive picture. Well water users for drinking and cooking purposes range from 33% and 31% respectively in Poyya Panchayat to 61% in Annamanada. The post monsoon users on the other hand range from 43% in Poyya to 77% to 78% in Kuzhoor. This variation is sharper in Vakkom-Anjengo scheme. In Kizhuvillam Panchayat, well water use for drinking and cooking is as high as 91% and 86% respectively in summer and 97% and 95% during the post monsoon period. On the other hand only 3% households use well water in both the seasons in Azhoor. In other Panchayats it varies in summer from 26% in Anjengo to 83% in Kadakkavoor and after monsoon, from 25% to 88% in the same Panchayat. In areas like Azhoor, Chirayinkil, Anjengo, being low lying area the water table is high. However, this well water is both brackish, muddy, and mettalic smelling. Among other scheme areas, Thrikkunnapuzha, being a coastal belt, only around 1 to 1.5% households use well water in post monsoon and dry seasons. In Cheriyanad it is 49% and 32% for drinking and 49% and 37% for cooking. In Koipuram 46% use well water in summer and 59% after the monsoon for both the purposes. The data on well water use for drinking and cooking purposes reveal a definite pattern. In the first instance availability of potable water is the main criterion for choosing the water source. If the well water is available, they prefer it to piped water. Secondly, since many wells dry up during summer, they shift to piped water and then return to the well after the rains. Details of Panchayat-wise use of well water for drinking and cooking, in both the seasons, may be seen in the Appendix IV.6. and IV.7. Table IV.7 gives scheme-wise position of well water use for drinking and cooking during the dry season and post monsoon season.



Traditional method of filtering muddy water

Table IV. 7 Well Water Used for Drinking and Cooking in Different Seasons

Schemes	Summer				Post Monsoon			
	Drinking		Cooking		Drinking		Cooking	
	No.	%	No.	%	No.	%	No.	%
Nattika	194	20.0	196	20.4	207	21.2	206	21.3
Mala	431	47.1	431	47.1	548	60.0	547	60.0
Vakkom-Anjengo	359	59.7	362	59.4	367	62.4	368	62.2
Thrikkunnappuzha	2	1.5	1	0.8	1	0.8	1	0.8
Cheriyamad	32	32.3	31	36.9	38	48.7	38	49.4
Koipuram	53	45.7	53	45.7	57	58.8	57	58.8
Total	1071	37.8	1074	38.3	1218	43.9	1217	43.9

Ownership of Well

4.24. Well as a source of drinking and cooking water may be privately owned by the household itself, or may belong to the neighbour or even a public one owned by the Panchayat. Table IV.8. gives an idea about the ownership pattern of the wells used by the sample households as a source for drinking and cooking in the six scheme areas.

Table IV. 8 Ownership of Wells

Scheme	Wells used in Summer						Wells used after Monsoon					
	Ownership for Drinking			Ownership for Cooking			Ownership for Drinking			Ownership for Cooking		
	O	N	P	O	N	P	O	N	P	O	N	P
Nattika	98	69	27	98	71	27	116	62	29	116	61	29
Mala	199	146	86	199	146	86	330	117	101	329	117	101
Vakkom-Anjengo	260	99	-	258	104	-	303	64	-	304	64	-
Thrikkunna-puzha	1	-	1	-	-	1	1	-	-	1	-	-
Cheriyamad	20	12	0	19	12	-	25	13	-	25	13	-
Koipuram	25	28	0	25	28	-	32	25	-	32	25	-
Total	603	354	114	599	361	114	807	281	130	807	280	130
%	56.3	33.1	10.6	55.8	33.6	10.6	66.3	23.1	10.7	66.3	23.0	10.7

4.25. Of the 1071 well user households for drinking and 1074 households for cooking in the summer season, 56% used own wells, 33 to 34% used neighbour's well and the rest (10.6%) collected water from the public well. Similarly during the post monsoon period 63% used own well, 23% neighbour's well and 11% drew water from

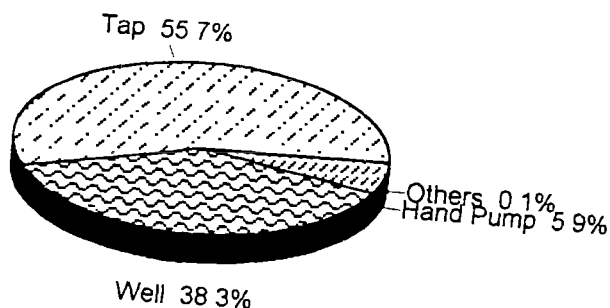
the public well. It also means, atleast 807 out of the total of 2394 sample households surveyed or about one third have their own dug-wells.

Hand Pump

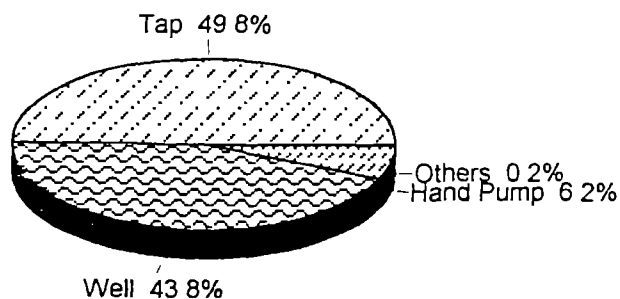
4.26. Another alternate source of water for drinking and cooking is the hand pump. The survey shows that except in Nattika and one each in Vakkom Anjengo and Cheriyamad, the hand pump is not common elsewhere. A total of 160 households in summer and 166 households during post monsoon period reported using hand pumps for drawing water for drinking purposes. On the other hand, for cooking, 164 households during summer and 167 after monsoon are stated to use hand pump water. Maximum users are from Nattika, 159 for drinking and 162 for cooking during summer and 166 and 167 during post monsoon period for the same purposes. Hand pump use in Nattika is of recent origin. Traditionally people used pond water for cooking but shifted to hand pumps after the devastating spread of blood dysentery. It is also economic to have a hand pump in a place with high water table. Two user households (one from Vakkom Anjengo and one from Cheriyamad) are reported using hand pumps. Almost all the hand pumps (147) are private and very few are owned by the Panchayat (for Panchayat-wise details refer to Appendix IV 6 and IV 7.) The extent of alternate sources, dug-well and hand pumps used for drinking and cooking in dry summer and post -monsoon seasons is depicted in the diagram IV.3 below.

Diagram IV. 3 Sources for Drinking and Cooking

Dry Season



Post Monsoon



Piped Water

4 27. Use of piped water for various needs is not entirely new to the six Netherlands assisted scheme areas, as the rural piped water supply programme under the aegis of the Public Health Engineering (P.H.E.) Department was in vogue in many areas, especially in the problem Panchayats. As for example such a scheme was functioning in Anjengo, Poyya, Nattika etc. Having known the benefits of piped water - Bacteria free safe water, economical and effortless - people are not averse to the idea as is reflected from the survey data. As would be seen later, choice of a water source, particularly for drinking and cooking, depends largely on its perceived quality, reliability, distance, cost and convenience.

4 28. Diagram IV 3. sums up the use of piped tap water as a source for drinking and cooking purposes in different seasons. Households using the source increase with summer and decrease with the setting in of rains. Data gathered from the six scheme areas indicate that, on an average, while about 50% of the households use piped water during the post-monsoon period, it is increased to around 56% during the peak of summer. Table IV.9, gives the scheme-wise position in the two seasons, both for drinking and cooking purposes.

Table IV. 9 Households Using Piped Tap Water for Drinking and Cooking in Different Seasons

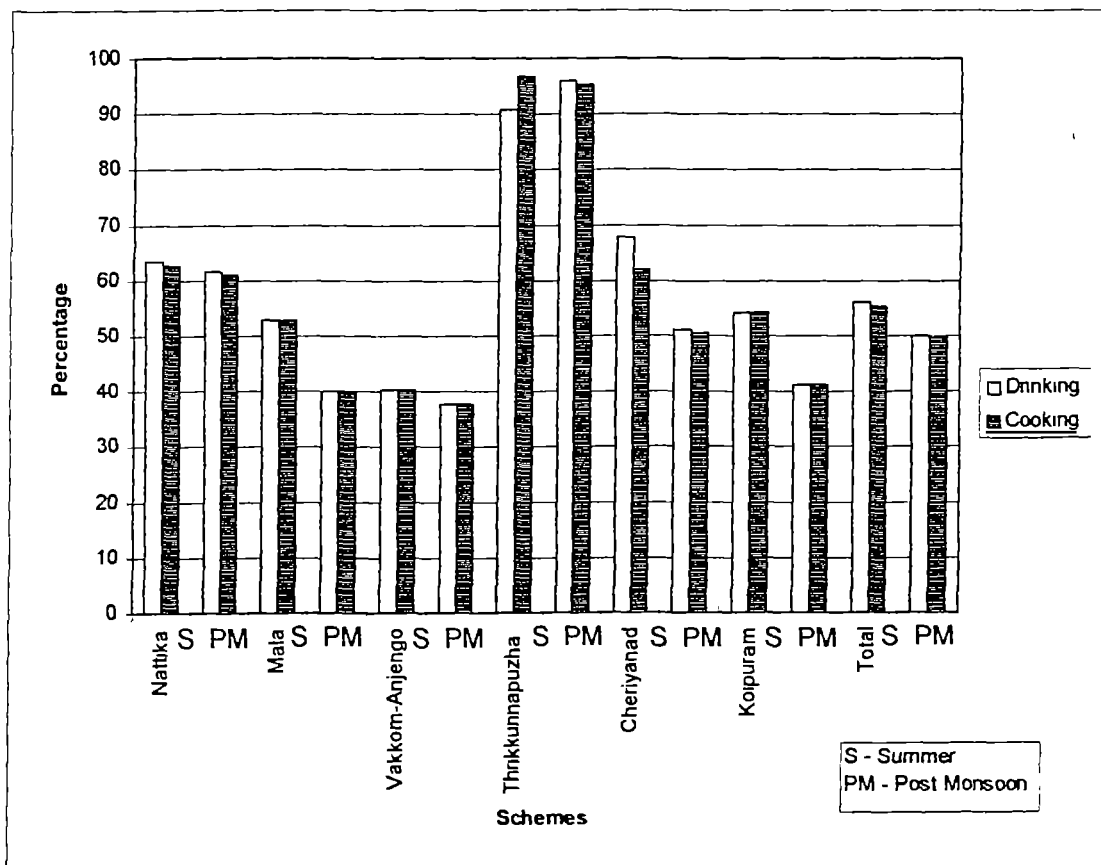
Schemes	Summer				Post Monsoon			
	Drinking		Cooking		Drinking		Cooking	
	No	%	No.	%	No.	%	No.	%
Nattika	615	63.4	599	62.5	602	61.6	592	61.2
Mala	484	52.9	484	52.9	365	40.0	365	40.0
Vakkom-Anjengo	242	40.3	246	40.4	221	37.6	224	37.8
Thrikkunnappuzha	119	90.8	118	96.7	118	95.9	118	95.2
Cheruvannad	66	66.7	52	61.9	40	51.3	39	50.6
Koipuram	63	54.3	63	54.3	40	41.2	40	41.2
Total	1589	56.1	1562	55.7	1386	49.9	1378	49.7

4 29 Piped tap water users vary, both in use and according to seasons, in all the scheme areas. In summer the percentage of users for drinking, range from 40% in Vakkom-Anjengo to 91% in Thrikkunnappuzha, the average being 56%. Except

Vakkom-Anjengo the user households are more than 54% in all other scheme areas. In the same season, when the average percent of user households for cooking purposes is 56%, it ranges from 40% in Vakkom Anjengo, as in drinking, to 97% in Thrikkunnappuzha. In other scheme areas it is more than 53%

4 30. The position is slightly different in post -monsoon period, when the percentage of households using piped water, both for drinking and cooking, comes down indicative of more reliance on dug-wells during the same period. The average percentage of households using piped water for drinking in the post monsoon period is 50%. It varies from 38% in Vakkom Anjengo to 96% in Thrikkunnappuzha. In all other scheme areas it is above 40%. As regards cooking, the number of users are slightly more with an average of 50% (49.7% to be exact). The variation in different scheme areas, range from 38% in Vakkom-Anjengo to 95% in Thrikkunnappuzha. It is above 40% in all other areas. The picture becomes clear in Diagram IV 4.

Diagram IV. 4 Piped Water Used for Drinking and Cooking in Different Seasons



Ownership

4.31 Ownership of piped water supply source provides interesting information. In the case of dug-well, it was the more affluent who could afford a private well. **And those who owned wells relied less on piped water.** On the same analogy, it may be seen that those who did not own the well relied more on piped water supply, for all basic household needs.

4.32. Of the 1589 Tap users in the summer, only 154 had used own taps. In other words, only about 10% sample households in the scheme areas had own house connections. Those using neighbour's private tap, unlike neighbour's well, are almost nil. Only 3 households in summer and 2 households, during post-monsoon season, used the neighbour's tap. Almost 90% of the households reported using public stand post taps for their needs, in particular for drinking and cooking purposes. Scheme-wise ownership of piped water sources used by different households in the two seasons are given in Table IV.10

Table IV. 10 Ownership of Piped Water Source

Scheme	Ownership of Taps Used in Summer						Ownership of Taps Used after Monsoon					
	Drinking			Cooking			Drinking			Cooking		
	O	N	P	O	N	P	O	N	P	O	N	P
Nattika	28	-	587	28	-	571	30	-	572	30	-	562
Mala	55	1	428	55	1	428	49	1	315	49	1	315
Vakkom-Anjengo	35	2	205	34	2	210	33	1	187	33	1	190
Thrikkunnapuzha	15	-	104	15	-	103	16	-	102	16	-	102
Cheriyanaad	18	-	48	4	-	48	3	-	37	3	-	36
Koipuram	3	-	60	3	-	60	-	-	40	-	-	40
Total	154	3	1432	139	3	1420	131	2	1253	131	2	1245
%	9.7	0.2	90.1	8.9	0.2	91.0	9.5	0.1	90.4	9.5	0.1	90.3

4.33 On an average, among the tap users, about 90% to 91% of the sample households in the six scheme areas, use public stand posts for their drinking and cooking needs. And as mentioned earlier a little less than 10% use their own private

taps The number varies from scheme to scheme as could be seen in Table IV 10 Within the scheme, there are variations in ownerships, from Panchayat to Panchayat as could be seen in Appendix IV.6. and IV 7.

Socio-Economic Profile of Public Stand-Post Users

4.33.1. The socio-economic Profile of Public Stand post users provide interesting insight into their water use pattern. Most of those who use public stand posts are poor, less educated being a fall out of poverty and belonging to the lower social strata. In one sense, therefore, the primary objective of the Netherlands assisted Water Supply Projects of providing drinking water, particularly to the poor, is amply fulfilled.

4.33.2 Table IV.10A reveals the details. As per the economic status, the poor users in different scheme areas range from 58.1% in Mala to 90.5% in Thrikkunnappuzha, with an overall average of 73.4% poor. The rest belongs to the middle class. None from the rich category uses the public stand post. The general belief that most of the poor belong to the lower strata of society is strengthened in the water use pattern. The Scheduled castes and the Backward castes, put together, form a good majority (62%) of public stand post users. The forward Hindu castes form only about 6% while the rest are Muslims (22%) and the Christians (10.5%). Scheme-wise, those belonging to the lower strata range from 38.3% in Cheriyanad to 72.6% in Thrikkunnappuzha. Achievements in levels of education, it is argued, have relationship with economic status. This sounds true in the case of public stand-post users. A large majority of them (65%) are either illiterate (22%) or studied only up to Primary level (43%). Those belonging to secondary level form 32% and Higher levels a little more than 3%. By far the educational scene is similar in the different scheme areas as could be seen in Table IV. 10A.

Table IV. 10 A Socio-Economic Profile of Public Stand Post Users

Socio-Economic Profile	Nattika %	Mala %	Vakkom-Anjengo %	Thrikkun- napuzha %	Cheriy- anad %	Koipu- ram %	Total HH	%
Economic Status								
Poor	80.37	58.09	79.13	90.53	76.67	90.19	1335	73.4
Middle	19.63	41.91	20.87	9.47	23.33	9.81	484	26.6
Rich	-	-	-	-	-	-	-	-
Total	100	100	100	100	100	100	1819	100
Education								
Illiterate	21.8	21.7	22.8	22.22	19.66	17.93	1328	21.8
Primary	49.3	38.5	42.0	42.69	34.18	37.5	2622	43.0
Secondary	26.0	36.5	30.8	33.33	43.58	42.39	1947	32.0
Higher	2.9	3.3	4.4	1.75	2.56	2.17	197	3.2
Total	100	100	100	100	100	100	6094	100
Social Status								
Scheduled Castes	23.86	19.98	17.68 [⊗]	14.73	23.33	33.33 [⊕]	373	20.5
Backward Castes	43.05	43.06	37.68	57.89	15.00	23.52	752	41.3
Forward Castes	2.71	2.47	16.52	-	18.33	9.80	106	5.8
Muslims	27.04	15.35	24.06	27.37	28.33	-	398	21.9
Christians	3.32	21.12	4.06	-	15.00	33.33	190	10.5
Total	100	100	100	100	100	100	1819	100

Households Using More than One Source

4.34. The survey provides data on households using more than one source for drinking and cooking purposes during the two seasons. They are shown in Table IV.11

[⊗] Including 1 Scheduled Tribe household

[⊕] Including 2 Scheduled Tribe households

Table IV. 11 Households Using More than One Source for Drinking and Cooking

Scheme	Summer				Post Monsoon			
	Households Using for Drinking		Households Using for Cooking		Households Using for Drinking		Households Using for Cooking	
	TNo.	UMO	TNo.	UMO	TNo.	UMO	TNo.	UMO
Nattika	782	118	782	177	182	195	782	186
Mala	754	161	754	161	754	159	754	158
Vakkom-Anjengo	583	18	583	26	583	5	583	9
Thrikkunnapuzha	119	12	119	3	119	4	119	5
Cheriyanaad	73	26	73	11	73	5	73	4
Koipuram	83	33	83	33	83	14	83	14
Total	2394	438	2394	411	2394	382	2394	376
%	100	18.3	100	17.2	100	16.0	100	15.7

4.35. On an average, 17% to 18% households use more than one source for drinking and cooking water during summer. It comes down slightly to around 16% in the post-monsoon period. Variations are noticed not only among the different scheme areas but also among the different Panchayats within the same scheme. Details of variations can be seen in Appendix IV. 6. and IV.7.

Summary

4.36. A summary of the data on the different sources used in the six scheme areas for drinking and cooking in summer and after the monsoon may be seen in Table IV 12. It also reflects the total number of sample households surveyed and the number of households using more than one source for drinking and cooking purposes.

Table IV.12. Sources Used for Drinking & Cooking During Summer and Post I

SCHEME	SOURCES USED FOR DRINKING																										
	Season	WELL					TAP					HAND PUMP					SPRING		POND		RIVER		OTHER		G.TOTAL	No. survey ed	No. Using more than one sources
		O	N	P	Total	%	O	N	P	Total	%	O	N	P	Total	%	No.	%	No.	%	No.	%	No.	%			
NATTIKA	Summer	98	69	27	194	20.0	28	0	587	615	63.4	138	18	3	159	16.4	0	0	2	0.21	0	0	0	0	970	782	188
	P. Monsoon	116	62	29	207	21.2	30	0	572	602	61.6	145	17	4	166	17	0	0	2	0.2	0	0	0	0	977	782	195
MALA	Summer	199	146	86	431	47.1	55	1	428	484	52.9	0	0	0	0	0	0	0	0	0	0	0	0	0	915	754	161
	P. Monsoon	330	117	101	548	60.0	49	1	315	365	40.0	0	0	0	0	0	0	0	0	0	0	0	0	0	913	754	159
VAKKOM-ANJENGO	Summer	260	99	0	359	59.7	35	2	205	242	40.3	0	0	0	0	0	0	0	0	0	0	0	0	0	601	583	18
	P. Monsoon	303	64	0	367	62.4	33	1	187	221	37.6	0	0	0	0	0	0	0	0	0	0	0	0	0	588	583	5
THRIKKUNNAPUZHA	Summer	1	0	1	2	1.5	15	0	104	119	90.8	0	0	0	0	0	0	0	10	7.63	0	0	0	0	131	119	12
	P. Monsoon	1	0	0	1	0.8	16	0	102	118	95.9	0	0	0	0	0	0	0	0	0	0	0	4	3.25	123	119	4
KOIPURAM	Summer	25	28	0	53	45.7	3	0	60	63	54.3	0	0	0	0	0	0	0	0	0	0	0	0	0	116	83	33
	P. Monsoon	32	26	0	57	58.8	0	0	40	40	41.2	0	0	0	0	0	0	0	0	0	0	0	0	0	97	83	14
CHERIYANAD	Summer	20	12	0	32	32.3	18	0	48	66	66.7	0	0	1	1	1.01	0	0	0	0	0	0	0	0	99	73	26
	P. Monsoon	25	13	0	38	48.7	3	0	37	40	61.3	0	0	0	0	0	0	0	0	0	0	0	0	0	78	73	5
TOTAL	Summer	603	354	114	1071	37.8	154	3	1432	1589	56.1	138	18	4	160	5.65	0	0	12	0.42	0	0	0	0	2832	2394	438
	P. Monsoon	807	281	130	1218	43.88	131	2	1253	1386	49.9	145	17	4	166	5.98	0	0	2	0.07	0	0	4	0.14	2776	2394	382

SCHEME	SOURCES USED FOR COOKING																											
	Season	WELL					TAP					HAND PUMP					SPRING		POND		RIVER		OTHER		G.TOTAL	No. survey ed	No. Using more than one sources	
		O	N	P	Total	%	O	N	P	Total	%	O	N	P	Total	%	No.	%	No.	%	No.	%	No.	%				
NATTIKA	Summer	98	71	27	196	20.4	28	0	571	599	62.5	141	18	3	162	16.9	0	0	2	0.21	0	0	0	0	959	782	177	
	P. Monsoon	116	61	29	206	21.3	30	0	562	592	61.2	147	16	4	167	17.3	0	0	3	0.31	0	0	0	0	968	782	186	
MALA	Summer	199	146	86	431	47.1	55	1	428	484	52.9	0	0	0	0	0	0	0	0	0	0	0	0	0	915	754	161	
	P. Monsoon	329	117	101	547	60.0	49	1	315	365	40.0	0	0	0	0	0	0	0	0	0	0	0	0	0	912	754	158	
VAKKOM-ANJENGO	Summer	258	104	0	362	59.4	34	2	210	246	40.4	0	1	0	1	0.16	0	0	0	0	0	0	0	0	609	583	26	
	P. Monsoon	304	64	0	368	62.2	33	1	190	224	37.8	0	0	0	0	0	0	0	0	0	0	0	0	0	592	583	9	
THRIKKUNNAPUZHA	Summer	0	0	1	1	0.8	15	0	103	118	96.7	0	0	0	0	0	0	0	3	2.46	0	0	0	0	122	119	3	
	P. Monsoon	1	0	0	1	0.8	16	0	102	118	95.2	0	0	0	0	0	0	0	0	0	0	1	0.81	4	3.23	124	119	5
KOIPURAM	Summer	25	28	0	53	45.7	3	0	60	63	54.3	0	0	0	0	0	0	0	0	0	0	0	0	0	116	83	33	
	P. Monsoon	32	26	0	57	58.8	0	0	40	40	41.2	0	0	0	0	0	0	0	0	0	0	0	0	0	97	83	14	
CHERIYANAD	Summer	19	12	0	31	36.9	4	0	48	52	61.9	0	0	1	1	1.19	0	0	0	0	0	0	0	0	84	73	11	
	P. Monsoon	25	13	0	38	49.4	3	0	36	39	50.6	0	0	0	0	0	0	0	0	0	0	0	0	0	77	73	4	
TOTAL	Summer	599	361	114	1074	38.3	139	3	1420	1562	55.7	141	19	4	164	5.85	0	0	5	0.18	0	0	0	0	2805	2394	411	
	P. Monsoon	807	280	130	1217	43.94	131	2	1245	1378	49.7	147	16	4	167	6.03	0	0	3	0.11	1	0.04	4	0.14	2770	2394	376	

Safe water use : no info. which has chlorinate their wells!

if tap + HP safe use is safe

Cleaning

4 37. The second basic household need of water relates to cleaning. For the purposes of the survey cleaning includes, bathing, toilet purposes including its cleaning (Toilet), washing hand, face and feet (hand washing), washing of clothes and washing of utensils (clothes & utensils) and house cleaning. Besides the sources used for drinking and cooking, ponds, streams and rivers and rarely backwaters and canals are also used for cleaning purposes. No sample households have reported using springs. These sources are grouped under (i) Ponds (ii) Rivers and (iii) others

4 38. Dug-well and piped water remain the major source for all cleaning purposes though depending upon the use, slight variations are noticed. Some variations are also seen according to the seasons. About 80% of the households use the well water or the piped water for all cleaning purposes.

Bathing

4 39. Bathing (including other ablutions) is one of the basic cleaning activity and as such much weightage is given to it. To the Malayali it is almost his second nature and an essential part of his daily routine. Bath is sacred too, without which a person is not ritually pure to begin an activity, whether attending a school, office or even a factory (Kurup . 1994) One can afford to skip the breakfast but not the bath.

4 40. The sources used for bath varies from household to household, depending upon the availability of water and their convenience. Traditionally, it is the pond, either privately owned or a public one adjunct to a worshipping place or that of the Panchayat. Those near streams and rivers make use of these sources. Using more than one source, according to convenience is also common.

4.41. Data from the survey of the total 2394 households spread over the six scheme areas indicate that over 82% of them use either the well or the piped water for bathing. Hand pump is the next common one accounting for about 8% of the households. Among the rest are pond users (over 5%)and river users for about 3% to 4%. There are variations depending on the season. Table IV.13 gives the details of sources used for bathing by the different households in the six scheme areas, in summer and in the post-monsoon period.

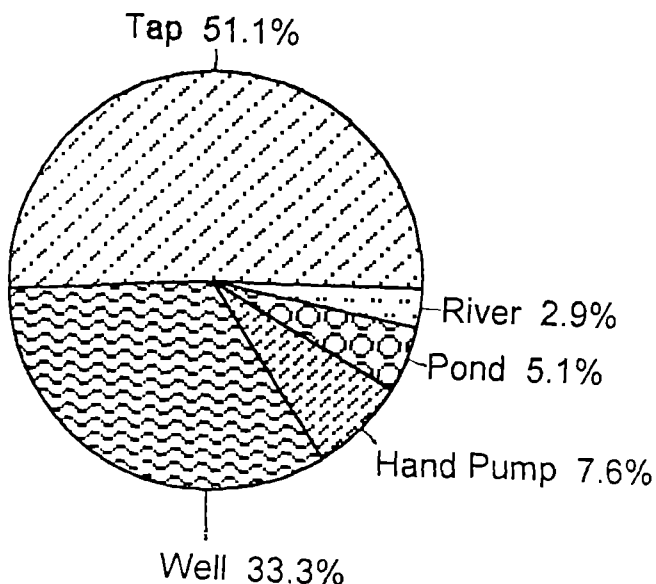
Table IV. 13 Sources Used for Bath in Different Seasons

Schemes	SUMMER SOURCES						POST MONSOON SOURCES					
	Well	Tap	HP	Pond	River	Other	Well	Tap	HP	Pond	River	Other
Nattika	20.4	46.8	21.5	10.1	1.2	0.1	19.9	43.6	21.3	11.9	3.15	0.2
Mala	34.0	64.2	-	1.6	0.2	-	48.9	49.8	-	1.2	0.1	-
Vakkom-Anjengo	59.0	36.1	0.2	0.8	3.9	-	67.5	32.3	-	-	0.2	-
Thrikkunna-puzha	6.1	48.5	-	18.2	27.3	-	6.8	21.8	-	22.6	48.9	-
Cheriyamad	25.0	63.5	1.04	-	10.4	-	37.0	49.4	-	-	13.6	-
Koipuram	44.5	54.5	-	-	0.9	-	61.3	37.6	-	-	1.1	-
Total	33.3	51.0	7.6	5.1	2.9	0.03	40.4	42.0	7.7	5.8	3.9	0.07

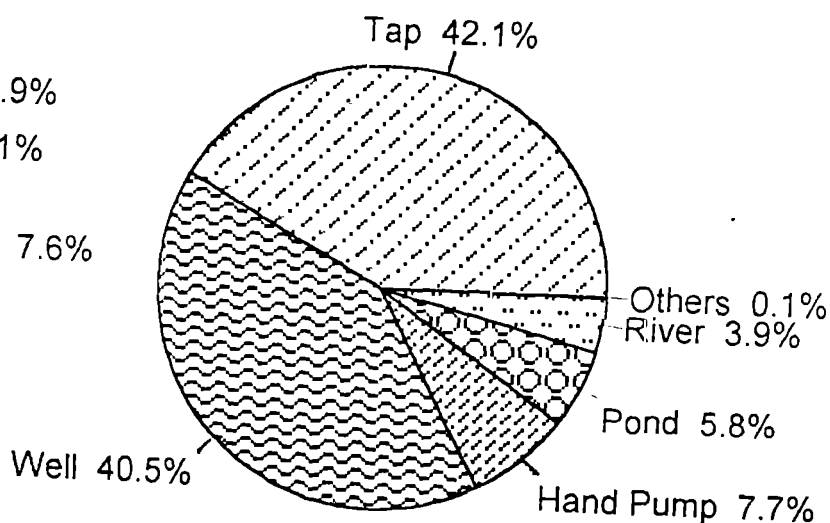
4.42. Barring ponds and rivers, the sources for bathing remains the same as for drinking and cooking - well, tap and hand pump - wherever available. As in the case of drinking and cooking well water use increases and tap water use decreases during the post monsoon period. Similarly percentage of households using different sources for bathing varies from scheme to scheme, depending upon the terrain and the season, as in the case of drinking and cooking, as could be seen from the Table IV 13 and diagram IV.5. For Panchayat-wise details of sources used, their ownership and seasonal variations Appendix IV 8 may be seen

Diagram IV 5 Sources used for Bathing in Different Seasons

Summer



Post Monsoon



Clothes-Utensils Wash

4.43. Another important cleaning activity is related to washing of clothes and utensils. People of Kerala irrespective of their social and economic status, attach great importance to wearing of clean clothes. Unlike in some other parts of the country, irrespective of the calling one is engaged in, Malayalis wear clean clothes both at home as well as when out on work. Ritual purity is another cultural requirement attributed to washing of clothes.

4.44. Cleaning of utensils is yet another activity consuming considerable quantity of water. Like washing of clothes, dish washing evokes plenty of attention. As in the case of bathing, ritually impure are the used clothes and utensils and are required to be washed before using them again. Both the activities are considered traditionally, a woman's domain, particularly the latter. Because of their close similarities, clothes washing and utensils cleaning are clubbed together for the purposes of this survey.

4.45. There is considerable similarity in the sources used for bathing, clothes washing, and utensils washing. Neither polluted water nor contaminated water could be used for these activities. These are some of the choice factors, besides availability and reliability, for selecting sources of water for cleaning of utensils and washing of clothes. All those sources used for bathing are also found to be used for these two purposes. There is also considerable similarity in the pattern of use.

4.46. Source-wise, on an average in summer, 34% of the households use well water for clothes washing and utensils cleaning. This increases to 51% during the post-monsoon period. On the other hand piped water users remain almost the same, 40.97% in summer and 41.2% during the post monsoon period. Households using hand pump is about 7% and 8% respectively in the two seasons. Other sources include pond and river which are used by 4.7% and 3.2% respectively in summer and 5.7% and 4.2% respectively, after rains.

4.47. Scheme-wise data, however, reveal variations in choice of sources as well as seasonal differences. Well water users range from 8% in Thrikkunnappuzha to 59% in Vakkom-Anjengo in summer and 6% to 68% during monsoon in the same scheme areas. In the case of piped water it is as high as 64% (Mala) in summer and

49% (Mala) during the post monsoon period. Lowest percentage of users is reported from Vakkom-Anjengo (37%) in summer and Thrikkunnappuzha (17%) in the post monsoon season. Details of other sources and Scheme-wise details are shown in Table IV. 14 Ownership of different sources, Panchayat wise, used for utensils cleaning and clothes washing and users of more than one source for the purpose could be seen at Appendix IV. 9.

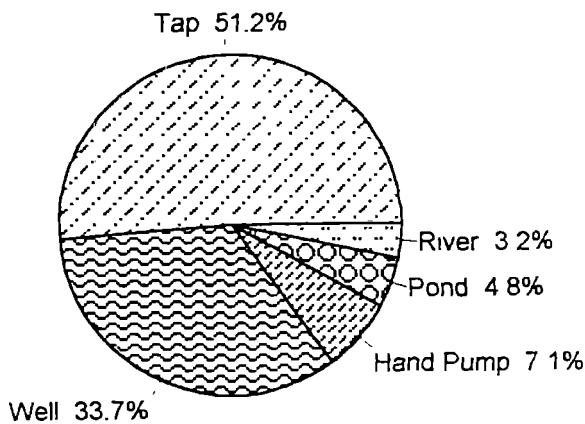
Table IV. 14 Sources Used for Clothes Washing and Utensils Cleaning (Percent)

Schemes	SUMMER SOURCES						POST MONSOON SOURCES					
	Well	Tap	HP	Pond	River	Other	Well	Tap	HP	Pond	River	Other
Nattika	20.5	47.5	20.8	10.0	1.2	-	20.1	42.4	22.2	11.9	3.3	0.1
Mala	34.0	64.1	-	1.2	0.8	-	49.1	49.3	-	1.0	0.5	-
Vakkom-Anjengo	59.3	37.1	0.2	0.8	2.7	-	68.4	31.6	-	-	-	-
Thrikkunna-puzha	7.8	42.6	-	17.1	32.6	-	6.2	16.9	-	23.8	53.1	-
Cheriyamad	26.3	61.1	-	-	12.6	-	38.0	48.1	-	-	13.9	-
Koipuram	44.5	54.5	-	-	0.9	-	61.3	37.6	-	-	1.1	-
Total	33.7	51.2	7.1	4.8	3.2	-	41.0	41.2	7.9	5.7	4.2	0.04

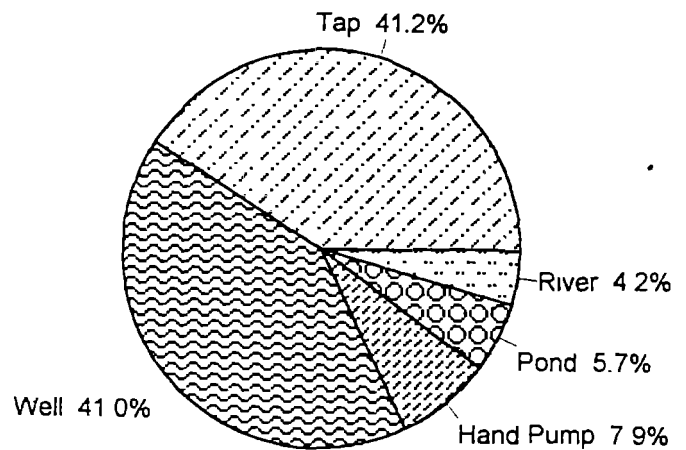
4.48. Diagram IV.6 given a clear picture of the sources used for the activities of the two seasons

Diagram IV. 6 Sources used for Clothes washing and Utensils Cleaning

Summer



Post Monsoon



Hand Wash

4.49. Under this are included sources used for a bunch of water use activities like washing of hands before and after meals and washing face and feet. The sources used for these activities are generally the same as those used for bathing and clothes washing. The main sources are the well and the tap. Hand pump is in vogue in the Nattika scheme area. Ponds and rivers are seldom used.

4.50. The survey reveals that a total of 37% households use well water for hand wash in summer and 42% in post monsoon period. In the case of piped water it is 52% and 44% respectively. Hand pump users form 8% in both the seasons and pond and river users account for 3% and 1.5% respectively in summer and 4% and 3% respectively during the post monsoon period.

4.51. The number of households using different sources for hand wash vary considerably from area to area. In summer, for example, percentage of well users range from 6.3% in Thrikkunnappuzha to 65.6% in Vakkom-Anjengo. In the post monsoon also the same areas show 6.1% and 67.5% of households. Among the piped water users Cheryanad tops with 72% in summer and 59% during the post monsoon period. Hand pump users are only in Nattika (except 1 household in Vakkom-Anjengo) with 8% in both the seasons. Pond and river water users are few and are found in most of the areas as could be noticed in Table no IV.15. Details of Panchayat wise users, ownership of different sources and households using more than one source may be seen in Appendix IV.10.

Table IV. 15 Percent Household using different Sources for Hand washing

Schemes	SUMMER SOURCES						POST MONSOON SOURCES					
	Well	Tap	HP	Pond	River	Other	Well	Tap	HP	Pond	River	Other
Nattika	21.3	49.3	23.3	5.9	0.1	-	22.3	45.8	23.2	7.6	1.1	-
Mala	34.4	65.4	-	0.2	-	-	49.6	49.9	-	0.6	-	-
Vakkom-Anjengo	65.6	34.2	0.1	-	-	-	67.5	32.3	-	-	0.2	-
Thrirkunna-puzha	6.3	48.4	-	16.7	28.6	-	6.1	28.2	-	18.3	47.3	-
Cheryanad	23.6	71.9	-	-	4.5	-	37.2	59.0	-	-	3.9	-
Koipuram	45.4	54.6	-	-	-	-	61.3	37.6	-	-	1.1	-
Total (No)	1059	1495	223	80	41	-	1169	1213	225	103	78	-
%	36.5	51.6	7.7	2.8	1.4	-	41.9	43.5	8.1	3.7	2.8	-

4.52 Majority of the well users have their own private wells (627 using in summer and 864 during rains) and about half of them (338 in summer) use the water from the neighbours' well for hand washing. Public well users for this activity are only few (94). On the other hand, most of the piped water users rely on public taps (1329 out of 1495 in summer) for hand washing, and those using own tap are few (162 in summer).

Toilet -Use

4.53 The pattern of water use and the sources availed of for bathing and toilet-use are almost similar, in the case of well, tap, and the hand-pump. For obvious reasons, the number of households using pond and river, are more in the case of bathing than that of toilet use Table IV 16 brings out this similarity

Table IV. 16 Sources Used for Bathing and Toilet Use in Different Seasons

Activity		Summer Source					Post Monsoon Source				
		Well	Tap	HP	Pond	River	Well	Tap	HP	Pond	River
Bathing	No.	974	1491	224	148	85	1167	1219	223	166	112
	%	33.3	51.0	7.7	5.1	2.9	40.4	42.2	7.7	5.8	3.9
Toilet	No	966	1486	222	88	45	1167	1199	223	107	82
	%	34.4	52.9	7.9	3.1	1.6	41.9	43.1	8.0	3.9	2.9

4.54. Like bathing, well users for toilet purposes are fewer than tap users in both summer and during the post monsoon periods. The number of hand pump users in both activities are almost the same in both the seasons. These similarities are discernible even in the different scheme areas. Scheme-wise details of toilet use are presented in Table IV 17

Table IV. 17 Sources Used for Toilet purposes in Different Seasons

	Summer/Sources					Post Monsoon/Sources				
	Well	Tap	HP	Pond	River	Well	Tap	HP	Pond	River
Nattika	20.7	49.5	23.1	6.6	0.1	21.4	46.4	23.2	7.8	1.3
Mala	34.4	65.5	-	0.1	1.3	49.5	50.1	-	0.4	-
Vakkom-Anjengo	61.1	38.6	0.2	-	0.2	68.7	31.3	-	-	-
Thrikkunnappuzha	6.9	42.0	-	18.3	32.8	6.7	19.3	-	20.7	50.4
Cheriyanaad	27.9	72.1	-	-	-	38.5	59.0	-	-	2.6
Koipuram	45.0	55.0	-	-	-	62.0	38.0	-	-	-
Total	34.4	52.9	7.9	3.1	1.6	41.9	43.1	8.0	3.9	2.9

4.55. Details relating to different Panchayats, ownership of sources and households using more than one source are provided at Appendix IV.11.

House Cleaning

4.56. The number of households reporting the use of different sources for cleaning/washing of house was fewer than those reported for other activities. The percentage of households using different sources, however, is comparable to other activities. Well users during summer was found to be about 34% as against 45% during the post monsoon period. In the case of piped water, it was 50% and 38% respectively, for the two seasons. Percentage of households using hand pump was 10% during the dry season and 8.5% in the rainy days. Pond users account for about 4% and 5% respectively during the summer and post monsoon period. River users are comparatively few as could be seen in Table IV.18. The same table also brings out the variations of use in different scheme areas. The lowest number of households among well users has been reported from Thrikkunnappuzha during the dry season.

Table IV. 18 Sources Used for House Cleaning

	Summer Sources					Post Monsoon Sources				
	Well	Tap	HP	Pond	River	Well	Tap	HP	Pond	River
Nattika	22.2	45.4	24.7	7.6	0.2	26.0	35.5	25.4	12.4	0.6
Mala	35.8	64.1	-	0.1	-	52.5	47.3	-	0.1	-
Vakkom-Anjengo	75.2	24.5	0.4	-	-	77.2	22.8	-	-	-
Thrikkunnappuzha	7.3	48.6	-	14.7	29.4	6.3	23.4	-	20.7	49.5
Cheriyanaad	25.8	74.2	-	-	-	40.0	58.3	-	-	-
Koipuram	52.8	47.2	-	-	-	69.5	30.5	-	-	-
Total	34.2	50.2	10.1	3.9	1.6	44.9	38.0	8.5	5.4	3.1

4.57. Appendix IV 12. contains detailed information on each Panchayat under the scheme areas, ownership of the water sources and also number of households using more than one source for house cleaning.

Other Uses

4.58. Under other uses, watering of plants, using water for watering cattle and retting of coconut leaves are included. A good number of households have reported using wells and piped water for gardening and watering of cattle. The details point towards the wrong use of piped water and therefore each one is separately dealt with.

Sources For Garden Use

4.59. Most of those using water for garden purposes are found to be from among piped water users. When the well water is used by 29% of the households in summer and 36.4% after the monsoon in all the scheme areas, the tap water users for the same purpose are 42% and 33.4% in the respective seasons. Among the piped water users only 53% in summer and 38% during the post monsoon period, use own taps. The large number of piped water users (393 in summer and 317 after rains), water their garden from the public stand posts. This wrong use of piped water is effected either by carrying it in pots or, as seen in the photograph, using a long hose. Bulk of such wrong users (235 in summer and 227 during rains) are from the Nattika area. A total of 17 and odd percent reported using hand pumps for garden purposes, all from Nattika scheme area. Pond users are from Nattika, Mala and Thrikkunnappuzha, accounting for about 10% of households. River users also belong to these areas and form 2% in summer and 3% during the post monsoon season. Scheme-wise users are shown in Table IV.19. Panchayat-wise information and ownership of sources can be seen in Appendix IV 13.

Table IV. 19 Sources used for Garden

Schemes	SUMMER SOURCES					POST MONSOON SOURCES				
	Well	Tap	HP	Pond	River	Well	Tap	HP	Pond	River
Nattika	22.6	38.0	26.8	12.3	0.32	26.0	35.5	25.4	12.4	0.63
Mala	35.5	63.2	-	1.3	-	64.3	35.7	-	-	-
Vakkom-Anjengo	74.1	24.7	-	-	1.2	79.7	20.3	-	-	-
Thrikku-nnapuzha	10.3	48.3	-	20.7	20.7	12.5	23.4	-	23.4	40.6
Cheriyamad	23.9	73.9	-	-	2.2	46.3	53.7	-	-	-
Koipuram	50.9	49.1	-	-	-	78.6	21.4	-	-	-
Total	29.1	41.9	17.7	9.5	1.7	36.4	33.4	17.1	9.9	3.2

4.60. A comparison of piped public tap water used for drinking and cooking and for watering of garden would reveal the extent of wrong use of piped tap water.

Table IV. 20 Extent of Piped Public Tap Water Use

Schemes	No. of Households Using Public Tap in Schemes											
	Nattika		Mala		Vakkom-Anjengo		Thrikku-nnapuzha		Cheriyamad		Koipuram	
	S	PM	S	PM	S	PM	S	PM	S	PM	S	PM
Drinking	615	602	484	365	242	221	119	118	66	40	63	40
Cooking	571	562	428	315	210	190	103	102	48	36	60	40
Garden	221	213	41	21	6	5	17	10	29	18	23	12
Animals	16	14	37	19	5	3	17	9	15	12	13	10
Retting	5	3	3	1	2	-	-	-	-	-	-	-

4.61. If the percentage of households putting public taps into wrong use, is considered, Cheriyamad tops the tally with 50% to 60% in the two seasons followed by Nattika and Koipuram. In other areas it varies from 3% to 17%. The number of households using public taps for garden use is the highest in Nattika with 221 in summer and 213 after the monsoons. They form 94% of the total tap users for garden purposes in the two seasons.

Sources Used For Animals

4.62. Compared to gardening, the households using water from different sources for animal related activities are fewer. A total of 39% use wells during the dry season and 48% during the post monsoon period for the purpose. Piped water users are much less with 32% and 22% during the respective seasons. Other sources

users vary from 6.3% (Hand pump) to 14.1% (Pond) in summer and 6.6% (Hand pump) to 14% (Pond) in the other season. Scheme-wise differences are shown in Table IV.21.

Table IV. 21 Sources Used for Animals

Schemes	SUMMER SOURCES					POST MONSOON SOURCES				
	Well	Tap	HP	Pond	River	Well	Tap	HP	Pond	River
Nattika	25.4	16.7	21.9	33.3	2.6	26.1	15.3	22.5	31.5	3.6
Mala	50.0	40.7	-	7.4	1.9	71.2	25.0	-	1.9	1.9
Vakkom-Anjengo	68.4	12.3	-	1.8	17.5	83.3	8.3	-	2.1	6.3
Thrikku-nnapuzha	6.4	44.7	-	19.1	29.8	6.1	20.4	-	28.6	44.9
Cheriyanaad	22.6	61.3	-	-	16.1	31.0	51.7	-	-	17.2
Koipuram	56.4	43.6	-	-	-	72.2	27.8	-	-	-
Total	38.9	32.1	6.3	14.1	8.6	48.0	21.8	6.6	13.8	9.6

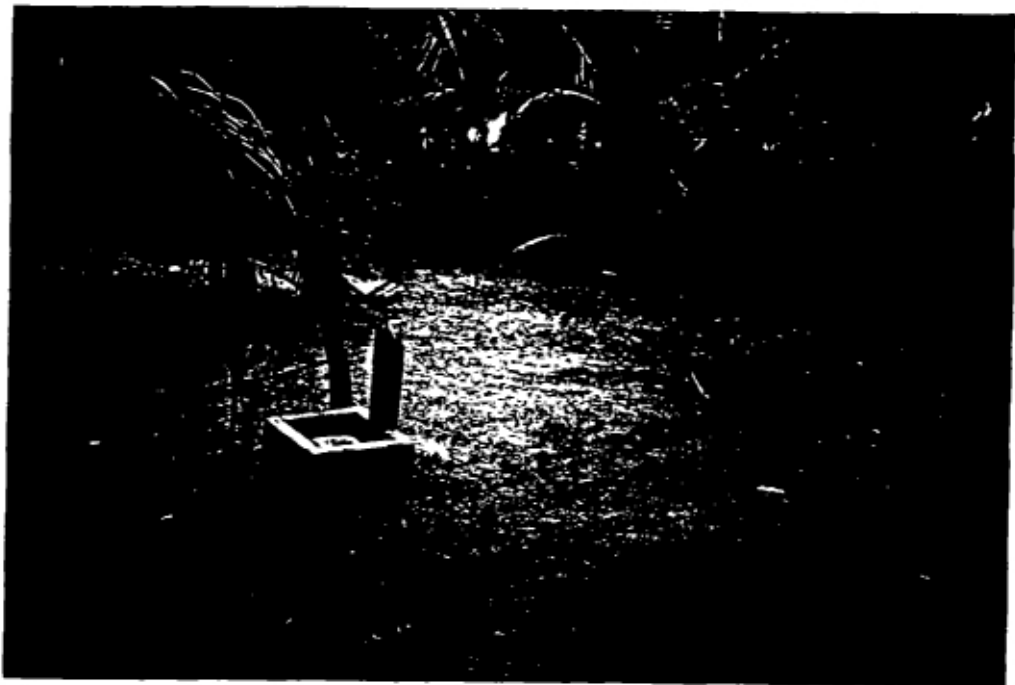
4.63. Panchayat-wise and ownership-wise details are presented at Appendix IV.14. Ownership details also indicate the extent of wrong use of public piped water as could be seen in Table IV.20. A total of 103 households use public tap water for animals in summer and 67 households in post monsoon period. When compared to garden use, it was less than one third of the former. Scheme-wise, Cheriyanaad with 61.3% tops the list of the tap water users for animal watering and Vakkom Anjengo the lowest with 12.3% households. The rest range from 16.7% in Nattika to 44.7% in Thrikunnappuzha.

Sources Used For Retting

4.64. Another water use activity relates to retting of coconut leaves/husks. After retting the split coconut leaf, it is platted, dried and used for thatching. For this purpose, since the leaves are to be immersed fully in water, wells and taps are seldom used. The most common source used are ponds and rivers. Data also show that springs are used for this activity in some areas like Nattika and Vakkom-Anjengo. Scheme-wise and source-wise details are given in Table IV.22. Further break-up, up to Panchayat level and ownership of sources could be seen at Appendix IV.15.



Wrong/misuse of stand post water



Stand post without water

Table IV. 22 Sources Used for Coconut Leaves/Husk Retting

Schemes	SUMMER SOURCES						POST MONSOON SOURCES					
	Well	Tap	HP	Spring	Pond	River	Well	Tap	HP	Spring	Pond	River
Nattika*	6.1	2.6	7.4	0.4	55.8	21.6	5.4	1.8	7.6	0.5	57.1	21.4
Mala	7.2	4.3	-	-	44.9	43.5	31.6	5.3	-	-	47.4	15.8
Vakkom-Anjengo	11.8	8.2	-	2.4	5.9	71.8	26.0	3.9	-	2.6	5.2	62.3
Thrikku-nnapuzha	-	-	-	-	50.8	49.2	1.6	-	-	-	46.0	52.4
Cheriyana-d	-	-	-	-	-	100	-	-	-	-	-	100
Koipuram	-	-	-	-	-	-	-	-	-	-	-	-
Total**	6.5	3.6	3.8	0.7	43.8	38.5	10.2	2.1	4.4	0.8	44.3	34.6

* 6.1% in summer and 6.3% during post monsoon period use other sources.

** 3.1% in summer and 3.7% during post monsoon period use other sources.

4.65. Table IV.22, reveals that for the purpose of retting coconut leaves the most common source used are ponds (43.8% in summer and 44.3% after the rains) and rivers (38.5% in summer and 34.6% after rains). Other sources range from 0.7% in the case of springs and 6.5% and 10.2% in the case of well during summer and post monsoon seasons, respectively. In this activity piped water is rarely used and it works out to only 3.6% of households in summer and 2.1% after the monsoon or a total of 10 and 4 households in these two seasons as could be seen from Table IV.22.

Right And Wrong Use Of Public Tap Water

4.66. The primary objective of all Netherlands assisted water supply schemes is to provide safe water for basic household needs like drinking and cooking. Others include bathing, washing clothes, cleaning of utensils, hand wash and such other water use activities which promote healthy living. Piped water is distributed either through house connections or Public stand post taps. Cost of house connections is borne by individual households and that of public stand posts by the Panchayat. Different water use activities may be grouped under

- i) **Primary basic household needs** which comprise drinking, cooking and food processing.
- ii) **Secondary basic household uses** covering bathing, clothes and utensils washing, hand wash, house cleaning and toilet use.
- iii) **Tertiary uses** consisting of watering of garden, watering of animals and retting of coconut leaves.

4.67. While the first two categories are considered as "necessary uses" tertiary use of piped water can be termed as 'wrong use' or 'misuse'. Among the tertiary users, those having house connections are few in number when compared to the public stand post users. The extent of wrong / misuse among the households using public stand posts, Scheme-wise and season wise may be seen at Table IV.20.

4.68. It would be seen that the wrong use of public stand post water is the maximum in the case of garden use followed by animal watering and coconut leaf retting. Among the scheme areas, Nattika leads the list with 221 households using public tap water for gardening in summer and 213 during the post monsoon period, followed by Mala with 41 and 21 households respectively. For the other two activities only few house-holds use public tap water.

4.69. Summary Table IV.23, provides a general picture of the water-use pattern - sources used, water use activities and seasonal variations in the different scheme areas

Source Preference and Choice Factors

4.71. Preference of a particular source for a specific water use depends on many factors. A general characteristic is that people make a reasoned choice of a particular water source for a specific water need. Women are usually the main decision makers with respect to water source selection. A study in Cambodia, for example, showed that rain water, well water, and canal water were all used for human consumption, depending on availability, proximity, and taste (Sophal et al 1986)

4.72. Information on the reasons for preferring different sources was collected from all the sample households in the six water supply scheme areas. The choice factors vary from place to place and source to source.

Choice Factors For Well

4.73. The choice for well water, as reported by the sample households, is indicated in the Table IV. 24

Table IV. 24 Reasons for Preference to Well Water

Schemes	Reasons for Preference								
	Clear	Tasty	Odourless	Proximity	Abundance	Always available	Only Source	Effortless	Cultural Reasons
Nattika	30.5	25.6	27.1	53.1	38.3	29.8	2.5	26.4	0.6
Mala	51.6	69.4	63.1	58.3	19.2	22.7	10.0	-	5.4
Vakkom-Anjengo	68.9	55.5	42.6	33.1	39.5	53.1	12.8	1.7	5.8
Thrikku-nnapuzha	2.5	0.8	0.8	0.8	7.6	7.6	-	2.5	-
Cheriyanaad	47.9	39.7	28.8	30.1	8.2	13.7	2.7	8.2	4.1
Koipuram	65.0	43.4	26.5	22.9	9.6	14.5	4.8	13.3	1.2
Total	46.9	46.6	40.9	45.6	29.2	35.1	7.4	9.9	3.5

4.74. Almost half of the households, are of the view that well water is clear (47%), tasty (47%), odourless (41%) and they like it because of its proximity (46%). In some areas like Vakkom-Anjengo, Koipuram and Mala, this view is shared by an overwhelming majority of households. Only 35% feel that water is perennial and 29% testifies its abundance. Well water is effortless according to about 10% and to another 7.4% it is the only source. A small minority (3.5%) like their well water as it is being used for generations or not ritually polluted by other socially backward

communities Panchayat-wise details of the reasons for their choice of well water is presented in Appendix IV 16

Choice Factors For Piped Water

4.75. Choice factors and preference for piped water bring out some interesting results as could be seen in the Table IV.25. About 60% of the households feel that piped water is clear. They also know that it is clean as well. To about half (49.7%) of the people it is tasty. Out of the 1189 households responded to this question 1084 (91.2%) were those using public stand post water, an effect of adaptation to piped water. But when it comes to the odour of piped water only one eighth (12.1%) perceives that it is odourless. The main complaint of the majority is that piped water has a strong smell of chlorine or bleaching powder. Another most important choice factor for using piped water is its proximity to dwellings. About 57%, mostly women who are the main procurers of household water, was happy about the proximity. Here again the opinion was mostly (88.3%) aired by those using public stand posts. Abundance of piped water was reported by 27.1%, mostly (578 out of 648) belonged to the Nattika scheme area indicative of the efficiency of the water supply service in that scheme. All other areas responded almost negatively to this question. Yet another important question related to the frequency of availability. Only 4% (95) of the 2394 sample households felt that it was always available. For about 30% of the households piped water is the only source and another 45% preferred to because of effortless in procuring it. None has reported its preference because of cultural compatibility. For Panchayat-wise details see Appendix IV. 17.

Table IV. 25 Reasons for Preference to Piped Water

Schemes	Reasons for Preference								
	Clear/ Clean	Tasty	Odour- less	Proxi- mity	Abun- dant	Always available	Only Source	Effort- less	Cultural Reasons
Nattika	80.3	65.5	10.2	73.1	73.9	7.8	33.1	71.8	-
Mala	48.0	58.6	16.6	70.1	4.5	2.7	29.0	49.2	-
Vakkom- Anjengo	48.9	29.3	9.8	23.2	6.0	1.2	19.7	11.1	-
Thrikku- nnapuzha	71.4	38.7	20.2	44.5	0.8	5.9	66.4	31.1	-
Cheryanad	60.3	16.9	4.1	53.4	-	-	23.3	32.8	-
Koipuram	44.6	7.2	2.4	33.7	-	-	30.1	21.7	-
Total	60.2	49.7	12.1	56.6	27.1	4.0	29.8	45.0	-

4.76. The four positive choice factors for the preference to piped water supply are that it is clear or clean, its proximity to dwellings, it is "tasty" and can be fetched without much efforts. On the other hand, the bane of the piped water supply is its offensive "chlorine smell", erratic availability and insufficient supply.

Choice Factors for Hand Pump Water

4.77. Another water source used for drinking and cooking is the hand pump. This is found only in the Nattika scheme area (except a couple of them in the Vakkom-Anjengo and Koipuram). Availability, reliability and economy are the guiding factors for this source [No analysis is attempted because of its insignificant contribution to water supply].

Perceptions on Water Supply Service

4.78. In one word, the attitude of households towards the Netherlands assisted water supply and sanitation scheme is ambivalent. The importance of safe drinking water and its positive impact on human health is known to the people, as about 60% consider it 'clean and clear'. Another positive index is their demand for piped water in areas where the water supply service has not yet reached. People are thus attracted towards the real benefits of piped water supply scheme. At the same time they are indignant of the shortcomings of water supply service experienced every day. To comprehend their perceptions about the functioning of the scheme data on their 'likes' and 'dislikes' have been gathered.

Reasons For Dislike Of Water Supply Service

4.79. Table IV.26 presents the reasons for not liking the piped water supply service as reported by the sample households using stand posts and house connections in the six scheme areas. For Panchayat-wise break-down Appendix IV.18 may be referred to.

Table IV. 26 Reasons for Disliking Piped Water Supply Service

Reasons	Owner	SCHEMES													
		Nattika		Mala		Vakkom-Anjengo		Thrikkunnapuzha		Cheriyanaad		Koipuram		Total	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Chlorine Smell	SP	597	78.9	472	68.4	241	45.9	63	62.4	55	83.3	60	76.9	1488	67.1
	PC	25	100	58	90.6	40	69.0	15	83.3	6	85.7	4	100.0	149	84.2
Variable Supply	SP	414	54.7	567	82.2	210	40.0	78	77.2	48	72.7	70	89.7	1387	62.6
	PC	17	68.0	59	92.2	41	70.7	7	38.9	6	85.7	4	100.0	135	76.3
Uncertain times	SP	474	62.6	452	65.5	207	39.4	82	81.2	53	80.3	62	79.5	1330	60.0
	PC	16	64.0	49	76.6	41	70.7	7	38.9	6	85.7	3	75.0	122	68.9
Days No Supply	SP	405	53.5	509	73.8	201	38.3	64	63.4	41	62.1	56	71.8	1276	57.6
	PC	14	56.0	50	17.1	39	67.2	3	16.7	3	42.9	3	75.0	112	63.3
Don't like Taste	SP	160	21.1	164	23.8	135	25.7	57	56.4	49	74.2	581	74.4	623	28.1
	PC	6	24.0	13	20.3	29	50.0	12	66.7	6	85.7	4	100.0	71	40.1
Low Flow	SP	222	29.3	40	5.8	92	17.5	70	69.3	8	12.1	25	32.1	457	20.6
	PC	5	20.0	-	-	14	24.1	13	72.2	1	14.3	-	-	33	18.6
Distance to tap	SP	106	14.0	109	15.8	27	5.1	18	17.8	10	15.2	5	6.4	275	12.4
	PC	-	-	2	3.1	-	-	-	-	-	-	-	-	2	1.1
Poor SP Condition	SP	116	15.3	38	5.5	52	9.9	21	20.8	9	13.6	3	3.8	239	10.8
	PC	1	4.0	-	-	1	1.7	-	-	-	-	-	-	2	1.1
Tedious	SP	73	9.6	-	-	8	1.5	11	10.9	10	15.2	1	1.3	103	4.7
	PC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Too Expensive	SP	3	0.4	-	-	-	-	-	-	-	-	-	-	3	0.1
	PC	6	24.0	-	-	-	-	5	27.8	1	14.3	-	-	12	6.78
Total Households	SP	757	100	690	100	525	100	101	100	66	100	78	100	2217	
	PC	25	100	64	100	58	100	18	100	7	100	4	100	177	

4.80. Of all the perceived reasons, chlorine smell in piped water is the most offensive one reported by the public stand post users (67.1%) and the house connection users (84.2%). Scheme-wise the percentage of complaint varies from 46% in Vakkom-Anjengo to 83.3% in Cheriyanad among the public stand post users. It is 79% in Nattika 77% in Koipuram, 68.4% in Mala and 62.4% in Thrikkunnappuzha. The complaint is more pronounced in the case of house connections. It varies from 100% in Nattika and Koipuram to 69% in Vakkom-Anjengo. It was as high as 91% in Mala, 86% in Cheriyanad and 83.3% in Thrikkunnappuzha.

4.81. Another important twin reason for not liking the piped water supply service is its variable supply and uncertain schedule and times of supply. It has been found that except Nattika in all other areas water supply is on alternate days or once in three days. Those who are unhappy about the variable supply, range from 40% in Vakkom-Anjengo to 90% in Koipuram among the SP users. In other places it is 55% (Nattika), 73% (Cheriyanad), 77.2% (Thrikkunnappuzha) and 82.2% (Mala). Among those with house connections, the position is worse which range from 39% in Thrikkunnappuzha to 100% in Koipuram. In other places it is 68% in Nattika, 71% in Vakkom-Anjengo, 86% in Cheriyanad and 92% in Mala.

4.82. The complaint regarding erratic water supply, at least in some areas like Anjengo Panchayat, was put forward with angry outbursts, at least by a few. The fisher folk of Anjengo are to go for fishing at sea just after midnight and water supply starts, most of the days, at midnight, they claim. Those who claim about uncertain times of water supply average to 60% among SP users and 69% among those having house connection. Among the different scheme areas it varies from 39.4% in Vakkom-Anjengo to 81.2% in Thrikkunnappuzha. It is 63% in Nattika, 66% in Mala 80% in Koipuram and Cheriyanad and 81% in Thrikkunnappuzha. More or less the same trend is discernible among the households having house connections.

4 83 'Days no supply', is another reason for not liking the water supply service, voiced by more than half the households among the SP users. This happens largely because of the failure on the part of the system to attend to complaints of repair which is very common in many places. It averaged 58% among the SP users and 63.3% in the case of households having house connection. There is fairly a large percentage in this category in Mala (74%), Koipuram (72%), Thrikkunnappuzha (63.4%) and Cheriyanad (62.1%). Nattika reported 54% and Vakkom-Anjengo

38.3%. Other reasons like does not like taste 28% (SP users) and 40% home connection, distance to tap (12.4% as among SP users and 1.1% among house connections), low flow (21% and 19%), poor SP condition (11% to 1.1%), too expensive, 0.1% among SP users and 6.8% by the others, are not of any significance. 'Tedious' nature has been reported by 4.7% of SP users. In other words 'Poor quality' (chlorine smell) and 'erratic supply schedule' (variable and uncertain times and days no supply) are the two outstanding reasons for dislike put forward by the users of piped water supply in the six scheme areas.

Reasons For Liking Piped Water Supply Service

4.84 Notwithstanding some complaints about the Netherlands assisted piped water supply scheme, it is also hailed by a good number of beneficiaries, as is seen in Table No IV.27.

4.85. An overwhelming majority of households use piped water as it is safe (bacteria free), clean and clear. This view is maintained by 71% of stand post users and 78.4% among the house connection beneficiaries. This important awareness is significant. In scheme areas like Nattika and Mala, which together account for more than 65% SP users in the sample, this view is held by 82% and 80% respectively. Even in other areas like Thrikkunnappuzha (71.3%), Cheriyanad (61%) and Vakkom Anjengo (50.3%) the majority of the people using SP are aware that piped water is clean and safe, unlike well water. Even in Koipuram it is 42%. As regards households having house connection, the opinion is strong with 96% in Nattika and 91% in Mala. In other areas it is 72.4% (Vakkom Anjengo), 61.1% (Thrikkunnappuzha), and 43% in Cheriyanad. None of the 4 households of Koipuram responded.

4.86 A significant number, (50%) among SP and House connection users, like the taste of piped water. They all agree that if the water is stored, the chlorine smell vanishes and become palatable. Those liking the taste form 68% in Nattika and 58% in Mala among the SP users and 76% and 64% respectively among the house connection group. In other areas it is less than 43% in both the groups.

Table IV. 27 Reasons for Liking Piped Water Supply Service

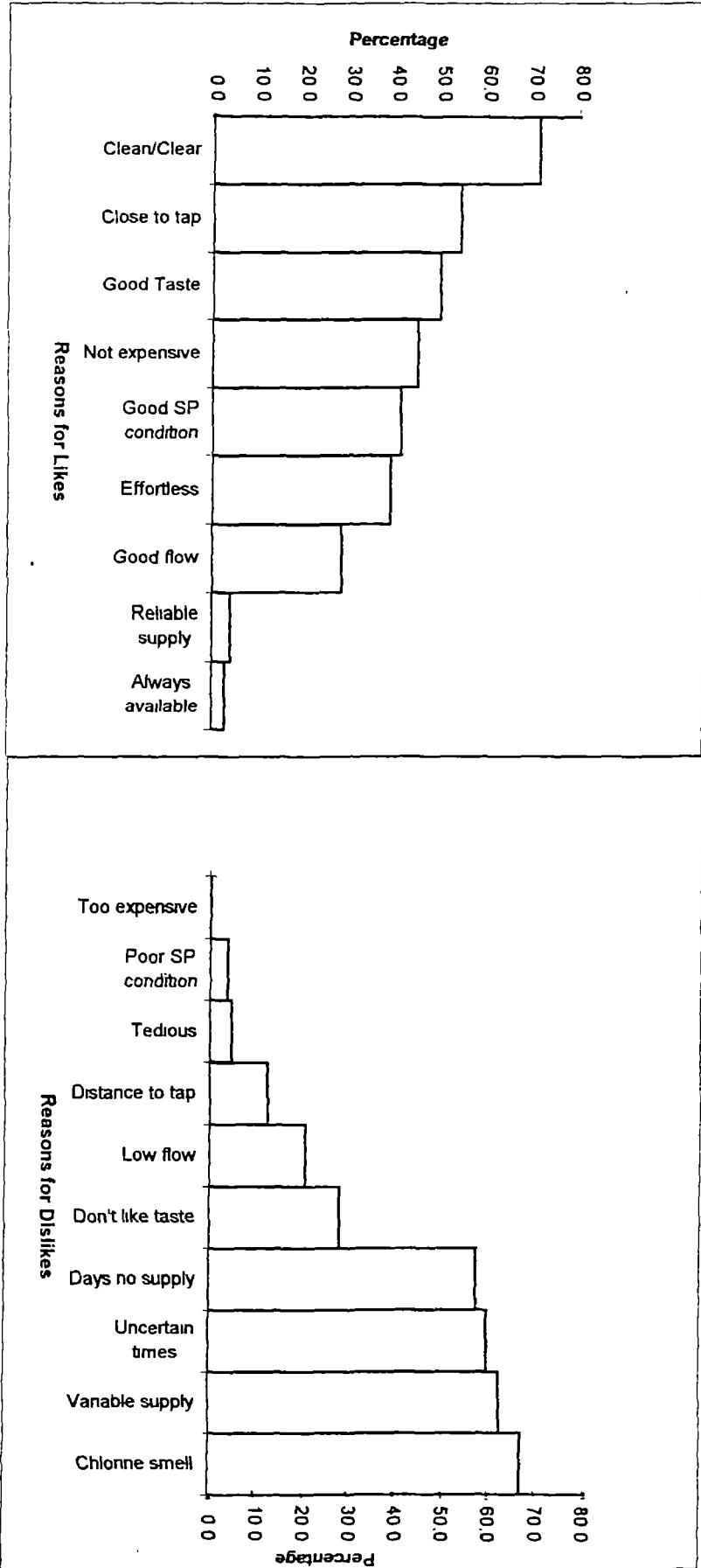
Reasons	Owner	SCHEMES													
		Nattika		Mala		Vakkom		Thrikkunna-puzha		Cheriyamad		Koipuram		Total	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Clean/Clear Water	SP	619	81.8	548	79.4	264	50.3	72	71.3	40	60.6	33	41.8	1576	71.1
	PC	24	96.0	58	90.6	42	72.4	11	61.1	3	42.9	-	-	138	78.4
Closer to tap	SP	541	71.5	483	70.0	85	16.2	38	37.6	34	51.5	21	26.6	1202	54.2
	PC	22	88.0	49	76.6	26	44.8	15	83.3	6	85.7	4	100.0	122	69.3
Good Taste	SP	497	65.7	400	58.0	147	28.0	43	42.6	11	16.7	6	7.6	1104	49.8
	PC	19	76.0	41	64.1	24	41.4	3	16.7	1	14.3	-	-	88	50.0
Not Expensive	SP	612	80.8	282	40.9	47	9.0	47	46.5	9	13.6	-	-	997	45.0
	PC	12	48.0	19	29.7	-	-	3	16.7	-	-	-	-	34	19.3
Good SP condition	SP	522	69.0	200	29.0	167	31.8	22	21.8	2	3.0	-	-	913	41.2
	PC	18	72.0	2	3.1	27	46.6	-	-	-	-	-	-	47	26.7
Effortless	SP	552	72.9	308	30.1	35	6.7	26	25.7	24	36.4	19	24.1	864	39.0
	PC	20	80.0	38	5.5	16	27.6	14	77.8	2	28.6	-	-	90	51.1
Good Flow	SP	380	50.2	154	22.3	79	15.0	-	-	2	3.0	10	12.7	625	28.2
	PC	12	48.0	12	18.8	19	32.8	-	-	-	-	-	-	43	24.4
Reliable Supply	SP	86	11.4	-	-	3	0.6	-	-	-	-	-	-	89	4.0
	PC	-	-	1	1.6	2	3.4	-	-	-	-	-	-	3	1.7
Always Available	SP	51	6.7	8	1.2	5	1.0	-	-	-	-	-	-	64	2.9
	PC	3	12.0	-	-	2	3.4	2	11.1	-	-	-	-	7	4.0
Total Households %	SP	557	100	690	100	525	100	101	100	66	100	79	100	2218	
	PC	25	100	64	100	58	100	18	100	7	100	4	100	176	

4.87 One another important reason of liking piped water, particularly among the SP users, is the proximity of water source. This view is maintained by a total of 54.2% among the SP users and 69.3% of households having house connection. In the former category it goes up to 72% and 70% respectively in Nattika and Mala. To the SP users in other areas proximity is not as important as quality persuading them to use piped water. It is 52% in Cheriyanad, 38% in Thrikkunnappuzha, 27% in Koipuram and 16.2% in Vakkom Anjengo. Around 88% (Nattika) and 77% (Mala) avail piped water service because of its proximity, according to households having house connection. Except in Vakkom Anjengo where it is only 45%, in all other areas, like Koipuram(100%), Cheriyanad (86%)and Thrikkunnappuzha (83.3%), this group of users like piped water due to its nearness.

4.88. Among other reasons, cost-benefit is more appealing to the SP users to the extent of 45% whereas for the other group it is a marginal (19.3%) attraction to use piped water. A good percentage in both the groups (39% SP users & 51.1% PC users) consider that collecting piped water is effortless. The view is prominent among both categories in certain areas like Nattika (73% SP users & 80% PC users).

4.89 Like the reasons for not using piped water, reliability of water supply, its availability and flow do not attract the households for using piped water. It is reflected in the responses to these questions. Only a total of 4% SP users and 1.7% PC users opt for piped water because of its reliable supply. Those liking it, due to availability at all times, are also few (3% SP & 4% PC users). To a good number particularly SP users (41.2%), good condition of stand post is an incentive to use piped water. A total of 28.2% SP users and 24.4% PC users like the 'good flow' of piped water. Depending upon the location, high or low, of the source the flow may be 'bad' or 'good'.

Diagram IV.7 Likes and Dislikes of SP Users



4 90 Panchayat-wise, reasons for liking piped water in scheme areas, both for SP users and PC users are given in Appendix IV 19. The Diagram IV 7 gives a comparative picture of likes and dislikes of the piped water supply service of the six Netherlands assisted schemes.

SUMMARY AND CONCLUSIONS

Considering the pervasiveness of water, in Kerala, the land with abundant natural resources - plenty of rains in two seasons, ponds, tanks, streams, rivers and dug-wells, one may doubt the need of turn-key arrangements of water supply, since it is like carrying coal to New Castle. But a closer look at the acquisition of these resources reveals that the own-key arrangements of rural population are inadequate and inefficient to cater to the basic water needs of a large majority. Of all, dug well is the only water source providing drinking and cooking water. And many of the dug-wells dry up during the summer season, inducing, particularly the weaker sections, to patronise piped water supply. Water use behaviour requires to be examined in the light of the above background. The instant survey also reveals the extent of change in the water use behaviour. To cope up the problem of non-availability and reliability of safe water, many have shifted from the traditional well water to piped water, although a good number still continues to use well water. This continuity and change in water use behaviour, augurs well for the introduction of piped water supply schemes in rural areas.

Water Policy and Programmes

5.2. Over the years, particularly after Indian Independence, the Governments, both at the Centre and in the States, have taken upon themselves the onus of providing safe water to rural millions. The National Development Plans give much priority to water supply and sanitation programmes. A National Water Policy enunciated in 1987 gives the highest priority to drinking water supply. The state of Kerala, is the first one to adopt the comprehensive water policy in 1992, which declares that water supply schemes will be commissioned in water scarce areas. Around 42% of the State's rural population has been covered by protected water supply schemes, according to the Economic Review of 1995 of the State Planning Board. In achieving this the Royal Government of Netherlands too has contributed through a bilateral agreement.

The Survey

5.3. The present survey is an exercise to gauge the efficacy of the Netherlands Assisted Water Supply and Sanitation Schemes in the Four districts spread over 25 Panchayats of Kerala. The primary objective of all Netherlands assisted water supply projects is to provide drinking water to all households covered by this schemes. The six schemes are located in places where, there is acute scarcity of drinking water, particularly in summer.

5.4. The objectives of the present survey include *inter-alia*, to study the extent of piped water use and use of alternate sources for basic household needs in different seasons, reasons for such preferences and choice factors for the use of different water sources. The survey has been accomplished using a sample frame which is a combination of multi-stage systematic sampling coupled with stratified random sample. Altogether 2394 households were included in the sample covering 831 stand posts in 82 sample wards of 25 Panchayats. The women-folk formed the bulk of the respondents as they are the ones traditionally charged with the collection of drinking water. A structured format, required for the purpose after a pre-test, was the main instrument of the survey. This was supplemented with observations and Focus Group Discussions, besides a few in-depth interviews. Thorough objectivity was ensured in the quality of the data by imparting appropriate training to surveyors, and supervisors, frequent visit to the field by the Project Director and close monitoring.

Profile of Households

5.5. Influence of socio-economic characteristics of people on their water use behaviour is well documented. The sample households in the survey belong to the three main religions found in Kerala - Hindus (67%), Christians (11%) and Muslims (22%). Among the Hindus, Forward Castes accounted for 8.5%, Backward Castes form the majority with 40.6% and Scheduled Castes and Scheduled Tribes constituted 17.5% and 0.2% respectively.

5.6 Total population of the sample households was 13,504 of which 6,457 (47.8%) males and 7,047 (52.2%) females. They comprise 65% adults, 18% children, 9.2% children under 5 and the rest the elderly

5.7. Only 15% of the population is illiterate, of the rest over 50% are educated up to Primary level, 31% to Secondary level and the rest Graduates.

5.8 Economic status of the households reveal that majority (55%) are poor or very poor (13.5%). The rest fall under lower-middle (27%), middle (5%) and Upper middle (0.47%) categories.

Water Use Behaviour

5.9 Water use needs of the six surveyed schemes are not different from those in the adjoining areas. They form the basic primary needs of drinking, cooking and food processing, secondary needs of cleaning like bathing, clothes and utensils washing, hand washing, toilet use and house cleaning, and tertiary uses of animal watering, garden watering and retting of coconut leaves. The sources commonly used for different purposes include piped water, dug-well water, hand pumps, ponds and tanks, streams and rivers. While the first three sources are used for drinking and cooking, the others (besides the first three) are used for other purposes. The pattern of use, however, varies according to seasons. Among the sample households, 807 have own dug-wells and 154 have piped water house connections. There are 130 households using public dug-wells and 1432 using public stand posts. There are 147 private hand pumps used for extracting water for drinking and cooking.

5.10. Data on use of water at source outside the compound indicate that it is a common phenomenon. Bathing, clothes washing and hand washing are some of the different activities resorted to at sources. Animal watering, garden watering and retting of coconut leaves are some other activities undertaken at water sources.

Sources Used for Drinking and Cooking

5.11. Dug-wells, piped water and hand pumps are the only sources used for satisfying the basic household needs of drinking, cooking and other food processing activities. The patterns of use of these sources vary according to seasons and areas. For example, while piped water is used by 56% of the households in the dry season, the number of users is dropped to 50% in the post monsoon period. On the other hand, the pattern is reversed in the case of well water use. Alternate source of dug-well is used by 38% of households during summer and 44% during the post monsoon period. Hand pump, as source for drinking water, is limited to certain areas like Nattika and only 6% are reported using it. In general piped water use is more in summer and well water use is more in post monsoon period. The pattern, however, varies from scheme to scheme, depending upon the physical terrain and hydrological condition of each area. Thrikkunnappuzha, being a coastal belt, with very few dug-wells, most of the households (91% in summer and 96% in the post monsoon period) depend upon piped water. At the same time, only 1% to 1.5% households use well water for drinking and cooking. Similarly over 60% tap users are found in Nattika and Cheriyana during dry season. Well water users in the same season are 20% and 32% respectively. Mala, Vakkom-Anjengo and Koipuram report 40% to 54% tap users in the summer and 38% to 41% in the post monsoon period as against 46% to 60% well water users in summer and 59% to 62% in the post monsoon period. Hand pump users are concentrated in Nattika and form 16% to 17% in the two seasons. Even within the same scheme area there are variations in water use pattern in different seasons.

5.12. Information on the ownership of different water sources used for drinking and cooking purposes in the sample is also available. The 807 private wells and 130 Public Panchayat wells in the surveyed area used for drawing drinking and cooking water in different seasons. In the case of piped water, there are 154 private house connections besides the public stand posts providing water to the sample households. A good majority of public stand post users are poor, less educated, and belong to the lower social strata of the society. It was also found that about 18% of the households use more than one source in summer and 16% in the post monsoon period for drinking and cooking water.

5.13. The secondary water needs are for cleaning purposes like bathing, clothes washing, utensil cleaning, hand washing, house cleaning and for toilet purposes. These needs are met by, besides wells, piped water and hand pumps, the



The long wait

ponds, streams or rivers, wherever they are present. For bathing wells are used by one third of the households in summer and over 40% during post monsoon period. In the case of tap it is increased to 51% and 42% respectively in the two seasons. Around 8% use hand pumps in both the seasons and those using ponds comes to 8% in summer and 6% during rains. River users comes to 3% and 4% respectively in summer and during post monsoon. Most of the pond and river users are in Thrikkunnappuzha.

5.14. Like bathing, lot of ritual significance is attached to clothes washing and utensil cleaning, so much so that, the water sources used for these activities are the same and are ritually pure. The incidence of use also remains almost the same as could be seen from Diagrams IV.5 and IV.6. Another activity closely related to the earlier ones is hand washing which comprises of washing of feet and face and washing hands before and after meals. Most of the households, use either well water (37% in summer and 42% after rains) or piped water (52% in summer and 44% post monsoon) for the purpose. Only few households reported using other sources like hand pumps (8% in both seasons), ponds and rivers ranging from 1.5% to 4% in the two seasons.

5.15. When compared to other activities, the number of households using water for cleaning houses regularly are few. Wells, piped water and hand pumps are mainly used for this activity. While the number using wells vary from 34% in summer to 45% during rains, the pipe water users account for 50% and 38% in the two seasons. Hand pump users work out to around 10%. Very few households use ponds and rivers for this purpose. Another secondary need relates to toilet use. Like bathing, well users are fewer than tap users in both seasons. Hand pump users in bathing and toilet use almost the same. So also other sources like pond, stream and river

5.16. Tertiary use covers garden watering, animal watering and retting of coconut leaves. Data reveal that tap water users (42%) are more than well water users (29%) in the case watering of garden, during summer, which in one sense, may be construed as wrong use of piped water. Even during post monsoon period 33% of households use tap water for gardening as against 36% using well water. Hand pump users (26% in Nattika), pond users (21% in Thrikkunnappuzha) and 12% in Nattika and a good number (21% in summer and 41% after monsoon) of river users are also reported under these activities.

5.17. Animal watering is another tertiary activity. Compared to garden watering the number of households using different sources for this activity is few. In both the seasons well water users (39% in summer and 48% percent in post monsoon) are more than piped water users (32% and 22%). Ponds and rivers, wherever available, are extensively used for this activity in both the seasons.

5.18. The last among tertiary use is retting of coconut leaves. Since this activity needs a suitable water body to immerse the leaves, wells and stand posts are seldom used. While only 6.5% and 10.2% of households use well water during the two seasons, tap water users are only 3.6% and 2.1%. On the other hand, pond users (44% in both seasons) and river users (38.5% in summer and 35% after rains) obviously outnumber other sources.

Wrong Use of Piped Water

5.19. Since piped water supply is mainly to cater to the primary needs of drinking and cooking and secondary needs of cleaning, tertiary needs can be construed as its wrong use. In the case of stand posts it is, in fact, a misuse. Table IV.20. reveals the extent of misuse of stand post piped water. Among the different activities, under the tertiary needs, garden watering stands out compared to the other two. There are 337 households using public taps in summer and 279 using them in post monsoon period for gardening, among the public stand post users. Only few households use this source for watering animals and a negligible number for retting coconut leaves.

Conclusions

5.20. Source preference and choices depend on many factors - availability, reliability, quality, distance and suitability. Data on choice factors among the sample households in the six schemes reveal that well water is preferred because it is clear (47%), tasty (47%), odourless (41%) and its proximity (46%). It is also perennial (35%) and abundant (29%). In the case of piped water 60% prefers because it is clean and clear, it is tasty to 50% of households and 57% prefers because of its proximity. Another 45% likes tap water because of its effortlessness. For 30%, it is the only source and hence the choice. A good number (27%) liked tap water because of its abundance. In other words, preference for piped water outweighs well water.

5.21. The attitude of the sample households, towards the piped water supply service is ambivalent or shilly-shally. They dislike it because of the pungent chlorine smell in water and erratic and uncertain supply. On the other hand, they are attracted towards the water supply service as they are aware of the bacteria free quality of piped water and its proximity. Cost-benefit is another aspect of water supply service which allures the beneficiary, the poor in particular.

5.22. A closer look at the survey data brings home certain interesting facts. Between the piped water and the dug-well, the choice is for the culturally conditioned well water. This seems to be the main reason why many households go back to wells after monsoon. Another important finding is that piped stand post water is patronised by those having no other source of drinking water, the poor, who belong to the lower social strata. Cost-benefit is yet another choice factor particularly, for the poor. Awareness about the bacteria-free quality of piped water too has attracted many people. Indications are that a large majority, particularly those who have no own-key arrangements are attracted towards the piped water supply programmes as it is reflected from the increased demand for home connections and request for extension of piped water to areas hitherto not covered by it. All the same, the programme needs to be stream lined to make it fully satisfying and acceptable.

5.23 Suggestions

1. Ensuring definite and punctual water supply, and making the piped water service reliable, will go a long way in creating confidence and faith in the service. This can be achieved by a two-pronged approach of :
 - i. Scheduled and controlled punctual release of treated water at fixed times.
 - ii. Promptly attending to complaints of repairs when supply is disrupted.
2. Strict water quality control and timely remedial measures are the other important services to restore confidence in the beneficiaries.
3. To augment the existing service, attempts could be made to rehabilitate, technically feasible, economically viable and socially acceptable abandoned rural water supply schemes.



An unutilised sustainable water source



*Abandoned water supply scheme waiting for
rehabilitation*

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4. Observations and discussions in the field have also brought to fore the need for the early energising of the planned stand posts, adding additional stand posts wherever necessary, and rationalising the locations of the existing stand posts
5. Awareness about right use of water would help avoiding wrong or misuse of stand post water. For this purpose, Kerala Water Authority, being the implementing agency, could make use of the basic social infrastructure institutions created by the Socio-Economic Units Foundation in the form of Ward Water Committees and Stand Post Attendants. Similarly in the case of house connections, a strong movement of consumer education would be effective.
- 6 This, coupled with close co-ordination and co-operation of Panchayats would be of great significance.
7. Last, but not the least important, is the crying need of periodical monitoring and inspection of the service by senior functionaries and periodic qualitative evaluation by competent independent agencies.

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Appendix III.1 SOCIAL PROFILE OF HOUSEHOLDS

Sl No	Scheme/Panchayat	Religion			Forward	Backward	S C	S T	Total
		Hindu	Christian	Muslim	Caste	Caste			
Nattika Scheme									
1	Engandiyoor	63	8	11	0	49	14	0	82
2	Mathilakam	41	11	26	0	17	24	0	78
3	S N Puram	58	1	57	0	42	16	0	116
4	Vadanapally	28	0	13	0	12	16	0	41
5	Kaipamangalam	64	3	39	13	29	22	0	106
6	Valappad	37	2	6	0	25	12	0	45
7	Perinjalam	48	3	19	5	36	7	0	70
8	Thalikulam	74	1	20	0	51	23	0	95
9	Nattika	57	2	20	7	35	15	0	79
10	Edathuruthy	63	5	2	0	36	27	0	70
Sub Total		533	36	213	25	332	176	0	782
Percentage		68.2	4.6	27.2	3.2	42.5	22.5	0.0	100.0
Mala Scheme									
11	Mala	183	46	34	6	117	60	0	263
12	Poyya	89	46	4	2	74	13	0	139
13	Kuzhoor	25	38	0	4	16	5	0	63
14	Annammanada	23	2	3	0	14	9	0	28
15	PuthenChira	74	22	25	12	45	17	0	121
16	Vellangallor	68	11	61	0	58	10	0	140
Sub Total		462	165	127	24	324	114	0	754
Percentage		61.3	21.9	16.8	3.2	43.0	15.1	0.0	100.0
Vakkom-Anjengo Scheme									
17	Vakkom	64	0	11	4	45	14	1	75
18	Kizhuvillam	70	0	33	16	30	24	0	103
19	Chirayinkil	97	2	36	85	3	9	0	135
20	Kadakkavoor	113	3	9	23	86	4	0	125
21	Azhoor	1	0	35	1	0	0	0	36
22	Anjengo	87	17	5	4	65	18	0	109
Sub Total		432	22	129	133	229	69	1	583
Percentage		74.1	3.8	22.1	22.8	39.3	11.8	0.2	100.0
23	Thrikkunnapuzha Scheme	77	0	42	0	62	15	0	119
		64.7	0.0	35.3	0.0	52.1	12.6	0.0	100.0
24	Cheyianad Scheme	40	11	22	13	9	18	0	73
		54.8	15.1	30.1	17.8	12.3	24.7	0.0	100.0
25	Koipuram Scheme	53	30	0	8	15	26	4	83
		63.9	36.1	0.0	9.6	18.1	31.3	4.8	100.0
TOTAL		1597	264	533	203	971	418	5	2394
Percentage		66.7	11.0	22.3	8.5	40.6	17.5	0.2	100.0

Appendix III.2 AGE DISTRIBUTION OF HOUSEHOLDS

Sl No	Scheme/Pan	Children <5			Children 6-15			Adults 16-60			Adults 60+			Total
		M	F	T	M	F	T	M	F	T	M	F	T	
Nattika Scheme														
1	Engandiyoor	16	17	33	35	50	85	148	157	305	21	26	47	470
2	Mathilakam	16	19	35	47	42	89	121	145	266	11	12	23	413
3	S N.Puram	25	22	47	73	69	142	219	247	466	14	32	46	701
4	Vadanapally	7	11	18	24	22	46	69	74	143	5	16	21	228
5	Kaipamangal	23	24	47	54	57	111	181	174	355	20	24	44	557
6	Valappad	9	9	18	25	17	42	74	92	166	7	8	15	241
7	Perinjanam	13	15	28	26	33	59	120	141	261	11	22	33	381
8	Thalikulam	16	17	33	41	42	83	174	212	386	19	21	40	542
9	Nattika	16	16	32	46	31	77	141	131	272	17	27	44	425
10	Edathuruthy	16	19	35	25	13	38	121	123	244	14	17	31	348
	Sub Total	157	169	326	396	376	772	1368	1496	2864	139	205	344	4306
	Percentage	3.6	3.9	7.6	9.2	8.7	17.9	31.8	34.7	66.5	3.2	4.8	8.0	100.0
Mala Scheme														
11	Mala	86	89	175	107	86	193	448	476	924	55	68	123	1415
12	Poyya	31	48	79	45	45	90	235	249	484	31	41	72	725
13	Kuzhoor	32	13	45	21	19	40	119	112	231	23	28	51	367
14	Annammanad	15	19	34	11	5	16	39	50	89	2	3	5	144
15	PuthenChira	26	23	49	51	43	94	188	247	435	37	44	81	659
16	Vellangallor	35	34	69	70	55	125	238	261	499	15	36	51	744
	Sub Total	225	226	451	305	253	558	1267	1395	2662	163	220	383	4054
	Percentage	5.6	5.6	11.1	7.5	6.2	13.8	31.3	34.4	65.7	4.0	5.4	9.4	100.0
Vakkom-Anjengo Scheme														
17	Vakkom	27	25	52	42	42	84	150	147	297	16	31	47	480
18	Kizhuvillam	32	24	56	71	73	144	130	191	321	27	31	58	579
19	Chirayinkil	49	48	97	69	76	145	244	281	525	21	30	51	818
20	Kadakkavoor	21	39	60	112	107	219	256	255	511	24	41	65	855
21	Azhoor	16	11	27	24	27	51	66	86	152	5	5	10	240
22	Anjengo	36	31	67	59	61	120	186	221	407	29	49	78	672
	Sub Total	181	178	359	377	386	763	1032	1181	2213	122	187	309	3644
	Percentage	5.0	4.9	9.9	10.3	10.6	20.9	28.3	32.4	60.7	3.3	5.1	8.5	100.0
23	Thrikkunnapu	24	19	43	73	90	163	208	215	423	13	26	39	668
		3.6	2.8	6.4	10.9	13.5	24.4	31.1	32.2	63.3	1.9	3.9	5.8	100.0
24	Cheyyanad S	15	21	36	48	52	100	120	130	250	9	16	25	411
		3.6	5.1	8.8	11.7	12.7	24.3	29.2	31.6	60.8	2.2	3.9	6.1	100.0
25	Koipuram Sc	16	15	31	42	41	83	142	136	278	15	14	29	421
		3.8	3.6	7.4	10.0	9.7	19.7	33.7	32.3	66.0	3.6	3.3	6.9	100.0
	TOTAL	618	628	1246	1241	1198	2439	4137	4553	8690	461	668	1129	13504
	Percentage	4.6	4.7	9.2	9.2	8.9	18.1	30.6	33.7	64.4	3.4	4.9	8.4	100.0

Appendix III.3 LITERACY & LEVELS OF EDUCATION

Sl. No.	Scheme/Panchayat	Illiterate			Pnmary			Secondary			Graduate			Post Graduate			Total
		M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	
Nattika Scheme																	
1	Engandyoor	36	45	81	109	125	234	67	62	129	7	13	20	2	4	6	470
2	Mathilakam	29	36	65	148	148	296	27	22	49	2	1	3	0	0	0	413
3	S N Puram	48	71	119	214	226	440	65	70	135	2	5	7	0	0	0	701
4	Vadanapally	10	25	35	71	83	154	21	16	37	1	1	2	0	0	0	228
5	Kaipamangalam	43	60	103	132	130	262	97	83	180	6	2	8	3	1	4	557
6	Valappad	12	16	28	68	72	140	30	33	63	3	7	10	0	0	0	241
7	Pennjanam	19	41	60	112	117	229	38	46	84	1	7	8	0	0	0	381
8	Thalikulam	31	16	47	177	179	356	51	76	127	5	7	12	0	0	0	542
9	Nattika	27	39	66	89	88	177	90	66	156	10	10	20	4	2	6	425
10	Edathuruthy	24	41	65	93	87	180	45	42	87	4	10	14	0	2	2	348
	Sub Total	279	390	669	1213	1255	2468	531	516	1047	41	63	104	9	9	18	4306
	Percentage	6.5	9.1	15.5	28.2	29.1	57.3	12.3	12.0	24.3	1.0	1.5	2.4	0.2	0.2	0.4	100.0
Maia Scheme																	
11	Mala	62	101	163	254	248	502	360	342	702	16	29	45	1	2	3	1415
12	Poyya	33	73	106	152	172	324	144	133	277	9	9	18	0	0	0	725
13	Kuzhoor	26	33	59	75	79	154	77	65	142	5	6	11	1	0	1	367
14	Annamanada	11	19	30	36	34	70	17	23	40	3	1	4	0	0	0	144
15	PuthenChira	16	91	107	160	170	330	98	110	208	3	10	13	0	1	1	659
16	Vellangallor	67	77	144	160	165	325	129	141	270	4	1	5	0	0	0	744
	Sub Total	215	394	609	837	868	1705	825	814	1639	40	56	96	2	3	5	4054
	Percentage	5.3	9.7	15.0	20.6	21.4	42.1	20.4	20.1	40.4	1.0	1.4	2.4	0.0	0.1	0.1	100.0
Vakkom-Anjengo Scheme																	
17	Vakkom	48	78	126	73	67	140	105	90	195	7	7	14	2	3	5	480
18	Kuzhuvillam	48	63	111	117	119	236	88	130	218	6	7	13	1	0	1	579
19	Chirayinkul	22	20	42	315	342	657	27	44	71	20	20	40	3	5	8	818
20	Kadakkavoor	50	76	126	295	295	590	46	38	84	25	25	50	1	4	5	855
21	Azhoor	9	7	16	82	93	175	16	28	44	4	1	5	0	0	0	240
22	Anjengo	65	91	156	86	97	183	148	156	304	10	13	23	3	3	6	672
	Sub Total	242	335	577	968	1013	1981	430	486	916	72	73	145	10	15	25	3644
	Percentage	6.6	9.2	15.8	26.6	27.8	54.4	11.8	13.3	25.1	2.0	2.0	4.0	0.3	0.4	0.7	100.0
23	Thnkunnapuzha Scheme %	4.2	1.8	6.0	16.8	19.4	36.2	12.4	11.0	23.4	1.0	2.2	12.0	0.0	0.0	0.0	66.8
		6.3	2.7	9.0	25.1	29.0	54.2	18.6	16.5	35.0	1.5	0.3	1.8	0.0	0.0	0.0	100.0
24	Cheyanad Scheme %	2.1	3.8	5.9	6.3	7.4	13.7	10.2	10.3	20.5	6.4	4.0	10.0	0.0	0.0	0.0	41.1
		5.1	9.2	14.4	15.3	18.0	33.3	24.8	25.1	49.9	1.5	1.0	2.4	0.0	0.0	0.0	100.0
25	Koipuram Scheme %	3.6	2.6	6.2	8.0	9.1	17.1	9.6	8.5	18.1	4.4	3.7	7.0	0.0	0.0	0.0	42.1
		8.6	6.2	14.7	19.0	21.6	40.6	22.8	20.2	43.0	1.0	0.7	1.7	0.0	0.0	0.0	100.0
	TOTAL	835	1201	2036	3329	3495	6824	2108	2114	4222	173	201	374	21	27	48	13504
	Percentage	6.2	8.9	15.1	24.7	25.9	50.5	15.6	15.7	31.3	1.3	1.5	2.8	0.2	0.2	0.4	100.0

Appendix III.4 ECONOMIC STATUS OF HOUSEHOLDS

Sl No	Scheme/Panchayat	Very	Poor	Lower	Middle	Upper	Total
		Poor		Middle		Middle	
Nattika Scheme							
1	Engandiyoor	6	40	19	14	3	82
2	Mathilakam	20	46	9	2	1	78
3	S N Puram	32	65	15	3	1	116
4	Vadanapally	7	27	7	0	0	41
5	Kaipamangalam	22	54	19	10	1	106
6	Valappad	9	28	7	1	0	45
7	Perinjnam	6	46	14	4	0	70
8	Thalikulam	8	71	15	1	0	95
9	Nattika	9	30	28	10	2	79
10	Edathuruthy	3	52	15	0	0	70
Sub Total		122	459	148	45	8	782
Percentage		15.6	58.7	18.9	5.8	1.0	100
Mala Scheme							
11	Mala	23	126	91	23	0	263
12	Poyya	15	58	58	8	0	139
13	Kuzhoor	1	23	35	4	0	63
14	Annammanada	3	14	9	2	0	28
15	PuthenChira	6	54	55	6	0	121
16	Vellangallor	17	59	59	5	0	140
Sub Total		65	334	307	48	0	754
Percentage		8.6	44.3	40.7	6.4	0.0	100
Vakkom-Anjengo Scheme							
17	Vakkom	25	29	15	6	0	75
18	Kizhuvillam	11	60	27	4	1	103
19	Chirayinkil	4	91	40	0	0	135
20	Kadakkavoor	0	98	26	1	0	125
21	Azhoor	9	13	13	1	0	36
22	Anjengo	24	50	27	8	0	109
Sub Total		73	341	148	20	1	583
Percentage		12.5	58.5	25.4	3.4	0.2	100
23	Thrikkunnapuzha Scheme	31	72	15	1	0	119
		26.1	60.5	12.6	0.8	0.0	100
24	Cheyanad Scheme	10	43	16	4	0	73
		13.7	58.9	21.9	5.5	0.0	100
25	Koipuram Scheme	23	48	9	3	0	83
		27.7	57.8	10.8	3.6	0.0	100
TOTAL		324	1297	643	121	9	2394
Percentage		13.5	54.2	26.9	5.1	0.4	100

Appendix IV.1 WATER USE NEEDS IN DIFFERENT SCHEMES

Sl No.	Scheme/Panchayat	PURPOSE																						
		No of HH	Drinking		Cooking		Bathing		Toilet		Hand Washing		Clothes/Utens Washing		House Cleaning		Gardening		Animals		Retting		Others	
			No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Nattika Scheme																								
1	Engandiyoor	82	82	100	82	100	82	100	82	100	82	100	82	100	76	92.7	55	67.07	9	11.0	21	25.6	0	0
2	Mathlakam	78	78	100	78	100	78	100	78	100	78	100	78	100	63	80.8	42	53.85	7	9.0	4	5.1	0	0
3	S N.Puram	116	116	100	116	100	116	100	116	100	116	100	116	100	110	94.8	82	70.69	11	9.5	32	27.6	0	0
4	Vadanapally	41	41	100	41	100	41	100	41	100	41	100	41	100	39	95.1	23	56.1	5	12.2	7	17.1	0	0
5	Kaipamangalam	106	106	100	106	100	106	100	106	100	106	100	106	100	99	93.4	88	83.0	39	36.8	61	57.5	0	0
6	Valappad	45	45	100	45	100	45	100	45	100	45	100	45	100	44	97.8	44	97.78	1	2.2	21	46.7	0	0
7	Perinjalam	70	70	100	70	100	70	100	70	100	70	100	70	100	67	95.7	46	65.71	13	18.6	15	21.4	0	0
8	Thalikulam	95	95	100	95	100	95	100	95	100	95	100	95	100	89	93.7	36	37.89	9	9.5	23	24.2	0	0
9	Nattika	79	79	100	79	100	79	100	79	100	79	100	79	100	75	94.9	67	84.81	0	0.0	5	6.3	0	0
10	Edathuruthy	70	70	100	70	100	70	100	70	100	70	100	70	100	59	84.3	35	50.0	8	11.4	21	30.0	0	0
Sub Total		782	782	100	782	100	782	100	782	100	782	100	782	100	721	92.2	518	66.24	102	13.0	210	26.9	0	0
Mala Scheme																								
11	Mala	263	263	100	263	100	263	100	263	100	263	100	263	100	236	89.7	45	17.11	34	12.9	6	2.3	0	0
12	Poyya	139	139	100	139	100	139	100	139	100	139	100	139	100	114	82.0	6	4.317	39	28.1	3	2.2	1	0.7
13	Kuzhoor	63	63	100	63	100	63	100	63	100	63	100	63	100	55	87.3	4	6.349	8	12.7	6	9.5	1	1.6
14	Annammanada	28	28	100	28	100	28	100	28	100	28	100	28	100	13	46.4	0	0	6	21.4	5	17.9	0	0
15	PuthenChira	121	121	100	121	100	121	100	121	100	121	100	121	100	96	79.3	9	7.438	14	11.6	26	21.5	0	0
16	Vellangallor	140	140	100	140	100	140	100	140	100	140	100	140	100	100	71.4	1	0.714	8	5.7	19	13.6	0	0
Sub Total		754	754	100	754	100	754	100	754	100	754	100	754	100	614	81.4	65	8.621	109	14.5	65	8.6	2	0.3
Vakkom-Anjengo Scheme																								
17	Vakkom	75	75	100	75	100	75	100	75	100	75	100	75	100	33	44.0	24	32	8	10.7	21	28.0	0	0
18	Kizhuvillam	103	103	100	103	100	103	100	103	100	103	100	103	100	65	63.1	6	5.825	10	9.7	8	7.8	0	0
19	Chirayinkil	135	135	100	135	100	135	100	135	100	135	100	135	100	73	54.1	18	13.33	18	13.3	4	3.0	0	0
20	Kadakkavoor	125	125	100	125	100	125	100	125	100	125	100	125	100	63	50.4	11	8.8	5	4.0	0	0.0	0	0
21	Azhoor	36	36	100	36	100	36	100	36	100	36	100	36	100	24	66.7	8	22.22	6	16.7	7	19.4	0	0
22	Anjengo	109	109	100	109	100	109	100	109	100	109	100	109	100	36	33.0	15	13.76	6	5.5	20	18.3	0	0
Sub Total		583	583	100	583	100	583	100	583	100	583	100	583	100	294	50.4	82	14.07	53	9.1	60	10.3	0	0
23	Thrikkunnapuzha Scheme	119	119	100	119	100	119	100	119	100	119	100	119	100	103	86.6	62	52.1	45	37.8	66	55.5	0	0
24	Cheyanad Scheme	73	73	100	73	100	73	100	73	100	73	100	73	100	58	79.5	42	57.53	28	38.4	1	1.4	0	0
25	Koipuram Scheme	83	83	100	83	100	83	100	83	100	83	100	83	100	53	63.9	44	53.0	32	38.6	0	0.0	0	0
TOTAL		2394	2394	100	2394	100	2394	100	2394	100	2394	100	2394	100	1843	77.0	813	34.0	369	15.4	402	16.8	2	0.1

Appendix IV.2 WATER USE AT SOURCE OUTSIDE HOUSEHOLD COMPOUND

Sl No	Scheme/Panchayat	No of	PURPOSE																													
			Drinking									Bathing			Toilet			Hand			Clothes/Utensils			Animals			Relting			Others		
			H.H	M	W	C	M	W	C	M	W	C	M	W	C	M	W	C	M	W	C	M	W	C	M	W	C					
1	Engandiyoor	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	13	4	0	0	0						
2	Mathilakam	78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0						
3	S N Puram	116	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	4	4	0	0	0						
4	Vadanapally	41	0	0	0	4	4	2	0	0	0	0	0	0	4	4	2	1	1	0	1	3	0	0	0	0						
5	Kaipamangalam	106	2	3	2	10	14	10	0	0	0	4	6	3	4	11	4	2	3	1	15	23	7	0	0	0						
6	Valappad	45	0	0	0	1	1	1	0	0	0	0	0	0	1	1	1	0	0	0	8	9	0	0	0	0						
7	Perinjnam	70	0	0	0	11	12	5	0	0	0	0	0	0	14	10	3	1	1	0	10	10	1	0	0	0						
8	Thaikulam	95	0	0	0	6	6	5	0	0	0	0	0	0	5	6	4	1	1	0	1	29	0	0	0	0						
9	Nattika	79	0	0	0	2	2	1	1	1	0	1	1	0	3	3	0	0	0	0	0	4	0	0	0	0						
10	Edathuruthy	70	0	0	0	3	3	2	0	0	0	0	0	0	3	3	2	2	1	0	8	15	0	0	0	0						
	Sub Total	782	2	3	2	37	42	26	1	1	0	5	7	3	34	38	16	7	7	1	57	111	17	0	0	0						
	%		0.26	0.38	0.26	4.73	5.37	3.32	0.13	0.13	0	0.64	0.90	0.38	4.35	4.86	2.05	0.90	0.90	0.13	7.29	14.19	2.17	0	0	0						
	Mala Scheme																															
11	Mala	263	0	0	0	1	1	3	0	0	0	0	0	1	1	2	0	0	1	0	1	3	0	0	0	0						
12	Poyya	139	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	0	3	1	0	0	0						
13	Kuzhoor	63	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	5	0	0	0	0						
14	Annammanada	28	0	0	0	1	1	0	0	0	0	0	0	0	2	7	0	1	2	0	2	6	0	0	0	0						
15	PuthenChira	121	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0	11	17	0	0	0	0						
16	Vellangallor	140	4	0	0	7	0	1	0	0	0	0	0	0	1	4	2	0	1	0	4	15	0	0	0	0						
	Sub Total	754	4	0	0	10	2	4	0	0	0	0	0	1	4	13	2	4	10	1	19	49	1	0	0	0						
	%		0.53	0	0	1.33	0.27	0.53	0	0	0	0	0	0.13	0.53	1.72	0.27	0.53	1.33	0.13	2.52	6.50	0.13	0	0	0						
	Vakkom-Anjengo Scheme																															
17	Vakkom	75	3	0	0	16	14	6	1	1	1	14	13	6	16	17	6	0	1	10	10	0	0	0	0	0						
18	Kizhuvillam	103	0	0	0	28	26	10	0	0	0	0	1	1	27	26	10	3	1	00	3	1	0	0	0	0						
19	Chirayinkil	135	2	1	1	18	12	8	6	1	2	4	1	1	9	2	1	3	0	00	2	2	0	0	0	0						
20	Kadakkavoor	125	0	0	0	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
21	Azhoor	36	0	0	0	4	0	3	1	0	0	1	1	1	1	1	0	1	0	00	13	4	0	0	0	0						
22	Anjengo	109	0	0	0	8	8	4	0	0	0	6	5	4	12	11	4	2	2	00	31	22	0	0	0	0						
	Sub Total	583	5	1	1	78	61	32	8	2	3	25	21	13	65	57	21	9	4	1	59	29	0	0	0	0						
	%		0.86	0.17	0.17	13.38	10.46	5.49	1.37	0.34	0.51	4.29	3.60	2.23	11.15	9.78	3.60	1.54	0.69	0.17	10.12	4.97	0	0	0	0						
23	Thnkkunnapuzha Scheme	119	0	1	4	38	36	20	31	30	16	22	23	18	34	42	15	0	6	00	17	54	0	0	0	0						
	%		0	0.8	3.36	31.93	30.25	16.8	26.05	25.21	13.4	18.49	19.3	15.13	28.57	35.29	12.6	0	5.04	0	14.29	45.38	0	0	0	0						
24	Cheiyamad Scheme	73	0	0	0	8	10	4	0	0	0	1	1	0	9	12	4	2	5	00	1	1	0	0	0	0						
	%		0	0	0	10.96	13.7	5.48	0	0	0	1.37	1.37	0	12.33	16.44	5.48	2.74	6.85	0	1.37	1.37	0	0	0	0						
25	Koipuram Scheme	83	0	1	7	8	10	9	0	0	0	5	3	4	7	14	9	0	0	00	0	0	0	0	0	0						
	%		0	1.20	8.43	9.64	12.05	10.84	0	0	0	6.02	3.61	4.82	8.43	16.87	10.84	0	0	0	0	0	0	0	0	0						
	TOTAL	2394	11	6	14	179	161	95	40	33	19	58	55	39	153	176	67	22	32	3	153	244	18	0	0	0						
	%		0.46	0.25	0.58	7.48	6.73	3.97	1.67	1.38	0.79	2.42	2.30	1.63	6.39	7.35	2.80	0.92	1.34	0.13	6.39	10.19	0.75	0	0	0						

Appendix IV.4 HOUSEHOLDS USING TAP WATER AT SOURCE OUTSIDE COMPOUND

Sl No	Scheme/ Panchayat	PURPOSE																	
										Hand		Clothes/ Utensils							
		No of		Dnking		Bathing		Toilet		Washing		Washing		Animals		Retting		Others	
HH	N	P	N	P	N	P	N	P	N	P	N	P	N	P	N	P	N	P	
Nattika Scheme																			
1	Engandiyoor	82	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
2	Mathilakam	78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	S N Puram	116	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	Vadanapally	41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	Kaipamangalam	106	0	4	0	2	0	1	0	4	0	1	0	0	0	0	0	0	0
6	Valappad	45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	Pennjanam	70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	Thalikulam	95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	Nattika	79	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
10	Edathuruthy	70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub Total		782	0	4	0	3	0	1	0	4	0	2	0	0	0	0	0	0	0
%			0	0.5	0	0.4	0	0.1	0	0.5	0	0.3	0	0	0	0	0	0	0
Mala Scheme																			
11	Mala	263	0	0	0	1	0	1	0	2	0	2	0	0	0	0	0	0	0
12	Poyya	139	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0	0	0
13	Kuzhoor	63	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	Annammnada	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	PuthenChira	121	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	Vellangallor	140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub Total		754	0	0	0	1	0	1	0	2	0	2	0	3	0	1	0	0	0
%			0	0	0	0.1	0	0.13	0	0.27	0	0.3	0	0.4	0	0.13	0	0	0
Vakkom-Anjengo Scheme																			
17	Vakkom	75	0	4	0	10	0	1	0	14	0	11	0	1	0	1	0	0	0
18	Kizhuvillam	103	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0
19	Chirayinkil	135	0	1	0	4	3	0	0	1	0	4	0	0	0	0	0	0	0
20	Kadakkavoor	125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	Azhoor	36	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
22	Anjengo	109	0	1	0	4	0	0	0	3	0	7	0	0	1	0	0	0	0
Sub Total		583	0	6	0	19	3	1	0	19	0	23	0	1	1	1	0	0	0
%			0	1	0	3.3	0.51	0.17	0	3.26	0	3.9	0	0.2	0.17	0.17	0	0	0
23	Thnkkunnapuzha	119	0	4	0	1	0	0	0	6	0	5	0	0	0	0	0	0	0
			0	3.4	0	0.8	0	0	0	5.04	0	4.2	0	0	0	0	0	0	0
24	Cheyyanad	73	0	1	0	1	0	0	0	0	0	2	0	0	0	0	0	0	0
			0	1.4	0	1.4	0	0	0	0	0	2.7	0	0	0	0	0	0	0
25	Koipuram	83	0	7	0	10	0	0	0	5	0	13	0	0	0	0	0	0	0
			0	8.4	0	12	0	0	0	6.02	0	16	0	0	0	0	0	0	0
G.TOTAL		2311	0	23	0	37	3	3	0	37	0	50	0	4	1	2	0	0	0
			0	1	0	1.6	0.13	0.13	0	1.6	0	2.1	0	0.2	0.04	0.09	0	0	0

Appendix IV.5. HOUSEHOLDS USING POND/STREAM/RIVER AT SOURCE OUTSIDE COMPOUND

Sl No	Scheme/ Panchayat	PURPOSE																
								Hand		Clothes/ Utensils								
		No of	Drnking		Bathing		Toilet		Washing		Washing		Animals		Retting		Others	
H H	Pd	SR	Pd	SR	Pd	SR	Pd	SR	Pd	SR	Pd	SR	Pd	SR	Pd	SR		
	Nattika Scheme																	
1	Engandiyoor	82	0	0	0	0	0	0	0	0	0	0	0	0	5	9	0	0
2	Mathilakam	78	0	0	2	1	0	0	0	0	2	1	0	1	4	4	0	0
3	S N Puram	116	1	0	9	1	0	0	0	0	4	0	0	1	12	10	3	0
4	Vadanapally	41	0	0	4	0	0	0	0	4	0	1	0	4	1	0	0	
5	Kaipamangalam	106	0	0	13	0	0	0	2	0	9	0	4	0	22	1	0	0
6	Valappad	45	0	0	1	0	0	0	0	1	0	0	0	6	3	0	0	
7	Pennjanam	70	0	0	9	3	0	0	0	9	1	1	0	5	5	0	0	
8	Thalikulam	95	0	0	0	6	0	0	0	0	7	1	0	4	24	0	0	
9	Nattika	79	0	0	0	2	0	1	0	1	0	3	0	3	1	0	0	
10	Edathuruthy	70	0	0	3	0	0	0	0	3	0	2	0	15	0	0	0	
	Sub Total	782	1	0	41	13	0	1	2	1	32	12	9	1	80	10	3	0
	%		0.1	0	5.2	1.7	0	0.1	0.3	0.1	4.1	1.5	1.2	0.1	10.2	1.3	0.4	0
	Mala Scheme																	
11	Mala	263	0	0	1	0	0	0	0	0	1	0	0	0	3	1	0	0
12	Poyya	139	0	0	0	0	0	0	0	0	0	0	0	2	0	3	0	0
13	Kuzhoor	63	0	0	1	0	0	0	0	0	0	1	0	6	0	0	0	
14	Annammanada	28	0	0	0	2	0	0	0	1	8	2	1	1	4	0	0	
15	PuthenChira	121	0	0	0	0	0	0	0	0	0	4	0	24	3	0	0	
16	Vellangallor	140	0	0	7	0	0	0	0	4	0	1	0	2	18	0	0	
	Sub Total	754	0	0	9	2	0	0	0	6	8	8	3	36	29	0	0	
	%		0	0	1.2	0.3	0	0	0	0.8	1.1	1.1	0.4	4.8	3.85	0	0	
	Vakkom-Anjengo Scheme																	
17	Vakkom	75	0	0	0	0	0	0	0	0	0	0	0	1	6	0	0	
18	Kizhuvillam	103	0	0	5	15	0	0	0	5	15	0	3	0	3	0	0	
19	Chirayinkil	135	0	0	0	9	0	1	0	0	0	0	3	0	4	0	0	
20	Kadakkavoor	125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
21	Azhoor	36	0	0	0	0	0	0	1	0	0	0	1	5	12	0	0	
22	Anjengo	109	0	0	0	0	0	0	0	0	0	0	2	4	31	0	0	
	Sub Total	583	0	0	5	24	0	1	0	1	5	15	0	9	10	56	0	0
	%		0	0	0.9	4.1	0	0.2	0	0.2	0.9	2.6	0	1.54	1.7	9.61	0	0
23	Thnkkunnapuzha	119	0	0	15	28	7	28	9	18	13	29	6	8	29	29	0	0
			0	0	13	24	5.9	24	7.6	15	11	24	5	6.72	24	24.4	0	0
24	Cheyyanad	73	0	0	0	8	0	0	0	0	0	9	0	5	0	1	0	0
			0	0	0	11	0	0	0	0	0	12	0	6.85	0	1.37	0	0
25	Koipuram	83	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
			0	0	0	1.2	0	0	0	0	0	1.2	0	0	0	0	0	0
	G.TOTAL	2394	1	0	70	76	7	30	11	20	56	74	23	26	155	125	3	0
			0.04	0	2.9	3.2	0.3	1.3	0.5	0.8	2.3	3.1	1	1.09	6.5	5.23	0.1	0

Appendix IV.6 SOURCES USED FOR DRINKING

SCHEME/PANCHAYAT		SOURCES																								HOUSEHOLDS			
		WELL					TAP					HAND PUMP					SPRING		POND		RIVER		OTHER		G.TOTAL	No. surveyed	No. Using more than one sources		
NATTIKA SCHEME	Season	O	N	P	Total	%	O	N	P	Total	%	O	N	P	Total	%	No	%	No	%	No	%	No	%				G.TOTAL	No. surveyed
Engadiyoor	Summer	13	9	0	22	23.9	8	0	62	70	76.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	92	82	10
	P. Monsoon	17	8	0	25	26.3	8	0	62	70	73.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	95	82	13
Mathilakam	Summer	8	5	11	24	24.2	2	0	53	55	55.6	17	2	1	20	20.2	0	0	0	0	0	0	0	0	0	0	99	78	21
	P. Monsoon	11	3	12	26	26.0	2	0	52	54	54.0	17	2	1	20	20	0	0	0	0	0	0	0	0	0	0	100	78	22
S N Puram	Summer	9	18	9	36	24.7	2	0	99	101	69.2	6	2	0	8	5.48	0	0	1	0.7	0	0	0	0	0	0	146	116	30
	P. Monsoon	9	18	9	36	24.3	2	0	100	102	68.9	7	2	0	9	6.08	0	0	1	0.7	0	0	0	0	0	0	148	116	32
Vadanappally	Summer	6	5	0	11	22.0	0	0	27	27	54.0	12	0	0	12	24	0	0	0	0	0	0	0	0	0	0	50	41	9
	P. Monsoon	6	5	0	11	22.4	0	0	25	25	51.0	13	0	0	13	26.5	0	0	0	0	0	0	0	0	0	0	49	41	8
Kaipamangalam	Summer	26	6	3	35	23.3	3	0	74	77	51.3	28	9	0	37	24.7	0	0	1	0.7	0	0	0	0	0	0	150	106	44
	P. Monsoon	26	5	2	33	22.3	4	0	71	75	50.7	30	9	0	39	26.4	0	0	1	0.7	0	0	0	0	0	0	148	106	42
Valappad	Summer	5	3	0	8	12.9	0	0	32	32	51.6	17	3	2	22	35.5	0	0	0	0	0	0	0	0	0	0	62	45	17
	P. Monsoon	5	3	1	9	13.8	0	0	31	31	47.7	19	3	3	25	38.5	0	0	0	0	0	0	0	0	0	0	65	45	20
Pernjanam	Summer	16	7	0	23	24.5	0	0	54	54	57.4	17	0	0	17	18.1	0	0	0	0	0	0	0	0	0	0	94	70	24
	P. Monsoon	17	6	0	23	25.0	0	0	52	52	56.5	17	0	0	17	18.5	0	0	0	0	0	0	0	0	0	0	92	70	22
Talikulam	Summer	2	4	2	8	7.0	8	0	74	82	71.3	23	2	0	25	21.7	0	0	0	0	0	0	0	0	0	0	115	95	20
	P. Monsoon	4	4	3	11	9.3	9	0	73	82	69.5	24	1	0	25	21.2	0	0	0	0	0	0	0	0	0	0	118	95	23
Nattika	Summer	8	10	2	20	22.5	2	0	50	52	58.4	17	0	0	17	19.1	0	0	0	0	0	0	0	0	0	0	89	79	10
	P. Monsoon	16	7	2	25	28.4	2	0	44	46	52.3	17	0	0	17	19.3	0	0	0	0	0	0	0	0	0	0	88	79	9
Edathuruthy	Summer	5	2	0	7	9.6	3	0	62	65	89.0	1	0	0	1	1.37	0	0	0	0	0	0	0	0	0	0	73	70	3
	P. Monsoon	5	3	0	8	10.8	3	0	62	65	87.8	1	0	0	1	1.35	0	0	0	0	0	0	0	0	0	0	74	70	4
Sub Total	Summer	98	69	27	194	20	28	0	587	615	63.4	138	18	3	159	16.4	0	0	2	0.2	0	0	0	0	0	0	970	782	188
	P. Monsoon	116	62	29	207	21.2	30	0	572	602	61.62	145	17	4	166	17.0	0	0	2	0.2	0	0	0	0	0	0	977	782	195

Appendix IV.6 SOURCES USED FOR DRINKING

SCHEME/PANCHAYAT		SOURCES																								HOUSEHOLDS			
		WELL						TAP						HAND PUMP						SPRING	POND	RIVER	OTHER						
MALA	Summer	98	33	25	156	54.7	13	1	115	129	45.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	285	263	22
	P. Monsoon	149	25	29	203	71.0	12	0	71	83	29.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	286	263	23
Poyya	Summer	15	10	23	48	33.1	6	0	91	97	66.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	145	139	6	
	P. Monsoon	30	9	29	68	43.3	14	0	76	89	56.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	167	139	18	
Kuzhoor	Summer	19	13	8	40	50.0	6	0	34	40	50.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	80	63	17	
	P. Monsoon	39	7	11	57	78.1	4	0	12	16	21.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	73	63	10	
Annammanada	Summer	9	9	1	19	61.3	0	0	12	12	38.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31	28	3	
	P. Monsoon	9	10	1	20	62.5	0	0	12	12	37.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32	28	4	
Puthenchira	Summer	31	17	13	61	40.7	4	0	85	89	59.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	150	121	29	
	P. Monsoon	67	10	16	93	57.4	4	0	65	69	42.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	162	121	41	
Vellangalloor	Summer	27	64	16	107	50.0	16	0	91	107	50.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	214	140	74	
	P. Monsoon	36	56	15	107	52.7	15	1	80	96	47.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	203	140	63	
Sub Total	Summer	199	146	86	431	47.6	45	1	428	474	52.38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	905	754	151	
	P. Monsoon	330	117	101	548	60.0	49	1	315	365	40.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	913	754	169	
VAKKOM-ANJENGO SCHEME																													
Vakkom	Summer	20	34	0	54	72.0	2	0	19	21	28.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	75	0	
	P. Monsoon	27	32	0	59	78.7	1	0	15	16	21.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	75	0	
Kizhuvillam	Summer	64	42	0	106	91.4	0	1	9	10	8.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	116	103	13	
	P. Monsoon	91	10	0	101	97.1	1	0	2	3	2.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	104	103	1	
Chirayinkil	Summer	62	3	0	65	47.1	5	0	68	73	52.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	138	135	3	
	P. Monsoon	64	3	0	67	49.3	4	0	65	69	50.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	136	135	1	
Kadakkavoor	Summer	100	4	0	104	83.2	3	0	18	21	16.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	125	125	0	
	P. Monsoon	107	4	0	111	88.1	2	0	13	15	11.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	126	125	1	
Azhoor	Summer	0	1	0	1	2.7	14	0	22	36	97.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37	36	1	
	P. Monsoon	0	1	0	1	2.8	14	0	21	35	97.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36	36	0	
Anjengo	Summer	14	15	0	29	26.4	11	1	69	81	73.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	110	109	1	
	P. Monsoon	14	14	0	28	25.2	11	1	71	83	74.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	111	109	2	
Sub Total	Summer	260	99	0	359	59.7	35	2	205	242	40.27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	601	583	18	
	P. Monsoon	303	64	0	367	62.4	33	1	187	221	37.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	588	583	5	

Appendix IV.6 SOURCES USED FOR DRINKING

SCHEME/PANCHAYAT		SOURCES																									
		WELL				TAP				HAND PUMP				SPRING	POND	RIVER	OTHER	HOUSEHOLDS									
THRIKKUNNAPUZHA	Summer	1	0	1	2	1.5	15	0	104	119	90.8	0	0	0	0	0	0	0	10	7.6	0	0	0	0	131	119	12
	P. Monsoon	1	0	0	1	0.8	16	0	102	118	95.9	0	0	0	0	0	0	0	0	0	0	0	0	4	3.3	123	119
CHERIYANAD	Summer	20	12	0	32	32.3	18	0	48	66	66.7	0	0	1	1	101	0	0	0	0	0	0	0	0	99	73	26
	P. Monsoon	25	13	0	38	48.7	3	0	37	40	51.3	0	0	0	0	0	0	0	0	0	0	0	0	0	78	73	6
KOIPURAM	Summer	25	28	0	53	45.7	3	0	60	63	54.3	0	0	0	0	0	0	0	0	0	0	0	0	0	116	83	33
	P. Monsoon	32	25	0	57	58.8	0	0	40	40	41.2	0	0	0	0	0	0	0	0	0	0	0	0	0	97	83	14
TOTAL	Summer	603	354	114	1071	38.0	144	3	1432	1579	56.0	138	18	4	160	5.67	0	0	12	0.4	0	0	0	0	2822	2394	428
	P. Monsoon	807	281	130	1218	43.9	131	2	1253	1386	49.93	145	17	4	166	5.98	0	0	2	0.1	0	0	4	0.1	2776	2394	382

Appendix IV.7 SOURCES USED FOR COOKING IN SUMMER AND POST MONSOON PERIODS																															
SCHEME/PANCHAYAT		SOURCES																								HOUSEHOLDS					
		WELL					TAP					HAND PUMP					SPRING		POND		RIVER		OTHER		G.TOTAL			No. surveyed	No. Using more than one sources		
NATTIKA SCHEME	Season	O	N	P	Total	%	O	N	P	Total	%	O	N	P	Total	%	No	%	No	%	No	%	No	%		No	%				
Engadryoor	Summer	13	9	0	22	23.9	8	0	62	70	76.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	92	82	10
	P. Monsoon	17	8	0	25	26.3	8	0	62	70	73.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	96	82	13	
Mathlakam	Summer	8	5	11	24	24.2	2	0	53	55	55.6	17	2	1	20	20.2	0	0	0	0	0	0	0	0	0	0	0	99	78	21	
	P. Monsoon	11	3	12	26	26.0	2	0	52	54	54.0	17	2	1	20	20	0	0	0	0	0	0	0	0	0	0	100	78	22		
S N Puram	Summer	9	18	9	36	25.2	2	0	96	98	68.5	6	2	0	8	5.59	0	0	1	0.7	0	0	0	0	0	0	143	116	27		
	P. Monsoon	9	18	9	36	24.5	2	0	99	101	68.7	7	2	0	9	6.12	0	0	1	0.7	0	0	0	0	0	0	147	116	31		
Vadanappally	Summer	6	5	0	11	22.4	0	0	25	25	51.0	13	0	0	13	26.5	0	0	0	0	0	0	0	0	0	0	49	41	8		
	P. Monsoon	6	5	0	11	22.9	0	0	24	24	50.0	13	0	0	13	27.1	0	0	0	0	0	0	0	0	0	0	48	41	7		
Kaipamangalam	Summer	26	6	3	35	24.0	3	0	70	73	50.0	28	9	0	37	25.3	0	0	1	0.7	0	0	0	0	0	0	146	106	40		
	P. Monsoon	26	4	2	32	22.2	4	0	68	72	50.0	30	8	0	38	26.4	0	0	2	1.4	0	0	0	0	0	0	144	108	38		
Valappad	Summer	5	3	0	8	12.9	0	0	32	32	51.6	17	3	2	22	35.5	0	0	0	0	0	0	0	0	0	0	62	45	17		
	P. Monsoon	5	3	1	9	13.8	0	0	31	31	47.7	19	3	3	25	38.5	0	0	0	0	0	0	0	0	0	0	65	45	20		
Perinjnam	Summer	16	7	0	23	24.7	0	0	53	53	57.0	17	0	0	17	18.3	0	0	0	0	0	0	0	0	0	0	93	70	23		
	P. Monsoon	17	6	0	23	25.3	0	0	61	61	56.0	17	0	0	17	18.7	0	0	0	0	0	0	0	0	0	0	91	70	21		
Talikulam	Summer	1	5	2	8	7.1	8	0	72	80	70.8	23	1	1	25	22.1	0	0	0	0	0	0	0	0	0	0	113	95	18		
	P. Monsoon	4	4	3	11	9.4	9	0	72	81	69.2	24	1	0	25	21.4	0	0	0	0	0	0	0	0	0	0	117	95	22		
Nattika	Summer	9	10	2	21	23.6	2	0	47	49	55.1	19	0	0	19	21.3	0	0	0	0	0	0	0	0	0	0	89	79	10		
	P. Monsoon	17	7	2	26	29.2	2	0	42	44	49.4	19	0	0	19	21.3	0	0	0	0	0	0	0	0	0	0	89	79	10		
Edathuruthy	Summer	5	2	0	7	9.7	3	0	61	64	88.9	1	0	0	1	1.39	0	0	0	0	0	0	0	0	0	0	72	70	2		
	P. Monsoon	5	3	0	8	11.1	3	0	61	64	88.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72	70	2		
Sub Total	Summer	98	70	27	195	20.4	28	0	571	599	62.53	141	17	4	162	16.9	0	0	2	0.2	0	0	0	0	0	0	958	782	176		
	P. Monsoon	117	61	29	207	21.4	30	0	562	592	61.16	146	16	4	166	17.1	0	0	3	0.3	0	0	0	0	0	0	968	782	186		

Appendix IV.7 SOURCES USED FOR COOKING IN SUMMER AND POST MONSOON PERIODS																														
SCHEME/PANCHAYAT		SOURCES																							HOUSEHOLDS					
		WELL					TAP					HAND PUMP					SPRING	POND	RIVER	OTHER										
MALA	Summer	98	33	25	156	54.7	13	1	115	129	45.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	285	263	22
	P. Monsoon	148	25	29	202	70.9	12	0	71	83	29.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	285	263	22
Poyya	Summer	15	10	23	48	31.0	16	0	91	107	69.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	155	139	16	
	P. Monsoon	30	9	29	68	43.3	14	0	75	89	56.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	157	139	18	
Kuzhoor	Summer	19	13	8	40	50.0	6	0	34	40	50.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	80	63	17	
	P. Monsoon	39	7	11	57	77.0	4	0	13	17	23.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74	63	11	
Annammanada	Summer	9	9	1	19	61.3	0	0	12	12	38.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31	28	3	
	P. Monsoon	9	10	1	20	62.5	0	0	12	12	37.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32	28	4	
Puthenchira	Summer	31	17	13	61	40.7	4	0	85	89	59.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	150	121	29	
	P. Monsoon	67	10	16	93	57.8	4	0	64	68	42.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	161	121	40	
Vellangalloor	Summer	27	64	16	107	51.4	16	0	85	101	48.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	208	140	68	
	P. Monsoon	36	56	15	107	53.0	15	1	79	95	47.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	202	140	62	
Sub Total	Summer	199	146	86	431	47.4	55	1	422	478	52.59	0	0	0	0	0	0	0	0	0	0	0	0	0	0	909	754	155		
	P. Monsoon	329	117	101	547	60.0	49	1	314	364	40.0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	911	754	157		
VAKKOM-ANJENGO SCHEME																														
Vakkom	Summer	20	34	0	54	72.0	2	0	19	21	28.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	75	0		
	P. Monsoon	26	32	0	58	77.3	1	0	16	17	22.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	75	0		
Kizhuvillam	Summer	62	47	0	109	85.8	0	1	16	17	13.4	0	1	0	1	0.79	0	0	0	0	0	0	0	0	0	0	127	103	24	
	P. Monsoon	91	10	0	101	94.4	1	0	6	6	5.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	107	103	4		
Chirayinkil	Summer	62	3	0	65	47.8	4	0	67	71	52.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	136	135	1		
	P. Monsoon	65	3	0	68	50.0	4	0	64	68	50.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	136	135	1		
Kadakkavoor	Summer	100	4	0	104	83.2	3	0	18	21	16.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	125	125	0		
	P. Monsoon	107	4	0	111	88.1	2	0	13	15	11.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	126	125	1		
Azhoor	Summer	0	1	0	1	2.8	14	0	21	35	97.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36	36	0		
	P. Monsoon	0	1	0	1	2.8	14	0	21	35	97.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36	36	0		
Anjengo	Summer	14	15	0	29	26.4	11	1	69	81	73.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	110	109	1		
	P. Monsoon	15	14	0	29	25.9	11	1	71	83	74.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	112	109	3		
Sub Total	Summer	258	104	0	362	59.4	34	2	210	246	40.39	0	1	0	1	0.2	0	0	0	0	0	0	0	0	0	609	583	26		
	P. Monsoon	304	64	0	368	62.2	33	1	190	224	37.8	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	592	583	9		

Appendix IV.7 SOURCES USED FOR COOKING IN SUMMER AND POST MONSOON PERIODS

SCHEME/PANCHAYAT	SOURCES																								HOUSEHOLDS		
	WELL						TAP						HAND PUMP					SPRING		POND		RIVER		OTHER			
THRIKKUNNAPUZHA	Summer	0	0	1	1	0.8	15	0	103	118	96.7	0	0	0	0	0	0	0	3	25	0	0	0	0	122	119	3
	P. Monsoon	1	0	0	1	0.8	16	0	102	118	95.2	0	0	0	0	0	0	0	0	0	1	1	4	3.2	124	119	5
CHERIYANAD	Summer	19	12	0	31	36.9	4	0	48	52	61.9	0	0	1	1	119	0	0	0	0	0	0	0	84	73	11	
	P. Monsoon	25	13	0	38	49.4	3	0	36	39	50.6	0	0	0	0	0	0	0	0	0	0	0	0	77	73	4	
KOIPURAM	Summer	25	28	0	53	45.7	3	0	60	63	54.3	0	0	0	0	0	0	0	0	0	0	0	0	116	83	33	
	P. Monsoon	32	25	0	57	58.8	0	0	40	40	41.2	0	0	0	0	0	0	0	0	0	0	0	0	97	83	14	
TOTAL	Summer	599	360	114	1073	38.3	139	3	1414	1556	55.6	141	18	5	164	5.86	0	0	5	0.2	0	0	0	2798	2394	404	
	P. Monsoon	808	280	130	1218	44	131	2	1244	1377	49.73	146	16	4	166	5.99	0	0	3	0.1	1	0	4	0.1	2769	2394	375

Appendix IV.8. SOURCES USED FOR BATHING

SCHEME/PANCHAYAT	Season	SOURCES																								HOUSEHOLDS		
		WELL					TAP					HAND PUMP					SPRING		POND		RIVER		OTHER		G.TOTAL	No. surveyed	No. Using more than one sources	
		O	N	P	Total	%	O	N	P	Total	%	O	N	P	Total	%	No	%	No	%	No	%	No	%				
Engadiyoor	Summer	16	8	0	24	25.8	8	0	59	67	72.0	1	0	0	1	1.08	0	0	1	1.08	0	0	0	0	93	82	11	
	P. Monsoon	20	6	0	26	25.2	6	0	58	64	62.1	1	0	0	1	0.97	0	0	10	9.71	2	2	0	0	103	82	21	
Mathilakam	Summer	7	2	13	22	22.0	2	0	50	52	52.0	19	1	2	22	22	0	0	4	4	0	0	0	0	100	78	22	
	P. Monsoon	10	3	18	31	28.7	2	0	48	50	46.3	19	1	2	22	20.4	0	0	4	3.7	1	1	0	0	108	78	30	
S N Puram	Summer	11	22	11	44	24.3	2	0	84	86	47.5	23	5	0	28	15.5	0	0	22	12.2	1	1	0	0	181	116	65	
	P. Monsoon	11	16	11	38	22.2	2	0	82	84	49.1	21	6	0	26	15.2	0	0	22	12.9	1	1	0	0	171	116	55	
Vadanappally	Summer	7	3	0	10	19.6	0	0	20	20	39.2	17	0	0	17	33.3	0	0	4	7.84	0	0	0	0	51	41	10	
	P. Monsoon	8	3	0	11	22.0	0	0	18	18	36.0	15	0	0	15	30	0	0	4	8	1	2	1	2	50	41	9	
Kaipamangalam	Summer	28	0	3	31	20.9	4	0	35	39	26.4	43	7	0	50	33.8	0	0	28	18.9	0	0	0	0	148	106	42	
	P. Monsoon	29	0	2	31	20.5	5	0	35	40	26.5	44	7	0	51	33.8	0	0	29	19.2	0	0	0	0	151	106	45	
Valappad	Summer	5	1	2	8	12.9	0	0	26	26	41.9	21	3	2	26	41.9	0	0	2	3.23	0	0	0	0	62	45	17	
	P. Monsoon	5	1	2	8	12.5	0	0	26	26	40.6	21	3	3	27	42.2	0	0	3	4.69	0	0	0	0	64	46	19	
Perinjnam	Summer	17	6	0	23	24.5	0	0	36	36	38.3	20	0	0	20	21.3	0	0	12	12.8	2	2	1	1.1	94	70	24	
	P. Monsoon	17	6	0	23	24.5	0	0	36	36	38.3	20	0	0	20	21.3	0	0	12	12.8	2	2	1	1.1	94	70	24	
Talikulam	Summer	4	2	3	9	7.8	10	0	57	67	58.3	28	1	0	29	25.2	0	0	3	2.61	7	6	0	0	115	95	20	
	P. Monsoon	5	1	3	9	7.0	10	0	49	59	45.7	29	1	0	30	23.3	0	0	10	7.75	21	16	0	0	129	95	34	
Nattika	Summer	17	6	2	25	24.8	3	0	39	42	41.6	26	1	0	27	26.7	0	0	5	4.95	2	2	0	0	101	79	22	
	P. Monsoon	17	3	3	23	23.7	3	0	32	35	36.1	26	1	0	27	27.8	0	0	7	7.22	5	5	0	0	97	79	18	
Edathuruthy	Summer	8	1	0	9	11.7	2	0	46	48	62.3	2	0	0	2	2.6	0	0	18	23.4	0	0	0	0	77	70	7	
	P. Monsoon	8	1	0	9	11.3	3	0	42	45	56.3	2	0	0	2	2.5	0	0	24	30	0	0	0	0	80	70	10	
Sub Total	Summer	120	51	34	205	20.1	31	0	452	483	47.26	200	18	4	222	21.7	0	0	99	9.69	12	1	1	0.1	1022	782	240	
	P. Monsoon	130	40	39	209	20.0	31	0	426	457	43.65	198	18	5	221	21.1	0	0	125	11.9	33	3	2	0.2	1047	782	265	

Appendix IV.8. SOURCES USED FOR BATHING

SCHEME/PANCHAYAT	Season	SOURCES																								HOUSEHOLDS					
		WELL					TAP					HAND PUMP					SPRING		POND		RIVER		OTHER			G.TOTAL	No. surveyed	No. Using more than one sources			
O	N	P	Total	%	O	N	P	Total	%	O	N	P	Total	%	No	%	No	%	No	%	No	%	No	%	No				%		
NATTIKA SCHEME	Summer	74	13	19	106	36.1	19	3	162	184	62.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	294	263	31
	P. Monsoon	136	12	0	148	63.8	18	2	105	125	45.5	0	0	0	0	0	0	0	0	0	0	0	2	0.73	0	0	0	0	276	263	12
Poyya	Summer	13	6	7	26	16.6	17	0	114	131	83.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	157	139	18
	P. Monsoon	30	6	15	51	32.3	16	0	91	107	67.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	158	139	19
Kuzhoor	Summer	16	4	5	25	31.3	9	0	45	54	67.5	0	0	0	0	0	0	0	0	0	0	0	1	1.25	0	0	0	0	80	63	17
	P. Monsoon	36	3	6	45	57.7	8	0	23	31	39.7	0	0	0	0	0	0	0	0	0	0	0	2	2.56	0	0	0	0	78	63	15
Annammanada	Summer	12	8	1	21	61.8	0	0	11	11	32.4	0	0	0	0	0	0	0	0	0	0	0	0	0	2	6	0	0	34	28	6
	P. Monsoon	12	8	1	21	65.6	0	0	10	10	31.3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	0	0	32	28	4
Puthenchira	Summer	30	13	11	54	35.5	4	0	94	98	64.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	152	121	31
	P. Monsoon	63	7	15	85	51.8	4	0	73	77	47.0	0	0	0	0	0	0	0	0	0	0	0	2	1.22	0	0	0	0	164	121	43
Vellangalloor	Summer	26	48	12	86	39.4	17	0	105	122	56.0	0	0	0	0	0	0	0	0	0	0	0	10	4.59	0	0	0	0	218	140	78
	P. Monsoon	36	39	11	86	42.2	17	1	95	113	55.4	0	0	0	0	0	0	0	0	0	0	0	5	2.45	0	0	0	0	204	140	64
Sub Total	Summer	171	92	55	318	34	66	3	531	600	64.17	0	0	0	0	0	0	0	0	0	0	0	15	1.6	2	0	0	0	935	754	181
	P. Monsoon	313	75	48	436	47.9	63	3	397	463	50.8	0	0	0	0	0	0	0	0	0	0	0	11	1.21	1	0	0	0	911	754	157
VAKKOM-ANJENGO SCHEME																															
Vakkom	Summer	12	12	4	28	37.3	8	1	38	47	62.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	75	0
	P. Monsoon	18	12	4	34	45.3	7	0	34	41	54.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	75	0
Kizhuvillam	Summer	40	25	1	66	53.2	6	0	31	37	29.8	0	1	0	1	0.81	0	0	5	4.03	15	12	0	0	0	0	124	103	21		
	P. Monsoon	87	5	1	93	76.2	7	0	22	29	23.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	122	103	19
Chirayinkil	Summer	76	7	2	85	81.0	7	0	4	11	10.5	0	0	0	0	0	0	0	0	0	0	0	9	9	0	0	105	135	-30		
	P. Monsoon	84	8	0	92	67.2	7	0	37	44	32.1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	137	135	2		
Kadakkavoor	Summer	100	4	1	105	83.3	11	0	10	21	16.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	126	125	1
	P. Monsoon	104	4	0	108	86.4	9	0	8	17	13.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	125	125	0
Azhoor	Summer	17	10	0	27	71.1	6	0	5	11	28.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38	36	2
	P. Monsoon	19	8	0	27	75.0	5	0	4	9	25.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36	36	0
Anjengo	Summer	34	18	1	53	48.6	6	0	50	56	51.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	109	109	0
	P. Monsoon	39	14	1	54	49.5	5	0	50	55	50.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	109	109	0
Sub Total	Summer	279	76	9	364	63.1	44	1	138	183	31.72	0	1	0	1	0.2	0	0	5	0.87	24	4	0	0	0	0	577	583	-6		
	P. Monsoon	351	51	6	408	67.5	40	0	155	195	32.3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	604	683	21

Appendix IV.8. SOURCES USED FOR BATHING																													
SCHEME/PANCHAYAT		SOURCES																										HOUSEHOLDS	
		WELL					TAP					HAND PUMP					SPRING		POND		RIVER		OTHER		G.TOTAL	No. surveyed	No. Using more than one sources		
NATTIKA SCHEME	Season	O	N	P	Total	%	O	N	P	Total	%	O	N	P	Total	%	No.	%	No.	%	No.	%	No.	%				No.	%
THRIKKUNNAPUZHA	Summer	6	1	1	8	6.1	11	0	53	64	48.5	0	0	0	0	0	0	0	0	0	24	18.2	36	27	0	0	132	119	13
	P. Monsoon	7	1	1	9	6.8	8	0	21	29	21.8	0	0	0	0	0	0	0	0	0	30	22.6	65	49	0	0	133	119	14
CHERIYANAD	Summer	14	10	0	24	25.0	7	0	54	61	63.5	0	0	1	1	1.04	0	0	0	0	0	10	10	0	0	96	73	23	
	P. Monsoon	23	7	0	30	37.0	7	0	33	40	49.4	0	0	0	0	0	0	0	0	0	0	11	14	0	0	81	73	8	
KOIPURAM	Summer	23	26	0	49	44.5	5	0	55	60	54.5	0	0	0	0	0	0	0	0	0	0	1	1	0	0	110	83	27	
	P. Monsoon	33	23	1	57	61.3	0	0	35	35	37.6	0	0	0	0	0	0	0	0	0	0	1	1	0	0	93	83	10	
TOTAL	Summer	613	256	99	968	33.7	164	4	1283	1451	50.5	200	19	5	224	7.8	0	0	143	4.98	85	3	1	0	2872	2394	478		
	P. Monsoon	857	197	95	1149	40	149	3	1067	1219	42.49	198	18	5	221	7.7	0	0	166	5.79	112	4	2	0.1	2869	2394	475		

Appendix IV.9. SOURCES USED FOR CLOTHES/ UTENSILS WASHING DIFFERENT SEASONS																																	
SCHEME/PANCHAYAT		SOURCES																								HOUSEHOLDS							
		WELL					TAP					HAND PUMP					SPRING		POND		RIVER		OTHER		G.TOTAL			No. surveyed	No. Using more than one sources				
NATTIKA SCHEME	Season	O	N	P	Total	%	O	N	P	Total	%	O	N	P	Total	%	No.	%	No.	%	No.	%	No.	%		No.	%						
Engadiyoor	Summer	17	7	0	24	27.6	6	0	56	62	71.3	1	0	0	1	1.15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	87	82	5
	P. Monsoon	19	5	0	24	25.0	5	0	53	58	60.4	1	0	0	1	1.04	0	0	10	10	3	3.13	0	0	0	0	0	0	0	96	82	14	
Mathlakam	Summer	7	2	13	22	21.8	2	0	50	52	51.5	19	1	2	22	21.8	0	0	4	4	1	0.99	0	0	0	0	0	0	101	78	23		
	P. Monsoon	10	3	12	25	25.0	2	0	46	48	48.0	19	1	2	22	22	0	0	4	4	1	1	0	0	0	0	0	0	100	78	22		
S N Puram	Summer	9	21	11	41	24.6	2	0	77	79	47.3	23	5	0	28	16.8	0	0	19	11	0	0	0	0	0	0	0	0	167	116	51		
	P. Monsoon	9	15	11	35	21.6	2	0	78	80	49.4	22	5	0	27	16.7	0	0	20	12	0	0	0	0	0	0	0	0	162	116	46		
Vadanappally	Summer	7	2	0	9	18.0	0	0	20	20	40.0	17	0	0	17	34	0	0	4	8	0	0	0	0	0	0	0	0	50	41	9		
	P. Monsoon	8	3	0	11	21.6	0	0	18	18	35.3	17	0	0	17	33.3	0	0	3	5.9	1	1.96	1	2	0	0	0	0	51	41	10		
Kaipamangalam	Summer	28	0	2	30	22.6	3	0	25	28	21.1	43	8	0	51	38.3	0	0	24	18	0	0	0	0	0	0	0	0	133	106	27		
	P. Monsoon	29	0	1	30	22.4	3	0	24	27	20.1	43	8	0	51	38.1	0	0	26	19	0	0	0	0	0	0	0	0	134	106	28		
Valappad	Summer	5	1	2	8	14.3	0	0	20	20	35.7	22	1	2	25	44.6	0	0	3	5.4	0	0	0	0	0	0	0	0	56	45	11		
	P. Monsoon	5	1	2	8	13.8	0	0	20	20	34.5	22	1	3	26	44.8	0	0	4	6.9	0	0	0	0	0	0	0	0	68	45	13		
Perinjanam	Summer	17	6	0	23	24.5	0	0	36	36	38.3	21	0	0	21	22.3	0	0	12	###	2	2.13	0	0	0	0	0	0	94	70	24		
	P. Monsoon	17	6	0	23	24.7	0	0	36	36	38.7	21	0	0	21	22.6	0	0	11	###	2	2.15	0	0	0	0	0	0	93	70	23		
Talikulam	Summer	3	2	3	8	7.0	10	0	57	67	58.8	28	1	0	29	25.4	0	0	4	3.5	6	5.26	0	0	0	0	0	0	114	95	19		
	P. Monsoon	5	1	3	9	6.8	10	0	50	60	45.1	30	1	0	31	23.3	0	0	11	8.3	22	16.5	0	0	0	0	0	0	133	95	38		
Nattika	Summer	15	4	4	23	22.3	4	0	41	45	43.7	26	1	0	27	26.2	0	0	5	4.9	3	2.91	0	0	0	0	0	103	79	24			
	P. Monsoon	17	1	3	21	22.1	4	0	32	36	37.9	28	1	0	27	28.4	0	0	7	7.4	4	4.21	0	0	0	0	0	96	79	16			
Edathuruthy	Summer	9	1	0	10	13.0	2	0	48	50	64.9	1	0	0	1	1.3	0	0	16	21	0	0	0	0	0	0	0	77	70	7			
	P. Monsoon	10	1	0	11	13.6	1	0	44	45	55.6	1	0	0	1	1.23	0	0	24	30	0	0	0	0	0	0	0	81	70	11			
Sub Total	Summer	117	46	35	198	20.2	29	0	430	459	46.74	201	17	4	222	22.6	0	0	91	9.3	12	1.22	0	0	0	0	0	0	982	782	200		
	P. Monsoon	129	36	32	197	19.6	27	0	401	428	42.67	202	17	5	224	22.3	0	0	120	12	33	3.29	1	0.1	0	0	0	0	1003	782	221		

Appendix IV.9. SOURCES USED FOR CLOTHES/ UTENSILS WASHING DIFFERENT SEASONS																															
SCHEME/PANCHAYAT		SOURCES																								HOUSEHOLDS					
		WELL					TAP					HAND PUMP					SPRING		POND		RIVER		OTHER		G.TOTAL			No. surveyed	No. Using more than one sources		
NATTIKA SCHEME	Season	O	N	P	Total	%	O	N	P	Total	%	O	N	P	Total	%	No	%	No.	%	No	%	No.	%		No.	%				
MALA	Summer	75	14	19	108	36.6	19	3	162	184	62.4	0	0	0	0	0	0	0	0	0	3	1	0	0	0	0	0	0	295	263	32
	P. Monsoon	136	12	21	169	57.9	18	2	101	121	41.4	0	0	0	0	0	0	0	0	2	0.7	0	0	0	0	0	0	292	263	29	
Poyya	Summer	13	6	7	26	16.7	17	0	113	130	83.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	156	139	17	
	P. Monsoon	30	6	15	51	32.5	15	0	91	106	67.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	167	139	18	
Kuzhoor	Summer	15	4	5	24	30.8	9	0	45	54	69.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	78	63	15	
	P. Monsoon	36	3	6	45	60.0	7	0	23	30	40.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	63	12	
Annammanada	Summer	12	7	1	20	57.1	0	0	7	7	20.0	0	0	0	0	0	0	0	0	0	1	2.9	7	20.0	0	0	0	35	28	7	
	P. Monsoon	12	6	1	19	59.4	0	0	7	7	21.9	0	0	0	0	0	0	0	0	0	1	3.1	5	15.6	0	0	0	32	28	4	
Puthenchira	Summer	29	13	11	53	34.9	4	0	95	99	65.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	152	121	31	
	P. Monsoon	63	7	15	85	61.8	4	0	73	77	47.0	0	0	0	0	0	0	0	0	2	1.2	0	0.0	0	0	0	0	164	121	43	
Vellangalloor	Summer	26	48	12	86	40.0	17	0	105	122	56.7	0	0	0	0	0	0	0	0	0	7	3.3	0	0.0	0	0	0	215	140	75	
	P. Monsoon	36	39	11	86	42.4	17	1	95	113	55.7	0	0	0	0	0	0	0	0	0	4	2	0	0	0	0	0	203	140	63	
Sub Total	Summer	170	92	55	317	34	66	3	527	596	64.02	0	0	0	0	0.0	0	0	0	0	11	12	7	0.75	0	0	0	931	754	177	
	P. Monsoon	313	73	69	455	49.3	61	3	390	454	49.2	0	0	0	0	0.0	0	0	0	0	9	1	5	0.54	0	0	0	923	754	169	
VAKKOM-ANJENGO SCHEME																															
Vakkom	Summer	10	11	4	25	33.3	9	1	40	50	66.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	75	0	
	P. Monsoon	16	11	4	31	41.3	9	0	35	44	58.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	75	0	
Kizhuvillam	Summer	38	22	1	61	50.4	6	0	33	39	32.2	0	1	0	1	0.83	0	0	0	5	4.1	15	12.4	0	0	0	0	121	103	18	
	P. Monsoon	85	4	1	90	77.6	6	0	20	26	22.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	116	103	13	
Chirayinkil	Summer	76	8	2	86	63.2	6	0	43	49	36.0	0	0	0	0	0	0	0	0	0	0	0	1	0.74	0	0	0	136	135	1	
	P. Monsoon	85	9	0	94	69.1	6	0	36	42	30.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	136	135	1	
Kadakkavoor	Summer	100	4	0	104	82.5	12	0	10	22	17.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	126	125	1	
	P. Monsoon	103	4	0	107	85.6	10	0	8	18	14.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	125	125	0	
Azhoor	Summer	21	11	0	32	86.5	2	0	3	5	13.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37	36	1	
	P. Monsoon	23	10	0	33	89.2	2	0	2	4	10.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37	36	1	
Anjengo	Summer	31	18	1	50	45.9	6	0	53	59	54.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	109	109	0	
	P. Monsoon	38	15	1	54	49.5	5	0	50	55	50.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	109	109	0	
Sub Total	Summer	276	74	8	358	59.3	41	1	182	224	37.09	0	1	0	1	0.2	0	0	0	5	0.8	16	2.65	0	0	0	0	604	583	21	
	P. Monsoon	350	53	6	409	68.4	38	0	151	189	31.6	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	0	0	598	583	15	

Appendix IV.9. SOURCES USED FOR CLOTHES/ UTENSILS WASHING DIFFERENT SEASONS																											
SCHEME/PANCHAYAT		SOURCES																								HOUSEHOLDS	
		WELL					TAP					HAND PUMP					SPRING		POND		RIVER		OTHER				
NATTIKA SCHEME	Season	O	N	P	Total	%	O	N	P	Total	%	O	N	P	Total	%	No.	%	No.	%	No.	%	No.	%	G.TOTAL	No. surveyed	No. Using more than one sources
THRIKKUNNAPUZHA	Summer	7	1	2	10	7.8	12	0	43	55	42.6	0	0	0	0	0	0	0	22	17	42	32.6	0	0	129	119	10
	P. Monsoon	6	1	1	8	6.2	6	0	16	22	16.9	0	0	0	0	0	0	0	31	24	69	53.1	0	0	130	119	11
CHERIYANAD	Summer	15	10	0	25	26.3	7	0	51	58	61.1	0	0	0	0	0	0	0	0	0	12	12.6	0	0	95	73	22
	P. Monsoon	23	7	0	30	38.0	7	0	31	38	48.1	0	0	0	0	0	0	0	0	0	11	13.9	0	0	79	73	6
KOIPURAM	Summer	23	26	0	49	44.5	5	0	55	60	54.5	0	0	0	0	0	0	0	0	0	1	0.91	0	0	110	83	27
	P. Monsoon	33	23	1	57	61.3	0	0	35	35	37.6	0	0	0	0	0	0	0	0	0	1	1.08	0	0	93	83	10
TOTAL	Summer	608	249	100	957	33.6	160	4	1288	1452	50.9	201	18	4	223	7.82	0	0	129	4.5	90	3.16	0	0	2851	2394	457
	P. Monsoon	854	193	109	1156	40.9	139	3	1024	1166	41.26	202	17	5	224	7.93	0	0	160	5.7	119	4.21	1	0	2826	2394	432

Appendix IV.10 SOURCES USED FOR HAND WASHING BY DIFFERENT HOUSEHOLDS																													
SCHEME/PANCHAYAT		SOURCES																								HOUSEHOLDS			
		WELL					TAP					HAND PUMP					SPRING		POND		RIVER		OTHER						
NATTIKA SCHEME	Season	O	N	P	Total	%	O	N	P	Total	%	O	N	P	Total	%	No	%	No	%	No	%	No	%	No	%	G.TOTAL	No. surveyed	No. Using more than one sources
Engadiyoor	Summer	18	6	0	24	27.0	7	0	57	64	71.9	1	0	0	1	1.12	0	0	0	0	0	0	0	0	0	0	89	82	7
	P. Monsoon	21	5	0	26	26.8	5	0	54	59	60.8	1	0	0	1	1.03	0	0	9	9.3	2	2	0	0	0	0	97	82	15
Mathlakam	Summer	8	2	14	24	23.8	2	0	51	53	52.5	19	1	2	22	21.8	0	0	2	2	0	0	0	0	0	0	101	78	23
	P. Monsoon	10	3	20	33	30.6	2	0	49	51	47.2	19	1	2	22	20.4	0	0	2	1.9	0	0	0	0	0	0	108	78	30
S N Puram	Summer	10	20	11	41	24.8	2	0	79	81	49.1	23	5	0	28	17	0	0	15	9.1	0	0	0	0	0	0	165	116	49
	P. Monsoon	9	14	11	34	21.7	2	0	79	81	51.6	22	5	0	27	17.2	0	0	15	9.6	0	0	0	0	0	0	167	116	41
Vadanappally	Summer	8	1	0	9	19.6	0	0	20	20	43.5	17	0	0	17	37	0	0	0	0	0	0	0	0	0	0	46	41	5
	P. Monsoon	8	2	0	10	21.7	0	0	18	18	39.1	17	0	0	17	37	0	0	0	0	1	2	0	0	0	0	46	41	5
Kapamangalam	Summer	28	0	2	30	22.7	3	0	30	33	25.0	44	8	0	52	39.4	0	0	17	13	0	0	0	0	0	0	132	106	26
	P. Monsoon	29	0	1	30	22.6	4	0	28	32	24.1	46	8	0	53	39.8	0	0	18	14	0	0	0	0	0	0	133	106	27
Valappad	Summer	5	1	2	8	14.5	0	0	21	21	38.2	21	1	2	24	43.6	0	0	2	3.6	0	0	0	0	0	0	55	45	10
	P. Monsoon	5	1	2	8	14.0	0	0	21	21	36.8	21	1	3	25	43.9	0	0	3	5.3	0	0	0	0	0	0	57	45	12
Perinjnam	Summer	17	6	0	23	27.7	0	0	36	36	43.4	21	0	0	21	25.3	0	0	3	3.6	0	0	0	0	0	0	83	70	13
	P. Monsoon	17	6	0	23	27.4	0	0	36	36	42.9	21	0	0	21	25	0	0	3	3.8	1	1	0	0	0	0	84	70	14
Talikulam	Summer	5	2	3	10	9.3	10	0	58	68	63.6	28	1	0	29	27.1	0	0	0	0	0	0	0	0	0	0	107	95	12
	P. Monsoon	5	1	3	9	8.0	10	0	51	61	54.5	30	1	0	31	27.7	0	0	5	4.5	6	5	0	0	0	0	112	95	17
Nattika	Summer	16	3	5	24	24.7	4	0	38	42	43.3	26	1	0	27	27.8	0	0	3	3.1	1	1	0	0	0	0	97	79	18
	P. Monsoon	18	1	3	22	23.7	4	0	34	38	40.9	26	1	0	27	29	0	0	4	4.3	2	2	0	0	0	0	93	79	14
Edathuruthy	Summer	9	1	0	10	13.7	2	0	49	51	69.9	1	0	0	1	1.37	0	0	11	15	0	0	0	0	0	0	73	70	3
	P. Monsoon	10	1	0	11	14.9	2	0	45	47	63.5	1	0	0	1	1.35	0	0	15	20	0	0	0	0	0	0	74	70	4
Sub Total	Summer	124	42	37	203	21.4	30	0	439	469	49.47	201	17	4	222	23.4	0	0	53	5.6	1	0	0	0	0	0	948	782	166
	P. Monsoon	132	34	40	206	21.4	29	0	415	444	46.2	203	17	5	225	23.4	0	0	74	7.7	12	1	0	0	0	0	961	782	179

Appendix IV.10 SOURCES USED FOR HAND WASHING BY DIFFERENT HOUSEHOLDS																											
SCHEME/PANCHAYAT		SOURCES																								HOUSEHOLDS	
		WELL					TAP					HAND PUMP					SPRING		POND		RIVER		OTHER				
NATTIKA SCHEME	Season	O	N	P	Total	%	O	N	P	Total	%	O	N	P	Total	%	No	%	No	%	No	%	No	%	G.TOTAL	No. surveyed	No. Using more than one sources
MALA	Summer	74	13	19	106	36.4	19	3	163	185	63.6	0	0	0	0	0	0	0	0	0	0	0	0	0	291	263	28
	P. Monsoon	136	12	21	169	58.3	18	2	101	121	41.7	0	0	0	0	0	0	0	0	0	0	0	0	0	290	263	27
Poyya	Summer	13	6	7	26	16.7	17	0	113	130	83.3	0	0	0	0	0	0	0	0	0	0	0	0	0	156	139	17
	P. Monsoon	30	6	15	51	32.5	15	0	91	106	67.5	0	0	0	0	0	0	0	0	0	0	0	0	0	167	139	18
Kuzhoor	Summer	15	4	5	24	30.8	9	0	45	54	69.2	0	0	0	0	0	0	0	0	0	0	0	0	0	78	63	15
	P. Monsoon	36	3	6	45	60.0	7	0	23	30	40.0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	63	12
Annammahada	Summer	12	8	1	21	65.6	0	0	11	11	34.4	0	0	0	0	0	0	0	0	0	0	0	0	0	32	28	4
	P. Monsoon	12	8	1	21	67.7	0	0	10	10	32.3	0	0	0	0	0	0	0	0	0	0	0	0	0	31	28	3
Puthenchira	Summer	29	13	13	55	35.7	4	0	95	99	64.3	0	0	0	0	0	0	0	0	0	0	0	0	0	154	121	33
	P. Monsoon	63	7	15	85	61.8	4	0	73	77	47.0	0	0	0	0	0	0	0	0	2	1.2	0	0	164	121	43	
Vellangalloor	Summer	26	48	12	86	41.0	17	0	105	122	58.1	0	0	0	0	0	0	0	0	2	1	0	0	210	140	70	
	P. Monsoon	36	39	11	86	42.8	17	1	96	113	56.2	0	0	0	0	0	0	0	0	2	1	0	0	201	140	61	
Sub Total	Summer	169	92	57	318	34.5	66	3	532	601	65.26	0	0	0	0	0	0	0	0	2	0.2	0	0	921	754	167	
	P. Monsoon	313	75	69	457	49.8	61	3	393	457	49.8	0	0	0	0	0	0	0	0	4	0.4	0	0	918	754	164	
VAKKOM-ANJENGO SCHEME																											
Vakkom	Summer	13	1	0	14	21.5	9	0	42	51	78.5	0	0	0	0	0	0	0	0	0	0	0	0	0	65	75	-10
	P. Monsoon	16	11	0	27	36.0	9	0	39	48	64.0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	75	0
Kizhuvillam	Summer	40	23	1	64	53.3	6	1	48	55	45.8	0	1	0	1	0.83	0	0	0	0	0	0	0	0	120	103	17
	P. Monsoon	86	3	1	90	77.6	7	0	19	26	22.4	0	0	0	0	0	0	0	0	0	0	0	0	0	116	103	13
Chirayinkil	Summer	79	6	0	85	62.0	7	0	45	52	38.0	0	0	0	0	0	0	0	0	0	0	0	0	0	137	135	2
	P. Monsoon	85	7	0	92	67.2	7	0	38	45	32.8	0	0	0	0	0	0	0	0	0	0	0	0	0	137	135	2
Kadakkavoor	Summer	100	4	0	104	82.5	12	0	10	22	17.5	0	0	0	0	0	0	0	0	0	0	0	0	0	126	125	1
	P. Monsoon	103	4	0	107	85.6	10	0	8	18	14.4	0	0	0	0	0	0	0	0	0	0	0	0	0	125	125	0
Azhoor	Summer	21	9	0	30	81.1	2	0	5	7	18.9	0	0	0	0	0	0	0	0	0	0	0	0	0	37	36	1
	P. Monsoon	23	8	0	31	86.1	2	0	3	5	13.9	0	0	0	0	0	0	0	0	0	0	0	0	0	36	36	0
Anjengo	Summer	37	17	1	55	50.5	6	0	48	54	49.5	0	0	0	0	0	0	0	0	0	0	0	0	0	109	109	0
	P. Monsoon	44	13	1	58	62.7	4	0	48	52	47.3	0	0	0	0	0	0	0	0	0	0	0	0	0	110	109	1
Sub Total	Summer	290	60	2	352	59.3	42	1	198	241	40.57	0	1	0	1	0.2	0	0	0	0	0	0	0	0	594	583	11
	P. Monsoon	357	46	2	405	67.6	39	0	155	194	32.4	0	0	0	0	0	0	0	0	0	0	0	0	0	599	583	16

Appendix IV.10 SOURCES USED FOR HAND WASHING BY DIFFERENT HOUSEHOLDS																													
SCHEME/PANCHAYAT		SOURCES																									HOUSEHOLDS		
		WELL					TAP					HAND PUMP					SPRING		POND		RIVER		OTHER		G.TOTAL	No. surveyed			No. Using more than one sources
NATTIKA SCHEME	Season	O	N	P	Total	%	O	N	P	Total	%	O	N	P	Total	%	No	%	No.	%	No.	%	No.	%			No	%	
THRIKKUNNAPUZHA	Summer	7	1	0	8	6.3	12	0	49	61	48.4	0	0	0	0	0	0	0	0	21	17	36	29	0	0	126	119	7	
	P. Monsoon	6	1	1	8	6.1	10	0	27	37	28.2	0	0	0	0	0	0	0	0	24	18	62	47	0	0	131	119	12	
CHERIYANAD	Summer	14	7	0	21	23.6	7	0	57	64	71.9	0	0	0	0	0	0	0	0	0	4	4	0	0	89	73	16		
	P. Monsoon	23	6	0	29	37.2	7	0	39	46	59.0	0	0	0	0	0	0	0	0	0	3	4	0	0	78	73	5		
KOIPURAM	Summer	23	26	0	49	45.4	5	0	54	59	54.6	0	0	0	0	0	0	0	0	0	0	0	0	0	108	83	25		
	P. Monsoon	33	23	1	57	61.3	0	0	35	35	37.6	0	0	0	0	0	0	0	0	0	1	1	0	0	93	83	10		
TOTAL	Summer	627	228	96	951	34.1	162	4	1329	1495	53.7	201	18	4	223	8	0	0	76	2.7	41	1	0	0	2786	2394	392		
	P. Monsoon	864	185	113	1162	41.8	148	3	1064	1213	43.63	203	17	5	225	8.09	0	0	102	3.7	78	3	0	0	2780	2394	386		

Appendix IV.11. SOURCES USED FOR TOILET																												
SCHEME/PANCHAYAT		SOURCES																								HOUSEHOLDS		
		WELL					TAP					HAND PUMP					SPRING		POND		RIVER		OTHER		G.TOTAL			
NATTIKA SCHEME	Season	O	N	P	Total	%	O	N	P	Total	%	O	N	P	Total	%	No.	%	No.	%	No.	%	No.	%		G.TOTAL	No. surveyed	No. Using more than one sources
Engadiyoor	Summer	18	5	0	23	25.6	8	0	58	66	73.3	1	0	0	1	1.1	0	0	0	0	0	0	0	0	0	90	82	8
	P. Monsoon	21	4	0	25	25.3	6	0	56	62	62.6	1	0	0	1	1.01	0	0	9	9.1	2	2	0	0	0	99	82	17
Mathilakam	Summer	8	2	14	24	23.5	2	0	52	54	52.9	19	1	2	22	21.6	0	0	2	2	0	0	0	0	102	78	24	
	P. Monsoon	10	3	18	31	29.0	2	0	50	52	48.6	19	1	2	22	20.6	0	0	2	1.9	0	0	0	0	0	107	78	29
S N Puram	Summer	11	20	11	42	25.1	2	0	80	82	49.1	23	5	0	28	16.8	0	0	15	9	0	0	0	0	167	116	51	
	P. Monsoon	11	14	11	36	22.8	2	0	80	82	51.9	21	5	0	26	16.5	0	0	14	8.9	0	0	0	0	0	158	116	42
Vadanappally	Summer	8	1	0	9	19.6	0	0	20	20	43.5	17	0	0	17	37	0	0	0	0	0	0	0	0	0	46	41	5
	P. Monsoon	8	2	0	10	21.7	0	0	18	18	39.1	17	0	0	17	37	0	0	0	0	1	2	0	0	0	46	41	5
Kapamangalam	Summer	28	0	1	29	22.3	3	0	32	35	26.9	44	6	0	50	38.5	0	0	16	12	0	0	0	0	0	130	106	24
	P. Monsoon	28	0	0	28	21.7	4	0	29	33	25.6	44	7	0	51	39.5	0	0	17	13	0	0	0	0	0	129	106	23
Valappad	Summer	5	1	2	8	14.5	0	0	22	22	40.0	21	1	2	24	43.6	0	0	1	1.8	0	0	0	0	0	55	45	10
	P. Monsoon	5	1	2	8	14.3	0	0	22	22	39.3	21	1	3	25	44.6	0	0	1	1.8	0	0	0	0	0	56	45	11
Perinjalam	Summer	17	5	0	22	26.2	0	0	35	35	41.7	21	0	0	21	25	0	0	6	7.1	0	0	0	0	0	84	70	14
	P. Monsoon	17	5	0	22	26.2	0	0	35	35	41.7	21	0	0	21	25	0	0	6	7.1	0	0	0	0	0	84	70	14
Talikulam	Summer	3	2	3	8	7.7	10	0	57	67	64.4	28	1	0	29	27.9	0	0	0	0	0	0	0	0	0	104	95	9
	P. Monsoon	5	1	3	9	8.0	10	0	49	59	52.7	30	1	0	31	27.7	0	0	6	5.4	7	6	0	0	0	112	95	17
Nattika	Summer	16	3	5	24	24.5	4	0	38	42	42.9	26	1	0	27	27.6	0	0	4	4.1	1	1	0	0	0	98	79	19
	P. Monsoon	18	1	3	22	24.2	4	0	32	36	39.6	26	1	0	27	29.7	0	0	4	4.4	2	2	0	0	0	91	79	12
Edathuruthy	Summer	8	1	0	9	12.2	1	0	49	50	67.6	2	0	0	2	2.7	0	0	13	18	0	0	0	0	0	74	70	4
	P. Monsoon	9	1	0	10	13.5	2	0	44	46	62.2	2	0	0	2	2.7	0	0	16	22	0	0	0	0	0	74	70	4
Sub Total	Summer	122	40	36	198	20.8	30	0	443	473	49.79	202	15	4	221	23.3	0	0	57	6	1	0	0	0	0	950	782	168
	P. Monsoon	132	32	37	201	21.0	30	0	415	445	46.55	202	16	5	223	23.3	0	0	75	7.8	12	1	0	0	0	956	782	174

Appendix IV.11. SOURCES USED FOR TOILET																															
SCHEME/PANCHAYAT		SOURCES																								HOUSEHOLDS					
		WELL					TAP					HAND PUMP					SPRING		POND		RIVER		OTHER		G.TOTAL			No. surveyed	No. Using more than one sources		
NATTIKA SCHEME	Season	O	N	P	Total	%	O	N	P	Total	%	O	N	P	Total	%	No	%	No	%	No	%	No	%		No	%				
MALA	Summer	74	13	19	106	36.4	19	3	163	185	63.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	291	263	28
	P. Monsoon	136	12	21	169	57.9	18	2	102	122	41.8	0	0	0	0	0	0	0	0	1	0.3	0	0	0	0	0	0	0	292	263	29
Poyya	Summer	13	6	7	26	16.7	17	0	113	130	83.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	156	139	17	
	P. Monsoon	30	6	15	51	32.5	15	0	91	108	67.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	167	139	18	
Kuzhoor	Summer	15	4	5	24	30.4	9	0	45	54	68.4	0	0	0	0	0	0	0	0	1	1.3	0	0	0	0	0	0	79	63	16	
	P. Monsoon	36	3	6	45	58.4	7	0	23	30	39.0	0	0	0	0	0	0	0	0	2	2.6	0	0	0	0	0	0	77	63	14	
Annammanada	Summer	12	8	1	21	61.8	0	0	11	11	32.4	0	0	0	0	0	0	0	0	0	0	2	5.9	0	0	0	0	34	28	6	
	P. Monsoon	12	8	1	21	65.6	0	0	10	10	31.3	0	0	0	0	0	0	0	0	0	0	1	3.1	0	0	0	0	32	28	4	
Puthenchira	Summer	29	13	13	55	35.7	4	0	95	99	64.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	154	121	33	
	P. Monsoon	63	7	15	85	51.8	4	0	73	77	47.0	0	0	0	0	0	0	0	0	2	1.2	0	0.0	0	0	0	0	164	121	43	
Vellangalloor	Summer	26	48	12	86	41.0	17	0	106	123	58.6	0	0	0	0	0	0	0	0	1	0.5	0	0	0	0	0	0	210	140	70	
	P. Monsoon	36	39	11	86	42.8	17	1	96	114	56.7	0	0	0	0	0	0	0	0	1	0.5	0	0	0	0	0	0	201	140	61	
Sub Total	Summer	169	92	57	318	34.4	66	3	533	602	65.15	0	0	0	0	0	0	0	0	2	0.2	2	0	0	0	0	0	924	754	170	
	P. Monsoon	313	75	69	457	49.5	61	3	396	459	49.7	0	0	0	0	0	0	0	0	6	0.7	1	0	0	0	0	0	923	754	169	
VAKKOM-ANJENGO SCHEME																															
Vakkom	Summer	14	11	0	25	33.3	9	0	41	50	66.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	75	0	
	P. Monsoon	16	11	0	27	36.0	9	0	39	48	64.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	75	0	
Kizhuvillam	Summer	40	21	1	62	50.4	6	1	53	60	48.8	0	1	0	1	0.81	0	0	0	0	0	0	0	0	0	0	0	123	103	20	
	P. Monsoon	88	3	0	91	76.5	7	0	21	28	23.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	119	103	16		
Chirayinkil	Summer	78	7	0	85	62.0	7	0	44	51	37.2	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	137	135	2		
	P. Monsoon	84	8	0	92	67.6	7	0	37	44	32.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	136	135	1		
Kadakkavoor	Summer	100	4	0	104	82.5	12	0	10	22	17.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	126	125	1		
	P. Monsoon	103	4	0	107	85.6	10	0	8	18	14.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	125	125	0		
Azhoor	Summer	22	11	0	33	91.7	0	0	3	3	8.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36	36	0	
	P. Monsoon	24	10	0	34	94.4	0	0	2	2	5.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36	36	0	
Anjengo	Summer	42	18	1	61	56.0	5	0	43	48	44.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	109	109	0		
	P. Monsoon	46	14	1	61	56.0	4	0	44	48	44.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	109	109	0		
Sub Total	Summer	296	72	2	370	61.1	39	1	194	234	38.61	0	1	0	1	0.2	0	0	0	0	0	1	0	0	0	0	0	606	583	23	
	P. Monsoon	361	50	1	412	68.7	37	0	151	188	31.3	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	0	0	600	583	17	

Appendix IV.11. SOURCES USED FOR TOILET

SCHEME/PANCHAYAT	Season	SOURCES																								HOUSEHOLDS			
		WELL					TAP					HAND PUMP					SPRING		POND		RIVER		OTHER		G.TOTAL	No. surveyed	No. Using more than one sources		
NATTIKA SCHEME		O	N	P	Total	%	O	N	P	Total	%	O	N	P	Total	%	No	%	No	%	No	%	No	%					
THRIKKUNNAPUZHA	Summer	7	1	1	9	6.9	11	0	44	55	42.0	0	0	0	0	0	0	0	24	18	43	33	0	0			131	119	12
	P. Monsoon	7	1	1	9	6.7	7	0	19	26	19.3	0	0	0	0	0	0	0	28	21	68	50	4	3			135	119	16
CHERIYANAD	Summer	15	9	0	24	27.9	7	0	55	62	72.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	86	73	13
	P. Monsoon	23	7	0	30	38.5	7	0	39	46	59.0	0	0	0	0	0	0	0	0	0	2	3	0	0			78	73	5
KOIPURAM	Summer	23	26	0	49	45.0	5	0	55	60	55.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	109	83	26
	P. Monsoon	33	23	1	57	62.0	0	0	35	35	38.0	0	0	0	0	0	0	0	0	0	0	0	0	0			92	83	9
TOTAL	Summer	632	240	96	968	34.5	158	4	1324	1486	53.0	202	16	4	222	7.91	0	0	83	3	47	2	0	0	2806	2394	412		
	P. Monsoon	869	188	109	1166	41.9	142	3	1054	1199	43.07	202	16	5	223	8.01	0	0	109	3.9	83	3	4	0.1	2784	2394	390		

Appendix IV.12 SOURCES USED FOR HOUSE CLEANING																																	
SCHEME/PANCHAYAT		SOURCES																								HOUSEHOLDS							
		WELL					TAP					HAND PUMP					SPRING		POND		RIVER		OTHER		G.TOTAL				No. surveyed	No. Using more than one sources			
NATTIKA SCHEME	Season	O	N	P	Total	%	O	N	P	Total	%	O	N	P	Total	%	No	%	No	%	No.	%	No.	%		No.	%	No.			%		
Engadiyoor	Summer	19	5	0	24	29.6	6	0	50	56	69.1	1	0	0	1	1.23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	81	82	-
	P. Monsoon	20	5	0	25	28.1	5	0	46	51	57.3	1	0	0	1	1.12	0	0	8	9	4	4.49	0	0	0	0	0	0	89	82	7		
Mathilakam	Summer	8	1	11	20	23.8	2	0	40	42	50.0	18	0	2	20	23.8	0	0	2	2.4	0	0	0	0	0	0	0	0	84	78	6		
	P. Monsoon	11	2	16	29	33.0	2	0	36	38	43.2	18	0	1	19	21.6	0	0	2	2.3	0	0	0	0	0	0	0	0	88	78	10		
S N Puram	Summer	9	18	11	38	23.5	2	0	68	70	43.2	33	4	0	37	22.8	0	0	17	10	0	0	0	0	0	0	0	0	162	116	46		
	P. Monsoon	9	14	11	34	22.7	2	0	70	72	48.0	22	5	0	27	18	0	0	17	11	0	0	0	0	0	0	160	118	34				
Vadanappally	Summer	8	1	0	9	30.0	0	0	18	18	60.0	2	0	0	2	6.67	0	0	1	3.3	0	0	0	0	0	0	0	0	30	41	-		
	P. Monsoon	8	2	0	10	22.2	0	0	16	16	35.6	17	0	0	17	37.8	0	0	0	0	1	2.22	1	2.2	0	0	45	41	4				
Kaipamangalam	Summer	28	0	2	30	25.0	3	0	20	23	19.2	41	8	0	49	40.8	0	0	18	15	0	0	0	0	0	0	120	106	14				
	P. Monsoon	29	0	1	30	24.8	3	0	19	22	18.2	41	8	0	49	40.5	0	0	20	17	0	0	0	0	0	0	121	106	15				
Valappad	Summer	5	1	2	8	15.1	0	0	17	17	32.1	22	1	2	25	47.2	0	0	3	5.7	0	0	0	0	0	0	53	45	8				
	P. Monsoon	5	1	2	8	15.4	0	0	17	17	32.7	21	1	2	24	46.2	0	0	3	5.8	0	0	0	0	0	0	52	45	7				
Perinjalam	Summer	15	6	0	21	26.6	0	0	31	31	39.2	21	0	0	21	26.6	0	0	5	6.3	1	1.27	0	0	0	0	79	70	9				
	P. Monsoon	15	6	0	21	26.3	0	0	31	31	38.8	21	0	0	21	26.3	0	0	6	7.5	1	1.25	0	0	0	0	80	70	10				
Talikulam	Summer	4	2	3	9	9.1	10	0	52	62	62.6	28	0	0	28	28.3	0	0	0	0	0	0	0	0	0	0	99	95	4				
	P. Monsoon	5	1	3	9	8.5	10	0	46	56	62.8	30	1	0	31	29.2	0	0	5	4.7	5	4.72	0	0	0	0	106	95	11				
Nattika	Summer	16	3	5	24	26.4	4	0	32	36	39.6	26	1	0	27	29.7	0	0	4	4.4	0	0	0	0	0	0	91	79	12				
	P. Monsoon	18	1	3	22	25.3	4	0	28	32	36.8	26	1	0	27	31	0	0	4	4.6	2	2.3	0	0	0	0	87	79	8				
Edathuruthy	Summer	9	1	0	10	19.6	2	0	38	40	78.4	1	0	0	1	1.96	0	0	0	0	0	0	0	0	0	0	51	70	-				
	P. Monsoon	10	1	0	11	17.5	1	0	35	36	57.1	1	0	0	1	1.59	0	0	15	24	0	0	0	0	0	0	63	70	-				
Sub Total	Summer	121	38	34	193	22.7	29	0	366	395	46.47	193	14	4	211	24.8	0	0	50	5.9	1	0.12	0	0	0	0	850	782	68				
	P. Monsoon	130	33	36	199	22.6	27	0	344	371	42.11	198	16	3	217	24.6	0	0	80	9.1	13	1.48	1	0.1	0	0	881	782	99				

Appendix IV.12 SOURCES USED FOR HOUSE CLEANING

SCHEME/PANCHAYAT	Season	SOURCES																								HOUSEHOLDS						
		WELL					TAP					HAND PUMP					SPRING		POND		RIVER		OTHER		G.TOTAL	No. surveyed	No. Using more than one sources					
NATTIKA SCHEME		O	N	P	Total	%	O	N	P	Total	%	O	N	P	Total	%	No.	%	No.	%	No.	%	No.	%				No.	%			
MALA	Summer	73	10	17	100	38.8	18	3	137	158	61.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	258	263	-	
	P. Monsoon	128	9	17	152	59.6	17	2	84	103	40.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	265	263	-	
Poyya	Summer	13	5	4	22	17.2	17	0	89	106	82.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	128	139	-	
	P. Monsoon	27	5	12	44	34.1	15	0	70	85	65.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	129	139	-	
Kuzhoor	Summer	15	4	6	25	36.2	5	0	39	44	63.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	69	63	6	
	P. Monsoon	35	2	4	41	61.2	6	0	20	26	38.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	67	63	4	
Annammanada	Summer	8	3	0	11	78.6	0	0	3	3	21.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	28	-	
	P. Monsoon	8	3	0	11	84.6	0	0	2	2	15.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	28	-	
Puthenchira	Summer	26	9	7	42	35.0	4	0	74	78	65.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	120	121	-	
	P. Monsoon	60	5	12	77	67.5	4	0	53	57	42.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	134	121	13	
Vellangalloor	Summer	25	34	10	69	44.5	17	0	68	85	54.8	0	0	0	0	0	0	0	0	1	0.6	0	0	0	0	0	0	0	0	155	140	15
	P. Monsoon	34	24	9	67	45.9	17	1	60	78	53.4	0	0	0	0	0	0	0	0	1	0.7	0	0	0	0	0	0	0	0	146	140	6
Sub Total	Summer	160	65	44	269	36.2	61	3	410	474	63.71	0	0	0	0	0.0	0	0	0	1	0.1	0	0	0	0	0	0	0	0	744	754	-
	P. Monsoon	290	48	54	392	52.7	59	3	289	351	47.2	0	0	0	0	0.0	0	0	0	1	0.1	0	0	0	0	0	0	0	0	744	754	-
VAKKOM-ANJENGO SCHEME																																
Vakkom	Summer	14	3	0	17	50.0	9	1	7	17	50.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34	75	-	
	P. Monsoon	16	4	0	20	58.8	9	0	5	14	41.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34	75	-	
Kizhuvillam	Summer	25	8	0	33	68.8	5	0	9	14	29.2	0	1	0	1	2.08	0	0	0	0	0	0	0	0	0	0	0	0	48	103	-	
	P. Monsoon	42	1	0	43	82.7	4	0	6	9	17.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	62	103	-	
Chiraynkil	Summer	61	0	0	61	80.3	5	0	10	15	19.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	76	135	-	
	P. Monsoon	63	0	0	63	82.9	5	0	8	13	17.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	78	135	-	
Kadakkavoor	Summer	51	0	0	51	79.7	9	0	4	13	20.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	64	125	-	
	P. Monsoon	53	0	0	53	81.5	8	0	4	12	18.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65	125	-	
Azhoor	Summer	19	5	0	24	96.0	0	0	1	1	4.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	36	-	
	P. Monsoon	20	4	0	24	96.0	0	0	1	1	4.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	36	-	
Anjengo	Summer	21	3	0	24	70.6	4	0	6	10	29.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34	109	-	
	P. Monsoon	23	1	0	24	75.0	3	0	5	8	25.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32	109	-	
Sub Total	Summer	191	19	0	210	74.7	32	1	37	70	24.91	0	1	0	1	0.4	0	0	0	0	0	0	0	0	0	0	0	0	281	583	-	
	P. Monsoon	217	10	0	227	79.9	29	0	28	57	20.1	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	284	583	-	

Appendix IV.12 SOURCES USED FOR HOUSE CLEANING																													
SCHEME/PANCHAYAT		SOURCES																									HOUSEHOLDS		
		WELL					TAP					HAND PUMP				SPRING		POND		RIVER		OTHER		G.TOTAL	No. surveyed	No. Using more than one sources			
NATTIKA SCHEME	Season	O	N	P	Total	%	O	N	P	Total	%	O	N	P	Total	%	No	%	No	%	No	%	No				%	No	%
THRIKKUNNAPUZHA	Summer	6	1	1	8	7.3	13	0	40	53	48.6	0	0	0	0	0	0	0	0	16	15	32	29.4	0	0	109	119	-	
	P. Monsoon	6	0	1	7	6.3	6	0	20	26	23.4	0	0	0	0	0	0	0	0	23	21	55	49.5	0	0	111	119	-	
CHERIYANAD	Summer	13	4	0	17	25.8	7	0	42	49	74.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	66	73	-	
	P. Monsoon	20	4	0	24	40.0	6	0	29	35	58.3	0	0	0	0	0	0	0	0	0	0	0	0	1	1.7	60	73	-	
KOIPURAM	Summer	18	20	0	38	52.8	5	0	29	34	47.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72	83	-	
	P. Monsoon	24	16	1	41	69.5	0	0	18	18	30.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	59	83	-	
TOTAL	Summer	509	147	79	735	34.6	147	4	924	1075	50.7	193	15	4	212	9.99	0	0	67	3.2	33	1.56	0	0	2122	2394	-		
	P. Monsoon	687	111	92	890	41.6	127	3	728	858	40.11	198	16	3	217	10.1	0	0	104	4.9	68	3.18	2	0.1	2139	2394	-		

Appendix IV.13.SOURCES USED FOR GARDEN																																
SCHEME/PANCHAYAT		SOURCES																								HOUSEHOLDS						
		WELL					TAP					HAND PUMP					SPRING		POND		RIVER		OTHER		G.TOTAL			No. surveyed	No. Using more than one sources			
NATTIKA SCHEME	Season	O	N	P	Total	%	O	N	P	Total	%	O	N	P	Total	%	No	%	No	%	No.	%	No.	%		No.	%					
Engadiyoor	Summer	16	3	0	19	33.9	6	0	30	36	64.3	1	0	0	1	1.79	0	0	0	0	0	0	0	0	0	0	0	0	0	56	82	-
	P. Monsoon	18	3	0	21	31.8	5	0	28	33	50.0	1	0	0	1	1.52	0	0	8	12	3	4.65	0	0	0	0	0	0	0	66	82	-
Mathlakam	Summer	9	0	8	17	29.8	1	0	25	26	45.6	13	0	0	13	22.8	0	0	1	1.8	0	0	0	0	0	0	0	0	57	78	-	
	P. Monsoon	11	0	10	21	35.0	1	0	24	25	41.7	13	0	0	13	21.7	0	0	1	1.7	0	0	0	0	0	0	0	0	60	78	-	
S N Puram	Summer	6	12	7	25	22.9	2	0	47	49	45.0	17	2	0	19	17.4	0	0	15	14	0	0	1	0.9	0	0	1	0.9	109	116	-	
	P. Monsoon	6	11	7	24	22.2	2	0	47	49	45.4	16	3	0	19	17.6	0	0	15	14	0	0	1	0.9	0	0	1	0.9	108	116	-	
Vadanappally	Summer	7	0	0	7	25.9	0	0	7	7	25.9	12	0	0	12	44.4	0	0	1	3.7	0	0	0	0	0	0	0	0	27	41	-	
	P. Monsoon	7	0	0	7	26.9	0	0	7	7	26.9	12	0	0	12	46.2	0	0	0	0	0	0	0	0	0	0	0	0	26	41	-	
Kaipamangalam	Summer	26	0	1	27	24.5	1	0	15	16	14.5	33	6	0	39	35.5	0	0	28	25	0	0	0	0	0	0	0	0	110	106	4	
	P. Monsoon	24	0	0	24	22.6	2	0	14	16	15.1	33	5	0	38	35.8	0	0	28	26	0	0	0	0	0	0	0	0	106	106	-	
Valappad	Summer	5	1	2	8	15.4	0	0	15	15	28.8	22	1	2	25	48.1	0	0	4	7.7	0	0	0	0	0	0	0	0	52	45	-	
	P. Monsoon	5	1	2	8	15.7	0	0	15	16	29.4	21	1	2	24	47.1	0	0	4	7.8	0	0	0	0	0	0	0	0	61	45	-	
Perinjnam	Summer	9	4	0	13	24.1	0	0	17	17	31.5	18	0	0	18	33.3	0	0	5	9.3	0	0	1	1.9	0	0	0	54	70	-		
	P. Monsoon	9	3	0	12	23.1	0	0	19	19	36.5	16	0	0	16	30.8	0	0	6	9.6	0	0	0	0	0	0	0	0	62	70	-	
Talikulam	Summer	3	0	1	4	9.3	2	0	21	23	53.5	14	0	0	14	32.6	0	0	2	4.7	0	0	0	0	0	0	0	0	43	95	-	
	P. Monsoon	3	1	1	5	11.1	2	0	20	22	48.9	14	0	0	14	31.1	0	0	4	8.9	0	0	0	0	0	0	0	0	45	95	-	
Nattika	Summer	16	0	3	19	24.4	2	0	28	30	38.5	24	1	0	25	32.1	0	0	4	5.1	0	0	0	0	0	0	0	0	78	79	-	
	P. Monsoon	18	1	2	21	27.6	2	0	24	26	34.2	24	1	0	25	32.9	0	0	4	5.3	0	0	0	0	0	0	0	0	76	79	-	
Edathuruthy	Summer	9	2	0	11	30.6	0	0	16	16	44.4	0	0	0	0	0	0	0	9	25	0	0	0	0	0	0	0	36	70	-		
	P. Monsoon	10	2	0	12	32.4	0	0	15	15	40.5	0	0	0	0	0	0	0	10	27	0	0	0	0	0	0	0	37	70	-		
Sub Total	Summer	106	22	22	150	24.1	14	0	221	235	37.78	154	10	2	166	26.7	0	0	69	11	0	0	2	0.3	0	0	0	622	782	-		
	P. Monsoon	111	22	22	155	24.7	14	0	213	227	36.2	150	10	2	162	25.8	0	0	79	13	3	0.48	1	0.2	0	0	0	627	782	-		

Appendix IV.13.SOURCES USED FOR GARDEN																														
SCHEME/PANCHAYAT		SOURCES																								HOUSEHOLDS				
		WELL					TAP					HAND PUMP					SPRING		POND		RIVER		OTHER							
NATTIKA SCHEME	Season	O	N	P	Total	%	O	N	P	Total	%	O	N	P	Total	%	No.	%	No.	%	No.	%	No.	%	G.TOTAL	No. surveyed	No. Using more than one sources			
MALA	Summer	13	1	5	19	36.5	2	0	31	33	63.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	52	263	-	
	P. Monsoon	25	2	4	31	64.6	2	0	15	17	35.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	48	283	-	
Poyya	Summer	2	0	0	2	33.3	0	0	4	4	66.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	139	-	
	P. Monsoon	3	0	1	4	57.1	0	0	3	3	42.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	139	-	
Kuzhoor	Summer	1	1	0	2	66.7	1	0	0	1	33.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	63	-	
	P. Monsoon	1	0	0	1	50.0	1	0	0	1	50.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	63	-	
Annammanada	Summer	0	0	0	0	0.0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0	28	-
	P. Monsoon	0	0	0	0	0.0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	0	0	5	0.0	0	0	5	28	-	
Puthenchira	Summer	3	0	0	3	30.0	1	0	6	7	70.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0	10	121	-
	P. Monsoon	8	0	0	8	100.0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0	8	121	-
Vellangalloor	Summer	1	0	0	1	100.0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0	1	140	-
	P. Monsoon	0	0	0	0	0.0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0	140	-
Sub Total	Summer	20	2	5	27	37.5	4	0	41	45	62.5	0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	72	754	-	
	P. Monsoon	37	2	5	44	62.9	3	0	18	21	30.0	0	0	0	0	0	0.0	0	0	0	0	0	5	7.14	0	0	70	754	-	
VAKKOM-ANJENGO SCHEME																														
Vakkom	Summer	11	1	0	12	52.2	7	0	4	11	47.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	75	-	
	P. Monsoon	12	1	0	13	54.2	7	0	4	11	45.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	75	-	
Kizhuvillam	Summer	4	0	0	4	57.1	2	0	1	3	42.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	103	-	
	P. Monsoon	6	0	0	6	100.0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	103	-	
Chrayinkil	Summer	17	0	0	17	94.4	1	0	0	1	5.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	135	-	
	P. Monsoon	16	0	0	16	94.1	1	0	0	1	5.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	135	-	
Kadakkavoor	Summer	8	0	0	8	66.7	3	0	1	4	33.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	125	-	
	P. Monsoon	8	0	0	8	72.7	2	0	1	3	27.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	125	-	
Azhoor	Summer	7	1	0	8	100.0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	36	-	
	P. Monsoon	7	1	0	8	100.0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	36	-	
Anjengo	Summer	12	1	0	13	92.9	1	0	0	1	7.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	109	-	
	P. Monsoon	12	0	0	12	92.3	1	0	0	1	7.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	109	-	
Sub Total	Summer	59	3	0	62	75.61	14	0	6	20	24.39	0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	82	583	-	
	P. Monsoon	61	2	0	63	79.7	11	0	5	16	20.3	0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	79	583	-	

Appendix IV.13.SOURCES USED FOR GARDEN

SCHEME/PANCHAYAT		SOURCES																								HOUSEHOLDS				
		WELL					TAP					HAND PUMP					SPRING		POND		RIVER		OTHER			G.TOTAL	No. surveyed	No. Using more than one sources		
Season	O	N	P	Total	%	O	N	P	Total	%	O	N	P	Total	%	No	%	No	%	No	%	No	%	No	%					
NATTIKA SCHEME	Summer	5	0	1	6	10.3	11	0	17	28	48.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	58	119	-
	P. Monsoon	7	0	1	8	12.5	5	0	10	15	23.4	0	0	0	0	0	0	0	0	0	15	23	26	40.6	0	0	64	119	-	
CHERIYANAD	Summer	8	3	0	11	23.9	5	0	29	34	73.9	0	0	0	0	0	0	0	0	0	0	1	2.17	0	0	46	73	-		
	P. Monsoon	16	3	0	19	46.3	4	0	18	22	53.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	41	73	-		
KOIPURAM	Summer	12	17	0	29	50.9	5	0	23	28	49.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	57	83	-		
	P. Monsoon	21	22	1	44	78.6	0	0	12	12	21.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	56	83	-		
TOTAL	Summer	210	47	28	285	30.4	53	0	337	390	41.6	154	10	2	166	17.7	0	0	81	8.6	13	1.39	2	0.2	937	2394	-			
	P. Monsoon	253	51	29	333	35.5	37	0	276	313	33.4	150	10	2	162	17.3	0	0	94	10	34	3.63	1	0.1	937	2394	-			

Appendix IV.14. SOURCES USED FOR ANIMALS																													
SCHEME/PANCHAYAT		SOURCES																				HOUSEHOLDS							
		WELL					TAP					HAND PUMP					SPRING		POND		RIVER			OTHER					
NATTIKA SCHEME	Season	O	N	P	Total	%	O	N	P	Total	%	O	N	P	Total	%	No	%	No	%	No.	%	No.	%	G.TOTAL	No. surveyed	No. Using more than one sources		
Engadiyoor	Summer	1	2	0	3	30.0	1	0	4	5	50.0	1	0	0	1	10	0	0	1	10	0	0	0	0	0	0	10	82	-
	P. Monsoon	3	2	0	5	50.0	1	0	2	3	30.0	1	0	0	1	10	0	0	1	10	0	0	0	0	0	0	10	82	-
Mathilakam	Summer	3	0	1	4	36.4	1	0	3	4	36.4	1	0	0	1	9.09	0	0	1	9.09	1	9.09	0	0	0	0	11	78	-
	P. Monsoon	3	0	1	4	36.4	1	0	3	4	36.4	1	0	0	1	9.09	0	0	1	9.09	1	9.09	0	0	0	0	11	78	-
S N Puram	Summer	3	2	1	6	42.9	0	0	2	2	14.3	2	1	0	3	21.4	0	0	2	14.3	1	7.14	0	0	0	0	14	116	-
	P. Monsoon	3	2	1	6	42.9	0	0	3	3	21.4	2	0	0	2	14.3	0	0	2	14.3	1	7.14	0	0	0	0	14	116	-
Vadanappally	Summer	1	0	0	1	20.0	0	0	0	0	0.0	3	0	0	3	60	0	0	1	20	0	0	0	0	0	0	5	41	-
	P. Monsoon	1	0	0	1	20.0	0	0	0	0	0.0	3	0	0	3	60	0	0	1	20	0	0	0	0	0	0	5	41	-
Kaipamangalam	Summer	7	0	0	7	15.9	1	0	6	7	15.9	10	3	0	13	29.5	0	0	17	38.6	0	0	0	0	0	0	44	106	-
	P. Monsoon	7	0	0	7	15.9	1	0	6	7	15.9	11	3	0	14	31.8	0	0	16	36.4	0	0	0	0	0	0	44	106	-
Valappad	Summer	0	0	0	0	0.0	0	0	0	0	0.0	1	0	0	1	100	0	0	0	0	0	0	0	0	0	0	1	45	-
	P. Monsoon	0	0	0	0	0.0	0	0	0	0	0.0	1	0	0	1	100	0	0	0	0	0	0	0	0	0	0	1	45	-
Perinjanam	Summer	3	1	0	4	30.8	0	0	0	0	0.0	2	0	0	2	15.4	0	0	7	53.8	0	0	0	0	0	0	13	70	-
	P. Monsoon	3	1	0	4	30.8	0	0	0	0	0.0	2	0	0	2	15.4	0	0	7	53.8	0	0	0	0	0	0	13	70	-
Talikulam	Summer	3	0	0	3	30.0	0	0	1	1	10.0	2	0	0	2	20	0	0	3	30	1	10	0	0	0	0	10	95	-
	P. Monsoon	3	0	0	3	30.0	0	0	1	1	10.0	2	0	0	2	20	0	0	2	20	2	20	0	0	0	0	10	95	-
Nattika	Summer	0	0	0	0	0.0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	79	-
	P. Monsoon	0	0	0	0	0.0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	79	-
Edathuruthy	Summer	0	1	0	1	16.7	0	0	0	0	0.0	0	0	0	0	0	0	0	5	83.3	0	0	0	0	0	0	6	70	-
	P. Monsoon	0	1	0	1	16.7	0	0	0	0	0.0	0	0	0	0	0	0	0	5	83.3	0	0	0	0	0	0	6	70	-
Sub Total	Summer	21	6	2	29	25.4	3	0	16	19	16.67	22	4	0	26	22.8	0	0	37	32.5	3	2.63	0	0	114	782	-		
	P. Monsoon	23	6	2	31	27.2	3	0	15	18	15.79	23	3	0	26	22.8	0	0	35	30.7	4	3.51	0	0	114	782	-		

Appendix IV.14. SOURCES USED FOR ANIMALS																												
SCHEME/PANCHAYAT		SOURCES																				HOUSEHOLDS						
		WELL					TAP					HAND PUMP				SPRING		POND		RIVER				OTHER				
NATTIKA SCHEME	Season	O	N	P	Total	%	O	N	P	Total	%	O	N	P	Total	%	No.	%	No.	%	No.	%	No.	%	G.TOTAL	No. surveyed	No. Using more than one sources	
MALA	Summer	19	1	4	24	66.7	3	0	9	12	33.3	0	0	0	0	0	0	0	0	0	0	0	0	0	36	263	-	
	P. Monsoon	26	0	3	29	80.8	4	0	3	7	19.4	0	0	0	0	0	0	0	0	0	0	0	0	0	36	263	-	
Poyya	Summer	4	3	2	9	29.0	3	0	17	20	64.5	0	0	0	0	0	0	0	0	0	0	2	6.45	0	0	31	139	-
	P. Monsoon	12	2	3	17	54.8	2	0	10	12	38.7	0	0	0	0	0	0	0	0	0	0	2	6.45	0	0	31	139	-
Kuzhoor	Summer	3	1	0	4	50.0	0	0	3	3	37.5	0	0	0	0	0	0	0	0	1	12.5	0	0	0	0	8	63	-
	P. Monsoon	4	1	0	5	62.5	0	0	2	2	25.0	0	0	0	0	0	0	0	0	1	12.5	0	0	0	0	8	63	-
Annammanada	Summer	3	0	0	3	0.0	0	0	1	1	0.0	0	0	0	0	0	0	0	0	2	33.3	0	0	0	0	6	28	-
	P. Monsoon	4	0	0	4	0.0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	2	0	0	0.0	0	0	6	28	-
Puthenchira	Summer	7	0	0	7	43.8	0	0	5	5	31.3	0	0	0	0	0	0	0	0	4	25	0	0.0	0	0	16	121	-
	P. Monsoon	11	0	0	11	68.8	0	0	0	0	0.0	0	0	0	0	0	0	0	0	5	31.3	0	0.0	0	0	16	121	-
Vellangalloor	Summer	6	1	0	7	63.6	1	0	2	3	27.3	0	0	0	0	0	0	0	0	1	9.09	0	0	0	0	11	140	-
	P. Monsoon	6	1	0	7	0.0	1	0	2	3	27.3	0	0	0	0	0	0	0	0	1	0	0	0	0	0	11	140	-
Sub Total	Summer	42	6	6	54	50	7	0	37	44	40.74	0	0	0	0	0	0	0	8	7.41	2	1.85	0	0	108	754	-	
	P. Monsoon	63	4	6	73	67.6	7	0	17	24	22.2	0	0	0	0	0	0	0	9	8.33	2	1.85	0	0	108	754	-	
VAKKOM-ANJENGO SCHEME																												
Vakkom	Summer	6	0	0	6	75.0	1	0	1	2	25.0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	75	-	
	P. Monsoon	6	0	0	6	75.0	1	0	1	2	25.0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	75	-	
Kizhuvillam	Summer	5	2	0	7	58.3	0	0	1	1	8.3	0	0	0	0	0	0	0	0	4	33.3	0	0	0	0	12	103	-
	P. Monsoon	8	0	0	8	66.7	0	0	0	0	0.0	0	0	0	0	0	0	0	0	4	33.3	0	0	0	0	12	103	-
Chirayinkil	Summer	14	0	0	14	77.8	0	0	1	1	5.6	0	0	0	0	0	0	0	0	0	3	16.7	0	0	18	135	-	
	P. Monsoon	14	0	0	14	77.8	0	0	1	1	5.6	0	0	0	0	0	0	0	0	0	3	16.7	0	0	18	135	-	
Kadakkavoor	Summer	4	0	0	4	66.7	0	0	1	1	16.7	0	0	0	0	0	0	0	0	1	16.7	0	0	0	0	6	125	-
	P. Monsoon	4	0	0	4	66.7	0	0	0	0	0.0	0	0	0	0	0	0	0	0	2	33.3	0	0	0	0	6	125	-
Azhoor	Summer	4	0	0	4	66.7	0	0	1	1	16.7	0	0	0	0	0	0	0	0	0	1	16.7	0	0	6	36	-	
	P. Monsoon	4	0	0	4	66.7	0	0	1	1	16.7	0	0	0	0	0	0	0	0	0	1	16.7	0	0	6	36	-	
Anjengo	Summer	2	2	0	4	66.7	0	0	1	1	16.7	0	0	0	0	0	0	0	0	0	1	16.7	0	0	6	109	-	
	P. Monsoon	2	2	0	4	66.7	0	0	1	1	16.7	0	0	0	0	0	0	0	0	0	1	16.7	0	0	6	109	-	
Sub Total	Summer	35	4	0	39	69.6	1	0	6	7	12.5	0	0	0	0	0	0	0	5	8.93	5	8.93	0	0	56	583	-	
	P. Monsoon	38	2	0	40	71.4	1	0	4	5	8.9	0	0	0	0	0	0	0	6	10.7	5	8.93	0	0	56	583	-	

Appendix IV.14. SOURCES USED FOR ANIMALS

SCHEME/PANCHAYAT		SOURCES																						HOUSEHOLDS							
		WELL					TAP					HAND PUMP				SPRING		POND		RIVER		OTHER				G.TOTAL	No. surveyed	No. Using more than one sources			
NATTIKA SCHEME	Season	O	N	P	Total	%	O	N	P	Total	%	O	N	P	Total	%	No	%	No	%	No.	%	No.	%	No.				%	No.	%
THRIKKUNNAPUZHA	Summer	5	0	1	6	10.3	11	0	17	28	48.3	0	0	0	0	0	0	0	0	12	21	12	20.7	0	0	58	119	-			
	P. Monsoon	7	0	1	8	13.8	5	0	10	15	25.9	0	0	0	0	0	0	0	0	15	26	20	34.6	0	0	58	119	-			
CHERIYANAD	Summer	8	3	0	11	23.9	5	0	29	34	73.9	0	0	0	0	0	0	0	0	0	0	1	2.17	0	0	46	73	-			
	P. Monsoon	20	3	0	23	50.0	4	0	18	22	47.8	0	0	0	0	0	0	0	0	0	0	1	2.17	0	0	46	73	-			
KOIPURAM	Summer	12	17	0	29	50.9	5	0	23	28	49.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	57	83	-			
	P. Monsoon	22	22	1	45	78.9	0	0	12	12	21.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	57	83	-			
TOTAL	Summer	123	36	9	168	38.3	32	0	128	160	36.4	22	4	0	26	5.92	0	0	62	14	23	5.24	0	0	439	2394	-				
	P. Monsoon	173	37	10	220	50.1	20	0	76	96	21.87	23	3	0	26	5.92	0	0	65	15	32	7.29	0	0	439	2394	-				

Appendix IV.15. SOURCES USED FOR RETTING

SCHEME/PANCHAYAT		SOURCES																				HOUSEHOLDS						
		WELL					TAP					HAND PUMP					SPRING		POND		RIVER		OTHER		G.TOTAL	No. surveyed	No. Using more than one sources	
NATTIKA SCHEME	Season	O	N	P	Total	%	O	N	P	Total	%	O	N	P	Total	%	No.	%	No.	%	No.	%	No.	%				No.
Engadiyoor	Summer	0	0	0	0	0.0	0	0	1	1	7.7	0	0	0	0	0	0	0	11	84.6	0	0	1	7.7	13	82	-	
	P. Monsoon	0	0	0	0	0.0	0	0	1	1	4.5	0	0	0	0	0	0	0	11	50	5	22.7	6	23	22	82	-	
Mathilakam	Summer	0	0	0	0	0.0	0	0	0	0	0.0	0	0	0	0	0	0	0	4	50	3	37.5	1	13	8	78	-	
	P. Monsoon	0	0	0	0	0.0	0	0	0	0	0.0	0	0	0	0	0	0	0	4	50	3	37.5	1	13	8	78	-	
S N Puram	Summer	1	0	0	1	2.9	0	0	2	2	5.7	2	0	0	2	5.71	0	0	16	45.7	9	25.7	5	14	35	116	-	
	P. Monsoon	1	0	0	1	3.2	0	0	0	0	0.0	2	0	0	2	6.45	0	0	14	45.2	9	29	6	16	31	116	-	
Vadanappally	Summer	0	0	0	0	0.0	0	0	0	0	0.0	0	0	0	0	0	0	0	5	71.4	0	0	2	29	7	41	-	
	P. Monsoon	0	0	0	0	0.0	0	0	0	0	0.0	0	0	0	0	0	0	0	5	71.4	0	0	2	29	7	41	-	
Kaipamangalam	Summer	11	0	0	11	17.5	1	0	2	3	4.8	5	1	0	6	9.52	0	0	42	66.7	1	1.59	0	0	63	106	-	
	P. Monsoon	10	0	0	10	15.6	1	0	1	2	3.1	6	1	0	7	10.9	0	0	44	68.8	1	1.56	0	0	64	106	-	
Valappad	Summer	0	0	0	0	0.0	0	0	0	0	0.0	9	0	0	9	39.1	0	0	11	47.8	3	13	0	0	23	45	-	
	P. Monsoon	0	0	0	0	0.0	0	0	1	1	4.3	8	0	0	8	34.8	0	0	11	47.8	3	13	0	0	23	45	-	
Perinjanam	Summer	1	0	0	1	6.7	0	0	0	0	0.0	0	0	0	0	0	0	0	10	66.7	2	13.3	2	13	15	70	-	
	P. Monsoon	1	0	0	1	6.7	0	0	0	0	0.0	0	0	0	0	0	0	0	10	66.7	2	13.3	2	13	15	70	-	
Talikulam	Summer	0	0	0	0	0.0	0	0	0	0	0.0	0	0	0	0	0	0	0	5	16.7	24	80.0	1	3.3	30	95	-	
	P. Monsoon	0	0	0	0	0.0	0	0	0	0	0.0	0	0	0	0	0	0	0	4	13.3	25	83.3	1	3.3	30	95	-	
Nattika	Summer	0	0	0	0	0.0	0	0	0	0	0.0	0	0	0	0	0	1	0	3	60.0	1	20.0	0	0	5	79	-	
	P. Monsoon	0	0	0	0	0.0	0	0	0	0	0.0	0	0	0	0	0	1	0	3	75.0	0	0.0	0	0	4	79	-	
Edathuruthy	Summer	0	0	0	0	0.0	0	0	0	0	0.0	0	0	0	0	0	0	0	22	100	0	0	0	0	22	70	-	
	P. Monsoon	0	0	0	0	0.0	0	0	0	0	0.0	0	0	0	0	0	0	0	22	100	0	0	0	0	22	70	-	
Sub Total	Summer	13	0	0	13	5.88	1	0	5	6	2.715	16	1	0	17	7.7	1	0	129	58.4	43	19.5	12	5.4	221	782	-	
	P. Monsoon	12	0	0	12	5.3	1	0	3	4	1.77	16	1	0	17	7.5	1	0	128	56.6	48	21.2	16	7.1	226	782	-	

Appendix IV.15. SOURCES USED FOR RETTING																											
SCHEME/PANCHAYAT		SOURCES																				HOUSEHOLDS					
		WELL					TAP					HAND PUMP					SPRING		POND		RIVER			OTHER			
NATTIKA SCHEME	Season	O	N	P	Total	%	O	N	P	Total	%	O	N	P	Total	%	No	%	No	%	No	%	No	%	G.TOTAL	No. surveyed	No. Using more than one sources
MALA	Summer	1	0	1	2	50.0	0	0	2	2	50.0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	263	-
	P. Monsoon	3	0	1	4	80.0	0	0	1	1	20.0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	263	-
Poyya	Summer	1	0	0	1	20.0	0	0	1	1	20.0	0	0	0	0	0	0	0	0	0	0	0	3	60	5	139	-
	P. Monsoon	1	0	0	1	33.3	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	2	66.7	0	0	3	139	-
Kuzhoor	Summer	0	0	0	0	0.0	0	0	0	0	0.0	0	0	0	0	0	0	0	6	100	0	0	0	0	6	63	-
	P. Monsoon	0	0	0	0	0.0	0	0	0	0	0.0	0	0	0	0	0	0	0	4	100	0	0	0	0	4	63	-
Annammanada	Summer	1	0	0	1	0.0	0	0	0	0	0.0	0	0	0	0	0	0	0	1	14	5	0.0	0	0	7	28	-
	P. Monsoon	0	0	0	0	0.0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0	28	-
Puthenchira	Summer	1	0	0	1	3.6	0	0	0	0	0.0	0	0	0	0	0	0	0	24	86	2	7.1	1	3.6	28	121	-
	P. Monsoon	1	0	0	1	14.3	0	0	0	0	0.0	0	0	0	0	0	0	0	5	71	1	14.3	0	0	7	121	-
Vellangalloor	Summer	0	0	0	0	0.0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	19	100	0	0	19	140	-
	P. Monsoon	0	0	0	0	0.0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	140	-
Sub Total	Summer	4	0	1	5	7.25	0	0	3	3	4.348	0	0	0	0	0.0	0	0	31	45	29	42	1	1.4	69	754	-
	P. Monsoon	5	0	1	6	31.6	0	0	1	1	5.3	0	0	0	0	0.0	0	0	9	47	3	15.8	0	0	19	754	-
VAKKOM-ANJENGO SCHEME																											
Vakkom	Summer	6	0	0	6	27.3	4	0	2	6	27.3	0	0	0	0	0	2	9	0	0	8	36.4	0	0	22	75	-
	P. Monsoon	9	0	0	9	42.9	3	0	0	3	14.3	0	0	0	0	0	2	10	0	0	7	33.3	0	0	21	75	-
Kizhuvillam	Summer	3	0	0	3	50.0	1	0	0	1	16.7	0	0	0	0	0	0	0	0	0	2	33.3	0	0	6	103	-
	P. Monsoon	4	0	0	4	80.0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	1	20	0	0	5	103	-
Chirayinkil	Summer	0	0	0	0	0.0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	4	100	0	0	4	135	-
	P. Monsoon	2	0	0	2	66.7	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	1	33.3	0	0	3	135	-
Kadakkavoor	Summer	0	0	0	0	0.0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	125	-
	P. Monsoon	0	0	0	0	0.0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	125	-
Azhoor	Summer	1	0	0	1	5.6	0	0	0	0	0.0	0	0	0	0	0	0	0	3	17	14	77.8	0	0	18	36	-
	P. Monsoon	4	1	0	5	33.3	0	0	0	0	0.0	0	0	0	0	0	0	0	2	13	8	53.3	0	0	15	36	-
Anjengo	Summer	0	0	0	0	0.0	0	0	0	0	0.0	0	0	0	0	0	0	0	2	5.7	33	94.3	0	0	35	109	-
	P. Monsoon	0	0	0	0	0.0	0	0	0	0	0.0	0	0	0	0	0	0	0	2	6.1	31	93.9	0	0	33	109	-
Sub Total	Summer	10	0	0	10	11.8	5	0	2	7	8.235	0	0	0	0	0.0	2	2	5	5.9	61	71.8	0	0	85	583	-
	P. Monsoon	19	1	0	20	26.0	3	0	0	3	3.9	0	0	0	0	0.0	2	3	4	5.2	48	62.3	0	0	77	583	-

Appendix IV.15. SOURCES USED FOR RETTING																													
SCHEME/PANCHAYAT		SOURCES																								HOUSEHOLDS			
		WELL					TAP					HAND PUMP					SPRING		POND		RIVER		OTHER		G.TOTAL			No. surveyed	No. Using more than one sources
NATTIKA SCHEME	Season	O	N	P	Total	%	O	N	P	Total	%	O	N	P	Total	%	No	%	No	%	No	%	No.	%		G.TOTAL	No. surveyed		
THRIKKUNNAPUZHA	Summer	0	0	0	0	0.0	0	0	0	0	0.0	0	0	0	0	0.0	0	0	0	0	31	51	30	49.2	0	0	61	119	-
	P. Monsoon	0	0	1	1	1.6	0	0	0	0	0.0	0	0	0	0	0.0	0	0	0	0	29	48	33	52.4	0	0	63	119	-
CHERIYANAD	Summer	0	0	0	0	0.0	0	0	0	0	0.0	0	0	0	0	0.0	0	0	0	0	0	0	1	100	0	0	1	73	-
	P. Monsoon	0	0	0	0	0.0	0	0	0	0	0.0	0	0	0	0	0.0	0	0	0	0	0	0	1	100	0	0	1	73	-
KOIPURAM	Summer	0	0	0	0	0.0	0	0	0	0	0.0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	0	0	83	-
	P. Monsoon	0	0	0	0	0.0	0	0	0	0	0.0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	0	0	83	-
TOTAL	Summer	27	0	1	28	6.4	6	0	10	16	3.7	16	1	0	17	3.89	3	1	196	45	164	37.5	13	3	437	2394	-		
	P. Monsoon	36	1	2	39	10.1	4	0	4	8	2.073	16	1	0	17	4.4	3	1	170	44	133	34.5	16	4.1	386	2394	-		

Appendix IV.16. REASONS FOR PREFERENCE TO WELL WATER

Sl.No	Scheme/Panchayat	No of	PURPOSE																											
			Clear			Like Taste			No Smell			Closer			Large Quantity			Always Available			Only Source			Effortless			Cultural Reasons			
			H.H	O	N	P	O	N	P	O	N	P	O	N	P	O	N	P	O	N	P	O	N	P	O	N	P	O	N	P
1	Engandiyoor	82	18	11	0	14	7	0	18	10	0	22	32	0	18	12	0	20	10	0	1	0	0	20	4	0	0	0	0	0
2	Mathitakam	78	11	5	20	10	5	8	11	5	10	12	27	18	7	1	8	10	5	19	0	0	0	12	4	19	0	0	0	
3	S N Puram	116	9	24	10	9	19	9	9	21	6	11	38	10	14	32	13	11	24	10	2	1	2	11	15	7	2	0	0	
4	Vadanapally	41	6	6	0	6	4	0	6	5	0	8	13	0	10	0	0	7	4	0	3	0	0	6	1	0	1	0	0	
5	Kaipamangalam	106	28	6	4	27	5	3	27	5	3	30	38	2	44	12	8	26	6	4	6	0	0	28	6	2	0	0	0	
6	Valappad	45	5	3	0	4	3	0	4	3	0	5	8	2	7	6	4	5	2	2	0	0	0	3	1	2	0	0	0	
7	Pennjanam	70	16	8	0	16	7	0	15	6	0	17	23	0	21	11	0	16	7	0	1	0	0	16	4	0	0	0	0	
8	Thalikulam	95	3	7	3	2	5	2	3	5	2	5	12	3	3	5	2	4	1	2	0	0	0	5	3	2	0	0	0	
9	Nattika	79	14	10	4	14	10	4	15	10	5	18	33	3	30	14	3	13	8	3	2	0	1	18	3	2	2	0	0	
10	Edathuruthy	70	5	3	0	5	2	0	5	3	0	11	14	0	12	5	0	11	3	0	1	0	0	10	3	0	0	0	0	
	Sub Total	782	115	83	41	107	67	26	113	73	26	139	238	38	166	98	36	123	70	40	16	1	3	129	44	34	5	0	0	
	%		14.7	10.6	5.2	13.7	8.6	3.3	14.5	9.3	3.3	17.8	30.4	4.9	21.2	12.5	4.6	15.7	9.0	5.1	2.0	0.1	0.4	16.5	5.6	4.3	0.6	0.0	0.0	
	Mala Scheme																													
11	Mala	263	65	27	21	122	32	27	121	31	22	130	18	20	43	5	13	52	17	14	12	3	8	17	1	1	18	0	0	
12	Poyya	139	20	12	21	28	14	28	27	10	20	26	6	18	2	0	3	6	0	2	2	1	4	3	1	2	2	0	0	
13	Kuzhoor	63	22	11	10	36	13	10	36	13	10	37	4	11	6	0	2	8	1	0	3	1	0	11	0	0	3	0	0	
14	Annammanada	28	1	4	0	3	8	1	3	8	1	10	5	1	10	6	2	11	8	0	8	4	1	3	0	0	2	0	0	
15	PuthenChira	121	42	17	16	57	18	16	55	15	14	60	6	17	18	6	4	19	6	2	12	3	0	17	2	1	6	0	0	
16	Vellangallor	140	26	59	16	34	60	17	31	50	9	35	26	10	13	10	2	13	11	1	10	4	0	18	4	1	10	0	0	
	Sub Total	754	176	130	84	280	145	99	273	127	76	298	65	77	92	27	26	109	43	19	47	16	13				41	0	0	
	%		23.3	17.2	11.1	37.1	19.2	13.1	36.2	16.8	10.1	39.5	8.62	10.2	12.2	3.58	3.45	14.5	5.7	2.52	6.23	2.12	1.72	0	0	0	5.44	0	0	
	Vakkom-Anjengo Scheme																													
17	Vakkom	75	26	29	0	5	12	0	15	15	0	16	0	0	7	5	1	8	6	1	3	9	0	2	0	0	6	4	0	
18	Kizhuvillam	103	91	48	0	86	41	0	69	25	0	45	2	0	4	0	1	7	39	1	9	1	0	1	0	0	22	1	0	
19	Chirayinkil	135	56	4	0	43	1	0	31	1	0	28	2	0	70	3	2	75	7	2	11	2	0	0	0	0	0	0	0	
20	Kadakkavoor	125	110	4	0	108	4	0	81	3	0	73	1	0	100	3	1	99	3	0	25	2	0	7	0	0	0	0	0	
21	Azhoor	36	2	0	0	0	0	0	0	0	0	6	2	0	8	5	0	22	11	0	1	2	0	0	0	0	0	0	0	
22	Anjengo	109	16	16	0	13	13	0	5	3	0	15	2	1	18	2	0	26	1	1	2	7	0	0	0	0	1	0	0	
	Sub Total	583	301	101	0	255	71	0	201	47	0	183	9	1	207	18	5	237	67	5	51	23	0	10	0	0	29	5	0	
	%		51.6	17.3	0	43.7	12.2	0	34.5	8.06	0	31.4	1.54	0.17	35.5	3.09	0.86	40.7	11.5	0.86	8.75	3.95	0	1.72	0	0	4.97	0.86	0	
23	Thrikkunnapuzha Scheme	119	1	0	2	0	0	1	0	0	1	1	0	1	6	1	2	6	1	2	0	0	0	2	0	1	0	0	0	
			0.84	0	1.68	0	0	0.84	0	0	0.84	0.84	0	0.84	5.04	0.84	1.68	5.04	0.84	1.68	0	0	0	1.68	0	0.84	0	0	0	
24	Cheyyanad Scheme	73	22	13	0	16	13	0	18	3	0	16	6	0	5	1	0	7	3	0	2	0	0	5	1	0	3	0	0	
			30.1	17.8	0	21.9	17.8	0	24.7	4.11	0	21.9	8.22	0	6.85	1.37	0	9.59	4.11	0	2.74	0	0	6.85	1.37	0	4.11	0	0	
25	Koipuram Scheme	83	28	26	0	22	14	0	13	9	0	15	4	0	4	4	0	7	5	0	1	3	0	8	2	1	1	0	0	
	%		33.7	31.3	0	26.5	16.9	0	15.7	10.8	0	18.1	4.82	0	4.82	4.82	0	8.43	6.02	0	1.2	3.61	0	9.64	2.41	1.2	1.2	0	0	
	TOTAL	2394	643	353	127	680	310	126	618	259	103	652	322	117	480	149	69	489	189	66	117	43	16	154	47	36	79	5	0	
	%		26.9	14.7	5.3	28.4	12.9	5.26	25.8	10.8	4.3	27.2	13.5	4.89	20.1	6.22	2.88	20.4	7.89	2.76	4.89	1.8	0.67	6.43	1.96	1.5	3.3	0.21	0	

Appendix IV. 17 REASONS FOR PREFERENCE TO TAP WATER

Sl No	Scheme/Panchayat	PURPOSE																												
		No of		Clear			Like Taste			No Smell			Closer			Large Quantity			Always Available			Only Source			Effortless			Cultural Reasons		
		HH	O	N	P	O	N	P	O	N	P	O	N	P	O	N	P	O	N	P	O	N	P	O	N	P	O	N	P	
Nattika Scheme																														
1	Engandiyoor	82	8	0	63	7	0	55	0	0	7	8	0	51	5	0	82	1	0	6	2	0	36	8	0	50	0	0	0	
2	Mathlakam	78	2	0	59	2	0	52	0	0	5	2	0	55	1	0	98	0	0	6	1	0	19	2	0	56	0	0	0	
3	S N Puram	116	2	0	100	1	0	66	0	0	7	2	0	96	2	0	39	0	0	2	0	0	29	2	0	93	0	0	0	
4	Vadanapally	41	0	0	26	0	0	22	0	0	2	0	0	20	0	0	27	0	0	7	0	0	14	0	0	22	0	0	0	
5	Kaipamangalam	106	4	0	75	2	0	47	0	0	7	4	0	60	4	0	27	0	0	6	0	0	12	4	0	60	0	0	0	
6	Valappad	45	0	0	31	0	0	21	0	0	3	0	0	30	0	0	17	0	0	3	0	0	7	0	0	27	0	0	0	
7	Pernjanam	70	0	0	56	0	0	45	0	0	15	0	0	55	0	0	50	0	0	7	0	0	15	0	0	53	0	0	0	
8	Thalikulam	95	9	0	68	9	0	70	0	0	14	10	0	66	20	0	93	0	0	6	2	0	43	10	0	67	0	0	0	
9	Nattika	79	4	0	56	2	0	46	0	0	8	4	0	47	4	0	20	0	0	0	1	0	26	4	0	45	0	0	0	
10	Edathuruthy	70	3	0	62	2	0	63	0	0	12	3	0	59	5	0	84	0	0	17	2	0	50	3	0	56	0	0	0	
	Sub Total	782	32	0	596	25	0	487	0	0	80	33	0	539	41	0	537	1	0	60	8	0	251	33	0	529	0	0	0	
	%		4.1	0.0	76.2	3.2	0	62.3	0	0	10.2	4.2	0	68.9	5.2	0	68.7	0.1	0	7.7	1.0	0.0	32.1	4.2	0.0	67.6	0	0	0	
Mala Scheme																														
11	Mala	263	6	1	96	9	1	99	4	1	38	12	6	141	0	1	18	1	2	16	7	0	38	5	3	55	0	0	0	
12	Poyya	139	6	0	44	14	0	75	2	0	16	14	0	90	0	1	1	0	0	0	9	0	52	11	0	51	0	0	0	
13	Kuzhoor	63	8	0	33	4	0	30	0	0	11	9	0	42	0	1	0	0	0	0	2	0	9	8	0	34	0	0	0	
14	Annammanada	28	0	0	5	0	0	12	0	0	4	0	0	7	0	1	0	0	0	0	0	0	7	0	0	10	0	0	0	
15	PuthenChira	121	2	0	67	4	0	86	0	0	25	4	0	83	0	1	9	0	0	1	3	0	42	4	0	77	0	0	0	
16	Vellangallor	140	10	1	83	16	1	91	1	1	22	17	1	103	0	1	0	0	0	10	0	40	13	1	99	0	0	0		
	Sub Total	754	32	2	328	47	2	393	7	2	116	56	7	466	0	6	28	1	2	17	31	0	188	41	4	326	0	0	0	
	%		4.24	0.27	43.5	6.23	0.27	52.1	0.93	0.27	15.4	7.43	0.93	61.8	0	0.8	3.71	0.13	0.27	2.25	4.11	0	24.9	5.44	0.53	43.2	0	0	0	
Vakkom-Anjengo Scheme																														
17	Vakkom	75	2	1	25	0	0	4	0	0	2	9	0	31	3	0	17	0	0	2	1	0	8	2	0	2	0	0	0	
18	Kizhuvillam	103	3	1	45	1	0	9	1	0	2	5	0	24	1	0	2	0	1	0	0	0	1	1	0	32	0	0	0	
19	Chirayinkil	135	4	0	63	3	0	62	1	0	33	4	0	14	2	0	5	0	0	3	4	0	43	0	0	4	0	0	0	
20	Kadakkavoor	125	8	0	15	4	0	17	2	0	13	6	0	4	2	0	0	0	0	1	0	8	7	0	3	0	0	0		
21	Azhoor	36	13	0	22	10	0	16	1	0	1	4	0	3	0	0	1	0	0	1	4	0	8	0	0	4	0	0	0	
22	Anjengo	109	11	1	71	8	1	36	0	0	1	8	1	22	0	0	2	0	0	1	0	36	0	0	10	0	0	0		
	Sub Total	583	41	3	241	26	1	144	5	0	52	36	1	98	8	0	27	0	1	6	11	0	104	10	0	55	0	0	0	
	%		7.03	0.51	41.3	4.46	0.17	24.7	0.86	0	8.92	6.17	0.17	16.8	1.37	0	4.63	0	0.17	1.03	1.89	0	17.8	1.72	0	9.43	0	0	0	
23	Thrikkunnapuzha Scheme	119	11	0	74	3	0	43	0	0	24	16	0	37	0	0	1	3	0	4	9	0	70	12	0	25	0	0	0	
	%		9.24	0	62.2	2.52	0	36.1	0	0	20.2	13.4	0	31.1	0	0	0.84	2.52	0	3.36	7.56	0	58.8	10.1	0	21	0	0	0	
24	Cheyyanad Scheme	73	3	0	41	1	0	11	1	0	2	5	0	34	0	0	0	0	0	1	0	16	2	0	22	0	0	0		
	%		4.11	0	56.2	1.37	0	15.1	1.37	0	2.74	6.85	0	46.6	0	0	0	0	0	1.37	0	21.9	2.74	0	30.1	0	0	0		
25	Koipuram Scheme	83	0	0	37	0	0	6	0	0	2	5	0	23	0	0	0	0	0	0	0	25	1	0	17	0	0	0		
	%		0	0	44.6	0	0	7.23	0	0	2.41	6.02	0	27.7	0	0	0	0	0	0	0	30.1	1.2	0	20.5	0	0	0		
	TOTAL	2394	119	5	1317	102	3	1084	13	2	276	151	8	1197	49	6	593	5	3	87	60	0	654	99	4	974	0	0	0	
	%		4.97	0.21	55	4.26	0.13	45.3	0.54	0.08	11.5	6.31	0.33	50	2.05	0.25	24.8	0.21	0.13	3.63	2.51	0	27.3	4.14	0.17	40.7	0	0	0	

Appendix IV 18 REASONS FOR THE DISLIKE OF PIPED WATER SUPPLY SERVICE

SI No	Scheme/ Panchayat	Total		Don't like		Chlorine		Distance		Variable		Uncertain		Days No		Low		Poor SP		Too		Tedious	
		Households		Taste		Smell		to Tap		Supply		Times		Supply		Flow		Condition		Expensive		SP	P
		SP	PC	SP	PC	SP	PC	SP	PC	SP	PC	SP	PC	SP	PC	SP	PC	SP	PC	SP	PC	SP	P
1	Engandiyoor	76	6	12	0	61	6	17	0	38	4	51	5	53	4	19	3	15	0	0	3	16	
2	Mathilakam	77	1	10	0	64	1	8	0	20	0	41	1	49	1	11	1	2	0	0	0	5	
3	S.N Puram	115	1	41	1	102	1	12	0	97	1	96	1	70	1	76	0	35	0	2	0	13	
4	Vadanapally	41	0	8	0	32	0	11	0	20	0	21	0	16	0	4	0	4	0	0	0	7	
5	Kaipamangalam	104	2	35	1	84	2	24	0	59	2	66	1	58	2	43	1	23	1	1	0	10	
6	Valappad	45	0	20	0	39	0	7	0	25	0	30	0	22	0	17	0	8	0	0	0	2	
7	Pennjanam	70	0	10	0	43	0	4	0	39	0	38	0	29	0	12	0	7	0	0	0	0	
8	Thalikulam	85	10	8	1	62	10	11	0	37	6	42	6	24	4	18	0	5	0	0	1	8	
9	Nattika	76	3	15	2	55	3	8	0	57	2	46	2	43	0	16	0	12	0	0	2	8	
10	Edathuruthi	68	2	1	1	55	2	4	0	22	2	43	0	41	2	6	0	5	0	0	0	4	
	Total	757	25	160	6	597	25	106	0	414	17	474	16	405	14	222	5	116	1	3	6	73	
	%			21.1	24.0	78.9	100	14.0	0	54.7	68.0	62.6	64.0	53.5	56.0	29.3	20.0	15.3	4.0	0.4	24.0	9.6	
	Mala Scheme																						
11	Mala	245	18	67	6	143	14	45	1	172	14	146	12	124	12	8	0	6	0	0	0	0	
12	Poyya	122	17	40	1	102	16	15	1	116	17	112	17	119	15	2	0	4	0	0	0	0	
13	Kuzhoor	54	9	20	5	42	9	6	0	48	9	31	8	40	3	0	0	2	0	0	0	0	
14	Annammanada	28	0	4	0	17	0	18	0	20	0	17	0	18	0	0	0	8	0	0	0	0	
15	Puthenchira	117	4	15	0	78	4	18	0	100	4	74	2	96	4	6	0	5	0	0	0	0	
16	Vellangallur	124	16	18	1	90	15	7	0	111	15	72	10	112	16	24	0	13	0	0	0	0	
	Total	690	64	164	13	472	58	109	2	567	59	452	49	509	50	40	0	38	0	0	0	0	
	%			23.8	20.3	68.4	90.6	15.8	3.1	82.2	92.2	65.5	76.6	73.8	78.1	5.8	0	5.5	0	0	0	0	
	Vakkom-Anjengo Schme																						
17	Vakkom	66	9	38	8	52	8	3	0	13	3	13	3	16	3	5	1	19	1	0	0	0	
18	Kizhuvillam	96	7	47	5	73	6	1	0	48	5	49	5	59	5	40	2	17	0	0	0	1	
19	Chiraynkil	130	5	5	1	15	1	11	0	63	5	63	5	58	5	12	0	2	0	0	0	0	
20	Kadakkavoor	114	11	1	7	2	7	1	0	16	9	19	10	16	9	0	0	0	0	0	0	0	
21	Azhoor	22	14	4	6	13	7	6	0	18	10	18	11	12	10	6	8	0	0	0	0	5	
22	Anjengo	97	12	40	2	86	11	5	0	52	9	45	7	40	7	29	3	14	0	0	0	2	
	Total	525	58	135	29	241	40	27	0	210	41	207	41	201	39	92	14	52	1	0	0	8	
	%			25.7	50.0	45.9	69.0	5.1	0.0	40.0	70.7	39.4	70.7	38.3	67.2	17.5	24.1	9.9	1.7	0	0.0	1.5	
23	Thnkunnappuzha Scheme	101	18	57	12	63	15	18	0	78	7	82	7	64	3	70	13	21	0	0	5	11	
	%			56.4	66.7	62.4	83.3	17.8	0.0	77.2	38.9	81.2	38.9	63.4	16.7	69.3	72.2	20.8	0	0	27.8	10.9	
24	Cheriyanaad Scheme	66	7	49	6	55	6	10	0	48	6	53	6	41	3	8	1	9	0	0	1	10	
	%			74.2	85.7	83.3	85.7	15.2	0.0	72.7	85.7	80.3	85.7	62.1	42.9	12.1	14.3	13.6	0	0	14.3	15.2	
25	Koipuram Scheme	78	4	58	4	60	4	5	0	70	4	62	3	56	3	25	0	3	0	0	0	1	
	%			74.4	100.0	76.9	100.0	6.4	0.0	89.7	100.0	79.5	75.0	71.8	75.0	32.1	0.0	3.8	0	0	0	1.3	
	G Total	2217	176	623	70	1488	148	275	2	1387	134	1330	122	1276	112	457	33	239	2	3	12	103	
	%			28.1	39.77	67.12	84.09	12.4	1.14	62.6	76.1	60	69.3	57.6	63.6	20.6	18.8	10.8	1.14	0.14	6.82	4.65	

Appendix IV 19 REASONS FOR LIKING PIPED WATER SUPPLY SERVICE

SI No	Scheme/ Panchayat	Total		Good		Clean/Clear		Closer		Reliable		Always		Good		Good SP		Not		Effortless	
		Households		Taste		Water		to Tap		Supply		Available		Flow		Condition		Expensive			
	Nattika Scheme	SP	PC	SP	PC	SP	PC	SP	PC	SP	PC	SP	PC	SP	PC	SP	PC	SP	PC	SP	PC
1	Engandiyoor	76	6	56	6	64	6	51	5	7	0	7	1	49	4	54	5	69	2	52	6
2	Mathilakam	77	1	53	1	61	1	57	1	4	0	4	0	51	0	59	1	62	1	57	1
3	S N Puram	115	1	69	0	103	1	97	0	16	0	2	1	25	0	72	1	106	0	96	0
4	Vadanapally	41	0	23	0	30	0	24	0	7	0	7	0	28	0	29	0	27	0	23	0
5	Kaipamangalam	104	2	48	1	79	2	59	2	7	0	4	0	19	2	51	0	64	0	61	0
6	Valappad	45	0	21	0	33	0	30	0	8	0	2	0	16	0	27	0	30	0	30	0
7	Perinjanam	70	0	48	0	59	0	53	0	7	0	5	0	46	0	56	0	54	0	53	0
8	Thalikulam	85	10	68	9	69	9	63	10	12	0	7	0	54	2	71	8	76	7	67	10
9	Nattika	76	3	47	1	57	3	48	2	2	0	0	1	35	2	44	2	60	1	53	2
10	Edathuruthi	68	2	64	1	64	2	59	2	16	0	13	0	57	2	59	1	64	1	60	1
	Total	757	25	497	19	619	24	541	22	86	0	51	3	380	12	522	18	612	12	552	20
	%			65.7	76.0	81.8	96.0	71.5	88.0	11.4	0	6.7	12.0	50.2	48.0	69.0	72.0	80.8	48.0	72.9	80.0
11	Mala	245	18	99	5	143	13	161	11	0	1	7	0	3	1	16	0	16	0	27	4
12	Poyya	122	17	78	13	116	16	90	13	0	0	0	0	2	0	1	0	42	7	55	12
13	Kuzhoor	54	9	28	4	45	9	41	9	0	0	1	0	20	2	22	1	27	2	25	6
14	Annamanada	28	0	13	0	24	0	6	0	0	0	0	0	5	0	5	0	13	0	9	0
15	Puthenchira	117	4	87	4	105	4	80	2	0	0	0	0	62	3	70	0	82	4	36	4
16	Vellangallur	124	16	95	15	115	16	105	14	0	0	0	0	62	6	86	1	102	6	56	12
	Total	690	64	400	41	548	58	483	49	0	1	8	0	154	12	200	2	282	19	208	38
	%			58.0	64.1	79.4	90.6	70.0	76.6	0	1.6	1.2	0	22.3	18.8	29.0	3.1	40.9	29.7	30.1	5.5
17	Vakkom	66	9	4	0	37	4	26	6	2	0	0	0	36	7	36	9	10	0	2	0
18	Kizhuvillam	96	7	10	1	49	3	17	2	0	0	0	0	14	4	62	7	13	0	23	4
19	Chirayinkil	130	5	63	4	63	4	17	2	1	0	4	0	1	0	1	0	1	0	3	1
20	Kadakkavoor	114	11	18	3	16	7	4	6	0	0	0	0	0	0	0	0	0	0	3	6
21	Azhoor	22	14	16	9	21	13	4	3	0	2	1	2	1	1	0	0	0	0	3	5
22	Anjengo	97	12	36	7	78	11	17	7	0	0	0	0	27	7	68	11	23	0	1	0
	Total	525	58	147	24	264	42	85	26	3	2	5	2	79	19	167	27	47	0	35	16
	%			28.0	41.4	50.3	72.4	16.2	44.8	0.6	3.4	1.0	3.4	15.0	32.8	31.8	46.6	9.0	0	6.7	27.6
23	Thrikkunnapuzha	101	18	43	3	72	11	38	15	0	0	0	2	0	0	22	0	47	3	26	14
	%			42.6	16.7	71.3	61.1	37.6	83.3	0	0	0	11.1	0.0	0	21.8	0	46.5	16.7	25.7	77.8
24	Cheryanad	66	7	11	1	40	3	34	6	0	0	0	0	2	0	2	0	9	0	24	2
	%			16.7	14.3	60.6	42.9	51.5	85.7	0	0	0	0	3.0	0	3.0	0	13.6	0	36.4	28.6
25	Koipuram	79	4	6	0	33	0	21	4	0	0	0	0	10	0	0	0	0	0	19	0
	%			7.6	0.0	41.8	0.0	26.6	5.1	0	0	0	0	12.7	0.0	0	0	0	0	24.1	0.0
	G Total	2218	176	1104	88	1576	138	1202	122	89	3	64	7	625	43	913	47	997	34	864	90
	%			49.8	50.0	71.1	78.4	54.2	69.3	4.0	1.7	2.9	4.0	28.2	24.4	41.2	26.7	45.0	19.3	39.0	51.1

SURVEY INSTRUMENT
SOCIETY FOR PSYCHO-SOCIAL RESEARCH &
REHABILITATION (PSRR), Thiruvananthapuram 695 004

SURVEY OF WATER USE PRACTICES
IN THE FIRST NETHERLANDS ASSISTED PROGRAMME

Sl. No
Date

I. IDENTIFICATION

House No .
House Name :
Name of Head :
Panchayat .
Ward No
Scheme .

II BACKGROUND INFORMATION

1. Social Status

Sl.No	Religion	Caste/Status			
		Forward Caste	Backward Caste	SC	ST
1	Hindu				
2	Christiam				
3	Muslim				

2. Demography

Age Distribution	Male	Female	Total
Children < 5			
Children 6 - 15			
Adult 16 - 60			
Aged 60+			

3. Educational Status

Level	Male	Female	Total
Illiterate			
Primary			
Secondary			
Graduate			
Post Graduate			

4. Economic Status

0. Very Poor
1. Poor
2. Lower Middle
3. Middle
4. Upper Middle
5. Rich



11. Why do you use each source?

	WELL			TAP			HAND PUMP			Spring	Pond	River/ Stream	Other
	Own	N's	Public	Own	N's	Public	Own	N's	Public				
Clear													
Like the taste													
No Smell													
Closer													
Large quantity													
Always available													
Only source													
Effortless													
Cultural reasons													
Any other													

12. What DO YOU LIKE about the **Pipe Water Supply Service**?

Feature	Good Taste	Clean/Clear Water	Close to Tap	Reliable Supply	Always Available	Good Flow	Good SP Condition	Not Expensive	Effortless	Other
Street Tap										
House Connection										

13. What DO YOU NOT LIKE about the **Pipe Water Supply Service**?

Feature	Don't Like Taste	Clorine Smell	Distance to Tap	Variable Supply	Uncertain Times	Days No Supply	Low Flow	Poor SP Condition	Too Expensive	Tedi-ous	Other
Street Tap											
House Connection											

14. Any other relevent information?

Date:

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