
Budget for water sample collection from Koraput and Malkangiri District

L.K Vaswani <lkv@ksrm.ac.in>

Mon, Feb 22, 2016 at 4:06 PM

To: Raj Srivastava <rsrivastava@unicef.org>

Cc: Madhumita Ray <madhumita@ksrm.ac.in>, Yumi Bae <ybae@unicef.org>, Director KSPH <directorksph@kiit.ac.in>

Dear Mr Raj

This is in continuation of the meeting held in UNICEF and the follow up discussion in this subject. We have received proposal from our Sister Organization KIIT School of Public Health for evaluation of 78 water sample with a financial implication of Rs 3,97,000/-. (proposal and proposed budget received from KSPH appended).

In this context, I would like to state that we have an unspent budget of Rs 5.2 lakh to CCS Researcher. We have spent 4.8 lakh against the allocated budget of Rs 10 lakh against salaries of CCS Personnel for the period 15 Sept- 2015 to 15 Jan 2016.

Therefore, I suggest the budget to the extend of Rs 3.97 lakh may be reallocated to the budget head " Water sample for WaSH Project ".

Submitted for favorable consideration and followup action.

With regards
Vaswani

On Thu, Feb 18, 2016 at 8:16 AM, Raj Srivastava <rsrivastava@unicef.org> wrote:

Dear Prof. Vaswani,

A gentle reminder for the proposal please. Considering the time constraints, requesting to please expedite the same.

Thanks and regards, raj

From: Raj Srivastava

Sent: Tuesday, February 16, 2016 10:43 PM

To: L.K Vaswani <lkv@ksrm.ac.in>

Cc: subhanil <subhanil@ksrm.ac.in>; 'Madhumita Ray' <madhumita@ksrm.ac.in>

Subject: RE: Budget for water sample collection from Koraput and Malkangiri District

Dear Prof. Vaswani,

This has to bilaterally discussed / agreed with you and Dr. Satpathy. Having analysis of budget availability in different heads, a formal request could be made for reallocation of budget within overall CCS approved budget.

Thanks and regards, raj

[Quoted text hidden]

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2 attachments



WaSH_Water analysis_ UNICEF.doc
53K



WaSH-UNICEF-Budget.xlsx
12K

Budget for water sample collection from Koraput and Malkangiri District

L.K Vaswani <lkv@ksrm.ac.in>

Fri, Mar 4, 2016 at 9:24 AM

To: Director KSPH <directorksph@kiit.ac.in>, Madhumita Ray <madhumita@ksrm.ac.in>

Cc: Raj Srivastava <rsrivastava@unicef.org>, subhanil <subhanil@ksrm.ac.in>

Dear Dr Satpathy,

This has reference to the proposal for analysis of water samples as a part of WASH project with a budget of Rs 3.97 lakh.

The UNICEF in principle has agreed to reallocate the budget within CCS funds but procedure of reallocation is taking some time. In the meantime may I request you to go ahead with the procurement of materials required to avoid delay in start of your work .

The formal approval funds will be available to you early the next week.

With regards,

Vaswani

[Quoted text hidden]

[Quoted text hidden]

Quality of water source and drinking water in health centres of 3 HPDs

Determination of water quality is mandatory from human consumption point of view. This generally involves estimation of fecal coliform load in the water samples by MPN (Most probable Number) method (Betty H. Olson, 1978).

Objective: Quality of water source and drinking water facility in health care centers in Koraput and Malkanagiri districts of Odisha will be assessed in terms of bacteriological contamination level.

1. MATERIALS (Chemicals, glassware's and reagents):

All glassware (DURAN, Wertheim, Germany) and materials used will be washed and rinsed with MilliQ (RiOs 16 Century, Millipore, USA) water. The analytical grade reagents used for the chemical analyses of water samples will be mostly from Merck chemicals (Merck Millipore, Darmstadt, Germany) and HiMedia (HiMedia Labs, Mumbai, India).

Disposable gloves

100% ethanol for flaming loop/needle

Wide mouth plastic bottles and petriplates

2. METHODS

Sampling of water under aerobic conditions for analysis of physico-chemical and biological parameters

2.1 Sampling sites, Sources and sample collection

50 % of the total number of water samples collected from different sampling points spanning all 3 HPD districts of UNICEF viz., Koraput, Malkanagir and Kondhamal wherein all district hospitals, SNCUs, NRCs, CHC and selected sample of PHCs (where delivery takes place) will be assessed as described in study proposal and their respective GPS coordinates (GARMIN) will be recorded by GPS tracker. Water samples will be collected by wearing gloves and hands are sterilized with 70% EtOH. Water samples will be immediately transferred to sterile (autoclaved) plastic bottles of 500 ml and transported to the laboratory on ice and stored at 4⁰C for future bacteriological analyses.

Sampling source includes: (any of the followings)

- Water Purifiers
- Overhead water tanks
- Ground water tanks
- Boring water point
- Washroom source point

2.2.3. Monitoring of sewage and faecal indicator bacteria (FIB) in water samples

Water Health Card Parameter:

1. pH
2. Total Bacterial Count (TBC)
3. Most Probable Number (MPN)

All the glassware (Borosil, Mumbai, INDIA) and materials used will be washed and rinsed with MilliQ (RiOs 16 Century, Millipore, USA) water. Both of the general and analytical grade chemicals used for the fulfillment of the above objective will be from HiMedia (HiMedia Labs, Mumbai, India). Plastic wares such as petriplates and micro tips will be from (Tarsons, Mumbai, INDIA). By using differential medium for enumeration of faecal coliforms, gram negative bacteria, *Vibrio cholerae*, *Streptococci Sps*, *Enterobacteria Sps* and other enteropathogenic microbes. All the specialised and general media used for the enumeration of faecal coliforms and enteropathogenic bacteria will be from HiMedia (HiMedia Labs, Mumbai, India). Brilliant green bile agar (BGBA), LB Broth + lactose + Bromothympl blue (**Presumptive test**), MacConkey agar and Eosin Methylene agar medium (**Confirmatory test**), Bile esculin agar medium (enumeration of faecal *Streptococci sp.*), Thiosulfate-citrate-bile salts-sucrose agar (TCBS) agar for the enumeration of *Vibrio cholera* and Slantez and Bartley agar medium for enumeration of faecal *Streptococci sp.*

- **Macconkey agar medium** for differentiating the presence of lactose fermenting bacteria
- **BGB Agar** for enumeration of faecal coliforms
- **Eosin-methylene blue agar medium** for differentiating the gram negative bacteria
- **TCBS Agar** (Thiosulfate Citrate Bile Salts Sucrose Agar) - for the selective isolation and cultivation of *Vibrio cholerae* and other enteropathogenic microbes
- **Slantez and Bartely Medium** (Enterococcus Agar) - for the detection and enumeration of faecal *Streptococci Sps*
- **Bile Esculin Agar Medium**- for detection and enumeration of faecal *Streptococci Sps*
- **Endo Agar** for isolation of *Enterobacteria Sps*

3. Total Bacterial Count: Water samples will be collected and the serial dilutions are made and spread on to nutrient agar plates and simultaneously spread on Bile Esculin agar, TCBS (Thiosulfate-citrate-bile salts-sucrose agar), Slantez and Bartley agar medium. The plates will be incubated at 37°C for 24 hours. The plates with respective number of colonies will be counted and multiplied by the dilution factor used in each case. The bacterial density will be expressed in number / ml of the sample.

4. MPN (Most probable number): This procedure will be used to estimate bacterial population, which includes **a) Presumptive test** and **b) Confirmatory test**.

a) Presumptive Coliform test:

Principle: Measured aliquots of water samples will be treated and added to lactose fermentation broth (LB broth+ lactose+ bromothymol blue) containing an inverted Durham's tube. When the bacterial cells will be exposed to lactose, a Lac operon will be induced; β -galactosidase is an enzyme which catabolizes the lactose into glucose and galactose. The catabolism of lactose into glucose and galactose is an indicative of fecal contamination in water and their detection is facilitated by the use of lactose fermentation broth. After incubation at 37°C for 24 hours, the development of gas and acid production in the broth is the presumptive evidence for the coliform bacteria.

Procedure: For 10 ml sample double strength lactose broth (Luria broth+ lactose+ bromothymol blue) will be used. 9 tubes of lactose broth (double strength) will be labeled as 1,2,3,4,5,6,7, 8, and 9 according to the volume of water sample i.e. 0.1ml, 1ml and 10 ml respectively. Dispensed 0.1ml water sample in each tube (1, 2, 3) and 1 ml in each tube 4, 5, 6 and 10 ml in 7, 8, 9. All the tubes will be Incubated at 37 ° C for 24 hours in an incubator for gas and acid production.

b). Confirmed coliform test:

Principle: The presence of doubtful and positive presumptive test immediately suggests that, the water is not potable. The selective media will be used for the confirmation of coliform bacteria is Eosin methylene blue (EMB) agar & MacConkey agar medium.

Procedure: A loop full inoculums from positive tubes will be taken and streaked on to the respective medium petriplates and incubated at 37 ° C for 24 hrs. On EMB medium the *E. coli* cultures produced a green metallic sheen and other coliforms like *Enterobacter aerogenes* produces dark pinkish color colonies.

3. EXPECTED OUTCOME:

*** Periodic sampling (pre and post monsoon) and quality analysis of the water sources will be able to provide us exact status of water sanitation and hygiene in the health care centers.**

- **Health outcomes:** Diarrhoea and other enteropathogenic bacterial infection.
Estimation of total bacterial count w.r.t enteropathogenic bacteria such as, *Vibrio cholerae*, *Streptococci Sps* and *Enterobacteria Sps* etc
Estimation of coliforms by MPN and enumeration of water health status in the water samples of specific health care centers for possible future intervention measures.
- **Environmental outcomes:** Water quality, hand contamination, human specific pathogen exposure
- **Behavior outcomes:** maintenance and use; possible extension for disposal of wastes, if any.
- **Economic outcomes:** cost effectiveness of the measures
- **Other outcomes:** Process monitoring;

Water treatment methods

1. Primary treatment
2. Secondary treatment
3. Complete treatment

1. Primary treatment: There are four methods of primary treatment: Chlorination, Ozone treatment, UltraViolet treatment and membrane filtration.

2. Secondary treatment: Secondary treatment of water consists of sedimentation and filtration followed by chlorination. The four basic types of filtration are cartridge filtration, rapid sand filtration, multimedia sand filtration, and up-flow filtration. **Cartridge filtration** system is designed to handle waters of low turbidity and will remove solids in the 5 to 100 micron range.

3. Complete treatment: Complete treatment consists of flocculation, coagulation, sedimentation and filtration followed by disinfection.

References:

1. WHO. 2004. Guidelines for Drinking-water Quality. Third Edition Volume 1: Recommendations. World Health Organisation, Geneva.
2. UNEP - GEMS / Water Programme. 2005. Workshop report: Development and use of global water quality indicators and indices. Vienna, Austria 4-6th May 2005. (http://www.gemswater.org/publications/pdfs/indicators_workshop_report.pdf).
3. Betty H.Olson (1978). Enhanced Accuracy of Coliform Testing in Seawater by a Modification of the Most-Probable-Number Method, *Appl Environ Microbiol*, 36(3): 438–444.
4. CPCB (Central Pollution Control Board, Govt. of India). The standard parameters such as pH, DO, BOD and total coliform (CPCB, 2011-2012).

TENTATIVE BUDGET (@ 78 samples = 50 % of the total 156 samples)

* Only for total bacteriological analyses and enumeration of enteropathogenic bacteria

WATER Sample Collection						
SI No	Item					Price (in INR)
1	Manpower:	Nos				
	i. Research Assistant, M. Sc (Microbiology) (@ 25,000.00 pm)	1				25,000.00
	ii. Field assistant: B. Sc (@15,000)	3				45,000.00
2	Instrument:					20,000.00
	GPS tracker- GARMIN					
3	Consumables:					2,05,000.00
	1. Media / reagents (@ pkd for 50 reactions)					
	2. Glassware and Plastic wares					
	3. Gloves					
	4. 100% ethanol					
						2,95,000.00
4	Travel and Accommodation:					
SLNO	DISTRICT	PARTICULAR	UNIT COST/day	No of Days		Price (in INR)
1	Koraput	Travel	3000	10		30,000
2		Accomadition	1000	12		12,000
3		Fooding	300 * 3 Persons	12		10,800
4		Transportation Charges				5,000
Total Amount						57,800
1	Malkangiri	Travel	3000	8		24,000
2		Accomadition	1000	8		8,000
3		Fooding	300 *3 Persons	8		7,200
4		Transportation Charges				5,000
Total Amount						44,200
TOTAL						3,97,000