



Central Zoo Authority  
केन्द्रीय चिड़ियाघर प्राधिकरण

unicef   
for every child



# GUIDELINES ON **WASH** FACILITIES IN ZOOS 2021



## **Disclaimer**

Facts and statistical inputs in this document have been made available by various zoos in the country. Central Zoo Authority has articulated these in this document with the assistance of acknowledged experts in the field. This document is a prescriptive document only to assist the zoos in designing their plans in the local context.

**Suggested Citation:** WASH-zoos (2021) Guidelines for Water, sanitation and Hygiene in Zoos.  
Central Zoo Authority, Ministry of Environment, Forest and Climate Change, Govt of India.

# **Guidelines on WASH Facilities in Zoos**



मंत्री  
पर्यावरण, वन एवं जलवायु परिवर्तन  
और  
श्रम एवं रोज़गार  
भारत सरकार



MINISTER  
ENVIRONMENT, FOREST AND CLIMATE CHANGE  
AND  
LABOUR AND EMPLOYMENT  
GOVERNMENT OF INDIA

भूपेन्द्र यादव

**BHUPENDER YADAV**



**MESSAGE**

Access to sanitation is fundamental; to ensure dignity, safety for all within a society and to enhance social inclusion. Shri Narendra Modi, the Hon'ble Prime Minister of India has urged us to "continue our ongoing efforts with renewed vigour and create a nation where both accessibility and equality prevail".

Different sections of the society visit the zoo, but some may require special attention so that they can access these facilities better. This document will assist the zoos to cater to the special needs of the Divyangjan (Person with Disabilities – PwDs) and children with respect to the WASH (Water, Sanitation and Hygiene) facilities at the zoo. Further it will also necessitate universal accessibility to WASH facilities during planning, designing and execution.

It is heartening to note that Central Zoo Authority in association with UNICEF India has come up with this informative document on WASH facilities in Zoos in which the significance of WASH in Zoos has been appropriately highlighted. I am also informed that this guideline is "first of its kind" for Zoological parks in India. I am confident that this Guideline shall foster good practice and influence decisions for efficient management of WASH facilities in zoos in the country.

I congratulate the Central Zoo Authority and UNICEF India and look forward to many more such achievements by them in future.

With best wishes.

(Bhupender Yadav)

Date: 28.09.2021





सत्यमेव जयते

आहारशुद्धौ सत्त्वशुद्धिः



एक कदम स्वच्छता की ओर

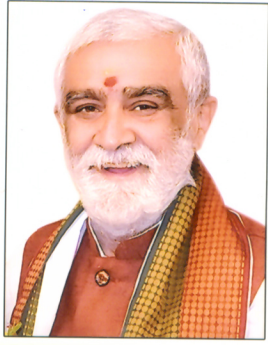
राज्य मंत्री

पर्यावरण, वन एवं जलवायु परिवर्तन  
उपभोक्ता मामले, खाद्य और सार्वजनिक वितरण  
भारत सरकार

MINISTER OF STATE

ENVIRONMENT, FOREST AND CLIMATE CHANGE  
CONSUMER AFFAIRS, FOOD & PUBLIC DISTRIBUTION  
GOVERNMENT OF INDIA

अश्विनी कुमार चौबे  
Ashwini Kumar Choubey



### संदेश

मुझे यह जानकार प्रसन्नता हो रही है कि केन्द्रीय चिड़ियाघर प्राधिकरण ने यूनिसेफ इंडिया के सहयोग से चिड़ियाघरों में WASH (Water and Sanitation Hygiene) सुविधाओं के लिए एक दिशा-निर्देश तैयार किया है।

इस दस्तावेज़ का मुख्य उद्देश्य भारतीय चिड़ियाघरों में पीने के पानी, सार्वजनिक शौचालय, हाथ धोने के स्थान और ठोस एवं तरल अपशिष्ट प्रबंधन प्रणालियों के लिए सुविधाओं के डिज़ाइन और रख-रखाव पर मार्गदर्शन प्रदान करना है।

ठोस और तरल कचरे का उचित प्रबंधन करने के लिए चिड़ियाघरों को कई चुनौतियों का सामना करना पड़ता है। यह दस्तावेज़, उपलब्ध भौतिक और वित्तीय संसाधनों के सर्वोत्कृष्ट उपयोग के साथ कचरे के संग्रह, पृथक्करण, परिवहन और उपचार के लिए उपयुक्त प्रणाली स्थापित करने में मदद करेगा।

मुझे विश्वास है कि इस प्रयास से चिड़ियाघरों को अपने परिसर में आगन्तुकों के लिए मूलभूत सुविधाओं जैसे- स्वच्छ पेयजल, स्वच्छता एवं प्रसाधन की समुचित व्यवस्था की योजना बनाने, उन्हें लागू करने एवं संचालित करने में मदद मिलेगी।

(अश्विनी कुमार चौबे)

॥ प्लास्टिक नहीं, कपड़ा सही ॥

Office: 5<sup>th</sup> Floor, Aakash Wing,  
Indira Paryavaran Bhawan,  
Jor Bagh Road, New Delhi-110 003  
(+91) 11-24621921/22 • Fax: (+91) 11-24695313  
E-mail: mos.akc@gov.in

Residence :  
30, Dr. APJ Abdul Kalam Road,  
New Delhi-110003  
Tel.: 011-23794971, 23017049



# Contents

<b>Introduction</b>	<b>1</b>
A. Background	2
B. Purpose, structure and target audience of this document	2
<b>Chapter 1: Drinking Water, Public Toilets and Handwash Stations</b>	<b>5</b>
A. Introduction	6
B. Drinking water	7
C. Toilets	9
D. Handwash stations	13
<b>Chapter 2: Solid Liquid Waste Management</b>	<b>15</b>
A. Introduction	16
B. Waste management systems	16
<b>Chapter 3: Information Education Communication (IEC)</b>	<b>25</b>
A. Introduction	26
B. IEC measures for WASH facilities	26
<b>Chapter 4: Sustainability of WASH Facilities</b>	<b>29</b>
A. Introduction	30
B. O&M of WASH facilities	30
C. Monitoring of WASH facilities	34
<b>Chapter 5: Signage for WASH Facilities</b>	<b>37</b>
A. Introduction	38
B. Developing proper signage for WASH facilities in a zoo	38
<b>Chapter 6: Integration of WASH Facilities</b>	<b>41</b>
<b>Chapter 7: Funding WASH: Sources and Convergence</b>	<b>43</b>
<b>References</b>	<b>47</b>





# Introduction

## A. Background

The criticality of adequate water supply and sanitation interventions in achieving improved health is recognized across the globe. The Sustainable Development Goals

### Relevant SDGs

**SDG-6:** Ensure availability and sustainable management of water and sanitation for all.

**SDG-15:** Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.

(SDGs) emphasizing sustainable access and management of WASH facilities have spurred a global movement for “availability and sustainable management of water and sanitation for all”. India is committed to the SDGs. Access to water and sanitation in public spaces is an essential element of sustainable WASH management.

The Central Zoo Authority constituted under the Ministry of Environment, Forest and Climate Change (MoEFCC) oversees the designing and functioning of WASH facilities in all zoos across the country. It has been an endeavour of the authority to ensure standard and efficient WASH facilities for visitors and staff at zoos. For ensuring standard and efficient WASH facilities, the preparation of comprehensive reference material is important.

In this context, the Central Zoo Authority, MoEFCC has developed these Guidelines in order to provide guidance to zoos for

creating and maintaining WASH facilities within their premises for the staff and visitors.

## B. Purpose, structure and target audience of this document

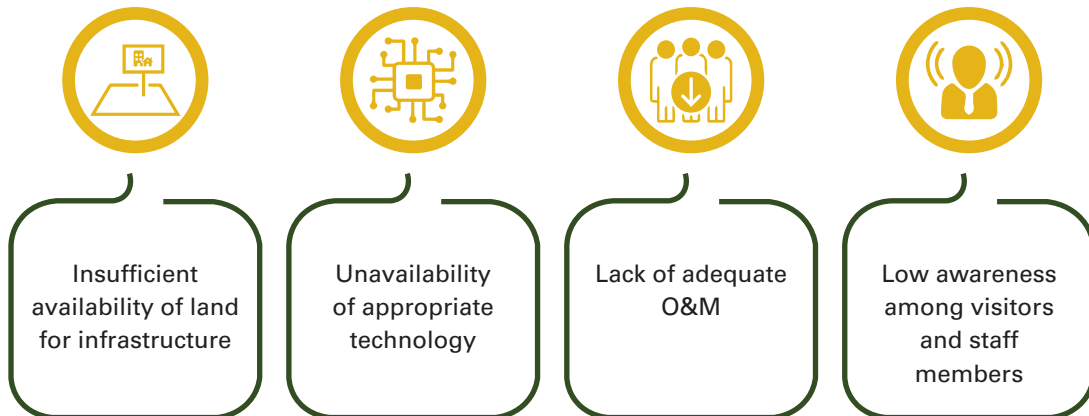
The main purpose of these Guidelines is to provide guidance on designing and maintaining facilities for drinking water, public toilets, handwash stations and solid and liquid waste management systems in zoos. This will help the zoos to plan, implement, operate and maintain the existing and newly created WASH facilities within their premises.

Access to sanitation is fundamental for ensuring the dignity, safety and equality of disadvantaged and marginalized individuals and groups within society and for enhancing their social inclusion. People from various sections of society visit the zoo out of which some require special attention so that they can access WASH facilities better. These Guidelines will assist the zoos to cater to the special needs of PwDs (persons with disabilities), children, and menstruating girls, with respect to WASH facilities in the zoo. Hence, it is necessary to consider universal accessibility to WASH facilities in such places during planning, designing and execution.

There are a number of challenges that zoos might face in managing solid and liquid waste properly, for example, insufficient availability of land for infrastructure, unavailability of appropriate technology, lack of adequate O&M and low awareness among visitors and staff members.

Many zoos are situated in urban or peri-urban areas which enables them to opt for centralized waste treatment options

### Challenges for managing solid and liquid waste in zoos



offered by local civic bodies. On the other hand, some zoos may not be able to access these services. Therefore, these guidelines will ultimately help them to set up appropriate systems for the collection, segregation, transport and treatment of waste through optimum utilization of physical and financial resources.

This work is divided into seven chapters. The first chapter provides guidance for setting up drinking water, public toilets and handwash facilities in zoos. Chapter 2 provides guidance for setting up solid and liquid waste management systems in the zoos.

The next chapter deals with information education and communication measures which are essential for public education regarding WASH facilities. Chapter 4 talks about O&M of the infrastructure and monitoring for sustainability of WASH facilities. Chapter 5 is about the important aspect of signage in a public space such as a zoo. Chapter 6 provides a brief introduction regarding the creation of an “integrated WASH complex” consisting of all the WASH facilities. The final chapter discusses possible sources for fund mobilization for various activities required to be undertaken.



Entrance of a zoo



संरक्षित क्षेत्र एवं उनमें बाधे जाने वाले  
 अन्य जीव सम्बन्धी जानकारी  
 PROTECTED AREA & RELATED  
 WILDLIFE INFORMATION

आप कैमरे की नजर में हैं।

किसी भी वस्तु को खराब करना गलत है।

प्राणियों की जान बचाए रखें।

**AQUARIUM**  
LUCKNOW ZOO

**ANIMALS IN LUCKNOW ZOO**  
PRACTICES

**Rescue**

Multi-Sensory Aids/Book





## Chapter 1

# Drinking Water, Public Toilets and Handwash Stations

## A. Introduction

This chapter is about the importance of WASH facilities in public places and especially zoos. The need of universal access i.e. accessibility of the WASH facilities for all including persons with disabilities, all genders and ages is discussed in the next section. The section also discusses the key considerations to be borne in mind when designing WASH facilities with universal access. The chapter further discusses key considerations for planning, designing and execution of the facilities like drinking water, toilets and handwash stations that need to be provided in zoos.

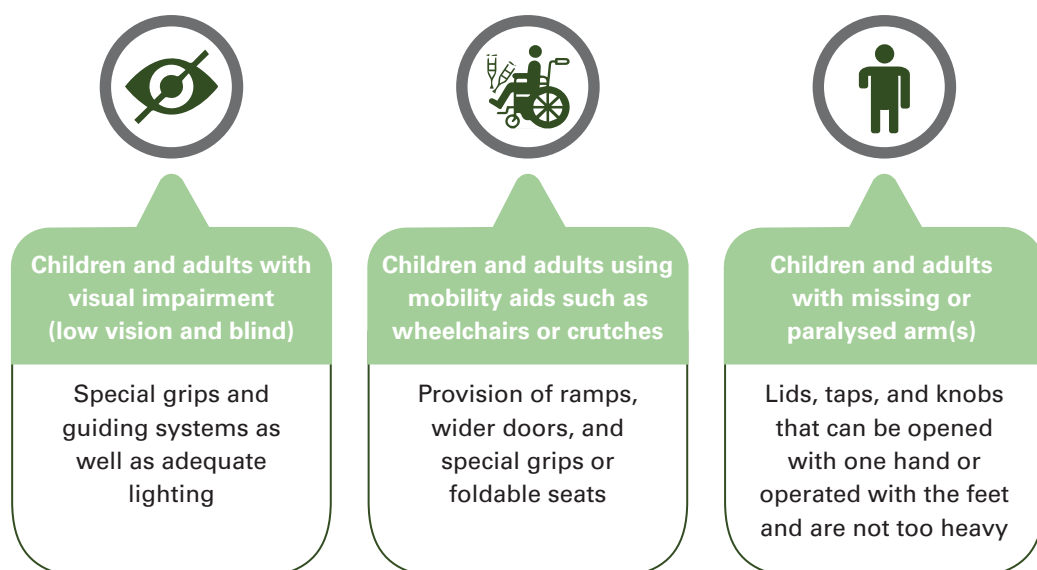
### Critical criteria to be considered for WASH facilities in zoos:

a. Universal design: Universal design principles i.e. "design for all", should be followed, so that facilities can be used by any person regardless of gender, age or state of health.

- b. Safety: Children, women and PwDs should feel secure when visiting WASH facilities and not be at risk of harassment by people or attacks by animals such as snakes, scorpions or spiders. Access routes have to be open and clear and the facilities must be in hearing/visual distance of the community so that assistance can be called for if necessary.
- c. Weather proof: It must be possible to reach facilities during all weather conditions, including after heavy rains or flooding.
- d. Supervision: The location of the facilities should allow for proper supervision and reduced risk of vandalism, particularly when communal WASH facilities are being installed.

Additional considerations with respect to signage, pathways and pavements, ramps, steps and stairs, circulation area, handrails, curbs, doors, etc. for the accessibility of WASH facilities especially for PwDs

### Categories of PwDs requiring adaptations to WASH facilities



and children are mentioned in *Design Guidelines for Zoo*, by Rommel Mehta and D.N. Singh, published by School of Planning and Architecture, New Delhi and Central Zoo Authority, New Delhi. The suggestions in this book should be considered during the planning and execution of WASH facilities within zoos.

## B. Drinking water

Zoos are generally spread over large areas and people typically spend long durations there. Therefore, it is necessary that the visitors have access to safe drinking water within the premises. This provision will also help reduce the dependency of visitors on bottled water, thus reducing the plastic waste generation overall.

### Accessibility

As mentioned in the section above, the drinking water facility should be placed in such a way that it is accessible by all including children and PwDs. The fixtures used and the operation mechanism should be such that they are easy to operate even with a single hand or by foot.

### Locations and adequacy

Thirst is a normal body demand during long walks in the zoo. Therefore, a drinking water fountain or tap should be available every 300–400m. Typically, drinking water fountains should be located near recreational areas, resting places like lawns, gazebos, etc. and locations that draw a congregation.

The number of drinking water outlets required at a location depends on the number of visitors at the location during peak hours. The option of providing

standalone taps for drinking water uniformly spread along the pathway should also be evaluated over the erection of a drinking water fountain with multiple outlets at a single location. This will prevent congestion and inconvenience due to too many people congregating at one spot to drink water.

### Components of drinking water facilities

Zoos in urban areas may have access to water supply infrastructure developed for the region. Hence, they can easily receive potable water through piped water supply systems. However, those in peri-urban or rural areas may need to rely on private sources of water. In either case, storage, handling and delivery of potable water at the drinking water outlets is crucial.

Zoos with private water sources like lakes, wells, bore-wells, etc. need to test the quality of the water at the source. In some cases, water treatment plants may be required. As a safety precaution, it is advisable to install a disinfection unit prior to delivery of water for drinking.

Periodic testing of water quality at the source, in storage as well as at the tail end is required to ensure that only potable water reaches the end user.

As mentioned above, a drinking water facility need not be a huge constructed structure. Standalone taps connected to piped water supply or a storage tank placed on a stand with an outlet can also be used. These should preferably be camouflaged in the surroundings and yet be accessible through the signage.

## Eliminating need for plastic water bottles in zoos

The Detroit Zoo (DZS), like many other zoos and aquariums, used to sell bottled water to visitors. In 2012, the zoo sold about 75,000 bottles of water, generating revenue of \$48,000. However, a waste audit of trash and recycling bins conducted by the Detroit Zoological Society (DZS)'s Green Team revealed that many of the plastic water bottles were ending up in the trash instead of the recycling bins, even though the majority of the trash cans at the zoo were coupled with a recycling container. The audit also discovered that most of the plastic in the recycling containers consisted of water bottles. To address this growing concern, the Green Team and green staff members created a plan to reduce the amount of bottled water sold at the Detroit Zoo.

The first phase of this project was to install a water bottle refilling station in a high traffic area, which proved to be an excellent fit. The second phase of the plan was two-pronged. First, six outdoor water bottle refilling stations were installed throughout the zoo's grounds. These combined drinking fountains and water bottle refilling stations made it easy for guests to refill their reusable water bottles, thus encouraging their use.

The second step was to increase the availability of reusable water bottles for sale throughout the zoo. Service Systems Associates, the DZS's concessionaire, partnered with the zoo to sell reusable water bottles at the concession stands. The stands had signs that explained why the zoo was selling reusable water bottles to get guests comfortable with the idea of using them.

In this way, the DZS took concrete steps to completely discontinue the sale of bottled water and drastically reduced the amount of plastic waste that the zoo was generating.



**Source:** GREEN TALES – Changes on tap for bottled water sales at Detroit Zoo, September 2013; Green practices, Association of Zoos and Aquariums

## C. Toilets

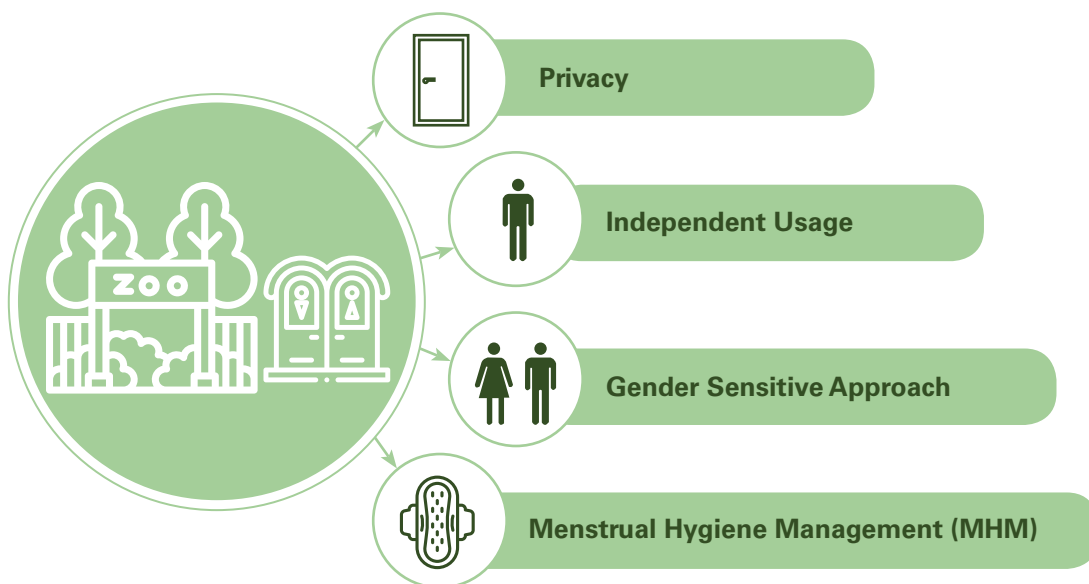
As mentioned in the section above, it is important to consider universal design in relation to access to toilet facilities in zoos. In this section, considerations to be borne in mind when planning toilet block locations, number of seats to be provided, addressing the requirements of specially-abled persons, children, etc., design of a typical toilet block and consumables to be provided are discussed. Lastly, the section also discusses the signage to be provided and IEC messages to be displayed about maintaining clean and functional toilets in the zoos.

### Accessibility

In addition to the points mentioned above, there are a few additional considerations regarding the safety, dignity and privacy of the users.

- a. **Privacy:** Particularly for people above the age of eight, toilet facilities and urinals should guarantee privacy. Locating girls and boys toilets in separate spaces will mean that boys have no reason to be near girls' facilities and will allow girls to have privacy.
- b. **Independent usage:** Toilet facilities should be so designed that PwDs who can transfer independently (those who can manage on their own), can access and use the facility without assistance.
- c. **Gender sensitive toilet:** can be defined as one which is easily accessible to women; has basic facilities such as water and electricity; is clean and adequately maintained; the design elements ensure privacy and

### Key considerations for accessibility to toilet facilities in zoos



dignity for women; is safe for women to use at all times (with lighting and adequate security provisions in terms of caretakers etc.); and has provisions for child care and menstrual hygiene management.

- d. **Menstrual hygiene management (MHM):** All girls should have access to sanitary material for use during menstruation. Safe and hygienic disposal of the same should also be provided for in girls toilets. Running water is required in girls and ladies toilets.

Special attention needs to be given to the design of toilet blocks and access for PwDs so that they can enjoy their visit to the zoo to the fullest. The toilet blocks

must be provided with ramps for entering and exiting.

### Adequacy and location of toilet blocks

The number of toilet seats to be provided depends on the footfall in the zoo. In order to calculate the number of toilet seats, the number of visitors during the peak season and peak hours should be considered. Typically, the number of visitors during April to June is higher than in other months of the year. However, this can vary depending on the location of the zoo. A zoo being a recreational space, the norm for the number of toilet seats required in art galleries, museums, etc. can be used for calculating the appropriate number of toilet seats to be provided in the premises.



Separate toilets for Men and Women

Source: sbmgramin.wordpress.com

**Table 1:** Table for calculation of number of toilet seats and urinals in the zoo<sup>2</sup>

Location of toilet	WC for men	Urinals for men	WC for women
Art galleries, libraries, recreational spaces, zoos, etc.	1 per 200 persons up to 400 persons; and for over 400 persons, add at the rate of 1 per 250 persons or portion thereof	1 per 50 persons	1 per 100 persons up to 200 persons, and for over 200 persons, add at the rate of 1 per 150 persons or portion thereof

The total number of toilet seats required can be calculated from the table above, however it is also necessary that the blocks be distributed throughout the area of the zoo. This spatial distribution of WASH facilities is required so that the visitors do not have to walk long distances, to and fro, for toilets or water. Locations of toilet blocks should be planned based on the following considerations<sup>3</sup>:

- a. Toilet facility should be available near the parking area, in the vicinity of the ticketing counters.
- b. Toilet blocks should be evenly spread out in the zoo area along the main visitors' path, at a distance of approximately 500m between each of them.
- c. These facilities should be close to the path for visitors but completely

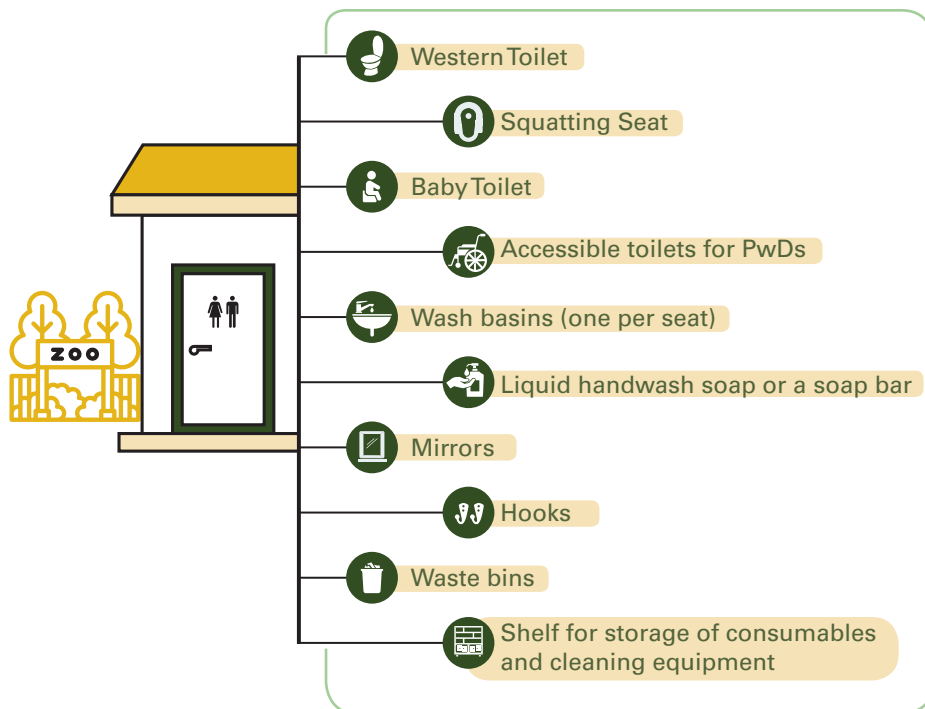
camouflaged with suitable vegetation and yet identifiable by directional signage.

- d. The location should not be visible to visitors walking on the main pedestrian route.
- e. The structure, colour and texture of external finish should merge with the surrounding vegetation i.e. should not be conspicuous by colour or size.

### Components of toilet block

In order to maintain privacy and dignity, the entry of toilet blocks for men and women should be in different directions or separated by some obstacle. The following units should be provided in a toilet block:

## Essential facilities and equipment for a toilet block



In addition, a women’s toilet block should contain a sanitary napkin vending machine and incinerator unit or a separate waste bin for disposal of used sanitary napkins. Platforms for changing diapers of infants and feeding rooms can additionally be provided in women’s toilet blocks.

Urinals need to be provided in men’s toilets and at least one urinal should be an

accessible urinal provided with grab bars for support.

At least one washbasin should be provided at a lower height to suit the requirement of PwDs and children.

In case fewer toilet seats are required per toilet block, the distribution of general toilets, baby toilets and accessible toilets



Access ramp for PwDs toilet

should be uniform and signage for the same should be used.

All toilets should be adequately lit and well ventilated. It is advisable to orient the windows of the toilets in a manner that natural lighting can be used most of the time. Continuous water supply or water storage available for flushing of toilets is essential to keep toilets clean and functional. The toilets should either be connected to sewers lines or appropriate containment units should be connected to the toilets.

In order to keep the toilets functional, regular cleaning and other O&M activities should be routinely undertaken. These are mentioned in the “Sustainability” chapter of this document.

A detailed design of all accessible toilets and urinals as well as toilets for children is given in *Accessible WASH, Public Spaces and Schools Practitioners Manual* by the Department of Empowerment of Persons with Disabilities, Ministry of Social Justice and Empowerment, Gol, which may be referred to during the designing and construction of toilets in zoos.

## D. Handwash stations

Handwash stations, other than those in the toilet blocks should be provided uniformly in the zoo. They should be placed in the areas that people gather, resting places like pergolas and gazebos, lawns and recreational areas.

### Accessibility

Universal access should be considered while planning handwash stations. Their location should make them easily accessible, but in a way that they do not interfere with the aesthetics of the zoo.



Wash basins provided at two levels for PwDs and children

The handwash stations should be provided at the same level as the pathway or ramps with comfortable slopes should be provided for access. The height of at least one tap and wash basin should be such that it can be comfortably used by a person in a wheelchair and/ or children.

### Components of handwash stations

Water availability and appropriate management of grey water generated after handwash are the two main requirements in respect of handwash stations. The stations should have sufficient overhead storage for water or a bucket and mug arrangement. Availability of soap bars or liquid soap is a must for all handwash stations.

Pedal operated liquid soap dispensers as well as taps are recommended in the current situation to reduce the requirement of touching the surfaces after washing of hands. Pedal operated taps and soap dispensers can also increase the comfort level of persons with disabilities to their arms.

The number of taps to be provided for handwash stations depends on the area served by the station and the number of visitors at peak time. It is advisable to place waste bins for biodegradable as well as non-biodegradable waste in close vicinity of the handwash station.

# यादगार





## Chapter 2

# Solid and Liquid Waste Management

## A. Introduction

Proper management of solid and liquid wastes is an important determinant of improved sanitation in public spaces. As the zoos in India have started attracting an increasing number of people as visitors, solid and liquid waste management (SLWM) has become crucial for the management.

This chapter discusses the need for setting up waste management systems, and provides a brief introduction to

**Waste management includes proactively minimizing the amount of waste that is generated, recycling and composting, and reducing the amount sent to landfills. Fifty-seven facilities attached with AZA reported recycling more than 60,000 tons of waste, while 48 facilities reported composting over 31,100 tons of materials.**

*Source: 2019 Annual Report on Conservation and Science, Association of Zoos and Aquariums*

various waste management technologies, approaches and steps for setting up efficient waste management systems.

## B. Waste management systems

### Solid waste management

Visitors bring with them or generate on-site large quantities of waste, much of which is recyclable or compostable. Roughly, biodegradable waste generated in a zoo includes animal waste, food waste generated by humans, dead leaves, branches, and other organic matter. Similarly, non-biodegradable waste includes plastic bags/containers/wrappers of different kind, glass, metal waste, etc.

The components of solid waste management (biodegradable and non-biodegradable) include waste generation, segregation and collection, transportation, treatment and disposal. Each step is extremely vital for the zoos, though not all activities may take place on-site.



Plastic bottle recycling machine at a zoo

## Eliminating single use plastic from zoos

Woodland Park Zoo in Seattle, Washington is helping to lead a plastic-free movement in Seattle by **phasing out single-use plastic bottles**. As of April 2018, the zoo no longer sells any beverages in single-use plastic bottles, including water, juice and soda.

Having eliminated plastic straws over 30 years ago and plastic carrier bags in 2013, the management worked towards **phasing out plastic toys and packaging from the gift shops**. Eliminating single-use plastic bottles is the next step for us on this journey.

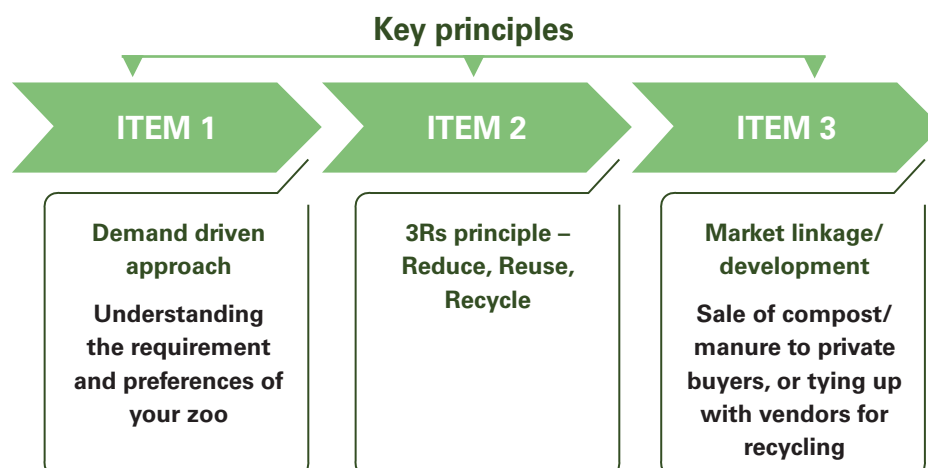
**Source:** GREEN TALES – Woodland Park Zoo leads a plastic-free movement in Seattle by Zosia Brown, resource conservation and sustainability supervisor at Woodland Park Zoo, January 2018; Green practices, Association of Zoos and Aquariums

Management of menstrual waste is an integral part of solid waste management and it should also be prioritized by the zoos. Women form a significant part of the total number of visitors to the zoo, of whom the majority may be in their menstruating years. Visitors often spend 3–4 hrs or even a whole day at the zoos, especially in the ones which cover large. Women may face emergencies related to menstruation in such cases which need to be catered to. Menstrual waste generated as a result, needs to be taken care of as part of the planning for solid waste management.

### A. Biodegradable waste management (BWM)

Some of the key issues to be considered for BWM are the needs and preferences of zoos, and the most appropriate and easy to use technology interventions with low operation and maintenance costs at appropriate levels. Some of the principles that can be followed during the planning and implementation of biodegradable waste management interventions and which can lead to sustainable outcomes are provided below in the infographic:

### Principles for planning and implementation of biodegradable waste management



### Collection, segregation and transport of waste

The following steps can be followed for collection of waste:

1. Provision of separate kerbside bins for biodegradable and non-biodegradable waste for visitors is essential. Kerbside bins can be of 30–50L capacity. A unit of 2 bins should be provided preferably after every 50m, but at least one per 250m. A unit should be compulsorily provided near resting places.
2. Segregation of waste before its treatment and disposal – it is important to segregate waste and ensure that non-biodegradable waste doesn't get mixed with biodegradable waste.
3. Provision of small push-carts for collection of swept material and waste from garbage bins. One cart should be provided for every 5–7 acres. In case of large zoos, other options such as tricycles or battery operated vehicles with 2 separate containers (for organic and inorganic waste). In such case, 2–3 vehicles might suffice for the whole zoo.

4. It is advisable that bio-degradable solid waste be composted on site. If that is not possible then waste containers should be kept in the premises to store the waste and deliver it to municipal vehicles for bio-degradable waste collection. Waste containers can be of 1000–1500L capacity.



Push cart for transfer of waste from bins to end treatment facility

### Local treatment and disposal of waste

Listed in the Table below, are a few feasible technologies which can be adopted by the zoos for on-site composting.

**Table 2:** List of technologies detailed in SBM (G) II Guidelines, DDWS, MoJS

Technology	Scale / level	Topography
Earthen pot composting/ Pit Composting	Micro scale	All
Pile Composting	Small to medium scale	All
Permanent tank method	Small to medium scale	All
Vermi-composting	Small to medium scale	All, except very low-temperature areas
Windrow Composting	Medium to large scale	All
Rotary Drum Composting	Small scale	All

**It is advisable that zoos manage their biodegradable waste on-site, as much as possible.** Details of these technologies can be found in Swachh Bharat Mission (Grameen) Phase II Guidelines.

## B. Menstrual hygiene management

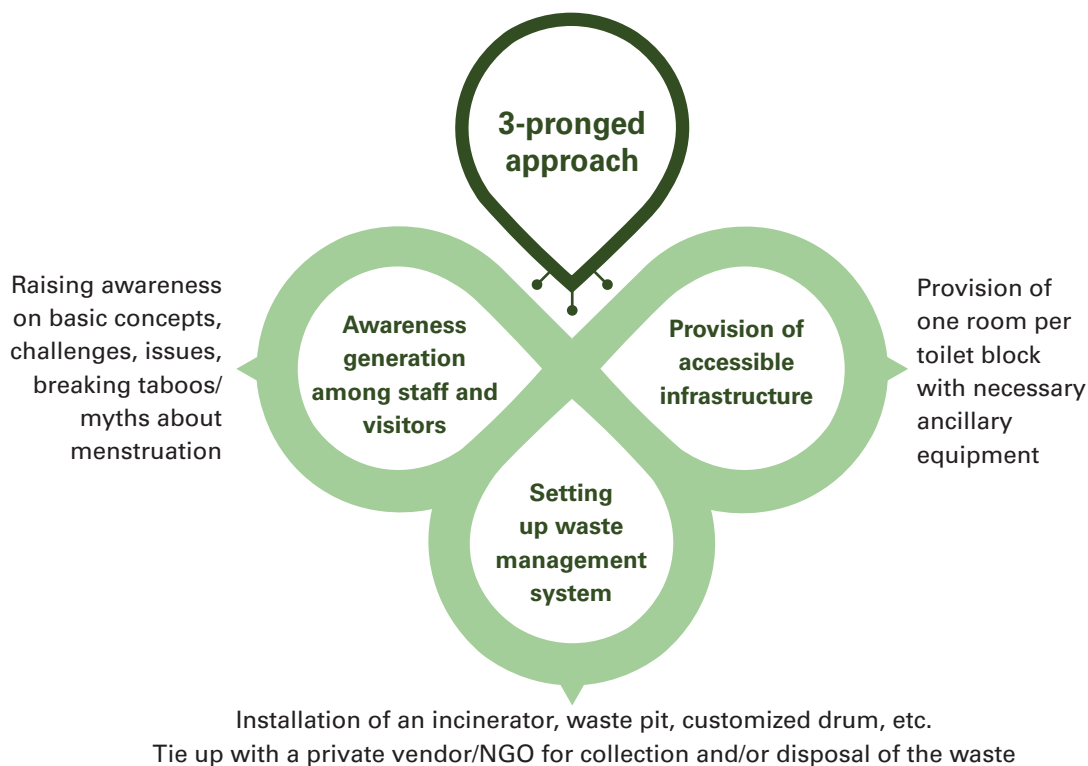
MHM is a multi-faceted issue which impacts the health, education, dignity and overall wellbeing of women and adolescent girls. Thus, there is a profound need for focused interventions involving not only women and adolescent girls but various stakeholders in society.

Absence of discussion on the process of menstruation, low awareness on required facilities, special provisions and management of menstrual waste, absence of necessary infrastructure, etc. are some of the key challenges faced by women in public spaces.

Zoos can adopt a 3-pronged approach while managing menstrual waste in the premises.

1. **Provision of infrastructure for accessibility** – At least one room per women’s toilet block should be provided for females to change their sanitary napkins/cloth. The room should have adequate space. The cubicle should contain the following:
  - a. shelf, hooks or niche to keep clothing and menstrual adsorbents dry
  - b. A well-positioned mirror so that girls can check for stains on their clothes
  - c. Vending machine for sanitary napkins/cloth
  - d. Separate garbage bin for safe disposal
2. **Awareness generation among staff and visitors** – raising awareness of the zoo management and visitors (especially girls) on basic concepts, challenges, issues, breaking taboos/ myths about menstruation.

## Menstrual waste management approach





Incinerator for sanitary napkins

contaminate the environment and spread diseases. Therefore, the zoo can either opt to train its staff for safe handling and collection of the waste, or hire a service provider for this work. For waste disposal, the zoo can opt for the following strategy:

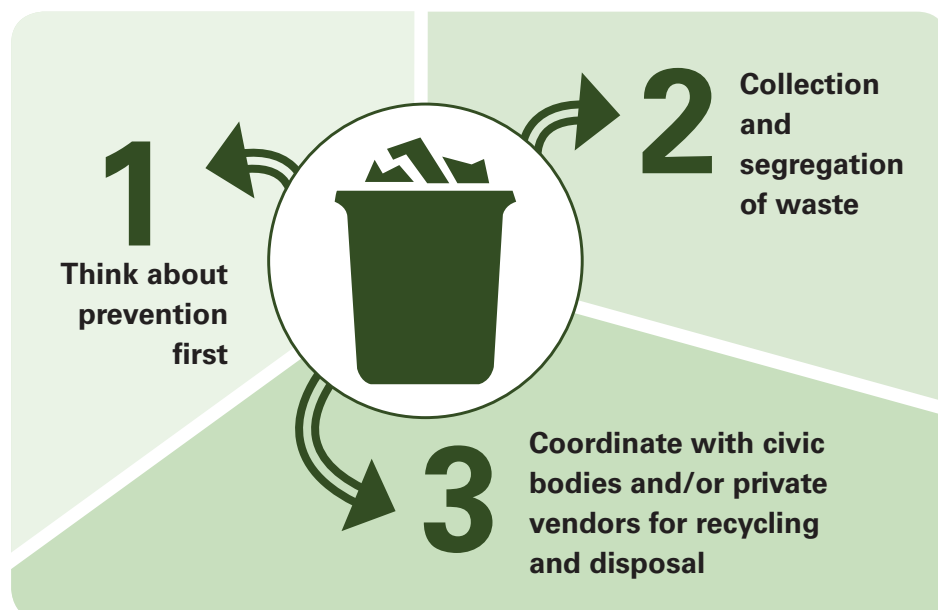
3. **Setting up waste management systems** – Menstrual waste comprises menstrual absorbents like cloth, sanitary napkins and other materials soiled with blood and human tissue remnants. Menstrual waste should be discarded at a distance of a minimum of seven metres from water bodies as blood stained materials can

- a. Installation of an incinerator, or waste pit, customized drum, etc. in the zoo to dispose of commercial napkin waste properly. Incinerators must have shafts that are high enough to ensure that emissions are not released on the premises. For reusable napkins, composting with other biomass can be opted for.
- b. Tie up with a private vendor/NGO for disposal. The zoo can hire such an agency for collection and/or disposal of the waste.

### C. Non-biodegradable waste management

Zoos should adopt the following strategy for managing non-biodegradable or dry waste:

### Non-biodegradable waste management strategy





IEC messages on PWM inside zoo premises

### 1. Think about prevention first

Zoos can set up a screening mechanism at the entry gate to prevent certain types of non-biodegradable waste from entering the zoo premises. For example, plastic bags/ containers/ bottles/ toys etc. can be discouraged. Zoos can take a small deposit from visitors per item, collect the items and return them later. Otherwise, zoos can completely prohibit the entry of specific items like PET bottles, thermocol, etc.

**The Houston Zoo uses paper made of recycled materials for their admission tickets, and uses toilet paper made only from recycled content.**

*Source: Reducing, Recycling, and Responsibly Sourcing (Paper and Wood), <https://www.houstonzoo.org/save-wildlife/take-action/paper-recycling/>*

### 2. Collection and segregation of waste

Non-biodegradable waste should be segregated from biodegradable waste. As stated above, separate kerbside bins of 30–50L capacity should be provided. Further, zoos should preferably segregate recyclable waste (paper, cardboard, glass, metal etc.) and non-recyclable waste (PET

mineral water bottles, nitrogen sealed packaging chips, tetra packs, thermocol, carbon paper, plastic coated visiting cards and sachets). An additional bin with proper signage can be provided for collecting recyclable materials.

### 3. Coordinate with civic bodies and/or private vendors for recycling and disposal

After collection and storage of recyclable and non-recyclable waste into separate containers, zoos can transport the waste to the nearest civic body's waste collection transport vehicle. In scenarios where zoos are located far away from cities/towns, they can tie up with private vendors for recycling various types of waste depending upon the quantity of waste generated. Involving them early in the planning and taking their input can help in better segregation of waste.

Disposal by burning of any type of solid waste should be strictly prohibited.

### Liquid waste management and faecal sludge management

Water wasted as a result of various human activities at home, in businesses, or in

industries is called liquid waste (LW). In other words, used and unwanted water generated during household or commercial activities is called liquid waste.

Wastewater is a mix of liquid waste which has come in contact with human waste such as human excreta, urine and the associated sludge (known as black water), and wastewater generated through bathing, cooking and other activities, excluding disposal of human waste (known as greywater)

**Top most common green practices followed by facilities associated with AZA**

- ▶ Recycling
- ▶ Composting (on-site or off-site)
- ▶ Local food procurement (on-site animals and/or guests)
- ▶ Waterwise landscaping
- ▶ Construction waste diversion/recycling
- ▶ Greywater reuse and/or rainwater harvesting
- ▶ Solar or wind energy generation

*Source: 2019 Annual Report on Conservation and Science, Association of Zoos and Aquariums*

Wastewater generated in zoos can be of two types: greywater from wash basins of public toilets, handwashing stations, and drinking water fountains; and black water generated from toilet waste.

Faecal sludge is the waste accumulated in a septic tank which is a raw or partially digested mixture mostly of excreta and water. Faecal sludge management involves collection, transportation from on-site sanitation systems, treatment and disposal of sludge in a safe manner.

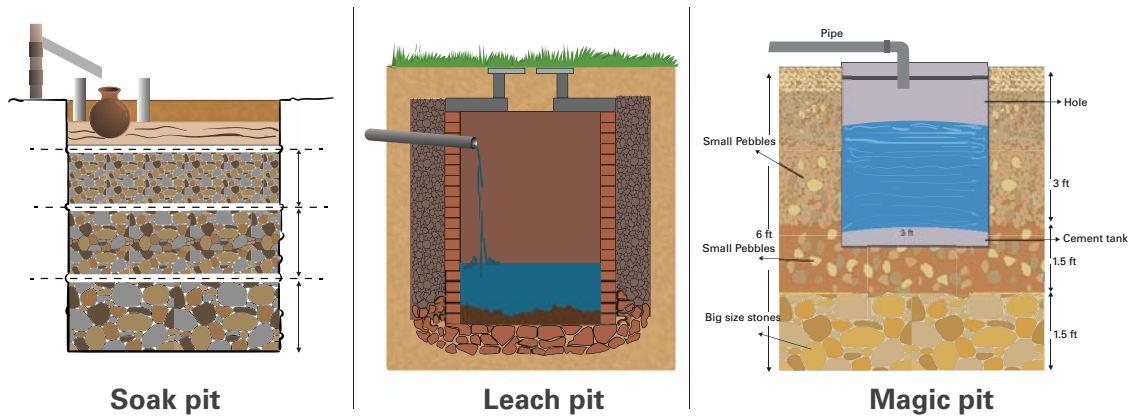
## **A. Zoos with infrastructure connected to the sewer line**

Zoos that have their public toilets and water delivery points (taps in handwashing stations, drinking water fountains, wash basins, etc.) connected to the sewer line monitored by a civic body must ensure that there are no problems in the conveyance pipelines, connections, chambers, etc. The zoo management must ensure that every upcoming toilet/handwashing/drinking water infrastructure is designed to be connected to the sewer line.

## **B. Zoos with infrastructure not yet connected to the sewer line**

If all or some infrastructure in a zoo has not been connected to the sewer line, the following options may be adopted:

1. Coordinate with the nearest civic body to check whether extending the sewer network is feasible for the zoo. In this case, the zoo should coordinate with the civic body to ensure that aspects like slope considerations, construction of inspection chambers, locations of manholes, etc. are managed properly.
2. In a scenario where connection to the sewer line is not possible, zoos should adopt the following strategy:
  - 2.1 For greywater management, the zoos should preferably provide a screen chamber and intercepting chamber for handwashing stations and water fountains. The filtered greywater can then be used for landscape irrigation. This will help in reducing the freshwater demand. Otherwise, the zoos can opt for construction of decentralized on-site greywater treatment systems, illustrated below (one pit for each handwashing station or water fountain):



**Figure 1:** Illustrative example for each pit is provided above. Please refer Swachh Bharat Mission (Grameen) Phase II Guidelines, Min. of Jal Shakti for further details.

- 2.1.1 **Soak Pit** - Dug out pit filled with stones or preferably burnt as the bottom-most layer. The large number of stones increase the surface area over which biological and chemical action takes place.
- 2.1.2 **Leach Pit** – Leach Pit is a brick-lined pit constructed in honeycomb masonry.
- 2.1.3 **Magic Pit** - A Magic pit is a covered, porous-walled chamber that allows water to slowly soak into the ground. Pre-settled effluent from a collection tank is discharged to the underground chamber.

Swachh Bharat Mission (Grameen) Phase II Guidelines, Ministry of Jal Shakti may be referred to for further details.

- 2.2 For faecal sludge management, zoos can opt for construction of septic tanks for the toilets. However, they must plan for regular desludging of the septic tanks. Zoos can coordinate with the nearest FSTP/STP for desludging, transport and disposal of the sludge. In this case, soak pits will have to be constructed for treating effluent from septic tanks.



MANDARVIN  
JUNGLE  
SAFARI  
BODA RAIPUR



# लकड़बाघा STRIPED HYENA

वैज्ञानिक नाम  
हायना हायना

Scientific Name  
*Hyaena hyaena*

अणी IUCN Status



संयोजक: एन.ए.



Chapter 3

# Information Education Communication (IEC)

## A. Introduction

IEC interventions are a vital part of any public space for promotion of appropriate behaviour and development of the right attitude among the people towards WASH facilities. An effective IEC intervention seeks to understand the motivations for behaviour change amongst different target groups as well as the barriers to change.

IEC interventions for water conservation, usage of toilets, maintenance of personal hygiene and keeping the premises clean are important in all public places. Places like zoos and parks are vital when it comes

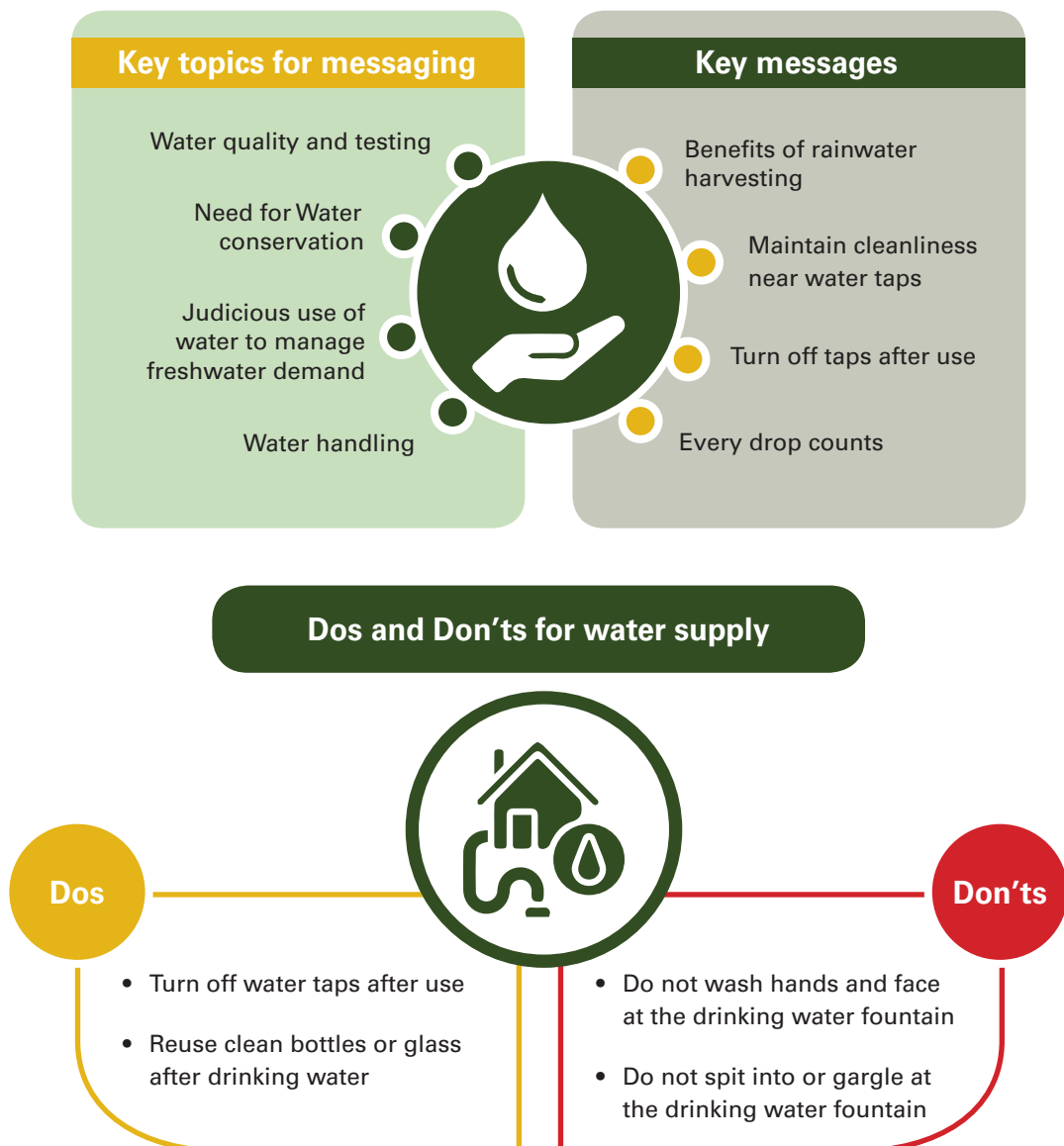
to promotion of important messages. The importance of personal hygiene, handwashing, etc. in the context of COVID-19 needs to be conveyed to all groups of people, especially children.

## B. IEC measures for WASH facilities

### Water Supply

#### Dos and Don'ts

IEC messages can also be presented in the form of Dos and Don'ts

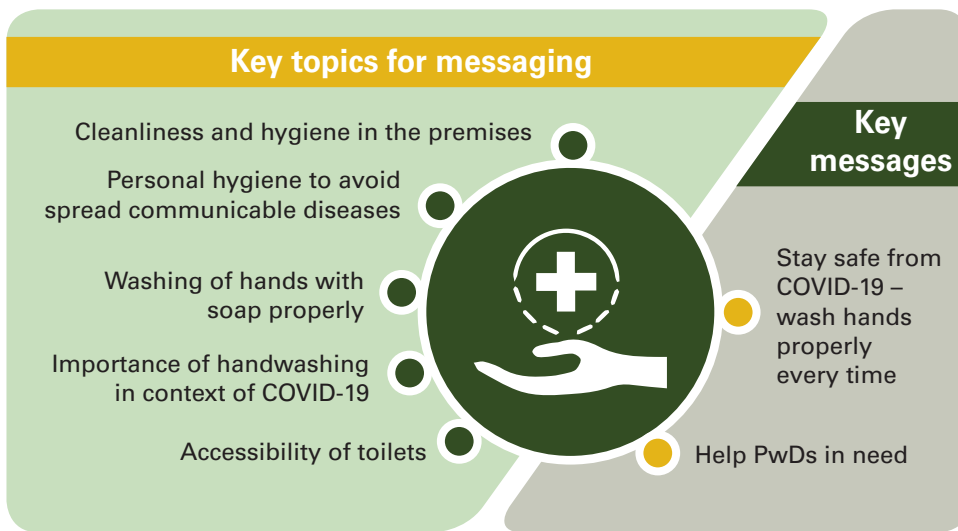


IEC messages in the form of posters for water conservation can be displayed near all drinking water fountains or at certain distances along the pathway. Visitors can be made aware of climate change and depletion in groundwater levels through graphs and other pictorial representations.

## Toilets and Handwash stations

### Dos and Don'ts

IEC messages can also be presented in the form of Dos and Don'ts



### Dos and Don'ts for using toilets and handwash stations

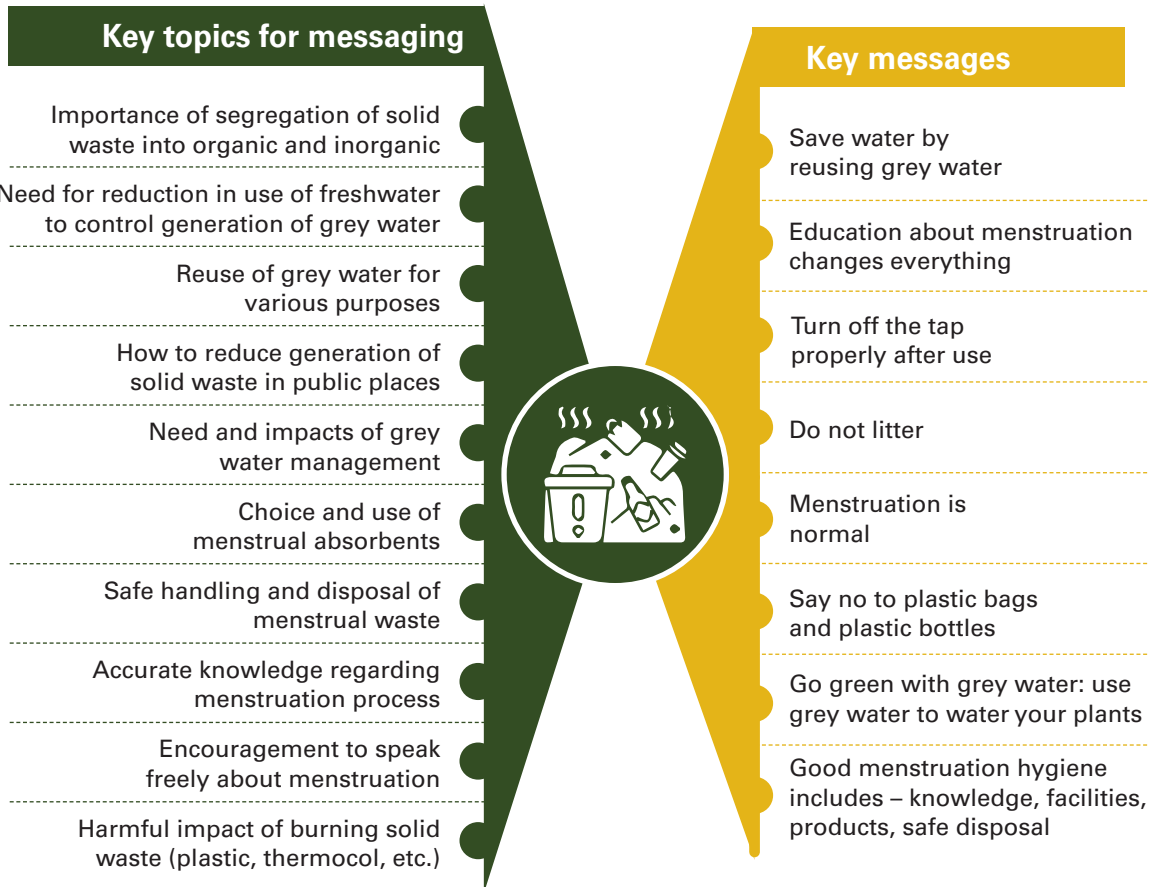


Illustrations of the steps of proper handwashing can be displayed at the handwash stations.

### Dos and Don'ts

IEC messages can also be presented in the form of Dos and Don'ts

## SLWM



### Dos and Don'ts for SLWM





## Chapter 4

# Sustainability of WASH facilities

## A. Introduction

Sustainability entails that activities – regardless of their and duration – result in a long-term positive impact on the environment and its inhabitants, or at least do not have negative impacts.

This chapter deals with the operation and maintenance of WASH facilities required for proper functionality of systems already existing or about to be installed. It also discusses possible monitoring measures that can be undertaken to ensure sustainability of the facilities.

## B. O&M of WASH facilities

WASH infrastructure deteriorates quickly after it is built if proper operation and maintenance (O&M) is neglected. O&M would involve recurring costs like electricity charges, chemical costs, expenditure on preventive and breakdown maintenance, costs of aesthetic improvements, human resources required to operate and maintain the infrastructure, etc.

Effective O&M of WASH facilities in zoos, requires efficient management and delivery of services by the staff. Zoos must also ensure delivery of quality services and efficient functioning of the infrastructure. Therefore, it is important for them to assess their O&M needs to see whether there may be a need to deploy professional service providers for this purpose.

### O&M of water supply

Water may be supplied to the zoo through a piped water system existing in the area or through private sources. In the former case, the zoo authorities only need to take care of the infrastructure within the zoo like pipes, delivery points, storage tanks if any. However, the overall of O&M of the system

is taken care of by the relevant department of the administrative body in the area.

If the zoo has a private source for water O&M of all the civil and electro-mechanical installations needs to be undertaken by the zoo authorities. Some of the major necessary O&M activities are explained below.

#### a. Source

1. Disinfection of the source(s) every three months, but monthly in the rainy season.
2. Testing of water quality using a field test kit.
3. Laboratory testing of water samples (bacteriological and chemical) as per the norms.

#### b. Pumping machinery and pipelines

1. Inspection of electric cables and insulation between cables.
2. Checking pump performance in respect of pump discharge, head, current and voltage reading and efficiency.
3. Carrying out repairs related to undue noise and vibrations, leakages, etc., if required.
4. Periodic overhauling of the pumps and motor assembly, at least once every year and in the instances where there are complaints regarding reduced discharge.
5. Carrying out checks as per the manufacturer's operation manual.
6. Maintenance of the electric panel, transformer and connection cables.
7. Visual inspection of pipelines for leakages and taking corrective measures.

**c. Treatment unit, if any**

Depending on the complexity of the treatment plant installed, the authorities may enter into a contract with service providers for appropriate O&M of the treatment units.

**d. RO units and disinfection unit**

Even zoos with access to piped water supply may opt to provide a disinfection unit near the delivery point. Both RO units and disinfection plants are provided with standard operating procedures and a maintenance schedule by the manufacturer. As with treatment units, the authorities may opt to enter into a contract with professional service providers for O&M of disinfection units.

**e. Storage**

1. Routine cleaning of all the storage tanks
2. Checking and taking corrective action in case of leakages

3. Checking the inlet and outlet pipe connections

**f. Delivery points**

1. Checking if there are taps to all the delivery points
2. Maintaining cleanliness around the delivery points
3. Periodic checking of the water quality at tail ends

**O&M of toilets and handwash stations**

O&M of toilets is crucial for maintaining hygienic conditions in and near the toilet blocks. It is not only important for the aesthetics of the premises but also for preventing the spread of various communicable diseases. Unclean, clogged toilets provide a breeding environment for disease vectors. A few O&M activities for maintaining clean and functional toilets are mentioned below.

**Simple O&M measures for water conservation**

The John G. Shedd Aquarium in Chicago, Ill, located on Lake Michigan's shores, is committed to the protection of the Great Lakes and knows that it can lead regional water conservation efforts by example.

In 2008, an external water audit provided the Shedd staff with information about its water use. The aquarium then decided to reduce its freshwater demand by analysing consumption levels and taking important yet simple O&M measures.

The staff identified and addressed high-priority projects, which included commonsense steps like **fixing leaks** and **replacing inefficient and old plumbing**. The aquarium invested in water-efficient fixtures and engaged staff in water friendly practices. The aquarium installed water meters to monitor its water use. **Daily meter readings to spot anomalies** and **timely repairs** were also undertaken to successfully conserve water.

*Source: GREEN TALES – Woodland Park Zoo Leads a Plastic-free Movement in Seattle by Zosia Brown, resource conservation and sustainability supervisor at Woodland Park Zoo, January 2018; Green practices, Association of Zoos and Aquariums*

### **a. Daily cleaning activities**

1. Cleaning of toilet pots and handwash facilities using disinfectant at least thrice a day.
2. Cleaning the access path to the toilets and the premises, particularly in the rainy season.
3. Sweeping and swabbing the floor.
4. Segregation of waste and its disposal in environmentally responsible manner.
5. Cleaning of fungus, slime or any organic matter growing on surfaces.

### **b. Custodian duties**

1. Remaining present for 24 hours a day.
2. Protecting urinal structure against damage and misuse.
3. Prevention of open urination and defecation in the area surrounding the toilet block.
4. Redressal of consumer complaints.
5. Guidance to users on maintaining hygiene as per COVID19 guidelines.

### **c. Maintenance of premises**

1. Clearing of choked/ clogged toilets, handwash facilities, chambers, manholes, etc.
2. Ensuring sufficient water is available and that storage tanks, drums, buckets, etc. are filled for flushing of toilets.
3. Ensuring availability of garbage bins.
4. Ensuring availability of soap and water or sanitizer at the handwash facility.
5. Mending of doors, window panes, latches, etc.
6. Application of approved polish to hardwood doors and fittings.



Dustbin at a zoo

7. Ensuring that the toilet blocks, adequately lit at all times.
8. Repairing of the electrical fittings, pumps, etc., if applicable.
9. Checking for leakages in the toilet fitting, taps, storage tank, etc. and taking corrective action.
10. Painting of the toilet blocks as per the schedule.
11. Disposal of menstrual waste (sanitary napkins) in the incinerator, if available.
12. Refilling of sanitary napkins in the dispenser, if applicable.

## **O&M of SLWM facilities**

### **O&M activities**

#### **a. Solid waste**

1. Removing garbage from dustbins and cleaning them if required.

2. Provision of garbage bins (1 set of 2–3 bins, as per requirement for recycling) in open spaces and in toilets (one bin per toilet; one additional bin in women’s toilet for menstrual waste).
  3. Cleaning of garbage bins on a daily basis.
  4. Replacing the cleared dustbins in their original spots.
  5. Sweeping of roads and road sides at least twice daily and dumping of waste collected in designated bins/ into the push-carts for solid waste collection.
  6. Segregation of collected non-biodegradable waste as plastic, building material, glass, rubber, cloth, leather, paper, wooden cardboard etc.
  7. Collection, segregation and disposal of menstrual waste separately.
  8. Composting of leaves and biodegradable waste. Compost pits should be emptied when filled up.
  9. Removing of grass and hedge trimmings every day and putting them properly in compost pits.
  10. Removing of mud/fertilizer heaps, if any, as soon as possible.
  11. Removal of branches/dead trees (if any) every fortnight/month as may be required and putting them properly in compost pits.
  12. Cleaning benches, other outdoor equipment every day.
  13. In case littering is observed in any specific area, it should be cleaned up immediately and the waste dumped in the appropriate garbage bin.
  14. Transportation of segregated waste, with proper covering, for treatment or to the transport vehicle of the civic body.
  15. Maintenance of electro-mechanical equipment used for waste management (e.g. in case of rotary drum composting, pumps, motors, etc.).
  16. Painting the interior and exterior of the units as per the schedule.
- b. Liquid waste and faecal sludge**
1. Raking of screens in the screening chamber and disposal of screenings in environmentally responsible manner, as applicable.
  2. Routine desludging and cleaning of sludge holding septic tanks, as applicable.
  3. Operation of decentralized treatment units for greywater management (soak pit/leach pit/magic pit), if applicable.
  4. Checking of all civil structures for leakages, and taking corrective action if required.
  5. Cleaning / de-siltation of all the drainage lines, chambers, manholes, etc. as per the schedule.
  6. Carrying out minor repairs of the drainage lines like replacing broken sections, leakages in the lines and chambers, manhole covers, etc.
  7. Painting the interior and exterior of the units as per the schedule.
  8. Transport of faecal sludge, with proper covering, for treatment in nearby STP/ FSTP.
- c. General**
1. Provision of brooms, gloves, masks, and other safety equipment as per need.
  2. Provision of staff uniform as per need.

## C. Monitoring of WASH facilities

Monitoring of the WASH facilities is important to track progress and improve accountability of the services provided. Regular monitoring of the facilities also helps in understanding the condition and efficiency of the facilities. Findings from the monitoring processes can help identify the gaps between achieved and desired service levels.

Record keeping, its audit and sample surveys can form the basis of the process for monitoring WASH facilities created within the zoo. Apart from this, feedback from visitors, suggestion/ complaint box and other grievance redressal systems can be used for effective monitoring. The feedback from visitors can be through pushbutton devices or physical forms. The feedback arrangement should set out ratings regarding the overall experience of visitors to the facility and also have a provision for registering any specific suggestion or complaint. Examples of feedback systems are given below.

The zoo management can monitor the following aspects of WASH facilities (indicative):

### Drinking water

- ▶ Availability of water – duration, days, pressure, etc.
- ▶ Functionality of taps, storage tanks, water treatment units (for example an RO unit)
- ▶ Overall cleanliness
- ▶ Accessibility issues for PwDs and/or children
- ▶ Leakages/damage to the structure

### Toilets and handwash

- ▶ Cleanliness in toilet blocks
- ▶ Regularity and thoroughness in cleaning
- ▶ Accessibility issues for PwDs and/or children
- ▶ Availability of water for flushing and cleaning
- ▶ Availability of soaps and cleaning equipment
- ▶ Availability of waste bins
- ▶ Leakages/damage to the structure



Examples of feedback systems

## SLWM

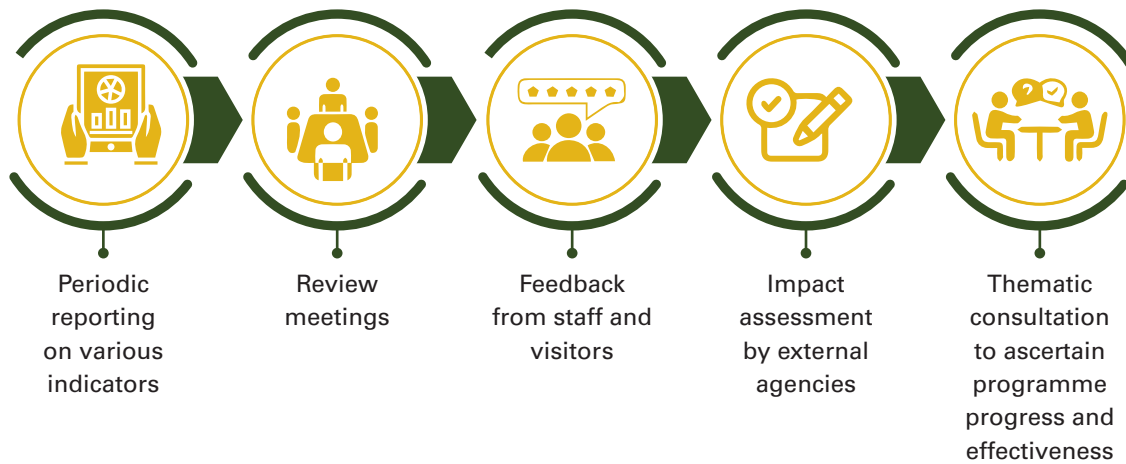
- ▶ Overall cleanliness in the zoo
- ▶ Overflowing waste bins
- ▶ Stagnant pools of water
- ▶ Availability of sanitary napkins in vending machines
- ▶ Leaky or damaged sewer lines

The monitoring process may include aggregation of the comments through

feedback, visual inspections, audits, etc., review and discussion on the comments, assessment of the feasible options for betterment and execution of the decisions taken.

In the current scenario of the COVID-19 pandemic, QR codes for feedback surveys can be used to ensure a contactless feedback process.

### How to monitor indicative methods for monitoring



Visitors at a zoo



संरक्षित क्षेत्र

National Zoological Park





## Chapter 5

# Signage for WASH Facilities

## A. Introduction

Signage performs multiple functions. It provides effective information and direction for people to find their way around a public space. It can also encourage learning experiences; create and maintain an image for a place; communicate rules in a user-friendly manner; and provide a sense of place and local pride by incorporating historical or cultural details.

In zoos, signs can meet specific needs and target certain areas. Signage related to WASH facilities for visitors is crucial as it concerns public health and hygiene. It is important to remember that not only are the content and its presentation relevant, but that the location of signs is crucial too. Placing signage in conjunction with other amenities such as benches, restrooms, or places where paths cross, can guide people better. Elements that are triangulated in an integrated manner have a bigger impact than they would separately. This also allows users to attend to several needs at the same place. When they are well-located, signs can help to create a comfortable public space and also to guide people in case of an emergency.



Example of educational signs at a zoo

## B. Developing proper signage for WASH facilities in a zoo

### Signage types that can be useful

#### 1. Maps at entry points

Maps help to increase and enhance users' knowledge about a place. They not only help visitors guide and direct themselves, but highlight conjunction areas as well (such as whether a toilet block is near a specific animal enclosure that the person may want to visit).

#### 2. Information kiosks/ bulletin boards

Kiosks and boards providing useful information help users who are unaware of the entire range of features or facilities available. They can be especially useful for senior citizens who might not be able to figure out things on their own, or for small children who might be lost.

#### 3. Educational signs

Signs with detailed information can be used to encourage people to engage with important principles and issues regarding the environment and ecology, water conservation, waste management, handwashing, etc.

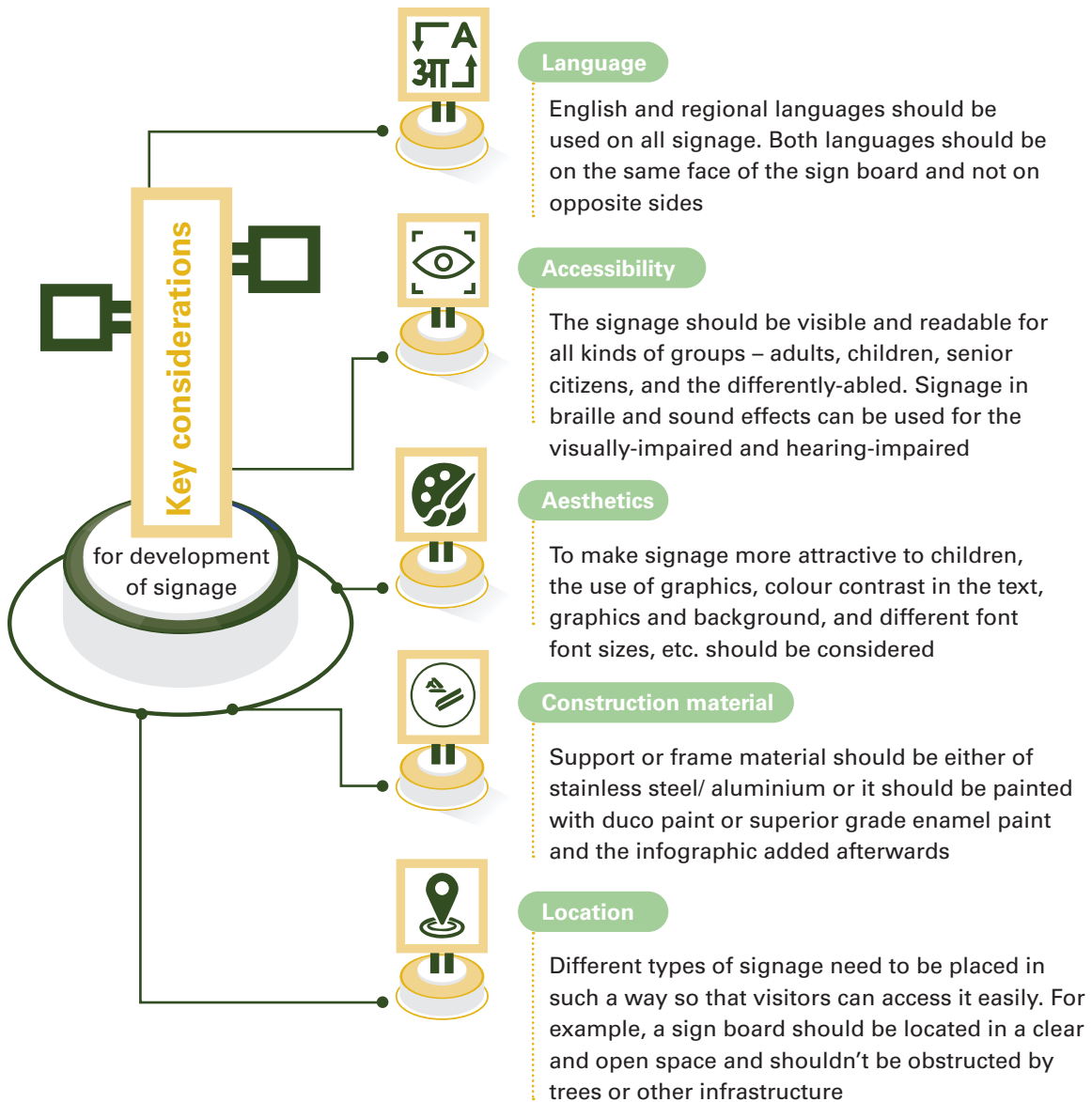
#### 4. Directional signs

Signs indicating the directions in which various destinations are to be found help people to identify paths to and distances of important facilities such as toilets, water fountains etc.

#### 5. Safety and regulatory signage

This type of signage can be helpful for alerting the public about important rules and regulations of the zoo formulated to ensure visitors' safety.

## Considerations while developing signage for zoos



## Steps for installing sign boards



- ▶ Identify the aim and purpose – Determine what functions the signage is to serve, whom it is to serve, and the kinds of information you want to communicate.
  - ▶ Survey existing signage conditions – Build upon what already exists by using what works well and improving on that which does not. A survey of the existing signage may include:
    - reviewing standards and guidelines
    - evaluation studies
    - surveying the physical signs by type, condition, and placement
    - getting staff feedback
  - ▶ Understand the users and decision points
    - Walk along the paths frequented by different types of user groups to understand their perspective
    - Get user feedback
  - ▶ Develop a plan – a detailed plan should be developed for upgrading existing signage and installing new ones.
- ▶ etc. It should indicate the direction and the destination it leads to.
  - ▶ Signage should be placed at all locations where visitors have to decide which direction to take e.g. at all junctions and change in alignment.
  - ▶ Educational signage to convey IEC messages can be installed near resting places and benches where people can take out time to read it.
  - ▶ Signs conveying rules and regulations should be placed at close distances (approximately 100–150 m) and at locations where there is a likelihood of the “wrong actions” happening. For example, “Do not litter” signs can be installed in open spaces where there are no garbage bins, and it is likely that people will dump waste in the area.
  - ▶ In case of MHM, the zoos need to limit the signage to assuring and informing visitors that facilities for vending and incineration exist in the premises.
  - ▶ Technologies for WASH should be explained through schematics and pictures. This will aid in effective designing and implementation of the same.

### General guidelines for signage on WASH facilities

- ▶ All signage in a zoo should be weather proof, meaning thereby, that the base material and the support/ fixing assembly should not be susceptible to rusting, otherwise deteriorate over time or decline in visibility.
- ▶ Information/IEC signage should be seen together with the respective facilities. For example, educational signage about menstruation can be placed inside or outside toilets.
- ▶ Direction signage should be provided for vehicular routes, pedestrian paths,



Example of signage for a toilet (including toilet for PwDs)



## Chapter 6

# Integration of WASH facilities

The importance of the provision of WASH facilities has already been discussed in the previous chapters. An integrated approach towards WASH facilities can save visitors from having to wander around unnecessarily in search of a specific WASH facility. A WASH complex i.e. a structure that includes all the WASH facilities at one place can be introduced for this purpose.

A WASH complex can include a feeding room, benches for resting along with all the other facilities like colour coded waste bins, toilet blocks with facilities for children and PwDs, separate handwash stations or wash basins outside toilet blocks and drinking water taps.

A WASH complex should be provided near the entry gates or the ticketing counters. Usually, ticketing counters are followed by the screening counters where visitors are checked for any unwanted/ harmful

material being carried to the zoo. This checking is a time consuming process and during the peak season visitors have to wait in long queues at the entry gates. Establishing a WASH complex at this place can provide visitors with a resting area along with all the WASH facilities.

Another WASH complex may be placed centrally or near the resting and recreational areas where people spend time for relaxation and eating and hence require drinking water, waste bins and toilet facilities in close vicinity. The possibility of littering and the creation of unhygienic conditions can be reduced by provision of adequate and functional WASH facilities spread uniformly over the area of the zoo.

An indicative schematic layout for the complex is given below.

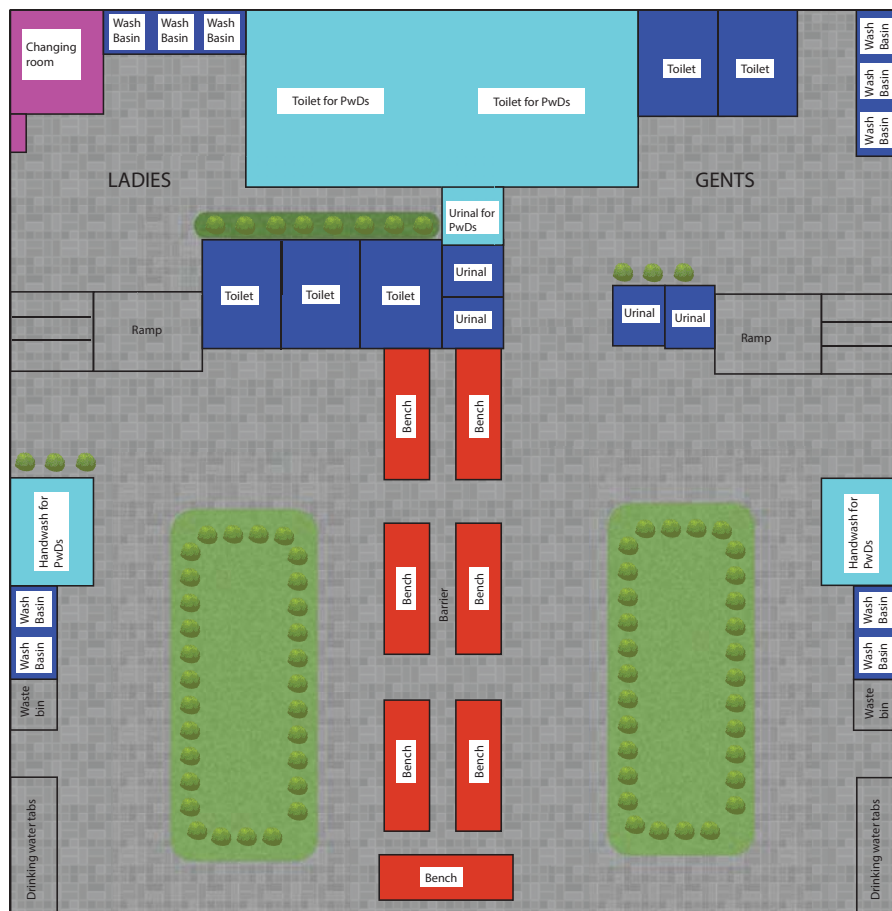


Figure 2: Indicative layout of integrated WASH complex



## Chapter 7

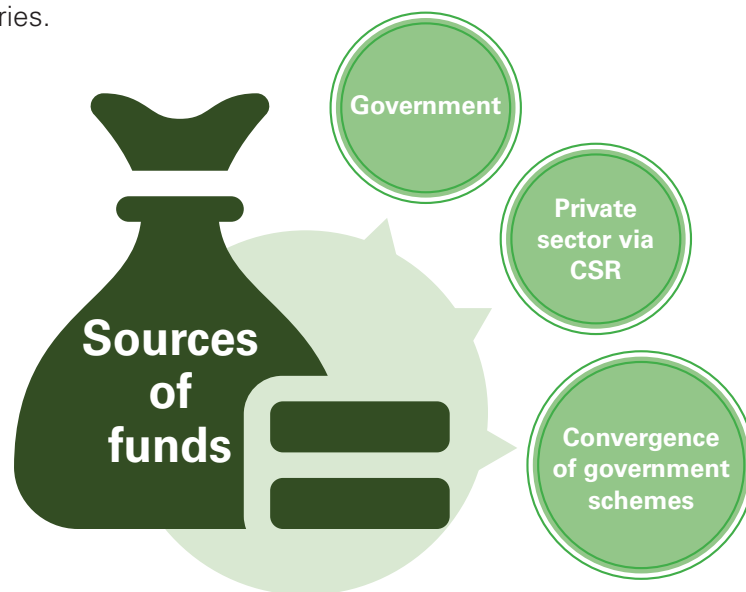
# Funding WASH: Sources and Convergence

Financial management is the most critical aspect of infrastructure creation and service delivery. For successful design and implementation of WASH facilities, robust financial planning, timely funding, mobilization of adequate resources and prudent utilization of funds are extremely important. Although funds are earmarked for WASH components but they may not be sufficient from the sustainability point of view.

Apart from the funds being devolved from CZA, MoEFCC and the revenue obtained by zoos from the gate fee, other sources can be explored for fund mobilization.

## Sources of funds

Sources of funds can be broadly divided into three categories.



## Government Funds

### 1. Member of Parliament Local Area Development Funds:

The objective of the scheme is to enable MPs to recommend for their constituencies development works that would create durable community assets based on locally felt needs. Right from the inception of the MPLADF scheme, durable assets based on national priorities in various fields including drinking water, primary education, public health, sanitation and roads, etc. are being created. The annual MPLADS fund entitlement per MP is Rs. 5 crores.

Zoo managements can actively engage with members of parliament of their



Handwashing and drinking water facilities at a zoo

respective constituencies and request them to utilize these funds for the creation of WASH facilities in zoos.

## 2. District Mineral Foundation:

The Mines and Mineral (Development and Regulation) Act, 1957 (MMDR Act, 1957) was amended in 2015. One of the amended provisions, section 9B, provides for the establishment of a District Mineral Foundation (DMF) in any district affected by mining related operations. The object of the DMF is to work for the interest and benefit of persons and areas affected by the effects of mining in the states of **Karnataka, Odisha, Madhya Pradesh, Telangana, Andhra Pradesh and Jharkhand**.

The Pradhan Mantri Khanij Kshetra Kalyan Yojana (PMKKKY) will be implemented through funds collected under DMF. At least 60 per cent of PMKKKY funds will be utilized for high priority areas, some of which are:

- a) **Drinking water supply** – centralized purification systems, water treatment plants, permanent/temporary water distribution network including standalone facilities for drinking water, laying of piped water supply systems.
- b) **Environmental conservation and pollution control measures** – effluent treatment plants, prevention of pollution of streams, lakes, ponds, ground water, other water sources in the region, measures for controlling air and dust pollution caused by mining operations and dumps, mine drainage systems, mine pollution prevention technologies, and measures for working on abandoned mines and other air, water & surface pollution control mechanisms required for environment-friendly and sustainable mine development.

- c) **Welfare of women and children** – Special programmes for addressing problems of maternal and child health, malnutrition, infectious diseases, etc. can be taken up under the PMKKKY.
- d) **Welfare of aged and people with disabilities** – Special programme for welfare of the aged and people with disabilities.
- e) **Sanitation** – collection, transportation and disposal of waste, cleaning of public places, provision of proper drainage and sewage treatment plants, provision for disposal of fecal sludge, provision of toilets and other related activities.

Other priority Areas – Up to 40 per cent of the PMKKKY funds are to be utilized under the following heads:

- a) **Physical infrastructure** – providing required physical infrastructure – roads, bridges, railways and waterway projects.
- b) **Irrigation** – developing alternate sources of irrigation, adoption of suitable and advanced irrigation techniques.
- c) **Energy and watershed development** – Development of alternate sources of energy (including micro-hydel) and rainwater harvesting systems. Development of orchards, integrated farming and economic forestry and restoration of catchments.
- d) Any other measures for enhancing environmental quality in mining districts.

Therefore, the zoos affected by mining activities (directly or indirectly) can coordinate with the DMFs in their respective districts for fund mobilization.

## Corporate social responsibility (CSR)

The Government of India introduced provisions regarding “corporate social responsibility” in the country’s Companies Act in 2014. “Environmental sustainability” was identified as one of the priority focus areas covered under CSR. Commitments to conserve biodiversity under these provisions can go a long way in reversing the current loss of biodiversity as well as the degradation of critical ecosystems and the sustenance they provide.

CSR presents an excellent opportunity for zoos to seek collaborations with like-minded organizations in the private sector. Each partner brings different priorities, resources and competencies. Partnerships are also critical to amplifying the impact of initiatives, increasing the level of innovation applied to solving long-standing challenges, as well as building mutual trust, and accountability. Zoos can actively engage with such companies/ organizations and invite them to visit the zoos and seek financial support for WASH facilities

## Convergence of government schemes

There is a lot of potential for various government schemes to complement each other, and to enhance growth and

development outcomes. A few examples of convergence include:

**Ministry of Housing and Urban Affairs –** Ongoing projects like Smart City Mission, AMRUT and Swachh Bharat Mission Urban can be converged for augmentation and improvement of water supply systems, sanitation facilities, public toilets, and waste management.

**Department of Empowerment of Persons with Disabilities, Ministry of Social Justice and Empowerment –** Funds from ongoing schemes such as Accessible India Campaign and Scheme for Implementation of the Rights of Persons with Disabilities Act, 2016 (SIPDA) may be utilized for creating a barrier free environment and making ministerial and departmental websites accessible and enhancing overall accessibility of government buildings.

**Department of Drinking Water and Sanitation:** Jal Jeevan Mission envisages the provision of safe and adequate drinking water for all. The programme will also implement source sustainability measures as mandatory elements, such as recharge and reuse through greywater management, water conservation, rainwater harvesting. Zoos can seek fund mobilization through the programme if possible.



## References

1. Accessible WASH, Public Spaces and Schools – Practitioners Manual Department of Empowerment of Persons with Disabilities, Ministry of Social Justice and Empowerment, Gol
2. Advisory on Public and Community Toilets, CPHEEO , Ministry of Housing and Urban Affairs, Gol
3. Design Guidelines for Zoos, Rommel Mehta and D.N. Singh, School of Planning and Architecture, New Delhi and Central Zoo Authority, New Delhi
4. Swachh Bharat Mission (Grameen) Phase II Guidelines, Min. of Jal Shakti, 2020
5. National Guidelines on Menstrual Hygiene Management, Min. of Drinking Water and Sanitation, 2015
6. Swachh Parks: Standard Operating Procedures, Min. of Urban Development
7. A Green Guide for Waste Management and Recycling During Special Events at National Capital Region Parks, U.S. Environmental Protection Agency
8. <<https://vizagzoo.com/visitors-help-desk/dos-donts/>>
9. Establishment and management of community sanitary complex in Rural Areas.
10. <<https://www.lucyinnovation.co.uk/2013/07/your-feedback-is-really-really-important-really/>>
11. <<https://www.financialexpress.com/lifestyle/swachh-bharat-condition-of-public-toilets-continues-to-be-dismal/1692405/>>
12. <<https://www.dmf.cg.nic.in/pdf/PMKKKYorder.pdf>>
13. Guidelines on Members of Parliament Local Area Development Scheme (MPLADS), Ministry of Statistics and Programme Implementation

## Key contributors

- Dr. S .P. Yadav (IFS), Member Secretary, Central Zoo Authority
- Dr. Sonali Ghosh (IFS), Deputy Inspector General Forest, Central Zoo Authority
- Dr. Devender Kumar, Evaluation and Monitoring Officer, Central Zoo Authority

## Other contributors

- Shri Sujoy Mojumdar, WASH Specialist, UNICEF India.
- Ms. Ananya Ghoshal, Wash Officer, UNICEF India.
- Shri Pragyal Singh, Partner, EY India LLP.
- Mr Avinash Swaroop, Consultant EY India LLP.
- Zoo in-charge/ Zoo Director (15 pilot zoos of the Vision Plan Initiative) and their teams

Dr. Siddhanand Kukrety (IFS), Additional Principal Chief Conservator of Forests & Director (FAC)- Nehru Zoological Park, Telangana; Dr. Nandani Salaria (IFS) Curator - Indira Gandhi Zoological Park, Visakhapatnam; Mr. Naresh Mahajan, Field Director, Mahendra Chaudhary Zoological Park, Punjab; Mr. Manoj Mahapatra (IFS) Director, Nandankanan Zoological Park, Odisha; Ms. Mercy Bella (IFS) Director - Nandanvan Jungle Safari (Naya Raipur), Chhattisgarh; Mr. R. K. Singh (IFS) Director - Nawab Wajid Ali Shah Zoological Garden, Uttar Pradesh; Dr. R. K. Hirpara (Zoo Superintendent) - Rajkot Municipal Zoo, Gujarat; Mr. Satyajeet Kumar (IFS) Director - Sanjay Gandhi Biological Park, Bihar; Mr. Ajit Kulkarni (IFS), DCF and Executive Director- Sri Chamarajendra Zoological Gardens, Karnataka; Mr. Ajay Yadav (IFS) former Director - Van Vihar National Park Zoo, Madhya Pradesh; Mr Debashish Jana (IFS) (Additional Principal Chief Conservator of Forests & Director and former Director) - Arignar Anna Zoological Park, Chennai ; Mr. Tejas Mariswamy (IFS) (Divisional Forest Officer and former Director) - Assam State Zoo Cum Botanical Garden, Assam; Mr. Y.K Das (IFS) former Director - Bhagwan Birsa Biological Park, Jharkhand; Mr. D. Venkateswarlu, (IFS) former Director, Bhagwan Birsa Biological Park, Jharkhand; Dr. M. Sudhagar, (IFS), former Director, Mahendra Chaudhary Zoological Park, Punjab; Ms. Kamalika Mohanta (IFS), former Director- Van Vihar National Park Zoo, Madhya Pradesh; Mr Shashi Paul (IFS), former Director- Nandankanan Zoological Park, Odisha; Mr Amit Kumar, IFS former Director - Sanjay Gandhi Biological Park, Bihar; Mr. Dharamdeo Rai (IFS) former Director - Padmaja Naidu Himalayan Zoological Park, West Bengal; Mr. Mahesh Kumar Choudhary, Deputy Conservator Of Forest (Wildlife), former Officer-in-Charge-Machia Biological Park, Rajasthan.

### Illustration credits:

Cover page Designed by UNICEF India and Ar. Sruthy Boopathy, Conservation Design Intern, CZA

**Photo credits :** Respective Zoos and Central Zoo Authority

## NOTES

A series of 30 horizontal dotted lines for writing notes.



unicef   
for every child



Central Zoo Authority  
केन्द्रीय चिड़ियाघर प्राधिकरण



## Central Zoo Authority

B-1 Wing, 6th Floor, Pt. Deendayal Antyodaya  
Bhawan, C.G.O. Complex, Lodhi Road, New  
Delhi – 110003.

(Tel): 011-24367846, 24367851, 24367852

(Email): [cza@nic.in](mailto:cza@nic.in),

(Website): <http://www.cza.nic.in>