

**A Study on
Water quality and various Chemicals used in Domestic Environment with Special
Reference to Sominaidivalasa of Komarada, M Parvatipuram
District of Andhra Pradesh**



**Community Service Project Report
Submitted in the partial fulfilment for B.Sc. (MCIC) Degree
(2020 – 2023 Batch)**



**Submitted
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Reaccredited by NAAC with "A" grade(3rd cycle)**



CERTIFICATE

This is to certify that the community service project report titled "A Study on Water quality and various Chemicals used in Domestic Environment" with Special Reference to Sominaiduvalasa of Komarada, M Parvatipuram District of Andhra Pradesh is the bonafide work carried out by Register No. 20207002 under my supervision. This work is original and has not been submitted for any other degree or diploma of this or any other university.


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DECLARATION

I hereby declare that the Project report “A Study on Water quality and various Chemicals used in Domestic Environment” with Special Reference to Sominaidivalasa of Komarada, M Parvatipuram District of Andhra Pradesh is my original work and has not been published or submitted for any degree, diploma or other similar titles elsewhere. This has been undertaken for the purpose of partial fulfilment of B.Sc. Degree of Dr. V. S. Krishna Government Degree & PG College (A) Visakhapatnam.

B.Sc. 2nd Year 4th Semester

Regd. No: 20207002

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1. INTRODUCTION

Sominaiduvalasa is an area in the Komarada Mandal of M Parvatipuram district. It is a small under developed village with low literacy and socio-economic backwardness. In order to identify the ground level reality and root causes of the backwardness and to create awareness about the present day economic, environmental and health issues a systematic socio-economic survey is conducted by direct interaction with the household persons with a pre prepared questioner. For this survey 72 houses in this habitation randomly selected and visited. While doing this survey it is observed that people are very much unaware of the hazardous chemicals present in the various consumer products and their effect on human health. Hence a house to house campaigning is conducted and explained the consequences of misuse of various products used in domestic environment and also focused on the misuse of pesticides and fertilizers. data in relation with the type of drinking water and the quantum of different consumer products with active chemicals being used by the people in this habitation is collected and analysed.

1. Profile of the village

1.1. Location and layout : Sominaiduvalasa of Komarada, M Parvatipuram District

1.2. Settlement pattern : Nucleated settlement

1.3. Population : 1951

Male	Female	Total
980	971	1951

1.4. Sex ratio (female: male) : 68:42

1.5. Literacy : 54%

1.6. Occupation : Diversified_ mostly labour some are employed

House wives	Students	Job less	Working
550	400	120	450

1.7. Education : Government school up to class x is present

1.8. Health services : P. H.C. is available

1.9. Electrification : Fully electrified

1.10. Road and transportation: Bus facility is available

1.11. Communication facilities: Good, connected with mobile networks.

2. FINDING OF THE HOUSEHOLD SURVEY

(Socio - Economic Profile of the community)

2.1. Number of houses visited: 72

2.2. Average no of house hold members: All are nuclear families with 1 to 4 members in each family. (At an average of 4)

Number of Houses in which more than 4 family members are present	0
Number of Houses in which 4 family members are present	72
Number of Houses in which 3 family members are present	0
Number of Houses in which 2 family members are present	0
Number of Houses in which only one person	0

2.3. Religion wise distribution of families:

Religion	Number of families
Hindu	69
Christian	3
Muslim	0
Others	0

Caste wise distribution of families

Group	Number of families	Group	Number of families
SC	3	BC - B	1
ST	6	BC - C	6
OC	5	BC - D	48
BC - A	3	BC - E	0

2.4. Age vs Gender distribution:

Age	Below 5 years	6 to 10	11 to 18	19 to 35	36 to 60	Above 60	Total
Male	2	5	39	28	66	5	145
Female	0	5	35	44	59	0	143

2.5. literacy rate: 74 %

Education status	Nursery	1 - 5	6 - 10	Intermediate	Graduation	B Tech	P G	M Phil & Ph.D.	Other professional	Diploma & ITI	Illiterate
Number of persons	0	33	85	33	37	2 3	2	0	0	1	74

2.6. Occupation pattern: **diversified_ mostly labor some are employed**

House wives	Students	Job less	Working
0	25	1	262

2.7. Livestock population

Cows	Buffalos	Sheep	Goats	Hens and cocks
16	8	10	6	47

2.8. Land holding pattern (Agri. Land distribution among families)

Land in Acre	0	0.1 to 1	1.1 to 2	2.1 to 3	3.1 to 4	4.1 to 5	5.1 to 6	>6
Number of families	39	19	5	6	2	1	0	0

2.9. Cropping pattern: 90% of the farmers are small and marginal farmers. The main crops grown by these farmers are Rice, Sugar cane, Vegetables and minor millets. Rice is the major crop and grown mainly in the Kharif season only.

2.10. Housing characteristics:

Type of house	Number
Hut	0
Semi pucca	1
Pucca	70
Apartment	0
Bungalow	1

Number of families living in own house	73
Number of families living in rented house	0

Number of families using own toilets	72
Number of families using community toilets	0

2.11. Cooking fuel

Type of cooking fuel being used in the community	Number of families
Only L P GAS	67
L P GAS & other fuels	2
Wood	0
Electricity stove	0
Kerosene stove	3
Kerosene stove & other	0
Solar stove	0

2.12. Ownership of transport vehicles

Vehicle less	Motor bike	Car	Van	Bus	Auto ricksha
4	61	0	0	0	4

2.13. Entertainment and internet availability:

percentage of families with TV:	98.61%
Number of families with dish connection	86.11%
Number of families with mobile phones:	100%
Number of families with lap top	20.83%
Number of families with internet availability	91.67%
Number of families with broadband connection at home	9.72%
Number of families with tv:	98.61%

2.13.A. Number of t v channels watching regularly

Number of channels	1	2	3	4	5	6	7	8	9	>=10

Number of families	0	0	12	19	19	19	19	19	19	4
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2.14. Government schemes availability

Percentage of families with govt. Arogya sri card:	86.11%
Percentage of families receiving Jagananna Vidhya Deevena	80.56%
Percentage of families receiving Jagananna Vasathi Deevena	80.56%
Percentage of families receiving Raithu Bharosa	77.78%
Percentage of families receiving old age/single women/ physically handicap / kidney disease pension.	1.39%

2.15. Sanitation - Status of drainage system

Number of houses with proper drainage connectivity	69
Number of houses without proper drainage connectivity	3

2.16. Status of health:

Normal. In some families common age-related problems are observed. Haven't noticed any habitation specific health issue.

2.17. Common problems reported by community participants:

- I. Poor sanitation
- II. Worsened roads
- III. Public transport
- IV. Protected water connections to individual families.

2.18. Common problems observed by surveyor:

1. Sanitation and drainage system is a serious issue and needs urgent attention of the authorities.
2. Public transport system should be improved.
3. Adequate supply of Protected drinking water to all families may decrease the water borne diseases in the community.
4. Engaging house wives in the DWCRA related activities i.e. production of commercial goods at home may enhance the economy of the community

3. COMMUNITY NEED ASSESSMENT

3.1. Background

Safe drinking Water is a fundamental human need. Many government schemes are implemented and awareness programmes are conducted to make all the people drink safe water. Despite all the efforts, unsafe drinking water is one of the major causes for health problems even now. Besides unsafe drinking water the chemicals used in domestic environment and their improper disposal is causing health problems. The pollutants from industries and automobiles are well discussed but the domestic pollutants, which are equally hazardous but are given less importance. With the change in the socio-economic conditions, urbanisation and industrialization the use of synthetic chemicals in different domestic activities have been increasing day by day. Every consumer product like tooth paste, soaps, shampoos, nail polish, sun screens, detergents, floor cleaners, toilet cleaners, disinfectants, incense sticks, camphor, dish wash bars, mosquito repellents, cockroach killers, rodenticides, insecticides, pesticides, fertilizers, paints, etc., that we are using contains active chemicals. Even our cooking fuel contains gases that can cause air pollution. These chemicals occupied our daily needs and we are in a situation that we can't avoid these chemicals. We are paying our long-term wellbeing in exchange for temporary comforts. The only solution for this problem is to aware the public regarding the hazards of these harmful chemicals and judicious use with proper care and safe disposal.

3.2. Methodology

For the present study, the researcher concentrated on socio economical back ground, health problems in relation to quality of drinking water and quantum of usage of consumer products with harmful chemicals by the people in the study area. The data for the research study is collected from primary source and sampling a primary survey has been conducted to find out the socio, economic and educational status of women sample household in the study area. The researcher has adopted purposive and random sampling techniques. A structured questionnaire was set up to get the data from households with respect to their socio- economic and quantum of consumer products being used by the people in the study area. The researcher has adopted purposive and random sampling techniques. The researcher randomly selected 72 households from Sominaiduvalasa of Komarada Mandal, M Parvatipuram District and conducted Survey.

3.3. Scientific facts behind community need:

i) water pollution: Water dissolves more substances than any other liquid. However, this ability means that water is easily prone to pollution.

Sewage and wastewater : After being used, water becomes wastewater. Wastewater can be domestic, such as water from toilets, sinks, or showers, or from commercial, agricultural, or industrial use. Wastewater also refers to rainwater that washes oil, grease, debris, or chemicals from the ground into waterways. 80% of wastewater returns to the ecosystem without being treated or reused. The agriculture industry is one of the biggest consumers of fresh water. Agriculture is also the main source of pollution in rivers and streams .

Consuming water contaminated by sewage: The WHO note that, globally, around 2 billion people use a drinking water source with faecal contaminants. Contaminated water can harbour bacteria, responsible for diseases such as diarrhoea, cholera, dysentery, typhoid and, hepatitis A. Chemical pollutants, such as pesticides, fertilizers, and heavy metals can cause serious health problems if ingested. The contaminated water caused rashes, hair loss, and itchy skin. Lead levels in the bloodstream of children who drank the water doubled. A person who ingests chemical toxins in their water can be at risk of: cancer, hormone disruption, altered brain function, damage Trusted Source to immune and reproductive systems, cardiovascular and kidney problems. Swimming in contaminated water can also trigger: rashes, pink eye, respiratory infections, hepatitis.

ii) *Mineral water or R O Water.*

What does Reverse Osmosis filters remove?

RO systems remove contaminants from water including bacteria, viruses, nitrates, sulphates, fluoride, arsenic and much more. But they also remove healthy minerals such as magnesium, calcium, potassium and sodium. Overall RO filters can remove 100s of substances from tap water with a 99% or higher filtration efficiency rate. Some high-pressure professional RO filters such as Blue Water even claim 99.99%.

Low-cost RO filters on the other hand generally have a much lower efficiency. Therefore, it's really important that you look at the independent lab tests and certifications of each specific brand and product.

RO does not remove chlorine or soften the water very efficiently. Therefore, activated carbon filters are almost always required in combination of RO. The activated carbon also helps remove 70+ other contaminants such as pesticides, herbicides, chlorine bi-products, pharmaceuticals and more.

Advantages (pros) of RO filters

Proven technology for pure drinking water

High quality filtration for non-potable tap water with e.g., bacteria or heavy metals

Can make tap water with extremely high mineral content (TDS of 1500 or higher) drinkable

Disadvantages (cons) of RO filtration

Wastes as much as 6x the amount of clean water produced

Requires professional maintenance to ensure effectiveness and safety

Water may taste flat and will make coffee and tea taste worse unless water is remineralised

Removes healthy minerals including calcium, magnesium, potassium and bicarbonates

Relatively expensive

Risk of bacteria growing in the water after the filter since the chlorine has been removed

In 2020 the government of India banned the use of Reverse Osmosis water filters for all water with TDS less than 500 to reduce water and energy waste. According to the World Health Organization, low mineral (TDS) drinking water produced by reverse osmosis or distillation is not suitable for long term human consumption and in fact, can create negative health effects to those consuming it.

iv) Detergents and their facts: Detergent is a cleaning agent which is used for washing or cleaning purposes, in the form of bar, liquid or powder. Detergent has several uses in household and industrial purposes. They are primarily a mix of surfactants having cleansing properties. Even though they are known to be better cleansing agents, detergents also cause several health hazards to those who use it.

Detergent poisoning: When someone accidentally or unknowingly inhales or swallows these cationic or anionic detergents, poisoning occurs. Poisoning ingredients may include benzalkonium chloride acid.

Few symptoms of detergent poisoning are: Skin irritation, Necrosis in the skin or tissue, breathing problem, Throat swelling, Low blood pressure, Loss of vision, burning sensation of eyes, nose, lips, ears, tongue, Vomiting, Abdominal pain, Blood in stools, Affect reproduction organs and foetal development.

Many detergents contain optical brighteners such as chlorine bleach or sodium hypochlorite which are used to convert UV light wavelengths to visible light; this will help making the clothes appear white.

It can cause allergic reaction when in contact with skin and is also an eye and lung irritant.

Detergents contain certain artificial fragrances made from petroleum products that provide a fragrance to clothes after washing.

These fragrances are allergic and highly irritating to lungs causing serious health hazards to the people with asthma or chronic heart problems.

Most Indian advertisements on detergents propagate the use of fragrance in their products, because the customers always stay in an illusion that their clothes are dirt free because their clothes smell good.)

v) Incense stick pollution : Here is how incense stick pollution can take a toll on your health: The emissions are highly toxic to cells and can cause changes in DNA and genetic level eventually

leading to mutations. These mutations might be responsible for the development of certain forms of cancer. Particulate matter and allergens produced by the incense sticks pollution interact with the skin and can cause skin allergies and diseases like dermatitis. The air pollutants and the irritants in the emissions are counted among the primary causes of asthma and inflammation of lungs. Babies and children are highly sensitive to incense sticks pollution. Research studies suggests that a new born child is at a risk of developing leukaemia if the mother is exposed to the incense smoke during pregnancy. Frequent exposure to incense sticks pollution leads to symptoms like regular coughing, sneezing and wheezing.

vi) *Mosquitoes Control Pesticides:* Four pesticides are commonly used for mosquito control. The trade names of these pesticides are scourage, anvil, permethrin and malathion. These affects the central nervous system. pipernyl butoxide used as a synergist and which is classified by the EPA as a possible human carcinogen. Permethrin is also a synthetic pyrethroid insecticide and neurotoxin. It is more acutely toxic to children than to adults. It has been shown to cause immune system damage as well as birth defects. Pyrethroids are highly toxic to fish, crustaceans, and bees. For that reason, Malathion is an organophosphate insecticide that can cause acute and long-term neurological health problems. Malathion is being reviewed by the EPA for its potential as a low-level carcinogen. It is toxic to fish and highly toxic to aquatic invertebrates and amphibians.

vii) *Health Effects of Pesticides.* : Health effects of pesticides can cause both acute and chronic problems. Acute health effects appear shortly after exposure to these pesticides and can include: skin and eye irritations, headaches, dizziness and nausea, weakness, difficulty breathing, mental confusion and disorientation, seizures, coma, and death. Chronic health effects may not be apparent until months or years after exposure. Such health ailments include nervous, reproductive, and immune system disorders, and cancer. Children can be particularly sensitive to exposure to chemicals due to their small body size, immature immune systems and rapid growth cycles. Although everyone is at risk from exposure, the most vulnerable groups are children, pregnant women, the elderly, patients undergoing chemotherapy, and people with compromised immune systems.

viii) *Common chemicals found in household products.*

1. *Hydrochloric acid (HCl):* Also known as muriatic acid, Hydrochloric acid (HCl) has a corrosive effect on human tissues and can cause irreversible contact damage to the skin, eyes, lungs and other internal organs upon contact

2. *Sodium lauryl ether sulphate (or Sodium Lauryl Sulphate, SLES) :* With properties similar to soap, SLES is used to clean stubborn stains in the bathroom—the acid is known to reduce the surface tension of water. However, SLES is a known irritant, that much like HCl, can cause damage to eyes

and the skin. It is advised to wear protective wear if you are handling the synthetic acid in a concentrated form.

3. Cetrimonium chloride (CTAC) : Another example of a chemical widely used in our toilet cleaners. Cetrimonium chloride or Cetyl trimethyl ammonium chloride can also irritate skin and eyes. Extremely dangerous if swallowed.

4. Sodium hydroxide (NaOH) : Sodium hydroxide is a highly corrosive acid that can cause serious burns to your body. One should always keep a safe distance from the acid and wear protective gear while handling it for NaOH is known to decompose proteins and lipids in our body tissues.

5. Sodium Hypochlorite (bleach) : The bleach comes with a clear warning to keep away from eyes, ears and nose. Of course, you won't use sodium hypochlorite directly, but as an ingredient in your toilet cleaner, it still has the potential to severely irritate your skin and eyes. In such a case, it is best to rush to your physician and seek expert guidance.

You may flush out the liquid, but the traces of acid remain on the seat even after. Plus, the toxic chemicals go down the gutter and, in the lakes, rivers or sea near you and pollute the water bodies, posing as a threat to the ecosystem there.

ix) dishwashing bars/ liquid. :The market offers a wide variety of dishwashing liquids some that promise to clean your utensils in one swipe, others that promise a pleasant fragrance after.

But some base ingredients remain common in most, if not all of these commercial dishwashing liquids. These are the active agents required to clean the grease and stubborn food residue from your plates, cutlery and cookware.

Some active chemicals present in dishwashing liquids are Triclosan, Sodium Lauryl Sulphate (SLES), Disodium EDTA, Phosphates, Formaldehyde. After all, if only water was powerful enough to clean them thoroughly, we wouldn't have opted for soaps anyway. The dishwashing detergents often leave behind a host of hazardous petrochemicals, perfumes, dyes, and animal by-products

The majority of dishwater detergents contain highly toxic ingredients that can cause many adverse reactions if ingested or inhaled. Some of these ingredients have been known to cause CNS (central nervous system) disorders such Multiple Sclerosis, Parkinson's, Alzheimer's, and sudden infant death syndrome. Here's a list of what you are likely to find, but what you won't see listed, in some of today's most popular dishwashing detergents

Source: Wikipedia

4. COMMUNITY NEED SURVEY FINDINGS CONCLUSIONS AND SUGGESTIONS

4.1. Water source for domestic usage

Source	Number of houses
Open well	1
Public tap	1
Bore well	70

Most of the community people are depending on bore wells for their domestic water needs. It is suggested to improve the quality of the water by implementing protected water supply scheme by the gram panchayat administration.

4.2. Quality of the water for domestic activities

Quality	Number of houses
GOOD	43
MODERATE	28
BAD	1

4.3. DRINKING WATER USED

Boiled water	1
Bore well water	37
Open well water	7
Public water supply	13
Mineral water	5

CONCLUSION:
more number of people are drinking unprotected water hence awareness should be given

4.4. water vs joint pains

Families with persons suffering from joint pains	4
Families with no joint pains	68
RO users with joint pains	0
joint pains in non-R O users	4

CONCLUSION:
implies that there is no relation between demineralised water and joint pains

4.5. Mosquito repellents usage per month

Repellent type	Usage	Persons	Average use per month	Conclusion
Mosquito refills used (in ml)	1500	24	63 ml	over use
Mosquito coils used in grams	19800	88	225 grams	optimum usage

4.6. Detergents usage per month

Detergents used in grams	number of persons	Average usage for one person	Conclusion
60400 grams	288	210 grams	optimum usage

4.7. Disinfectants usage per month

Disinfectant with harmful chemical	Qty	Number of people	Average consumption	Conclusion
Acid usage in ml	13500	108	125	optimum usage
Phenyl/ domex/ harpic etc. In ml	31000	248	125	optimum usage
Bleaching powder use in grams	350	28	12.5	optimum usage

4.8. Pesticide usage per Anum

Total agriculture land in acres	Total quantity of pesticides used in litres	Average per acre	Conclusion
59	38	0.6	moderate usage but suggested to avoid and go organic

4.9. Usage of fertilizers

Total agriculture land in acres	Total Quantity of fertilizers used in kg	Average quantity of fertilizers used per acer in kg	Conclusion
59	8325	141	optimum usage

4.10. Disposal of containers/cans/buckets of used hazardous chemicals like pesticides & paints

% Of people reusing	% Of people recycling	% Of people throwing away	Conclusion
32	26	42	Need awareness about their dangerous effects on humans and environment. These must be collected back for recycling

5. COMMUNITY NEED SURVEY FINDINGS CONCLUSIONS AND SUGGESTIONS

5.1. Key Findings: Illiteracy and ignorance are the major causes for all the socio-economic problems. On analysing the data collected during the community need survey the following observations are made.

- i. The community is highly dependent on unprotected water for their domestic needs.
- ii. Large section of older people is suffering from arthritis and when tried to establish the connection between demineralised water and arthritis, the data analysis suggests that no relation.
- iii. Synthetic mosquito repellents with potent neuro toxins are used in optimum quantity but they may have some ill effects on the health of the people.
- iv. The consumption of detergents and harmful disinfectants are used below the global per capita level so they haven't any effect on the primary consumers but their uncontrolled after use entry into environment is a major threat to the sustainability of ambient ecosystem for this community.
- v. The agrarian community has shifted completely to synthetic pesticides and fertilizers and they are not using any organic agricultural practices. Most of the farmers are using synthetic chemicals in prescribed quantities, but ignorant of the proper precautionary measures.
- vi. It is found that the plastic cans, containers, and buckets of consumed pesticides, paints are used in the houses for food and food grain storage by many families. Some people are throwing away these plastics being unaware of their environmental hazards.

5.2. Recommendations:

As a result of this needs assessment, I wish to make following recommendations.

- Proper awareness is an urgent need for this community regarding the quality of the drinking water and the health issues in relation with the unsafe drinking water.
- The people must be enlightened of the precautionary measures to be taken while using the harmful chemical products used in the domestic environment.
- An intensive campaigning for "safe disposal methods of containers of dangerous chemicals like pesticides and paints" must be conducted for the farmers and the house wives.

6. ANNEXURE I : QUESTIONNAIRE

QUESTIONNAIRE FOR S E S	QUESTIONNAIRE FOR C N A
<ul style="list-style-type: none"> ❖ Name of village ❖ Name of Mandal ❖ Name of District. ❖ Door no ❖ Names of the family members ❖ Genders of the family members ❖ Ages of the family members ❖ Education status of the family members ❖ Professions of the family members ❖ Social Status details:(i) Caste: ❖ Religion: ❖ Type of House Building: ❖ Ownership of House Building: ❖ Availability of Agricultural land: _____ acres ❖ Names of crops cultivating: ❖ Cattle: Cows __ Ox __ Buffaloes ____ Sheep/Goats _____ ❖ Availability of own Toilets ❖ Cooking fuel used ❖ Motor vehicles owned ❖ Long-term diseases in the family ❖ Availability of Television set ❖ Availability of Dish connection ❖ Channels Watched regularly: ❖ Availability of Mobile phone ❖ Availability of Laptop ❖ Availability of Internet connection ❖ Availability of Broad band connection ❖ Availability of Govt. Arogya Sri Card ❖ Type of Govt. schemes receiving. ❖ Major problems to be addressed in the village 	<ul style="list-style-type: none"> ➤ Water source for domestic consumption. ➤ Quality of water. ➤ Drinking water source ➤ Is proper drainage system existing for your used water? ➤ Is any of your family members suffering from joint pains (Arthritis) ➤ Water borne diseases encountered in the last few years in the family ➤ Mosquito repellents using and their quantity ➤ Chemical products using as toilet cleaners and their quantity ➤ Pest killers using in your house and their quantity ➤ Quantity of pesticides used per year for all crops (in kg/ lit) ➤ Quantity of Fertilizers used per year for all crops (No of 50 kg bags) ➤ State of awareness regarding disposal of empty containers pesticide and other hazardous chemicals ➤ Names of the medicine frequently used in the family and their quantity









