

### Executive Summary

Over the years Concern has been engaged in a wide range of construction projects. These projects have ranged from small-scale village hand-dug wells to large scale waste water treatment plants and solar-powered systems. In order to support the development of a quality assurance system over the coming year, and identify areas for organisational learning, an inventory was carried out for all engineering works undertaken by Concern in 2015.

### Key Findings

- In 2015 over fifteen million US Dollars was spent on construction works across 20 Concern programmes. Over 50% of this expenditure was spent in Concern's Africa programmes, and 46% on its Asia/Middle Eastern programmes, with just five countries - Afghanistan, DRC, Pakistan, Sierra Leone and DPRK spending over 62% of this total amount.
- Over ten million US Dollars, 68% of the total expenditure, was spent on purely WASH infrastructure, with more than seven million USD Dollars of this going on water supply infrastructure, including 635 boreholes, 29 solar-powered systems, 208 hand-dug wells and 76 spring protection schemes. A large amount of rainwater harvesting was also completed in five countries, with tanks and storage facilities of various sizes.
- A further USD 2.6 million was spent on sanitation infrastructure, including 5,885 household latrines, 691 school latrines and 664 demonstration latrines to allow communities to replicate and build their own latrines.
- The three countries with the biggest WASH expenditure in 2015, over one million USD each, were DRC, Pakistan and DPRK.
- Nearly five million USD Dollars, 32% of the total expenditure, were spent on other construction work – this included works to improve disaster reduction, such as 289 flood protection walls and 377 gabion walls; 12,500 emergency shelters, 169km of road rehabilitation, 24 bridges and certain specific infrastructure projects during the ebola crisis in West Africa, community centres and micro hydropower plants in Afghanistan, and winter greenhouses in DPRK.
- The inventory also showed that a large proportion of the work (at least 68% of expenditure) is completed by contractors or Concern partners in the field. This has significant implications for how we quality assure these projects.
- There was an increase from approximately thirteen million US dollars expenditure on construction in 2013 to fifteen million US Dollars in 2015.
- Concern programmes have been shown to engage in a wide range of areas which should be documented over the coming year, to provide lessons learned across Concern. These include:
  - Solar-powered water supply systems: 29 completed in 2015 across five countries
  - Overground and underground rainwater harvesting systems: 1,271 of a range of sizes completed across five countries
  - Deep boreholes (over 100m) in countries such as Bangladesh, DRC, Somalia and Uganda.

## CONTENTS

Executive Summary.....	1
Key Findings .....	1
Purpose .....	3
Method .....	3
Responses .....	4
Analysis of Engineering Works, including expenditure, scale and type.....	5
General.....	5
Comparison of 2015 results with those from 2013 .....	7
WASH Infrastructure .....	7
Water Infrastructure .....	7
Sanitation Infrastructure.....	11
Solid Waste Management.....	15
Non-WASH Infrastructure works .....	16
Disaster Risk Reduction (DRR) Infrastructure .....	16
Other Infrastructure.....	17
Shelter .....	17
Roads.....	17
Bridges .....	18
Health Centres .....	18
Schools .....	18
Other Miscellaneous Works.....	19
Concern, Partners and Contractors .....	20
Next Steps .....	22

## Purpose

The inventory for all engineering works completed by Concern in 2015 was undertaken in order to ascertain the level of this construction, budget spent, and specific and innovative works that had been completed in 2015. An engineering inventory was last carried out for works completed in 2013. Understanding the type and extent of Concern's engineering works will allow for better planning in terms of quality assurance of engineering works, remote or in-country technical support required, and also identify areas which would benefit in organisational learning.

A new WASH Strategy was introduced in 2016 to cover the period 2016-2021, and, as such, it was also felt that this inventory would act as a baseline for the strategy, especially given the development of a quality control system. As such, follow up inventories may also be carried out for works in 2018/19 and 2021, in order to understand the effect of the WASH Strategy, and quality assurance system, on the level of engineering works being undertaken.

## Method

This inventory was completed between August and October 2016. A single excel spreadsheet was sent individually to each programme director asking for specific information on the infrastructure completed. This was split into the following categories and applicable sub-categories:

- Water Infrastructure, which includes infrastructure supplying potable water to humans and also animals – this includes new and rehabilitated boreholes, hand-dug wells, gravity-flow systems, rainwater harvesting, solar-powered systems and animal troughs.
- Sanitation Infrastructure, which includes infrastructure used to collect and, where applicable, treat human waste – this includes latrines at households, schools, health centres and in communal areas, distribution of latrine slabs, and sewage works
- Health Centres, which includes the construction and rehabilitation of health centres/clinics
- Schools, which includes the rehabilitation of school buildings/classrooms
- DRR-related infrastructure, which includes infrastructure used to protect communities and infrastructure from damage which could be caused by disasters such as floods, landslides and earthquakes – this includes drainage schemes, check dams and retaining walls
- Other infrastructure, such as roads and bridges.

Four general questions on construction challenges, procedures and support required were also asked.

In each of the categories, a list of the most common types of infrastructure were listed (e.g. for water – new boreholes, rehabilitation of hand-dug wells, etc.) in order to aid with the completion. For each sub-category of infrastructure, countries were requested to include:

- The number completed in 2015
- The approximate total cost in USD (given massive exchange rate fluctuations in 2015, USD was chosen over EUR due to a greater stability)
- Whether these works were completed by Concern, a Partner or a Contractor
- For Water infrastructure, the number completed in communities, schools or health centres
- Total number of beneficiaries
- Additional information (e.g. the depth range for boreholes)

It was clearly recognised during the collection of data that the numbers would not show an accurate representation of the cost of all engineering works. For example, it may cover the cost of materials

and payments to contractors, but not the cost of the staff working on the engineering works (e.g. local engineers, some of a WASH programme manager's time, drivers to take materials to site) or the logistics needed (e.g. fuel for the cars, the cost of advertising a tender, etc.). As such the total cost of engineering works completed in 2015 as reported by countries is likely an underestimate.

## Responses

Responses were received from 20 countries, plus the DRC WASH Consortium unit. Data was not received from the following countries for the following reasons:

- Tanzania – programme closed in 2016, so no representative present
- Philippines – programme closed in 2015/2016, so no representative present
- Zambia – no response received (minimal infrastructure)
- Mozambique – no response received (minimal infrastructure)
- Malawi – no infrastructure in 2015
- Burundi/Rwanda – no infrastructure in 2015

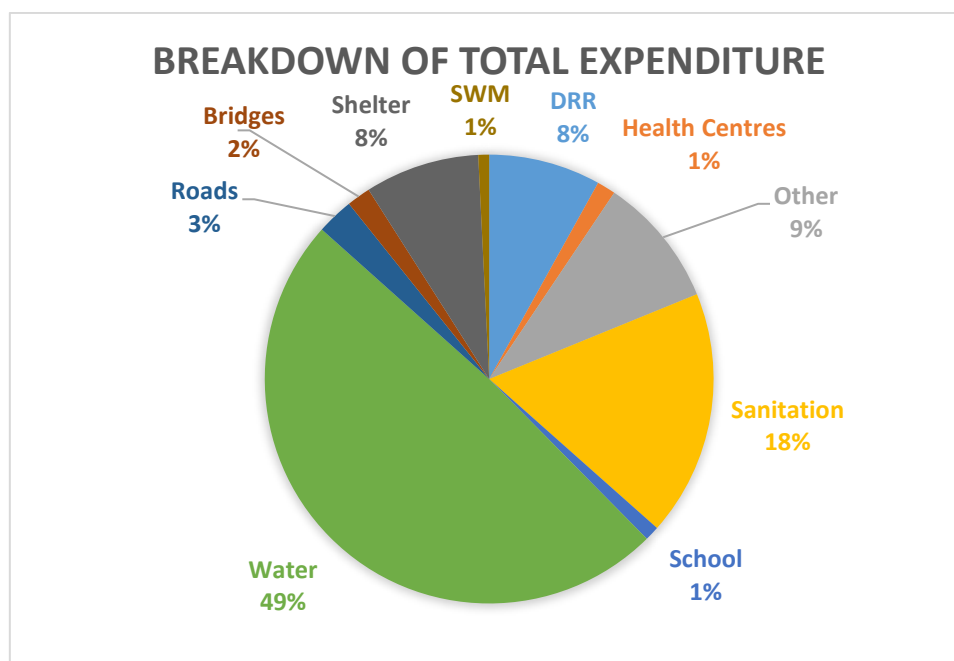
## Analysis of Engineering Works, including expenditure, scale and type

### General

In 2015, at least USD 15,153,836 was spent on construction activities across Concern programmes. 51% of this was spent in 12 sub-Saharan African countries (USD 7.77m), 46% was spent on the seven Asia/Middle East programmes (USD 6.95m), with the remaining 3% on Haiti (USD 426k).

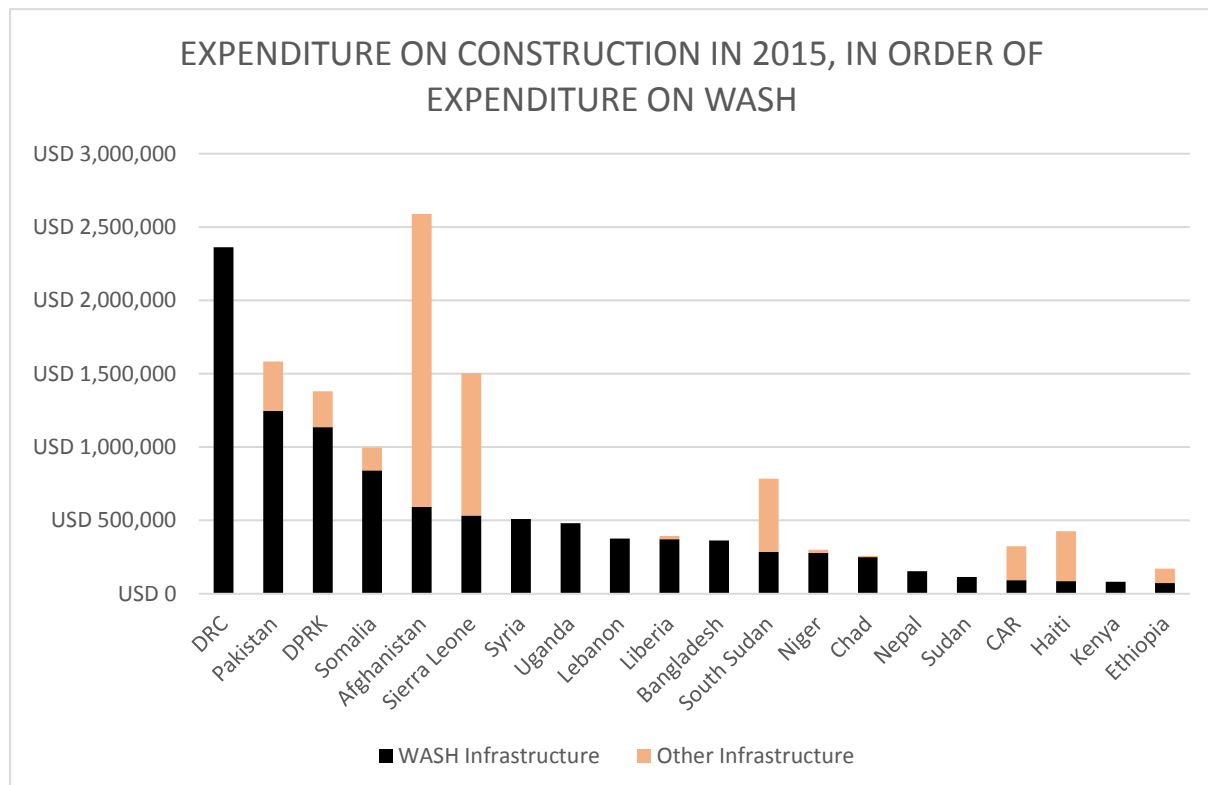
As can be seen below, almost 50% of the total expenditure on construction (USD 7.43m – 49%) was on water infrastructure, which included boreholes, hand-dug wells, spring protection systems, and rainwater harvesting. A further 18% was spent on sanitation infrastructure (USD 2.69m), which included school latrines, household latrines in emergencies and sewage works. 8% of expenditure was spent on shelter and 8% on DRR (USD 1.25m, and USD 1.22m respectively). DRR works included gabion walls, retaining walls and drainage schemes, while shelter was purely on the construction or rehabilitation of emergency/refugee shelter. The remainder was spent on construction and rehabilitation of schools, construction of bridges, rehabilitation of roads, solid waste management (SWM) and some other miscellaneous projects.

Afghanistan, Sierra Leone and South Sudan were the countries who had the majority of expenditure on non-WASH activities (approximately USD 3.5 million between them). Afghanistan undertook a wide range of non-WASH projects such as disaster risk reduction work, roads, bridges and work on microhydro power plants and irrigation systems. A large proportion of Sierra Leone's non-WASH work was working in cemeteries as part of the ebola response, while South Sudan constructed a large number of IDP shelters.



In terms of purely WASH activities, USD 10,229,935 (68% of the total) was spent on WASH infrastructure, with three countries, DRC, Pakistan and DPRK, each spending over one million USD in 2015.

The main reason for DRC spending the most in WASH infrastructure is due to the Concern-led WASH Consortium, working with five partners (including Concern) to construct, amongst others, boreholes, hand-dug wells and institutional latrines. Of the almost USD 2.4 million spent on WASH in DRC in 2015, USD 373,000 was spent by the Concern programme itself. Pakistan had the second-largest expenditure in WASH in 2015, spending over USD 1.2 million on household latrines (predominantly in emergencies), boreholes and rainwater harvesting systems, among others. DPRK was the only other programme to spend over USD 1 million on WASH activities, spending USD 1.14 million principally on solar-powered pumps with gravity-flow water systems.



### *Comparison of 2015 results with those from 2013*

An engineering inventory was completed by Concern in 2014, for all engineering works completed in 2013, in order to assess the scale and scope of these engineering works. 19 out of the 26 operational countries at the time responded, which showed that approximately USD 12.9 million, or 9% of overseas expenditure, was spent on construction works. Out of this USD 12.9 million:

- 59% was spent on only three countries – Pakistan, Haiti and Somalia
- 47% was spent on work done by contractors (Concern – 35%; Partners – 18%)
- 34% was spent on water and 34% on emergency/refugee shelter (Sanitation – 12%; Schools – 12%)

A comparison of amounts spent in different sectors can be seen below.

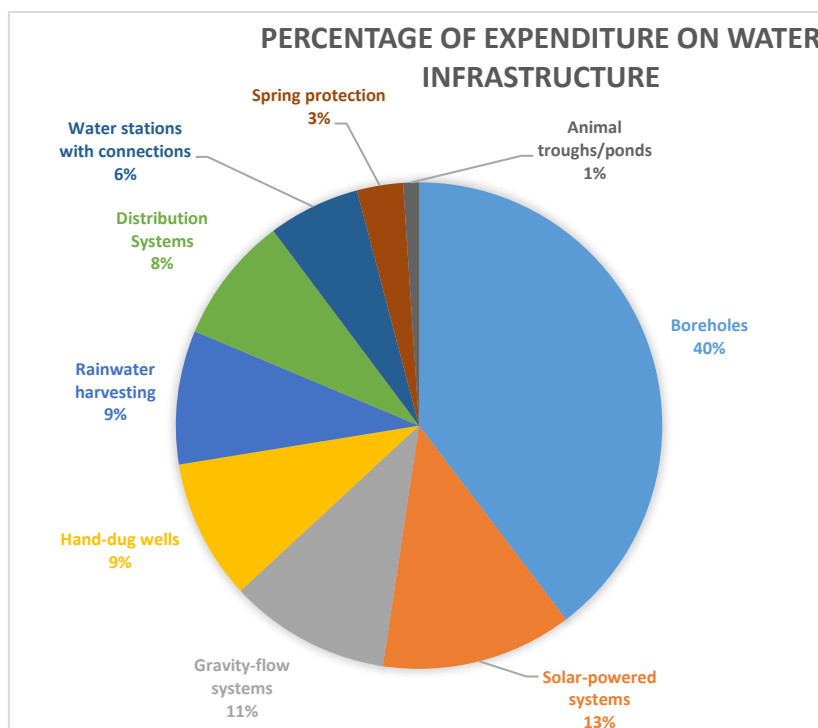
<b>Sector</b>	<b>Spend in 2013 (USD)</b>	<b>Spend in 2015 (USD)</b>
<b>Water</b>	4,434,682	7,426,152
<b>Sanitation</b>	1,593,223	2,685,732
<b>Shelter</b>	4,350,556	1,250,000
<b>Schools</b>	1,584,984	158,909
<b>DRR</b>	568,032	1,222,886
<b>Other</b>	394,951	2,410,158
<b>TOTAL</b>	12,926,428	15,153,837

Overall, expenditure in WASH appears to have increased from approximately USD 6 million in 2013 to approximately USD 10 million in 2015, whilst construction in shelter and schools decreased from nearly USD 6 million in 2013 to approximately USD 1.4 million in 2015.

## WASH Infrastructure

### *Water Infrastructure*

The below shows the breakdown of expenditure in terms of the type of water infrastructure that Concern constructed/rehabilitated, out of a total expenditure of USD 7.4 million. The most amount of money was spent on boreholes. USD 2.9 million was spent in 15 countries on a total of 635 boreholes, including 538 new boreholes and 97 rehabilitated boreholes, reaching nearly 420,000 beneficiaries. The majority of these were in Bangladesh (152), Pakistan (130), DRC (117) and Uganda (92). The next type of infrastructure attracting the most spend was solar-powered systems, with 29 being completed in five countries, at a cost of USD 935,000, reaching approximately 132,000 beneficiaries. An impressive 208 hand-dug wells were also constructed or rehabilitated across 7 countries, at a cost of USD 687,000, reaching over 103,000 beneficiaries, with the majority (128) in Liberia during the ebola response.



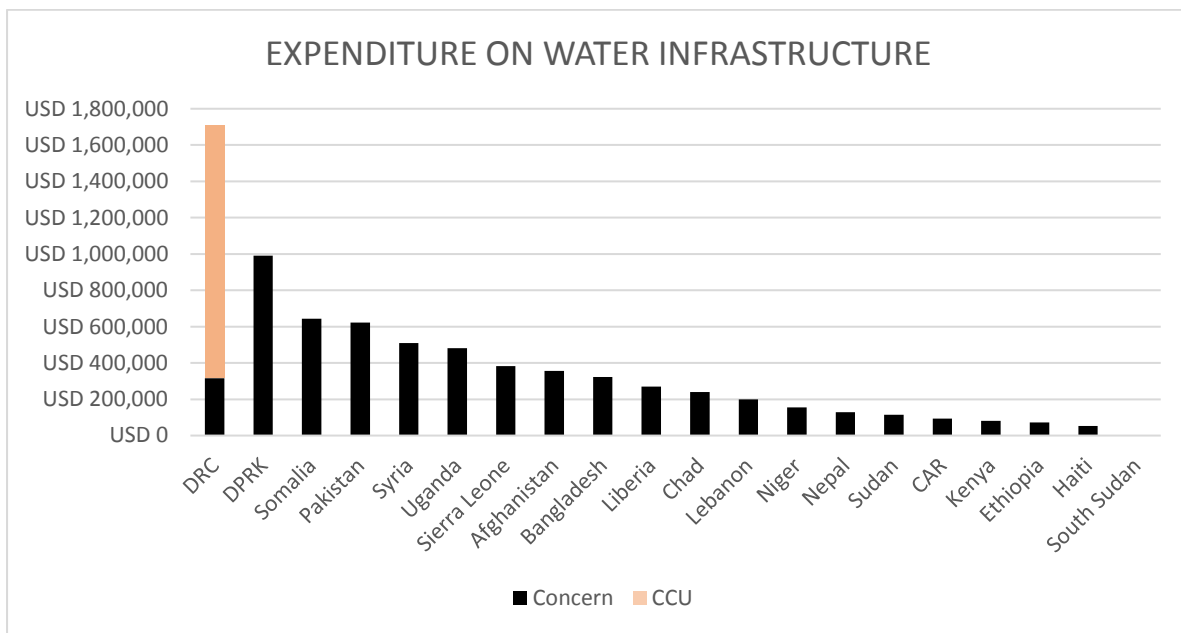
Type of Infrastructure	New	Rehabilitated	Amount (USD)	No of beneficiaries	Countries
Boreholes	538	97	2,922,163	419,178	Afghanistan, Bangladesh, CAR, Chad, DRC, Haiti, Kenya, Lebanon, Liberia, Niger, Pakistan, Sierra Leone, Somalia, Sudan, Uganda
Solar-powered systems	29		935,697	132,054	DPRK, Kenya, Pakistan, Sierra Leone, Somalia
Gravity-flow systems	38	13	790,826	At least 43,902	Chad, DPRK, DRC, Ethiopia, Nepal, Pakistan, Sudan
Hand-dug wells	106	102	686,965	103,561	CAR, DRC, Liberia, Niger, Sierra Leone, Somalia, Sudan
Rainwater harvesting <sup>1</sup>	1271	10	655,260	81,477	Bangladesh, Haiti, Pakistan, Sierra Leone, Somalia
Distribution Systems	61		621,813	110,927	Afghanistan, Chad, Ethiopia, Sierra Leone, Somalia, Sudan, Syria
Water stations with connections	20		450,000	110,000	Syria
Spring protection	76		226,000	53,726	CAR, DRC, Ethiopia
Animal troughs/ponds	81		77,178	17,205	Afghanistan, Chad, Ethiopia, Pakistan, Somalia, Uganda
Water towers	9		60,250	127,643	Sierra Leone
<b>TOTAL</b>			<b>7,426,152</b>	<b>1,219,673</b>	

Table 1: A breakdown of the different types of water infrastructure undertaken by Concern

<sup>1</sup> A range of different types of rainwater harvesting was constructed or rehabilitated, including large underground and overground communal tanks, and household level tanks, both underground and overground. All types of infrastructure have been included here for simplicity.



The below shows the amount spent in each programme on water infrastructure alone in 2015 in order of cost. The most money spent occurred in DRC, mainly due to the DfID-funded WASH Consortium (CCU) project working with 4 partners as well as Concern – this was a total of USD 1.7 million, with Concern’s work alone (which included the IrishAid programme) at USD 315,000. In terms of Concern-only programmes, DPRK spent the most, at approximately USD 990,000 – working on mainly solar-powered pumps and gravity-flow water systems. Somalia was next, having spent approximately USD 644,000 on a range of water infrastructure, including boreholes, distribution systems and underground rainwater harvesting storage. Pakistan then spent USD 622,000, working again on a range of infrastructure, including solar-powered systems, rainwater harvesting infrastructure at a communal and household level, and boreholes.



Country	Amount (USD)	Activities
DRC	1,707,750	
- Concern	315,050	New boreholes, hand-dug wells, spring protection
- CCU	1,392,700	New boreholes, hand-dug wells, spring protection, gravity-flow systems
DPRK	990,507	New gravity-flow systems, solar-powered systems
Somalia	643,809	New boreholes & underground rainwater harvesting, distribution systems, rehabilitation of hand-dug wells, solar-powered systems, animal troughs
Pakistan	622,107	New boreholes, communal and underground reservoirs, rehabilitation of gravity-flow systems, communal and underground reservoirs and boreholes, solar-powered systems and animal troughs
Syria	510,000	Rehabilitation of water stations, distribution systems and direct household connections
Uganda	482,000	New and rehabilitation of boreholes, animal troughs
Sierra Leone	383,383	New boreholes, rainwater harvesting, water towers and water kiosks with distribution systems, solar-powered systems and rehabilitation of hand-dug wells
Afghanistan	356,443	Distribution systems with taps, new boreholes and animal water ponds
Bangladesh	322,969	New boreholes, and overground communal and household rainwater harvesting
Liberia	270,000	New and rehabilitation of hand-dug wells, rehabilitation of boreholes
Chad	239,180	New boreholes and gravity-flow systems with distribution network, animal troughs
Lebanon	200,000	New borehole
Niger	155,523	New and rehabilitation of hand-dug wells, rehabilitation of boreholes
Nepal	127,917	Rehabilitation of gravity-flow systems
Sudan	114,322	New boreholes and hand-dug wells, rehabilitation of boreholes, hand dug wells and gravity-flow systems, distribution systems
CAR	93,220	New spring protection and hand-dug wells, rehabilitation of boreholes
Kenya	81,772	Solar-powered systems and rehabilitation of boreholes
Ethiopia	72,250	New spring protection and gravity-flow system, distribution systems and animal troughs
Haiti	53,000	New boreholes and household rainwater harvesting
South Sudan	-	Although no expenditure was seen here on construction, Concern did operate a UNICEF-installed borehole and Medair-installed surface water treatment plant, as such costs were incurred on operation and maintenance.
<b>TOTAL</b>	<b>7,426,152</b>	

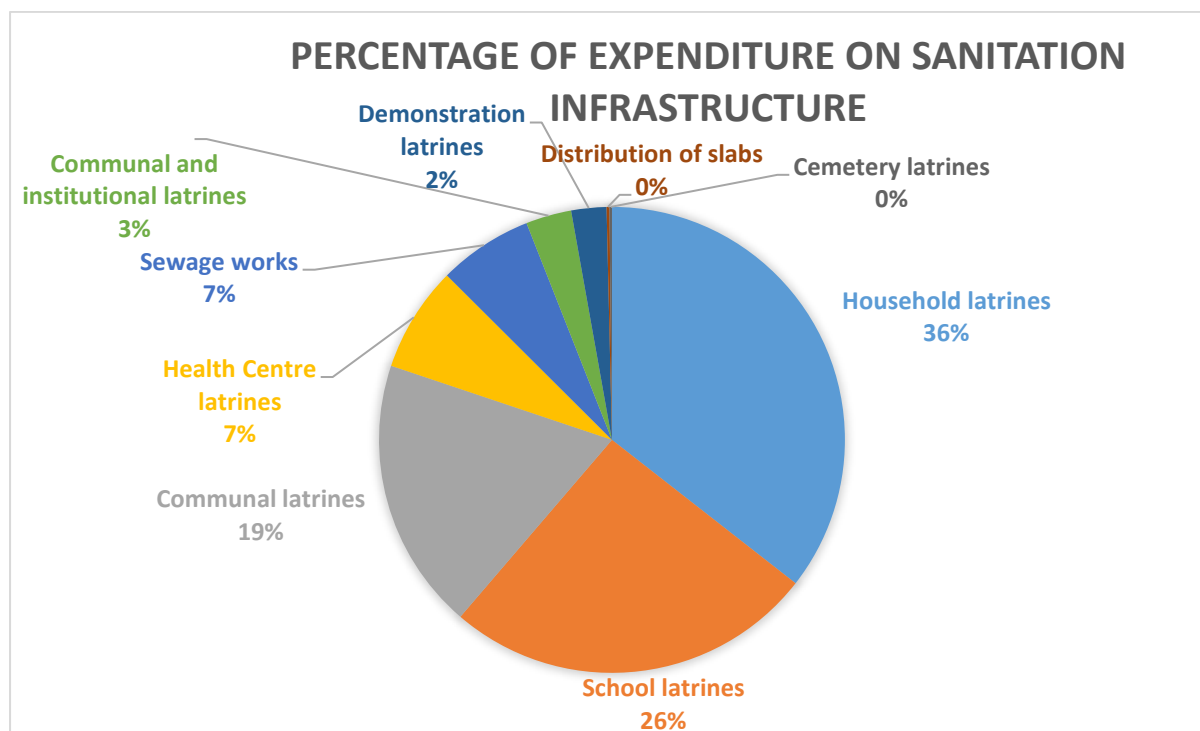
Table 2: A breakdown of country programmes activities and expenditure on water infrastructure

A number of water infrastructure works stand out due to the large amount of infrastructure completed, or the unique works that have been completed in 2015. These include:

- Afghanistan: 132km of water distribution systems with 255 taps and 318 cubic metres of water storage – this system can supply water to over 20,000 people
- Bangladesh: 199 boreholes with all of them drilled to a depth of over 200m (due to the risk of arsenic at shallower depths) – this large number of boreholes at such a depth would have required a large amount of contractor supervision.
- Liberia: 128 hand-dug wells, newly-constructed or rehabilitated – these works were mainly done as part of the Liberia ebola response.
- Pakistan: 123 new boreholes drilled for over 50,000 people; 1,100 new underground water storage/rainwater harvesting tanks for households and 48 large communal rainwater harvesting tanks and natural ponds, giving over 20,000 people year-round access to water.
- Syria: the rehabilitation of 20 water stations for 110,000 people
- Uganda: 92 boreholes drilled or rehabilitated, with new ones down to a depth of up to 140m, giving over 35,000 people access to potable water.

### *Sanitation Infrastructure*

The below shows a breakdown of expenditure in terms of the type of sanitation infrastructure that Concern constructed/rehabilitated, out of a total expenditure of nearly USD 2.7 million. Over USD 950,000 was spent on household latrines, with over 5,800 having been constructed in 2015. The majority of these were in Pakistan (3,823), DPRK (787) and Afghanistan (703). A total of 691 school latrines (cubicles) were constructed or rehabilitated at a cost of over USD 690,000 for over 53,000 pupils and teachers. The largest number of these were in DRC (including the Consortium programme; 234), Sierra Leone (208) and Niger (72). In supporting Concern's general no subsidy approach for household latrines, the Chad, DRC and Liberia programmes constructed 664 demonstration latrines, leading to an unknown number of replications in communities in these countries.



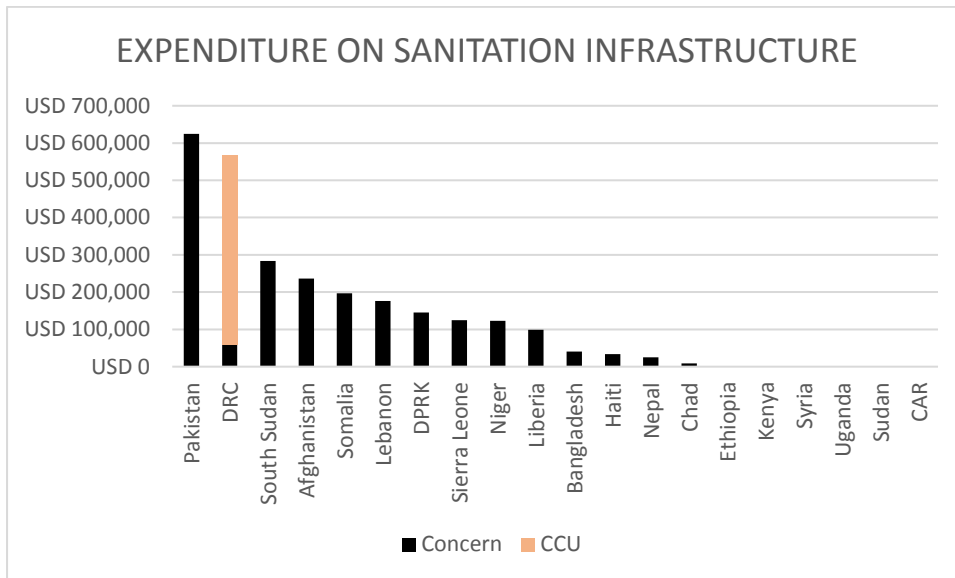
Type of Infrastructure	New	Rehabilitated	Amount (USD)	No of beneficiaries	Countries
Household latrines <sup>2</sup>	5,885	0	954,870	13,950	Afghanistan, DPRK, DRC, Nepal, Pakistan, Sierra Leone
School latrines	483	208	690,894	53,487	Afghanistan, Bangladesh, DRC, Haiti, Liberia, Nepal, Niger, Sierra Leone, Somalia
Communal latrines	1687	6	506,853	No figures	Liberia, Sierra Leone, Somalia, South Sudan
Health Centre latrines	69	6	196,574	306,272	CAR, Chad, DRC, Liberia, Sierra Leone, Somalia
Sewage works	3	0	176,000	5,940	Lebanon
Communal and institutional latrines <sup>3</sup>	443	0	85,061	16,315	DPRK
Demonstration latrines	664	0	65,550	31,170	Chad, DRC, Liberia
Distribution of slabs	103	0	5,260	490	Chad, Ethiopia, Kenya, Somalia
Cemetery latrines	2	0	4,667	300	Sierra Leone
<b>TOTAL</b>			<b>2,685,732</b>	<b>428,924</b>	

Table 3: A breakdown of the different types of sanitation infrastructure undertaken by Concern

<sup>2</sup> Some of these household latrines were constructed in emergencies, such as a complex emergency in Pakistan, and in ebola hotspots in Sierra Leone. Similarly, the context of DPRK means that household construction of latrines is the norm, and non-subsidy approaches are difficult. However, it is interesting that Concern programmes constructed so many household latrines, given that there is now a no-subsidy approach.

<sup>3</sup> These were not broken up in donor report, and constitute communal latrines as well as latrines in schools, kindergartens, nurseries, offices and clinics

The below shows the amount spent on each country programme in sanitation infrastructure in 2015 in order of cost. Pakistan spent the most amount of money on sanitation – over USD 624,000 on the construction of shared household latrines during the complex emergency in 2015 and drought-affected area. The DRC programme (including consortium partners) spent a total of over USD 567,000 on a latrines at households during an emergency, latrines in schools and health centres, as well as on demonstration latrines in communities triggered by CLTS. The emergency programme in Bentiu camp, South Sudan, was next, having spent USD 284,000 on 1,136 latrine cubicles for IDPs.



Country	Amount (USD)	Activities
Pakistan	624,401	Household latrines
DRC	567,873	
- CCU	509,523	Demonstration latrines, school latrines, health centre latrines
- Concern	58,350	Emergency household latrines, demonstration latrines, school latrines
South Sudan	284,000	Communal latrines
Afghanistan	236,109	Household latrines, school latrines
Somalia	196,610	Communal latrines, school latrines, rehabilitation of health centre latrines, distribution of latrine slabs
Lebanon	176,000	Sewage works
DPRK	145,117	Household latrines, communal latrines and institutional latrines
Sierra Leone	124,500	Household latrines, health centre latrines, latrines in cemeteries, rehabilitation of communal and school latrines
Niger	122,738	School latrines
Liberia	99,194	Isolation centre latrines, communal latrines, school latrines, demonstration latrines
Bangladesh	40,520	School latrines
Haiti	34,000	School latrines
Nepal	24,870	Household latrines, school latrines
Chad	8,650	Health Centre latrines, demonstration latrines, distribution of slabs
Ethiopia	1,000	Distribution of slabs
Kenya	150	Distribution of slabs
Syria	-	
Uganda	-	
Sudan	-	
CAR	-	
<b>TOTAL</b>	<b>2,685,732</b>	

Table 4: A breakdown of country programmes activities and expenditure on sanitation infrastructure

A number of sanitation infrastructure works stand out due to the large amount of infrastructure completed, or the unique works that have been completed in 2015. These include works done during the ebola reponse in Sierra Leone and Liberia:

- Two cemetery latrines in Sierra Leone
- 15 new health centre latrines in Sierra Leone
- 10 new latrines in isolation units in Liberia
- 29 incinerators and medical waste pits in both Sierra Leone and Liberia

### *Solid Waste Management*

Concern constructed facilities at health centres for the disposal of solid waste in four countries – DRC, Chad, Liberia and Sierra Leone, at a total cost of USD 118,050.

57 such facilities were constructed, and whilst the majority were incinerators, Sierra Leone also installed sharp pits and placenta pits at health centres.

<b>Country</b>	<b>Amount (USD)</b>	<b>Activities</b>
DRC (CCU partners)	86,450	Incinerators
Sierra Leone	25,000	Incinerators, sharp pits and placenta pits
Liberia	3,600	Incinerators
Chad	3,000	Incinerators
<b>TOTAL</b>	<b>118,050</b>	

*Table 5: A breakdown of country programmes activities and expenditure on solid waste management infrastructure*

## Non-WASH Infrastructure works

### *Disaster Risk Reduction (DRR) Infrastructure*

In terms of works for Disaster Risk Reduction, five countries undertook specific construction focussing on disaster risk reduction, with a total cost of over USD 1.2 million. The majority of the work focussed on flood protection walls and gabion walls. Afghanistan, Haiti, Pakistan and Sierra Leone all spent over USD 200,000 on a total of 289 flood protection walls, 377 gabion walls (normally used to stop landslides) and 10 drainage protection schemes, among others.

Type of Infrastructure	New	Amount (USD)	No of beneficiaries	Countries
Flood protection walls	289	585,561	20,865	Afghanistan, Pakistan
Gabion Walls	377	340,390	23,770	Afghanistan, Haiti
Retaining walls	5	151,317	84,075	Afghanistan, Sierra Leone
Drainage schemes	10	75,694	105,243	Liberia, Pakistan, Sierra Leone
Transversal dry walls and water infiltration channels	205	25,200	3,000	Haiti
Piped Culverts	68	23,094	66,505	Pakistan, Sierra Leone
Terraces	4	20,510	2,300	Afghanistan
Check dam	1	1,119	No number	Afghanistan
<b>TOTAL</b>		<b>1,222,885</b>		

*Table 6: A breakdown of the different types of DRR infrastructure undertaken by Concern*

Country	Amount (USD)	Activities
Afghanistan	395,309	Check dams, flood protection walls, gabion walls, retaining walls, terraces
Haiti	339,600	Gabion walls, water infiltration channels
Pakistan	254,218	Drainage scheme, flood protection walls, piped culverts
Sierra Leone	233,083	Drainage schemes, piped culverts, retaining walls
Liberia	675	Drainage schemes
<b>TOTAL</b>	<b>1,222,885</b>	

*Table 7: A breakdown of country programmes activities and expenditure on DRR infrastructure*



## Other Infrastructure

Concern spent over USD 3.7 million on construction works not related to WASH or DRR in 2015. The type of works completed included work on rehabilitation of roads, construction of bridges, emergency shelter, and health centre and school construction and rehabilitation. The highlights include:

- USD 1.25 million of this was spent on emergency/refugee shelter in Afghanistan and South Sudan.
- USD 401,000 on a total of 169km length of roads in Afghanistan, CAR, DRC, Pakistan and Sierra Leone
- USD 259,752 on 24 bridges in Afghanistan, CAR, DRC, Ethiopia, Haiti and Liberia
- USD 203,043 constructing and rehabilitating 23 health centres in CAR, Chad, Ethiopia, Sierra Leone and Somalia
- USD 158,909 rehabilitating 5 schools in Niger and Somalia
- USD550,000 on 16,500 graves & headstones and USD 53,600 on fencing around new cemeteries in Sierra Leone during the ebola crisis
- Over USD 870,000 on a range of other infrastructure projects including:
  - Winter greenhouses in DPRK
  - Community centres in Afghanistan
  - Micro hydropower plants in Afghanistan

A complete breakdown of construction undertaken in each category can be seen below.

## Shelter

Country	Amount (USD)	Beneficiaries	Number of shelters
Afghanistan	750,000	900	150
South Sudan	500,000	120,000	12,350
<b>TOTAL</b>	<b>1,250,000</b>	<b>120,900</b>	<b>12,500</b>

Table 8: A breakdown of country programmes activities and expenditure on shelter

## Roads

Country	Amount (USD)	Beneficiaries	Total number of kilometres	Number of projects
Afghanistan	165,463	8,625	15	10
CAR	196,300	3,420	85	1
DRC	Unknown	Unknown	39	
Pakistan	33,491	1,978	30	15
Sierra Leone	6,333	82,500	0.1	1
<b>TOTAL</b>	<b>401,587</b>	<b>96,523</b>	<b>169.1</b>	<b>27</b>

Table 9: A breakdown of country programmes activities and expenditure on roads

## Bridges

Country	Amount (USD)	Beneficiaries	Number of bridges	Maximum span (m)
Afghanistan	168,296	5,700	9	
CAR	16,456	77	4	22
DRC	Unknown	unknown	4	30
Ethiopia	55,000	25,330	2	9
Haiti	Unknown	20,000	1	
Liberia	20,000	25,750	4	55
<b>TOTAL</b>	<b>259,752</b>	<b>76,857</b>	<b>24</b>	<b>-</b>

Table 10: A breakdown of country programmes activities and expenditure on bridges

## Health Centres

Country	Amount (USD)	Beneficiaries	New	Rehabilitated
CAR	6,747	22,998	5	0
Chad	6,600	28,304	3	0
Ethiopia	42,500	8,000	2	2
Sierra Leone	129,500	35,600	0	3
Somalia	17,696	3,867	2	1
<b>TOTAL</b>	<b>203,043</b>	<b>98,769</b>	<b>12</b>	<b>6</b>

Table 11: A breakdown of country programmes activities and expenditure on health centres

## Schools

Country	Amount (USD)	Beneficiaries	Rehabilitated
Niger	21,909	1,469	4
Somalia	137,000	4,476	1
<b>TOTAL</b>	<b>158,909</b>	<b>5,945</b>	<b>5</b>

Table 12: A breakdown of country programmes activities and expenditure on schools

## Other Miscellaneous Works

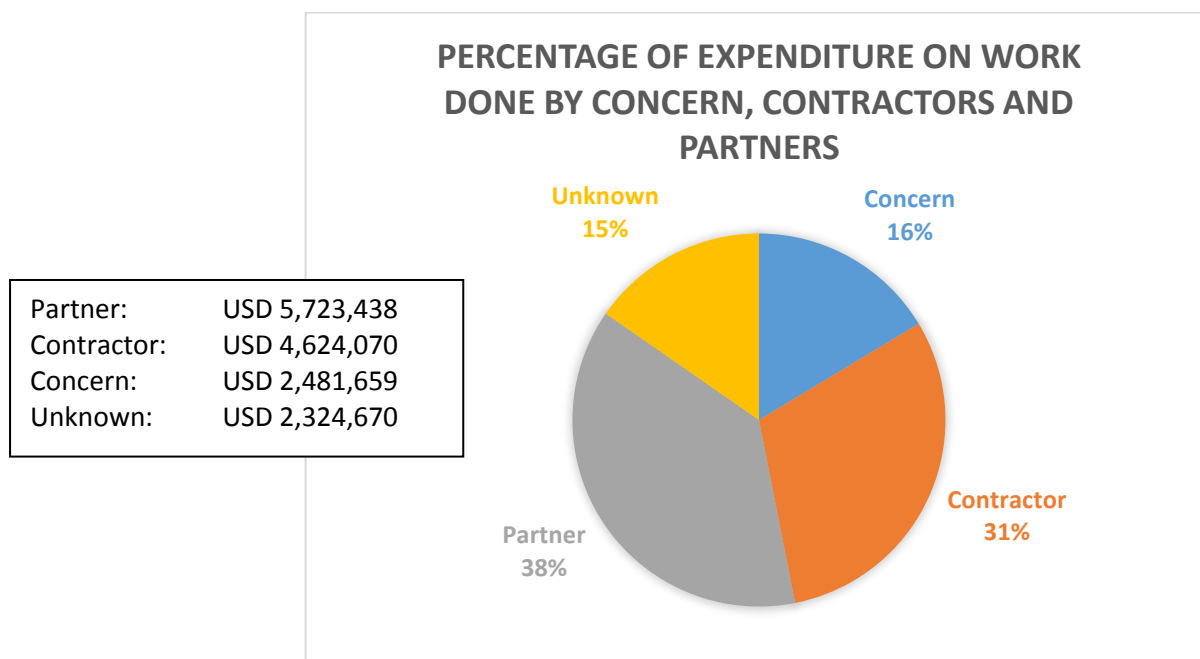
Country	Explanation of work	Amount (USD)	Number	Beneficiaries	Further details
Afghanistan	Construction of Community centres	264,345	10	8960	
Afghanistan	Micro hydro power scheme	185,103	9	5200	Total output 129.2kw
Afghanistan	Aqueduct	8,350	1	1400	Length 12m, Width 0.7m, Height 0.8m
Afghanistan	Irrigation system	16,181	2	2675	Total length of pipeline: 3,600m
Afghanistan	Grain Bank	22,650	21	17,430	
Afghanistan	Irrigation Channels	20,565	2	1750	Stone wall = 40m, pipeline = 660m, superpassage = 60m
CAR	Miscellaneous <sup>4</sup>	11,726	1	56	
DPRK	Winter Greenhouses	244,202	22	4,400	
Pakistan	Irrigation Channels	30,004	15		To reduce loss of water through run-off
Pakistan	Rehabilitation of flood-damaged water mills	18,913	31	1,550	Normally used for grinding of grains
Sierra Leone	Construction of head stones and graves	550,000	16500	82,500	During ebola reponse
Somalia	Self-help group training centre	2,016	2	220	
<b>TOTAL</b>		<b>1,374,055</b>			

Table 13: A breakdown of country programmes activities and expenditure on miscellaneous construction

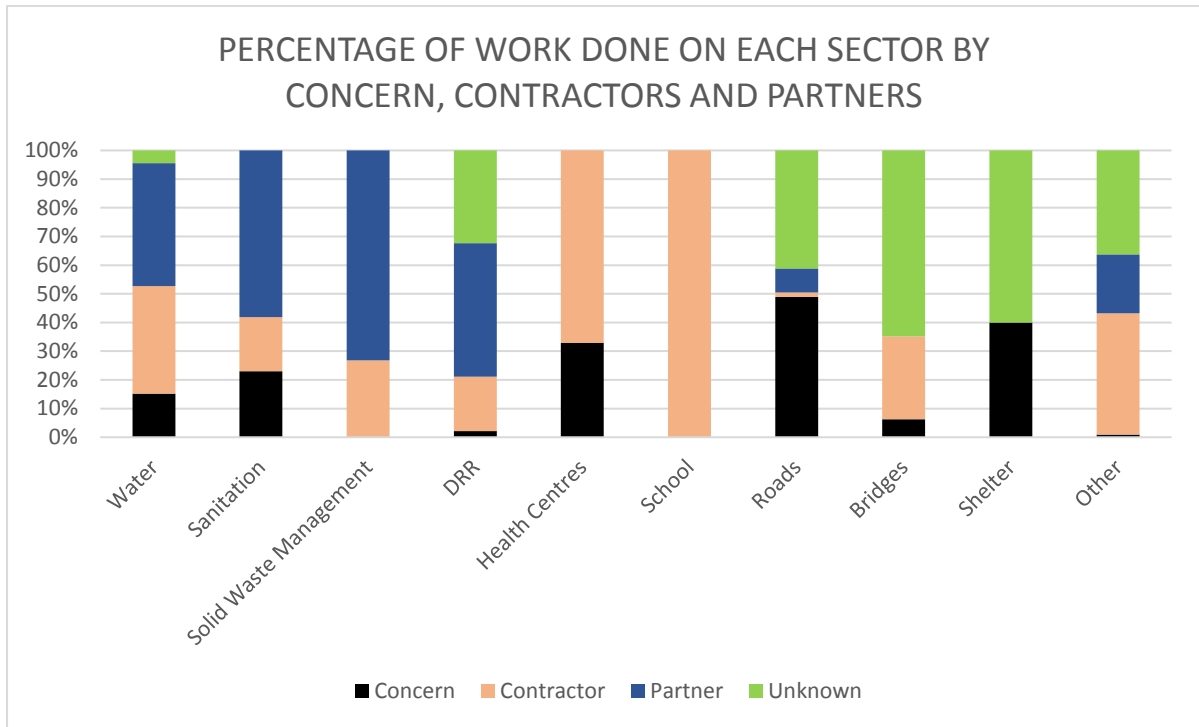
<sup>4</sup> « 7 passages buses et 11 tetes de buses »

## Concern, Partners and Contractors

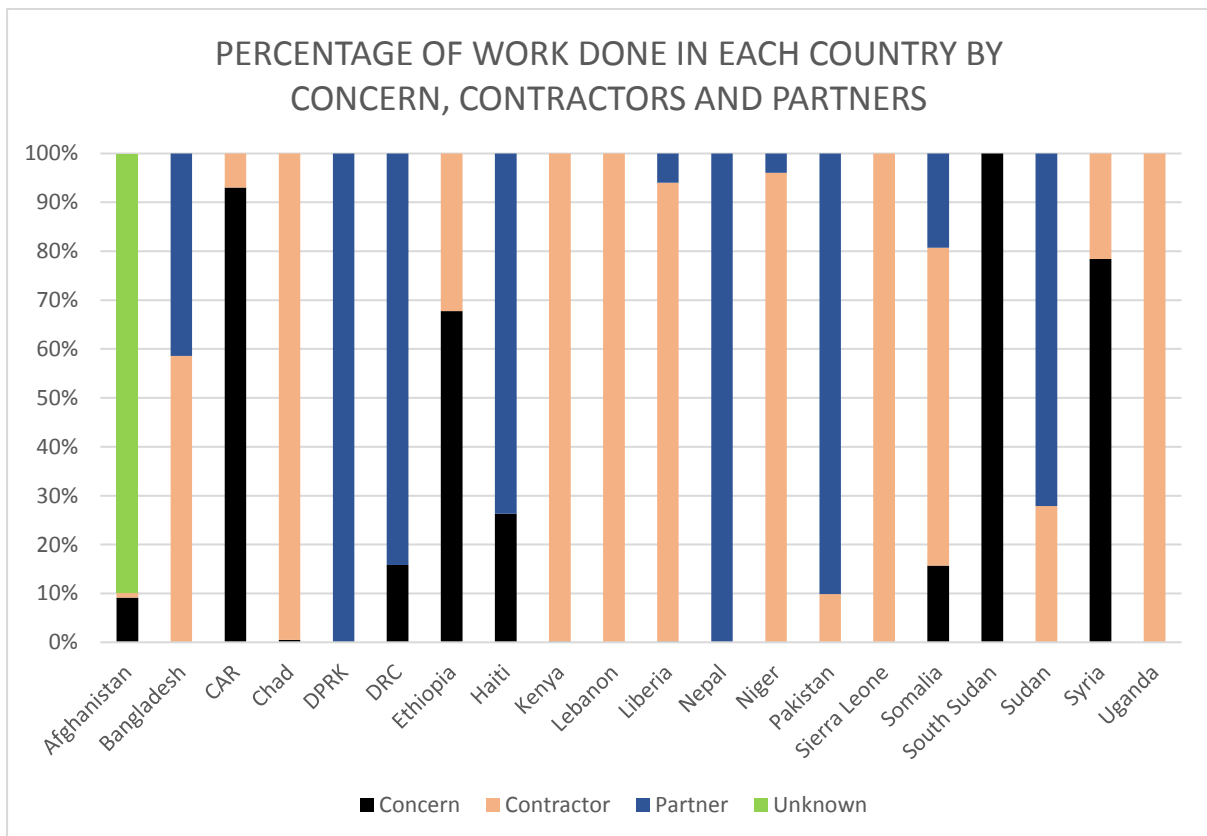
As can be seen below, a high percentage of construction work is completed by partners and contractors used by Concern, with 69% of the total cost of infrastructure work completed by partners and contractors. Only 16%, just over USD 2.5 million, is completed by Concern in-house. Another 15% is unknown.



The graph below shows the percentage of work done by Concern in-house, contractors and partners (and some which is unknown) for each specific sector. In terms of WASH infrastructure (water, sanitation and solid waste management), a large majority of the work is completed by contractors and partners (cost of USD 8 million), with a relatively small amount (cost of USD 1.74 million) completed by Concern in-house. For non-WASH infrastructure, health centre, school and miscellaneous (other) construction stand out as having a large amount of work done by contractors, with only a small amount done in-house by Concern.



The graph below shows the percentage of work completed in each country by Concern in-house, contractors and partners (and some which is unknown). It shows that most countries (all except CAR, Ethiopia, South Sudan and Syria) outsource the majority of their construction to either partners or contractors, which has major implications in terms of ensuring quality control for all Concern-funded engineering work.



## Next Steps

- Work should be continued on a quality assurance system specifically for WASH, taking into account the increase in WASH infrastructure, and to include the standardisation on construction contracts to help in ensuring good management of contractors, and the WASH Engineering SOPs
- Concern's experiences on the following should be documented to find any lessons learned:
  - Solar-powered systems
  - Rainwater harvesting systems
  - Deep boreholes and the technologies used
- It should be considered to undertake an inventory again in 2018/19 and 2021/22, and/or investigate a method for country programmes to be able to input data on everything being constructed in real-time
- Research should be undertaken to understand if and why some country programmes are still constructing household latrines given the "no-subsidy" approach now in place as part of Concern's WASH Strategy.
- Where we are constructing demonstration latrines, we do not yet seem to be aware of how many household latrines to, and/or their quality – it would be good to follow this up, somehow.
- Further information should be gathered on drawing and designs for school latrines, rainwater harvesting designs and other large WASH works to see about the potential for sharing of ideas across country programmes.