

2015



EXTERNAL EVALUATION REPORT

BALUCHISTAN WATER AND SANITATION PROJECT CHAGAI & NOUSHKI



External Evaluation Report
for Balochistan Water and Sanitation Project (BWSP) District Chagai and Noushki Balochistan

List of Abbreviations

BHU	Basic Health Unit
CBO	Community Based Organization
EDO	Executive District Officer
HH	Household
H&H	Health and Hygiene
IRP	Islamic Relief Pakistan
LG	Local Government
MDGs	Millennium Development Goals
M&E	Monitoring & Evaluation
NGO	Non-Governmental Organization
PHE	Public Health Engineering
PSDP	Public Sector Development Program
P&DD	Planning & Development Department
TMO	Tehsil Municipal Officer
WASH	Water, Sanitation and Hygiene
W & S	Water and Sanitation
WATSAN	Water and Sanitation
KII	Key Informant Interviews
UPS	Uninterrupted Power Supply
VO	Village Organization

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Rasheed Shah
Chief Executive SMAAJ

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Rural areas of Balochistan have low access to water and sanitation. More than 80% of the population of Chagai and Noushki lives in rural areas. Sanitation has been a much neglected area without much support from the provincial government. Donors with the support of INGOs and NGOs are the main contributor in providing access to sanitation facilities as the communities, being poor, cannot afford development of sanitation facilities. As per report of PHE department, most parts of the target UCs of Chagai and Noushki have sufficient amount of groundwater but there are quality and quantity at Saddar, Daak and Kishingi¹. According to Balochistan Multiple Indicator Cluster Survey (2010), 33.4% and 55.4% households of Chagai and Noushki have access to improved water source and improved sanitation respectively. Balochistan Sanitation Strategy and Action Plan (2008) states that only 1% household in rural Balochistan have proper disposal of waste water and it is observed that situation in both the districts is almost the same.

Balochistan Water and Sanitation Project was designed to provide access to water and sanitation facilities to the population in six UCs of Chagai and Noushki districts. Bearing in view objective of the project i.e. increase accessibility to water and sanitation facilities, major activities under the project included construction of 1594² household latrines, installation of solar and wind water pumps and provision of simple water treatment systems. A baseline survey for this project was conducted to take stock of water and sanitation situation in the target districts. As per baseline survey only 26.2% had access to latrine facility.

At the conclusion of the project, the evaluation study was initiated to assess efficiency and effectiveness of the interventions undertaken. Evaluation study followed same qualitative and quantitative methods as used in the baseline study so that consistency in research is maintained.

Overall assessment with regard to appropriateness, relevance, efficiency, effectiveness and efficacy of interventions, keeping in view the project goal, comes out to be satisfactory. The interventions were well targeted and feedback from the households survey (conducted for this study) and participants of the FGDs, which included men, women and children, show gratitude toward IRP's efforts. One-year project successfully completed almost all of its targets. Increased access to water and sanitation facilities and safety from risks associated with absence of these facilities showed that the project was effective. Sustainability of the project intervention has very high probability as quality was maintained and the communities were imparted trainings of operation and maintenance of the facilities. Solutions opted to provide facilities were economical by design, durability and life. Implementation of activities followed parallel and series sequence depending upon the nature of the tasks. Unforeseen challenges and some inherent weakness (like insufficient time allocation to some activities) in project design put pressure on the management of the project. Transparency and participation of the communities were maintained in all phases of activities. Attempts were made to empower communities, which were successful but could be strengthened by developing institutional links between communities and the public service delivery departments / agencies. Health and hygiene sessions noticed reasonable level of awareness among the participants, who demanded more training sessions to practice the knowledge imparted. However, a full cycle of health and hygiene could prove more effective and beneficial.

¹ Brief report prepared by Senior Geo-physicist of PHED on request for this study

² As per revised work plan of the project

A household survey was also conducted to compare result of the baseline survey with the evaluation study. A range of indicators, relating access to water and sanitation, were used to collect data. There is improvement in almost all the indicators in the surveyed areas. Access to water was gauged through different options like piped water, protected and unprotected wells, boreholes and various sources of surface water. Without much variations in obtaining water from most of the sources since baseline survey, there appeared shift from unprotected to protected wells in all UCs, which can be attributed to installation of solar and wind water pumps. Distance to water sources shows variation since baseline survey but perception of 'less than a kilometer' and '1-3 kilometer' may vary from respondent to respondent. However, results are consistent when these two categories are combined. Responsibility of fetching water was heavily on the shoulders of women when baseline was conducted (75%) and a slight decrease was noticed later (70%). Now greater proportion of households have access to sweet water in Chagai (75%) and Noushki (68%) as compared to baseline survey period when these figures were 66% and 50% for former and later districts. FGDs of both baseline and evaluation study mention households using both sweet and brackish water. Because of better access, percent of HH who don't pay for water increased from 80% (baseline) to 95% in the surveyed areas. Percent of water treatment also increased from 41% to 70% in the surveyed areas. Existence of water management committees recorded rise by 18% in Chagai and by 8% in Noushki.

The baseline survey indicated that only 26.2% of the surveyed population had access to latrine. After interventions by the project, there is an improvement by 29.4%. The participants of the FGDs shared that due to access to the latrines women, old persons and children were greatly facilitated. This facility also saved them from harsh seasonal conditions and from wildlife. A few areas mentioned shortage of water for use of latrine (reported to be mostly flush latrines). A change in defecation practices was reported: during baseline survey defecation at open spaces was 72% , it reduced to 41% by the time evaluation study was conducted. A number of observations were recorded during inspection of latrine: key ones include presence of water, soap and broom/wiper. In the baseline survey presence of these items was 73%, 54% and 38% respectively: later these indicators increased to 98%, 85% and 55% respectively. Household solid waste disposal (at specified open place) improved from 23% to 45% but situation of disposal of baby feces needs more attention as it was thrown on unspecified places outside HH: baseline survey figure was at 51% and that of evaluation study at 73%.

Health and hygiene sessions have positive results but still there is room for further improvement. The FGDs show that communities have digested the information about health and hygiene but it may take time to observe practical manifestation. Indicators of hand washing practices show that mostly people wash hands before / after taking meals and after using latrine: 30% and 36% respectively. Hand washing with soap is not common as 66% and 46.5% of people were reported to be washing hands only with water at the time of baseline survey and evaluation study respectively. Diarrhea is the most common diseases among other disease like malaria, typhoid and cholera. Incidence of diarrhea has not changed much since baseline survey (33% then and now 43.5%). Its effect shows increasing trend with decrease in age group as higher incidence is found in girls (18%) and boys (20%) of less than 5 years. When fell ill due to diarrhea, 40% and 44.8% of the households consulted doctors / physician during baseline survey and evaluation study respectively followed by traditional home treatment and use of ORS. In FGDs (females) participants desired to have more practice sessions for preparation of ORS as mere one session was not considered sufficient.

The project faced a number of challenges, which put pressure on timeline of activities and also on effectiveness in some cases. Start up delays, restrictions to open VOs'

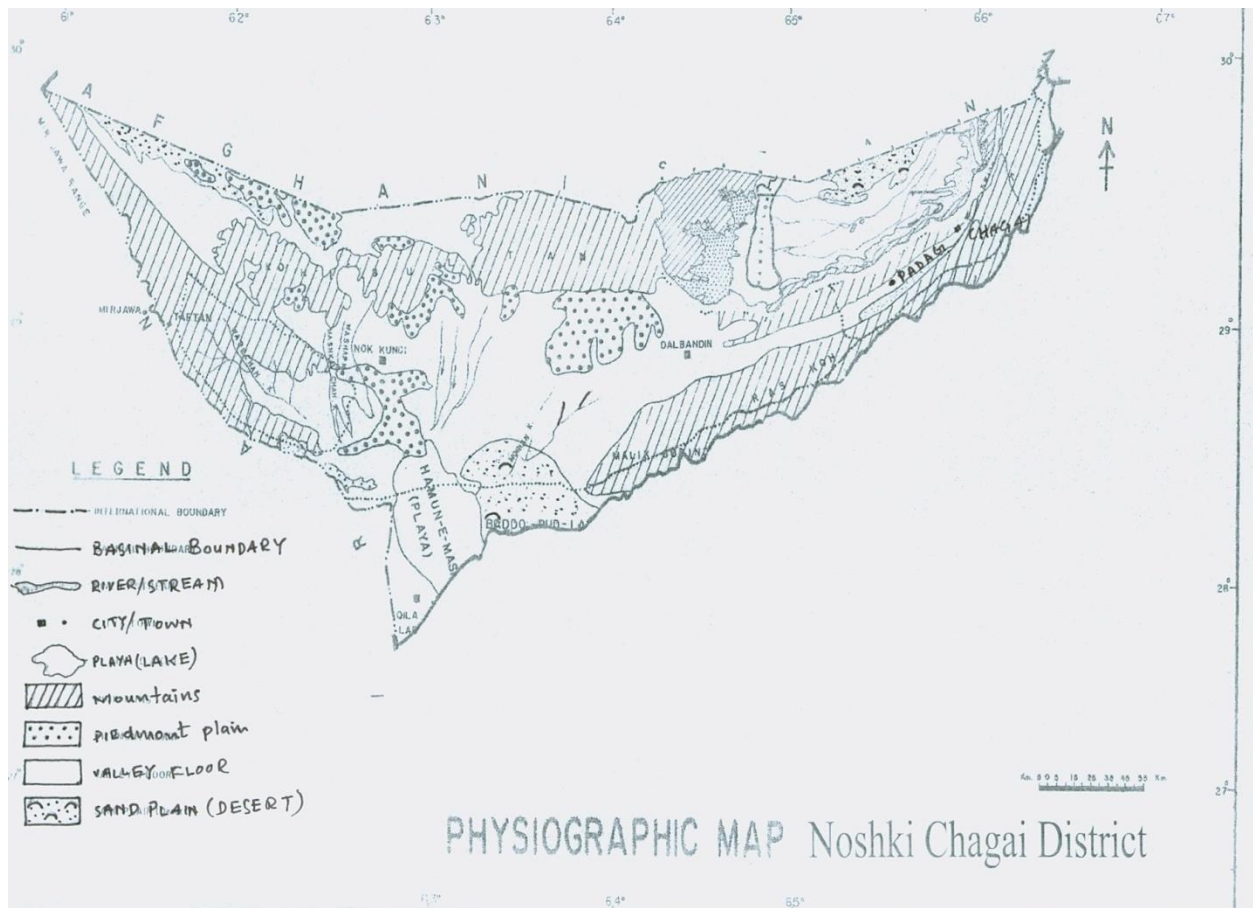
bank account, undue political influence and volatile law and order situation were some of the challenges encountered during project implementation. A careful revision of design and implementation will yield efficient and effective results.

Water and Sanitation Situation of Chagai and Noushki

Whereas access to water is relatively better, the access to sanitation, particularly in rural areas of Balochistan, is very low. This is due to the fact that without water survival is impossible and without sanitation it is possible to survive but the survival is fraught with risks of diseases and health hazards. Access to water has visible support of the government, as reflected in the development budget, but access to sanitation is a neglected area. The communities or the donors with the support of INGOs /NGOs fill the service gap created by the government in water and sanitation.

Chagai, much larger in area than Noushki, has weaker indicators of water and sanitation. More than 80% of the population in these districts lives in rural areas. As population density per square kilometer is very low in Chagai, service delivery becomes a difficult task. Communities in both the districts cannot afford cost of development of water sources and that of building sanitation infrastructure (includes toilets, sewerage system and solid waste collection and proper disposal mainly). Lack of financial resources and weak governance mar public service delivery in water and sanitation sectors in both the districts. Drought like situation has mild to severe impact on access to water and sanitation. Though Pakistan is signatory to Millennium Development Goals-MDGs, planning at provincial level does not take into account goals and targets of MDGs. Low indicators of access to sanitation in both the districts indicate low priority accorded to this sector by the provincial government.

Situation of surface and groundwater, with flavor of geographic features, in both districts has been presented below, which reflects technical inputs of Public Health Engineering department of Government of Balochistan. The following physiographic map of Chagai and Noushki districts shows physical features of the land, which has arid to semi-arid climatic conditions.



Water³

Chagai and Noushki are part of Hamun-e-Mashkel basin and a little portion is of hamun-e-Lora drainage basin. The Hamun-e-Mashkel comprises of sub-catchments namely Noushki, Dalbandin-Nokkundi and Buzurg plain.

The study area lies in the continental zone. Its climate is arid which is characterized by low precipitation, high rate of evaporation and wide range in temperature. The average annual precipitation in whole of the area is about 4 inches. Further, the area comprises of independent sub-catchments which directly or indirectly drain in some small localized hamuns / lakes and form closed inland drainage system. The streams and rivers of the system have dendritic as well as parallel pattern. The drainage comprises of six sub-catchments namely, Noushki plain, Nokkundi-Dalbandin plain, Koh-e-dalil, Basima, Badoo rud-Gruk-ladgasht plain and the Buzurg plain.

Existing land forms of the basin are the result of weathering erosion and re-deposition. On the basis of physiographic parameter of the area, the land forms of the basin can be divided in to five major units viz, mountain high lands, piedmont plains, sand dunes, valley floor and playa lakes.

All the streams and rivers of the Noushki sub-basin are ephemeral except Kaiser Kaur which is perennial near Noushki town. In Dalbandin-Nokkundi there is no definite system and no master stream/river which drains the area in any particular direction. There are number of same rivers which flow independently and drain in their respective catchments in different direction. In general, there are three sets of streams: one set of streams exists in the extreme eastern part between Padag and Dalbandin. This set originates from northern and southern flanks i.e. from Chagai hills and Ras Koh range and independently flows towards the central axis of the valley and drain to their respective areas into localized playas located near Nok Chah and Pishak localities. The second set of streams mostly originates from the northern part of sub-basin and flows from north to south and drains the area into localized small playas and western portion into hamun-e-mashkel. The third set of streams originates from koh-e-Sultan mountains in north western part and flows from south to north and drains the area into Kirtaka Niwar.

The maximum known thickness of alluvium in the basin within the area investigated is more than 600 feet in Dalbandin Nokkundi plain. It is more than 400 feet in Naushki and Buzurg plains and its thickness remains above 200 feet in koh-e-Dalil sub-basin. Out of total alluvium encountered in test holes drilled in the basin, the thickness of saturated alluvium ranges from 558 to zero feet and the thickness of saturated permeable material (aquifer) within drilled depth is ranges from 400 feet to zero feet.

In Nushki sub-basin, data show that test holes/tube wells have depths ranging from 450 to 700 feet. The thickness of total alluvium encountered in these test holes also ranges from 450 feet: bedrock is encountered at Kishingi. Out of total alluvium encountered in these test holes, the thickness of saturated alluvium varies from 700 feet to 136 feet and the thickness of saturated permeable material within drilled depth is maximum up to 700 feet but generally ranges from 368 to zero feet .

In Dalbandin-Nokkundi Plain, the total thickness of alluvium encountered in these test holes ranges from 700 feet to 86 feet, out of which the thickness of saturated alluvium ranges from 529 feet to zero feet. The thickness of saturated permeable material (aquifer)

³ Courtesy, Mr. Mazhar Ali, Senior Geo-Physicist, PHE Department, Government of Balochistan

within drilled depth is maximum up to 700 feet. On the basis of thickness of saturated permeable material (aquifer) 3 zones namely a,b and c have been marked to depict the area and vertical variation and to identify the areas underlain by aquifer/aquifers. The areas underpin by aquifer more the 200 feet thick are classified as zone-a from 200 feet to 100 feet thick as zone-b and less than 100 feet thick as zone-c.

The only and ultimate source of all forms of water resources in the study area is precipitation which falls over the catchments area of its rivers/streams such as Khaisar river, ware chah kaur and their subsequent tributaries in the north-western and south-western extremities of the area. The quantum of flood inflow is not known. The irrigation, on sustained basis, by direct utilization of precipitation received by the area is not feasible due to its irregular spatial distribution, uncertain and untimely occurrence, insufficient quantity and variation of volume from year to year and season to season. However, precipitation falling over the watershed of the area not only generates flood flows but also is a main source of soil moisture and recharge to groundwater reservoir by direct infiltration through overland flows and percolation of flood flows beneath the rivers/streams bed which also ultimately maintains perennial base flows in some of the streams through groundwater runoff.

The contribution from precipitation towards water resources is controlled by its areal distribution, frequency, intensity, geological set-up, topography and climate of the area. The water resources of the study area are classified into two main units namely, surface water resource and groundwater resources. However both the water resources are interlinked and inter-related to one another as the surface water at many places dissipates into alluvium and become a part of groundwater and at certain places groundwater appear as surface water where the alluvium is thin and the basement hard rock is impervious.

Groundwater

Major source of water is groundwater, which is presently partially exploited through open dug wells fitted with centrifugal pumps, karezes, springs, and tube wells in public/private sector. Presently, it is the most dependable source, from which through proper development and management the potential water supplies on sustained basis may be obtained both for irrigation and domestic needs. The perennial base flows of some of the streams of project area, khaisar river (north of Nushki) and Pishuk Kaur, are also maintained from the groundwater reservoir of the basin through groundwater runoff from their upper catchments. The source of groundwater in the basin is entirely precipitation. Some portion of this precipitation infiltrates directly downwards through soil and underlying rocks. It reaches the zone of saturation and thus recharges the groundwater reservoir of the basin. In general, most of the groundwater of deep aquifer zone is suitable for irrigation purposes with exceptions of groundwater of Nokundi, Koh-e-Dalil and Buzurg plain.

Keeping in view geological / hydro-geological parameters, test holes and tube wells data, it is concluded that at all nine UCs of Nushki district have sufficient amount of groundwater within permissible limit of water quality under WHO standard. There are some areas, which have qualitative and quantitative issues of groundwater: the areas are Saddar, Daak, Kishingi and Badini. For Chagai district, reasonable amount of groundwater is present at Ghat area near Nokundi, Sia Jungle/ Pazoi area near Dalbandin and Thalab area near Taftan etc. Bearing in view drinking as well as agriculture purpose water requirements, tube wells not less than 500 ft. are feasible at both the districts.

Access to Sanitation

Unfortunately, development of sanitation facilities have been accorded very low priority in Balochistan over the past decades: the trend continues unabated. Whereas only a small proportion of the rural population has access to toilet facilities, there is no sewerage system in almost any of the villages in Balochistan. As a result, open defecation and bucket / pit latrines are the norm. Sanitary practices are not followed, therefore communities face health risks.

Access to improved water sources and improved sanitation is lower in Chagai than Noushki. Please see table below.

**Percentage of household population having improved water source and improved sanitation, Balochistan
Multiple Indicator Cluster Survey, 2010**

Noushki	55.4
Chagai	33.4

Almost negligible number of households have proper disposal of waste water. Unpaved open drains, spilling out waste water around, in rural areas in the middle of unpaved street are a common site. According to Balochistan Sanitation Strategy and Action Plan (2008), only 1% household in rural Balochistan have proper disposal of waste water (sewerage connected with main line, open drain or septic tank). Situation in Chagai and Noushki is not much different than at provincial level. Moreover, solid waste management in both the districts is very poor.

Project's Overview

Balochistan Water and Sanitation Project was designed to improve access to water and sanitation in six union councils of Chagai and Noushki districts. Project interventions ranged from hard to soft components. The one-year project undertook the following activities:

- Community mobilization
- KAP survey
- Baseline survey
- Installation of 5 wind powered water-pumps
- Installation of 17 solar-powered water-pumps
- Rehabilitation/construction of 08 need based water and sanitation schemes
- Installation of water treatment systems for 496 households
- Operation and maintenance training for solar pumps and wind mills
- Distribution of tool kits to the trained beneficiaries
- Construction of 1,594 household latrine
- 100 school hygiene promotion sessions
- 60 community based hygiene promotion sessions
- 4 awareness raising events

Objectives of External Evaluation

- ✓ The external evaluation of the project focuses on determining the overall impact on the targeted communities of project goal, objectives and outcomes as per LFA. Further, it:
 - figures out how increased accessibility to water and sanitation facilities have contributed towards health, social, economic and cultural aspects of lives of targeted community,
 - determines that technology used for water extraction is user-friendly and sustainable, and

- Assesses the capacity of water management committees/community organizations to continuously operate and maintain the water facilities.
- ✓ It determine the appropriateness, relevance, efficiency, effectiveness and efficacy of interventions with respect to the project goal by:
 - Looking into whether measures for provision of water were socially, culturally and environmentally appropriate and relevant or otherwise,
 - Finding out whether sustainable provision of safe drinking water to community with respect to quantity and quality has been ensured or not, and
 - Assessing/analyzing that economical solutions have been designed and implemented for provision of water.
- ✓ The external evaluation aims at reviewing the program strategies, methodologies and systems used during the project cycle management leading towards positive impact.
- ✓ The external evaluation focuses on assessing to what extent the project has adhered to the principles of transparency, participation and accountability by:
 - Reflecting on objectivity, neutrality and impartiality in selection and verification process of beneficiaries, and
 - Evaluating how far community has actively participated in designing, planning and implementation and to what extent the community has been empowered to take up project related issues and expectations with project management.
- ✓ The evaluation also Identifies challenges, obstacles, and lessons learned in designing, planning and implementation stages of the project, and proposes recommendations for effective designing, planning and implementation of similar projects in the future.

Methodology

Review of Documents

In order to get in-depth knowledge of the project's activities and implementation methodology, a number of documents relevant to the project were reviewed. Overall impression gathered from the review is that the project was well planned and designed. The execution was efficient and effective. All the planned activities were completed on time.

Study Locations

The project was implemented in the following six union councils of Chagai and Noushki districts of Balochistan:

- | | | |
|----------------------|---|------------------|
| i. Chagai | } | Chagai district |
| ii. Padag | | |
| iii. Sadar Dalbandin | | |
| iv. Dhaak | } | Noushki district |
| v. Anam Bostan | | |
| vi. Keshingi | | |

The study areas are the selected villages in the above mentioned UC.

Sample Size

In order for the results to be comparative, it is essential that sample size and sampling technique is kept same as was in baseline survey conducted for this study. The baseline study covered 392 HH from the district Chagai and Noushki from 28 villages representing 6 UCs (3 in each) in both the districts. In the baseline study, six FGDs were conducted in each district (1 for male and 1 for female FGD in each UC). For evaluation two sessions with the children (one in each district) were added. The research was supplemented by KII with district authorities, which included PHED, Local Government (LG) / Municipality, UC secretary and EDO health.

According to the National Census of 1998, percent share of population of the six union councils in their respective districts is given in the table below.

District	UC	% share in district population
Chagai		
	Chagai	7.16
	Sadar Dalbandin	24.94
	Padag	3.12
Total		35.22
Noushki		
	Aman Bostan	1.34
	Kishingi	1.63
	Daak	22.46
Total		25.43

Since the interventions of the Balochistan Water and Sanitation Project are in the above six union councils, if these union councils are covered 100%, it means there should be an improvement in various indicators of the project by 35.22% in Chagai and 25.43% in Noushki district because population of three union councils of Chagai is 35.22% of the total population of Chagai district and that of three union councils of Noushki is 25.43% of the total

population of Noushki district. As the interventions have been undertaken in the selected villages of the UCs, overall improvement will be less than 35.22% and 25.43% respectively in each of the districts.

Household survey

The inputs from the household were collected using a questionnaire, which had modules regarding 'Awareness about Health & Hygiene', 'Water & Sanitation' and 'Household Assets'. Each module comprised of close-ended questions ranging from general to specific.

Focus Group Discussion

A series of FGDs were held targeting various segments of the communities including males, females and children. A number of open-ended questions were designed to get insight to the problems faced by the communities and impact of interventions that were carried out under the project. The FGDs were attended, inter alia, by the members of village organizations, beneficiaries of water and sanitation schemes and those who had O&M trainings for solar and wind based water pumps.

Interviews

Key informant interviews were also held with the following so that evaluation could be comprehensively covered. Findings of these interviews have been presented under survey result in the following pages at relevant places.

- Project team
- Persons assigned O&M responsibilities (wind and solar water pumps installed: toolkits also distributed)
- PHED
- TMO/Municipality
- Representative of Health department

Overall Assessment

In the following paragraphs, appropriateness, relevance, efficiency, effectiveness and efficacy of interventions, with respect to the project goal, have been assessed and then household survey results are presented.

Appropriateness and relevance of interventions with respect to the project goal

Chagai and Noushki, being among the some of the least populated districts of Balochistan, have very scattered pattern of population, which makes development interventions very difficult. Further, the condition of availability of groundwater is not good everywhere. To aggravate the situation, poverty comes in way to access to water and sanitation facilities. As these districts have been experiencing droughts in recent decades, means of subsistence of families have seriously been disturbed. Both agriculture and livestock activities, which used to be basis of income for the families have seriously been affected. The goal of the project in the selected district was to improve access to water and at the same time improve sanitation.

In the key highlights of the target districts, "Balochistan Water and Sanitation Project" was appropriate and relevant, particularly in case of Chagai. The interventions were well targeted as these were in those areas which did not have water and sanitation facilities. In FDGs, majority of the participants expressed deep gratitude for having been provided with access to water and sanitation facilities. For instance, before the project, men and women alike had to spend considerable time to fetch water, which disturbed their other household chores and after the project interventions they felt greatly relieved. Similarly, in case of latrine facilities, all the participants said that this facility not only provided privacy but also saved them from vagaries of extreme weather besides safety from wild life.

Efficiency

The project life spanned over one year. Thirteen categories of activities were conducted under the project in one year. Though a conscientious work plan did not exist, all the activities were completed during the life of the project. Absence of detailed work plan poses a danger of lagging behind the schedule but the project administration and implementation team successfully managed to complete all the activities. The advantage of having a detailed work plan are obvious. Planning, scheduling and management software like MS Project, The Project or Primavera can facilitate greatly and thus ensure that benefits reach the target population in timely way.

In order to gauge performance and efficiency achieved, results have been tabulated below, which clearly indicate that the project successfully achieved planned targets.

TABLE 1 ACTIVITY WISE PERFORMANACE AND EFFICIENCY OF THE PROJECT

S.No.	Activity	Target	Timeline	Achievement	Timeline
1.	Community mobilization	Mobilize ___ communities	One year	___communities mobilized	One year
2.	Baseline survey	One baseline survey	___days	Completed	___days

S.No.	Activity	Target	Timeline	Achievement	Timeline
3.	KAP Survey	One KAP survey	___ days	Completed	___ days
4.	Installation of Wind powered water-pumps	5 Nos..	One year	5 installed, are functional	One year
5.	Installation of Solar-powered Water-pumps	17 Nos.	One year	17 installed, are functional	One year
6.	Rehabilitation/construction of need based water and sanitation schemes	8 Nos.	One year	08 rehabilitated / constructed	One year
7.	Installation of water treatment systems for households	496 Nos.	One year	496 systems installed successfully	One year
8.	Operation and maintenance training for solar pumps and wind mills	___Nos.	___ days	Conducted effectively	___days
9.	Distribution of tool kits to trained beneficiaries	___Nos.	___days	Distributed	___days
10.	Household latrine construction	1638 Nos.	___mont hs	1638 latrines constructed	___mon ths
11.	School hygiene promotion sessions	100 Nos.	___days	100 sessions conducted	___days
12.	Community based hygiene promotion sessions	60 Nos.	___days	60 sessions conducted	___days
13.	Awareness raising events	4 Nos.	___days	4 events conducted	___days

All the activities were completed successfully except construction of latrines, which lagged behind slightly. The reason for delay was shift in implementing methodology. Formerly, the construction had to be through the communities. One of the prerequisites in this regard was to open community's bank account, which could not be opened due to restrictions to open bank account at VO level⁴. The matter lingered on for while in the hope that there could be a way out to open VOs' bank accounts when it became clear that there would not be any relaxation, a shift in the implementation methodology had to be made.

Construction work was executed through contractors, which took its time to start as in order to maintain transparency and competitiveness the work was advertised in newspapers.

All the aforementioned activities had their own peculiarities and were wrapped in various kinds of challenges but which were surmounted.

Effectiveness

Physical completion of the activities was achieved within project's life time. These activities generated desired results showing that the interventions are effective. The beneficiaries of the wind and solar powered water pumps, rehabilitated water and sanitation schemes and latrines felt highly facilitated and were overwhelmed with gratefulness for the help of the IRP. Whereas water supply schemes made life easier for the community members, the sanitation schemes saved them from harsh weather conditions and at the same time provide privacy and safety from wildlife. Further, sanitation scheme has very positive impact on environment as amount of

⁴ Input from IRP Office

human excreta decreased at open spaces, which reduced pollution. Both in FGDs and individual interviews with the beneficiaries it was clearly shown that the schemes undertaken are fruitful. Awareness raising through training sessions with the community and school children show positive change. The message delivered by the IRP teams were effectively absorbed. Participants of these sessions not only appreciated the knowledge transferred but also highly valued the guide book given as a resource for future use. Retention of the awareness knowledge was satisfactory. Both the communities and school children exhibited relevant knowledge. Similar answers to the questions posed express uniformity in trainings conducted. The resources persons were well equipped with relevant knowledge and knew how to deliver. It was effectiveness of sessions that in FGDs conducted for this study, the participants demanded continuation of such sessions. Similarly, where supply of goods and services fell short of demand, the communities requested more. There was demand for more latrines particularly.

Sustainability of interventions

If the community is low income and least developed, then it is widely acknowledged that the sustainability of services can only be achieved through ongoing financial and technical support to communities by external bodies. In Balochistan Water and Sanitation project, some interventions may need technical support while other will sustain by support from the community. Solar and wind water pumps at times may require technical support, which is not available at local level. Luckily, both types of pumps have long durability. For routine maintenance training has been imparted and supporting toolkit has also been provided. Further, in all project components benefit for the community are clear and visible, which makes the facilities a dire requirement. This aspect will on its own ensure sustainability. A brief assessment, component wise, has been presented below.

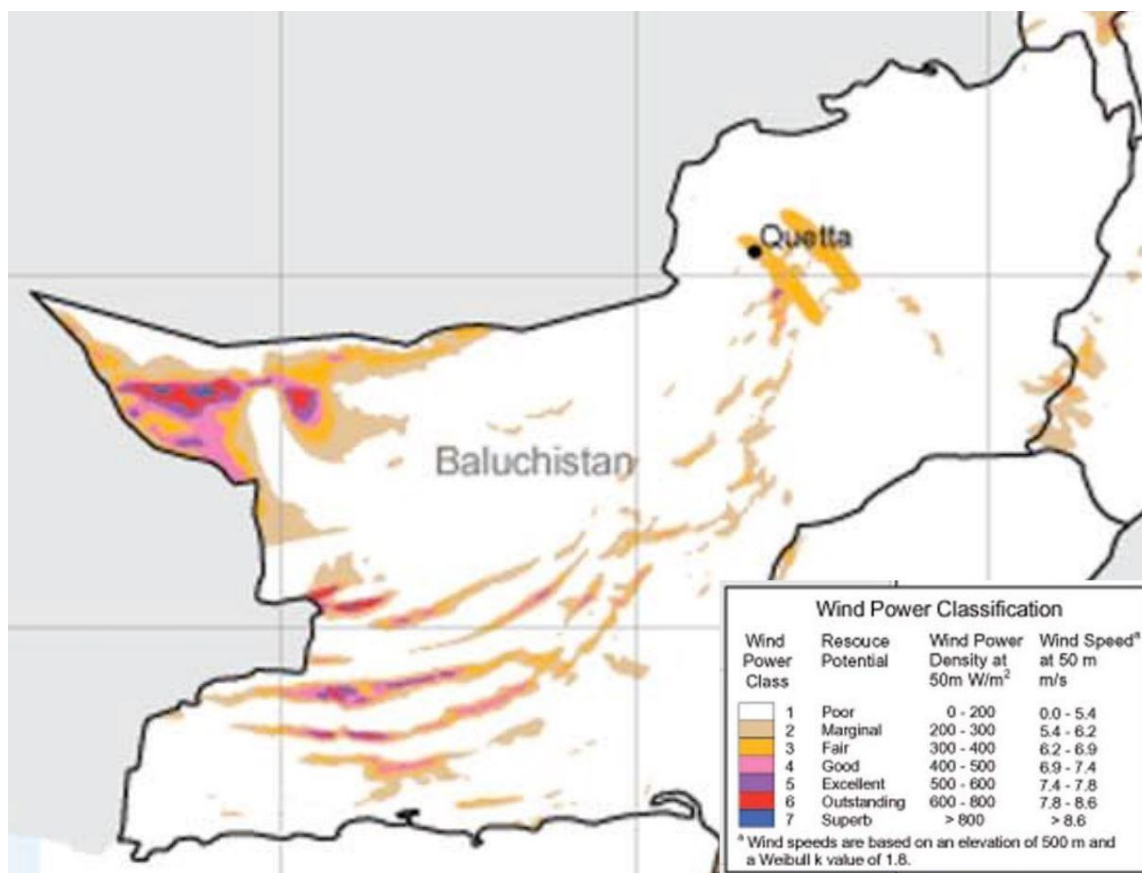
Solar Powered Water Pumps: Under the project, 17 solar water pumps were installed. Major reasons to consider the use of solar powered pumps are that these pumps require no fuel, are pollution-free, work noiselessly, and require very little maintenance. Solar water pumps are specially designed to use photovoltaic-generated power efficiently and they produce the best output during dry sunny weather when the need for water is to its maximum. However, before proceeding with the designing & purchase of the SPS components the information such as type of water source, its depth in case of a well / bore, depth of static water, inside diameter of the well/bore, application of water, vertical lift from water surface to the storage tank or pipe out let, water requirement in gallons per day, water recharge/ flow rate at the source and geographical location of the system etc, need to be worked out. The solar pumping system sizing inclusive of Solar Array to be selected is done according to the **water requirement** of each medical facility per day plus the **Total Dynamic Head (TDH)**. The system has the highest probability of sustainability as it has low maintenance cost. Major components are a solar panel, pump, along with the control system, storage tank and delivery pipes. The panel type is mono-crystalline, which is more efficient than poly-crystalline solar panels because monocrystalline solar panel are made of the highest grade silicon. The solar panel generally have life of 25 years:⁵ keeping them clean gives maximum efficiency and their efficiency output extends beyond 20 years. Pumps, made by Lorentz of Germany, have two years warrantee and if used as per instruction of the manufacturer will last long. Best quality pipes have been used whose life is more than 15 years. Some of the replaceable parts have been included in the toolkit. If the pump becomes irreparable, replacement will have to be made. With such a system, Chinese made pump can also be used, which are cheaper in cost. There are Chinese pumps which use brushless motor of

⁵ Source: <http://energyinformative.org/best-solar-panel-monocrystalline-polycrystalline-thin-film/>

Lorentz and rest of the parts of the pump are Chinese made⁶. These pumps are also durable and cost much less than the ones which are fully German made. Though communities are poor, they may manage to generate repair and replacement costs.

Social mobilization and capacity building of the community was done during and after the installation of the systems. In a community gathering as many people of the village as possible were briefed about the technology and the benefits the community can enjoy for effectively utilizing the solar systems, and measures to be taken to make them sustainable. It was further emphasized upon them that the solar systems can only give longer life through effective operation and maintenance.

Wind Powered Water Pumps: Balochistan is blessed with wind corridors suitable for wind farms. The main points are Nokundi, Hoshab, north of Panjgur, Mastung, Dasht near Quetta and Zhob. Map⁷ below shows Balochistan wind data. Chagai has superb, outstanding, excellent and good wind speed for wind projects.



Considering the best geographical location of Chaghi & Nushki districts in terms of wind speed, five water pumping wind mills have been installed under the project. Wind pumps require little maintenance—usually only a change of gear box oil annually.

Sustainability of the interventions primarily depends upon two things: better O&M and availability of resources to fix any fault. In order to ensure sustainability at first place, training on O&M was imparted to the selected members of the communities. To strengthen the training, toolkits for maintenance work were also given. A question was asked if any fault developed since installation. The response in all the cases was that the pumps operated without any fault ever since they were installed.

⁶ <http://nakin.gmc.globalmarket.com/show-product/solar+pumps-1-38.html>

⁷ Wind Resource Assessment and Mapping of Afghanistan and Pakistan by Dennis Elliot (National Renewable Energy Laboratory, Golden Colorado USA)

Latrines: Flush latrines have been constructed under the project. Structure of the flush latrine comprises of four walls made of common clay burnt bricks and covered with roof and an iron-made door. Mortar plaster at the base and floor while mud plaster on remaining part of the wall has been used to make the solution economical as well as durable. The community members were aware that the latrine should be used carefully so that it last long. At few places, scarcity of water was mentioned to be an issue but the facilities were functional. Generally, the facility does not involve any significant O&M cost as long as it is used properly. Rains may affect mud plaster in the long run to some extent, but communities can manage fix it on their own. If a facility becomes a basic requirement, chances of sustainability increase.. As the communities are benefitting from these latrines and feel them a necessity, they will maintain the latrines to keep using them for longer period of time.



Water and sanitation schemes: 08 schemes of water and of sanitation were constructed / rehabilitated. These included communal latrines and elevated water tanks with taps. O&M of these schemes is the responsibility of the community. As long as water is available for the communal latrines, these will remain functional. So is the case with water tanks. However, cleanliness of the communal latrines may become an issue with the passage of time.

Water treatment system: The project adopted a very economical way of water treatment, which is simple and can be maintained without much efforts. O&M cost is negligible. An earthen pitcher, having a water outlet, forms the main body of the system. It is filled with sand and gravel to achieve maximum turbidity entrapment. The system called "Nadi" does not involve high replacement cost: monthly maintenance involves replacement / cleaning of sand and gravel. However, the point of concern may be that earthen pitchers, which form the body of the treatment system, are not available locally, which may make replacement a difficult task. A business outlet of the earthen pitcher at least in the district headquarter will ensure that replacement is manageable.

Assessment whether solutions for provision of water were economical

Water accessibility in the target union councils has been increased by installing solar and wind water pumps and rehabilitation of water supply schemes. With regard to wind and solar water pumps, the most essential point is that not only in Balochistan but in Pakistan there is power crises. Even if solar and wind powered water pumps appeared to be expensive, they provide regular supply of water and thus meet water requirement of the area. Balochistan has a total demand of about 1650 MW while the shortfall is of over 1000MW, which may take years to bridge. Excessive load shedding, particularly in rural areas, practically means no electricity. Majority of the areas in the Chagai and Noushki are even without grid electricity. Promoting renewable energy options instead of extending the national grid lines in the scattered population is

considered a viable option. Therefore, economic analysis is not prudent at least in case of utilizing renewable energy options like solar and wind water pumps. However, economic analysis conducted across the globe for these two types of solutions indicates that these are economical. Initial cost of the products is higher as compared to conventional way of drawing out water but in the long run these solution cost much less primarily because of two reasons: one less running cost and second less maintenance cost. In case of the target districts, these solutions have advantage when running time is compared. Solar water pump can operate as long as solar irradiation is available and wind water pump as long as there sufficient wind velocity. On the other hand, when there is excessive load shedding of power, the conventional pump won't supply water as per requirement. In a word, in case of rural Balochistan necessity takes over economical aspect even: however the solutions are economical.

Water treatment system are the most economical system available. Once the community fully realizes the benefits of the system and gets accustomed to it, the system will be considered a basic necessity by the community itself. Having low cost, it will remain in use. The availability, as mentioned earlier, will be problem if any business outlet is not open in the area.

Generally, the cost of construction in rural and far flung areas of Balochistan is higher. Hence, situation may be viewed from perspective of Balochistan's peculiar geographical circumstances. Construction of latrines has been based on durability aspects as well as affordability.

Whereas base of the four walls and floor has mortar plaster, remaining of the walls have earthen plaster on walls built with common clay burnt bricks. Roof is set with iron-guarders and common clay burnt bricks. Keeping in view durability aspect as well, it is economical structure.

Assessment of Program Implementation Strategy

Project activities followed parallel and series sequence depending upon the nature of the tasks. Where the activities were bound to follow sequential order, delay would put extra pressure on the management. If not controlled such tasks would delay the project. There were factors, which were out of control of the project management. These factors included strikes, lengthier than agreed or expected delivery of supplies and processing of re-appropriation of funds request etc. There were times of strains and stress but the project teams skillfully managed completion on time is most of the cases. Some weakness in project design like allocation of unrealistic time to activities for efficient and effective implementation also caused concerns: community mobilization in Noushki needed more time as it was a new area for IRP. The project was designed to be implemented in one year's duration and it achieved its targets on time. However, documented planning could be improved. Use of project management software could help better management and would show clear picture of consequences of delay of an activity over the other. Difference appearing in comparison with the baseline of the schedule could be shared with main office to get support in solving delays.

Assessment of Adherence of the Project to Principles of Transparency, Participation and Accountability

- Selection and verification of beneficiary communities:

For various project interventions, which were limited in quantity, a segment of communities had to be selected. Even in presence of selection criteria, it was very challenging for IRP teams first to make a selection and then carry out interventions. For instance, first to select beneficiary community and then a segment from within for provision latrine facility, the following criteria was adopted:

- ✓ Community is willing to allow construction of this facility,
- ✓ Water is available to avail the facility,
- ✓ There is sizable population, which is geographically accessible (at many a places, population is thinly scattered),

Given the peculiarities of rural Balochistan, the aforementioned selection criteria is fair enough. The following challenges were experienced when dealing with rural communities of Chagai and Noushki districts:

- Some of the communities were totally unwilling to allow any humanitarian activities, which made social mobilization an extremely difficult task;
- At places, there existed a degree of abhorrence towards NGOs and hostile attitude was expressed when interacting;
- In a selected community, some members created hurdles to initiate and complete project interventions because they could not get selected as beneficiaries. This internal conflict caused undue delays; and
- Sometimes, after community's consent to avail project facilities, vacillating decision in some segments pushed time line for activities beyond limits.

In short, selection of beneficiary community and within the community, choosing the beneficiary households or cluster of households was kept transparent. Surfacing of challenges thereafter exhibited that everything was shared with the communities. As supply was short of demand, there appeared issues which were successfully tackled.

▪ Participation of community in designing, planning & implementation

Involving communities, particularly low income, in social projects ensures better sustainability and promotes accountability. Evidence suggests that informed hardware choice and ongoing system maintenance and management by communities can lead to longer-lasting access to both water and sanitation services. Yet without an enabling environment and some form of ongoing support, it is often reported that community engagement does not automatically lead to sustainable projects and programmes. Wherever possible the communities were involved in planning process but of course there were limits to the extent of community involvement. For instance, in technical issues, the communities did not have any specific knowledge or experience, therefore could not be involved fully-they did participate as observer in such cases. In fact, this is common reported barrier in low income and less developed communities.

As IRP had already undertaken interventions in Chagai, community mobilization was swift but in Noushki, being a new area for IRP, community mobilization took time, which resulted in some difficulties during implementation of the project activities. Despite the mobilization challenges, the

communities were consulted at various stages of project planning, design and implementation. In case of construction of latrines, the communities had informed that if the wall were made of common clay bricks (whether burnt or un-burnt) and not plastered at the base with mortar, the wall would not stand vagaries of weather. Picture below reflects result of community consultation.



Further, the communities had also suggested that tapped water should also be provided at household level. The suggestion was agreed upon and water tanks were constructed at higher level to make delivery of water possible.

Similarly, in consultation with communities provision of bathing was kept in the latrines wherever demanded.

Moreover, as far as construction of latrines is concerned, it was planned that the work would be executed through the community after a bank account had been opened in the name of community but unfortunately due to ban by the government to open such accounts at VO level, this plan could not be materialize. Other tasks like installation of wind and solar water pumps involved technicalities which the communities did not have the capacity to handle.

- Community empowerment to take up project related issues and expectation with the project management:

Community mobilization was an effective tool to build relationship with the communities. This laid a platform to implement project activities. Awareness raising sessions further strengthened this bond, which empowered communities to take up project related issues with project team.

Generally, rural communities are not aware of existence of various departments at district or even lower level. As scope of work of IRP and that of government department varies, the communities have to approach the concerned department to have their problems solved. IRP can provide support for a specific period. Ultimately, it is the departments which have to deliver.

IRP did inform the communities about the existence of various departments but meeting of the communities with the departments could not be held. An improvement can be made by developing institutional links between the communities and the government departments / agencies by coordinating meetings / interaction sessions. As mere knowledge of existence of a

department or agency may not necessarily build confidence to approach the concerned department / agency to have the problem solved.

Assessment of level of awareness of communities including school children

FGDs were held the communities (both with males and females) and the children. A number of questions were asked to assess the level of awareness about health and hygiene. Similar responses to various questions showed uniformity of trainings conducted. In all the FGDs, the participants exhibited satisfactory level of awareness. They all knew about bodily hygiene and highlighted importance of taking bath, brushing teeth, washing hand with soap, keeping house and streets clean. Collecting solid waste in a pit and later either burning it or taking it away from the village to dump was also shared. School children showed enthusiasm during the sessions and recalled what was delivered by the IRP's trainers. Their teachers had also strengthened basic concepts about health and hygiene. Overall outcome of the trainings appeared to be satisfactory. Participants for some FGDs demanded that there should be more sessions as they learned a lot. They particularly mentioned guide book in this regard, which served as reference for them. The participants wanted more trainings to practice the knowledge imparted, especially activities like 'how to prepare ORS' were requested to be repeated for effective learning.

Comparison of Surveys' Results

A baseline survey was conducted for the project in which a number of indicators relating to water and sanitation, including those pertaining to health and hygiene, were used to assess the situation in the districts of Chagai and Noushki. Various interventions were undertaken by the "Balochistan Water and Sanitation Project" and a few by government agencies. Besides, economic condition of the communities was also assessed. Past experience show that in case of Balochistan, it very difficult to get data about income and expenditure of households. Unfortunately, people tend to understate their family income and over-state the expenditure. Due to limitations posed by this trend with regard to collecting accurate information about income and expenditure, an attempt in the evaluation study has been made, as in case of baseline study, to get information about household assets only. A comparison below shows slight improvement in possession of assets by the households but mostly single digit figure of assets of the household clearly indicate that in the target districts, families are poor.

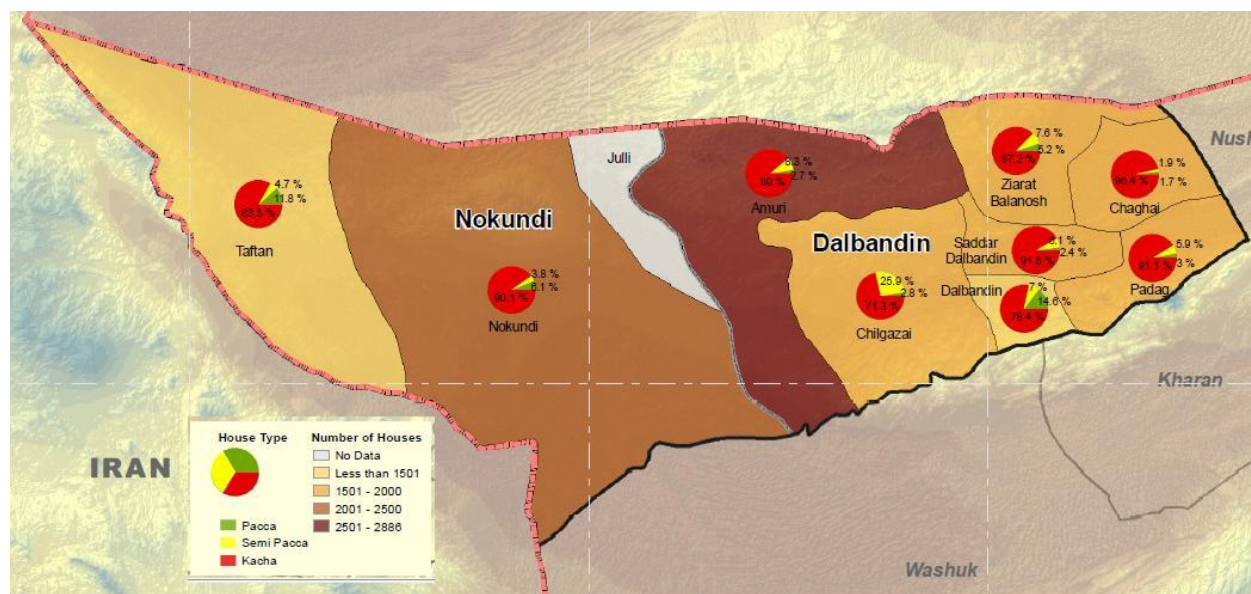
TABLE 2 TYPE OF ASSETS BY HOUSEHOLDS (%)

Assets	Baseline	Evaluation study
Cow	1	4.9
Buffalo	1	
Sheep	23	50 ⁸
Goat	28	
Camel	6	--
TV	2	5
Computer	0	1.8
Bicycle	6	40
Motor Cycle	12	20
Tractor	2	3.5
Generator	1	2.5
UPS	1	
Washing Machine	3	35
Sewing Machine	7	
Car	4	7.2
Refrigerator	1	5.8
Air Cooler	0	6.8 (AC/Air cooler/geyser/heater)

Periodic spells of drought have adversely affected agriculture and livestock, which are mainstay of rural economies of Chagai and Noushki. Though Chagai is mineral rich district but the provincial or even federal governments have not been able to tap this potential, which of course is capital intensive too. Lack of technical capacity is another impediment to start mega mineral projects by the provincial government. Therefore, keeping aside the

⁸ Sheep and goats were treated as one category in the evaluation study and so were few other items as shown in the table above

potential, means of subsistence of people of Chagai and Noushki remain, primarily, agriculture and livestock. Having depleted opportunities of earning, the people of Chagai and Noushki are involved in low level, unskilled labor work.



The map above, based on data of the Census of 1998, indicates that most of the household structures are either kacha or semi pacca. A visit of these districts brings into notice that the pattern depicted by the Census data hasn't changed much since then.

Access to Safe Water Sources of Water

In both the districts, households mainly rely on well water. Whereas the baseline study figure show that the households were mostly using unprotected well as main source of water but the result of the evaluation study indicates that now it is protected well. The change in trend may be mainly due to awareness raising activities conducted by IRP in the districts. In FGDs, the participants showed good level of understanding with regard to clean and safe water. They were aware that covered well saved from spread of water borne diseases. Second major source of water is tube wells. The provincial government considers that a quick solution to manage water scarcity issue is to drill tube wells for provision of water. Therefore, number of tube wells is likely to grow by each year. For 10 towns in the province, dams are being constructed for drinking water purposes and this number will increase with passage of time.

Under development budget of Government of Balochistan, 09 new projects of water supply schemes, worth Rs. 173.15 million will be executed during financial year (FY) 2015-16 in Noushki. One project of construction of various water supply schemes, costing Rs. 40 million was executed and completed in FY 2014-15. In Chagai district, the only water supply project, worth Rs. 1980 million, is meant for Reko Diq Copper and Gold project. List of projects as reflected in the Public Sector Development Program 2015-16 may be seen in the annexure.

Comparison of the results of the baseline survey and that of evaluation study has been presented in table below. Sources of water were grouped under two main categories: inside house and outside house. In Noushki, in all three union councils percent of use of water from protected well (located outside the households) has increased significantly and on the other hand use of unprotected well as source of water has decreased. Apart from wells, other sources of water in Noushki include tube wells and surface water sources: their use as source of water has also decreased as shown in table below.

TABLE 3 UNION COUNCIL WISE HH DISTRIBUTION BY THE SOURCE OF WATER, NOUSHKI (%)

	Water Sources	Noushki					
		DAAK		Anam Bostan		Kishingi	
		Baseline	Eval. Study	Baseline	Eval. Study	Baseline	Eval. Study
Inside House	Piped Water	0	0	0	0	0	0
	Borehole/Nalka/Motor Pump	3	0	0	0	10	2
	Protected dug well	0	6.1	0	3.2	0	4
	Unprotected dug well	0	1	0	0	3	0
Outside House	Public Tap/Standpipe	3	0	4	0	10	0
	Protected dug well	0	89.2	18	75.2	15	74.0
	Unprotected dug well	63	2.9	31	10	28	3
	Water from protected spring	0	0	0	0	0	0
	Water from unprotected spring	0	0	2	0	0	0
	Surface water (river/dam/lake/ponds/stream/canal/irrigation channel)	0	0	40	10	3	2
	Tube well	30	1.6	5	0	20	15
Others	tanker Truck	0	0	0	0	13	0

From amongst the sources of water located inside the house, use of piped water has increased in Chagai and Padag union councils since baseline study: from 7% to 12.5% in Chagai and from 3% to 19% in Padag. Similarly, use of tube well has shown considerable increase in Chagai (43%) and Padag (57%). On the other hand, reliance on tanker / truck has risen from 16% to 46% in Sadar, which indicates that public sector water supplies are unable to provide sufficient amount of water to the households in Sadar UC.

TABLE 4 UNION COUNCIL WISE HH DISTRIBUTION BY THE SOURCE OF WATER, CHAGAI (%)

	Water Sources	Chagai					
		Chagai		Saddar		Padag	
		Baseline	Eval. Study	Baseline	Eval. Study	Baseline	Eval. Study
Inside House	Piped Water	7	12.5	0	0	3	19
	Borehole/Nalka/Motor Pump	6	0	0	0	8	0
	Protected dug well	2	3.1	0	0	17	0
	Unprotected dug well	5	3.1	0	0	0	0
Outside House	Public Tap/Standpipe	2	25	4	0	4	0
	Protected dug well	22	0.5	23	0	22	0
	Unprotected dug well	25	0	44	0	46	11.9
	Water from protected spring	2	0	3	0	0	2.5
	Water from unprotected spring	0	0	3	0	0	0
	Surface water (river/dam/lake/ponds/stream/canal/irrigation channel)	1	0	8	43	1	0
	Tube well	7	43	0	7	0	57.1
Others	Tanker/ truck	22	0	16	46.2	0	2.4

Whereas in Chagai there is only one project of water supply, Noushki has 9 projects which will be implemented during FY 2015-16 under development budget of Government of Balochistan. Further, the Federal government is providing grant for National Assembly constituencies under its Millennium Development Goals Program: since water and sanitation is part of the MDGs, greater number of schemes in all constituencies are being identified in water and sanitation. Rs. 20 million were provided for each constituency in FY 2014-15 while greater amount is expected during FY 2015-16.

Administrative Setup

In the baseline survey report, it is mentioned that "all public sector schemes are subject to approval of MPA". In fact, it is not correct. Some of the schemes, including those pertaining to PHE, in development budget are identified by the MPA while approval is accorded either by Departmental Sub-Committee - DSC headed by Secretary PHED or Provincial Development Working Party-PDWP, which is headed by Additional Chief Secretary (Development), P&D department. Both of these forums can reject any scheme if it is not feasible due to any reason. At times, approval takes time due to lack of coordination but generally approval is swift. Moreover, 10 dams are being built for various towns to meet drinking water shortage: this project was identified by PHED. In development budget of 2015-16, there are many schemes, which have been identified by PHED. Federal Government is allocating funds under its Millennium Development Program and each constituency of National Assembly. Water supply schemes dominate the schemes so far identified for various districts.

Balochistan is geographically almost half of Pakistan's land mass having scattered population (population density per square kilometer in Chagai and Noushki is very low) and difficult terrain. Size of Balochistan's development budget is not big. Whole provincial development budget of Balochistan is Rs. 54 Billion while only one project of Kachhi Canal is worth Rs. 57 billion. Construction of medium dams is also costly affair. Any medium dams in Balochistan costs over Rs. 5.0 billion. Without support of development partners / international NGOs, Balochistan cannot develop in any sector on its own. Bearing in view this reality, many donors provide financial and technical support especially in social sectors

Water Source Distances

In rural areas of Balochistan, including those of the target districts, access to piped water is minimum, which is due to lack of financial resources and wide area with scattered population. Distance, time and gender are permanently attached to sources of water outside the premises. Mostly it is women who have to walk considerable distance to fetch water consuming time which affects their other household chores. The following comparison does not show much variations with regard to distance to the water sources for the household members fetching water but in the FGDs it was shared by the participants that due to installation of wind and solar water pumps time consumed in fetching water had reduced significantly. In fact, it should not be expected that in one year distance will decrease in great proportions unless many new projects of water supply schemes are completed in the target areas. The evaluation show achievement in terms of facilitating the households to have easy access to water by reduction in time and also providing piped water to households wherever possible. Figures of evaluation household survey, quoted below, indicate the percent of household having source of water in less than a kilometer ranges from 55.4% to 87% in all sic UCs. Minimum percent of sources of water fall in the group of 4-6 kilometer as shown in table below. Except for Sadar UC, where 7.3% of the households have reported distance to the water sources between 4-6 KM, households of no other target UCs indicated their water sources at such a distance. Overcrowding at watering point was highlighted in the baseline survey adding that overcrowding resulted in conflicts. Since water is being drawn out at faster rate, waiting time has decreased reducing chances of conflict. Table below shows UC wise comparison of access to source of water in terms of distance.

TABLE 5 UNION COUNCIL WISE PERCENT DISTRIBUTION OF HH BY THE DISTANCE TO THE WATER SOURCE

Distance	Noushki						Chagai					
	DAAK		Anam Bostan		Kishingi		Chagai		Saddar		Padag	
	Baseline	Eval. Study	Baseline	Eval. Study	Baseline	Eval. Study	Baseline	Eval. Study	Baseline	Eval. Study	Baseline	Eval. Study
Less than a KM	23	55.4	34	78.3	4	57	0	87	0	69.1	0	78.6
1-3 KM	62	44.6	42	27.7	81	43.0	97	12.5	81	23.6	100	21.4
4-6 KM	15	0.0	25	0.0	15	0.0	3	0.0	19	7.3	0	0

Water Fetching Responsibility

The baseline survey indicated that mostly it was the responsibility of adult women (75.3%) to fetch water followed by adult men (16.5%). In the evaluation study survey, the trend hasn't changed much. Figures for male and female child under 15 years of age comes out to be zero while percent share of adult male has increased from 16.5% to 30.21%.

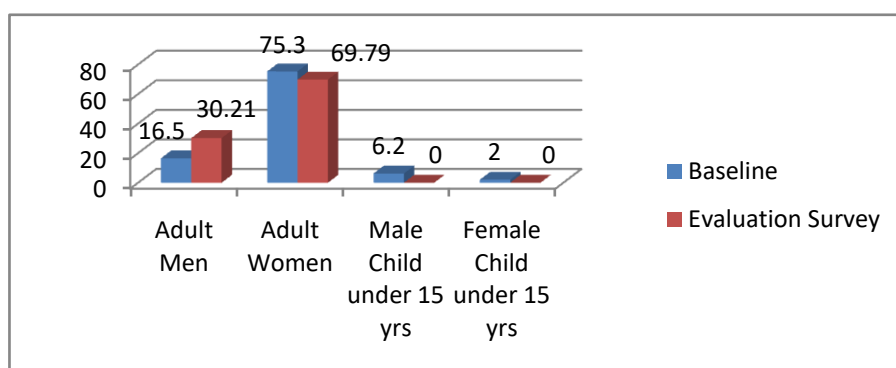


FIGURE 1 PERCENT WATER FETCHING RESPONSIBILITY

Cost of Drinking water

In urban and semi-urban areas, population is concentrated at one place while in rural areas of Balochistan it is thinly scattered: in case of Chagai and Noushki, population density per square kilometer is very low. Water-provision-services of tankers / truck are found in urban and semi urban areas predominantly. In rural areas, the households have to fend for themselves. The scarcity of water has been reported both in urban and rural areas in the baseline survey and it was confirmed in the FGDs as well. Therefore, while looking at the figures of percent of HH who pay for water, it should be kept in mind that paying for water does not adequately reflect water scarcity in the area of study. Further, in other sense there is no system of paying fee for water charges in most parts of Balochistan. Hence, this payment of water is to purchase water in case of unavailability through a source (like tube well) developed by public sector agency. Even

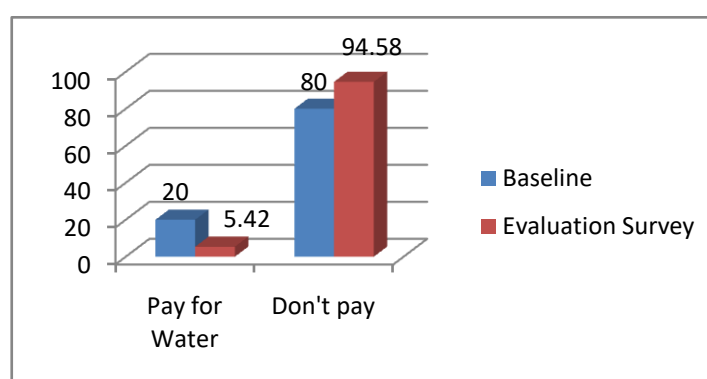


FIGURE 2 HH DISTRIBUTION BY WATER PAYMENT (%)

though there had been scarcity of water, 20% of the households were paying for water at the time of baseline survey. Situation has improved by about 15% in the surveyed areas.

Nature / Taste of Drinking water

Public Health Engineering department of Government of Balochistan has conducted a series of test holes in both Chagai and Noushki districts in order to assess depth and nature of water. Keeping in view geological / hydro-geological parameters, the department concludes that in all nine UCs of Noushki sufficient amount of groundwater having permissible limits of water quality under WHO standard is available but there are some areas which have some qualitative and quantitative issues relating to groundwater. These areas are: Saddar, Daak, Kishingi and Badini. In Chagai, reasonable amount of water is available at Ghat and Thalab areas. In both the districts, tube wells at the depth of 500 ft. are termed feasible both for drinking and agriculture purposes.

From tube wells' data available with PHE department, the following information about depth and discharge (gallon per minutes-GPM) of tube wells has been derived.

TABLE 6 GROUNDWATER SITUATION IN SELECTED UC (SOURCE: PHED)

Location	Total depth	Depth to water	Discharge GPM
Kishingi	450	120	40
Kishingi	480	130	45
Chagai	570	165	45
Chagai	590	185	45
Dalbandin	600	200	35
Noushki	650	280	40
Padag	600	200	40

Experience of the respondents with regard to water taste and accessibility shows that situation has improved since baseline survey meaning that access to sweet water has increased. This, of course, does not mean that either on ground or underground nature of water has changed to the extent as experienced by the respondents.

TABLE 7 HH DISTRIBUTION BY THE NATURE OF DRINKING WATER (%)

District	Taste of water			
	Sweet		Brackish	
	Baseline	Evaluation Study	Baseline	Evaluation Study
Chagai	65.5	75	34.5	25
Noushki	50.4	68	49.6	32

In the FGDs, the participants informed that they were using both sweet and brackish water. For instance, in one of the FGDs it was shared that out of two wells water of one was brackish. Further, where the community was forced to use pond water, it was informed that when the pond was full, the water was sweet though muddy. As the quantity of water decreased to a certain level, the water became brackish. In the pond a point was told to

be reached when the water became unfit for use. The baseline survey had also highlighted similar situation with regard to taste and availability of water. The communities having pond as only sources of water, expressed demand for tube well to get rid of irregular supply and deteriorating condition of pond water with passage of time. One of the communities reiterated that access to water was a big problem as there was no tube well in the area. The community was facing water scarcity since 1998 as they relied on rain water. Drought had aggravated situation for them. They said that no NGO provided them tube well because there was no electricity. They added that even if there was electricity there would be excessive load shedding.

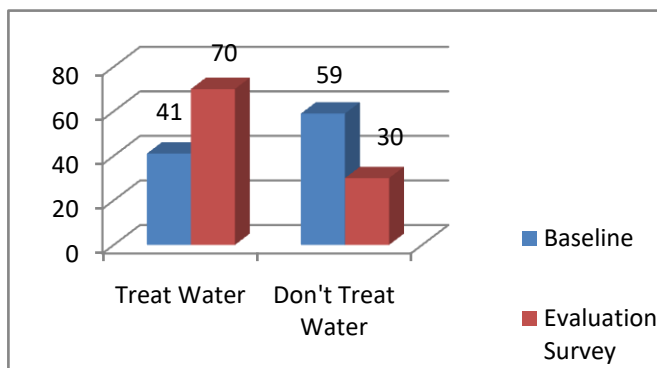


FIGURE 3 : HH DISTRIBUTION BY THE WATER TREATMENT (%)

Water Treatment & Management

At the time of the baseline survey, 59% of the households did not treat water but the evaluation study survey exhibits a change in trend due to better understanding of risks involved in using untreated water on the one hand and having access to clean water on the other hand. Since the baseline survey, there is an increase of 29% for use of treated water. As per information provided by the PHE department about the areas, which have water quality issues (Kishingi, for instance) need more attention with regard to awareness raising and provision of water treatment system. Both the baseline and evaluation study

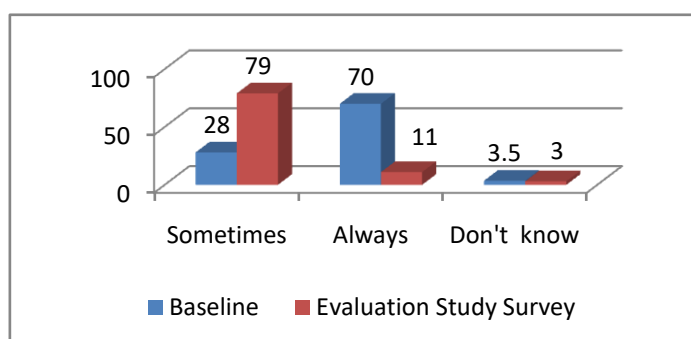


FIGURE 4 : HH Distribution by Water Treatment (%)

households surveys show that frequency of water treatment ranges between 'sometimes' to 'always'. Whereas the baseline survey figures show that 28% of the households reported that they sometimes treated water and 70% did it always, the evaluation study household showed a variation telling that 79% of the households treated water sometimes and 11% always.

During the FGDs of the baseline survey, the participants had shared that they faced both quantity and quality issues in water that they had to use. The problem of quantity became acute during summer season. With regard to quantity, people of the surveyed areas have higher availability due to facilitation through solar and wind water pumps but quality issues may persist.

At government level, there wasn't any lab for testing water quality in the target UCs or even at district level and by now there is no plan of government to establish any such labs there, which means that the water used will carry risks for safety and health of people consuming the water. Moreover, when there is scarcity of water and limited choices with respect to sources of water, people are bound to consume water which is available. Baseline survey indicates that huge proportion of population (84%) never tested water quality. In fact, level of awareness, financial resources and availability of water testing facility determine this high proportions. In the absence of these prerequisites, it is unwise to expect that most of the households or communities will have water quality test before using it.

Water management figures show that water is being stored mostly in canneries, jerry cans and plastic gallons. Table below presents a comparison between the baseline and evaluation study's households surveys. Though means of storing water are different but an overwhelming majority of the households, in both baseline (95%) and evaluation study (99%) surveys, reported that they cleaned the containers before use.

TABLE 8 HH Distribution by the Water Containers (%)

Container Type	Baseline	Eval. Study
Canneries	26.20	0.0
Water tanks on roof	1.2	0.0
Underground tank	5.4	0.0
Plastic drum with tap	6.5	0.0
Metal drum with tap	0.50	0.0
Plastic bucket	9.10	0.0
Metal bucket	2.40	0.0
Jerri cane	20.20	30.00
Plastic gallon	26.20	48.88
Water cooler	1.30	0.0
Other	0.50	11.12
Don't answer	0.40	0.0

Not only the households are well aware of keeping the water storing containers clean, they are also cognizant of the fact that unclean and unhygienic utensils would be a cause of incidence of diseases. Participants of FGDs of both baseline survey and evaluation study shared almost similar views.

Water management committees / CBOs/VOs

It's an established fact that involvement of communities in planning, design and implementation of water and sanitation projects increases not only ownership but also enhances chances of sustainability. Further, when institutional arrangements have limited outreach, a gap in services is unavoidable. Study of water and sanitation projects and evaluation reports across the globe suggest to increase coordination between communities and development partners / agencies. This suggestion emanates from the coordination gap. To bridge this gap, there is practice of forming WASH committees / CBOs / VO in various parts of the world. The baseline survey indicated that in both the districts a total 13.8% of the respondents reported existence of such committees. At district level in Chagai existence of such committees / organizations was 6.2% and in Noushki 7.7%. Moreover, 90% of the respondents (in the baseline survey) said these committees were functional. The evaluation study's household survey indicates improvement in both districts and percent of existence of WASH committees / CBOs / VO in Chagai and Noushki rises to 20 and 16 respectively. Further, in over 90% of the cases the committees /organizations are functional.

Access to Sanitation

Toilet facility at household & open defecation practices

Development budgets are prepared both at national and provincial levels. Before 18th constitutional amendment, there was likelihood that sanitation projects might find place in

the national development budget but now the subjects related to social sectors have been devolved to the provinces, which means provincial budget is the only source in public sector. An analysis of Balochistan's development budget shows that sanitation projects, in the social sectors, have been the lowest priority of the government, particularly in the rural areas. Occasionally, a small amount of funds is spent on small sanitation projects through funds allocated to public representatives. This situation highlights need for contribution by the development partners and INGOs / NGOs.

The baseline survey indicated that only 26.2% of the surveyed population had access to latrine. After interventions by the project, this figure reaches at 55.6%. (in the surveyed areas). In the FGDs of the baseline study, the participants had informed that they did not have this facility because they could not afford it and second there was water scarcity. This fact was confirmed by the participants of the FGDs again in the evaluation study. Though access to water has improved overall, residents of a few areas said that they had latrines then but there was shortage of water. In water scarce areas, type of latrine may be changed.

As the project has constructed flush latrines, the result of the household survey of the evaluation study confirms that majority households is using flush latrines. A comparison has been drawn below.

TABLE 9 Distribution of Type of Latrine (%)

Practice	Baseline	Evaluation Study
Flush toilet	73.5	92.42
Composting toilet	3.1	1.2
Pit latrine without slab	1	0.5
Pit latrine with slab	12.2	3.38
Ventilated improved pit (VIP) latrine	9.2	2.0
Others	1	0.5

A change in defecation practiced is noticed since the baseline survey. Among those who did not have latrine facility now 40.6% defecate in open as compared to 72.1% at the time of the baseline survey. Further, use of community latrines appears to be growing as this figure has jumped to 47.35% from the baseline survey percent of 1.7. whereas community mobilization at some places of the UCs was a real challenge due to particular segment of the populace, convincing such communities to allow construction of latrines was even more difficult. There were segment of population in the target UCs who did not accept any help from INGOs or NGOs and there were those who considered construction of latrines a bad practice. However, despite these challenges the IRP teams managed to construct latrines. The following figure presents comparison of other options of defecation practices.

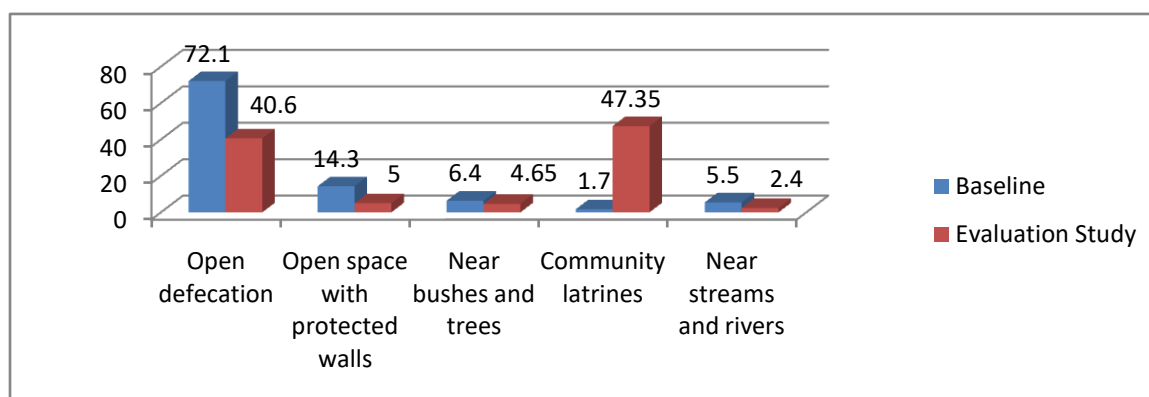


FIGURE 5 DEFECACTION PRACTICES (%)

Latrine inspection

If intended benefits are to be derived from the facility of latrine, it should be used hygienically. Further, it should address issue of lack of privacy especially in case of women. Literacy rate in rural Balochistan is generally very low, which affects living conditions adversely. More often than not, level of awareness in illiterate communities is found low. These fact are taken into account when planning and implementing water and sanitation projects. Various awareness raising sessions were conducted by the project's field teams. The impact was visible when latrines were inspected. A glance at the table below shows that there is higher presence of soap and improvement in cleanliness conditions, which augers well to contain diseases and depicts better sense of using latrines.

TABLE 10 Latrine Observation (%)

Observations	Baseline	Evaluation Study
Latrine had a protected entry	92.2	97.98
It has a curtain or door	95.2	98.48
There was arrangement of water	73	98.48
Soap was placed in the latrine	54	85.21
Wiper & broom were placed in the latrine	38.3	55.71
Detected faeces in pit	57.4	40.22
Latrine was smelly	26.2	15.33
Stagnant water seen in the toilet	16.4	10.32
Flash slab was wet	30.6	20.67
Children's diapers were there in latrine	6.7	3.89

Latrine Cleaning

By and large, women in the household are entrusted responsibility of maintaining the latrine. Frequency of cleaning the latrine shows that households mostly clean it once in a day. Whereas in the baseline survey once-in-a-day cleaning frequency was 56.2%, by the time of the evaluation study this figure rose to 69.10%. Those who cleaned this facility twice a day formed 34.2% and 39.64% during baseline survey and evaluation study respectively.

Frequencies of once in a week, after every two week or once in month are quite low as shown in the figure.

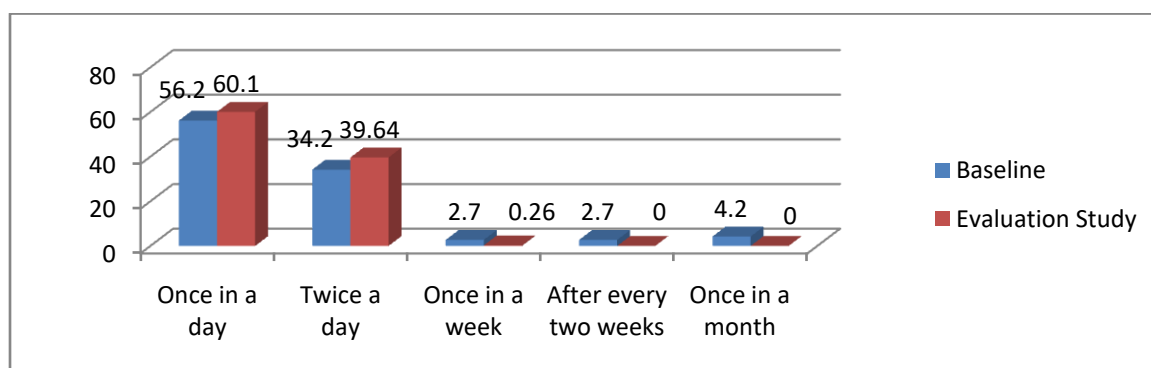


FIGURE 6 Percent Distribution Of Latrine's Owner By the Latrine Cleaning Frequency (%)

As more latrines are being constructed, it is ensured that drainage of the latrine is concealed. Response of households was recorded to check the status of this indicator, which showed that 67.1% and 80% households reported concealed drainage of their latrines during the baseline and evaluation study surveys respectively.

Understanding about the Importance of Toilet

Importance of toilets is realized by the communities of the target UCs. In FGDs, the participants were of the view that the toilet not only avoided risk of falling prey to diseases, it saved them from harsh weather conditions and the wildlife. They considered toilet a great facility, which benefited women, children and older persons alike. In the baseline study 94.5% of the surveyed households realized importance of latrine.

HH waste & Baby Feces Disposal

Municipal services are mostly weak in rural areas of Balochistan, which shifts burden of responsibilities to the communities. If trainings are not given to the communities on ways of dumping and disposing of solid waste properly, health hazards are likely to crop up. Both baseline and evaluation study surveys show that now the communities are mature enough not to throw garbage in streets. However, trend of throwing it at unspecified open space is alarmingly high (64.6% during the baseline survey and 52.76% at the time of evaluation study). Though throwing solid waste at specified open place has improved but it cannot be termed as satisfactory.

TABLE 11 HH Waste Disposal (%)

Places	Baseline	Evaluation Study
In street	10.7	3.07
Unspecified open space	64.6	51.76
Specified open place	23.2	44.91
Others	1.3	0.26

Improper disposal of baby's feces has been one of the causes of spread of diseases. As latrines are being built in the target UCs, better and effective disposal of baby's feces is being reported. Notwithstanding, throwing it at unspecified places outside house is still very high at 52.43%. This practice had even higher occurrence when the baseline survey was

conducted. Figure below gives a comparative picture of indicators related to disposal of baby's feces. On the whole, waste disposal practices are not good and there is no mentionable support from relevant government department. During the baseline survey, representative of LG department had informed about a designated place close to the village which is called "DUP", where people mostly dumped their HH waste, but there was no system to dispose it further. This situation hasn't registered any change since the baseline survey.

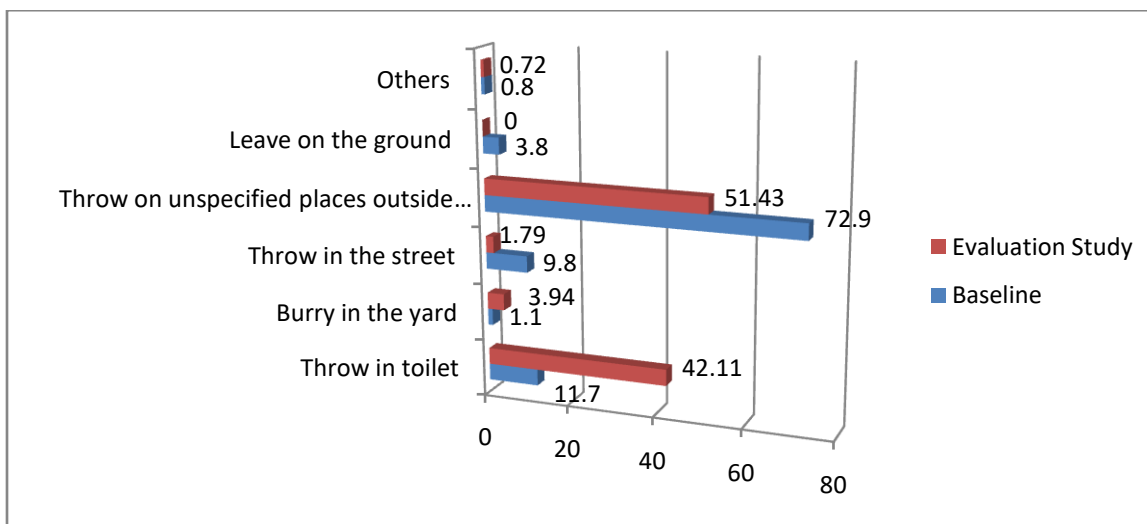


FIGURE 7 Method of Baby's Feces Disposal (%)

Waste water drainage at HH

It is common site in rural areas that unpaved village streets are bifurcated in the middle by an unpaved drain veining out waste water in all directions. In particular hours of the day, foul smell carries on winds. As provincial government has not been able to spare funds for sanitation facilities, situation reflects health risks accordingly. A whopping majority (98% in the baseline survey and 91.38% in evaluation study) reports that they don't have a proper drainage / sewerage system attached to their households. This situation demands attention and investment to improve sanitation system. Of and on, some street pavement and drain construction is carried out in cities and towns but rural areas face a total neglect in provincial development budget. In rural areas, self-help to some extent and donors' support are the options available to develop / improve drainage / sewerage system.

Health & Hygiene

Importance of Hand washing

Level of awareness with regard to health and hygiene practices has improved since the baseline survey though still a lot more needs to be done. The awareness campaign appears to have positive results coupled with construction of latrines where presence of soap was visible during field inspections. In all the indicators, except hand washing before preparing meals, there is improvement which ranges from 1.6% to 12%. Hand washing before preparing meal is reported to be low.

TABLE 12 Response Distribution by the Importance of Hand Washing (%)

Critical times to wash hands	Baseline	Evaluation Study	Percent Change
Before / after taking meals	25.1	30.3	5.2
After using the latrine	24.4	36.4	12

Critical times to wash hands	Baseline	Evaluation Study	Percent Change
Before preparing meals	13.9	10.08	-3.82
After dealing with animal	10.5	12.12	1.62
After handling the garbage	9.5	11.1	1.6

With respect to usage of any agent for hand washing, still a sizable majority of people in the survey area don't use any agent like soap, ash or sand to wash hands. 66% and 46.5% of people were reported to be washing hands only with water at the time of the baseline survey and evaluation study respectively. Percent of people who washed hands with soap was 26.6 during the baseline survey period and increased to 38% when this study was being conducted. Use of ash as hand washing agent was negligible whereas use of sand remained at 6.5% and 14.5% during first and second surveys respectively.

Common diseases in the area

The respondents of the surveys were asked to share occurrence of the following five common diseases: diarrhea, skin diseases, typhoid, cholera and malaria besides any other disease. Most frequent disease was reported to be diarrhea (34.5%) followed by malaria (25.14%), typhoid (21.95%) and cholera (18.19%). Incidence of diarrhea has not changed much since the baseline survey when it was reported to be 33%. Causes of water borne diseases portray close similarity. With regard to the causes, highest proportion was accorded to contaminated water (around 41%) followed by defective food (around 38%) and to the combination of contaminated water, defective food and dirty hands.

Study of data about gender and age groups shows that children under 5 years of age are more vulnerable than those of other age groups. Mainly burden of disease appears evenly distributed among the given age groups in the evaluation study survey. In the baseline survey, the highest affected were women (25.4%) and least affected were girls of 5-18 years of age (9.6%) while in the latest survey maximum and minimum cases were reported for boys under 5 years of age (20.78%) and men (10.71%). Age groups wise details are given below.

TABLE 13 Diarrheal Cases with Respect to Age and Gender

Age and Sex Category	Baseline	Evaluation Study
Men	12.3	10.71
Women	25.4	15.93
Girls (5-18 years;)	9.6	17.44
Boys(5-18 years)	21.1	16.93
Girls < 5 years	19.3	18.21
Boys < 5 years	12.3	20.78

Common treatment practice to deal with diarrhea

There appears to be a growing trend to consult physicians / doctors for treatment of diseases. Had there been sufficient coverage of health services by the public sector, situation might have been even better. Use of ORS for diarrheal treatment is low (12.8% during baseline survey and 21.31% at the time of this evaluation study). In FGDs, some of the participants highlighted that training for preparation of ORS with practical should be repeated

to the extent that the households properly learn to make ORS and then use it when required. Use of boiled water is even lower as compared to use of ORS: barely 11.1% and 6.64% in successive surveys. Awareness raising with some health specialist as resource person will help increase effective and accessible treatment of diarrhea.

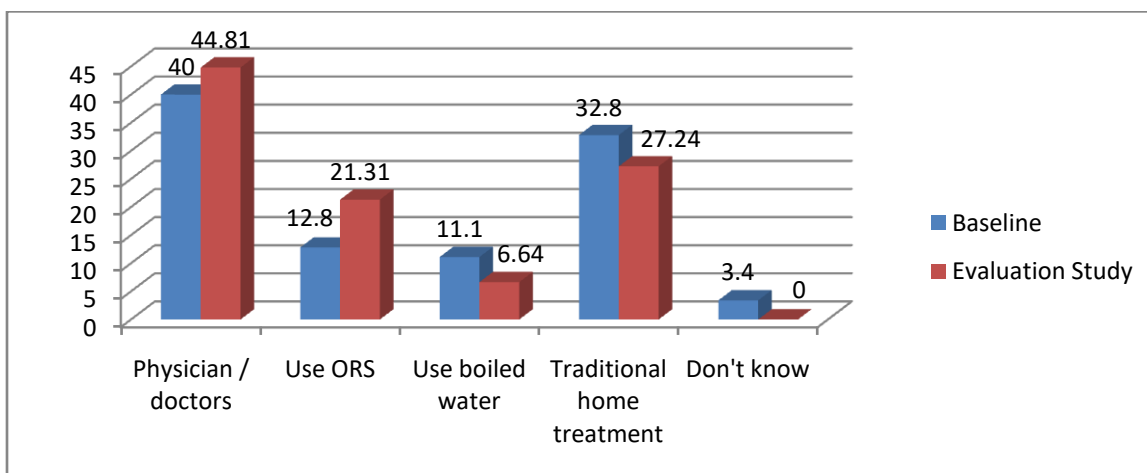


FIGURE 8 Diarrheal Cases With Respect to Age and Gender

The baseline survey mentioned weakness in service delivery by the public sector. Lack of awareness on the part of communities about method of preparing ORS was also noted. Besides, there was service delivery infrastructure in the UCs but of no use. The response of the FDGs as recorded during evaluation study was the same. The participants complained that government would not budge to provide health services.

In the FDGs, the participants expressed that unsafe and unclean water, defective food, polluted environment, and non-maintenance of bodily hygiene could cause various types of diseases. They added that they should keep their clothes, hands and utensils clean: food should also be covered. Further, they stressed upon the use of soap to wash hands. They were also aware that cleanliness prevents incidence of diseases. They also perceived that because the project had provided them clean water by installing solar and wind water pumps, the incidence of water borne diseases had decreased.

Health & Hygiene Sessions

By and large, feedback from the participants of FDGs about the knowledge and understanding of health and hygiene was found to be good. The FDGs' members confirmed organization of 'health and hygiene sessions' which were conducted by IRP teams. Females particularly appreciated the way these sessions were conducted and valued guide book, which was provided by the resource person, for use as reference. They demanded to have such sessions in future too as they considered them to be practically fruitful.



The FDGs of the baseline survey stated that the children had very basic knowledge about health and hygiene, which was mostly imparted by the teachers. Further, from the physical appearance it was observed that most of the kids were having big nails and wearing dirty cloths. On the other hand, in the evaluation study situation looked comparatively better. Appearance of the students looked cleaner and they exhibited better knowledge about health and hygiene. It may be noted that poverty, rural desert like setting with dust and sand in the

environment and low level of literacy both in males and females determine some of the features of life style including observing neatness.

In the LF, the target indicated against project goal states to the effect that 46% of the population has access to safe and clean drinking water and sanitation facilities. According to the population census of 1998, population of three target UCs of Chagai form 35.22% of the total population of the Chagai district. Similarly, in total population of Noushki district, three target UCs (Daak, Anam Bostan and Kishingi) contribute 35.22%. Project interventions were undertaken in few villages of the target UCs, which means that overall improvement in indicators will not be as high as indicated in the target set if sample of the survey is drawn at random (two-stage cluster sampling) at the district level. Therefore, target setting in context of whole districts appears to be high. Similar observation applies to other outputs and outcomes. Further, 'important assumptions' state that government will support and political situation will be helpful. Project design did not include any measures to build institutional linkage to make these assumptions true.

Expected outcome (result 1), target setting mentions 'targeted communities' while the baseline states 'the target population'. If by words in commas, population of whole districts is meant then same observation, as in above paragraph, applies. If it is the population of the surveyed villages only, base of target setting i.e. household survey at district level will vary from 'whole' to 'specific parts of the population' with indicators and will be inconsistent. Assumption records that government policies will remain favorable. The requirements of opening a bank account were there at the time of project design. It was lack of knowledge of the policy that the situation turned out to be unfavorable and bank accounts could not be opened for VOs. Moreover, sources of verification include "case studies", which have not been conducted: a few would have given thorough insight.

Expected outcome (result 4) states that communities are able to maintain and use water pumps (solar and in wind power based) even after IRP('s presence). Generally, components of the pump systems have one year limited warranty. In worst case scenario, if right after one year pump goes out-of-order, there is no strategy to deal with this situation.

Similarly, if a replacement of pump has to be made (with other components of the system intact), do communities have financial resources to make a replacement? This aspect needs to be looked into from sustainability aspect as German made Lorentz company pumps' cost may be unaffordable for the communities.

Expected outcome (result 4) under expected output result describes that 'community participants (will) adopt hygiene practices'. This seems an assumption as in one-year duration of project implementation only one phase of awareness raising cycle has been covered. Time limitation did not allow (and the cycle was not covered in project design) to implement complete health and hygiene cycle. The project plan should have incorporated complete health and hygiene cycle.

On the whole, method of target setting needs to be reviewed. Baseline data, targets and achievement should be measurable in a consistent way. That is to say if interventions are to be undertaken in whole of the district, target setting should be accordingly and if the interventions are going to be in selected villages of the selected UCs, the target should be set with regard to selected population only. In fact, geographic areas of interventions and that of baseline data should be the same. Further, for clear target setting and measurement of achievements, survey area and the target areas should be the one where no other agency is doing similar work. If interventions are not at large scale and IRP is not the only party

contributing in water and sanitation, result of evaluation will be misleading indicating that all improvement in the indicators is due to the interventions of the IRP.

Challenges and Obstacles Faced During Planning, Designing and Implementation Phases

- Both Chagai and Noushki have very harsh climatic conditions featured with sand storms and fast shifting sand dunes, extreme temperatures and gusty winds. At one instance, sand storm stopped work for 10 days leaving no options to make progress.
- Lack of ownership by the concerned departments with regard to proper maintenance of machinery /equipment: In one instance, pump house and battery rooms of a water supply scheme were filled with sand making the system non-functional until clearance of sand.
- Undue political influence with regard to selection of type of interventions, sites and the beneficiaries.
- Low priority accorded by the provincial government to sanitation leaving wide gaps in sanitation sector.
- Limited access to financing for extending services to rural scattered population of the target districts.
- Lack of awareness at government level including political leadership about the importance of water and sanitation with particular focus on sanitation component is an issue. Unfortunately, the cited segment appears to be unaware of the fact that Pakistan is signatory to Millennium Development Goals (MDGs) and that the Federal Government allocated Rs. 12.5 billion and Rs. 20.00 billion to MDGs Programs in financial years 2014-15 and 2015-16 respectively in its Public Sector Development Program. Balochistan received Rs.300 million at closure of the last financial year under MDGs Program and is expected to get equal or higher amount in FY 2015-16. These allocations are meant to plan and implement projects, inter alia, water and sanitation sectors.
- Absence of private businesses relating to construction material stretched implementation time. Even common clay burnt bricks are not available at main places. Almost all construction material including fittings had to be brought from faraway places.
- Government policy to restrict opening of new bank accounts for the communities or even NGOs resulted in volte-face in implementation strategy and shrank time span. 1638 latrines were targeted to be constructed under the project through communities but had to be constructed by the contractor then. In former case, the cost of construction was less with better quality. Execution through contractor resulted in higher cost, which forced to reduce number of latrines from 1638 to 1594.
- Project startup delay put pressure on already limited time for project planning, designing and implementation. Contract signing took about a month, which is mandatory activity to initiate any project task.
- Re-appropriation of funds from one head of account to another took about 2 months, which considerably drained HR energies and squeezed implementation time further.
- Volatile law and order situation forestalled project activities intermittently: transporters strike for about 10 days once not only precluded project activities but resulted in rise in transportation cost significantly.
- The higher the contract cost, the lengthier the procurement procedure. Combined effect of change in implementation methodology from community to the contractor, processing and approval of re-appropriation of funds from one

head to another and the procurement method posed time management challenge. Generally, squeeze on time may force compromise in quality. In FDGs, few of the participants hinted at difficulty in opening and closing latrine doors. The issue was reported in Daak area.

- Different components of the project like installation of solar water pump, construction of latrines and installation of wind mills etc. had varying criteria to select beneficiaries . In case of doing more than one component in the same area, difference in selection criteria created situation where compromise had to be made. In the next phase of the project, beneficiary's selection criteria should be the same, especially when beneficiary community avails more than one facility.
- Construction of latrine was meant to be through the communities for which bank account was a prerequisite but government policy did not allow to open the bank account at VO level. This delayed project's activities and simultaneously put pressure on completion of other activities too. In the next phase of the project, level of organization to implement project activities through participatory approach should be raised to CCO and CBO which are registered with Social Welfare department of Government of Balochistan and also fulfill criteria of opening bank account.
- Health and hygiene component was not implemented with its complete cycle. Only trainings were imparted, which do not have long lasting and deep impact. As far as knowledge about the health and hygiene is concerned, both the communities and the school children expressed reasonable knowledge. The subject of health and hygiene has practical aspect too, which is covered in health and hygiene cycle. In the next phase of this project, the H&H cycle should be made part of the project design so that it can have effective outcomes.
- Effective mobilization takes considerable time, just making COs and right after the formation and orientation sessions, initiating interventions creates hurdles during implementation. Noushki was new area for the project and community mobilization had to be undertaken prior to commencement of work on various components. The lack of sufficient time span created issues, including internal conflicts to avail a particular facility, during implementation. Adequate time should be kept for community mobilization in the next phase of the project.
- Apparently, there was incompatibility between design and implementation methodology. The design of the project followed humanitarian model while implementation depicted it as development project with strict and short timeframe. It is hard to carry out works at CO level with development project like approach. Had it been CCO or CBO level, implementation methodology adopted would have been fine. One the of the two i.e. upgrade of CO level to CCO / CBO or change of development approach to humanitarian approach, will have to be changed for smooth implementation of the project's activities.

Recommendation for Effective, Designing and Implementation of Similar Projects in Future:

- When the interventions are to be undertaken in selected areas like villages, it is better to do complete mapping of the selected villages than do conventional baseline survey employing any suitable random sampling technique. Because taking stock of situation through survey at district level and then doing interventions in selected villages creates difficulties during evaluation stage and the results of the evaluation study may not be a true picture of the outcomes generated as a result of the project's activities.
- A database of beneficiaries be developed and maintained. For individual beneficiaries households, CNIC of the head of the household should be registered in the database and in case of communities exact location with x-y spatial coordinates be recorded. This will be helpful in two ways: first it will help avoid duplication of interventions and second it will make future evaluations easy. In the public sector project, it is mandatory to conduct the evaluation for 5 consecutive years. Therefore, evaluation at the closure of the project is not sufficient to feel satisfied. Evaluation spanned over longer duration will have more lessons to design and implement similar projects in future.
- Planning the duration of the project should take into account startup delays (contract signing, reaching effectiveness date of the contract and subsequent disbursement of first installment of resources, for instance). This will help ensure quality of work and increase sustainability of interventions at the same time.
- As size of contract package for procurement of services and goods increases, considerable processing time is involved. This should be taken into account while fixing project duration: a balance in human resource availability and the tasks to be performed is essential for efficient and effective implementation of the project.
- Greater awareness should be raised to take care of school latrines and community water points. This will strengthen sustainability aspect and provide services for longer period of time. Water conservation techniques should also be introduced as for Balochistan water scarcity has been an issue and will remain an issue.
- Monitoring should be strengthened to ensure that achievable quality is maintained.
- Follow-up mechanism to ensure sustainability of interventions is essential as worldwide experience in water and sanitation projects suggests that eventually even organized rural communities need external institutional support to ensure sustainability.
- In water treatment system, the earthen pitcher has water outlet but no tap. In the next similar interventions tap should also be affixed to avoid loss of precious water.
- Though project was completed on time even in the face of numerous daunting challenges, improvement in terms of planning, implementation and monitoring can be had. Project planning, implementation and monitoring tools like MS Project, Primavera or the Project should be used. Bearing in view familiarity with MS Office interface, it is suggested that MS Project should be used. This tool helps in better time and resource management on one hand and supports in assigning weekly and monthly tasks to the team on the other hand. Further, baseline of the schedules clearly indicates time lags, which otherwise may go unnoticed and may tax the project heavily.

- Miles and miles have to be travelled to provide access to water and sanitation facilities to rural Balochistan. Low-cost solution means increasing outreach. In present project, solar pumps have high quality and relatively expensive solution. Cost of solar solution can be brought down by about 3-4 times if good quality Chinese made mono-crystalline solar panels and pumps having Lorentz's (German Company) brushless motor inside) are used. Batteries, if required, can also be Chinese made based on AGM-VRLA technology (lead-acid). Life span and efficiency of these components is highly satisfactory.

Annexure

Public Sector Development Projects

Project Executed during FY 2014-15 in Nushki, Balochistan PSDP

1. Construction of Various Water Supply Scheme In District Nushki.

Projects to be Executed during FY 2015-16 in Nushki, Balochistan PSDP

1. WSS Killi Ghulam Shah, Killi Sardar Naseer Jan, Killi Meer Sultan Mohd Mengal, Malik Badal Kahan, Shaker Zai Mall
2. Wss Killi Badeni, Killi Sharef Khan, Killi Qadir Abadi, Killishah Mohd Mall.
3. Augmentation of WSS Killi Mir Bahadur Khan, Killi Mohd Hashim, Dehdar, Wss Killi Ahmed Wall
4. WSS Killi Malik Azam Mangel, Jamadar Nazar Khan, Attaullah Zain-Uddin, Sardar Sumall Khan & Abdul Rehman Khan.
5. WSS for Killi Haji Muhd Murad, Killi Haji Khar Bakhsh, Killi Bulghni, Killi Surkab Ahmed, Killi Haji Mohd Azam etc.
6. WSS for Killi Moh Hayat, Killibadeni, Killi Sharef Khan, Killi Qadirabad -I , Pipe Line Killi Shah Mohammad.
7. Augmentation of WSS Noushki Town.
8. WSS Pipe Line For Village Bhatoo, Nushki.
9. Provision of WSS Pipe Lines For Killi Jamaldini, Nushki.

Questionnaire

Water and Sanitation Projects

Chagai, Nuhki, Balochistan

		3	2	1	A	Questionnaire No
House- hold Number		Padag	Chagai	Sadar Dalbandin	Chagai	
		6	5	4	B	
		Kishingai	Anam Bostan	Dhaak	Nushki	

Islamic Relief Pakistan, SMAAJ Balochistan

A1: Name of Interviewer & No. _____; A2: Supervisor's name & No. _____

A3: Date of interview: ____ / ____ / ____

My name is _____. I am working in ...

We are working on a survey about evaluation of a water and sanitation project. The aim of the survey is assess strengths and weaknesses of the project so that based on this exercise better working is achieved in future. We assure you that your answers will be kept secret. Your responses are very important for us and will play a vital role in the development of your area.

Result of HH interview		MAY I START INTERVIEW NOW?	
Completed	1	YES, PERMISSION GRANTED.	<input type="checkbox"/>
Not at home	2.	NO, PERMISSION NOT GRANTED	<input type="checkbox"/>
Refused	3		
	Destroyed/Vacant		
HH.....	4		
Other (explain)	6		
____ / ____ / ____	DATA ENTRY DATE	____	NAME OF DEO AND NO.
		____ MINUTES	____ HOURS :TIME

Awareness About Health And Hygiene			
HH1	Why is it important to wash hands?	Because Disease/illness can be spread from person to person by shaking hands etc.....1 Because Disease/illness can be spread from hand to mouth.....2 To Remove invisible dirt (germs).....3 To Remove visible dirt.....4 Don't know.....9	
HH2	Please tell the key times when you wash your hands?	Before eating	1
		After using latrine	2
		After handling animals	3
		After work.....	4
		After handling baby diapers / feces	5
HH3	What do you usually use to wash your hands?	Water only	1
		Water & Soap	2
		Water & Ash	3
		Water & Sand	4
		Other Specify _____	5
HH4	Why it is important to use soap when washing their hands or body?	If they don't wash hands with soap it may cause Diarrhoea.....	1
		If they don't wash hands with soap it may cause Scabies.....	2
		Food poisoning/sickness.....	3
		Infection by parasites.....	4
		Kill germs that can spread illness.....	5
		Remove odour (smell) of body.....	6

HH5	What kind of diseases are common in your family?	Diarrhoea.....	1
		Skin diseases.....	2
		Typhoid fever.....	3
		Cholera.....	4
		Malaria.....	5
		Others.....	6
		Don't know.....	9
HH6	Was there any case of diarrhoea in your house in the last two months?	Yes	1
		No.....	2
HH7	If yes, what do you think the reason was?	Bad water.....	1
		Defective food.....	2
		Dirty hands.....	3
		Bad water, food & dirty hand.....	4
		Others _____	5
		Don't Know.....	9
HH8	How much was spent to treat the diseases?	Rs. _____	
HH9	Who was mostly affected by these diseases?	Men.....	1
		Women.....	2
		Girls (5-18 years)	3
		Boy (5-18)	4
		Girls < 5 years.....	5
		Boys <5 years.....	6
HH10	What are your treatment practice to deal with diarrhoea?	Use boiled water	1
		Use ORS.....	2
		Consult the Physician / Doctors	3
		Traditional Home Treatments.....	4
		Don't know.....	9
WATER AND SANITATION			

WS1	What is important source of drinking water for your household?	Inside Household	
		Piped water /borehole/water pumps.....	1
		Protected dug well.....	2
		Unprotected dug well.....	3
		Outside Household	
		Public tap.....	4
		Protected dug well.....	5
		Unprotected dug well.....	6
		Water from protected spring.....	7
		Water from unprotected spring.....	8
		Surface water (river/ dam/ lake/ ponds/stream/ canal/ irrigation channel)	10
		Tube well.....	11
		Other (tanker / truck)	12
	If water source is outside household, go to WS2 else go to WS3		
WS2	What is the distance to water source from your House?	Less than a kilometre.....	1
		1-3 KM.....	2
		4-6 KM.....	3
		7-9 KM.....	4
		More than 9 km.....	5
		Don't Know	9
WS3	Whose responsibility is it to fetch water?	Adult men	1
		Adult women.....	2
		Male Child (under 15 years)	3
		Female Child (under 15 years)	4
WS4	Approximately, how much time does it to fetch water?	5 minutes or Less.....	1
		6 to 15 minutes	2
		16 to 30 minutes	3
		31 to 60 minutes	4
		More than hour to 2 hours	5
		3 to 4 hours	6

		More than 4 hours	7
		Don't Know.....	9
		Didn't Answer.....	10
WS5	Do you pay to get water?	Yes	1
		No.....	2
WS6	If yes, how much do you pay per month?	Rs. _____	
WS7	What is the nature of water?	Sweet	1
		Brackish	2
WS77	If brackish, for how long have you been facing this situation?	Time in Months _____	
WS8	Have water related issues decreased over past one year?	Yes	1
		No.....	2
WS9	Do you treat the water to make it safe in any way?	Yes	1
		No.....	2
WS10	If Yes, which treatment do you use?	Boiling	1
		Cloth filtration	2
		Sunlight / oxidation	3
		Any other _____	4
WS11	How frequent you treat the water to make it safer in any way?	Always	1
		Sometime.....	2
		Never.....	3
		Don't know.....	9
WS12	Which water container do you use to store drinking water?	Canaries.....	1
		Water tank on roof.....	2
		Underground water Tank.....	3
		Plastic Drum with tape	4
		Metal Drum with tape	5

		Plastic Bucket.....	6
		Metal Bucket.....	7
		Jeri cane	8
		Plastic Gallons.....	9
		Water Coolers.....	10
		Others.....	11
		Don't Know.....	99
WS13	Do you clean water container before using?	Yes.....	1
		No.....	2
WS14	How many times do you clean the water container?	Every time before filling it	1
		Once a day.....	2
		Once a week.....	3
		Once every two week.....	4
		Once in a month	5
WS15	Has any water treatment system been installed at household?	Yes.....	1
		No.....	2
WS16	If Yes, are you satisfied with its performance?	Yes.....	1
		No.....	2
WS17	Do you have any of the following committees in your area?	WMO.....	1
		CBO.....	2
		VOS.....	3
WS18	If Yes, are these committees functional?	Yes.....	1
		No.....	2
WS19	Does your HH have toilet facility?	Yes.....	1
		No.....	2
WS20	If No, where do you people go for defecation?	In open fields	1
		Open space with protected walls	2
		Near bushes & trees	3
		Community latrine	4
		Near streams or river	5

		Others _____	6
WS21	What type of toilet facilities do you have at house hold?	Flush toilets	1
		Ventilated Improved Pit (VIP) latrine	2
		Composting toilet.....	3
		Pit latrines with slab.....	4
		Pit latrine without slab.....	5
		Bucket	6
		Others _____	7
WS22	Who use the latrine facility?	All member of HH.....	1
		Only male members of HH use it	2
		Only female , children and old members of the HH use it	3
		Latrine is used by the guests only	4
WS23	Observation: May I see the latrine facility please?	Allowed	1
		Not Allowed	2
WS24	OBSERVE: Circle 'Yes' or 'No'	Latrine had a protected entry?	Yes No
		It has a curtain or door ?	Yes No
		There was arrangement of water	Yes No
		Soap was places in the latrine	Yes No
		Wiper & broom were placed in latrine	Yes No
		Detected faeces in pit	Yes No
		Latrine was Smelly	Yes No
		Stagnant water seen in the toilet	Yes No
		Flash slab is wet	Yes No
		Children's Diapers were there in latrine	Yes No
WS25	If latrine facility is in the HH then ask, "what is frequency of cleaning the latrine?" else go to WS 28	Once a day	1
		Twice a day	2
		Once a weak	3
		Once a month.....	4
		Twice in a month	5

WS26	Who is responsible to clean the latrine?"	Male member of HH	1
		Female member of HH.....	2
		Toilet cleaner appointed by the community	3
WS27	Is the drainage facility of the latrine is concealed?	Yes.....	1
		No.....	2
WS28	Where you dispose of your HH solid waste?	In Street	1
		Unspecified open places.....	2
		Specified open places.....	3
		Others _____	4
WS29	Where do you throw the stools of babies and children ?	Throw in the toilet	1
		Buried in the yard.....	2
		Do not disposed/leave on the ground.....	3
		Others _____	4
		Don't Know.....	9
WS30	Is there any drain for your HH water wastes?	Yes.....	1
		No.....	2

What type of assets does your HH own? Circle 'Yes' or 'No' of all relevant options.

No	Yes	Assets		No	Yes	Assets		No	Yes	Assets	
2	1	Generator/ UPS	K	2	1	Motorbike	F	2	1	Cow/ Buffalo	A
2	1	Refrigerator/freezer	L	2	1	Bicycle	G	2	1	Sheep / Goat	B
2	1	Others	N	2	1	Television	H	2	1	Tractor	C
2	1	Don't Know	O	2	1	Computer	I	2	1	Washing machine/Sewing Machine	D
2	1	Didn't Answer	P	2	1	AC/ Air Cooler/ Gyser/ heater	J	2	1	Car/ jeep etc.	E

OBSERVATIONS OF INTERVIEWER

OBSERVATIONS OF FIELD SUPERVISOR

Questionnaire for FGDs

Questions for Wind and Solar Power Hand Pumps

1. Which kind of the hand pump has been installed in your area / vicinity (solar or wind powered)?
2. When was the pump installed?
3. How many people (approximately) are benefitting from the pump?
4. How do you compare situation of access to water before and after the pump was installed?
5. Is it user friendly?
6. Are you satisfied with the quality of the pump?
7. Is it still functional?
8. If not, how long has it been since it is non-functional?
9. Did you find any fault since it was installed?
10. If yes, how did you remove the fault?
11. How much did it cost to remove the fault?
12. What is expected life of the pump as told to you by the people who installed it? So do you think it may last that long?
13. Do you feel there is need to install more pumps in the area?

Questions for HH having Latrines Constructed in their Households

1. What kind of latrine has been constructed in your household?
2. When was it constructed?
3. Are you satisfied with the design and quality of the latrine?
4. How long do you think should this latrine be usable?
5. Is it functional?
6. If no, what made non-functional?
7. Do you feel facilitated after construction of latrine?
8. Do you think more latrines are need in your area?

Questions for Water Treatment Systems

1. What kind of water treatment system has been installed in your HH?
2. Are you satisfied with the design and quality of the water treatment system?
3. How long do you think should this system be usable?
4. Is it functional?
5. If no, what made non-functional?
6. Do you feel facilitated after provision of the water treatment system?
7. Do you think more water treatment systems are need in your area?

FGDs with School Children

S. No.	Question	Responses
1.	Do your teachers tell you anything about health and hygiene?	
2.	Do you recall having a session on health and hygiene sometimes back by any organization?	

S. No.	Question	Responses
3.	What did they talk about?	
4.	What do you know about health and hygiene?	
5.	What actions do you include in personal hygiene?	
6.	What actions do you include in keeping environment clean in your school and village?	
7.	<p>Who amongst you have brushed teeth today?</p> <p>Do you know benefits of teeth cleaning and harms of not brushing your teeth?</p> <p>Do you cut your nails regularly?</p> <p>Please ask reasons from children who gave answer in no?</p> <p>What are the harms of not cutting nails?</p>	
8.	<p>Who has taken bath today?</p> <p>After how much period you take bath?</p> <p>How do you feel after taking bath?</p>	
9.	<p>How many times in a day you wash your hands?</p> <p>What are the key times to wash your hands or after which things it is necessary to wash hands?</p> <p>Can you demonstrate how do you wash your hands?</p>	
10.	Where you and your family members go for defecation?	

S. No.	Question	Responses
	What are harms of open defecation?	
11.	Keeping in view the hygienic principle, which things should be there in latrine?	
12.	Which diseases can be spread due to solid waste and waste water?	

Key Informant Interviews

PHE Department

Water Supply Projects

S.No.	Questions	
1.	In available water supply schemes in the UC, is there any sustainability issue?	
2.	If so, what are the issues?	
3.	What do you think are the solutions to sustainability related issues?	
4.	With regard to power source (electricity, diesel) to water supply schemes, what are the issues?	
5.	What power source would you recommend for new water supply schemes, if they are not gravity flow based?	
6.	How many water supply schemes have been installed during past one year in UCs (names....)?	
7.	Are communities involve in O&M of the newly installed, if any, water supply schemes?	
8.	Is there shortage of drinking water in the area? If so, is it seasonal or permanent?	

TMA**Sanitation**

S.No.	Questions	
9.	Do you observe any change in sanitation situation during past one year in the UCs (names)?	
10.	Do you see any change in behavior of people with regard to disposal of waste of their home?	
11.	Are there designated places for garbage disposal?	
12.	If so, do people throw garbage at designated places?	
13.	Are you satisfied with excreta disposal mechanism in the UCs (names)?	
14.	Do you suggest any improvement in excreta disposal mechanism?	
15.	Do you find any gaps in demand and services (like collecting and disposing of garbage) that your agency provides?	
16.	Do you think any other agency can provide support in this regard?	
17.	Do any community / village organization approach your agency for any help with regard to garbage disposal or sanitation system cleaning / maintenance?	

Health

S.No.	Questions	
18.	Do you observe any change in occurrence of water borne diseases in your area during past one year?	
19.	Did your department undertake any preventive health initiative in your area with regard to water borne diseases during past one year?	
20.	Do you observe any change in health and hygiene behavior of people in your area in recent months?	
21.	Do you think support from NGO/INGO is required to promote health and hygiene in your area?	
22.	Are you aware of working of any NGO in respect of health and hygiene promotion in your area? If so, have you attended any session organized by them? If yes, how did you find the session?	

UC Secretary

S.No.	Questions	
23.	Do you observe any improvement in access to drinking water in your area?	
24.	Do you observe any improvement in sanitation facilities in your area?	
25.	Do you observe any change for improvement in collection and disposal of garbage practices in recent months?	
26.	Do you think that use of latrine has increased in the area during past one year?	
27.	Do you see any improvement in solid waste management on the part of the people during past one year?	