

A critical look at South Africa's Green Drop Programme

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ABSTRACT

In this paper we briefly reflect on the different legislation and types of regulatory mechanisms that South Africa's Department of Water and Sanitation (DWS) has in place to try to improve the performance and compliance of water services authorities (WSAs) in the controversial wastewater services sector. In particular, we focus on DWS's incentive-based mechanism, the National Green Drop Certification Programme (Green Drop Programme), and evaluate the achievements and challenges associated with its implementation to date. While there has been considerable improvement in performance in all areas of the programme since its inception in 2009, much still needs to be done in order to address the dire situation the country's wastewater services sector finds itself in. Challenges facing the Green Drop Programme and the municipalities implementing the programme include: lack of human resource capacity to prepare effective corrective action plans and/or wastewater risk abatement plans; lack of finances for mainstreaming of wastewater treatment in municipal decision-making; lack of forward planning; problematic bureaucratic processes; complex relationship between some municipalities and DWS; theft, vandalism and misuse of wastewater treatment infrastructure and not enough transparency. Based on this discussion, we make some concluding remarks about possible areas of improvement that could potentially strengthen the functioning and success of this programme, and thereby help to improve the levels of performance and compliance of the country's WSAs.

Keywords: wastewater treatment, regulation, Green Drop Programme, incentive-based mechanism, command-and-control mechanism

INTRODUCTION

In South Africa water services authorities (WSAs) are responsible for providing potable water and sanitation services to all customers in their respective areas of jurisdiction (RSA, 1997). These services include, amongst other responsibilities, the management of domestic wastewater treatment works (WWTW) and sewage disposal systems. Wastewater treatment is the process of removing organic and inorganic matter from the waste stream and making it suitable for releasing back into the environment. This technology can often be very expensive and requires high levels of technical knowledge, specialist plant operators and specific equipment (DWA, 2011a). In South Africa, wastewater services are currently provided by a total of 152 WSAs via a vast network of 824 wastewater collector and treatment facilities (DWA, 2013). More than 70% of the country's WWTW are micro-, small- and medium-sized (DWA, 2012). The country's WWTW have a collective hydraulic design capacity of 6 509 ML/day and 78.8% of this capacity is accounted for by the current operational flows of 5 128.8 ML/day (DWA, 2013). These numbers imply that, theoretically, the country currently has a surplus of 22.2% of 'available' capacity to accommodate future demand. However, many individual WWTW have no surplus and run at full capacity (DWA, 2013).

Poor and insufficient wastewater treatment has often been referred to as one of South Africa's main water pollution problems. This problem also manifests itself in the increasing incidents of non-compliance with national water resources legislation, policies, norms and standards aimed at the protection of South Africa's water resources (Van der Merwe-Botha, 2009; Herold, 2009; CSIR, 2010). Most sewage from the country's

urban areas, particularly small towns and densely populated areas, is improperly treated before discharge as a result of incomplete or non-functional WWTW or because these works are overloaded and mismanaged (Oberholster, 2010). There is currently also a lack of trained operators at many WWTW and these often operate with limited budgets for infrastructure maintenance and upgrades (Van Rooyen and Versfeld, 2010). Other challenges include inadequate capital and operating funds for wastewater treatment, lack of planning to provide for increased levels of urbanisation, inadequate human resource capacity and technical skills and a lack of co-operative governance between stakeholders in municipalities (Ntombela et al., 2013). In light of the above-mentioned challenges, the need for improved regulation and performance of wastewater services has become a prominent issue on the national water agenda.

In this paper we briefly reflect on the different legislation and types of regulatory mechanisms that the Department of Water and Sanitation (DWS) has in place to improve the performance and compliance of WSAs. In particular, we focus on DWS's incentive-based mechanism, the National Green Drop Certification Programme (Green Drop Programme), and evaluate the achievements and challenges associated with its implementation to date. Based on this discussion, we make some concluding remarks about possible areas of improvement that could potentially strengthen the functioning and success of this programme, and thereby help to improve the levels of performance and compliance of the country's WSAs.

METHODOLOGY

We combined a literature review with semi-structured interviews in order to obtain the necessary data to write this paper. The primary sources of information for the literature review component included relevant national policy and legislation, regulations and norms and standards, as listed in the references section.

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We made use of journal articles and other relevant material, including available Green Drop reports, as secondary sources of information. In addition, we conducted a series of semi-structured interviews with two national DWS managers, one regional DWS manager, seven managers from two large metropolitan municipalities, two managers from a rural district municipality, and representatives from a consulting company. These interviews were held in order to gauge how officials implementing the Green Drop Programme view the successes and shortcomings of the programme. The interviews were held with respondents from the following provinces: Gauteng, Limpopo, KwaZulu-Natal and the Western Cape.

The interview data were analysed by applying a cross-sectional code and retrieve method. This method involves identifying key themes, concepts or categories in the mass of data that has been collected from different sources (Spencer et al., 2003). A theme is a general idea, notion or element that stands out as being significant, either because it is recurring, is significantly different, or has a major impact. Having generated and coded a set of themes, we then wrote descriptive and explanatory accounts to identify key dimensions and expand on the range and diversity of each theme (Spencer et al., 2003). We subsequently incorporated this analysis into the writing of this paper.

Unless otherwise referenced, the content of this paper is the result of the interviews that were conducted and/or the authors' own conclusions. We have chosen not to divulge the identity of the interview respondents in order to guarantee their anonymity.

WASTEWATER SERVICES SECTOR REGULATION IN SOUTH AFRICA

As the highest law in the country, the Constitution of South Africa (Act 108 of 1996) represents the most overarching legal framework for wastewater services regulation. Relevant sections in the Constitution include the Bill of Rights, the assignment of powers and responsibilities to different spheres of government and the co-operative government principle (RSA, 1996).

The Constitution, together with the Municipal Structures Act (Act 117 of 1998) and the Water Services Act (Act 108 of 1997), assign the responsibility for the provision of wastewater services to the local sphere of government (municipalities). In this regard some municipalities have been classified as WSAs that are responsible for providing water services within their areas of jurisdiction (RSA, 1997). The regulation of wastewater services is however the responsibility of the national sphere of government and more specifically DWS (RSA, 1998). This involves, among other things, ensuring compliance with the country's water legislation, particularly water quality requirements, and taking enforcement actions in cases of non-compliance (DWA, 2003; Ntombela, 2013). Applicable legislation in this regard includes the National Environmental Management Act (Act 107 of 1998), the National Water Act (Act 36 of 1998) and again the Water Services Act. The legal provisions for the regulation of the pollution resulting from the wastewater sector can primarily be drawn from these pieces of legislation.

Command-and-control based mechanisms

In order to implement the above-mentioned pieces of legislation as far as water resources regulation is concerned, DWS has for a long time relied on command-and-control focused measures. Such measures are based on directive-based regulation where objectives and acceptable standards are set and subsequently

applied, monitored and enforced using administrative and criminal justice instruments (Ntombela, 2013). The effective use of these measures in the context of wastewater services regulation is, however, limited due to the constitutional imperative of co-operative government, in terms of which organs of state are to avoid criminal proceedings against each other (RSA, 1996). This means that DWS is required to ensure that every reasonable effort is made and all remedies are applied to address non-compliance before a matter involving a WSA is taken to court for resolution (Ntombela, 2013). This often renders enforcement actions against WSAs rather difficult and lengthy compared to other non-compliant water users (e.g. mines, industries etc.) against which legal action can be more easily instituted.

The Enforcement Protocol for Organs of State (Enforcement Protocol) can be classified as a command-and-control focused instrument, although it also takes into account the principle of co-operative government. This protocol sets out a generic process to be followed for all interventions in cases of non-compliance by organs of state. As such, it initially prescribes a positive engagement process between DWS and the WSA in order to try to get the WSA to comply. If this is not successful, the relevant DWS regional office will issue a directive, and if the conditions of the directive are not adhered to criminal charges may be laid against the WSA (DWA, 2010).

In spite of attempts by DWS to strike a balance between command-and-control based regulation and co-operative government, the implementation of the Enforcement Protocol has not been without problems. So, for instance, the protocol is currently being implemented without a proper, effective and publicly available case management and reporting system. This has made it difficult, particularly for the media and civil society, to track compliance and evaluate the overall effectiveness of the Enforcement Protocol since its implementation (Ntombela, 2013). The absence of credible information about actions taken against non-compliant WSAs also impacts negatively on the credibility, accountability and transparency of DWS as the regulator. An additional problem is that DWS has adopted a reactive rather than proactive approach to the implementation of the Enforcement Protocol. This means that only those cases that the media and civil society expose as crises needing an immediate response are dealt with (Ntombela, 2013).

Incentive-based mechanisms

In light of the challenges facing the implementation of the Enforcement Protocol, DWS launched the Green Drop Programme in 2008. This programme is an incentive-based mechanism, which, in contrast to command-and-control type mechanisms, aims to facilitate compliance with regulatory objectives and standards through motivation and reward rather than direct regulation. The programme is based on DWS's realisation that rewarding positive behaviour may be more efficient and effective than sanctioning negative behaviour (Ntombela, 2013).

The Green Drop Programme aims to sustainably improve the quality of wastewater management in South Africa by identifying and developing the core competencies required to achieve this. It furthermore aims to draw together the current goodwill demonstrated by WSAs and existing government support programmes to realise the focus, commitment, planning and resources that are necessary to achieve excellence in wastewater treatment (DWA, 2013). The programme is administered by the water services directorate within DWS, which aims to ensure that all wastewater discharges from the water services sector meet the specified minimum standards in order to protect human health

and the environment through the use of environmental regulation (DWA, 2010).

As part of the Green Drop Programme, DWS runs the Green Drop water services audit, which is a tool to carry out incentive- and risk-based regulation in South Africa. In essence the programme measures and compares the performance of WSAs. It subsequently rewards or penalises the WSAs based on how they have fared according to the minimum standards or requirements set by DWS (DWA, 2013). While the Green Drop assessment takes into account the entire wastewater value chain (reticulation, pumping, treatment, discharge) (DWA, 2013), the cumulative risk assessment component focuses on the wastewater treatment function specifically. This element can be interpreted as one of the high-risk components of the wastewater value chain. Regulation that is risk-based allows the municipality to identify and prioritise the critical risk areas within its own specific wastewater treatment process and to adopt the necessary measures to address and correct these (DWA, 2013). Where high risks are identified, DWS applies the Enforcement Protocol to ensure that an incremental process is followed which allows for actions such as municipal support, emergency measures and legal action (DWA, 2011a).

The two main outputs from the 2013 Green Drop report, which was made available to municipalities, are: a weighted Green Drop score for each municipal WWTW and a cumulative risk rating for each municipal WWTW. WWTW that score 90% or more receive Green Drop certification, whereas those that score less than 30% are said to reside in a critical state and receive a 'Purple Drop' (as per Fig. 1).

EVALUATION OF THE GREEN DROP PROGRAMME

The current context of wastewater services in the country requires regulation to be developmental and supportive because many WSAs are not self-sustainable at present. Both the Enforcement Protocol and the Green Drop Programme are therefore meant to enable DWS to proactively encourage, support and incentivise compliance. After this pro-activeness, reactive and punitive measures may be applied in cases of recurrent non-compliance. Against this contextual backdrop, it is DWS's broad vision that neither of the two regulatory mechanisms should take preference over the other, but that they are both to be implemented in a complementary manner to facilitate improvement in wastewater service provision (DWA, 2010). While the regulator's vision seems clear and viable on paper, current practice within DWS demonstrates the need to strengthen the synchronization of these two mechanisms as they are currently being implemented in a somewhat fragmented manner. As stated earlier, in this paper we focus on some achievements as well as some challenges facing the implementation of the Green Drop Programme, which are now discussed in more detail.

The achievements of the Green Drop Programme

There are numerous reasons why the Green Drop Programme has the potential to make a valuable contribution to the South African wastewater sector. To begin with, South Africa is ranked 56 out of 178 countries on the Environmental Performance Index in terms of wastewater treatment (DWS, 2015). While this is not the worst position to be in, there is of course still considerable room for improvement.

In addition, the Green Drop Programme embodies a promising combination of an incentive-based approach and a risk-based



Figure 1

Images depicting WWTW being awarded a Green Drop and those being marked with a Purple Drop (DWA, 2013)

approach. Overall, the programme has managed to raise awareness regarding the need for improved performance throughout the wastewater sector by identifying and acknowledging problem cases, and initiating measures to address these. Green Drop reports with WWTW-specific information, which enables the regulator to track and monitor compliance, are made available to each of the participating municipalities. This implies that prioritised and WWTW-specific interventions can be designed, implemented and enforced in the light of poor performance and failure (DWA, 2013).

Before the Green Drop Programme started in 2009 it was difficult to determine the state of wastewater treatment in South African municipalities. Initially only 98 municipalities participated in the programme, which can be attributed to a number of reasons. These include the failure by municipalities to respond to the then Department of Water Affairs (DWA)'s call to participate (DWA became DWS after the national elections in 2014), a lack of confidence on behalf of municipal officials, and a lack of management information required for Green Drop assessments because of municipalities not managing wastewater services according to the expected requirements (DWA, 2009). This situation has changed since then as all municipalities now participate in the programme (152, up from an initial 98). As a result a clear picture has emerged of what the state of wastewater treatment is in the country so that problems can be addressed (DWA, 2013). It is also remarkable that this development has been voluntary as municipalities cannot be forced to participate. This speaks to the success of the incentive-based approach and its potential to progressively move the country towards sustainable wastewater management (DWA, 2011b).

According to the then DWA (2013), an analysis of the 2012/13 Green Water Services Audit and site inspection results indicates 'that the Green Drop objective is close to being achieved'. This statement was supported by the significant and progressive improvements in overall performance that have been made on a national scale. These improvements are evident in Table 1 below, which presents the performance trends for the different categories that form part of the Green Drop comparative analysis.

The 2012/13 Green Drop audit included all municipalities that own and operate wastewater infrastructure in South Africa and showed continued 100% coverage. The number of municipalities that was assessed in 2012/13 appears to be lower than the number for 2010/11, but this was as a result of changes in demarcation. According to the then DWA (2013), these results show that the Green Drop incentive-based regulatory approach, supported by a risk-based methodology, successfully acts as a positive stimulus to facilitate improved performance, while establishing essential systems and processes to sustain and measure gradual improvement.

Figure 2 elaborates on the information presented in Fig. 1 by providing a visual representation of the different Green Drop scores that WWTW have received.

The cumulative risk rating analysis also indicates an improvement in wastewater services from 2011 to 2013. The number of WWTW in the 'critical risk' space decreased from 154 to 121 between 2012 and 2013, whereas the WWTW that were previously placed in the 'critical risk' space now occupy the high and medium risk categories. This is evident in the increase in high risk (213 to 232) and medium risk WWTW (244 to 272) over the same period. Overall, the cumulative risk ratio for the country's municipalities (i.e. the national score) went down from 69.2% in 2011 to 65.4% in 2013 (DWA, 2013).

These trends indicate an overall improvement trend as WWTW are moving into lesser-risk positions, and municipalities will benefit from continuing with the implementation of their wastewater risk abatement process. Here it is important to note that municipalities need to ensure that their risk positions remain constant once they are in an acceptable risk space (DWA, 2013).

From a provincial perspective, three of the provinces that we are looking at in this paper scored high in terms of the Green Drop. Gauteng received an 82.7% provincial Green Drop score, with 82.6% of its WWTW being placed in the low- and medium-risk categories. None of its WWTW obtained a score of less than 30% (DWA, 2013).

The Western Cape achieved an 84.5% provincial Green Drop score with 84.2% of its WWTW being placed in the low- and medium-risk categories. Nine of its WWTW obtained a score of less than 30% and have therefore been placed under regulatory surveillance (DWA, 2013).

KwaZulu-Natal achieved an 81.5% provincial Green Drop score with 75.9% of its WWTW being placed in the low- and medium-risk categories. Thirty-two of its WWTW obtained a score of less than 30% and have therefore been placed under regulatory surveillance (DWA, 2013).

Limpopo Province, which is also of interest to this paper, is one of the provinces that are listed as having shown the best overall progress from 2011 to 2013, with an improved weighted Green Drop score from 24% to 44.6%. However, only one of its WWTW received a Green Drop certificate in 2013 (DWA, 2013)

In addition, the implementation of the Green Drop Programme has assisted many municipalities in improving the running of WWTW through training and other support. In the past, when DWS still released the Green Drop results in the

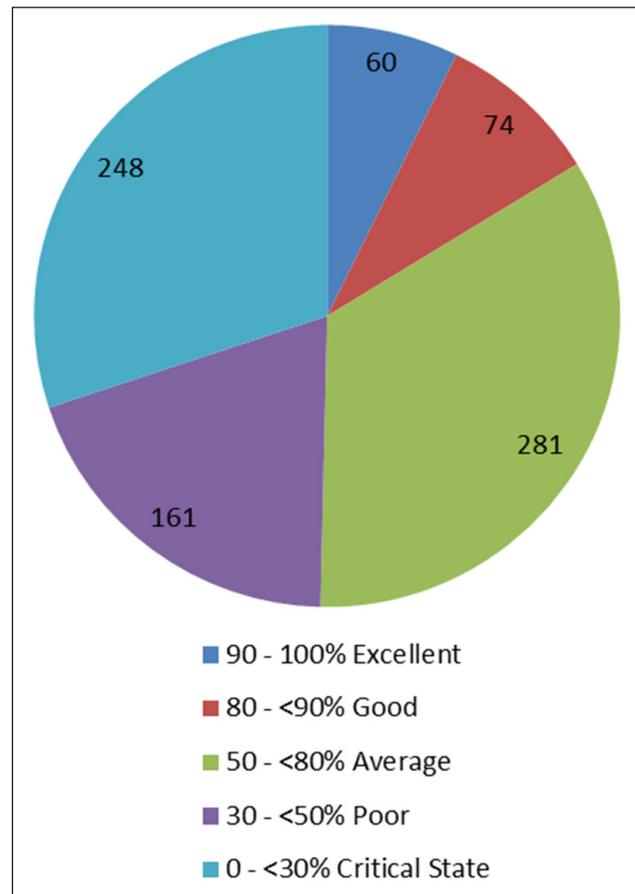


Figure 2

Pie chart depicting the WWTW that have been awarded different Green Drop scores ranging from 'excellent' to 'critical state' (DWA, 2013)

public domain, the programme also contributed to improving the relationship between municipalities and the public, as well as raising awareness about wastewater treatment.

Challenges facing the Green Drop Programme

Although the Green Drop Programme has been successful in a number of areas, it is clear that there is still considerable room for improvement. We therefore now also reflect on some of the challenges that the programme is facing.

Green Drop comparative analysis				
Performance category	2009	2010/11	2012/13	Performance trend
Number of municipalities assessed	98	156 (100%)	152 (100%)	→
Number of WWTW assessed	444	821	824	↑
Average Green Drop score	37%	45%	46.4%	↑
Number of Green Drop scores ≥50%	216 (49%)	361 (44%)	415 (50.4%)	↑
Number of Green Drop score <50%	228 (51%)	460 (56%)	409 (49.6%)	↑
Number of Green Drop awards	33	40	60	↑
Average site inspection score	N/A	51.4%	57.0%	↑
National Green Drop score	N/A	71%	73.8%	↑

N/A = Not applied ↑ = improvement, ↓ = digress, → = no change

Poor performance by a large number of WWTW in South Africa

While the 2013 Green Drop report executive summary presents an overall picture of improvement regarding wastewater treatment in the country, there is also cause for concern. This statement can be supported by the fact that although 50.4% of WWTW scored more than 50% in 2012/13; by implication, 49.6% (almost half or 409 WWTW) still scored below 50%. In addition, 30.1% of all WWTW (248 WWTW) in South Africa were issued Purple Drops (indicating a score of less than 30%) during 2012/13, which means that they are 'in crisis' and that regulatory actions need to be taken to address their poor performance (DWA, 2013). In addition, 121 WWTW are in critical risk positions and need to be put under surveillance as 'hot spots' to ensure that risk mitigation and compliance measures are 'fast-tracked and up-scaled' (DWA, 2013).

To further illustrate this situation, since April 2015 there have been at least 19 reported cases of WWTW overflowing into water bodies (Basson, 2015). In addition, an article from the *Mail & Guardian* refers to the dozens of articles on the Internet that have featured problems associated with WWTW since the beginning of the year, with some of these describing the situation as 'a ticking health time bomb'. Furthermore, the article mentions DWS's 2015 strategic overview document, which states that the wastewater treatment situation is in fact deteriorating, and that polluted water will need to be treated to ever higher standards before being discharged because water resources are becoming increasingly scarce (Davies, 2015). It is interesting that DWS would make this point after emphasising the considerable progress that has been made regarding the implementation of the Green Drop Programme in the executive summary of the 2013 Green Drop report.

Lack of human resource capacity to prepare effective corrective action plans and/or wastewater risk abatement plans

In response to Green Drop and risk analysis results, WSAs are required to prepare corrective action plans and/or wastewater risk abatement plans (collectively here referred to as ratification plans) to rectify high-risk areas and poor performance (DWA, 2011a). In fact, the success of the entire Green Drop Programme relies on the ability of relevant WSAs to prepare and implement these plans. Unfortunately, as Scheepers (2010) points out, a number of WSAs in small towns and rural areas often lack the knowledge required to assess their poor results from the previous year. They furthermore lack the capacity to prepare and implement appropriate ratification plans to submit to the regulator (DWA, 2012). This was further confirmed when the then DWA found in 2012 that most of the wastewater risk abatement plans which are currently being implemented by WSAs were developed without the relevant expertise and therefore lack substance (DWA, 2012). As a result, responses to poor Green Drop results can be quite inappropriate or inefficient. An example is the construction of costly and sophisticated wastewater treatment in deep rural areas where simple oxidation ponds may have been the best solution (Prinsloo, 2015).

Lack of financial capacity for the mainstreaming of wastewater treatment in municipal decision-making

In addition to a lack of human resource capacity and expertise, a lack of financial capacity also presents a substantial problem to both rural and larger metropolitan municipalities. This was

confirmed by an official working at a large metro's WWTW. He informed us that although the municipality has a corrective action plan in place, it is not able to implement all of its components due to budgetary shortfalls.

Such budgetary shortfalls can be linked to the fact that wastewater or water quality management officials do not control municipal budgets and have no say in how these budgets are allocated. Furthermore, these shortfalls can be attributed to the problem of water quality departments having to compete with other municipal departments for available budget (DWA, 2012), and to general operational and capital expenditure budget cuts at the municipal level. Another reason why insufficient funding is often made available for wastewater treatment may be because decision-makers do not understand the importance of successfully and effectively treating wastewater. Furthermore, effective wastewater treatment is not an activity that will necessarily result in more votes for those in power as compared to more popular initiatives such as rolling out free WiFi access.

Lack of forward planning

An official from a rural district municipality in Limpopo Province said that although the municipality is participating in the Green Drop Programme and is willing to do so, the absence of long-term planning presents a substantial challenge to its successful participation. The municipality is generally only able to plan and budget for activities one year in advance. This negatively impacts its ability to plan for and implement longer-term projects such as those envisaged under the municipal infrastructure grant.

A manifestation of this lack of forward planning is the crisis management that often takes place in municipalities. Maintenance of a WWTW (as per the corrective action plan) is not conducted on a preventative basis but on a reactive basis. Such an approach would typically result in a discrepancy in scores where the municipality would obtain a score of 90% for its risk abatement plan (as it responds to urgent risks that are identified), but at the same time would only obtain 40% for effluent compliance (which arguably is the more important score).

The absence of forward planning also presents a problem at the national level. The Minister of Water and Sanitation, Nomvula Mokonyane, has admitted that the Department had an unspent amount of R2.1 billion in the 2014/15 financial year. This money is sorely needed to repair the sector's ageing infrastructure, which can be labelled as a fundamental cause of sewage spills and water supply problems (Davies, 2015).

Problematic bureaucratic processes

A further challenge to implementing the Green Drop Programme at municipalities has to do with the process of procuring goods and services. There seems to be a problem with the Municipal Finance Management Act (Act No. 5 of 2003). The Act has not been amended to reflect the current cost of WWTW maintenance and repair. For instance, a municipality can currently only spend a limited amount of money to repair a WWTW (the same amount that it could spend in 2003 or 2004) without putting the job out on tender, whereas the cost of WWTW repair has increased substantially over the past 10 years.

In addition, contracts awarded through tenders only have a three-year duration. This may be problematic because it may take several years to establish a relationship of trust with the service provider, which may only just have started to develop when the

contract period comes to an end. Furthermore, it can be quite difficult to identify and appoint service providers because of the unpleasant nature of working with wastewater. There is also a problem with finding service providers who are trustworthy.

Complex relationship between some municipalities and DWS

From our interviews we gauged that that municipal officials at the metropolitan municipality we spoke to seem to have mixed feelings about the role and involvement of DWS in their implementation of the Green Drop Programme. Some of these officials indicated that they are not receiving any support from the Department. This lack of support can be attributed to the fact that DWS is a regulatory unit rather than a unit that is mandated to offer support to municipalities. Another reason why the Department may be offering limited support to metropolitan municipalities is because it may view these as being better capacitated than rural municipalities. One of the anonymous reviewers of this paper also suggested that DWS does not have the capacity or skills to offer the support needed by municipalities. Furthermore, different directorates within DWS find it difficult to co-operate to offer support to municipalities within the context of compliance and enforcement.

A compounding factor is that the criteria for the Green Drop Programme are not only very strict but also keep changing. Because the standards are so stringent and maintenance is problematic, process controllers at WWTW often dose the water with chlorine to comply with the required standards. This not only has a negative impact on the municipality's budget but also on the riverine environment, which as a result receives treated water with elevated levels of chlorine. The frequently changing criteria also present a problem to the implementation of other areas of the Green Drop Programme. For example, the training of process controllers takes place based on certain criteria. This means that training courses need to be constantly amended, which can result in a waste of time and financial resources.

Another challenge is that in addition to the Blue Drop and Green Drop programmes, two new programmes are being rolled out at the municipal level (the Regulatory Performance Management System and the No Drop Programme). DWS is reportedly also considering combining all four programmes and running them annually, which would place a considerable additional burden on municipalities. According to one of the anonymous reviewers of this paper, this problem could be eliminated if DWS were to streamline the reporting requirements for the four programmes. This would however require a change in mindset as DWS and the respective municipalities would need to work together closely. At the moment there is considerable pressure on municipal officials as the reporting periods for the Blue Drop and Green Drop Programmes run consecutively.

DWS also faces a challenge when attempting to hold municipalities accountable in terms of the Green Drop Programme. If the municipalities receive a score of less than 30%, they have 30 days in which to implement a corrective action plan. If they do not comply they subsequently receive a directive from DWS. If there is still no compliance it becomes very difficult for the Department to take action against them because of the principle of co-operative government in the South African Constitution (RSA, 1996). This strongly discourages organs of state from taking each other to court. In addition, DWS faces a number of internal problems, including a high level of staff turnover, which increases the burden placed on DWS officials, especially in light of having to oversee the future running of the four incentive-based programmes.

Theft, vandalism and misuse of wastewater treatment infrastructure

Another challenge that came to light in most of our interviews is the problem of theft and vandalism of wastewater treatment infrastructure (in particular copper, diesel and electronic equipment). This is a problem in both metropolitan and rural municipalities. Such incidents of theft and vandalism make it all the more difficult for municipalities to meet the requirements of the Green Drop Programme, particularly in light of the budgetary shortfalls mentioned earlier.

An additional challenge to ensuring the optimal functioning of WWTW can come from the behaviour of the very people who effective wastewater treatment is supposed to benefit. One example of such behaviour is people diverting stormwater run-off from roofs into the sewage system. This behaviour leads to an increase in the volume of wastewater a WWTW receives during and after heavy rainfall and can impact on its capacity to function properly. Another example refers to sewage systems often being used as solid waste disposal facilities, with everyday objects ranging from toiletries to blankets ending up in the WWTW. These objects damage the WWTW and also make it more labour-intensive for operators to manage the WWTW and keep it working optimally.

Not enough transparency

An issue that was raised repeatedly by our interview respondents is the failure of Government to release the full Green Drop results to the public since the 2011 round of reporting (a national Green Drop Report is released every two years) (Tancott, 2013). Instead, the results are only made available to DWS regional offices and municipalities, which negatively impacts the transparency of the Green Drop initiative. In fact, the reports seem to carry a substantial degree of confidentiality as municipal officials are not allowed to release them to third parties without the express permission of their top management. One of our interview respondents mentioned that the failure to release the results may have a political dimension because releasing them will lead to certain municipalities being named and shamed, which may negatively impact the chances of municipal officials getting re-elected.

The only evidence of municipalities' current Green Drop performance that is available in the public domain is an executive summary of the 2013 national Green Drop report, as cited earlier in this paper. The report was never publicly released. This summary gives a broad overview of the performance of municipalities in terms of the Green Drop Programme, but does not present any information on the performance of individual municipalities or their specific WWTW (DWA, 2013). While the reader is able to gauge what the progress of the programme is in overarching terms, he/she is not able to construct a picture of how well individual municipalities in the country's respective provinces are faring. Therefore the public cannot compare the performance of individual municipalities to that of previous years. Furthermore, not having access to the full report may leave the reader of the report with some unanswered questions. For example, the executive summary states that the average Green Drop score across municipalities has increased from 37% in 2009 to 45% in 2011 and 46.4% in 2013. However, the summary also states that the national Green Drop score, which applies a weighting related to the size of WWTW, has increased from 71% in 2011 to 73.8% in 2013. Not being privy to any additional information, the reader may then ask (as we certainly

did), how the national Green Drop score can be so high if the average Green Drop score across municipalities is much lower.

The fact that information about the individual performance of municipalities is not made readily available presents a challenge because this makes it impossible for the public, civil society and the media to hold Government accountable for service delivery failings. If wastewater is not treated to an acceptable standard this can pose serious health problems to downstream water users. In fact, it can even be argued that the issue of not publicly releasing the Green Drop report is symptomatic of the generally decreasing levels of transparency and accountability in the South African State.

CONCLUSION AND RECOMMENDATIONS

In our analysis, we introduce the two regulatory mechanisms which DWS currently employs to facilitate compliance and enforcement in the wastewater services sector: the Enforcement Protocol and the Green Drop Programme. (DWA, 2010). Both these mechanisms generally reflect the current trend in international and domestic environmental regulation. In essence they encompass a hybrid of the traditional approach to regulation (command-and-control) and the more contemporary alternative approach (incentive-based). Nevertheless, despite the presence of these innovative mechanisms, non-compliance still persists in the country's wastewater services sector.

In order to further build on the progress made to date in terms of the regulation of the wastewater services sector, it is critical for DWS to address and overcome the challenges, which we have presented here.

Firstly, there is a definite need to build the capacity within municipalities to draft and implement relevant and substantive ratification plans as required by the Green Drop Programme. This capacity includes addressing the need for relevant expertise as well as for the necessary resources to draft and implement these plans.

Secondly, Green Drop report findings need to be mainstreamed in municipal planning. Linked to this, municipal decision-makers need to be aware of the importance of adequately functioning WWTW for environmental and human health, as well as water security in a water-stressed country. Based on such an increased awareness, these decision-makers then need to start making available adequate budgets for WWTW to be efficiently upgraded and maintained. This could be done by ring-fencing budgets especially set aside for delivering effective wastewater services. The availability of financial resources is critical, particularly in light of a growing South African population, and ever-increasing levels of development and urbanisation.

Thirdly, it is critical for the planning and budgeting processes of municipalities to be adapted so that municipalities can engage in long-term planning, ideally more than one year in advance, when it comes to wastewater treatment. This will enable municipalities to adopt preventative measures and a monitoring and evaluation-focused approach, rather than only doing crisis management.

Fourthly, it would be very beneficial to municipalities if the process to procure goods and services would be amended to assist them in maintaining and repairing their WWTW effectively. This would mean allowing municipalities to make available sufficient funds for WWTW maintenance and repair that are reflective of current pricing.

Fifthly, it is important to address the problems that characterise the relationship between some municipalities and DWS. Based on our interviews, solutions include ensuring that

municipalities receive more support from DWS to effectively implement the Green Drop Programme. In particular there is a need to address the capacity and co-operation challenges within DWS. In addition, DWS should desist from changing the Green Drop criteria too often. A very serious problem regarding the relationship between municipalities and DWS is the considerable challenge that DWS faces in holding municipalities accountable in terms of wastewater treatment. This can be attributed especially to the principle of co-operative government. It is critical to find a way to continue upholding the ethos of this principle, while at the same time overcoming the limitations it imposes upon the ability of organs of state to hold each other accountable. Furthermore it is important to better co-ordinate the Green Drop Programme and the Enforcement Protocol's implementation processes. Such improved co-ordination would contribute to enabling DWS to move away from a situation of fragmented and poorly co-ordinated regulatory functions, and to work towards a consolidated and continuous regulatory cycle.

Sixthly, it is critical for municipalities and DWS to effectively address the problems of theft, vandalism and misuse of wastewater treatment infrastructure, which can lead to costly damage. Interventions in this regard may require a mix of better policing by the Department and the South African Police Service (SAPS), and raising awareness amongst water users.

Lastly, the issue of DWS not releasing the full Green Drop results in the public domain since the 2012 progress report has done considerable damage to the credibility of the Green Drop Programme, the DWS and the country's municipalities. This needs to be addressed with some urgency. While the Minister of Water and Sanitation, Ms Nomvula Mokonyana, promised to release the 2013/14 Green Drop report by 30 September 2015 (Basson, 2015), at the time of writing this paper, this had not been done.

In conclusion, in this paper we have focused on the Green Drop Programme and the achievements and challenges around its functioning and implementation to date. From our analysis it becomes clear that while the Green Drop Programme has resulted in an overall improvement in wastewater treatment in the country, there is still substantial cause for concern, particularly in the context of the considerable strain the country's water resources find themselves under. We believe that overcoming the challenges presented in this paper will bring South Africa considerably closer to having an effectively functioning wastewater services sector.

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