



Rural Water Supply and
Sanitation Project in
Western Nepal Phase II

2016

ODF revisited – Sanitation in 5,506 Households in Western Nepal



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Contents

1	EXECUTIVE SUMMARY	1
1	INTRODUCTION.....	3
2	METHODOLOGY	4
2.1	Research Design, Objectives, Scope and Limitations.....	4
2.2	Research questions and indicators used.....	5
2.3	Study Area and Sample Size.....	7
2.4	Demographic Overview.....	9
3	RESULTS AND DISCUSSION.....	11
3.1	Toilet Facilities	11
3.1.1	Households with toilets in non-ODF declared wards	11
3.1.2	Households with toilets in ODF declared wards	12
3.1.3	Households with toilets by ethnicity.....	13
3.1.4	Improved and unimproved toilets	14
3.1.5	Improved toilet types.....	15
3.2	Use of Toilets.....	15
3.2.1	Use of improved and unimproved toilets	15
3.2.2	Use of toilet by all family members	17
3.2.3	Use of toilet by age groups	18
3.2.4	Use of toilet by gender.....	19
3.2.5	Use of toilet by caste/ethnic group	20
3.4	Case Silautiya-1 – Situation after 12 months.....	22
3.5	Maintenance of Toilets	25
3.6	Cooking Stoves and Biogas Systems	25
3.7	Washing Facilities.....	27
3.8	Waste Management	28
3.8.1	Solid and liquid waste management.....	28
3.8.2	Cleanliness of the surrounding	29
3.9	Water Availability.....	31
4	CONCLUSIONS AND RECOMMENDATIONS.....	33

List of tables

Table 1 Sanitation and hygiene related indicators used in this study	6
Table 2 Study area and household sample	8
Table 3 Population and population density in the study districts in 2011	9
Table 4 Average HH size and sex ratio in the study districts in 2011	9
Table 5 Socio-economic indicators for the studied districts in 2011.....	10
Table 6 Toilets in ODF declared and non-declared wards by District.....	13
Table 7 Households with toilets in ODF and non-ODF wards by ethnicity	14
Table 8 Use of toilet by caste/ethnic group amongst improved toilet owners.....	21
Table 9 Use of toilet by caste/ethnic group amongst improved toilet owners.....	21
Table 10 Silautiya – 1 sanitation situation in 2015	22
Table 11 Has toilet pit ever been full? Has it ever been emptied?.....	25
Table 12 Households with cooking stoves and biogas systems by ethnicity	26
Table 13 Households with washing platforms and utensil drying racks by ethnicity.....	27
Table 14 Households with solid waste pits by ethnicity	28
Table 15 Clean surrounding and waste pit	30
Table 16 Clean surrounding by district and VDC	30
Table 17 Households with clean surrounding by ethnicity.....	31
Table 18 Households with private tap by ethnicity	32
Table 19 Water easily available and toilet used by all family members.....	32

List of figures

Figure 1 Two approaches to exploring null hypothesis H(0)	4
Figure 2 Approaches to exploring alternative hypothesis H(1)	5
Figure 3 Overview to total sample by district and by ODF-status	7
Figure 4 Households studied by district and by ODF-status	9
Figure 5 Ethnicity and number of the studied households.....	10
Figure 6 Households studied by district and ethnic-caste group	11
Figure 7 Toilets in ODF and non-ODF declared wards	12
Figure 8 Household toilets in non-ODF declared wards	12
Figure 9 Households without toilet in ODF declared wards	13
Figure 10 Households with toilets by ethnicity.....	14
Figure 11 Types of improved toilets	15
Figure 12 Use of improved toilets district-wise	16
Figure 13 Use of improved toilets ward-wise	16
Figure 14 Toilet used by all family members district-wise	17
Figure 15 Toilet use by all family members ward-wise.....	18
Figure 16 Toilet use by age group wise in households with improved latrines.....	19
Figure 17 Toilet users by age and gender in ODF wards.....	20
Figure 18 Case Silautiya-1 – change in 12 months with regards to toilets	23
Figure 19 Case Silautiya-1 – change in 12 months with regards to total sanitation.....	24
Figure 20 Cooking stoves and biogas systems	26
Figure 21 Utensil drying rack and washing platform	27
Figure 22 Waste pits and waste water management	29
Figure 23 Household surrounding cleanliness	29
Figure 24 Water availability	31

**Rural Water Supply and Sanitation Project in Western Nepal Phase II
ODF Revisited - Sanitation in 5,506 Households in Western Nepal**

Abbreviations

DoLIDAR	Department of Local Infrastructure Development and Agricultural Roads
DDC	District Development Committee
GESI	Gender and Social Responsiveness
HDI	Human Development Index
HH	Household
MoF	Ministry of Finance
MoFALD	Ministry of Federal Affairs and Local Development
ODF	Open Defecation Free
RWSSP-WN II	Rural Water Supply and Sanitation Project in Western Nepal Phase II
TBC	Total Behaviour Change
TS	Total Sanitation
VDC	Village Development Committee
WASH	Water supply, Sanitation and Hygiene

Acknowledgement

This study is a result of work done by several persons in the RWSSP-WN II team itself. The study was essentially in-house study, using the enumerators from the District WASH Units. The following persons have been involved in this effort:

- Field research coordinator & data quality supervisor: Kalpana Dishwa
- Data entry team: Monika Ghimire
- Data analysis team: Sanna-Leena Rautanen, Jari Laukka, Kalpana Dishwa
- Reporting: Sanna-Leena Rautanen, Jari Laukka, Sini Pellinen

The findings from this study has been shard in a sector stakeholder workshop on Behaviour Change Communications, held in Kathmandu xx.xx.2015, and published as a RWSSP-WN II Brief xxx and as an article in the journal “Rural Infrastructure”, published by Society for Environmental and Rural Development Engineers (SERDEN), Nepal, in 2016.

1 EXECUTIVE SUMMARY

The core purpose of this study was, as the name suggests, to revisit and verify whether the areas declared as Open Defecation Free (ODF) truly are open defecation free. During the data collection two districts, Gulmi and Nawalparasi, declared District ODF. The study was made in 19 VDCs and 4 municipalities, in 27 Wards of which 23 Wards were declared as ODF, in Western Nepal. Out of 5,506 households, 5,009 are located in 23 ODF wards and 497 located in 4 non-ODF wards. The non-ODF wards were selected for a comparison. The survey included both items that can be observed, and items that had to be asked. Therefore, the total sample varies in between the questions and the combinations of questions. This study contributes to further improvement of approaches and tools that work. In particular, the study brought to attention social and age groups, pointing out locations that need to be targeted more rigorously in sanitation campaigning.

➲ Do all have households have a toilet?

The total sample is 5,506 households. Of these, 4,901 households have toilets (89%) and 5,009 (91%) are in the ODF declared wards. Out of those who have toilets, 89% are in the wards declared as ODF. 497 households are in non-ODF declared wards: 237 in Kapilvastu and 260 in Rupandehi. Out of these, 44% have toilets overall, 41% of the non-ODF ward households in Kapilvastu and 47% of those in Rupandehi. Out of all Dalit households, 82% had a toilet, the corresponding figures being 63% of the disadvantaged Tarai Groups households, 74% of the religious minorities households, 96% of the Janajati households and 99% of the advantage groups households.

➲ What kind of toilets?

Practically all who have toilets, have improved toilets. Out of 5,506 observed toilets, 4,880 are improved and only 21 are unimproved. Out of the improved toilets, 52% are single pit, 24% double-pit, 22% have septic tanks, and 2% linked to biogas. Total 811 households reported that the pit had got full and it had been emptied, and only nine that the pit got full but it was not emptied.

➲ Are the toilets used?

Having a toilet does not necessarily mean that the toilet is used. Out of 4,880 households with improved latrine in this study, 96% of the improved latrines are also used. All 21 unimproved latrines are also used. Out of all 4,766 improved latrine owners, 4,567 (96%) reported that the toilet is used.

➲ Are the toilets used by all family members?

Another important question is: are all family members using the toilet? No, they are not. Only 90% out of 4,766 agreed; this is 93% of those households who had first reported that the improved latrine is used. This equals to 297 households where there is an improved latrine that is also reported as used, but not by all family members. In specific wards the situation can be worse. In the worst case where the VDC had been declared ODF and where the expectation was accordingly, we found that only 15% of all households in the ward chosen for this study had a latrine that was also used by all family members.

➲ Which family members are using the toilet?

While in one district it may be the senior citizens that avoid using the toilet even if one is available, in another location it may be the younger generation. The worst situation for the younger generation was in Nawalparasi where only 69% of the children under 5 years old used their toilet. The lowest use within the age category 5-59 is in Kapilvastu where 78% of family members in this age category use

**Rural Water Supply and Sanitation Project in Western Nepal Phase II
ODF Revisited - Sanitation in 5,506 Households in Western Nepal**

the toilet even if the household indeed does have an improved toilet. In the age category 60 or over, the worst figure is again in Kapilvastu where 79% of people in this category use their toilet.

➲ What is the difference gender-wise?

The toilet use data age and gender wise is available only for Nawalparasi and Gulmi districts, both declared ODF. We found no significant difference in between the genders; and conclude that there is a bigger difference in between the age groups rather than in between the genders.

➲ What is the difference ethnic/social/caste group-wise?

Out of all Dalit households, 82% had a toilet, the corresponding figures being 63% of the disadvantaged Tarai Groups households, 74% of the religious minorities households, 96% of the Janajati households and 99% of the advantage groups households.

➲ Did the toilets have water available?

Private tap or hand-pump within the compound was common in Tarai, with 68% of households in Kapilvastu, 65% in Nawalparasi and 81% in Rupandehi having such water facility within their compound, while only 12% in Gulmi had the same.

➲ Are improved cooking stoves and biogas common?

The improved cooking stoves (ICS), considering both gas and stoves with chimney, are not that common. Out of all 5,506 households, 51% (2,807) have ICS. While in Gulmi district 86% of the households had ICS, in Tarai this was much lower with Rupandehi 61%, Nawalparasi 32% and Kapilvastu 29%. Ethnic group-wise differences are clear: within the ‘other advantaged group’, 77% of the households have ICS while only 9% of the disadvantaged Tarai groups and 6% of the religious minorities have the same. Out of all 5,506 households, only 4% (243 households) have a biogas system, Kapilvastu 8%, Gulmi and Nawalparasi 5% and Rupandehi 4%.

➲ Are there washing platforms and utensil drying racks?

Under the concept of washing facilities, the study covers a utensil drying rack (chang) and washing platform. Similarly to the improved cooking stoves, also here only half of the households do have these facilities overall: exactly 50% of 5,506 have a utensil drying rack and 68% have washing platform. The highest percentage of households with utensil drying racks are in Nawalparasi (56%), followed by Rupandehi (55%), Kapilvastu (42%) and Gulmi (20%). On the other hand, Gulmi has the highest proportion of washing platforms (78%), and Kapilvastu the lowest (49%). Ethnic/caste-group wise differences in having or not having these facilities are visible.

➲ What do we conclude from here?

While coverage of improved toilets is higher than expected, their use by all is a challenge: it is just not enough that there is a toilet and that only some of the family members use it. All need to use to get the full benefit of ODF. Post-ODF strategies need to take this as the point of entry: even if declared ODF, and even it seems that all have a toilet, it may still not mean that all use it. There are differences in between the age-groups, and also in terms of caste/ethnic groups. All these call for targeted action since at the moment the most problematic age-groups are not targeted: the elderly and the young. District- and VDC/Ward-wise detailed summaries will also assist in developing meaningful Post-ODF Strategies.

1 INTRODUCTION

Rural Water supply and Sanitation Project in Western Nepal, Phase II (RWSSP-WN II) is a bilateral development cooperation Project funded by the Governments of Nepal and Finland. The Project is implemented under the Ministry of Federal Affairs & Local Development (MoFALD) and executed by the Department of Local Infrastructure Development and Agricultural Roads (DoLIDAR) through the District Development Committees (DDC) in 12 districts for both water supply and sanitation & hygiene and in two districts only for sanitation & hygiene support in Western and Mid-Western Development Regions of Nepal.

RWSSP-WN Phase I (2008-2013) was spearheading the sanitation movement in Nepal by introducing the behavior change triggering and the concept of total behavior change well before many others were even discussing about it. Towards the end of Phase I such deep-rooted practices as sanitation subsidies were still distributed even if the National Sanitation and Hygiene Master Plan 2011 was already advocating for non-subsidy policy. Yet, many Open Defecation Free declarations (ODF) have been made in the subsidy-driven locations. The sustainability of ODF is now an increasing concern when it is evident that not all subsidy-driven locations changed their behavior. RWSSP-WN since its Phase I has published several documents related to its approach to sanitation. The working principles and approaches are not further discussed in this report, but the reader is kindly referred to see the web-site at www.rwsspwn.org.np or other location for the various guidelines, studies and other documents on how the work is done in practical terms

RWSSP-WN Phase II (09/2013-2018) is now driving towards Total Sanitation. Most of the RWSSP-WN II working districts are already declared as ODF districts. As of 15 January 2016, out of 14 working districts of RWSSP-WN II only Rupandehi, Kapilvastu and Palpa are remaining to achieve the ODF status. Yet, Total Sanitation is not possible if its foundation, ODF, is not solid. Post-ODF and total sanitation activities are continued in all working districts to sustain the ODF practice and to achieve the Total Sanitation status. The interest of this study was two-fold:

1. To confirm whether what we expected was true (ODF declared areas are ODF: all have toilet and more importantly, all use toilet, regardless of sex, caste/ethnic group or age).
2. To explore to what extent the study areas have moved beyond ODF only, towards *total sanitation*. Here the focus was more on visually observable items that were used as a proxy for the related behaviour.

This study was seeking to provide insights for the post-ODF phase activities by exploring to what extent the already ODF-declared locations truly are ODF, and to what extent they have already moved towards Total Sanitation as far as the physically observable environmental sanitation issues go. The study focused on observing the following aspects in the household level: toilet facilities and their use by age and gender, maintenance of toilets, cooking stoves, washing facilities, waste management, and water availability. The household level sanitation and hygiene indicators used in the surveys covered most of the total sanitation indicators as described in the Nepal Sanitation and Hygiene Master Plan (2010). Some aspects of the surveys were observable, some relied on a household member being available to answer the questions. The enumerators' aim was to cover 100% of the households within a chosen ward, resulting in some households being observed without presence of any household members. Therefore, total number of answers varies, and for each item the total is always indicated.

2 METHODOLOGY

2.1 Research Design, Objectives, Scope and Limitations

The main research problem for this study stemmed from the question whether wards, VDCs and entire districts are declared as 'Open Defecation Free' without truly having achieved this status. There are numerous global reports available of the merits of declaring 'ODF', both in terms of health outcomes but also in other positive results, such as school success. These benefits are obviously not achieved if the 'ODF' is not true, after all. We wanted to explore with a large sample to what extent ODF is ODF.

The emphasis of this report is in the leading research problem whether '*ODF declared*' corresponds with the households having a toilet and also using it. Is ODF something that is declared regardless of the actual situation, driven by some other motives that the motive of having no open defecation in the locality? This is the null hypothesis $H(0)$ for the statistical analysis of the data: we assume that there is no difference in the datasets for household being located in a ODF declared ward, a household having a toilet and all household members using the toilet. These cases are validated both as a combined set (all at the same time are true) and case-wise against 'ODF declared' as it is also possible that a household does not have a toilet but all family members do use a toilet. In this set up the most important behavior from the 'ODF' point of view is obviously that all family members use a toilet, whether or not it is their own toilet.

This is the spirit of ODF declaration, the desired situation.

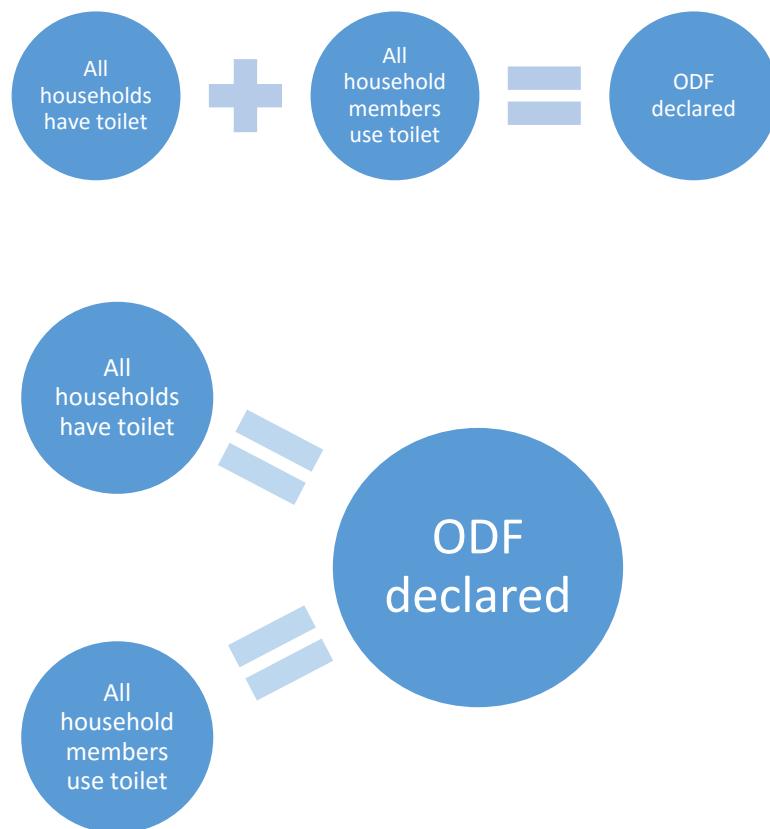


Figure 1 Two approaches to exploring null hypothesis $H(0)$

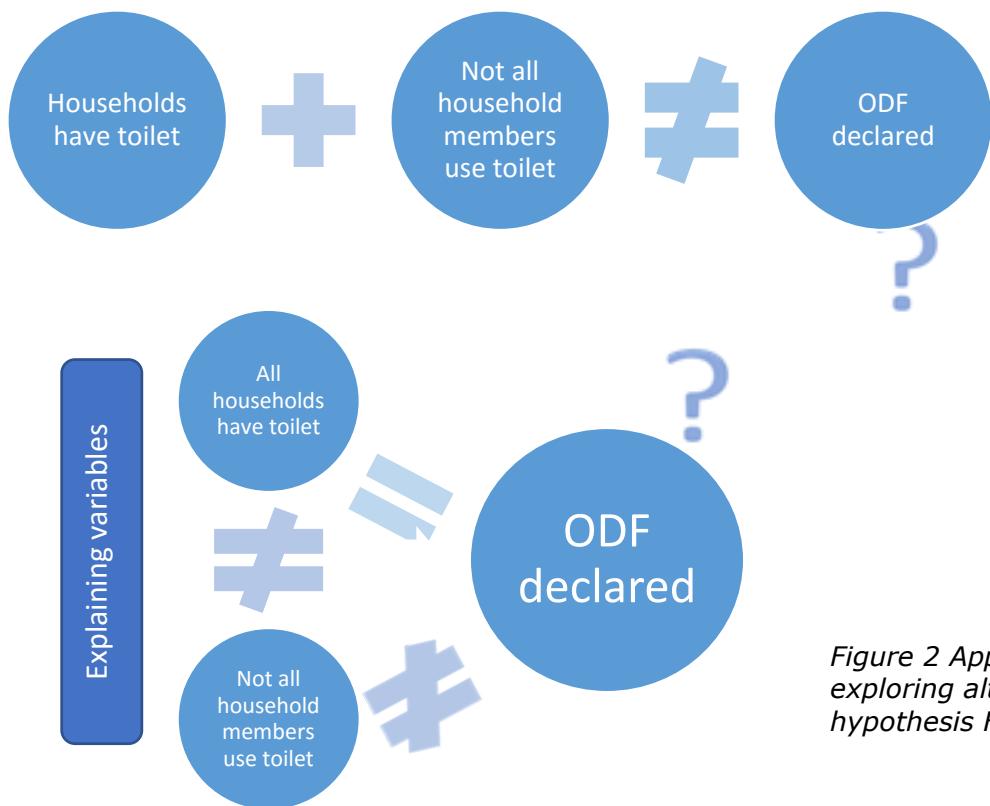


Figure 2 Approaches to exploring alternative hypothesis H(1)

Given that we have a large sample which consists mainly of categorical, dichotomous variables, Chi Square test is used to explore whether there is a difference in between our observed counts and the counts you would expect if there were no relationship at all in the population. A high value for the chi-square statistic means there is a high correlation between your two sets of data, the *p*-value indicating whether the result is significant or not.

2.2 Research questions and indicators used

The selected indicators of the household level sanitation and hygiene for this study covered most of the total sanitation indicators. The study focused on the household level toilet facilities and their use. Data on toilet use is disaggregated by age, gender and ethnicity. Maintenance of toilets, cooking stoves and biogas systems, washing facilities, waste management, and water availability were also observed. The indicators included in the survey are explained in Table 1 below.

RWSSP-WN II Project Support Unit (PSU) prepared the field survey format and mobilized the local enumerators and support persons working in the WASH Unit/DDCs for the data collection at the household level. The data was collected through house-to-house observations and interviews. The enumerators were oriented and closely supervised to ensure quality of data. The survey instruments evolved over the course of study.

The data was collected within a very short time span, representing a cross-sectional research. We now consider repeating the survey in those locations where ODF did not appear to be real ODF, and in those locations that have declared ODF within one year from this study, to explore what, who and why the situation has changed. Specific aspects of the repeated survey in two VDCs are thereby also longitudinal, to be added as an annex to this report when available.

**Rural Water Supply and Sanitation Project in Western Nepal Phase II
ODF Revisited - Sanitation in 5,506 Households in Western Nepal**

Table 1 Sanitation and hygiene related indicators used in this study

Indicator	Definition / remarks
Toilet facilities	By observation
Improved toilets	The household toilet facility data was observed according to technology type. "Improved toilet" is considered as permanent up to the plinth level. The superstructure may be permanent or temporary.
Unimproved toilets	Unimproved toilet is a temporary toilet with simple dug pit and not necessarily covered properly. The number of pits, septic tank and biogas systems were recorded too where available.
Improved toilets with 1 pit	
Improved toilets with 2 pits	
Improved toilets with septic tank	
Improved toilets with biogas	
Use of toilets	By interview
Use of improved toilets	The data on the use of toilets was collected by toilet type, age group and gender (female/male) to see who were using and not-using toilets.
Use of unimproved toilets	
Use of toilet by all family members	The gender wise data is available only for Gulmi and Nawalparasi districts. For the children under 5 years the gender wise data is not available; the answer was considered as 'Yes' if children used the toilet (with or without assistance) or the feces were disposed to the toilet from a potty, nappy etc. by the caretaker.
Use of toilet by male > 60 years	
Use of toilet by female > 60 years	
Use of toilet by male 5-59 years	
Use of toilet by female 5-59 years	
Use of toilet by children < 5 years	
Maintenance of toilets	By interview
Toilet pit full	The users were asked if the toilet pit has ever become full and if so, have they emptied the pit or no. This applies to the improved toilets.
Emptying toilet pit	
Cooking stoves and biogas system	By interview and observation
Improved cooking stoves	Under the concept of improved cooking stove, the survey included LPG stove, biogas stove, or traditional type of improved cooking (smokeless) stove, where the smoke is exhausted out from kitchen. If the household has a biogas system installed (regardless whether it is connect to toilet or no), it was included.
Biogas installed	
Washing facilities	By observation
Washing platform	Washing platform can be made of concrete/stone/wood for washing of hands, utensils, clothes or other.
Utensil drying rack (Chang)	Drying rack is for drying utensils and it can be made of plastic/stone/wood/bamboo or other materials. The purpose is to keep utensils out from the ground after washing them.
Waste management	By interview and observation
Waste pits all	Household garbage may be collected into a pit, which is dug in the ground, or into a container/structure made of stone, mud, cement, or other material and which is in a fixed place and attached to the ground.
One waste pit	
Two waste pits	
Cleanliness of the surrounding	
Waste water used in kitchen gardening/ irrigation	
Water availability	By observation (only Gulmi and Nawalparasi)
Private tap/hand-pump installed	Access to water for toilet use was observed in Gulmi and Nawalparasi districts. Water was defined to be easily available if water fetching time takes maximum of 15 minutes, regardless of the source of water.
Water easily available	In addition, the survey team observed if the household has a private tap or hand-pump within their compound, which indicates that water is easily available for toilet uses and hand washing.

The data was entered into Microsoft Excel software, and migrated to SPSS from there. The following coding was applied in the survey formats and data entry: yes = 1, no = 2, not applicable = 3, and cannot get information or information missing = 999. During the data entry the field research coordinator

verified any discrepancies and if needed, sent the enumerators back to file to correct the data. At this point also the abandoned households were cut out. The data analysis presented in this report was done both in Excel and in SPSS.

Limitation of the study: There is a general challenge of getting accurate data on sanitation and hygiene practices when applying the interview method. It may be caused by various reasons depending on the enumerator and respondent. Either of them may have difficulties in discussing potentially sensitive personal topics, or letting the enumerator to observe private property. This applies especially to the indicators which cannot be directly observed at the time of data collection such as toilet use by different age groups, toilet pit emptying, or water fetching time. Some indicators were added to the survey format after completing data collection in some districts. Therefore, all data is not available from all districts, see the indicators table above.

2.3 Study Area and Sample Size

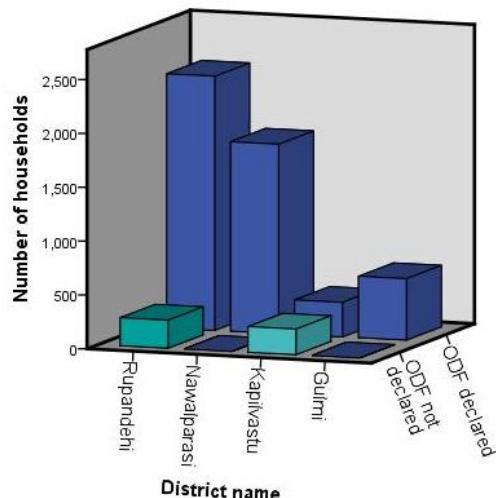
This study is *not* based on random sampling as the leading question was whether the wards and VDCs declared or being declared ODF truly are ODF. Therefore, most of the households included into this study were in the ODF declared wards, aiming to cover all households within the chosen wards. These wards were chosen as recommended by the District WASH Coordination Committees, aiming to cross-check those wards that were most suspected as not being truly 'ODF'.

The study area included three Terai districts (Rupandehi, Nawalparasi and Kapilvastu), and one hill district (Gulmi). The study covered total of 27 wards in 19 VDCs and 4 municipalities. Out of all studied 27 wards, 23 were declared ODF and 4 were non-ODF wards at the time of data collection (June-July 2015). At the time of collecting the data, both Gulmi and Nawalparasi districts were getting ready to declare district ODF. The sample covered all households of each 27 ward. The total number of households covered was 5,517 out of which 5,506 were included into this study (Table 2).

The total number of households covered by the enumerators of this study covered 5,517 households (hh), out of which we included 5,506 into this study. Migrated households, i.e. empty residences, were cut out from the sample even if the enumerators did list these and their names, given that their target was to cover each household in a given location. The survey included both items that can be observed, and items that had to be asked. Therefore, the total sample varies in between the questions and the combinations of questions. The sample wards were selected so that they represent both rural and urban communities located across the districts, including some VDCs located in Indian border.

The ward selection also paid attention to including Religious Minority communities so that data analysis is possible with disaggregated ethnicity. The project requested the districts to choose locations where they have anecdotal evidence that "ODF may not be ODF, after all", given that the main purpose of the study was to assure that the two districts were ready to declare themselves as 'ODF'.

Figure 3 Overview to total sample by district and by ODF-status



**Rural Water Supply and Sanitation Project in Western Nepal Phase II
ODF Revisited - Sanitation in 5,506 Households in Western Nepal**

Majority of the households visited for this study are in the ODF wards as the main purpose of this study was to verify whether 'ODF' truly is 'ODF'. Out of total 5,506 households 5,009 are located in 23 ODF wards and 497 are located in 4 non-ODF wards. The non-ODF wards were selected for a comparison from in Kapilvastu and Rupandehi districts, see the proportions in the Figures 3 and 4.

Table 2 Study area and household sample

District	Name of VDC / Municipality	VDC or Municipality	Wards covered	ODF Status (at the time of data collection)	HHs
Gulmi	Arje	VDC	3	District ODF	56
	Balithum	VDC	1		77
	Bhanabhane	VDC	9		74
	Bharse	VDC	3,4 & 6		139
	Harmichaur	VDC	4		91
	Palikot	VDC	7		61
	Shantipur	VDC	2 & 3		72
Total			10	<i>10 ODF wards</i>	570
Kapilvastu	Baluhawa	VDC	6 & 8	Both wards Non-ODF	158
	Mahendrakot	VDC	4	ODF	129
	Rangpur	VDC	4	Non-ODF	79
	Shivagadhi	VDC	1	ODF	53
	Sishwa	VDC	3	ODF	138
Total			6	<i>3 Non-ODF & 3 ODF wards</i>	557
Nawalparasi	Hakeui	VDC	3	District ODF	165
	Porseuni	VDC	3		322
	Ramgram	Municipality	13		268
	Ratanpur	VDC	6		121
	Sanei	VDC	5		74
	Sunwal	Municipality	6		809
Total			6	<i>6 ODF wards</i>	1,759
Rupandehi	Ama	VDC	8	ODF	266
	Devdaha	Municipality	7	ODF	660
	Jogada	VDC	2	ODF	177
	Sainamaina (Parroha)	Municipality	4	ODF	1,257
	Silutiya	VDC	1	Non-ODF	260
Total			5	<i>1 non-ODF & 4 ODF wards</i>	2,620
Grand total	4 districts	19 VDCs & 4 municipalities	27 wards	4 non-ODF wards & 23 ODF wards	5,506

**Rural Water Supply and Sanitation Project in Western Nepal Phase II
ODF Revisited - Sanitation in 5,506 Households in Western Nepal**

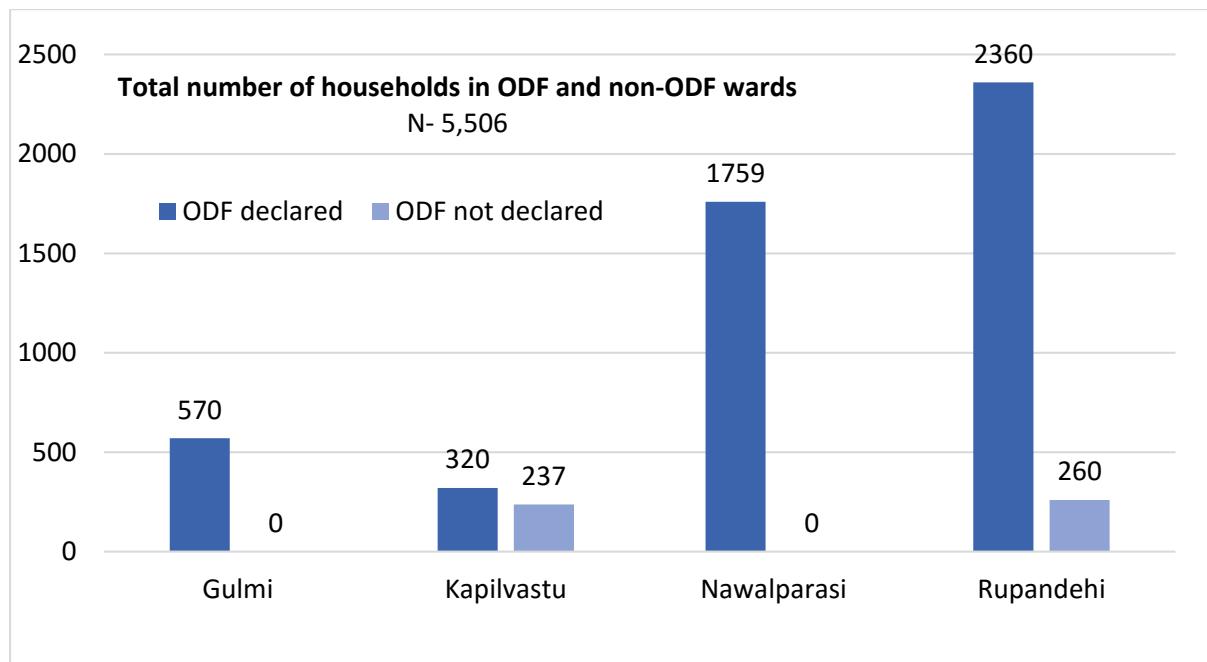


Figure 4 Households studied by district and by ODF-status

2.4 Demographic Overview

Demographic characteristics: Table 3 shows the district wise population and population density. The highest population of the studied districts is in Rupandehi. Generally, the Terai districts have higher population than the hill districts making also the sanitation and hygiene work more challenging due to large size of the communities. The largest households are found in Kapilvastu and smallest in Gulmi when comparing the studied districts in Table 4. The lowest sex ratio is found in Gulmi district.

Table 3 Population and population density in the study districts in 2011

District	Population (2011)	Population density
Gulmi*	280,160	244
Kapilvastu	571,936	329
Nawalparasi	643,508	298
Rupandehi	880,196	647
Nepal total/average	26,494,505	180

Source: Census 2011, referred in District and VDC Profile of Nepal, 2014. *Gulmi became RWSSP-WN working district in the Phase II.

Table 4 Average HH size and sex ratio in the study districts in 2011

Districts	Average HH size	Sex ratio (ratio of males to females)
Gulmi*	4.3	76.0
Kapilvastu	6.3	99.7
Nawalparasi	5.0	89.4
Rupandehi	5.4	96.5
Nepal total/average	4.9	94.2

Source: Census 2011, referred in District and VDC Profile of Nepal, 2014

*Gulmi became RWSSP-WN working district in the Phase II.

**Rural Water Supply and Sanitation Project in Western Nepal Phase II
ODF Revisited - Sanitation in 5,506 Households in Western Nepal**

Social characteristics: Table 5 presents basic socio-economic indicators for the studied districts with comparison to the national figures. The Per Capita Income (Purchasing power parity; the value of all final goods and services produced in a given year, divided by the average population) is lowest in Gulmi and highest in Nawalparasi. The densely populated Terai districts of Nawalparasi and Rupandehi have relatively high per capita income. The life expectancy of 67.6 years of Kapilvastu is the lowest among the studied districts. Also the literacy rate and Human Development Index (HDI) are lowest in Kapilvastu.

Table 5 Socio-economic indicators for the studied districts in 2011.

District	Per Capita Income (PPP \$) *	Average life expectancy at birth (years)*	Literacy Rate (%)**			HDI (Geometric Mean)*
Gulmi	752	68.1	72.6	81.7	65.9	0.464
Kapilvastu	990	67.6	54.9	64.9	45.0	0.432
Nawalparasi	1157	67.8	70.8	79.9	62.8	0.493
Rupandehi	1123	68.3	69.8	79.2	60.8	0.498
Nepal total/average	1160	68.8	65.9	75.1	57.4	0.490

*District and VDC Profile of Nepal – 2014/2015, data from 2011.

** Census 2011.

Ethnicity of the studied households: Figure 5 shows which ethnicities the households surveyed in the study represent. From 19 households the ethnicity data was not available. **Error! Reference source not found.** Figure 6 shows how the sample divided in between the districts. It also shows the total sample size per district. Note that Gulmi as a hill district did not have any “Disadvantaged Tarai groups” or “Religious minorities” which in most cases means Muslim community. In Tarai districts these two social/ethnic groups were more strongly represented, in Kapilvastu 56% of the households visited belonged to these groups, and 20% of those visited in Rupandehi. In Nawalparasi this group represented only 20% while “Adhidasi/Janajati” represented 41% of the total sample.

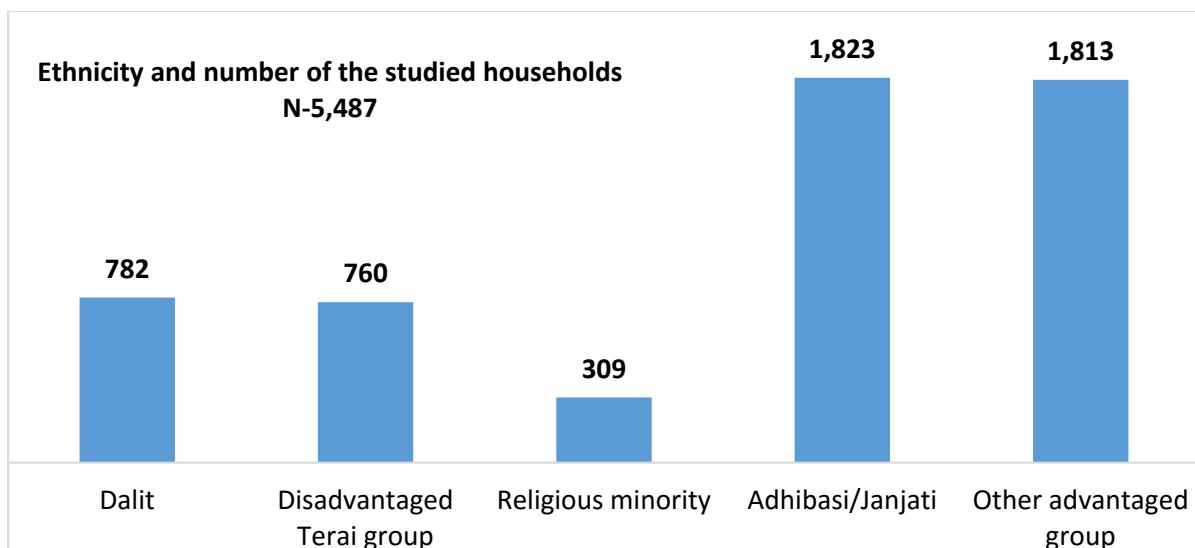


Figure 5 Ethnicity and number of the studied households

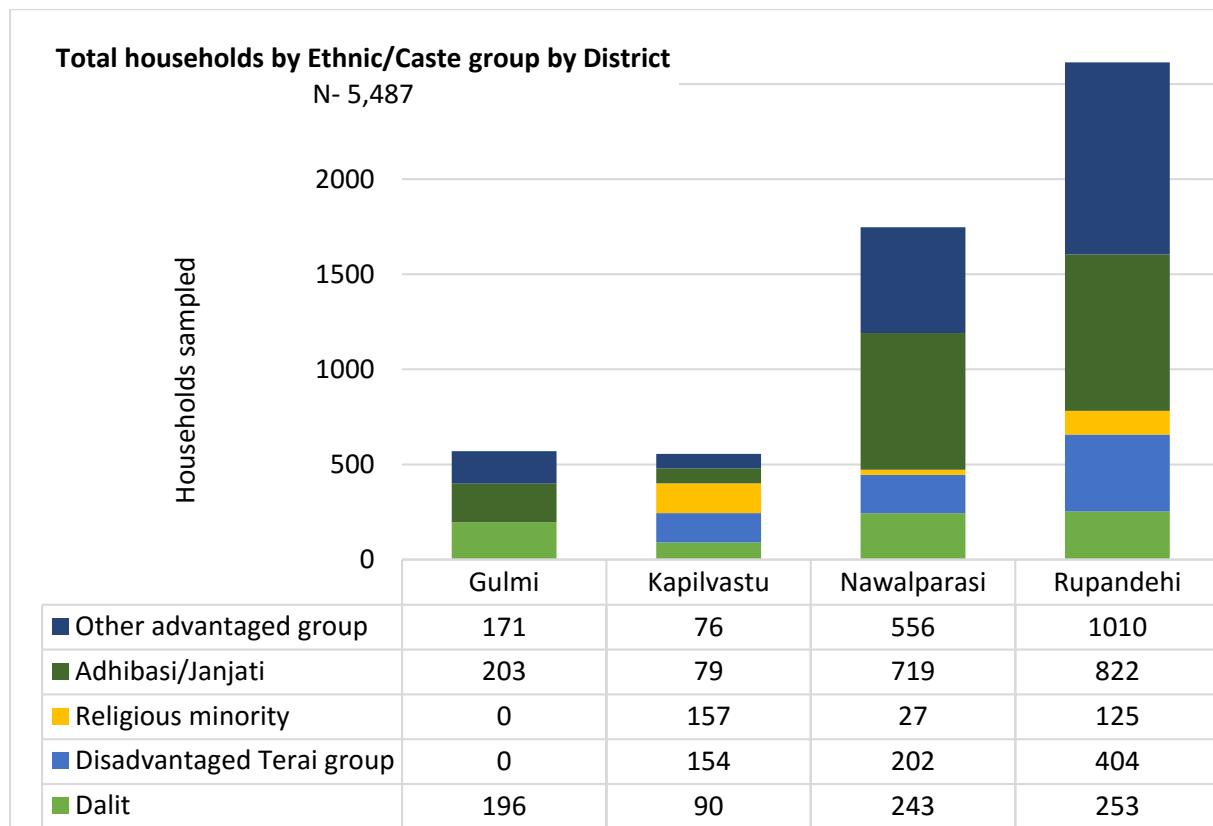


Figure 6 Households studied by district and ethnic-caste group

3 RESULTS AND DISCUSSION

3.1 Toilet Facilities

3.1.1 Households with toilets in non-ODF declared wards

The total sample is 5,506 households. Of these 497 households are in non-ODF declared wards: 237 in Kapilvastu and 260 in Rupandehi. Out of these, 44% have toilets overall, 41% of the non-ODF ward households in Kapilvastu and 47% of those in Rupandehi. As expected, households having toilets in non-ODF wards is clearly less than in ODF wards, but the ward-wise differences are clear. In Rupandehi, 53% out of 260 households in Silaytiya Ward 1, a non-ODF ward, have toilets. In Kapilvastu, Rangpur Ward 5, the corresponding figure is 80%, while in Kapilvastu's Baluhawa Ward 6 it is 33% and Baluhawa Ward 8 it is 69%.

Figure 8 draws the attention to the three non-ODF declared wards that will be considered for the longitudinal re-survey IF these VDCs have planned to declare ODF.

**Rural Water Supply and Sanitation Project in Western Nepal Phase II
ODF Revisited - Sanitation in 5,506 Households in Western Nepal**

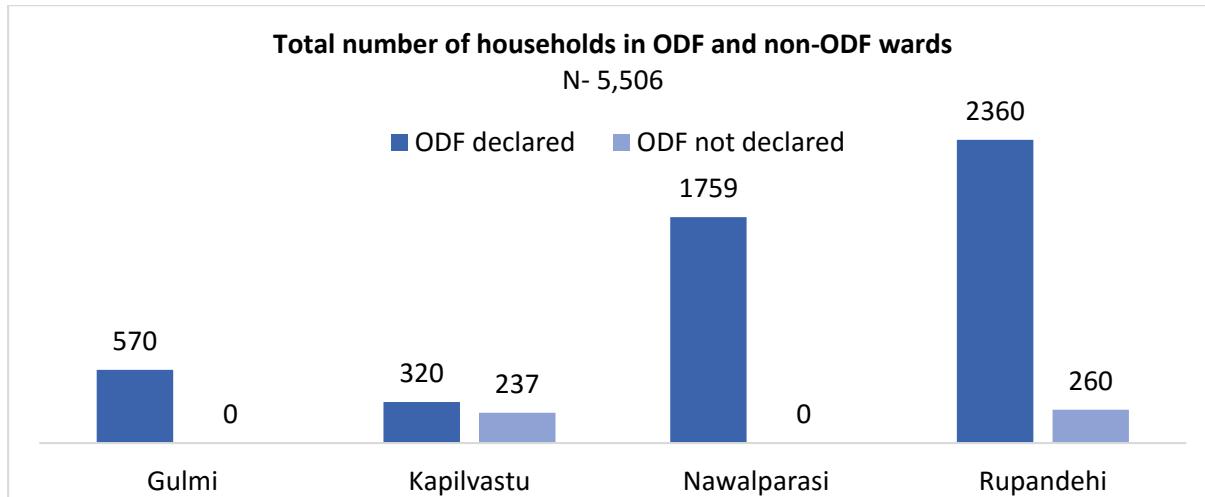


Figure 7 Toilets in ODF and non-ODF declared wards

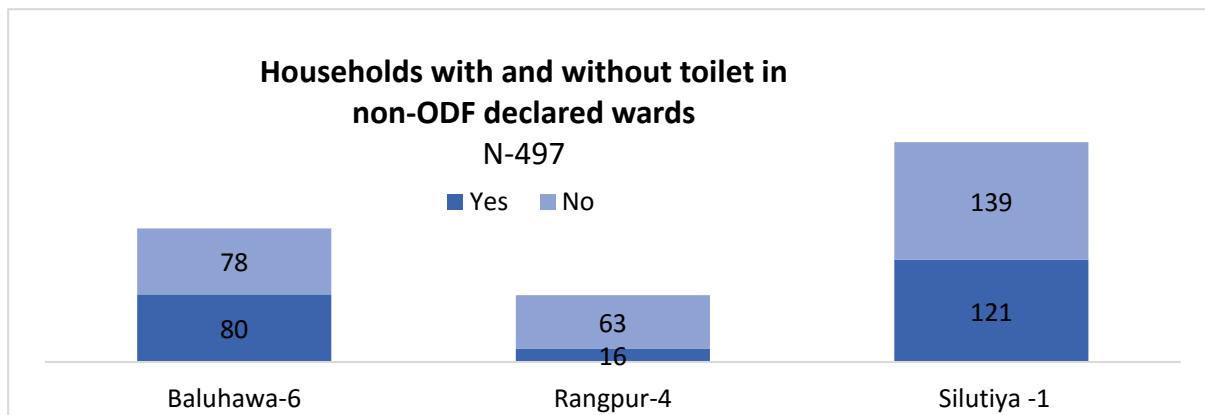


Figure 8 Household toilets in non-ODF declared wards

3.1.2 Households with toilets in ODF declared wards

The total sample is 5,506 households. Of these, 4,901 households have toilets (89%) and 5,009 (91%) are in the ODF declared wards. Out of those who have toilets, 89% are in the wards declared as ODF.

There were *total 5,009 households in the ODF declared locations, out of which 94% had a toilet*. The Phi test statistic for ODF declared and have toilet (N-5,506) is 0.457, being significant at the 0.05 level ($p<0.000$). The most worrying findings are from the ODF declared wards. When comparing the ODF wards district wise, the best figure is in Gulmi district (97% out of 570 hh), followed by Nawalparasi (96% out of 1,759 hh), then Rupandehi (91% out of 2,360 hh) and the lowest in Kapilvastu (89% out of 320 hh). However, in some cases the toilets may be shared: not having a toilet does not necessarily mean that the household members are not using the toilet: they may be using a shared toilet.

Total 27 wards out of 31 in this study were declared ODF. Of these, in four wards all households had a toilet. These were: Arje-3 and Bharse 3 and 4 (in Gulmi district) and Mahendrakot-4 in Kapilvastu. At the time of data collection, only Rupandehi and Kapilvastu had non-ODF VDCs remaining. The worst situation was in *Ama VDC Ward 8, Rupandehi, where after VDC having been declared as ODF, 58% of the sampled 266 households did not have a toilet*. Figure 9 shows that proportionally Ama VDC does have the highest share of households without toilets in ODF declared wards, followed by Sishwa (Kapilvastu) and Devdha (Rupandehi).

**Rural Water Supply and Sanitation Project in Western Nepal Phase II
ODF Revisited - Sanitation in 5,506 Households in Western Nepal**

Table 6 Toilets in ODF declared and non-declared wards by District

District	ODF declared			ODF not declared			Total	
	Have toilet		% - yes	Have toilet		% - yes		
	Yes	No		Yes	No			
Gulmi	555	15	97%	-	-	n.a.	570	
Kapilvastu	285	35	89%	96	141	41%	557	
Nawalparasi	1,685	74	96%	-	-	n.a.	1,759	
Rupandehi	2,159	201	91%	121	139	47%	2,620	
Total	4,684	325	94%	217	280	44%	5,506	

Figure 9 suggests that follow up is needed in Ama VDC Ward 8 as ODF declared VDC and Silaytiya VDC Ward 1 that plans to declare ODF one year after the data was collected, both in Rupandehi district, are selected for the longitudinal survey to explore further what has changed over the past year. See Chapter 3.4 for the Case Silautiya-1 to see how the situation changed.

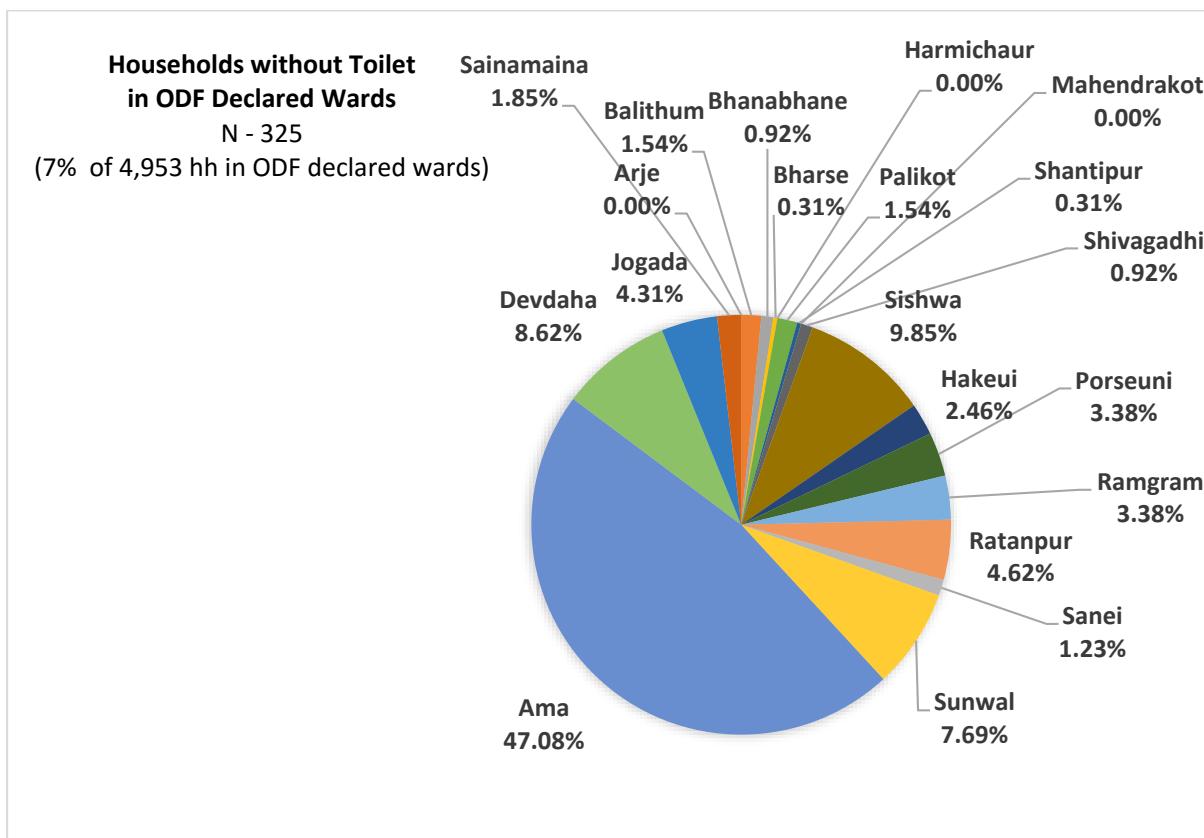


Figure 9 Households without toilet in ODF declared wards

3.1.3 Households with toilets by ethnicity

The total sample of 5,487 households had the ethnicity information available. Within this sample, 89% have a toilet. Figure 10 shows the total counts for households with toilet within each ethnic group. Out of all Dalit households, 82% had a toilet, the corresponding figures being 63% of the disadvantaged Tarai Groups households, 74% of the religious minorities households, 96% of the Janajati households and 99% of the advantage groups households. There was a correlation in between the ethnic groups and a household having a toilet, the Phi test giving 0.404 at Sig. 0.000.

**Rural Water Supply and Sanitation Project in Western Nepal Phase II
ODF Revisited - Sanitation in 5,506 Households in Western Nepal**

There are very clear ethnic group-wise differences when exploring the data further within the ODF declared and non-ODF declared locations, see Table 7. While 99% of the other advantaged group households and 96% of the Janajati/Abidasi households out of total number of households within each group within the ODF declared locations have toilet, only 77% of all the disadvantaged Tarai group households had the toilet (in ODF declared locations). In the non-ODF declared locations the differences are less but still evident. The ethnic group appears to count, and calls for further study on how the behaviour change communications and other approaches could be made more appropriate considering the ethnicity. The targeted action within the group is needed.

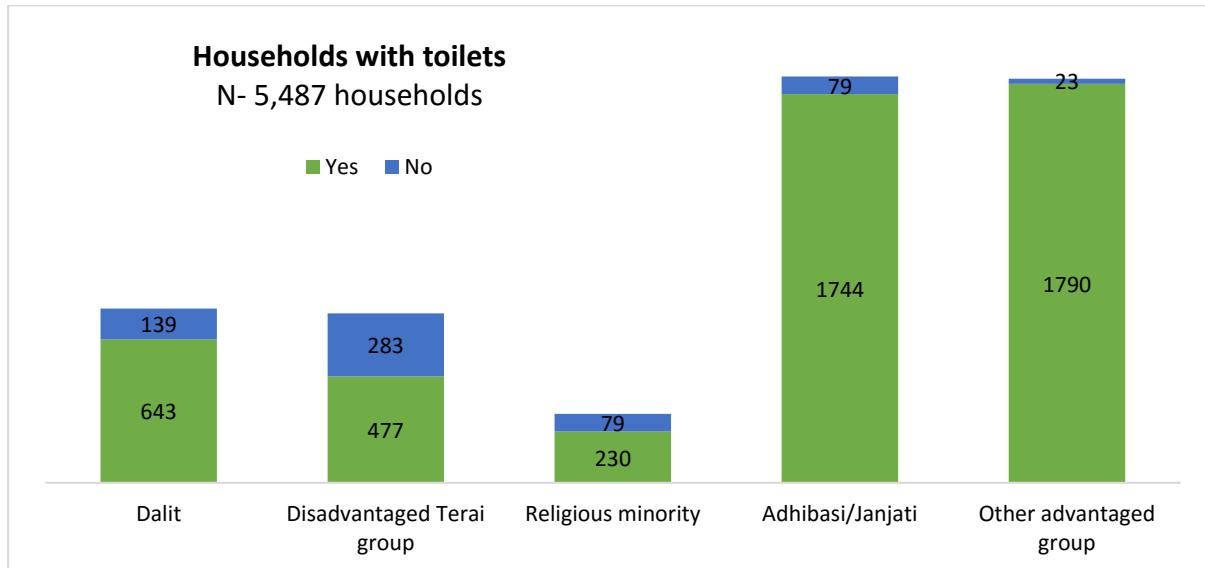


Figure 10 Households with toilets by ethnicity

Table 7 Households with toilets in ODF and non-ODF wards by ethnicity

Ethnicity N-5,487	ODF declared				ODF not declared			
			Have toilet				Have toilet	
	Yes	No	Total	%-yes	Yes	No	Total	%-yes
Dalit	615	90	705	87%	28	49	77	36%
Disadvantaged Terai group	355	104	459	77%	122	179	301	41%
Religious minority	178	37	215	83%	52	42	94	55%
Adhibasi/Janjati	1,736	75	1,811	96%	8	4	12	67%
Other advantaged group	1,783	17	1,800	99%	7	6	13	54%
Total	4,667	323	4,990	94%	217	280	497	44%

3.1.4 Improved and unimproved toilets

The data shows that almost all the household toilets are improved. Out of total 5,506 toilets that were observed in the study, only 21 (0.4%) are unimproved ones. In the 4 non-ODF wards selected for the study, all household toilets are improved ones. The data includes both ODF and non-ODF wards. Overall, the difference in toilet type (improved or unimproved) when compared between districts is not significant. The unimproved toilets were in 7 wards out of 31, the Sainamaina municipality ward 4 having the highest ward-wise number of unimproved toilets: 10. However, the total number of households observed in Sainamaina was also the highest, total 1,257 households. The total number of unimproved toilets was thereby less than 1%. *All unimproved toilets were used.*

3.1.5 Improved toilet types

Figure 11 presents the types of improved toilets in percentages: single pit, double pit, septic tank and biogas toilets. As discussed above, the sample consists of total of 4,880 improved toilets. The most common type of improved toilet is the single pit toilet with 2,542 counts (52%), followed by the double pit toilet with 1,193 counts (24%), then septic tank toilets with 1,070 counts (22%). The least common type is the biogas toilet with 75 counts (2%).

Nawalparasi has the highest proportion of double pit toilets – 45% of total 1,685 toilets. In fact, in Nawalparasi single and double pit latrines are equally popular, whereas in all other districts single pit toilet is the most common type of improved toilet. In Rupandehi and Gulmi, the septic tank is the second most common type of improved toilet after the single pit toilet. In Gulmi, only 6% of improved toilets are double pit type. Biogas toilets are observed only in Gulmi (5%) and Nawalparasi (3%); in the sample of Kapilvastu (total of 379 for all types) and Rupandehi (total of 2,272 for all types) there were no biogas toilets at all. The single pit toilet is challenging in long-term when considering the emptying of the full pit.

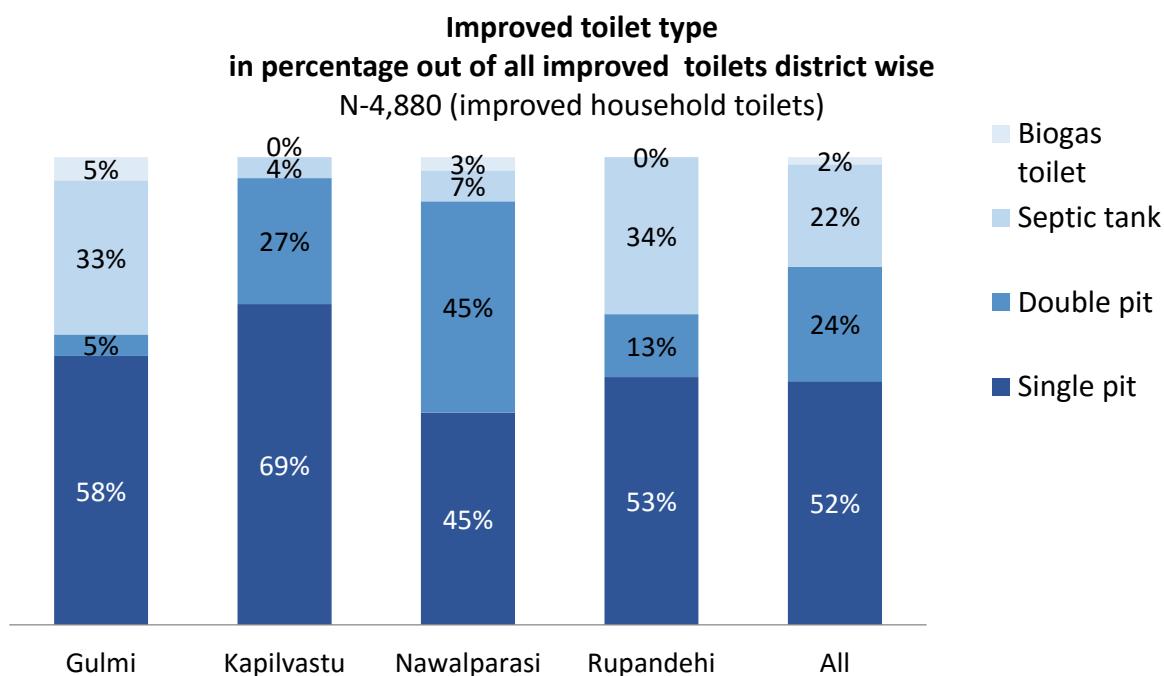


Figure 11 Types of improved toilets

3.2 Use of Toilets

3.2.1 Use of improved and unimproved toilets

Having a toilet alone does not reveal the true ODF-status of the area, but toilet use also matters. Figure 12 shows whether the household toilets are used or not. The findings show that overall out of 4,880 households with improved latrines, 96% of the improved latrines are also used. For unimproved toilets the data shows that all of them (21) are in use (100%).

At district-level the differences are clear: while in Nawalparasi 99% of the households with an improved latrine also report it as used, in Kapilvastu the corresponding figure is 83! Figure 13 for the district-wide situation. However, as is evident in Figure 14, at the ward-level the differences are more pronounced. For instance, in Gulmi it seems that practically all unused toilets can be found from one

**Rural Water Supply and Sanitation Project in Western Nepal Phase II
ODF Revisited - Sanitation in 5,506 Households in Western Nepal**

Wards (Shantipur-3). Without Shantipur-3, the improved latrine utilization amongst improved latrine users would be 99.4%! Similarly, in Kapilvastu Baluhawa 6 and 8 bring the overall district figure down: without Baluhawa's situation, the improved latrine utilization at the district level would be 86.6% instead of 83%. The differences are also clear within the VDCs. For instance, in Gulmi, Shantipur-2 had 100% toilet use while Shantipur-3 had 0%! The learning here is that when a VDC or District is planning to declare ODF, it is worth taking full blanket sample of entire wards to get the real picture.

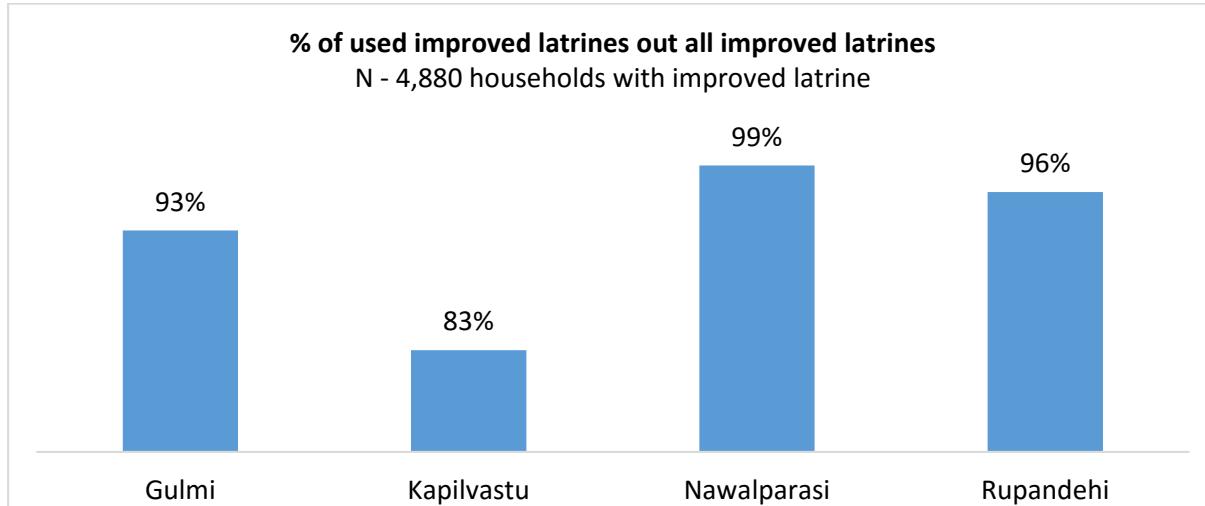


Figure 12 Use of improved toilets district-wise

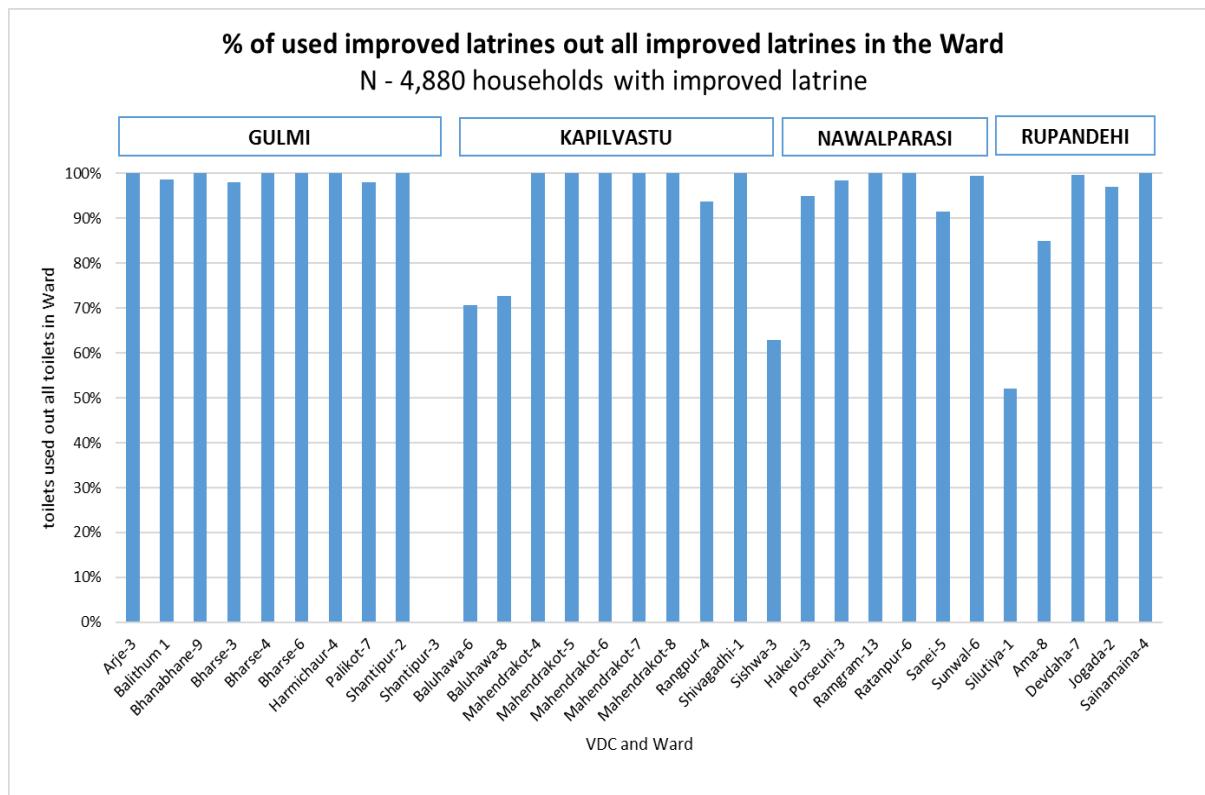


Figure 13 Use of improved toilets ward-wise

3.2.2 Use of toilet by all family members

The survey explored the toilet use practice among the family members. It shows to what extent all family members use the toilets in the households with toilets. Out of total sample of 5,380 households, 4,766 had an improved toilet and 19 unimproved toilet. Since all unimproved toilets were also used by all family members, the following analysis here focuses on improved latrines only.

Out of all 4,766 improved latrine owners, 4,567 (96%) reported that the toilet is used. However, when asking more specifically whether all family members use it, only 90% out of 4,766 agreed. This is 93% of those who had first reported that the improved latrine is used. This equals to 297 households where there is an improved latrine that is also reported as used, but not by all family members.

Figure 14 shows the district-wise difference in between the use of improved latrines and their use by all family members. The total sample constitutes of those who have an improved toilet. In Gulmi there was only one household out of 490 where not all family members were using the latrine even if reported as 'used'. The corresponding figures were 90% in Kapilvastu, 87% in Nawalparasi and 97% in Rupandehi. Similarly to Figure 13 earlier, the ward-wise differences are clear in Figure 15. In 15 wards out of 31 wards all households that had an improved latrine that was used, also reported that all family members use it.

There are four cases where the household reports as not having a toilet, but using one (three households in Silutiya-1 and one in Jogada-2). In Silutiya-1 case not all household members were using these shared toilets, in Jogada-2 all did (1 household). This number is statistically so small that it does not influence the results from the % point of view.

Again such locations as Ama-8 in Rupandehi district stand out. First of all, it was earlier noted that this ward is far from being an ODF ward with only 42% of the households having the latrine. Out of those who have the toilet, only 85% reportedly used it, and out of those, 43% reported that all family members use it. This means that out of all 266 households in Ama-8 where all should have had a toilet, only in 41 households (15%) the situation is as it should be: there is a latrine and all family members use it! Another similar cases can be found from Baluhawa-8, Kapilvastu, where only in 17% of all households.

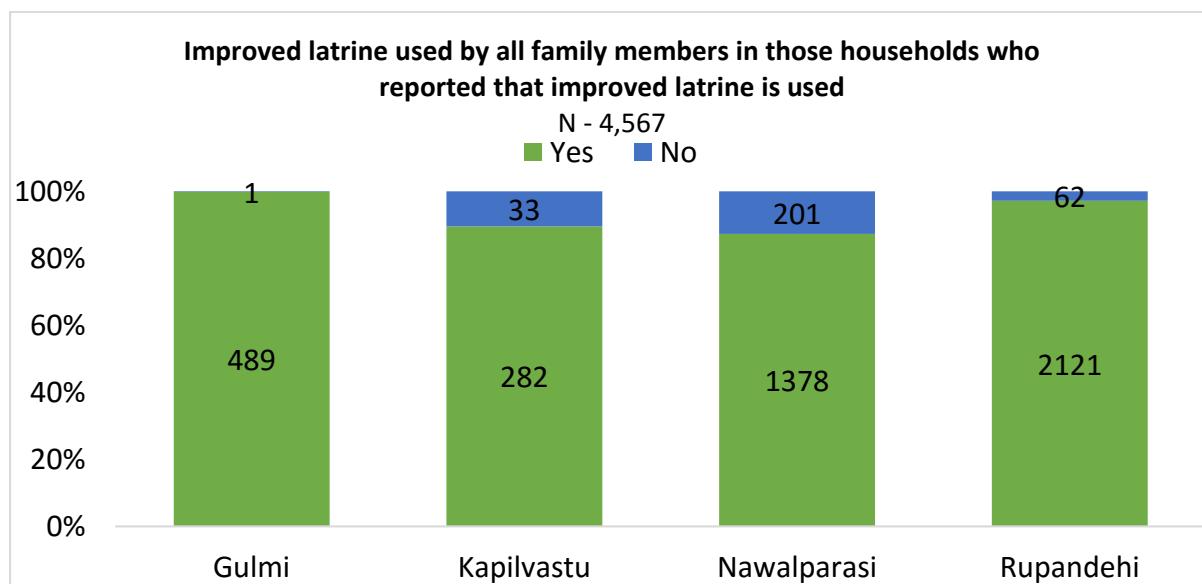


Figure 14 Toilet used by all family members district-wise

**Rural Water Supply and Sanitation Project in Western Nepal Phase II
ODF Revisited - Sanitation in 5,506 Households in Western Nepal**

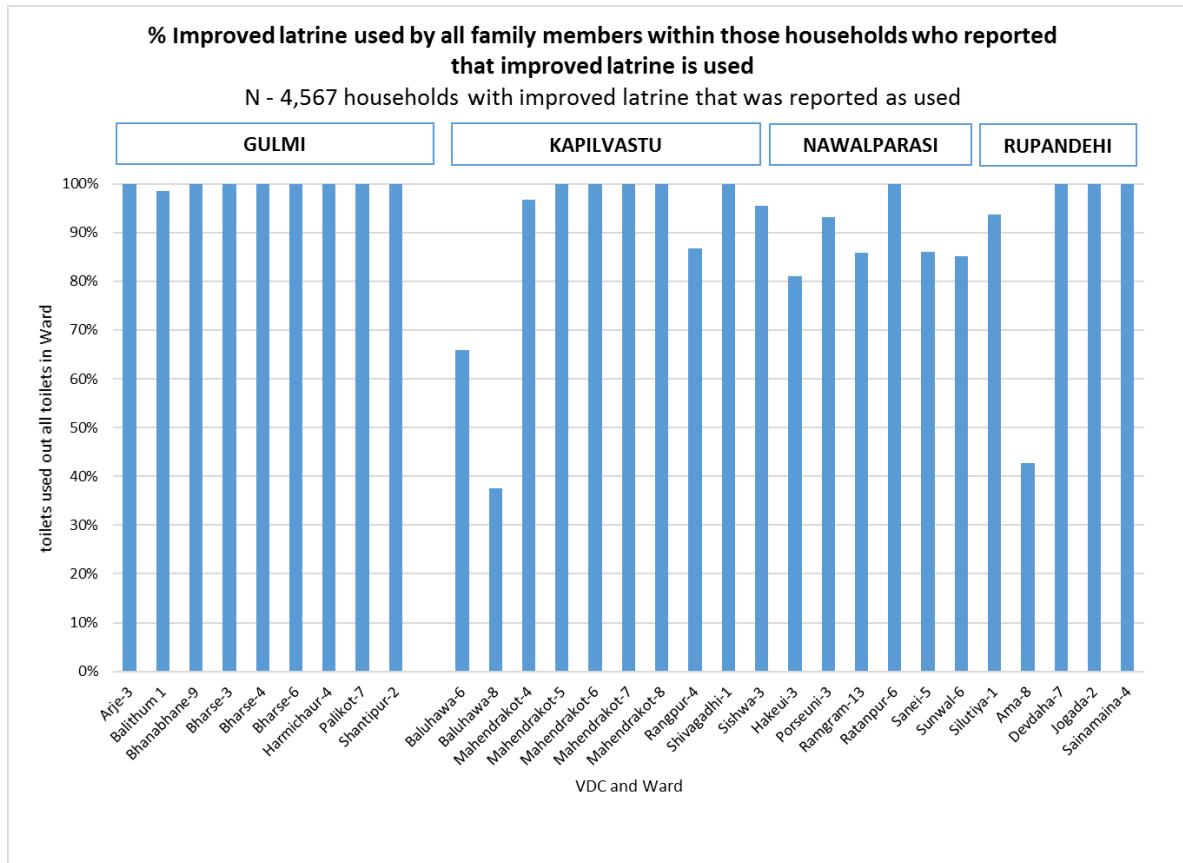


Figure 15 Toilet use by all family members ward-wise

3.2.3 Use of toilet by age groups

The earlier chapters make it clear that ODF is not always ODF in the ideal sense where all households do have a latrine, this is used, and more to it, used by all family members. The findings above call for further analysis who are those family members who are not using the latrine even if there is a one available. This chapter explored the question from the age of family members point of view.

The ratios are calculated out of households having both the toilet and a family member in the respective age group, who also provided the information on the toilet use of the group. This sample consists of only those households who have an improved toilet, given that there are only four cases where there was no latrine but one was used nevertheless, and that those having unimproved toilets also used them. The case of shared toilets will be analyzed separately.

Regarding the toilet use of children under 5 years old, the data was recorded as 'Yes' if the children's feces are disposed to toilet according to the respondent, meaning that the child is assisted in a toilet or feces from a potty or nappy are discarded to the toilet by a caretaker. However, since the data collection was based on interview of people, there is some unreliability factor involved.

In the following, the total sample size is 4,766, i.e. households with improved toilets where the date was available about its use by age group. The data on age-group wise latrine users is available from all four districts. In total, 71% of the households in this group had children under 5 years old, 77% had people 60 or over 60 years old, and 99% people in between 5-59. The gender-wise details are discussed in the following chapter.

Rural Water Supply and Sanitation Project in Western Nepal Phase II ODF Revisited - Sanitation in 5,506 Households in Western Nepal

The total number of households with children under 5 years old is 3,375; the total number of households with 5-59 years old people is 4,766; and the total number of households with 60 or more years old people is 3,675. These are used in calculating the ratios for the toilet use covering both ODF and non-ODF wards (total of all districts). District specific numbers were used for the district ratios. Interestingly, in every single household in Rupandehi and Kapilvastu, there was somebody over 60 and somebody below 5.

Focusing on those households with latrines, Figure 16 shows the district and age-wise differences. Kapilvastu has the worst situation overall, even if in Nawalparasi the use of toilets by children under 5 years old is the worst at 69%. The lowest use within the age category 5-59 is in Kapilvastu where 78% of family members in this age category use the toilet even if the household indeed does have an improved toilet. In the age category 60 or over, the worst figure is again in Kapilvastu where 79% of people in this category use the toilet even if they do have one.

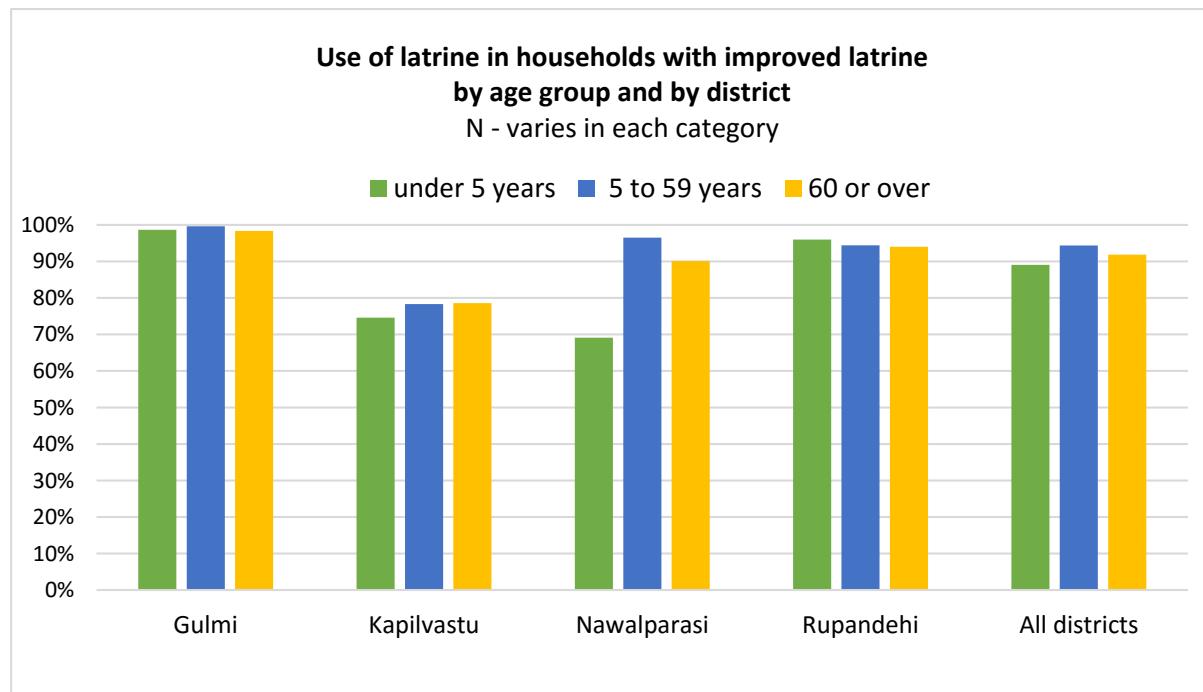


Figure 16 Toilet use by age group wise in households with improved latrines

3.2.4 Use of toilet by gender

The toilet use data age and gender wise is available only for Nawalparasi and Gulmi districts. All sample wards in Gulmi and Nawalparasi are ODF areas. The gender wise data is available only for the people of 5-59 years old and 60 years or more old as it was assumed that children under 5 years old have similar behavior. Similarly to the previous chapter, only households that indeed do have a toilet, are included. Hence, the total number of households with 5-59 years old males is 2,151 and females 2,157. The total number of households with 60 or more years old males is 587 and females 631. The ratios for the total of both districts were calculated out of these numbers.

When considering the total of both districts, the ratio for 5-59 years old males for toilet use is 97% and for females 98%. For the 60 or more years old males the ratio is 91% and for females 92%. The bigger difference can be observed between the age groups than the gender groups. Nawalparasi has slightly lower ratios than Gulmi.

As is evident in Figure 17 below, there is hardly any difference in the toilet use ratio gender wise inside the same age group. Note the range in the figure: it starts from 90% to show the minor differences in between the categories.

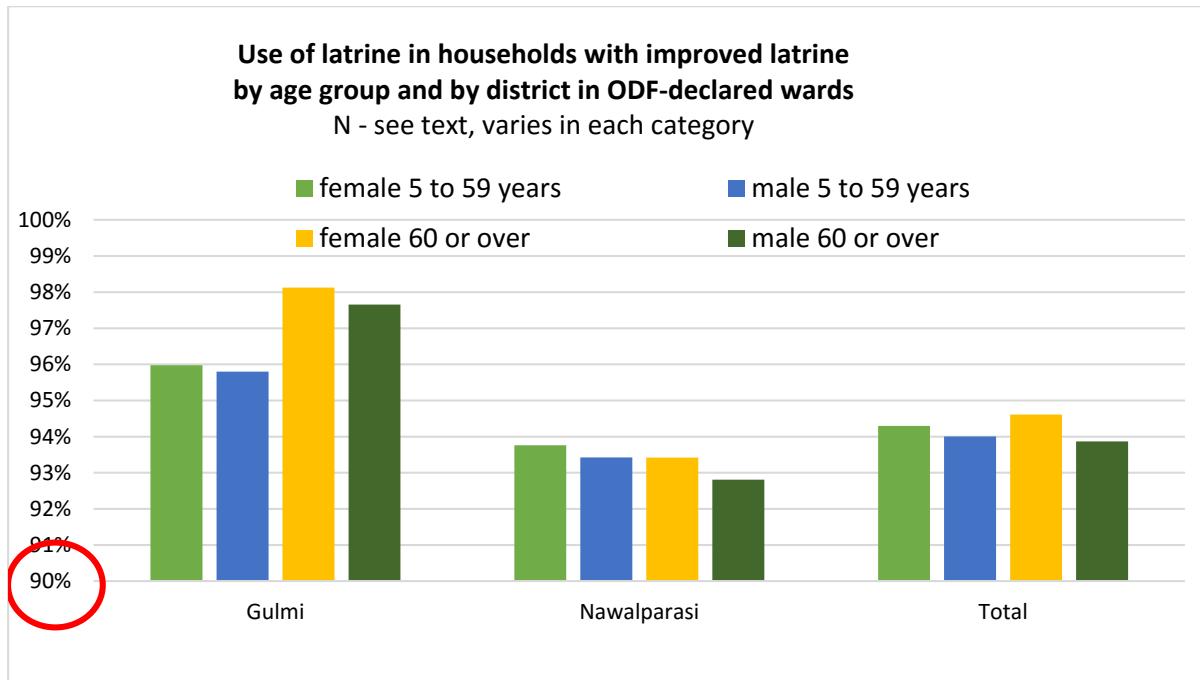


Figure 17 Toilet users by age and gender in ODF wards

3.2.5 Use of toilet by caste/ethnic group

The question is whether the differences in between the different social/ethnic groups are more clear than differences in between VDCs. Does the ethnic/social group explain anything, or is the situation in a given location more dependent on ‘what is going on in the VDC’, i.e. VDC-wide social norms rather than group specific? In Table below the sample consists of only those who have an improved toilet, total 4,863. In an ideal case, in this group, all who have a toilet would also use it, hence, the expectation was that all do use the toilet, i.e. that there is a perfect association in between the two variables. We observed a strong association in between these variables with $\chi^2(4) = 360.643$, $p = .000$.

Both in Table 8 Use of toilet by caste/ethnic group amongst improved toilet owners and in Table 9 Use of toilet by caste/ethnic group amongst improved toilet owners the total sample includes only those households that had an improved toilet. In other words, in both tables the expectation in an ideal case is that since there is a toilet, it is also used. The two table show the subtle difference in between the toilet being used (by anyone) and the toilet being used by *all* family members. Note that the total sample in each table is different – the data with regards to *all* family members using the toilet was available in less number of cases.

In Table 8 out of total sample of 4,658 households with improved toilet, 96% reported that it is used. The ethnic/caste group specific figures vary. For instance, amongst all Dalit households (N-632), 93% reported that it is used. The lowest percentage is within the religious minority group (N-230), where 82% of the toilet owners reported also using it. In Table 9 the users get even less. Now for instance, out of total 4,762 households with improved toilet, 4,267 (90%) report yes on both accounts, that the toilet is used and that the toilet is used by all family members. In this table the disadvantaged Tarai group stands out with 67% of all Disadvantaged Tarai households with improved latrines reporting

**Rural Water Supply and Sanitation Project in Western Nepal Phase II
ODF Revisited - Sanitation in 5,506 Households in Western Nepal**

both that the toilet is used and that all family members use it. None of the ethnic/caste groups were close to 100%, the Adbhidasi/Janajati (94%) and Other advantaged group (95%) having the highest proportions of toilet owners where all family members do use the toilet.

Table 8 Use of toilet by caste/ethnic group amongst improved toilet owners

Ethnic/ caste group	Used Improved toilet		Total	Yes of total
	Yes	No		
	Count	Count	Count	Percentage
Dalit	585	47	632	93%
Disadvantaged Terai group	402	75	477	84%
Religious minority	189	41	230	82%
Adhibasi/Janajati	1,726	11	1,737	99%
Other advantaged group	1,756	31	1,787	98%
Total	4,658	205	4,863	96%
	96%	4%		

Table 9 Use of toilet by caste/ethnic group amongst improved toilet owners

No 4,762 improved latrine users (each household has a toilet)	Used Improved toilet					
	Yes		No		Total	%
	Toilet used by all family members	Toilet used by all family member				
	Yes	No	Yes	No		
Ethnic/caste group	Count	Count	Count	Count	Count	%
Dalit	513	57	12	35	617	83%
Disadvantaged Terai group	319	80	2	73	474	67%
Religious minority	171	16	2	39	228	75%
Adhibasi/Janjati	1,594	87	2	5	1,688	94%
Other advantaged group	1,670	56	24	5	1,755	95%
Total	4,267	296	42	157	4,762	90%
	90%	6%	1%	3%		
Total	4,563		199		4,762	

3.4 Case Silautiya-1 – Situation after 12 months

Silautiya VDC is located in the Southern belt of Rupandehi District. It has a large proportion of Disadvantaged Tarai groups (65%) and Dalit households (22%). Silautiya VDC ward no. 1 was visited twice, first in May/June 2015 and again just before the VDC declared ODF in June 2016. Silautiya-1 is added to this report as an example of the tremendous improvement that can be there within one year only. Tarai Southern belt in Nepal is considered the most challenging part, in many places lacking behind with regards to many development indicators, not only sanitation. For this reason it is even more encouraging to see how Silautiya-1 has changed within 12 months.

Table 10 captures some of the core figures as reported in 2015. At that time, only 47% of the households had a toilet, and even less, 24% out of all 260 households in this ward actually reported that all family members use them. The percentages within the various groups remain very low. Figure 18 shows the change with regards to sanitation and figure 19 with regards to Total Sanitation. A separate Case Silautiya-1 report will be available to explore the change both in quantitative and qualitative terms.

Table 10 Silautiya – 1 sanitation situation in 2015

Silutiya - 1, Household Rupandehi district		Improved toilet				Used Improved toilet				Total 'yes' of all househo lds in group	Group- wise 'yes' out of all househo lds (N- 260)
Caste/ethnic group	# %	Yes No Total				Total 'yes'				#	%
		#	#	#	%	Yes	No	Total	%		
Dalit	58 22%	21	37	58	36	12	9	21	57	21	5
Disadvantaged Terai group	17 65%	78	92	17	46	37	41	78	47	22	14
Religious minority	17 7%	13	4	17	76	10	3	13	77	59	4
Adhibasi/Ja njati	7 3%	4	3	7	57	2	2	4	50	29	1
Other advantaged group	8 3%	5	3	8	63	2	3	5	40	25	1
	26 100 0 %	12	13	26	47	63	58	12	52	24	24
		47	53			52	48				
		%	%			%	%				
						24					
						%					

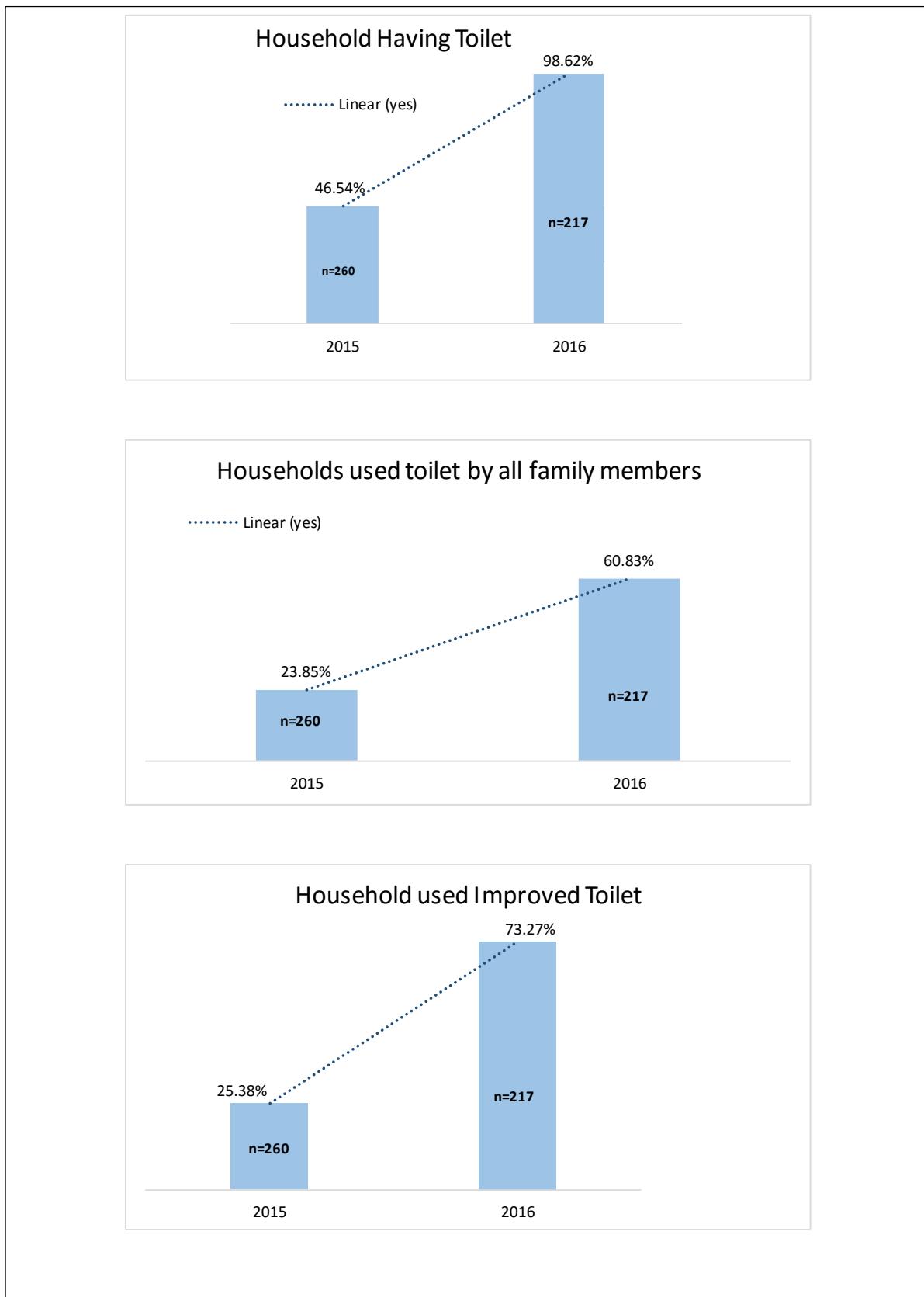


Figure 18 Case Silautiya-1 – change in 12 months with regards to toilets

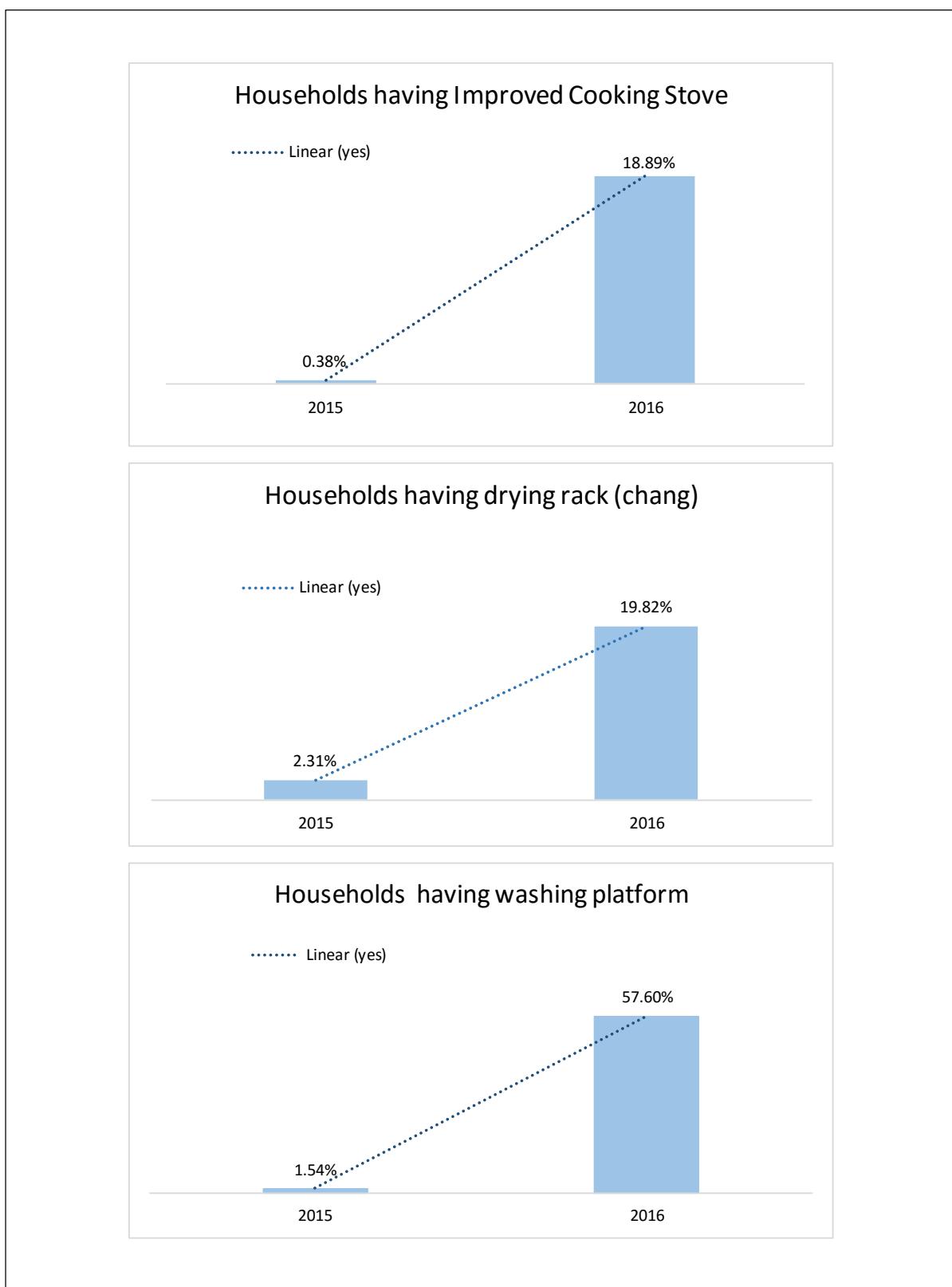


Figure 19 Case Silautiya-1 – change in 12 months with regards to total sanitation

3.5 Maintenance of Toilets

Maintenance of toilets is crucial for sustaining the ODF in the long run. In this survey, the maintenance aspect is focusing whether the toilet pit has become full and if yes, has it been emptied or no. Table 11 presents the totals and percentages of different types of toilets has ever become full. The findings show that out of all toilets, 16.5% (808) have ever become full. The toilet type-wise differences are clear, perhaps indicating the age of these toilets. Two-pit toilets tend to be clearly much older than most of the one-pit toilets that have been constructed over the recent years. The entire sample had very few unimproved toilets. Out of those, only three cases reported that the pit had ever became full, and that it was also emptied. 18 other unimproved toilet users reported that the pit had never been full.

Overall, there were not many pits that were ever full, indicating how most of the toilets are truly something new. The encouraging finding is that those pits are emptied when they do get full, only in nine cases out of 4,901 they were not emptied.

Table 11 Has toilet pit ever been full? Has it ever been emptied?

Type of toilet	Total	Toilet pit ever been full			
		Yes		No	
		% yes	Empty toilet pit (if yes)	Yes	No
Used unimproved toilet	21	14.3%	3	-	18
Improved toilet with 1pit	2,542	13.9%	352	2	2,188
Improved toilet with 2pit	1,193	33.8%	396	7	790
Improved toilet with septic tank	1,070	5.0%	54	-	1,016
Improved toilet with biogas	75	4.0%	3	-	72
Total	4,901	16.7%	808	9	4,084
		100.0%		16.5%	0.2%
					83.3%

3.6 Cooking Stoves and Biogas Systems

Improved cooking stoves, smokeless stoves, are also part of the total sanitation and household hygiene practices. The data collected in this survey regarding the improved cooking stoves and biogas systems of the households are presented in percentages in Figure 20. The data is based on the total number of 5,506 households with the data available about improved cooking stoves and biogas systems.

Out of all 5,506 households, 51% (2,807) have an improved cooking stove installed. In this study the improved cooking stove considers any type of cooking stove which is smokeless. It can be LPG stove, biogas stove or other type of modern or traditional improved, smokeless cooking stove where smoke is exhausted out from kitchen. Gulmi district has the highest ratio of 86% (491 out of 570) households who have an improved cooking stove. The second highest ratio of 61% (1,602 out of 2,620) is in Rupandehi. Nawalparasi has the ratio of 32% (558 out of 1,759) and Kapilvastu has the lowest ratio of 29% (163 out of 557). Figure 20 also shows that out of all 5,506 households, 4% (243 households) have a biogas system. The biogas system may or may not be connected to the household toilet. The highest ratio of household level biogas systems is in Kapilvastu with 8% (43 out of 557). Gulmi and Nawalparasi

**Rural Water Supply and Sanitation Project in Western Nepal Phase II
ODF Revisited - Sanitation in 5,506 Households in Western Nepal**

have 5% ratio (27 out of 570 and 81 out of 1,759 respectively). Rupandehi has the lowest ratio of 4% (92 out of 2,620).

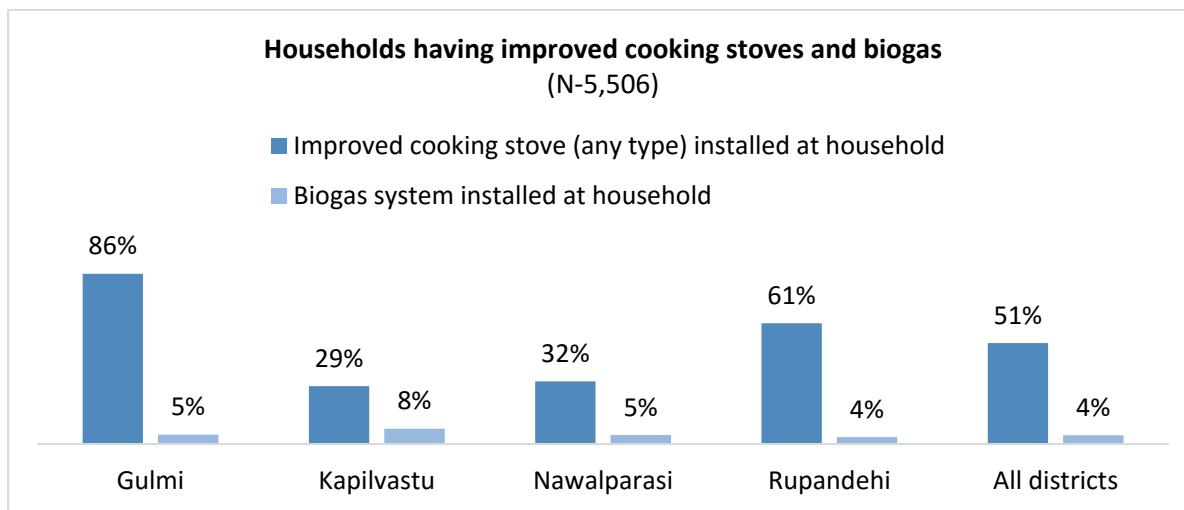


Figure 20 Cooking stoves and biogas systems

The same data is tabulated from other perspective in Table 12 Households with cooking stoves and biogas systems by ethnicity. While overall 51% of the households observed (N=5,487) had an improved cooking stove, there are differences in between the different ethnic/caste groups. The biggest differences in between the ethnic groups are evident with the improved cooking stoves. Within the ‘other advantaged group’, 77% of the households have an improved cooking stove while only 9% of the disadvantaged Tarai groups and 6% of the religious minorities have the same. This is also statistically relevant finding with $p < .000$, Phi-test showing weak relationship in between ethnicity and having improved cooking stove (Phi .489)

Table 12 Households with cooking stoves and biogas systems by ethnicity

Ethnicity	ICS installed			Biogas			Improved toilet with biogas		
	Yes	No	% yes	Yes	No	% yes	Yes	No	% yes
	A	B	A/(A+B)	C	D	C/(C+D)	E	F	E/(E+F)
Dalit	308	474	39%	8	774	1%	4	778	1%
Disadvantaged Terai group	70	690	9%	19	741	3%	3	757	0%
Religious minority	19	290	6%	13	296	4%	1	308	0%
Adhibasi/ Janjati	1,023	800	56%	56	1,767	3%	14	1,809	1%
Other advantaged group	1,387	426	77%	147	1,666	8%	53	1,760	3%
Total	2,807	2,680	51%	243	5,244	4%	75	5,412	1%
	5,487			5,487			5,487		

3.7 Washing Facilities

Under the concept of washing facilities, the study covers a utensil drying rack (chang) and washing platform. The data is available for 5,506 households. A drying rack is for drying utensils and it can be made of plastic/stone/wood/bamboo/other local materials. The main purpose is to avoid keeping utensils directly on ground after washing them. A washing platform can be made of concrete/stone/wood for washing of hands, utensils, clothes or other items. The drainage from these washing platforms is preferably directed to the kitchen garden. Figure 21 shows that 50% of all households (2,756 out of 5,506) have a utensil drying rack. The highest ratio of households is in Nawalparasi with 56% (980 out of 1,759), followed by Rupandehi with 55% (1,429 out of 2,620), Kapilvastu with 42% (273 out of 557) and at last Gulmi with only 20% (114 out of 570).

On the contrary, Gulmi has the highest ratio of households (78%) having a washing platform (445 out of 570). Nawalparasi has the ratio of 73% (1,279 out of 1,759), Rupandehi 67% (1,744 out of 2,620) and Kapilvastu 49% (273 out of 557). For the total of all districts, the ratio is 68% (3,742 out of 5,508). Based on the data, the washing platforms are more common than the utensil drying racks in the household level. Table 13 Households with washing platforms and utensil drying racks by ethnicity draws the attention to ethnic/caste group wise differences. Similarly to improved cooking stoves, in all accounts the data is statistically relevant with $p < .000$. There is a weak correlation in between the ethnicity and utensil drying racks, Phi = 0.407 and for the ethnicity and washing platforms Phi = 0.464.

Percentage of households having utensil drying rack and percentage of households having washing platform district wise
(total number of households with data available 5,508)

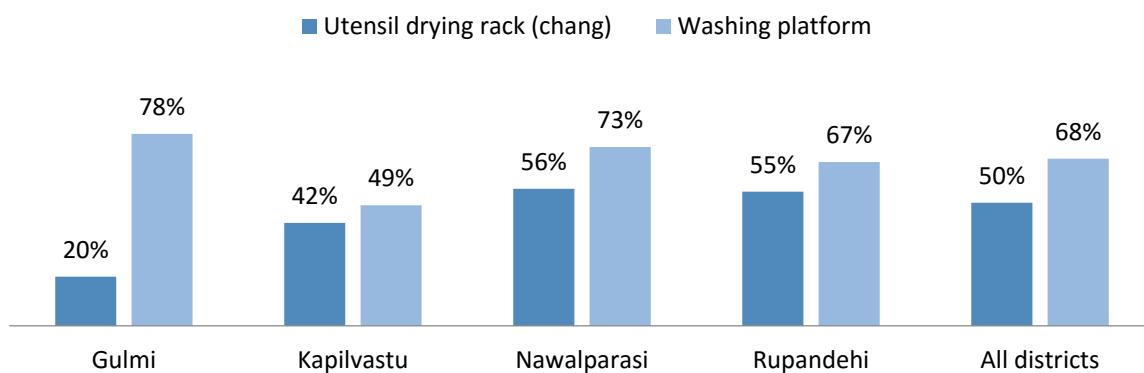


Figure 21 Utensil drying rack and washing platform

Table 13 Households with washing platforms and utensil drying racks by ethnicity

Ethnicity	Utensil drying rack (Chang)			Washing platform			Total
	Yes	No	%-yes	Yes	No	C/E	
	A	B	A/E	C	D	E	
Dalit	251	531	32%	416	366	53%	782
Disadvantaged Terai group	127	633	17%	207	553	27%	760
Religious minority	68	241	22%	132	177	43%	309
Adhibasi/Janajati	995	828	55%	1,338	485	73%	1,823
Other advantaged group	1,310	503	72%	1,635	178	90%	1,813
Total	2,751	2,736	50%	3,728	1,759	68%	5,487

3.8 Waste Management

3.8.1 Solid and liquid waste management

Solid and liquid waste management is one of the total sanitation indicators. Table 14 shows the households with solid waste pit and Figure 22 shows the percentages against each districts' total sample. In total the data was available from the total of 5,506 households. The waste pits are divided into following categories: household having a waste pit system, and more specifically if the system was with one waste pit or two waste pits (enabling thus waste segregation).

The findings show that across all the districts, 25% of households have a waste pit with one pit and only 1.3% have a double pit system. Rupandehi district has a highest ratio of households with any waste pit (37%) out of which 1.7% are double pits systems (45). Kapilvastu has the second highest ratio with 31% (173 out of 557), and 0.2% are double pit systems (1). Nawalparasi has the ratio of 13.8% (242 out of 1,759) with 1.6% double pits (28). Gulmi has the lowest ratio with 10.7% of households having a waste pit system (61 out of 570); no double pit systems in Gulmi.

Table 14 Households with solid waste pits by ethnicity

Ethnicity	Household has a solid waste pit			
	Yes	No	Total	% yes
	A	B	A+B	A/(A+B)
Dalit	124	658	782	19%
Disadvantaged Terai group	86	674	760	13%
Religious minority	40	269	309	15%
Adhibasi/Janjati	474	1,349	1,823	35%
Other advantaged group	730	1,083	1,813	67%
Total	1,454	4,033	5,487	36%
	26%	74%		

Based on the data, ***the waste water management for kitchen gardening is more common than having a waste pit for solid waste disposal***. For all districts, 38% of the households use their waste water for kitchen gardening (2,093 out of 5,506). The highest ratio of 50% is for households in Rupandehi (1,305 out of 2,628). Then is Nawalparasi with the ratio of 30% (529 out of 1,759). Thirdly comes Kapilvastu with 26% (144 out of 557). Gulmi has the lowest ratio of 20% (115 out of 570). Gulmi seems to have lower ratios both in solid and liquid waste management than the three Terai districts.

We expected to see a strong correlation in between having washing platforms and using waste water (drainage) in kitchen gardening for irrigation. Out of all households (5,506), 68% (3,741) have a washing platform, but only 35% (1,909) have the washing platform and use wastewater for kitchen gardens. However, out of all those who do use wastewater in the kitchen garden (2,093), 91% have a washing platform. The findings are statistically significant with $p < 0.000$, the Phi-test showing weak correlation (Phi 0.390).

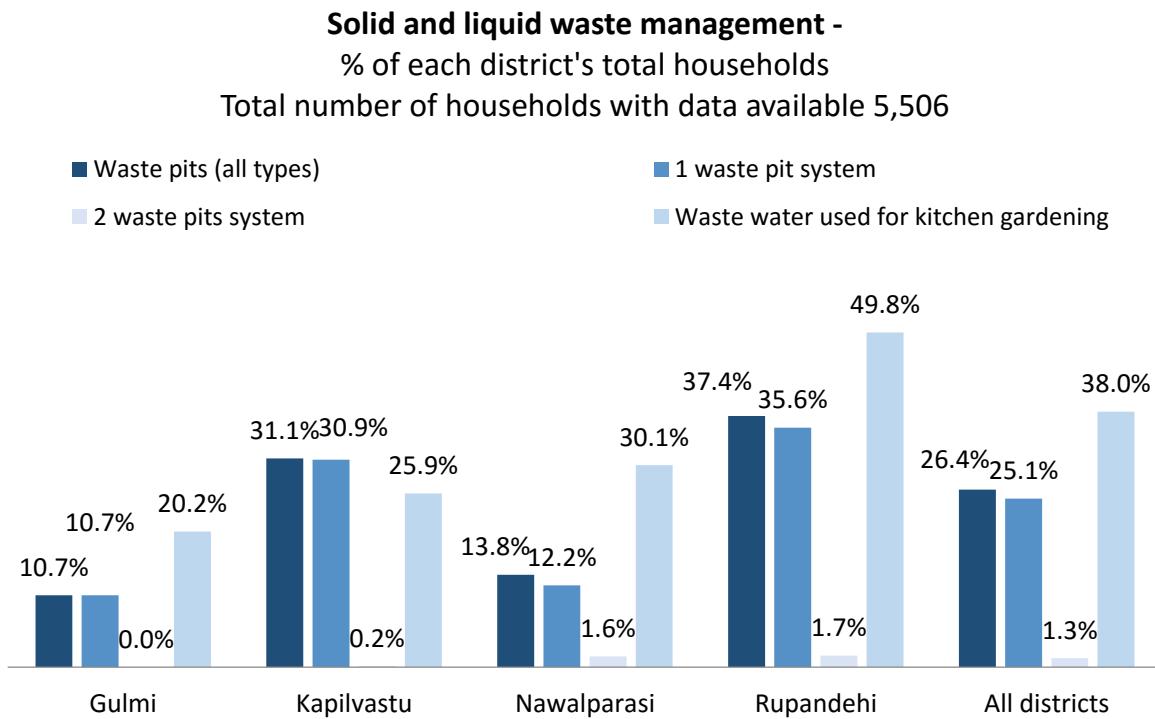


Figure 22 Waste pits and waste water management

3.8.2 Cleanliness of the surrounding

Data on overall cleanliness was collected only from Gulmi and Nawalparasi districts, for total 2,329 households. Simple observation of the household surrounding was conducted during the data collection and the status recorded as clean or not clean. In Gulmi district, 79% of the households have clean surrounding of their house (449 out of 570). In Nawalparasi the ratio is 68% of the households (1193 out of 1,759). The total ratio of both districts is 71% (1,642 out of 2,329).

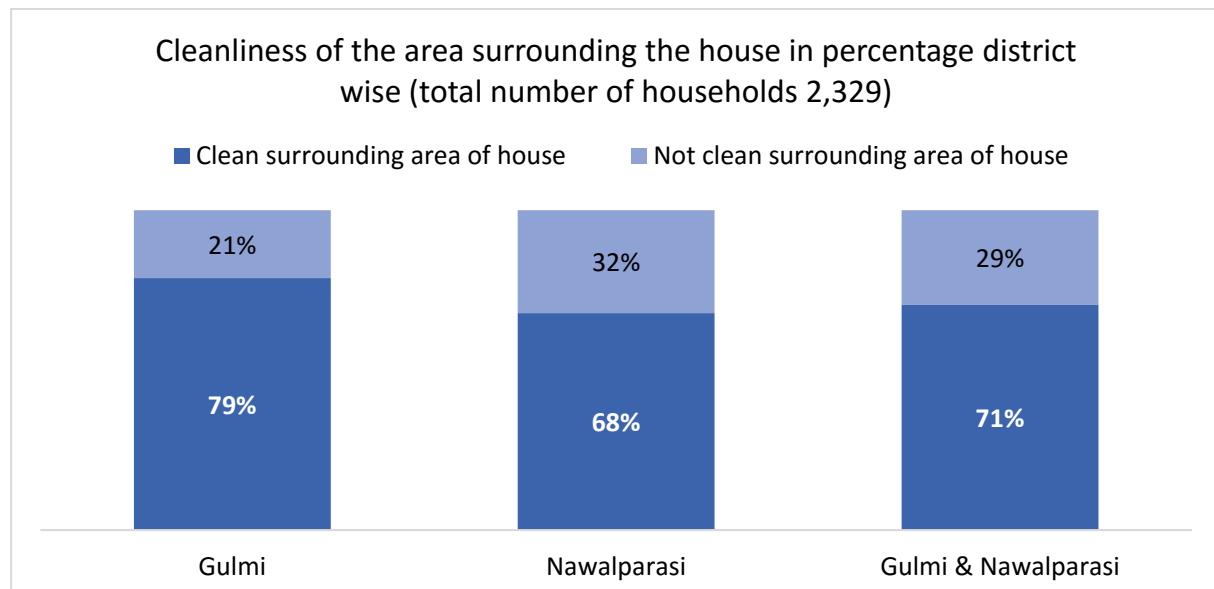


Figure 23 Household surrounding cleanliness

**Rural Water Supply and Sanitation Project in Western Nepal Phase II
ODF Revisited - Sanitation in 5,506 Households in Western Nepal**

Interestingly a household having a waste pit does not correlate with the observation related to clean surroundings in the compound. Out of all households, in total only 11% (253) had both waste pit and clean surrounding. Out of those who had a waste pit (total 1,642), only 15% were considered having a clean surrounding. The result is statistically significant at $p<.000$ level, the Phi-test showing no relationship (Phi 0.110). Table 15 Clean surrounding and waste pit shows the findings district-wise. Table 16 Clean surrounding by district and VDC indicate that the differences are in between the wards rather than in between the districts or caste/ethnic groups:

Table 17 shows that there is no significant differences in between the different caste/ethnic groups. Overall, out of the total sample (N=2,317), 71% of the households had clean surrounding. While the sample is again statistically significant, there is no correlation in between the groups (Phi 0.109).

Table 15 Clean surrounding and waste pit

District name	Clean surrounding area of house				Total	
	Yes		No			
	Waste pit		Waste pit			
	Yes	No	Yes	No		
Gulmi	60	389	1	120	570	
Nawalparasi	193	1,000	49	517	1,759	
Total	253	1,389	50	637	2,329	

Table 16 Clean surrounding by district and VDC

District	VDC	Clean surrounding area of house			
		Yes	No	Total	%-yes
Gulmi	Arje	56	-	56	100%
	Balithum	62	15	77	81%
	Bhanabthane	13	61	74	18%
	Bharse	134	5	139	96%
	Harmichaur	91	-	91	100%
	Palikot	50	11	61	82%
	Shantipur	43	29	72	60%
Total		449	121	570	79%
Nawalparasi	Hakeui	117	48	165	71%
	Porseuni	180	142	322	56%
	Ramgram	195	73	268	73%
	Ratanpur	55	66	121	45%
	Sanei	65	9	74	88%
	Sunwal	581	228	809	72%
	Total	1,193	566	1,759	68%
Grand Total		1,642	687	2,329	71%

Table 17 Households with clean surrounding by ethnicity

Ethnicity	Clean surrounding area of house			
	Yes	No	Total	%-yes
Dalit	274	165	439	62%
Disadvantaged Terai group	136	66	202	67%
Religious minority	20	7	27	74%
Adhibasi/Janjati	650	272	922	70%
Other advantaged group	556	171	727	76%
Total	1,636	681	2,317	71%

3.9 Water Availability

Water availability was included in the survey to know if it could explain some of the sanitation and hygiene related behaviors or lack of them. The private tap/handpump data is available for all districts (total of 5,506 households) but the easy access (as per fetching time) data is only for Gulmi and Nawalparasi districts (2,329 households). **Error! Reference source not found.** shows that percentage of households having a private tap/handpump installed in their household/yard and percentage of households having an easy water access (15 min or less water fetching time for round trip).

According to the data, the private tap or handpump has been installed in 67% of the all households in all districts (3,709 out of 5,506). The highest ratio is in Rupandehi with 81% (2,110 out of 2,620), then Kapilvastu with 68% (379 out of 557), thirdly Nawalparasi 65.5% (1,152 out of 1,759) and lastly Gulmi with the ratio of 12% (68 out of 570). Clearly, when comparing the hill households with the Terai households, the private water access (tap/pump) is more common in Terai.

Percentage of households having private tap/handpump (N- 5,506)

Percentage of households having easy access to water

(data only for Gulmi and Nawalparasi, N-2,329)

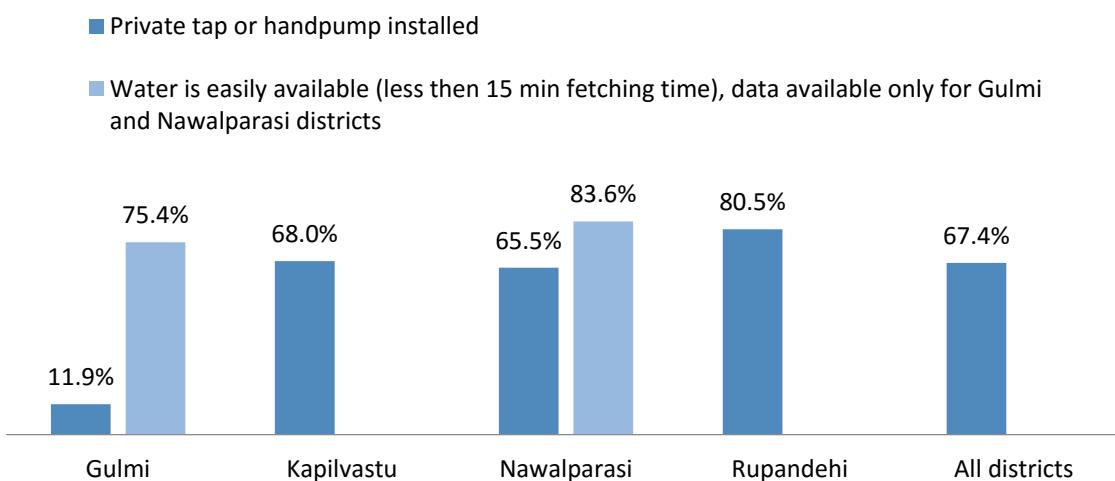


Figure 24 Water availability

**Rural Water Supply and Sanitation Project in Western Nepal Phase II
ODF Revisited - Sanitation in 5,506 Households in Western Nepal**

Having private tap installed or a private tube well in the compound did not correspond with the water availability. In the sample of 2,329 households in Gulmi and Nawalparasi districts, out of total sample 82% reported having water easily available. The corresponding figures district-wise were 75% for Gulmi and 84% for Nawalparasi. Yet, only in one VDC in Gulmi all households had private connections while according to the data for easy water access, 75% of the households in Gulmi were reported to have water easily available (fetching time maximum of 15 minutes). In Nawalparasi, the same ratio is 84%. This results in only a weak correlation in between having water available in the compound (private tap or tube well in the compound) and having water easily available (within 15 minutes round trip), with Phi test resulting in 0.482 (N-2,329). The correlation in between the ethnicity and water availability is similarly weak with Phi test resulting in even lower figure at 0.193 (N-2,317).

However, when comparing the number of households with private taps within the total number of responses within the ethnic groups, we can see clear differences. For instance, within all Dalit households, 49% had private tap installed while within the advantaged others the corresponding percentage is 80%. The impact of having a shallow tube wells widely available in Tarai shows how 98% of all disadvantaged Tarai households have water easily available even if not all have private taps (76%).

Having water easily available does not correspond with the use of the toilets by all family members. Out of total sample of 2,209 households where this question could be paired, 71.8% (1,587) responded that they all family members used the toilet and that water was easily available. Only 1.5% responded that the water was not available and not all family members used the toilet. Out of all those who reported that all household members used the toilet (N-1,942), 82% reported that water was easily available. Similarly, out of total 1,820 who reported that water was easily available, 82.4% reported that toilet was used by all family members (Table 19).

Table 18 Households with private tap by ethnicity

Ethnicity	Private tap installed				Water easily available			
	Yes	No	Total	%-yes	Yes	No	Total	
Dalit	383	399	782	49%	325	114	439	74%
Disadvantaged Terai group	576	184	760	76%	197	5	202	98%
Religious minority	217	92	309	70%	24	3	27	89%
Adhibasi/Janjati	1,079	744	1,823	59%	797	125	922	86%
Other advantaged group	1,444	369	1,813	80%	546	181	727	75%
Total	3,699	1,788	5,487	67%	1,889	428	2,317	82%
	67%	33%			82%	18%		

Table 19 Water easily available and toilet used by all family members

	Water easily available			
	Yes	No	Total	%-yes
Toilet used by all family member	Yes	1,587	355	81.7%
	No	233	34	87.3%
Total		1820	389	82.4%
		82.4%	17.6%	

4 CONCLUSIONS AND RECOMMENDATIONS

The Executive Summary of this Report summarizes the findings, these are not reported here. Rather, this chapter looks back to the initial research design to draw conclusions on the hypothesis set in Chapter 2 of this report. The leading research problem for this study was whether '*ODF declared corresponds with the households having a toilet and also using it*', in other words, whether wards, VDCs and entire districts are declared as 'Open Defecation Free' without truly having achieved this status.

➲ What do we conclude about ODF being ODF? Is our null hypothesis true?

The null hypothesis H(0) was the assumption that there is no difference in the datasets for household being located in a ODF declared ward, a household having a toilet and all household members using the toilet. In an ideal case where "ODF means ODF" all these responses should have been positive "yes!" In this set up the most important behavior from the 'ODF' point of view is obviously that all family members use a toilet, whether or not it is their own toilet. Unfortunately, we need to reject the null hypothesis: in the ODF declared wards, 94% of the households have a toilet, and more to it, in none of the ODF declared wards the coverage was 100%. In non-ODF wards 44% of households had toilet at the time of data collection.

As per the spirit of ODF movement there should not open defecation at any given time and location. However, even in ODF declared communities there are some households without toilets, for a range of reasons. The difference between the hill district and Terai districts in toilet coverage is not very big: in Gulmi the rate is 97% and in Terai districts 89-96%. Lack of toilet does not necessary mean open defecation, in some cases toilets can be shared. This can be true especially in Tarai where the family units can in practice be living in the same compound. This cases were very rare, only four households did not have a toilet but they did use one.

The findings were similar to the two related questions whether the toilet that exists is also used, and whether all family members use it. They are not. In all those cases where there was a toilet, improved or unimproved (total 4,329 hh), 91% were also used by all family members. District-wise differences are clear: in Gulmi 99% of those who reported having a toilet, also reported that all family members used it. Kapilvastu this was 75%, in Nawalparasi 86% and Rupandehi 94%. These are households in both ODF-declared and ODF wards, yet, all households that do have a toilet.

The study shows the most of the toilets are improved toilets, only 0.4% (21) are unimproved ones. To ensure sustainability of the ODF practice, all unimproved toilets should be made improved ones. Interestingly though, according to the data all unimproved toilets are in use (100%) whereas the using ratio of improved toilets is 96%. When considering the toilet coverage ratio and the toilet use ratio, as expected, the ratio for the use is less than the coverage of facilities. This gap should be filled in order to achieve true ODF and total behavioral change in toilet use. The most common type of improved toilets is single pit toilet which may cause a risk for sustainability. However, the study shows that most of the pits have also been emptied after becoming full. Though, not so many households said that the pit has become full yet.

➲ What do we recommend for making ODF true?

The following issues come up: before the ODF is declared, a rigorous house-to-house monitoring has to take place. At least the Ward-WASH-CC itself should take this issue seriously. As this study has shown, even in populous Tarai VDC, it is not impossible to visit each and every house within one ward, covering chosen locations 100%. The monitoring itself is triggering, and gives an opportunity to

question whether the latrines are also used and whether all family members use it? There is still work to do to improve the ratio of all family members using the toilet, especially in Terai where the ratio varies between 75-89% in ODF declared wards. In Gulmi, the ratio was 99%. Regarding the age group wise use of the toilet, more focus is needed on improving the use of toilet by children under 5 years old and people 60 or more years old. The difference is not big but their level of toilet use less than the group of 5-59 years old. Gender wise, the differences are not major, however it seems that the males are using toilet slightly less than females. More visible differences can be observed between the age groups.

➲ Are the ODF-declared Wards ready to move towards Total Sanitation?

This study suggests that as long as there is doubt about whether all households have a toilet, use a toilet and make sure that all family members use it as well (i.e. that there is truly no Open Defecation in the ward), the focus needs to stay in sanitation behavior. Behaviour change specialists do suggest that targeted action brings better results. Furthermore, the benefits of Total Sanitation will be undermined by Open Defecation.

There are many aspects of Total Sanitation that could move ahead at the same time ‘naturally’, as a side-product of continued effort that focuses on having and using a latrine. For this reason, we expected that such as washing platforms, utensil drying racks, smokeless stoves/improved cooking stoves and even waste management, both liquid and solid, would have been more evident in the study locations. They were not: the Total Sanitation related visible improvements were observed only in half of the total households. For instance, 51% of the households have improved cooking stoves, though it seems to be more common in Gulmi (86%) than in Terai districts (29-61%). Utensil drying rack can be found in 50% of the households and washing platform in 68% of the households. Waste pits can be found only in 26% of the households and waste water is used for kitchen gardening in 38% of the households. Compared to waste management, taking care of cleanliness of the surrounding is more common with 71% rate based on combined data of Gulmi and Nawalparasi. A private tap/pump is available in 67% of the household. In order to achieve total sanitation status in all areas of indicators there is progress to be done both in hill and Terai districts. Especially the waste management is not well organized in households based on the data. The study scope did not include other Total Sanitation indicators such as handwashing at critical times and personal hygiene.

➲ What is the next Step for RWSSP-WN?

RWSSP-WN II will use the ward-wise, ethnic/caste-group-wise, and age-group-wise data to further explore how to do the Behaviour Change Communications better. It is hereby acknowledged that since the data sample is statistically significant and the wards and households are known, it could be a topic for further study to explore what kind of approaches and tools have been used in these wards, and how the situation has changed over the past 12 months. The use of behavior change communications on one hand, and use of subsidies on the other, might add further depth into this study. The large sample also warrants numerous ways of correlating the data sets, and therefore it is expected that this report will get its follow up report that dives deeper into the data presented in this report to explore the findings through more detailed statistical analysis that takes the change into account. As of July 2016, for instance, Silautiya VDC of Rupandehi district had declared itself ODF. Before the declaration, the Silautiya Ward no. 1 was revisited again to verify whether the 139 missing toilets had truly materialized. They had, but hardly any change with regards to total sanitation related indicators was evident. The re-survey and mapping of the households and their responses have now established an excellent baseline for Silautiya on which to build the Total Sanitation targets.