GENERAL GUIDELINE FOR IMPLEMENTATION OF DECENTRALIZED GRAM PANCHAYAT LEVEL ACTION PLAN

Solid, Liquid Waste and Faecal Sludge Management System

Mission Nirmal Bangla

PREPARED AND SUBMITTED BY

UNICEF

WEST BENGAL FIELD OFFICE

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Rationale and Approach to Waste Management

While the discourse and focus of India's rural sanitation effort is on household sanitation, an overarching objective of Mission Nirmal Bangla is to create clean environment in the villages. Achieving ODF is only halfway to achieving a safe and liveable environment for the people in rural areas. Collection, treatment and management of all solid and liquid waste will help in not only meeting the objectives of SBMG, but also in creating clean and healthy villages.

However, the current solid and liquid waste disposal practices is far from desirable and needs a rethink and an innovative approach with emphasis on conservation and reuse to meet the goals of clean, healthy and liveable villages. Indiscriminate and uncontrolled abstraction has resulted in significant fall of ground water. Compounding the falling ground water table is the contamination of groundwater from untreated wastewater from households. Recharge of groundwater with treated wastewater from households (cooking, bathing and washing) is an option to reverse this trend. The present practice at most households is to discharge the wastewater in the open which finds its way to low lying areas and / or water bodies, contaminating surface and / or ground water. Households wastewater could also be discharged to drains which if blocked with animal / solid waste could result in stagnant / overflowing drains and the ensuing mosquito menace and unsightly conditions.

Hence, the need to improve the solid and liquid collection, treatment and disposal practices to improve cleanliness and make the village healthy and liveable. As recommended by the Ministry of Jal Shakti, preference would be for decentralized and community / village level intervention other than situationa when space or hydrogeological constraints restricts such approach.

(A) Grey water

Rather than letting the grey water to flow to the drains and contaminating surface water, effort is made to:

- Reuse in household kitchen garden, and
- Recharge ground water through individual and / community leach pits

(B) Black water (effluent from septic tanks)

- Provision of leach pit for management of effluent otherwise flowing into open or drains

(C) Yellow water (Human Urine)

Promoting simple, cost effective urine utilization systems in schools and public places.

(D) Dung and cattle shed waste

Households with cattle generates between 20 – 40 kg of dung every day. Biogas plants and composting / vermicomposting units are a few options to manage the waste.

(E) Cattle Urine

Urine with sufficient dilution is a rich source of nutrients and could be used for gardening / agriculture. Encourage and promote simple systems to collect and reuses the urine.

Non-biodegradable Solid Waste

(A) Paper, metal, glass

Household / GP to collect and sell through kabadiwalas or local scrap dealers

(B) Plastic / Styrofoam

Legislate and ban the use of plastics, styrofoam and support SHGs / entrepreneurs to produce substitutes. Understanding this would take time, in the interim promote blending and reuse of plastic waste in road construction. Plastic shredders can be installed at block levels. Styrofoam needs to be collected and stored until such time viable and cost-effective treatment are available / else GP could arrange for transfer and disposal at the nearest engineered landfill

(C) Non-recyclables

Support the Gram Panchayats for collection and safe storage of non-recyclable and hazardous solid waste such as CFL bulbs / tube lights / chemical containers / multilayer packings / E waste until it is lifted by the competent authority

Beautification of villages

In order to increase the green cover in the villages, the programme will promote:

- Greening of village open spaces,
- Plantation along roads and ponds
- Designated children's parks
- Herbal Gardens

Proposed Institutional Arrangement at the Gram Panchayat Level

(A) Formation of task team at the GP level – To support the pilot project, the Gram Panchayat has formed a task team with the key drivers who took lead role in achieving ODF and others. The task team is comprised of the followings:

- Elected GP representatives
- GP Employee(s)
- Swachhagrahis / Community Facilitators
- VWSC
- Local Masons (worked during ODF campaign)
- School Teachers
- Anganwadi and ASHA Workers
- Para Nojordari Committee
- Women SHGs
- Village level organizations (Farmers' cooperative, Clubs, CSOs)

(B) Distribution of responsibilities to the members of the task team to executive various activities to prepare, plan and implement SLWFSM action plan. The distribution of responsibilities has been proposed to coordinate the following activities as per the action plan:

- Capacity Building, Triggering, IEC and beautification of villages
- Identification, training and deployment of surveyor and survey activities
- Preparing Gram Sansad (ward) level maps to support implementation
- Preparing draft GP action plan from the collected data
- Plan implementation, procurement and monitoring
- User orientation and post implementation follow-up

The task team is trained and re-trained in various phases of planning and implementation to equip them with necessary skill and knowledge. Details of which is provided in the action plan summary of activities.

Waste Characterization

Category of Waste		Type of Waste	Description / Examples
1	Liquid Waste	Grey Water	– Wastewater from kitchen – Wastewater from washing cloths – Wastewater from bathing
		Black Water	– Wastewater from toilets (flushing, ablution and hand wash)
		Yellow Water	– Human urine
2	Solid Waste	Biodegradable	– Food waste (left overs / rejects) – Vegetable and fruits peels
		Recyclable	– Paper – Glass – Metal
		Non-Recyclable	– Plastic/Polythene – Styrofoam – Leather
		Hazardous (non-recyclable)	– Mercury in CFL bulb – Multilayer packing – E-waste
3	Animal Waste		– Animal wash water – Animal Dung – Animal urine
4	Biomedical Waste		– Used syringe – Used gloves – Used cottons, bandage etc – Human body parts

Waste Quantification

Quantification of waste is a matter of traditional challenge. The best and most scientific way to quantify the waste is to weight it after proper segregation depending on the category and type. Considering all practical purposes, the variation between

actual quantification of the waste derived after weighing and the same computed based on the norms is not significant to impact selection of technology for management. Therefore, the following norms have been used for quantification of various types of waste while preparing this DPR. The used norms are either in reference with government reports or contemporary research on solid and liquid waste management:

Norm for Quantification of Household Waste		
1	Grey Water	– 38 Liter per capita per day
2	Black Water	– 10 Liter per capita per day if the toilet has cistern flush and the toilet type is septic tank with outlet left in the open or drain – 5 Liter per capita per day if the toilet has pour flush and the toilet type is septic tank with outlet left in the open or drain
3	Yellow Water – Human Urine	– 0.5 Liter per capita per day
4	Biodegradable waste	– 0.2 Kg per capita per day
5	Recyclable waste	– 0.075 Kg per capita per day
6	Non-Recyclable waste	– 0.025 kg per capita per day
7	Animal Waste - Urine	– 10 Liter for big animals like cow, buffalo, camel etc.
8	Animal Waste – Dung (kg/day)	– Cow - 10 – Buffalo - 20 – Camel - 15 – Pig - 5 – Goat - 0.25 kg
8	Animal Waste – Water used for washing animals and washing animal shed	– 50 Liters per buffalo per day – 25 Liters per day for washing 100 sq ft of paved animal shed
Educational Institutions		
1	Grey Water	– 2.5 Liter per capita per day (this includes water used for cooking and handwashing)
2	Black Water (computation on the basis of average user per day)	– 10 Liter per capita per day for toilet with cistern flush and the toilet type is septic tank with outlet left in the open or drain – 5 Liter per capita per day for toilet with pour flush and the toilet type is septic tank with outlet left in the open or drain
3	Yellow Water (Urine)	– 0.5 Liter per capita per day
4	Recyclable waste	– As responded by the institution
5	Non-recyclable waste	– As responded by the institution
Health Institutions		
1	Grey Water	– 40 Liter per in-patient/residential staff per day – 4 Liter per out-patient/non-residential staff per day

2	Black Water (computation on the basis of average user per day)	– 10 Liter per capita per day for toilet with cistern flush and the toilet type is septic tank with outlet left in the open or drain – 5 Liter per capita per day for toilet with pour flush and the toilet type is septic tank with outlet left in the open or drain
3	Yellow Water (Urine)	– 0.5 Liter per capita per day
4	Recyclable waste	– As responded by the institution
5	Non-recyclable waste	– As responded by the institution
Government Offices		
1	Grey Water	– 5 Liter per employee/visitor per day
2	Black Water (computation on the basis of average user per day)	– 10 Liter per capita per day for toilet with cistern flush and the toilet type is septic tank with outlet left in the open or drain – – 5 Liter per capita per day for toilet with pour flush and the toilet type is septic tank with outlet left in the open or drain
3	Yellow Water (Urine)	– 0.5 Liter per capita per day
4	Recyclable waste	– As responded by the office
5	Non-recyclable waste	– As responded by the office
Public Spaces		
1	Grey Water (computation on the basis of average user per day)	– As responded by the Gram Panchayat
2	Black Water (computation on the basis of average user per day)	– As responded by the Gram Panchayat
3	Yellow Water (Urine) (computation on the basis of average user per day)	– As responded by the Gram Panchayat
4	Recyclable waste (computation on the basis of average user per day)	– As responded by the Gram Panchayat
5	Non-recyclable waste (computation on the basis of average user per day)	– As responded by the Gram Panchayat

Technology for Decentralized Management of Liquid Waste

The following technologies have been proposed to manage the liquid waste:

(a)Grey Water

i) At household

- Kitchen garden
- Individual leach pit (bricks / Cement concrete rings)

ii) At community

- Washing platform with Nhani trap to prevent mosquito breeding and water seal to prevent foul odor

- Silt Chamber (connected to washing platform) for separating the sludge and scum from water to re-use in kitchen garden
- Community plantation if land is available and there is excess water to re-use
- Community Leach Pit (for a group of 15 -20 houses when space is a constraint)

(b) Black Water
- Leach pit (individual or community level)

(c) Yellow Water (urine)
- Leach pit
- Collect, dilute and reuse in garden / agriculture

Technology for Decentralized Management of Solid Waste

The following technologies have been proposed to manage the solid waste:

(d) Biodegradable waste (household with cattle) will have a common solution for management of household biodegradable waste and cattle waste (dung, urine etc.)
- Home Composting Unit (recommended for households without cattle)
- Vermi Composting Unit (recommended for households without cattle)
- Biogas Plant (recommended for households with cattle and animal waste of 30-40 Kg every day)
- NADEP Composting Tank (recommended for household with cattle but not interested in biogas plant)
- Bamboo composter (recommended for any household).
- Foldable composter (recommended for households who do not want to use any fixed place for composting and may require to use the space for other purposes occasionally)
- Earthen or pot composter (recommended for household who generate very less quantity of waste and do not have space or not willing to have relatively expensive composting option)

(e) Recyclable Waste
- Households store and sell to local scrap dealers or kabadiwalas
- GP collects the recyclable wastes from households, stores and sells to kabadiwalas

(f) Non-recyclable Waste
- Periodical collection from households by the GP
- Storage by GP in a centralized shed for safe confinement

Data Collection and Finalization of the Technology Option

Data for the action plan has been collected through an extensive survey by a team of trained enumerators. The enumerators were supervised by a core team at the district, and block level to provide on-site support and guidance. The core team and the enumerators received a 4-day comprehensive training before being mobilized to the field. The training covered clear understanding of the need for having solid and liquid waste management system, the technology options, community participation and ownership through through triggering, data collection instruments and

techniques. The training also covered extensive practical on some of the technology options and live demonstration of data collection using smartphone. All the households, Gram Panchayat, local education, health, public offices and public places have been included in the scope of survey. During the survey the enumerators engaged into a process of consultation with the respondent and finalized the most appropriate technology option after physical verification of available space and other parameters.

Smartphone application was designed and used for the survey to avoid common data collection and data entry errors. Besides, the technology has been significantly helpful to reduce time and human resources in the process of preparing the action plan apart from saving thousands of paper to make it more environment friendly.

Procurement

The action plan recommending the decentralized model of SLWM is designed to earmark activities in two broad categories i.e. (a) IEC activities and (b) installation of infrastructure. The following procurement process is recommended at the GP level to support the implementation.

(a) IEC Activities – Local women self-help groups / Local NGOs could be engaged on the basis of the activities proposed in the action plan. The cost for procurement is also featuring in the action plan furnished.
(b) installation of infrastructure - The Gram Panchayats may follow its prevalent procurement practice through competitive bidding process and engage a firm for carrying out the installations under direct supervision and monitoring of the GP level task team members assigned with such responsibilities. The procurement could be carried out in two ways as described below:
    a. The Gram Panchayat may procure the required volume of material as indicated in the action plans directly from local market and invite tender only for labour supply from local contractors to carry out the construction activities. This approach is beneficial to substantially reduce the construction cost.
    b. The Gram Panchayat may invite tender from local contractors for compact work against each type of construction activities as prescribed in the action plan. The unit cost for each type of technology solutions proposed in the action plan may be computed on the basis of the existing schedule of rates applicable to the Gram Panchayats following the bill of quantities provided in the technical manual for respective installations. This approach will increase the construction cost significantly.

Funding Norms

The Gram Panchayat will adhere to the following funding guidelines at the time of implementation of the action plan for waste management.

Sl No.	Activity Narrative	Funding Norms
1	Orientation and Capacity Building of GP level Task Team	The district will earmark funds from its IEC budget under MNB to support the planned capacity building activities at the Gram Panchayat. The District/ Block level team of master trainers will impart training to the GP level task teams as per the action plan. The district plan for capacity building plan will be prepared based on the capacity building activities at the GP level
2	Pre-triggering and Triggering	
3	Entry Point Activities	
4	IEC Activities	
5	Beautification of Villages	The activities proposed under beautification of villages to improve the village aesthetics will be undertaken by the Gram Panchayat with 100% community contribution (cash, material or labour). Such initiative will promote clean surrounding and also be pivotal to improved waste management behavior among the citizen. Judicious use of MNREGS and GP's own fund can be utilized for this purpose.
6	Deployment and Training of Surveyor / Enumerator	For the pilot Gram Panchayats, this cost has been born by UNICEF/HRD. While the model is rolled out to other GPs, the district IEC budget will be allocated to engage required number of surveyors and their training as per the action plan.
7	Household – Bio-Degradable Waste Management	Bio-degradable wastes will not be collected from any household in the Gram Panchayat. Gram Panchayat will lead appropriate IEC activities to promote household / community level management of bio-degradable wastes through simple and traditional composting methods/feeding cattle and livestock. No government subsidy will be provided to any household for this purpose.
8	Institution and Public Places – Bio-Degradable Waste Management	The Gram Panchayats will create necessary bio-degradable waste management infrastructure for composting in all institutions and public places as per the action plan. The GP will identify, train and engage women self-help groups for operation and maintenance of the composting units in the institutions and public places.
9	Household – Non Bio-Degradable Recyclable Waste Management	The Gram Panchayat will establish appropriate linkage with the local scrap dealers and institutionalize the mechanism to promote doorstep collection of recyclable wastes. The Gram Panchayat will undertake IEC activities to promote segregation of recyclable and non-recyclable wastes at home
10	Institution and Public Places – Non Bio-Degradable Recyclable Waste Management	
11	Household – Grey Water Management	The Gram Panchayat will promote individual soak pit / leach pit for the households with mandatory contribution of at least 25% of the total cost. Wherever space constraint restricts such approach, the GP will construct community leach

Sl No.	Activity Narrative	Funding Norms
		pits to connect such households. The cluster of households will share at least 25% of the cost including the cost for connecting the households with the community leach pit through underground PVC pipe
12	Institution and Public Places – Grey Water Management	The Gram Panchayat will create necessary infrastructure for grey water management at the institutions and public places.
13	Household – Black Water Management	The Gram Panchayat will take a resolution in a specially convened general body meeting and enforce a rule so that the households discharging their black water in the open or drain will take necessary measures to manage the same through a soak pit / leach pit. This initiative will be backed by necessary IEC tools as well. The Gram Panchayat will not fund any infrastructure for black water management at the household level
14	Institutions and Public Places – Black Water Management	The Gram Panchayat will create necessary infrastructure for black water management at the institutions and public places.
15	Institutions and Public Places – Yellow Water Management	The Gram Panchayat will identify suitable public institutions (preferably schools) for piloting yellow water management to use as manure in agriculture
16	Shed for Storage of Non-biodegradable Non-recyclable Wastes	The Gram Panchayat will construct a shed for collection and storage of Non-biodegradable Non-recyclable Wastes until the same is used for scientific disposal
17	Equipment for Collection and Storage of Non-biodegradable Non-recyclable Wastes	The Gram Panchayat will procure necessary equipment for Collection and Storage of Non-biodegradable Non-recyclable Wastes in the shed
18	Person-days required for Collection and Storage of Non-biodegradable Non-recyclable Wastes and Operation and Maintenance of SLWM Infrastructure at Public Places	The Gram Panchayat will identify, train and engage local Community Based Organizations (CBOs) for collection of Non-biodegradable Non-recyclable Wastes from the households, institutions and public places once or twice every month. The engagement will be made on the basis of the number of person days required for collection, secondary segregation at the shed and systematic storing to the capacity of the shed
19	Summary of User Orientation Programme Required	The Gram Panchayat, like the preparatory activities, will undertake IEC based approach to orient the users to manage their waste management infrastructure. The cost of this activity will be borne by the IEC budget of MNB at the district level.

RECOMMENDATIONS FOR FAECAL SLUDGE MANAGEMENT

Preparing an actionable plan to introduce an institutional mechanism for faecal sludge management (FSM) at the Gram Panchayat level will require the following considerations. The survey carried out in the Gram Panchayat has been extremely helpful to get hold of the scale of the FSM requirement. The summary of which is presented below:

(a) The Gram Panchayat has substantial number of households with either single pit or septic tank toilet which requires periodical desludging. The survey database is capable of providing Gram Sansad-wise list of such households to enable further planning.

(b) In order to create system of parodical de-sludging, the Gram Panchayat needs to identify the households and make an assessment of the sludge holding capacity of each and every toilets vis-à-vis the number of members in the family to be able to take policy decision to enforce a scientific frequency of de-sludging to create a system of FSM. This process will enable the GP to forecast the volume of sludge-flow to the fecal sludge processing unit

(c) The Gram Panchayat need to identify local private partners for pit emptying along with fixing a unit price for the same to be paid by the households/institutions. The pit emptier will have the mandate to dump the sludge in the designated fecal sludge processing unit only.

(d) The Gram Panchayat may set up a faecal sludge processing unit away from habitations in conformity with the pollution control board norms. The processing unit will work on non-mechanized and traditional form of treatment to separate the solids from the liquid through *Row Entrenchment* and later the dried solids could be used for co-composting in the form of organic manure. This is a low cost technology which is manageable at Gram Panchayat scale.

(e) The Gram Panchayat will undertake extensive awareness and IEC campaign to inform people about the need of a FSM system and the role citizens are expected to support the initiative.

(f) The Gram Panchayat will be supported to prepare a Detailed Project Report (DPR) for FSM by MNB

RECOMMENDATIONS FOR MANAGEMENT OF USED MENSTRUAL SANITARY ABSORBENTS AND DIAPERS

The Gram Panchayat will undertake IEC campaign so that the households start using more environment friendly sanitary absorbent which are bio-degradable.
For disposal, two options could be explored – 1. at HH level and 2. connected to a common collection mechanism by GP.
Households should wrap the used sanitary absorbents and diapers in newspapers.
At household scale, the households can bury the absorbents away from drinking

water sources or water bodies or safely burn the same (though it is not a recommended practice as per SWM rule).
Alternatively, wherever possible, the Gram Panchayat may collect such waste and incinerate the same in a common facility meant for treatment of waste in a confined area.
The Gram panchayat may encourage the secondary and higher secondary schools and health institutions to install low cost incinerator to deal with sanitary absorbents and diapers.