



GOVERNMENT OF MALAWI

INDICATORS CONCEPTS AND DEFINITIONS FOR IRRIGATION, WATER AND SANITATION



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LIST OF ACRONYM

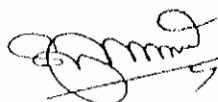
Ecosan	Ecological Sanitation
GoM	Government of Malawi
Imp	Improved
JMP	Joint Monitoring Programme
ODF	Open Defecation Free
ODF++	Open Defecation Free++
PMF	Probable Maximum Flood
PMP	Probable Maximum Precipitation
PPP	Public Private Partnership
SDF	Spillway Design Flood
Unimp	Unimproved
VIP	Ventilated Improved Pit
WUA	Water Users Association
WUG	Water Users Group
TWG	Technical Working Group
MGDS	Malawi Growth and Development Strategy

FOREWORD AND ACKNOWLEDGEMENT

The Irrigation, Water and Sanitation (IWS) Sector indicators definition handbook has been prepared to harmonise definition of all the indicators and concepts used in the sector's statistics. It is envisaged that this handbook will help in ensuring coordination and harmonisation of statistics that is produced highlighting the performance of the sector in its service delivery. The handbook outlines a list of definitions for statistical concepts and indicators used in the sector. The use of this handbook by all stakeholders will ensure adherence to common standards in data process and use, and enhanced comparability.

On behalf of the IWS sector, I am grateful to the World Bank and the African Water facility through the African Development Bank for providing financial resources that helped in coming up with the document. Special thanks should be extended to all the IWS Sector's Monitoring & Evaluation Technical Working Group members for the preparation and development of this handbook, especially, officials from the National Statistical Office, Ministry of Health, Ministry of Economic Planning and Development, Engineers Without Borders Canada, WaterAid Malawi, UNICEF, the Open Defecation Free Task Force, and those from my Ministry.

Finally, I would like to recognize the effort and dedication of all those who participated in one way or another in the preparation of this handbook.



S.C.Y Maweru

SECRETARY FOR WATER DEVELOPMENT AND IRRIGATION

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1.0 INTRODUCTION

1.1 Background

The Irrigation, Water and Sanitation Sector is currently in the process of institutionalizing the Sector Wide Approach (SWAp). The adoption of SWAp and the Joint Sector Review (JSR) process call for the establishment of a robust Monitoring and Evaluation and Management Information systems that inform and underpin annual technical performance reviews of the sector. However, according to the Joint Country Programme Review (JCPR) of May 2007 that assessed the sector's performance, the sector was discovered not have a harmonized M&E framework and is characterized by lack of consistent and reliable data collection nation-wide at the river/lake basin, community and household level.

During the 2010 Joint Sector Review it was noted that in addition to lack of the Monitoring and Evaluation framework for the sector, different stakeholders within the sector use different definitions for the indicators that are used in the sectors statistics. This resulted into conflicting/different statistics for same indicators analysed by different stakeholders.

It is against this background that the 2010 Joint Sector Review workshop recommended that the sector should develop a handbook for definitions of all the indicators and concepts that are used in the sectors statistics as a way of harmonising them. The Monitoring and Evaluation Technical Working Group, which comprises of various institutions relevant to the sector, was tasked to implement this recommendation. The TWG held meetings and utilised input and recommendations from other regional workshops in the process of coming up with the document.

1.2 Objective of the Handbook

Monitoring activities are often carried out by a range of different actors at the national level, including the Ministry, NSO, Donor Agencies and Non Governmental Organizations. Without an effective and coordinated monitoring system, these actors may use their own approaches to data collection and interpretation. The Irrigation Water and Sanitation Sector in Malawi has had different definitions for important terms that various actors in the sector use when implementing various activities within the sector. Discrepancies have been observed between data reported by the Ministry and those reported by the National Statistical Office in its countrywide surveys. This has arisen from diverse ways in which data is sourced, how various forms of infrastructure are defined and categorized, as well as which indicators and tools are used for surveys.

This handbook is an effort to help reconcile and bring harmony to the various methodologies used, and is aimed at facilitating better coordination around monitoring of Irrigation, water and sanitation services by various actors in the sector. It is hoped that, if all actors adhere to the concepts/indicators definitions contained in this handbook, duplication of efforts or contradictions between figures produced by various agencies operating at national level will be avoided. Furthermore, this is expected to have a knock-on effect on global estimates as they are based on a combination of all national level surveys and censuses.

The main aim of developing the handbook was to bring about harmony in the way various technical terms, concepts and indicators are used in the irrigation, water and sanitation sector. It contains the final full definitions for all indicators to be introduced for the sector. It collaborates earlier efforts to reconcile data at national level to ensure that measuring of MGDS II outputs and outcomes is harmonized. It further supports regional/international efforts aimed at harmonizing the measuring of global progress towards the Millennium Development Goals (MDGs).

The handbook will help in the process of coming up with a sector wide information system that could provide vital data and information for programme/project planning and implementation, resulting in a robust M&E and MIS systems that inform and underpin annual technical performance reviews of the sector. The handbook will be the basis and reference point for all actors who will need to regularly meet in order to ensure that emerging viewpoints within and beyond the sector are understood and taken into account.

2.0 WATER SUPPLY SERVICES

2.1 Improved Water Supply Facilities

Basic Definitions:

2.1.1 Safe Drinking Water: Water which meets the Government of Malawi's Water Quality Standards for chemical, physical and microbial content.

2.1.2 Improved Water Supply Facility: A drinking water facility which provides a community or household with water which is considered likely to be safe to drink, free from risk of contamination, economically affordable, and reliable over a long time period.

NB; Any water facility for which a water quality test has been conducted cannot be counted as an improved water source unless the water quality results meet the Government of Malawi standards, regardless of other characteristics.

2.1.3 Technologies that provide safe water supply

- i. Piped water into dwelling, yard or plot
- ii. Public / communal tap/standpipe or kiosk
- iii. Borehole or tube well
- iv. Protected dug well
- v. Protected spring

Borehole with Hand Pump



A borehole with a hand pump is considered an improved water supply if it has a soak away pit, apron, and a drain¹, and if it is located at least 100 m from the closest toilet or latrine.²

¹Implementation Manual for Piped and Point Water Supply Systems, MoWDI, pg 18

² Borehole Technical Manual, MoWDI, Pg 13

Communal Tap



A communal tap is considered an improved water source if it has a soak away pit, apron, and a drain.³

³ Rural Piped Water Technical Manual, Ministry of Water Development and Irrigation - Gravity Fed Water Supply, pg 45

A Kiosk



A kiosk is considered an improved water supply if it has a soak away pit, apron, and a drain

Protected Shallow Well with Hand Pump



A protected shallow well with a hand pump is considered an improved water supply if it has a soak away pit, apron, and a drain⁴, and if it is located at least 30m from the closest toilet or latrine.⁵

⁴Implementation Manual for Piped and Point Water Supply Systems, MoWDI, pg 20

⁵ Borehole Technical Manual, MoWDI, Pg 13

Protected Spring



A protected spring is considered an improved water supply if it has a soak away pit, apron, and a drain⁶, is located at least 30m from the closest toilet or latrine⁷, and if it has a water-tight concrete cover to protect from runoff.

⁶ Technology Notes, Water Aid/Caroline Penn, pg 14

⁷ Borehole Technical Manual, MoWDI, Pg 13

Private Piped Connection



A private or household piped connection is considered an improved water supply if it has a soak away pit, apron, and drain.⁸

⁸ Rural Piped Water Technical Manual, Ministry of Water Development and Irrigation - Gravity Fed Water Supply, pg 45

2.2 Water Supply Access and Coverage

Basic Definitions:

- 2.2.1 **Access to Improved Water Source:** The government of Malawi defines a household as having access to an improved water source if that household has access to a minimum of 27L of water per person per day⁹, from an improved water source (as outlined in this guide), at a maximum one-way distance from the household of 500m in rural areas and 200m in urban areas¹⁰. Further, to be considered having access to an improved water source, the maximum round-trip time for that household to collect water should be less than 30 minutes¹¹. Access rates to improved water can only be determined using household surveys.
- 2.2.2 **Improved Water Coverage:** Improved water coverage is the ratio of people served with improved water facilities (according to the design population of facilities) in a given area to the total number of people in that area. Coverage estimates are useful for planning but are not to be used as official figures and do not take into account functionality of infrastructure. Official figures should use access rates (see above), determined using rigorously conducted household surveys.
- 2.2.3 **Access to Safe Water:** The government of Malawi defines a household as having access to a safe water source if that household has access to a minimum of 27L of water per person per day¹², from water source meeting the Government of Malawi Water Quality Guidelines, at a maximum one-way distance from the household of 500m in rural areas and 200m in urban areas¹³. Further, to be considered having access to a safe water source, the maximum round-trip time for that household to collect water should be less than 30 minutes¹⁴. Access rates to safe water can only be determined using a combination of household surveys and water quality testing.

⁹ Rural Piped Water Technical Manual, Ministry of Water Development and Irrigation - Gravity Fed Water Supply, pg 5

¹⁰ Rural Piped Water Technical Manual, Ministry of Water Development and Irrigation - Gravity Fed Water Supply, pg 6

¹¹ Rural Piped Water Technical Manual, Ministry of Water Development and Irrigation - Gravity Fed Water Supply, pg 6

¹² Rural Piped Water Technical Manual, Ministry of Water Development and Irrigation - Gravity Fed Water Supply, pg 5

¹³ Rural Piped Water Technical Manual, Ministry of Water Development and Irrigation - Gravity Fed Water Supply, pg 6

¹⁴ Rural Piped Water Technical Manual, Ministry of Water Development and Irrigation - Gravity Fed Water Supply, pg 6

2.3 Functionality of Water Supply Facilities

Basic Definitions:

2.3.1 **Functional:** A water point is considered functional if it is providing water at the minimum appropriate flow-rate¹⁵ at the time of a spot check, and if all components of the water extraction system are in good working order.

2.3.2 **Partially Functional:** A water point is considered partially functional if it is providing water at a rate below the minimum acceptable flow-rate (0.25 L/s for groundwater points, 0.076 L/s for taps)¹⁶ at the time of a spot check.

2.3.3 **Non-Functional:** A water point is considered non-functional if it is not providing water at the time of a spot check. There are several possible reasons for non-functionality which should be used for standard reporting;

- i. *Broken:* The water point is not producing water but could be repaired or rehabilitated.
- ii. *Disconnected (Non-Payment):* The water point has been disconnected due to other factors, but could be reconnected.
- iii. *Vandalized:* The water point is not producing water because of vandalism or theft but could be repaired or rehabilitated.
- iv. *Abandoned:* The water point is not producing water or is not being used due to water quality reasons and should not be repaired or rehabilitated.

2.3.4 **Under Construction:** The water point is still being built.

¹⁵ Rural Piped Water Technical Manual, Ministry of Water Development and Irrigation - Gravity Fed Water Supply, pg 6, Flow-rates for technologies are: 0.25 L/s for groundwater points, 0.076 L/s for taps)

¹⁶ Borehole Technical Manual, Ministry of Water Development and Irrigation, pg 41

2.4 Water Point Sanitation

2.4.1 Clean Surrounding: *A Clean Surrounding* includes no water stagnation, free from excessive dirt, free from bushes, a soak way pit with stones present. (Note – Waste water from a water point should not be used for irrigation or watering of animals)

2.5 Management of Water Supply Indicators

2.5.1 Water User Association

A non-profit making organisation formed and registered by the members to ensure efficient, reliable and sustainable water supply and sanitation services through improved management system at the lowest appropriate level (WUA Training Manual, 2010).

2.5.2 Local Utility Operator

A private individual or firm recruited by the WUA Board in accordance with the appropriate recruitment procedures¹⁷.

2.5.3 Water User

All individuals, households or institutions using the water supplied by a water supply system (WUA Training Manual, 2010).

2.5.4 Operations and Maintenance

The running and handling of a water supply system and an activity or a set of activities that ensures that a water supply system is in proper working condition (WUA Training Manual, 2010).

2.5.5 Preventive Maintenance

It is a pre-scheduled systematic inspections, repairs or replacements on the system (WUA Training Manual, 2010).

¹⁷ WUA formation guidelines, Ministry of Water Development and Irrigation, 2010

2.5.6 Breakdown Maintenance

It is a timely response to breakdowns and public complaints and it involves carrying out repairs or replacements on the system (WUA Training Manual, 2010).

2.5.6 Area Mechanics

Established network of entrepreneurs of community based repair team trained in CBM Phase 2 with the sole purpose of providing technical services to the water point committee (Community Based Rural Water Supply, Sanitation and Hygiene Education: Implementation Manual, 1999).

2.5.7 Water Point Committee

Members elected from the water user Communities to regulate, use and care for the water point, collect and manage money to pay for spare parts and repairs (Community Based Rural Water Supply, Sanitation and Hygiene Education: Implementation Manual, 1999).

2.5.8 Sustainability:

In water supply, sustainability refers to maintained functionality of water facilities through operation and maintenance of the systems at all times (Community Based Rural Water Supply, Sanitation and Hygiene Education: Implementation Manual, 1999).

2.5.9 Community Based Management

It is an approach where communities are empowered to assume ownership and responsibility for their water supply. The objective is to establish a self-sustaining community financed maintenance system operated and managed by the users. (Community Based Rural Water Supply, Sanitation and Hygiene Education: Implementation Manual, 1999)

2.5.10 Hand pump spare parts supply chain

A network of service providers (wholesale and retail) that procure, stock and sell spare parts for hand pumps to communities.

2.5.11 Individual / private connection

Piped water supply service provided to a household

2.5.12 Per capita water consumption

Refers to the average volume of water used in a household per person per day (NWP, 2005).

2.5.13 Tariff

It is a functional cost at which water services are provided to the water users or consumers (NWP, 2005).

2.5.14 Town

Settlements which are sufficiently large and dense to benefit from the economies of scale offered by piped systems, but too small and dispersed to be efficiently managed by a conventional urban water utility. Towns usually have populations between 5,000 and 50,000 but can be larger or smaller (UN-Habitat, 2004).

2.5.15 Market centre

Any authorized place or premises that are only set up and maintained only by a local government to allow the public sell and buying of goods and services of their choice (NSO, May 2012).

2.5.16 Customer categories

Refers to predetermined groups of people supplied or entitled to be supplied with water supply for personal, institutional, industrial and commercial use but does not include a person supplied with water for delivery to another person (NSO, May 2012).

2.5.17 Residential

A building for which the major part (more than 50% of its gross floor area) is built for dwelling purposes, i.e. for habitation of households (NSO, May 2012).

2.5.18 Industrial

It is the activity concerning: Mining and quarrying, manufacturing and the production and distribution of electricity, gas and water (NSO, May 2012).

2.5.19 Institution:

Any set of premises in a structure designed to house groups (usually large) of persons who are bound by either a common public objective or a common personal interest. In this type of living quarters, persons of the same sex frequently share dormitories. Hospitals, barracks, boarding schools, convents, prisons etc. fall within this category (NSO, May 2012).

2.5.20 Peri-urban:

Peri-urban areas are considered to be those on the periphery of the urban areas,, usually with high population growth, low priority in terms of urban planning, diverse socio-cultural composition, and a lower-income, socio-economic situation (UN-Habitat, 2004).

2.5.21 Urban

Urban areas in Malawi constitute the following: all areas within city boundaries, all district centers, and all townships. These areas are designated by the department of physical planning (NSO, May 2012).

2.5.22 Urbanization

The process by which there is an increase in the proportion of people living in urban areas. The common indices used to describe urbanization are: population size, population density and level of administration (NSO, May 2012).

2.5.23 Rural Area

All areas which are outside the geographical boundaries of urban areas as defined above (Compendium of Statistical Concepts and Definitions, May 2012).

2.5.24 Non-revenue water

Refers to the difference between water produced and consumed or it refers to all physical water losses (NWP, 2005)

2.5.25 Participation

An active process by which beneficiaries influence the directions and execution of a development project with the aim of enhancing their well being. It involves the local people in planning process and incorporates their knowledge in finding solutions to their own problems (NSO, May 2012).

2.5.26 Accountability

The acknowledgement and assumption of responsibility by all stakeholders for actions, products, decisions, and policies including the administration, governance, and implementation within the scope of the role or employment/elected position and encompassing the obligation to report, explain and be answerable for the resulting consequences (NSO, May 2012).

2.5.27 Community contribution

The monetary value attached to inputs and or factors of production that project beneficiaries contribute towards the implementation of communal project, as a way to assure supporting institutions of ownership and commitment to sustain the project (NSO, May 2012).

2.5.28 Gender

Socially constructed roles, relationships, responsibilities, status and privileges assigned to women, men, boys and girls in a given culture or location. It is learnt through the process of socialization. Gender relations are dynamic, changeable and vary from culture to culture.

2.5.29 Gender Roles

Are culturally defined roles and responsibilities to which women and men are socialized to conform to and are affected by age class, religion, ethnicity, political environment, education, technology among others.

2.5.30 Gender Desegregated Data

Information about socially defined roles and activities of women and men in any social or economic activity.

2.5.31 Water-area

It refers to the area declared under section 4 of the Water Works Act 1995 as being an area serviced by a water utility

2.6 Government of Malawi Water Quality Standards

GOVERNMENT OF MALAWI WATER QUALITY STANDARDS (MBS)			
<i>The Malawi Standards specifies requirements for untreated or raw ground water in boreholes and protected shallow wells for human consumption and all usual domestic purposes.</i>			
BOREHOLE AND PROTECTED SHALLOW WELL WATER QUALITY (MS 733:2005)			
CATEGORY OF PARAMETERS	DETERMINANTS	UNITS	MAXIMUM PERMISSIBLE LEVEL
PHYSICAL AND MACRO-CONSTITUENTS	Colour	TCU	50
	Electrical Conductivity at 20°C	$\mu\text{S cm}^{-1}$	3500
	Total Dissolved solids	mg/l	2000
	PH value	pH units	6.0 - 9.5
	Calcium (Ca)	mg/l	250
	Chloride (Cl)	mg/l	750
	Magnesium (Mg)	mg/l	200
	Sodium (Na)	mg/l	500
	Sulfate (SO_4)	mg/l	800
CHEMICAL REQUIREMENTS - MICRO DETERMINANTS	Aluminium (Al)	mg/l	0.5
	Antimony (Sh)	mg/l	0.005
	Zinc (Zn)	mg/l	15
	Arsenic (As)	mg/l	0.05

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	Barium (Ba)	mg/l	0.7
	Borate (B)	mg/l	5.0
	Cadmium (Cd)	mg/l	0.01
	Chromium (Cr)	mg/l	0.01
	Copper (Cu)	mg/l	2.0
	Fluoride	mg/l	6.0
	Cyanide (CN ⁻)	mg/l	0.07
	Iron (Fe)	mg/l	3.0
	Lead (Pb)	mg/l	0.05
	Manganese (Mn)	mg/l	1.5
	Selenium (Se)	mg/l	0.01
	Sulphate (SO ₄ ²⁻)	µg/l	800
	Nitrate (NO ₃)	mg/l	45
MICROBIOLOGICAL CONSTITUENTS	Total coliforms	Number/100ml	50
	Faecal (Thermotolerant coliforms)	Number/100ml	50
	Faecal Streptococci	Number/100ml	0
	Sulphite reducing Clostridia	Number/20ml	1
	Colony counts	Number/1ml at 22°C	100

2.7 Physical/Chemical Standards

GOVERNMENT OF MALAWI WATER QUALITY STANDARDS (MBS)			
Suitability of drinking water is normally based on its physical and chemical properties, and its microbiological content. The following are the standards:			
DRINKING WATER STANDARDS: MS 214:2005			
CATEGORY OF PARAMETERS	DETERMINANTS	UNITS	UPPER LIMIT AND RANGES
PHYSICAL AND ORGANOLEPTIC REQUIREMENTS	Colour	mg/l HU	5 - 10
	Conductivity at 25°C	ms/m	75 - 150
	Dissolved solids	mg/l	450 - 1000
	Odour	TON	1 - 5 (or odourless)
	PH value at 25 °C	pH units	5.0 - 9.5
	Taste	-	Acceptable
	Turbidity	NTU	0.1 - 1
CHEMICAL REQUIREMENTS - MACRO-DETERMINANTS	Ammonia (N)	mg/l	0.2 - 1.0
	Calcium (Ca)	mg/l	80 - 150
	Chloride (Cl)	mg/l	100 - 200
	Fluoride (F)	mg/l	0.7 - 1.0
	Magnesium (Mg)	mg/l	30 - 70
	Nitrate and nitrite) (N)	mg/l	6.0 - 10.0
	Potassium (K)	mg/l	25 - 50

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	Sodium (Na)	mg/l	100 - 200
	Sulphate (SO ₄ ²⁻)	mg/l	200 - 400
	Zinc (Zn)	mg/l	3.0 - 5.0
CHEMICAL REQUIREMENTS - MICRO- DETERMINANTS	Aluminium (Al)	µg/l	150 - 300
	Antimony (Sb)	µg/l	5 - 10
	Arsenic (As)	µg/l	10 - 50
	Cadmium (Cd)	µg/l	3 - 5
	Chromium (Cr)	µg/l	50 - 100
	Cobalt (Co)	µg/l	250 - 500
	Copper (Cu)	µg/l	500 - 1000
	Cyanide (free) (CN)	µg/l	30 - 50
	Cyanide (recoverable) (CN)	µg/l	70 - 200
	Iron (Fe)	µg/l	10 - 200
	Lead (Pb)	µg/l	10 - 50
	Manganese (Mn)	µg/l	50 - 100
	Mercury (Hg)	µg/l	1 - 2
	Nickel (Ni)	µg/l	50 - 150
	Selenium (Se)	µg/l	10 - 20
Vanadium (A)	µg/l	100 - 200	
CHEMICAL REQUIREMENTS - ORGANIC	Dissolved organic Carbon (C)	mg/l	5 - 10
	Total	µg/l	100 - 200

DETERMINANTS	trihalomethanes		
	Phenols	µg/l	5 - 10

2.8 Microbiological Standards

DRINKING WATER STANDARDS: MS 214:2005				
DETERMINANTS	UNITS	ALLOWABLE COMPLIANCE CONTRIBUTION		
		95% of sample min	4% of samples max	1% of sample max
		Upper Limits		
Heterotrophic Plate count	count/ml	100	1000	10000
Total coliform bacteria	count/100ml	Not detected	10	100
faecal coliform bacteria	count/100ml	Not detected	1	10
E. coli	count/100ml	Not detected	Not detected	1
Somatic coliphages	count/100ml	Not detected	1	10
Enteric virus	count/100ml	Not detected	1	10
Protozoan parasites (Giardia/cryptosporidium/ helmith ova)	count/100l	Not detected	Not detected	1

3.0 SANITATION AND HYGIENE

3.1 Household Sanitation Facilities

Basic Definition:

3.1.1 Unimproved Facility “Unsatisfactory Toilet”: Refers to a facility without any hygienic features such as a key-hole shaped drop hole, tight fitting drop hole cover, and foot rests that guide the appropriate positioning on the drop hole. The facility contains the following elements:

- Pit Latrines where walls are missing or do not provide "privacy" for the user (e.g. walls are missing or inadequate) and/or there is no roof
- Hanging toilets
- Bucket latrine.
- A pit or receptacle of any depth which is not full or over-flowing, No other form of hygienic features such as a tight fitting drop hole cover (which would minimize smell and movement of flies).



Examples of unimproved facility

3.1.2 Basic Facility¹⁸ “Adequate Toilet”: Basic facility has the following characteristics:

- A pit of any depth which is not full or over flowing
- Floor is a well finished mud slab with drop hole
- Walls can be made of anything but must provide privacy for the user
- Roof can be made of anything but must provide shelter from the rain
- Some form of or no foot rests (that will guide appropriate positioning),

¹⁸ National Sanitation Policy, pg ix

- A superstructure with some form of a door or a type of closing mechanism or enclosure and a roof,



Examples of basic sanitation facilities

3.1.3 Improved Sanitation Facility: is defined similar to basic excreta sanitation facility with the addition that there should be an impermeable floor and a tight fitting lid to the latrine, or in the case of ecological sanitation (ecosan) where no lid is needed, the ecosan latrine should be properly looked after with the regular addition of soil, ash and other organic material. (National Sanitation Policy, 2008). An improved sanitation facility should have the following characteristics:

- a well constructed and functional pit or receptacle with a minimum depth of 1.0 metre (which is not full or over-flowing),
- impermeable floor made of concrete, plastic, tiles or burnt brick with cement lining and foot rests
- a good superstructure with a door, roof and walls (which would offer privacy, comfort, security and dignity for the user) and
- some other hygienic features such as a tight fitting drop hole cover (which would minimise smell and movement of flies).



An inside view of an improved facility

3.1.4 Examples of Improved Sanitation Facilities

3.1.4.1 *Ecosan (Composting) Latrine with Ash/Soil Present*



A compost (ecosan) latrine is a sanitation facility designed with the following characteristics:

- Well-constructed sub-structure (normally with accessible double holes mostly referred to as vaults);

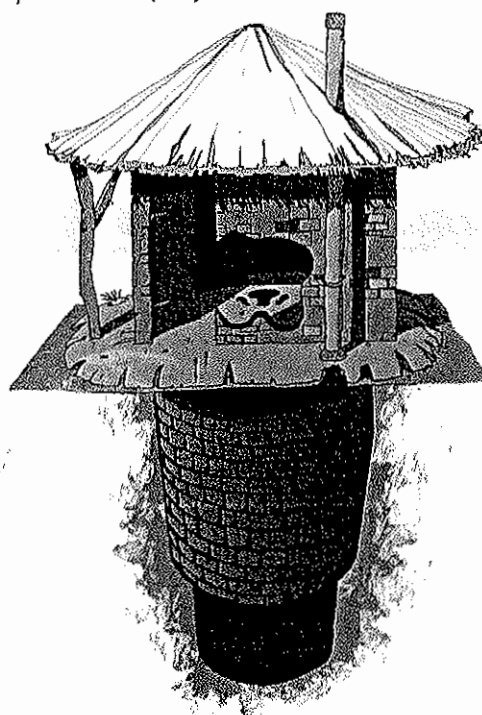
- either separates urine from human faeces or not (in extremely dry climates) and safely contains new or fresh faeces separate from composted faeces
- where urine is separated, it can be stored in containers for use as liquid fertilizer
- Well-constructed superstructure with walls that provide privacy and roof providing shelter from the rain
- Where ash and/or soil are used after use.

3.1.4.2 Flush Toilet

To be considered improved, a flush toilet should be in clean and hygienic condition, have running water available, and flush to either a sewer or a septic tank.



3.1.4.3

Ventilated Improved Pit (VIP) Latrine

A ventilated improved pit (VIP) latrine should have the following characteristics¹⁹:

- Vent pipe protruding above roof of latrine
- a well constructed and functional pit with at least a minimum depth of 1 m
- impermeable floor made of concrete, plastic, tiles or burnt brick with cement lining and foot rests
- Key shaped drop hole with tight fitting drop hole cover
- Well constructed superstructure with walls providing privacy and roof providing shelter from the rain

¹⁹ Technology Notes, Water Aid/Caroline Penn, pg 39, pg 40, Rural water/sanitation projects, Water for the world pg 185, page 186

3.1.4.4 Improved Pit Latrine



An improved pit latrine should have the following characteristics²⁰:

- Privacy
- Safe from collapse
- Pit not full
- Impermeable floor
- Tight fitting drophole cover
- Non-leaking roof²¹

²⁰ National Sanitation Policy, pg x

²¹ Recommended by the TWG

3.2 Institution Sanitation Facilities

3.2.1 Schools: incase of schools facilities should have:

- Adequate numbers of toilets for both girls and boys with a ratio of at least 1:60 (drop hole/pupils) for schools
- Separate urinals for girls and boys (not part of the toilet block)
- Privacy provided for matured girls menstrual hygiene management needs
- Consideration for use by the disabled children
- Toilets type can be blocks or individual of those listed Improved Toilets but considering the following points:
 - Cleaned regularly
 - VIP blocks should have sub-structure compartment and vent pipe per drop hole
 - Flush toilets are discouraged as unless there is a guaranteed continuous supply as any disruption through breakdown or nonpayment of bills will quickly lead to a health hazard
 - Eco-san toilets must be properly managed according to guidelines provided
- Hand washing facilities with running water and soap must be available e.g. taps with running water, buckets with tap, concrete tank with tap and/or homemade hand washing facility (as defined above)



Examples of school sanitation facilities

3.2.2 Health Centres: Facilities in health centre should have

- Adequate numbers of toilets depending on number of patients but at least one for male and one for females
- Designed to consider for the needs of patients, the elderly and the disabled
- Toilets type can any of those listed Improved Toilets but considering the following points:
 - Cleaned regularly
 - VIP blocks should have sub-structure compartment and vent pipe per drop hole

- Flush toilets are discouraged as unless there is a guaranteed continuous supply of water as any disruption through either breakdown or nonpayment of bills will quickly lead to a health hazard
- Eco-san toilets must be properly managed according to guidelines provided
- Hand washing facilities with running water and soap must be available e.g. taps with running water, buckets with tap, concrete tank with tap and/or homemade hand washing facility (as defined above)

3.3 Open Defecation Free Status

3.3.1 Open Defecation Free (ODF)²²

"Every household uses a latrine with drop hole cover (except for eco-san and VIP types), that offers privacy, and there is no excreta in the open. In this particular case sharing is acceptable".

3.3.2 Open Defecation Free++ (ODF++)²³

Every household has and uses a latrine with drop hole cover, superstructure, and hand washing facility. In addition for a village to qualify for ODF++, all primary and secondary schools, community-based childcare centres, religious institutions, market centres and health centres in the village have latrines with drop hole covers, superstructures, and hand washing facilities

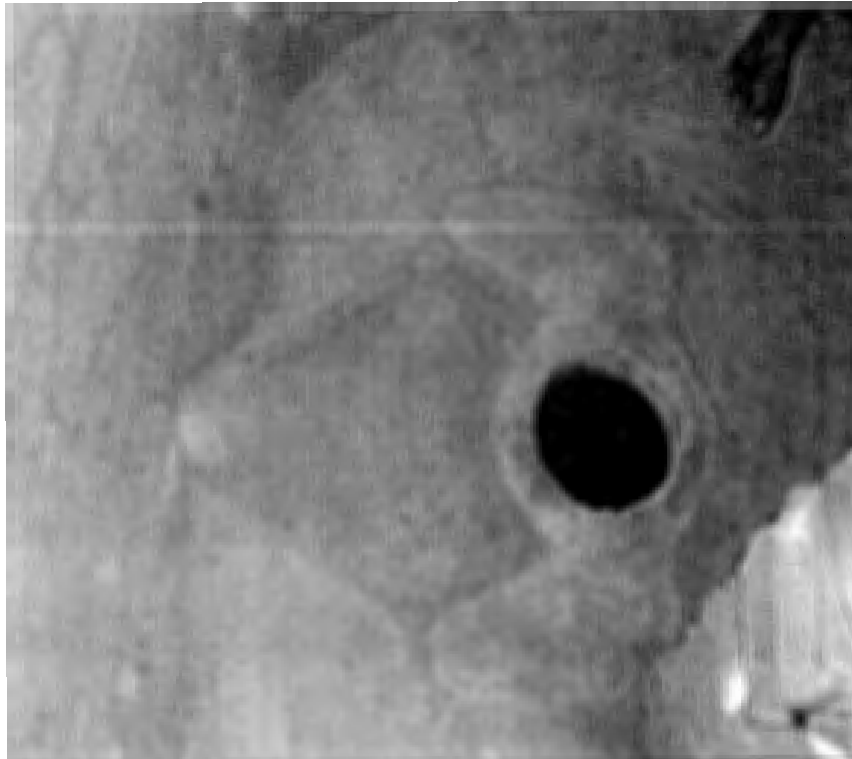
²² Malawi ODF Strategy, pg 9

²³ Malawi ODF Strategy, pg 9

3.4 Further Definitions

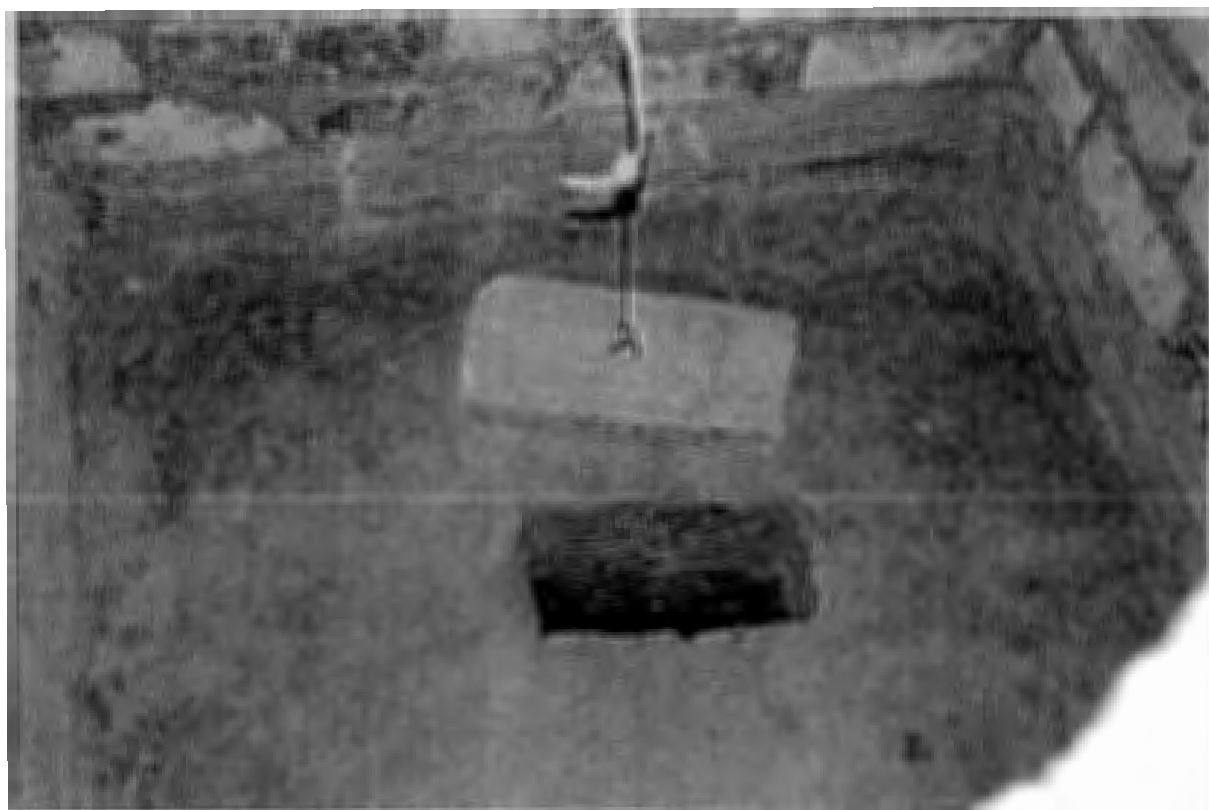
This section provides further definitions for important concepts related to sanitation and hygiene.

3.4.1 Impermeable Floor (Latrine)



An impermeable latrine floor may be made from cement plaster, concrete, ceramic, fibre glass, metals, plastic, clay tiles/burn bricks plus mortar, or other materials that can be cleaned easily. An impermeable floor must be smooth and solid, have no cracks, perforations, or openings other than the drop-hole

3.4.2 Drop Hole Cover (Latrine)



A drop hole cover should be tight fitting and cover the entire latrine drop hole. No gaps should be present that would allow flies to escape the latrine. A drop hole cover should be fitted with a handle for easy removal and replacement

3.4.3 Hygienic Hand Washing Facility

A hand washing facility should allow for free flowing water to be released over the hands (e.g. bucket with tap, home plastic water facility, jug and bowl and Soap should also be available next to the hand washing facility



4.0 WATER RESOURCES MANAGEMENT AND DEVELOPMENT



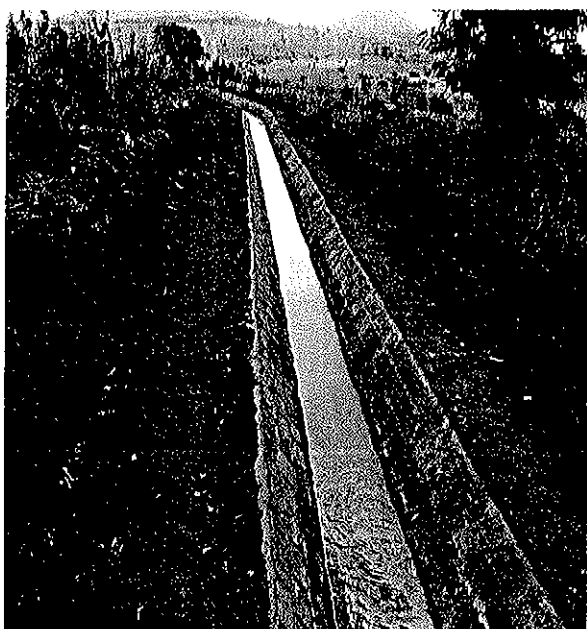
ITEM	THEME	CONCEPTS	DEFINITIONS
1	Water Allocation	Water Rights	License issued to allow water users to abstract specified volume of water from a water body for a specified time period.
2		Effluent Discharge Permit	License issued to allow polluter to discharge wastewater with specified qualities into any receiving water body for a specified time period.
3		Certificate of Easement	Certificate issued to allow water users to pass through somebody's land in order to have access to water resources
4		Equitable water allocation	Fair distribution of water resources to all water users
5	Eco-hydrology	Aquatic Weeds	Aquatic weeds are all unabated plants which grow and complete their life cycle in water.
6		Water Year	A 12 month period used as a basis for processing river flows and other hydrological data. A water year is usually selected to begin and end during a relatively dry season for example Malawi's water year starts in November and ends in Oct.
7		Water Area	Means the area declared under section 4 of the Water Works Act as being an area serviced by a water utility.

8		Catchment area	Refers to the surface or area that harvest rainwater directly before being channeled to a storage structure or into the field.	
9		Buffer Zone	A strip of vegetated or bare land along a river bank/shoreline of a watercourse, which acts as a screen for protecting the water body or a receptor from environmental degradation.	
10		Effluent	Wastewater or other fluid originating from a domestic or an agricultural or industrial activity, whether treated or untreated and whether discharged directly or indirectly into the environment.	
11		Riparian Country	A country through or along which portion of a transboundary river flows or a common water body lies.	
12	Water Harvesting	Rain water	All water collected after a precipitation event from impervious areas that do not allow water to permeate through such rooftops, cemented areas, polythene mulch etc that are used before it is drained out of the area.	
14		Dam	Any artificial barrier and its appurtenant works (such as outlet pipes) constructed for the purpose of holding water or any other fluid.	
15		Pond	A body of standing water, either natural or man-made, that is usually smaller than a lake.	
		Reservoir	A natural or artificial place (pond or lake) where water is collected and stored for use.	
17		Active storage	The usable storage volume of water in a reservoir that is free from sedimentation effect	
18		Dead Storage	The storage volume in a reservoir not usable and left for accumulation of sediments	
19		Maximum Impoundment Capacity	Maximum Impoundment Capacity is the volume of water held when the water surface is at the top of the dam.	
20		Spillway	Spillway is a structure which discharges flows from a reservoir. It is also known as by-wash.	
21		Auxiliary Spillway	Auxiliary spillway is a secondary spillway designed to operate only during large floods	
22	Spillway Design Flood	Spillway Design Flood (SDF) is the largest flow that is designed to pass the dam safely.		
23	Freeboard	Freeboard is the vertical distance between the design high water level and the top of the dam.		

24		Appurtenant works	Appurtenant works are structures or materials built and maintained in connection with dams. These can be spillways, low-level outlet works and conduits.
25		Probable Maximum Flood	Probable Maximum Flood (PMF) is the flood that can be expected from the severest combination of critical meteorological and hydrologic conditions possible for the particular region. It is the flow resulting from the PMP.
26		Probable Maximum Precipitation	Probable Maximum Precipitation (PMP) is the maximum amount of precipitation that can be expected over a drainage basin.
27		Flood Routing	Flood Routing is the computation which is used to evaluate the interrelated effects of the inflow hydrograph, reservoir storage and spillway discharge from the reservoir.
28		Cofferdam	Temporary structure enclosing all or part of the construction area so that construction can proceed in the dry.
29		Seepage Collar	Structure built around the outside of a pipe or conduit under an embankment dam to lengthen the seepage path along the outer surface of the conduit.
30		Dam height	Dam Height is the vertical dimension from the downstream toe of the dam at its lowest point to the top of the dam.
31		Toe of dam	Toe of Dam is the junction of the downstream face of a dam and the natural ground surface, also referred to as downstream toe. For an earth dam the junction of the upstream face with the ground surface is called the upstream toe.
32		Throw back (fetch)	Throw back is the length of the longest stretch of water surface on the reservoir at full supply level
33		Energy Dissipater	Energy Dissipater is a structure constructed in a waterway which reduces the energy of fast-flowing water.
34	Ground Water	Shallow well	A hole which has been dug, bored, driven or drilled into the ground to depth of less than 25m for the purpose of extracting water.
35		Borehole (Deep Well)	A hole which has been dug, bored, driven or drilled into the ground to depth of more than 25m for the purpose of extracting water.
36		Sustainable yield	A safe yield of water extraction per unit time, beyond which the aquifer risks the state of overdrafting or even depletion
37		Dry borehole	Borehole with no or limited water supply due to limited recharge (yield of less than 0.25l/s)

38	Wet Borehole	Borehole that adequately supply water at a rate of more than 0.25l/s.
39	Recharge	The process of surface water joining the groundwater aquifers
40	Aquifer	Wet underground layer of water bearing-peameable rock or unconsolidated material from which groundwater can be extracted.
41	Water table	Water table the level of water within inter-granular pores of soil below which the pores of the host are saturated

5.0 IRRIGATION SERVICES



ITEM	THEME	INDICATOR/ CONCEPTS	DEFINITIONS
1	Land Under Sustainable Irrigation	Potential area	Area that can accommodate irrigation development and is characterized by adequate water quantities and quality, soil fertility, appropriate topography and land tenure among others.
2		Developed area	Area that has been provided with irrigation infrastructure that is able to supply water for crop production.
3		Rehabilitated area	Area where irrigation infrastructure has been restored to its design operational level and is able to supply water for crop production.
4		Utilised area	A percentage of the developed area that is under irrigation.
5		Mordenised/ upgraded area	Existing developed area whose irrigation facilities have been improved

INDICATORS CONCEPTS AND DEFINITIONS FOR IRRIGATION, WATER AND SANITATION

ITEM	THEME	INDICATOR/ CONCEPTS	DEFINITIONS
6		Gross Area	Area of the scheme or site including agricultural land used for agricultural purposes, irrigation facilities and land incidental to them

ITEM	THEME	INDICATOR/ CONCEPTS	DEFINITIONS
1	Crop Diversification and Intensification	Area under main staple crops	Area planted to food crops such as maize or rice or sorghum or cassava
2		Area under high value crops	Area planted to crops which fetch high prices on the market like horticultural crops, sugarcane, tea, cotton, tobacco, etc
3		Area under 3 or more cropping cycles	Area where 3 or more crops are grown consecutively within one year
4		Area under 2 cropping cycles	Area where 2 crops are grown consecutively within one year

INDICATORS CONCEPTS AND DEFINITIONS FOR IRRIGATION, WATER AND SANITATION

ITEM	THEME	INDICATOR/ CONCEPTS	DEFINITIONS
5		Area under 1 cropping cycle	Area where 1 crop is grown within one year
6	Farmers and Farmer Organisations	Irrigators	Farmers engaged in irrigation farming
7		Water Users Association (WUA)	A group of irrigators, with a common water intake point, organized for the purpose of operation, management and maintenance of irrigation facilities with legal status.
8		Water Users Group (WUG)	A group of irrigators, with a common water intake point, organized for the purpose of operation, management and maintenance of irrigation facilities but without legal status.
9	Productivity	land productivity(Tonnes/ha/crop)	Crop yield realised per hectare of land
10		water productivity(Tonnes /m ³ /crop)	Crop yield realised per cubic metre of water
11		Total investment (MWK/year)	The total cost of developing area for irrigation incurred in one year
12		Area under private sector management	Area under irrigation that is managed by commercial farmers or Civil Society Organisations

ITEM	THEME	INDICATOR/ CONCEPTS	DEFINITIONS
13	Optimised Investments	Matching grants	This is a grant that is awarded only if the receiving entity is able to put up (or independently raise) a sum proportional to the amount provided by the granting entity.
14		Area maintained through matching grants	Area maintained through the contribution made toward irrigation development by financier in proportion to beneficiary contribution.
15		Area utilised without matching grants 2 years after handover	Area utilised through the smallholder farmers' own contribution after graduating from use of matching grants.
16		Hectarage developed under PPP arrangements	Area developed using collaborative arrangements between smallholder farmers and investment partner.
17		Number of WUAs accessing and repaying credit	Water Users Associations that are able to benefit from microfinance institutions and to pay back loans.
18		Funds disbursed through Irrigation Fund	Funds that interested irrigation farmers will be able to access from a government established

ITEM	THEME	INDICATOR/ CONCEPTS	DEFINITIONS
			fund for irrigation development through submitting proposals.
19		Irrigation Technology	An irrigation technology is a device or technique used to improve irrigation water abstraction, conveyance, distribution or application.
20	Business Culture	Produce sold at competitive prices	Crops sold with optimum profits following a proper market research
21		Average income per hectare of irrigated crop	Returns obtained after sale of irrigated crop .
22		Average production per hectare of irrigated crop	Produce obtained from a hectare of irrigated land.
23		Marketing and processing centres	Infrastructure developed for value addition and distribution of irrigated crop produce.
24		Total investment in storage, processing and marketing	Financing of marketing and storage infrastructure b.
25		Area under private sector management ²⁴	Area under irrigation that is managed by commercial farmers

²⁴ Private sector refers to firms or organizations participating in irrigation on a large commercial basis. Individual independent farmers doing irrigation on smallscale are categorized as smallholder farmers in this context

