

WATER LOSS & SEWERAGE LEAKS, ENVIRONMENTAL & HEALTH CRISIS



**Translating grass roots successes into working solutions
– and financial savings – for the City of Johannesburg**

Report produced by Sticky Situations in partnership with WASSUP.
Written and researched by Tanya Zack and Kirsten Harrison, photographs by Mark Lewis.



FIGURE 01: ON THE COVER: Toilets in Diepsloot Extension 1. Photograph by Mark Lewis 2018

FIGURE 02: Princess Zondi of WASSUP installing PVC pipes on communal toilets. Photograph by Sean Kearney

IWSH.org

The International Water, Sanitation and Hygiene Foundation



A proposal for the adoption of the WASSUP programme, principles and practices by the City of Johannesburg, in order to scale up the provision of sustainable water and sanitation services in Diepsloot and in other under-served communities.

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FIGURE 03: Junitha Kgatla of WASSUP shows a WASSUP maintained toilet



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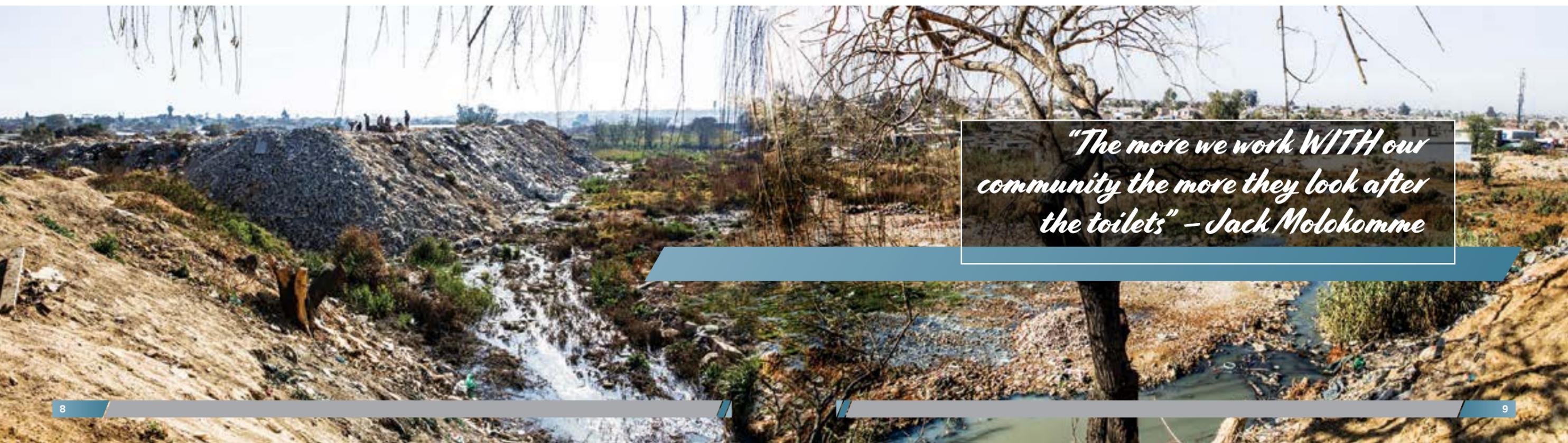
FIGURE 04: Community Plumbing Challenge (CPC) Diepsloot 2016, working at the Father Louis Blondel Youth Centre.

Acronyms, abbreviations and terms used throughout this document

BPEC	British Plumbing Employers Council, British based network of employers, colleges and private training providers, offering quality training materials, assessments and qualifications. www.bpec.org.uk
CDW	Community Development Worker, Gauteng provincial government Department of Corporate Governance and Traditional Affairs, South Africa. CDW's are deployed to maintain direct contact with the people where they live and to ensure that government improves the qualities of the outcomes of public expenditure. http://www.gauteng.gov.za/government/departments/co-operative-governance-and-traditional-affairs/Pages/About.aspx
CASE	Community Agency for Social Enquiry, a leading South African research NGO focusing on socio-economic and policy issues in support of social and economic justice.
CoJ	City of Johannesburg, the municipal department which Diepsloot is part of, within Region A.
CSUD	Centre for Sustainable Urban Development, a research body within the Earth Institute at Columbia University http://csud.ei.columbia.edu/
DAP	Direct Aid Program, Australian High Commission https://southafrica.embassy.gov.au/ . A small-grants scheme aiming to support non-profit organisations working in local communities on activities which support sustainable and equitable development.
DBSA	Development Bank of Southern Africa, an organisation which seeks to play a pivotal role in delivering developmental infrastructure in South Africa and the rest of the African continent. https://www.dbsa.org/
GCRO	Gauteng City Region Observatory, a research unity the builds the data, information and analysis to help inform development in the Gauteng region. http://www.gcro.ac.za/
Healthhabitat	Healthhabitat, an Australian company that aims to improve the health of disadvantaged people, particularly children, through the improvement of housing and general living environment. http://www.healthhabitat.com/about

IAPMO	The International Association of Plumbing and Mechanical Officials (IAPMO): A US-based NPO that continues to support WASSUP through skills development, training and knowledge sharing via its charitable foundation, IWSH: the International Water, Sanitation and Hygiene Foundation.
IWSH	International Water and Sanitation and Hygiene, a division of IAPMO, with a specific focus on the role of the Plumbing Industry in community collaborations and educational exchange. http://www.iwsh.org/
JDA	Johannesburg Development Agency, a development arm of the City of Johannesburg whose mission is to plan, implement, manage and facilitate area-based developments in efficient, equitable, sustainable and innovative ways. http://www.jda.org.za/
kL	kiloLitres equal to 1,000 litres, which is one cubic metre of water.
NDP	National Development Plan, a South African national government plan which aims to eliminate poverty and inequality by 2030. https://www.gov.za/issues/national-development-plan-2030
SANCO	South African National Civic Organisation, Civic Movement representing the lives of ordinary people in accessing the services available from different government departments and other parastatals.
SDG	Sustainable Development Goals, a series of goals developed by United Nations as a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity. http://www.undp.org/content/undp/en/home/sustainable-development-goals.html
WASSUP	Water, Amenities, Sanitation Services, Upgrading Program, Cooperative formed by Diepsloot residents in order to tackle the water and sanitation crisis in Extension 1 of Diepsloot. www.facebook.com/WASSUPDiepsloot/

FIGURE 05: Illegal dumping on Diepsloot's wetland, Photograph by Mark Lewis 2018



"The more we work WITH our community the more they look after the toilets" – Jack Molokomme

Adopting the WASSUP programme for sustainable water and sanitation services in Diepsloot and elsewhere

EXECUTIVE SUMMARY

Since its founding in 2008, WASSUP (Water, Amenities, Sanitation Services, Upgrading Program) Diepsloot, a community-based organization, in collaboration with Sticky Situations, a Johannesburg based organisation, has worked against extraordinary odds to improve water and sanitation services in Extension 1, Diepsloot township, Johannesburg. In collaboration with international partners including Global Studio, Healthabitat and IAPMO, WASSUP has been able to make excellent progress, given the crisis our city's human settlements are facing in terms of health, environment, sanitation, resources and wellbeing.

For over ten years WASSUP has been repairing and maintaining communal toilet facilities in Extension 1. Working with limited resources, **the co-operative has not only developed a sustainable and accountable repair and maintenance model, it has also developed a water tracking system that has helped to generate important data around water use and huge potential cost savings for the City of Johannesburg.** WASSUP's processes and practices provide scope for innovative best practice. The methodology developed is an easily adoptable model that can be applied at scale to existing City infrastructure.

This submission argues that it is time for the City of Johannesburg to step up to its responsibilities in Diepsloot and to provide the much needed financial and technical resources that will ensure comprehensive and sustainable water and sanitation services to under-served populations across the city of Johannesburg. Such action by the City would be in line with its commitment to South Africa's National Development Plan (NDP) and its commitments to the UN Sustainability Development Goals, especially Goal 3 (Good health and well-being), Goal 6 (Clean water and sanitation) and Goal 11 (Sustainable cities and communities).

This submission also argues that the people-centered approach developed by WASSUP and Sticky Situations provides **a model that the City of Johannesburg can adopt, build upon, and successfully implement into other communities in need across the city.**



FIGURE 06: WASSUP Diepsloot team at their headquarters in Diepsloot, 2018

Introduction

The need for improved water and sanitation services remains a huge challenge across South Africa, particularly for those living in informal settlements. Within these marginalised areas, great vulnerabilities exist with respect to poor or non-existent physical and social service provision and maintenance. Grossly inadequate water and sanitation services continue to deprive residents of adequate health, social and environmental conditions and, very importantly, their personal dignity.

These challenges are acutely evident in Diepsloot, an informal settlement in the north of Johannesburg. In the most densely populated area — Extension 1 — with **25,000 registered shacks** (registered with the City of Johannesburg Housing Department, not including the non-registered shacks built in between the registered shacks¹), there are only **642 toilets**, this means that an average

of **39 households share one toilet, tap and drain**. In the absence of government intervention and support, the responsibility for attending to this critical situation has been taken up by WASSUP, a community-based organisation that has, since 2008, worked consistently and collaboratively to try improve water and sanitation services in Extension 1. Over the last decade, WASSUP has not only been involved in the repair and maintenance of toilet facilities, but has also carried out monitoring and reading of water meters so as to gather important data related to water usage, savings and performance when water and sanitation services are better attended to. The data shows strong evidence that there are big savings to be made from better maintained water and sanitation facilities; savings not only in financial capital, but also in physical resources and human capital.

1. Figure provided verbally at a meeting with Department of Housing, Region A, City of Johannesburg.

FIGURE 07: Toilets in Diepsloot's Extension 1. Photograph by Mark Lewis 2018



DIEPSLOOT EXTENSION 1

25,000
registered shacks

642
toilets

39
households
per toilet

FIGURE 08: Jack Molokomme of WASSUP shows a WASSUP maintained toilet

This report seeks to highlight WASSUP's work on the ground and the improvements the organisation has been able to make, as well as explain WASSUP's research and research outcomes. In doing so, the aims of the report are three-fold. Firstly, the report highlights the necessary and important work being undertaken by a community-based organisation, developed in response to a lack of government support and investment. Adopting a **'bottom-up' approach**, these change agents – local men and women – continue to work at the **grassroots, sharing and building on local knowledge and skills**. Secondly, the report argues that it is **critical for the City of Johannesburg to take greater responsibility** – financial and technical – to ensure that **comprehensive and sustainable water and sanitation services** are available for people in marginalised informal areas, in and beyond Diepsloot. Ultimately, this report recommends, in the strongest terms, that the WASSUP's well-developed, **people-centred programme** and methods should be adopted and built upon by the City of Johannesburg, so that they can be implemented in Diepsloot and in other communities in need.

The provision of comprehensive and sustainable water and sanitation services is a key policy and practical consideration at both a local and a global level. At a local level, the South African National Development Plan (NDP) explicitly seeks to address past injustices and to guide the country's development policies and actions with the aims of eliminating poverty and reducing inequality. The NDP is instituted through five-year Medium-Term Strategic Frameworks. The provision of comprehensive water and sanitation services is addressed in a number of Outcomes, or targets, to be achieved: **Outcome 2:** A long and healthy life for all South Africans; **Outcome 6:** An efficient,

competitive and responsive economic infrastructure network; **Outcome 8:** Sustainable human settlements and improved quality of household life; and **Outcome 10:** Protect and enhance our environmental assets and natural resources.

At a global level, emerging from the UN 2030 Agenda for Sustainable Development, the Sustainable Development Goals (SDGs) further develop the Millennium Development Goals (MDGs) into broader sets of priorities and aspirations to guide all countries in tackling their most pressing challenges. The SDGs emphasize the interlink between the social, economic and environmental dimensions of these challenges and contexts, and encourage broad-based and collaborative mechanisms to achieving these goals. Although not legally binding, the SDGs have captured interest and support across most countries and sectors and have spurred the development of new initiatives, partnerships, networks and policy considerations.

The provision of comprehensive and sustainable water and sanitation services is addressed in 3 Goals of the SDGs: **Goal 3** - Ensure healthy lives and promote wellbeing for all at all ages; **Goal 6** - Ensure availability and sustainable management of water and sanitation for all; and **Goal 11** - Make cities and human settlements inclusive, safe, resilient and sustainable. This highlights the importance of water, sanitation and hygiene as a fundamental and basic human right that cross-cuts a whole host of social and political considerations, including health; food and energy provision; economic growth; and gender equality and inclusivity. In addition, environmentally it addresses the sustainability of ecosystems and biodiversities, and contributes to mitigation against climate change.



SUSTAINABLE DEVELOPMENT GOALS



FIGURE 09: Sustainable Development Goals
<http://www.undp.org/content/undp/en/home/sustainable-development-goals.html>

South Africa played a key role in the negotiations and processes that led to the development of the 2030 Agenda for Sustainable Development. Many aspects of these negotiations were informed by the priorities of National Development Plan, underscoring a clear link between challenges and considerations on the ground and at the level of policy, as well as the need to align national policies with global development goals.

South Africa's constitution contains a **Bill of Rights** which also addresses basic human rights: 'This Bill of Rights is a cornerstone of democracy in South Africa. It enshrines the rights of all people in our country and affirms the democratic values of human dignity, equality and freedom.'² The issue of water and sanitation are addressed in three chapters:

- Everyone has inherent dignity and the right to have their dignity respected and protected.
- Everyone has the right to an environment that is not harmful to their health or wellbeing.
- Everyone has the right to have access to sufficient food and water.

This report seeks to lodge the important and necessary work undertaken by WASSUP between these local and global policy and practical considerations. Realising the goals for comprehensive and sustainable water and sanitation services needs to answer both local as well as global imperatives, that require broad-based partnerships to account for the full integration of social, economic and environmental levels of sustainable development across all sectors. **This integrated approach fosters a mindset of ownership, agency and strategic leadership across the whole of society, not simply within government.** These are the types of best practice considerations and strategies that WASSUP have put into place within Extension 1, Diepsloot, which have enabled them to achieve what they have thus far. These are also the types of best practice considerations and strategies that speak simultaneously to the imperatives and outcomes set out in the NDP and the SDGs.

2. <http://www.justice.gov.za/legislation/constitution/SACConstitution-web-eng-02.pdf> Sourced 14 November 2018

The case for City of Joburg adoption of the WASSUP Programme

Diepsloot residents experience grossly inadequate water and sanitation services, with the majority depending on insufficient public toilets and taps. In the most densely populated area, Extension 1, there are only 642 toilets with each serving an average of 39 households, **although the figure of households sharing is probably much higher.**³ The extreme density in Extension 1 make it essential to limit the 'down time' (loss of service) of any water supply, toilet or wastewater facility, with the result that the services need constant repair. There is no government-based ongoing public maintenance and repair programme to ensure that the toilets and taps remain in good working order. WASSUP, a community-based organization, has been filling this gap for a decade, over which time it has built an effective community-centered approach to sanitation service provision. Whilst the organisation has been successful in building confidence and skills, it has also struggled in an environment of financial challenges and rapid population growth.

Since its inception in 2008, WASSUP has developed a programme for the repair and maintenance of toilets, taps and drains in Extension 1. That programme however has now reached its funding limit. Because it is a viable and necessary service in Diepsloot, with a proven track record, it would benefit the City of Johannesburg to absorb the programme and the elements associated with it. It is also a programme that can usefully and sustainably be rolled out to other informal settlements in Johannesburg. This document outlines the context, background and workings of the WASSUP programme, and motivates strongly why it should be adopted by the City of Johannesburg.

"Sometimes toilets and taps are not working for months and even years, if we don't fix them, no one will."
 – Lerato Monama

FIGURE 10: Isaac Nkhoesa, Zonke Ngunuza and Siza Mamosebo, some of the residents of Rabie Ridge facilitated by Sticky Situations and WASSUP Diepsloot to pilot a program to repair taps in their township of Rabie Ridge. Photograph by Mark Lewis 2018



3. Figure is based on information provided by City of Joburg officials of 25,000 registered shacks. The same officials also state that the figure does not include the shacks built in between the registered ones, and all agree the figure is most likely much higher.

1. THE DIEPSLOOT ENVIRONMENT

1.1 Context

Diepsloot is one of the most disadvantaged areas in the city of Johannesburg. Its residents are economically, socially and environmentally marginalized. Initially established as a transit camp, Diepsloot has long acted as a reception area for new migrants to the city, experiencing fast growth since its establishment in 1994 (Harber, 2011: 9). It is now estimated that Diepsloot is home to between 500 000 – 800 000 residents (there is currently no accurate data available on this figure, all reports and officials have

only widely varying estimates). Diepsloot is 5.18 km² in size and has a mixture of formal and informal housing and development. Estimates suggest that around 76% of residents live in informal settlements/informal housing/backyard structures (www.alhdc.org.za). The Region A officials responsible for Housing recently stated there are 25,000 registered shacks in Extension 1 of Diepsloot, but this does not include the dwellings built in between the registered shacks.⁴

According to the GCRO's (Gauteng City Region Observatory) Quality of Life Survey (2017), Diepsloot residents have varying levels of deprivation. Many of its residents' experience:

- Poverty
- Unemployment
- Lack of access to housing, and
- Poor public health

(Zack, Harrison and Govender, 2017: 19).



FIGURE 11: Jack Molokomme, members of WASSUP Diepsloot, steps across a river of household garbage, leaking sewerage and leaking water. Photograph by Mark Lewis 2018

Government interventions to address these issues have been sporadic and inadequate. Improving the quality of life in an informal settlement requires both a physical platform of a safe and healthy environment and a social infrastructure or human development platform of opportunity for health, learning, employability and social integration (Zack et al, 2017: 19).

The South African Cities Network (2013) argues in favour of upgrading that secures health and safety. It suggests:

- Short-term interventions (clearing storm water drainage or social interventions)
- Medium-term interventions (installing simple infrastructure)
- Long-term visions on how to transform and integrate the informal settlement (SACN, 2013)

The lack of access to services creates great vulnerability amongst households. As far back as 2006, a quality of life study done by CASE indicated that residents of Diepsloot were unhappy with water and sanitation (2006: 55). At that time, residents complained that not only were toilets in a state of disrepair, but they were inadequate for a growing population. The condition of water and sanitation services in Diepsloot remains dire and the health and social conditions of those living in informal settlements requires urgent interventions. The South African Early Childhood Review 2017 concludes that over 1,5 million children in South Africa don't have accessible toilet facilities. One result of this lack of sanitation is **diarrhea which results in one fifth of deaths of children under five in South Africa** (Farber, 2017).

4. Region A officials informed us of this figure during a meeting in 2018.

1.2 Communal toilets in Diepsloot, Ext 1

Extension 1, Diepsloot is the reception area of the informal settlement. In theory, new arrivals to the area move into Extension 1 and will at some point be resettled elsewhere. In reality this settlement has a permanent footprint but lacks the basic level of services required to provide a platform for formalisation or permanence. In addition to there being a sheer absence of the most basic service as well as many service backlogs, the area is subject to extreme levels of pollution from contaminated water, sewage overflows and unmanaged levels of solid waste. Combined with a lack of adequate lighting and electricity, these conditions confine residents to very poor living conditions with dire health and safety risks. Residents are confronted by many environmental and service delivery challenges on a daily basis, which inhibit the possibility of living dignified and productive lives in the settlements. A report on Diepsloot by CORC (2005) highlighted the following problems:

- Water shortages and low water pressure
- Sewerage problems
- Lack of service infrastructure such as roads, public lighting, street names and bridges
- Stormwater drainage and management
- Use of communal taps and chemical toilets
- Limited community facilities



FIGURE 12: Child in a typical Extension 1 Street. Photograph by Mark Lewis 2018

The maintenance of toilets and of water points are amongst the most basic steps required for securing basic health and safety and dignity of life. As recently as 2016, the Diepsloot Times (2016) argues that living conditions in Extension 1 continue to

deteriorate, highlighting the plight of human densification only being served by 642 public toilets. The toilets have been in the settlement for over 20 years but there is no government programme for the maintenance of these services. Located on the sides of

uneven informal gravel pathways and in small clearings amongst the shacks of the settlement, the location of the toilets and their lack of maintenance has resulted in not only public health problems but also safety issues for women and children.



FIGURE 13: Constant sewerage leaks cause both a serious health hazard as well as deteriorate road infrastructure. Photograph by Mark Lewis 2018

RABIE RIDGE EXTENSION K60C

High densities

In the same study, extension K60B, right next door with much higher densities, was shown to have over 400 households per water stand.

FIGURE 14: The Rabie Ridge pilot project was rolled out to extension K-60C, counted to have 810 households with 7 working tap stands, which averages to 116 households using 1 water stand. With a South African average household size of 3.3, that's an average of 382 people sharing 1 water stand. (<https://www.statssa.gov.za/publications/03-01-06/03-01-062016.pdf> sourced 30.OCT.2018). Data collection and map by Sticky Situations. Aerial map from Google Maps. Photograph by Mark Lewis 2018.



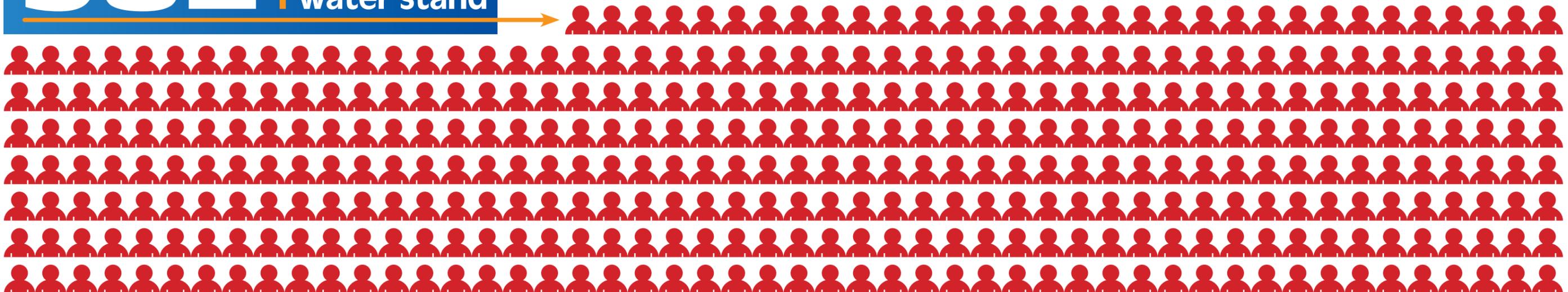
810 households

2,673 residents *

7 working water stands **

116 households share 1 water stand

382 people share 1 water stand



2. THE WASSUP PROGRAMME

2.1 What is WASSUP?

The Water, Amenities, Sanitation Services, Upgrading Program (WASSUP) emerged in the context of the crisis for public toilets in Extension 1, Diepsloot. WASSUP, which began in Extension 1 has, through its work, developed into a participatory and co-operative community sanitation project. It emerged from The Global Studio program and the WASSUP team was formed by then Ward Councillor Mahlangu (now Ndlazi), and Community Development Workers Sam Sikhosana and Dorah Mogano.

Since the conceptualization and piloting of the programme in 2007 during the Global Studio program, followed by formalization into a community-based repair program in 2009, the team of residents who make up the

WASSUP Diepsloot co-operative have continued to provide **repairs and maintenance to different sections of the 642 communal toilet facilities located in Extension 1**. This has been done through **employing and training 6 residents** who live in Extension 1, plus developing a series of **partnerships with local and international organisations**. Unfortunately, this innovative programme has occurred in a context where the **maintenance of public toilets is largely overlooked by local municipalities**. While City of Johannesburg municipal departments fund the extension of municipal infrastructures as a priority, once implemented, these toilets are mostly neglected. In fact, **it still remains unclear as to who in the local municipality is responsible for ongoing maintenance**.



FIGURE 15: Example of a before and after toilet repair in Diepsloot, Extension 1.



To date, the maintenance of toilets in this area has been undertaken through a mix of government and private sector donor contributions to WASSUP, who continue to function as a co-operative. Operating now for a decade, WASSUP's work has been noted for its **innovation, community engagement, training and good practice**. It offers processes and practices that have been developed

over a number of years and that hold important keys for a sustainable repair and upgrading system. WASSUP's impact on the communities in which it is working are manifold, and extend beyond maintenance to data collection and research support. Water use, tracked through water meter readings, indicate that post improvements for toilets and tap points, there was an average difference of **4,000 litres per day per**



FIGURE 16: WASSUP's work truck/bakkie is the most efficient system to access the internal streets of Diepsloot's Extension 1.

toilet water savings (see figure 21). WASSUP has worked with limited resources, yet it provides the scope to act as best practice in informal settlements throughout South Africa. As of now, the project is very localized and due to modest funding and resourcing it has not been scalable.

WASSUP also has an impressive history of partnering with local and international organisations. Through collaboration and with funding from various organisations (as detailed in Appendix 10.4), by 2016, **110 toilets had been upgraded through the program**, plus an **emergency repair program** has been implemented for residents to report on facilities that need attention outside of the 110 upgraded toilets. WASSUP however recognizes that upgrading is not the end point and that without ongoing maintenance of these public toilets, improvements made to people's lives through access to functioning water and sanitation can be short-lived.

The intentions of the project have started to spread beyond the location of Diepsloot, an indication of the potential that the project could have in other, under-served/less-served spaces. During 2018, a **pilot project for the repair of water taps was undertaken in Rabie Ridge**, a nearby township. This project was facilitated by Community Development Worker Evelyn Ramapulana and Ward Councillor Cllr Mokgoba Pakgadi of Ward 80, with a group of residents, (Isaac Nkhoesa, Zonke Ngunuza and Siza Mamosebo), calling themselves the 'Rabie Ridge Community Plumbers'. This pilot was rolled out across five extensions, with slight adaptations in response to local conditions (for example tap stands only in Rabie Ridge as opposed to toilets and taps and drains in Diepsloot), which demonstrates the **easy scalability and replicability of this model**.



FIGURE 17: Isaac Nkhoesa and Siza Mamosebo (working with Zonke Ngunuza) from Rabie Ridge Community Plumbers, residents of Rabie Ridge, facilitated by the CDW and Ward Councillor to mobilise to repair taps in their township. Photograph by Mark Lewis 2018

FIGURE 18: (Below) Woman carrying water in Rabie Ridge. Photograph by Mark Lewis 2018

2.2 WASSUP Aims

The aims of the repair and maintenance programme undertaken by WASSUP are:

- To establish high function rates of the health hardware: the trial project included repairing or replacing rusted water feed pipes, dysfunctional taps, cisterns, drains, doors, as well as testing basins across all of the toilet units and water access points included in the trial.
- To establish an efficient, responsive repair and maintenance programme across 110 toilet units (of the 642 toilet/tap facilities in Extension 1) and water access points.
- To demonstrate reductions in water losses resulting from leaks through the ongoing collection and analysis of water use data and the analysis of the financial savings that can be achieved through an effective repair and maintenance programme.
- To demonstrate the health improvements that can be achieved through the collection and analysis of Healthy Living Practice (HLP) data, (linking the safety and health of people to the functions of key parts of the house and surrounding living environment).⁵



“The residents talk to us every time we walk past, telling us where other problems are, and thanking us for doing the repairs.” – Isaac Nkhoesa

5. HLPs link the safety and health of people to the functions of key parts of the house and surrounding living environment

2.3 A programme of repairs

The WASSUP programme focuses on emergency and more routine work. Its targets are:

- Immediate repairs to be tackled within 4 hours. These are: blocked drains, blocked toilets, blocked water troughs, burst water pipes, dirty water inside and outside of toilets and contaminated water supply.
- Urgent repairs to be tackled in 2 days. These include overflowing cisterns, leaking taps, small leaks and cracked toilet pans.
- Routine repairs to be tackled within 3 months (each toilet to be dealt with at least once every three months). These included broken doors, broken door locks and cracked walls.

THE WASSUP IDEA

It's a simple idea: To ensure that the TAP, the TOILET and the DRAIN at each water or toilet point in the neighbourhood is in good working order, for residents

to walk into the toilet with dignity, and to walk out of the toilet with dignity.



TAP: The water available at each toilet structure supplies water for drinking, cooking, washing people, hand washing after toilet use, clothes washing and cleaning.

The tap is in good order when: water is available at the tap point, the tap turns on and off easily and does not leak.

There must be an easily accessible and working stop valve to ensure that maintenance of the cistern and tap is possible.



TOILET: The toilet is in good working order when: there is a toilet pan and a cistern available and in good condition, the pan is stable and not cracked and the cistern and lid are well secured and not damaged. The toilet flushes waste away and refills with water in 3 minutes or less. There is a door that gives privacy.

Other items that impact on the toilet function include an outside lock, a tethered toilet brush and a toilet seat.



DRAINS: All drainage for toilet wastewater and all other washing water are in working order when: there is a well-sealed, unbroken pipe to take toilet waste to the sewer system and there is a working drain near the tap point to drain general wastewater from cooking, washing, clothes washing or hand washing to the sewer system. If a tub / basin is provided, it drains water to the sewer system.

The importance of good drainage cannot be emphasized enough. If the pipe behind the toilet or the general waste-water drain is cracked, blocked or broken, wastewater may end up on the street. Even small cracks or missing caps will allow flies, insects and vermin to breed and to spread disease. The wastewater may also erode the street and undermine the toilet structure.

Other items that impact on the water supply, toilet function and drainage include the built structure around the toilet. If that building is in poor condition with large cracks or holes in the walls or roof, all the above services may be unusable.



FIGURE 14: WASSUP Diepsloot's motto printed on their work t-shirts



FIGURE 19: Residents have been trained in plumbing skills, and some are pursuing formal plumbing qualifications – mostly thanks to the assistance from partners such as Healthabitat, WorksSkills Foundation, IAPMO and The Australian Government.

2.4 Training and local employment

Initially a team of 10 residents were appointed to undertake training and do the repairs through the facilitation of the Ward Councillor and Community Development Workers. The team was selected to represent gender, local organisations, local government, youth and disabilities. But the work is not for everyone and people move on, so over the years the team has refined to a solid core of 5 co-operative members who are owners of and workers within the co-operative, with 1 employee who administrates the daily routines of parts, tools reports and community reporting.

WASSUP has trained 6 residents in the repair of toilets with 4 attending formal training at qualified plumbing centres, 1 attending safety courses, and one employee adopted from a Gauteng Provincial women's empowerment program that had already received basic plumbing training. An operations centre has been set up for this purpose and for the storage of materials and the community reporting station. With 6 full time employed people this is around **1,440 days of employment per year**.

In addition, **WASSUP sources materials locally** when possible, as well as appoints **local small businesses** when required within their programs.

2.5 Community Engagement

The WASSUP Diepsloot team are all residents of Diepsloot, 4 currently reside in Extension 1. All of the members are active in their community in different ways, for example SANCO (South African National Civic Organisation) members, clean up campaigns, community meetings, CPF volunteers, and all are generally supportive of many community events through their own leadership skills. This means they are well equipped for engaging the neighbourhood of Extension 1.

At program inception, WASSUP spent a lot of time engaging Diepsloot organisations and community leaders, also talking to residents and neighbourhood block leaders about their program. This has ensured a smooth implementation process and ongoing work for the past 8-10 years.

WASSUP continue to conduct ongoing neighbourhood public programs about water awareness, human rights issues, environmental campaigns, and of course Mandela Day programs.

WASSUPs skills have become strong enough to facilitate a similar pilot program in Rabie Ridge, supporting a community team to repair taps in their own neighbourhoods. In addition, WASSUP conducted toilet repairs in buildings in Jeppestown in collaboration with neighbourhood women.



FIGURE 20: Community awareness programs in Diepsloot by WASSUP and Sticky Situations. This event was demonstrating to residents what 1 KiloLitre of water looks like in physical size (1m³) and sharing the data of how much water the WASSUP repairs are saving.

2.6 Community Management

WASSUP are responsible to their own community, and in turn the community look after the toilets they are based in, live in, work in, or are associated with in their own community.

Toilets in Extension 1 are organized into a system of linking the households to a specific toilet. Households put in cash for a padlock and keys and toilets are locked when not in use and at night to ensure no damage occurs. Once WASSUP repairs a facility, they talk to the respective community, who in turn either buy a new lock and co-ordinate themselves, or reinforce the existing household to toilet allocation arrangements with residents allocated to that specific toilet/tap.

Residents of Extension 1 report broken facilities to

the WASSUP Community Reporting Window located in Extension 1. This reporting system is a rigorous system of locating said toilet, recording who reported it, inspecting the tools/materials required to repair, and carrying out the repair work. Ongoing accountability and monitoring is done by the community who communicate with WASSUP if the repairs are not carried out timeously.

The work undertaken by WASSUP is constantly inspected and supported by the local Ward Councilor and Community Development Worker. In addition, residents regularly report to WASSUP about problems and in turn will remind WASSUP if a reported problem has not been repaired. This is part of the **built-in monitoring system which holds WASSUP accountable to their own community.**



"If we don't do our job the residents always remind us as we walk past or knock on our doors or come to our office." – Obed Kekae

FIGURE 21: View of Diepsloot. Mark Lewis 2018



*"This our home where we live; our families are here, we work here, we play here, our children go to school here. But people are getting sick so we can't keep standing by and doing nothing."
- Luckie Manyisi*

FIGURE 22: Toilet in Diepsloot's Extension 1. Water leaks are a constant problem. Photograph by Mark Lewis 2018

3 OUTCOMES

3.1 Measuring improvements in water usage

Since 2014, regular water meter readings by WASSUP have helped provide information on:

- Toilet use and overall water use per toilet
- Mapping of toilets that have high and low use
- Tap point use
- Leaks and failures of all parts of the system
- Cyclical use trends



FIGURES 23: Water metres were installed (which required new galvanised pipes due to deterioration) and systems for regular readings were established.

This in turn has lead to:

- The specifying of better hardware
- A better understanding of the loading placed on the wastewater system
- The ability to compare the performance of toilets and tap points with improved hardware to the unmodified toilets.



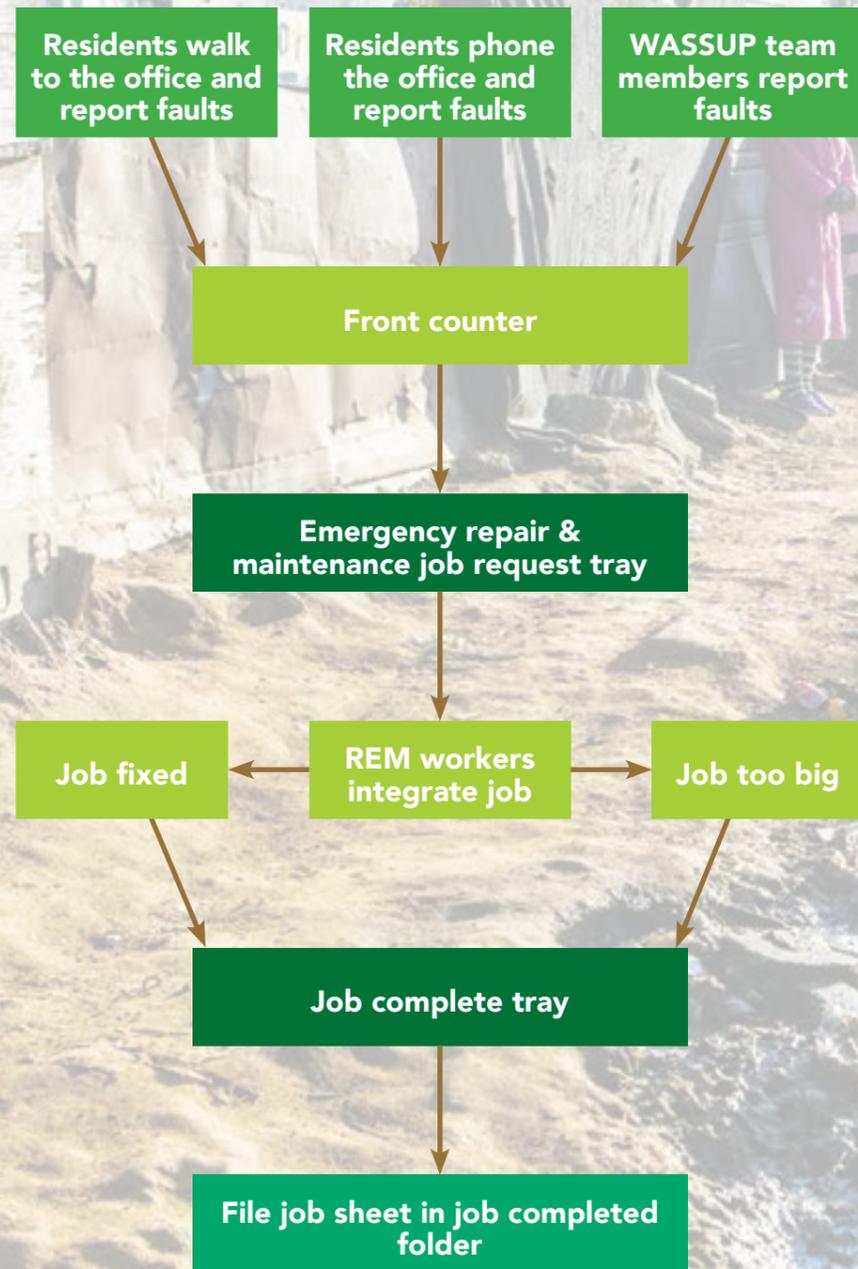
FIGURES 18: The top images show the deterioration of parts, which dispels the common misconception that facilities are always broken because of vandalism. The majority of cases show that damage occurs through sheer high densities and lack of any maintenance or repair program. The galvanised pipe here is clearly rusted from over 20 years of use since installation, the drains are broken due to people's attempts to repair and unblock, or as seen in the flexi-pipe fitting, the parts used can be sub-standard and break under water pressure. It is therefore critical to ensure the installation of SABS tested products and high quality fittings.



FIGURE 24: Water collection points in Rabie Ridge.

3.2 Establishment of efficient and responsive repair and maintenance program

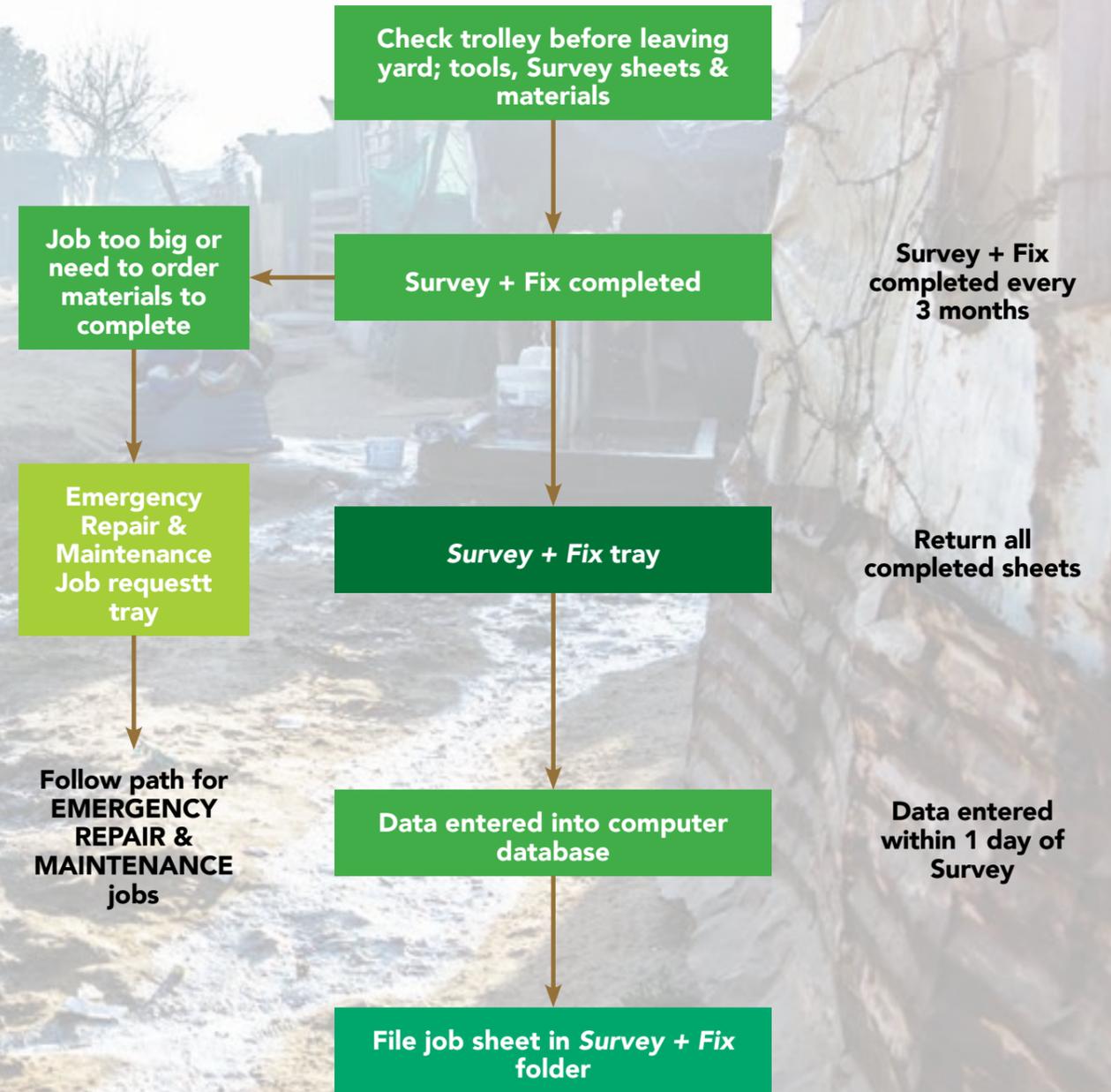
In March 2017 WASSUP hosted workshops to develop its Repair & Maintenance Systems which included work flow diagrams, repair response times; processes for reporting and completing resident emergency repair requests were developed and agreed. Survey + Fix (the name of the program to monitor and repair the 110 toilets) work flow diagrams were developed, trialed, agreed and documented.



WASSUP established a new office, front counter and material/tool store, establishing a strong and resilient team; possessing the tools required to get the job done, whilst also creating sustainable local employment, all of which has been critical to the success of this project

3.2 Establishment of efficient and responsive repair and maintenance program

Work flow diagrams for the Survey + Fix, and processes for completing the Survey + Fix were trialed, agreed and documented.



FIGURES 25: Systems developed for the WASSUP program: Work flow diagram plus processes for reporting and responding.

Background photo of Rabie Ridge street. Photograph by Mark Lewis 2018.

FIGURE 26: Jack Molokomme of WASSUP repairing toilets in Diepsloot, Extension 1.



10 upgraded toilets

Saved **1.6million** litres of water

In **42** days



3.3 Results

Lead by Healthhabitat, water metre readings and data collection became part of the WASSUP team's routine, with the raw data sent to Healthhabitat for external monitoring and analysis.

34 water metres were installed in different programs in 2014, 2015 and 2016.

- 20 metres were installed in 2014 during the first water data collection period, in collaboration between World Skills Foundation plumbers and Healthhabitat. 10 toilets were repaired and had metres installed, and 10 toilets only had metres installed – although the galvanized pipe was so deteriorated that in some of the control group, the piping had to be replaced in some instances.
- 2 metres were installed in 2015 during a program to look at furthering the collaboration between Healthhabitat and WASSUP, with assistance

from IAPMO and World Skills foundation. Both metres were installed in upgraded toilets during the program, which also looked at fitting quality (cistern, tap, basin, and other) parts to find the longest lasting products in the conditions of that neighbourhood.

- 12 metres were installed in 2016 during the CPC program into fully upgraded toilet units, which included replacing the concrete structure.

The below data is provided from Healthhabitat in collaboration with IAPMO, who as a team provided data input and analysis services, with WASSUP collecting metre reading data. Most of the below information can be found in the Healthhabitat close out report, and data is available on request.⁶

In the first 42 days these 20 water meters were read 29 times (11.MAR.2018 first reading at 0 to



FIGURE 27 & 28: WASSUP's administrator, Princess Zondi, manning the reporting counter where residents report emergency repairs..

24.APR.2018). The readings show the difference between the improved toilet/tap points and the control group, with an average **difference per toilet of over 4,000 litres per day** (See Figure 18). This means that **10 upgraded toilets saved 1.6million litres of water in 42 days**. This could mean around 2.5million litres of unnecessarily wasted water per day passes through the 642 toilets/taps in Extension 1, if the poor existing hardware in not improved.

6. MTBH Final Report September 2018.pdf

Toilet and water supply point – average water use / day in kilolitres (1,000)

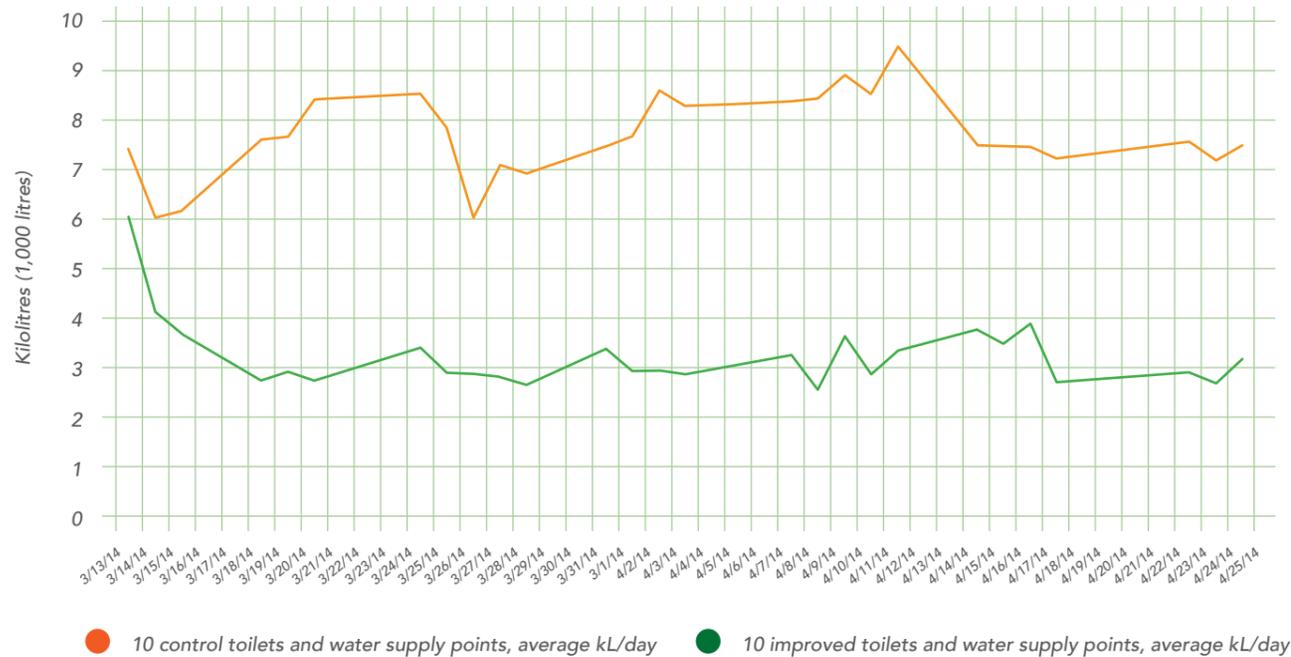


FIGURE 29: Graph showing water use from control group of toilets and repaired group of toilets after 42 days, showing an average difference of over 4,000 litres of water per day per toilet. That demonstrates a saving of 1.68million litres of water over 42 days over just 10 toilets.

After 109 days of maintenance, the same water metres were read 36 times, which show the difference between the upgraded facilities and the control group, with an average difference of over 3,600 litres per day (see FIGURE 19). **This means that 10 upgraded and repaired toilets saved 3.9 million litres of water in 109 days.**

Toilet and tap point – average water use / day in kilolitres (1,000)

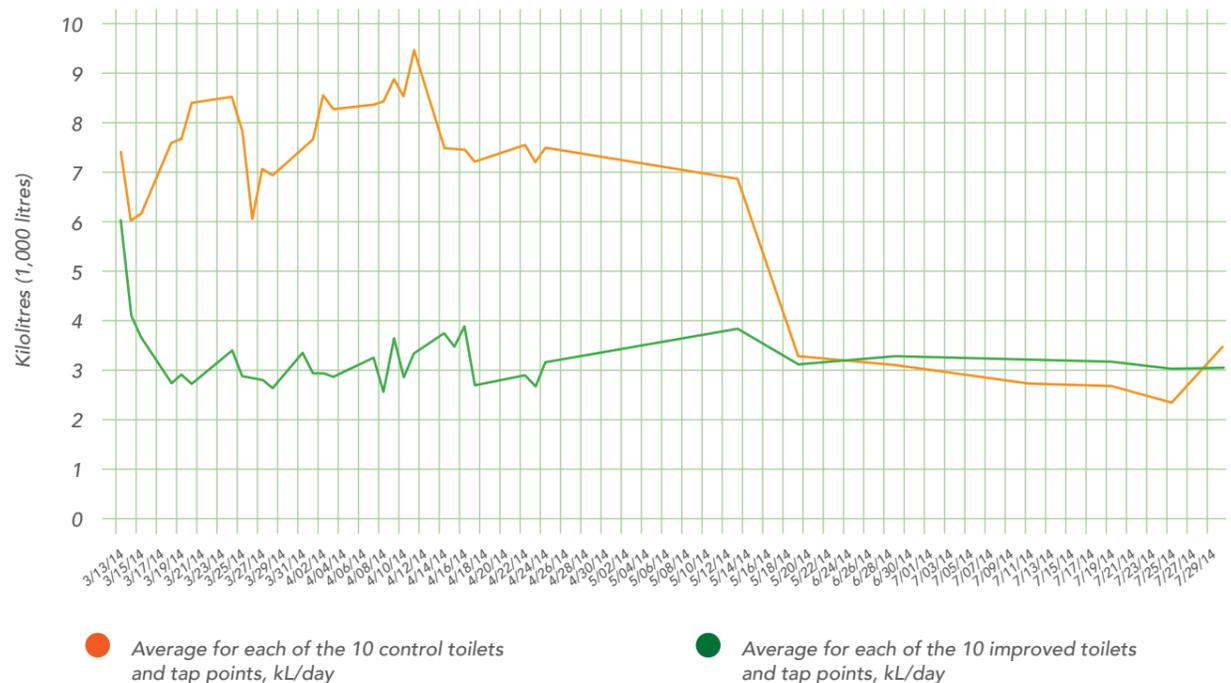


FIGURE 30: Graph showing water use from control group of toilets and repaired group of toilets after 109 days, showing an average difference of 3,600 litres of water per day per toilet. Note that in May 2014 the control group of toilets were upgraded which is why the red line comes down to similar water use levels of the green maintained toilets.

24 metres were added over 2015 and 2016, and **over 4 years** water meter readings continued to be read to measure the impact that repair & maintenance had on reducing water loss. The graph below is just over 4 years of water usage data (see FIGURE No 7). By April 2018 each of the control toilets were using 4.64kL more water per day than the maintained toilets. **This is a water savings of 16.9 million litres of water per year for 10 repaired and maintained toilets.**

Toilet and tap point – average water use / day in kilolitres (1,000) from March 2014 to April 2018

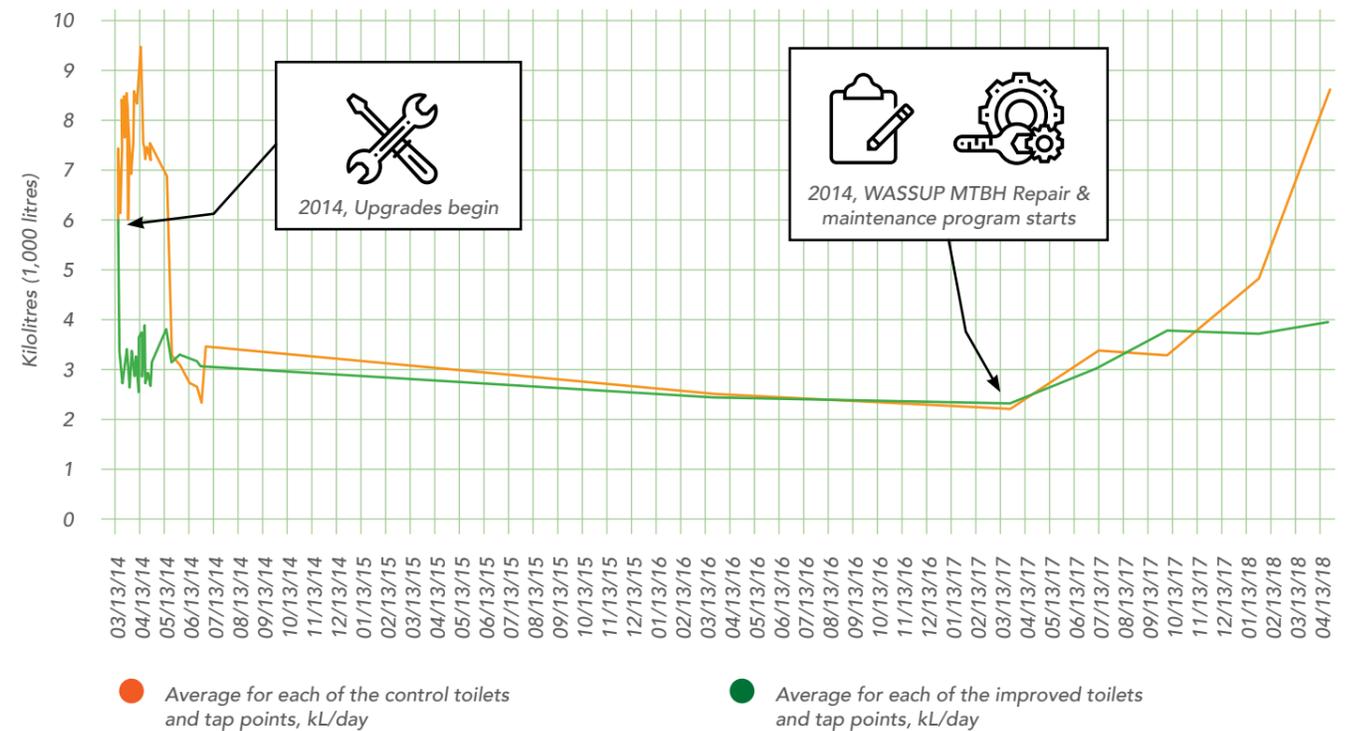


FIGURE 31: This graph shows the water use over 4 years, demonstrating the average per toilet savings of 4,640 litres of water per day. Note that the control toilets were upgraded in May/June 2014 which lowered the water waste, but without repairs & maintenance, the control group again increased in water wastage.

"We have tried reporting problems to the City of Joburg, but leaks keep going, sometimes for years. We now report directly to Joburg Water repair teams. But the problem is that the infrastructure is not designed to service so many people, so it will keep on breaking" – Junitha Kgatla

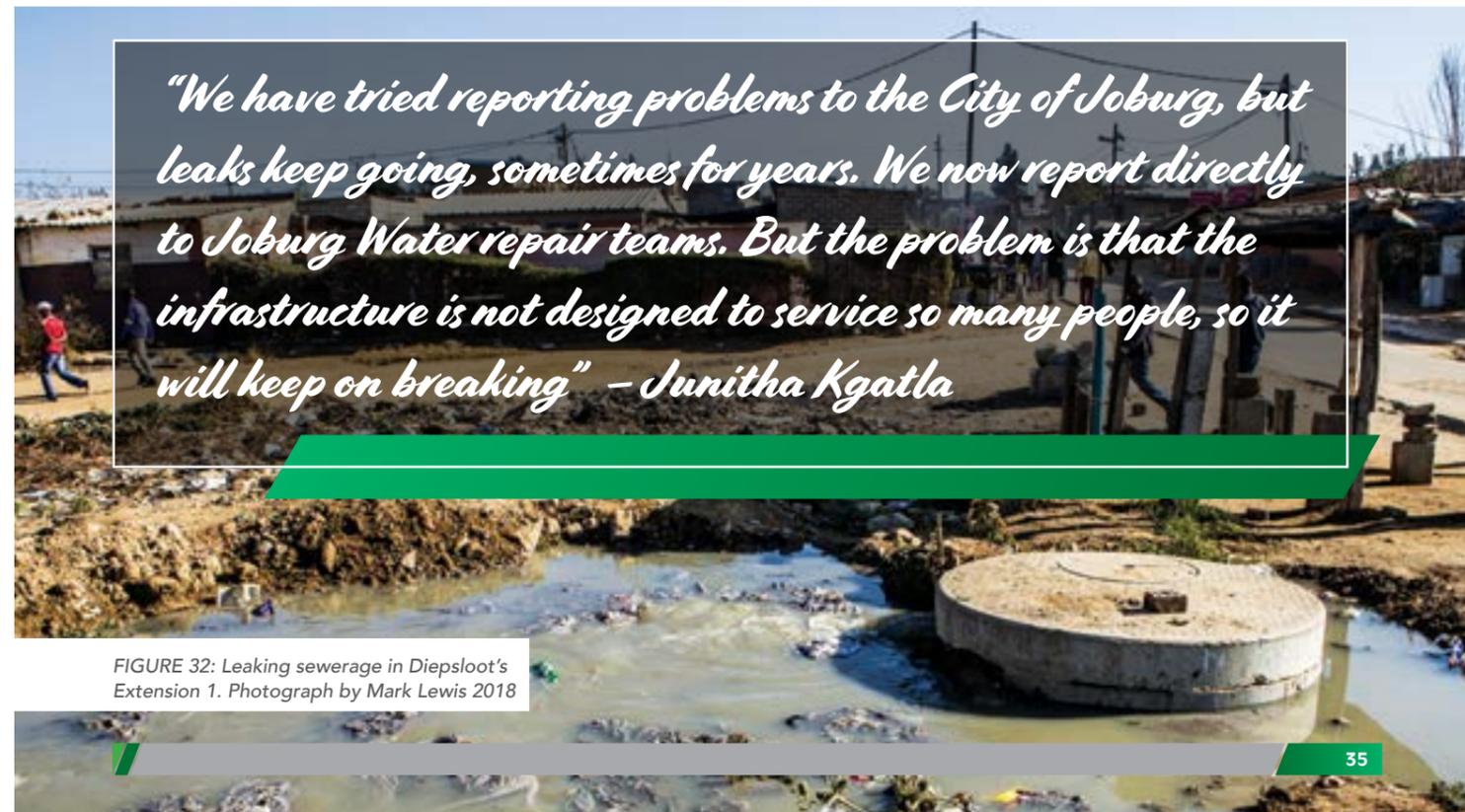


FIGURE 32: Leaking sewerage in Diepsloot's Extension 1. Photograph by Mark Lewis 2018

1,000,000,000 litres lost per year

COSTING THE COJ
R20,473,693 per year

WASSUP COST? JUST
R1,319,800 per year

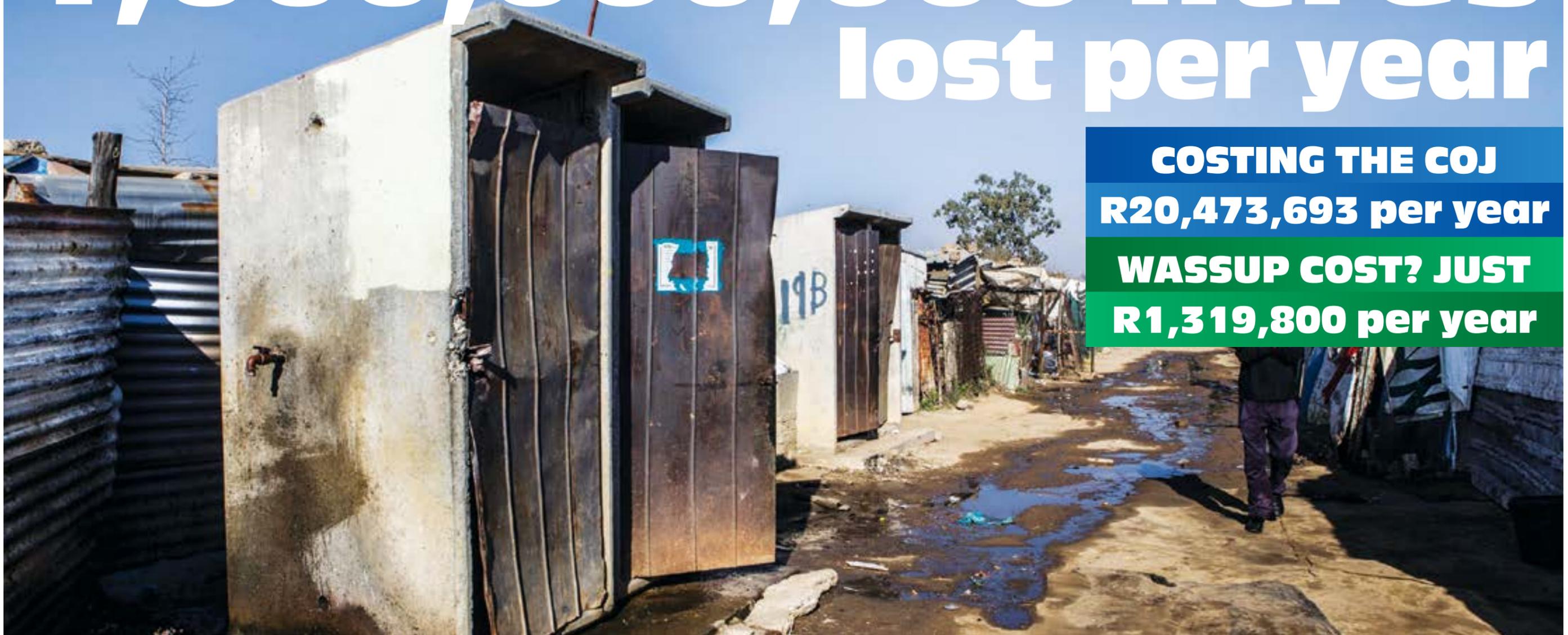


FIGURE 33: Toilet facilities in Diepsloot's Extension 1. Water leaks are clearly visible. Photograph by Mark Lewis 2018.

3.4 The program proposal makes financial sense to the City of Johannesburg

The data in the previous chapter could mean that:

- An ongoing maintenance program could save **1,087,291 kL per year** if all 642 toilets in Extension 1 were repaired & maintained regularly (4,640 lt/day)
- A Diepsloot CoJ rates bill in 2016 sold water at a rate of R18.830/KL (Diepsloot rates bill 2016). If this was to be spread across all 642 toilets, this would amount to water sales increase of **R20,473,693 per year**
- For Current WASSUP team to maintain all 642 toilets in Extension 1 Maintenance would cost **R1,319,800 per year**
- This is a per toilet water sales loss of **R 31,890.48 Per year**
- A repair and maintenance programme is a per toilet cost of **R2,055.76 Per year**
- Initial upgrade would cost **R4,256,000**, around R8,000/toilet, 532 toilets (110 already repaired)

In addition:

If an ongoing repairs & maintenance program was rolled out across only Extension 1 of Diepsloot, **Johannesburg Water would save millions in avoidable sewerage treatment infrastructure costs.**

The Northern Wastewater Treatment Works is the largest of 6 treatment works in Johannesburg, designed to treat 450 million litres of raw sewerage a day, with a plan to increase capacity to treat an additional 50 million litres in 2018.

An Extension 1 repair program could save 2,978,880 litres of water per day flowing through the treatment works. Now imagine if this was rolled out in settlements with communal toilet flush facilities across the City.

It is important to note:

Over one year, as each Survey + Fix program was rolled out (every three months), the repairs required were reduced, which meant that the cyclical repair program maintenance cost decreased as the year progressed (see FIGURE 23).

Results after Survey + Fix 1



FIGURE 34: An example of some key improvements from Survey + Fix March 2017 to July 2018, demonstrating that cyclical repairs reduce the ongoing workload.

The WASSUP Survey + Fix team were able to immediately improve function rates of critical health hardware to 100% for most toilets at the time that Survey + Fix 1 was

completed.

Strong improvements were recorded in taps and drains still working at Survey + Fix 6 compared to Survey + Fix 1.

The Surveys highlight that existing cisterns, in particular their internal mechanisms, have a short life-span and require regular maintenance to keep them functioning.

3.5 Sanitation costs globally

The World Bank's Water and Sanitation program, (WSP) estimates that a **lack of access to sanitation costs the world US\$260 Billion yearly, an average of 1.5% of a country's GDP, and US\$5.5 Billion every year across 18 African countries.** For example, Kenya loses US\$324 million, made up of: \$244 million premature deaths (19,500 Kenyans including 17,100 children under 5); \$52 million health care costs; \$2.7 million productivity costs; and

\$26 million access time (finding places to defecate). In turn the report claims that, globally, improved sanitation has a rate of return of more than 5 times for every dollar invested than in other areas including tourism, safety/security, land value, water quality, greater dignity.⁷

Now considering, the Diepsloot case this report only considers the cost of water loss, it does not consider other items such as health costs



FIGURE 35: Child in Rabie Ridge

7. <http://www.worldbank.org/en/news/feature/2013/08/30/whats-a-toilet-worth-infographic> Sourced 14 November 2018

Lack of access to sanitation costs ...
 US\$5.5 Billion every year across 18 African countries*

In summary:

The WASSUP Diepsloot program has proven to:

- 1 Massive water savings
- 2 Sustainable local employments
- 3 Sewerage plant infrastructure upgrade savings
- 4 Improved health outcomes for residents
- 5 Dignified access to dignified toilets
- 6 Savings and reduction of costs to water budgets
- 7 Savings in health care

* <http://www.worldbank.org/en/news/feature/2013/08/30/whats-a-toilet-worth-infographic> Sourced 14 November 2018

4 SUCCESSES AND CHALLENGES OF WASSUP



Figure 36: Team USA at the 2016 Community Plumbing Challenge installing new toilet units.



FIGURE 37-38: Partnerships have been key to WASSUP's success, pictured left and above with the IAPMO Community Plumbing Challenge (CPC) program with Team USA and Team INDIA installing new toilet blocks in 2016. The CPC program, along with longer-term partnerships with international plumbing organisations, gave a real boost to the Diepsloot program.

4.1 Achievements

WASSUP operates at a local level, but its successes have the potential to provide city-wide best practice. Not only has WASSUP accessed international donor money, but they have also been able to extend the project into Rabie Ridge.

Specifically, WASSUP has achieved:

- Sustained interventions in communal toilets in Extension 1 for almost a decade.
- The collection of data to prove they have saved a substantial amount of water. This is in a context where Johannesburg Water's biggest challenge is unaccounted for water; the entities 2009 Annual Report indicated that its unaccounted for water losses in 2008/2009 were 35.15%.
- Localised systems of accountability, participatory processes and community involvement.
- The provision of employment and formal training.
- Gender equity on the ground.
- Utilising commercial grade fittings which have helped to make overburdened toilets more robust.
- Procuring from local businesses and industries which contributes to local economic stimulation.

The success of WASSUP is also largely due to its processes of collective and incremental decision making and transparency and accountability to its local community. Local and international partnerships with both government and private sector are long-standing and solid and have been key to sharing of knowledges and improving systems.



FIGURE 39 The City of Joburg ran a MineCraft public space design program in partnership with UN-Habitat Global Public Space Programme. By aligning multiple projects related to public space and public amenities, projects can go much further than by operating independently.

4.2 Challenges

Despite their successes, WASSUP is also faced with noteworthy challenges including:

- Sustainable funding
- The magnitude of need and the need for the programme to be scaled up
- The challenging physical, social and environmental context in which they operate
- The expense of providing commercial grade toilet fittings

5 WHO ELSE IS INVOLVED? WASSUP COLLABORATIONS

The WASSUP Diepsloot program is successful because of its participatory and co-operative methodologies, which grew out of the approaches modeled in Global Studio Johannesburg (2007-09), and has continued to permeate relationships and collaborations of all kinds, from local to global and from government to private. A summary of the types of support and partnerships is listed below, with details provided in Appendix 10.2.

Global Studio: An interdisciplinary, hands-on design and planning programme lead by Anna Rubbo that grew out of the work of the 2002-04 Millennium Development Goals Task Force on Improving the Lives of Slum Dwellers. Global Studio was invited to Johannesburg in 2007, where it partnered with Wits School of Planning and Architecture and the City of Johannesburg, and over the next three years focused on issues identified by residents as needing attention. WASSUP was founded in 2008 in response to the urgent need to repair and upgrade toilets. The director of Healthhabitat, the late Paul Pholeros attended Global Studio Johannesburg, and returned later to lead an international effort to improve Diepsloot sanitation.

Sticky Situations: Created by Jennifer van den Bussche as a direct outcome of the 2007 Global Studio Johannesburg. The NGO is a key driver and founding partner in the original creation of WASSUP and remains the primary facilitator for the community collective regarding strategic planning, development, fundraising and management.

Australian Aid: The Direct Aid Program (DAP) from the Australian High Commission in Pretoria has been contributing funds, resources and networks over three years, which has assisted the program to pilot, expand and lobby local government for change.

Development Bank of Southern Africa (DBSA): An important initial funder that helped launched WASSUP in the early stages of the programme.

Johannesburg Development Agency (JDA): A local government entity that has provided and channeled funding to WASSUP as well as operational and spending advice and support.

Joburg Water: A local government entity that has provided ongoing support in terms of funding to repair toilets and the donation of some materials.

Healthhabitat: An Australian social business that has worked with WASSUP and Sticky Situations to improve the design and construction of toilet and tap points in Diepsloot and to introduce new partners for WASSUP to collaborate with.

WorldSkills Foundation: A non-profit membership association open to agencies or bodies who promote vocational education and training in over 75 member countries and regions. The WorldSkills foundation has provided support to WASSUP, connecting it to other bodies that could provide training and financial support. This support led to Shane Trevitt (one of the early plumbers who came to Diepsloot with Healthhabitat) receiving a British Plumbing Employers Council (BPEC) 'Life Award' program, which helped with funds and knowledge towards the WASSUP repair program.

The International Association of Plumbing and Mechanical Officials (IAPMO): A US-based NPO that has supported WASSUP through skills and knowledge sharing and training.

Numerous other partnerships: Over the years of collaborations, there have been many other formal and informal relationships with organisations and individuals both local to global, with each relationship bringing its personal style of knowledge and skills sharing. In addition, WASSUP has exhibited and presented at international conferences all over the country and the world.



"Our ongoing collaboration with WASSUP and Sticky Situations is a world-class, inspirational learning exchange" – Sean Kearney

FIGURES 40: Some other partnerships (Johannesburg Development Agency, Smithsonian Exhibition 'Design With the other 90%', Anna Rubbo from The Global Studio, Anne Fitchett from University of the Witwatersrand, Paul Pholeros from Healthhabitat, Australian Embassy visitors and Community Plumbing Challenge 2016).

FIGURE 41: Toilets in Extension 1, Diepsloot. CPC 2016 planning site visit. Photograph by Sean Kearney



6 WASSUP FUNDING

Funding for this programme contributes to the wages of the plumbers, the costs of materials, office, storage and management costs. The basic funds required to maintain 100 toilets is R50 000 per month.

Previously monies were received from:

■ ZAR 130,000 JDA
■ ZAR 620,000 from DBSA

■ GBP 9,000 pounds from British Plumbing Engineers commission

■ ZAR 934,000 support funds from Australian Direct Aid Programme (DAP)

■ ZAR 194,799.91 repair order from Joburg Water

There are other smaller amounts and contracts linked to specific challenges such as the Community Plumbing Challenge and hosting academic researchers. Small donations are sometimes received, such as donated taps for Mandela Day, two doors from Wot-if? Trust, discounted doors from Avenge, 'fixers fees' from researchers and payment for student tours.

In 2016, Direct Aid Programme (DAP) of the Australian government's Department of Foreign Affairs and Trade in South Africa approved a grant of R 498,000 over two years. The DAP supports organisations working in local communities on activities that support sustainable and equitable development, including education and skills, human rights, disability inclusiveness, and women's

social and economic empowerment.

The grant was provided for a new workshop on the same site as the Diepsloot Housing Authority Office (facilitated by Ward Councillor and Community Development Worker). The grant also covered the renovation of a public toilet and washroom and the repairs and maintenance of communal toilets in the area, formal plumbing training, events

and research. This funding combined with IAPMO and BPEC funding supported WASSUP for almost two years of programme delivery and data collection. The sustainability of these projects are supported through the development of formally accredited job training opportunities for local apprentice plumber and tradespeople, which has broadened WASSUP's capacity.



FIGURE 42: Failed infrastructure in Diepsloot Extension 1. Photograph by Mark Lewis

7 GOING FORWARD

It is proposed that the WASSUP programme be absorbed by the City of Johannesburg. As indicated in the introduction, the programme not only aligns with local government mandates, but also speaks to the imperatives and targets made specific within the NDP and the UN SDGs. It is a functional, community-based programme

that has the potential to be significantly scaled up within Diepsloot, as well as Rabie Ridge and other under-served areas. The WASSUP programme aligns with the City's priorities for Diepsloot and with many municipal priorities. These are outlined below.

7.1 Communal toilets are a local government responsibility

The establishment of decent, well-functioning water and sanitation in Diepsloot goes to the heart of basic human rights. In 2017, the Social Justice Coalition took the case of inadequate toilets to the Equality Court arguing that every person has the fundamental right to decent, safe and adequate provision of sanitation services (Ampofo-Anti, 2017). Increasingly, inadequate sanitation is being contested by communities. In South Africa, the provision of service delivery has become a site of conflict and of violence, whilst also potentially a site of transformation

and development. The risk of inaction around such basic service delivery needs is that it pits local government against the most vulnerable of its population, contributing to a climate of mistrust and division.

Repairing and maintaining these public facilities have multiple potentialities, both social and physical: it allows for potential employment creation and offers avenues for community engagement, whilst at the same time contributes to considerations around poverty, marginalization and exclusion. Effective

water and sanitation are fundamental to good public health and wellbeing. WASSUP has emerged in this environment and has had a positive effect both on health as well as water conservation. Local government has a responsibility to maintain these communal toilets as they do communal standpipes and other infrastructure. Developing and embedding sustained repair and upgrading programmes for the public toilets in Diepsloot, and in many other settlements that are served by public toilets, requires committed local government resourcing and institutionalization.

7.2 The City of Johannesburg's priority focus in Diepsloot and WASSUP

The City of Johannesburg has begun to implement a long-term urban development programme in Diepsloot through the Johannesburg Development Agency. Its funding is limited and projects have to be focused and prioritised. In 2017, the JDA commissioned a report on how to transform Diepsloot into a place of opportunity (Zack, Harrison and Govender, 2017). The report proposed the following intervention principles:

- Promotion of Spatial Justice
- Incremental Development
- Neighbourhood-based Precinct Development
- Engaged Approaches
- Integrated Projects
- Long term Programmes
- Scalable Solutions
- Sustainable Institutions (Zack et al, 2017).

Specifically, the report advocates:

- Improving infrastructural developments, including basic services and social facilities
- Growing from the inside through developing informal and micro-enterprises
- Improving partnerships
- Promoting physical health, safety and well-being through infrastructural development
- Improving education and skills development
- Seizing the value already present (Zack et al, 2017).

The WASSUP programme already meets these criteria and could be an important initiative to begin to bring to life the objectives.

CITY OBJECTIVES: DIEPSLOOT	WASSUP
Infrastructural Developments – services and social facilities	Improving communal toilets through improved water and sanitation. Making an important contribution to attending to unaccounted for water.
Developing Informal and Micro-enterprises	Local micro-enterprise to maintain upgraded toilets Supporting local businesses through local procurement
Improving Partnerships	Partnerships between NGO, international donors and local government
Improving education and skills development	Providing access to plumbing training – two plumbers have already gone through training. Hosted International Association of Plumbers.
Seizing the value already present	These skills exist in Diepsloot already with the potential to scale up.



FIGURE 43: Water leaks running through Diepsloot Extension 1. Photograph by Mark Lewis

8 OPPORTUNITIES FOR CITY OF JOHANNESBURG IN ABSORBING THE WASSUP PROGRAMME

Local government is well-placed to incorporate the programme that has been initiated by WASSUP because:

The programme can be responsible for enormous savings in water and so contributes to environmental health and sustainability;

Well-maintained toilets are important for urban safety. Women and children are extremely vulnerable in informal settlements especially after dark and if functioning toilets are not accessible, they are forced to take bigger risks by moving through the settlement at night;

The continued use of dysfunctional public toilets can be life threatening.

- The ongoing poor functioning of these toilets and water points adds to the considerable environmental risks in Diepsloot;
- The programme potentially contributes to improved public health and wellbeing;
- The programme offers skills development and local employment possibilities;
- The programme offers the possibility for co-operatives or micro businesses to undertake community services;
- The programme is already established and much groundwork has been laid for a scaling up of the initiative;
- The programme can be rolled out to other settlements;
- The programme is well grounded in community engagement; and
- The programme is straightforward and easily implementable.



FIGURE 44: Household waste in Extension 1 Diepsloot



FIGURE 45: Young girl collecting water in Rabie Ridge

9 CONCLUSION



This report has aimed to highlight the essential work undertaken by WASSUP in trying to manage the dire water and sanitation situation in Extension 1, Diepsloot in the face of lacking municipal infrastructural support and maintenance. The monitoring and research undertaken by WASSUP reveal strongly the potential for huge capital, resource and social savings, not to mention the large financial savings that can be achieved. The work undertaken by WASSUP has developed into best practice methodologies and processes that have proven potential to be absorbed by the City of Johannesburg, to be scaled up and implemented for the greater Diepsloot area as well as other under-served and lacking settlements across Johannesburg, and potentially the country.

The provision of comprehensive and sustainable water and sanitation services are fundamental policy and practical considerations that speaks to both local developmental needs and imperatives as well as global priorities seeking to redress injustices and inequalities for all citizens. Grossly inadequate water and sanitation services continue to deprive citizens, not only of adequate health, social and environmental conditions, but most importantly their personal dignity. We, both civil society and government, cannot afford to ignore this crisis any longer.

The message of WASSUPs work over a decade is clear: a person should walk into the toilet with dignity and should walk out of the toilet with dignity.



FIGURE 46 & 47: (above) WASSUP team members repairing toilets and collecting data.

FIGURE 48: (right) Woman washing in Diepsloot. Photograph by Mark Lewis 2018



10 APPENDICES

Appendix: Biographies of WASSUP AND Sticky Situations



Luckie Manyisi is the chairperson of WASSUP, joining the program during the Global Studio project between 2007 and 2009. Manyisi has experience as an exam manager, a chief invigilator, a chauffeur and a body guard. As secretary for the local SANCO (South African National Civic Organisation) committee, he became interested in WASSUP as a program that could contribute to help developing his community. As chairperson, Manyisi represents WASSUP's interests alongside his community's interests, and as a co-operative, WASSUP want to continue working towards a healthier and more sustainable environment for residents, to create jobs for their community, and to conserve the precious resource of water.



Junitha Kgatla is a founding member of WASSUP. Having worked as a plumber in the field since 2009, over the past two years she has been studying towards her formal plumbing qualification. She is assistant treasurer in the WASSUP organisation and works in her community to promote gender equality. Kgatla is passionate about improving the quality of living for her community.



Jack Molokomme was a key player in forming WASSUP in 2007, being one of the first residents to be involved in the program with the Global Studio students. Jack has a background in security work and the service industry and has been a core contributor to the ongoing growth of WASSUP. As WASSUP secretary, his key role has been ensuring transparency and accountability within the organisation and to his community. As the work of WASSUP has grown, so has Jack's interest in plumbing, he has recently completed a basic plumbing course, and intends pursuing more advanced plumbing qualifications.



Lerato Monama is treasurer of WASSUP and plays a key role in accountability. Monama initially studied computers and call centre training, but was attracted to the hands-on entrepreneurial opportunities presented by WASSUP, and became a founding member of WASSUP co-operative. Having learnt her plumbing skills on the job, she obtained her formal basic plumbing qualification in 2018 and is keen to pursue more advanced training.

Obed Kekae is a more recent addition to WASSUP, who spent some time volunteering in the toilet repair programme before being admitted to the core team. Kekae believes that healthy living is linked very closely to water & sanitation, and, with the bad state of ablutions in Diepsloot, strongly feels that the repair and maintenance work of the organisation is critical to the health of his community. Kekae has completed plumbing training and is planning to sit the plumbing trade test shortly.



Princess Andiwa Zondi joined WASSUP in 2017 following her completion of plumbing training through a government program called 'Vuthela Project', which trained women in plumbing skills. Zondi, along with 16 other trained women, were placed with WASSUP for practical training in the field. In 2017 she applied successfully for the position of WASSUP administrator and store manager, and now occupies a critical role within the WASSUP Diepsloot organisation.



Jennifer van den Bussche is the founder and director of Sticky Situations, a Johannesburg-based collaborative organisation with a special focus on participatory development and design methods to facilitate, co-ordinate and implement community-driven projects of all shapes and sizes, grounded in community capacity building. A project manager with more than twenty-five years' experience, she has strong facilitation skills complemented by a background in construction and architecture and extensive experience in community development. Sticky Situations was a key driver and founding partner in the original creation of WASSUP, and has remained ever since the primary facilitator for the community collective regarding strategic planning, development, fundraising and management.



FIGURE 49: (Right) Trading stall in Diepsloot Extension 1. Photograph by Mark Lewis 2018

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10.3 Appendix: References

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FIGURE 50: Household waste in Diepsloot Extension 1.

10.4 Appendix: WASSUP Collaborations

The WASSUP Diepsloot program is only successful because of its participatory and co-operative methodologies, which stemmed from its inception in the Global Studio, and has continued to permeate relationships and collaborations of all kinds, from local to global and from government to private.

10.4.1 Global Studio

Global Studio is an inter-university collaboration set up between 2007–2009 in response to the Millennium Development Goals Task Force Improving the Lives of Slum Dwellers. Its founding members are: University of Sydney (Australia), Columbia University (USA) and the University of Rome (Italy) who work with a consortium of universities. In 2007, Global Studio Johannesburg brought together students, academics and professionals in the city building professions from developing and developed countries to take part in an interdisciplinary forum and studio in Johannesburg. The Studio's practical project work focused on Diepsloot and identified the need for the repair and upgrading of toilets.

The Studio worked with community members in that year and again in 2008 and 2009, but funding for the project was exhausted in March 2010. During its work, Global Studio proposed the establishment of WASSUP. It partnered with WASSUP to develop a simple bucket drain system to solve drain issues; helped form the steering committee of WASSUP; trained residents in the repair and maintenance of toilets; and paid stipends for the repair and maintenance of 46 toilets, taps and drains.

10.4.2 Sticky Situations

Sticky Situations was created by Jennifer van den Bussche as a direct outcome of the 2007 Global Studio Johannesburg. The NGO uses participatory design methods to facilitate, co-ordinate and implement community-driven projects of all shapes and sizes, grounded in community capacity building. Sticky Situations was a key driver and founding partner in the original creation of WASSUP, and has remained ever since the primary facilitator for the community

collective regarding strategic planning, development, fundraising and management.

10.4.3 Development Bank of Southern Africa (DBSA) <https://www.dbsa.org/>

The DBSA is an organisation which seeks to play a pivotal role in delivering developmental infrastructure in South Africa and the rest of the African continent. The DBSA funded an initial substantial tranche of funding, championed by the late 'Gio' Orapeleng Letsholonyane, funding which lasted a number of years and really helped grow the idea into a functioning organisation. In 2009 DBSA approved funding of R800,000, of which R620,000 was allocated to WASSUP to launch the WASSUP program. The City of Johannesburg required that the approved funds be ciphred through them due to an MOU between the parties; however it wasn't until April 2011 that this contract was signed and WASSUP could invoice for funds. Sadly, by that point the DBSA project facilitator had

passed away and the WASSUP team received only a handful of visits from DBSA representatives in the early stages of the project.

10.4.4 Johannesburg Development Agency (JDA)

The JDA provided some interim pilot funding of R130,000 due to the delay in DBSA funds transfer (at the time the City of Joburg Region A offices insisted that the funds go via them due to an existing MOU, and not directly to WASSUP) and also facilitated the DBSA contract and channeled funds from DBSA, through the JDA, to WASSUP. This also meant that JDA provided support in terms of advice and ensuring the funds were spent as intended.

10.4.5 Joburg Water

Joburg Water Depot has provided ongoing support in terms of some donated materials and repair of water leaks reported by WASSUP to the Depot. One order was placed with WASSUP for a total of ZAR 194,799.91.

10.4.6 Healthabitat

In 2014, Healthabitat (a mentor of The Global Studio) began working with Sticky Situations and WASSUP in Diepsloot to improve the design and construction of toilet and tap points in Diepsloot. Healthabitat is an Australian social business whose projects aim to make immediate and measurable improvements to living conditions that contribute to good health for people living in poverty throughout the world.

The Maintaining Toilets for Better Health Project is a key component of the South Africa Health Improvement Project, which aims to improve public health. The aim of the project in Diepsloot was to undertake an initial pilot which would upgrade and maintain 110 toilets in Extension 1 Diepsloot which involved both testing the viability of such an approach and trialing new robust design, i.e. exploring what type of materials, equipment, fittings and installation methods are best suited and most sustainable in this environment.

Healthabitat gained further traction for WASSUP by introducing a series of other international collaborations, including IAPMO, BPEC, and the WorldSkills Foundation (see below).

10.4.7 WorldSkills Foundation

Active between 2012–2015, the WorldSkills Foundation (WSF) was a philanthropic arm of WorldSkills International: a non-profit membership association open to agencies or bodies which have a responsibility for promoting vocational education and training in their respective countries/regions. Today WorldSkills represents more than 45 vocational skills in over 75 member countries and regions, all working together with youth, educators and industries to help prepare the workforce and talent of today for the jobs of the future.

Following WSF support and collaboration for Healthabitat community plumbing and sanitation projects in Nepal, Healthabitat introduced WASSUP Diepsloot to WSF in 2013. New support and collaboration in Diepsloot was

subsequently driven by then-WSF Trustee IAPMO: the International Association of Plumbing and Mechanical Officials.

In early 2014 WSF provided funding for gold medal-winning Plumbing and Heating WorldSkills Champions from the UK and Ireland to travel to Diepsloot and support the ongoing WASSUP maintenance program. This experience inspired the UK representative to apply for further funding via the BPEC (British Plumbing Employers Council) 'Life Award' program, supporting ongoing maintenance and repair works in Extension 1.

10.4.8 The International Association of Plumbing and Mechanical Officials (IAPMO) AND the International Water, Sanitation and Hygiene Foundation (IWSH)

US-based non-profit IAPMO runs a programme called the Community Plumbing Challenge, via its charitable arm IWSH. In collaboration with

WASSUP, Sticky Situations and Healthabitat, IAPMO presented this international event in Diepsloot in 2016, bringing together teams from four different countries to develop the best prototype for communal toilets suitable to Diepsloot. This partnership has provided a strong and ongoing skills swap and collaboration program over a number of years, with one of the WASSUP team soon to attend the Community Plumbing Challenge in USA.

The relationship with plumbers also encouraged WASSUP workers to receive a formal qualification: 2 Diepsloot team members have recently completed 18 months of formal training and 5 team members from Diepsloot and Rabie Ridge have recently completed 2 weeks of formal basic training.

10.4.9 Australian Embassy

Not only did the Direct Aid Program at the High Commission of Australia in South Africa provide much needed

funds to enable the program to grow and get stronger, they also provided ongoing support as a conduit for networking, site visits, strategic insights and knowledge and ideas sharing. This high-level support was as critical to the program as was the hands on support of other collaborators.

10.4.10 Numerous other partnerships

Over the years of collaborations there have been many other formal and informal relationships with organisations and individuals both local to global, with each relationship bringing its personal style of knowledge and skills sharing. In addition, WASSUP has exhibited and presented at international conferences all over the country and the world. The list of collaborators is very long and happened at various institutional levels — government and private sector, individuals and organisations and WASSUP are grateful for the knowledge and experiences shared at each event.



FIGURE 51: Toilets in Rabie Ridge. Photograph by Mark Lewis 2018

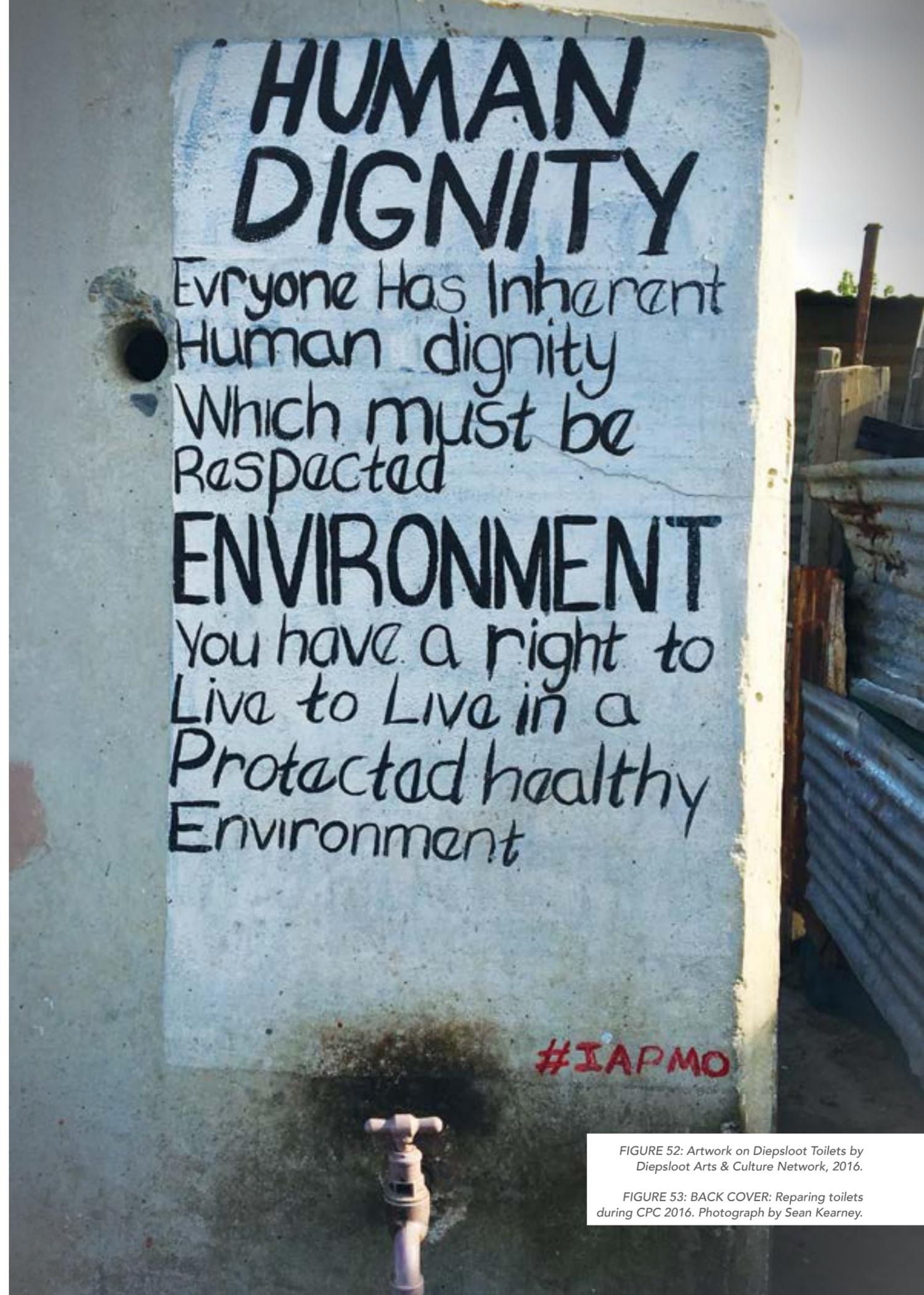


FIGURE 52: Artwork on Diepsloot Toilets by Diepsloot Arts & Culture Network, 2016.

FIGURE 53: BACK COVER: Repairing toilets during CPC 2016. Photograph by Sean Kearney.



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