

THE TRIGGER TO RECYCLING IN A DEVELOPING COUNTRY – IN THE ABSENCE OF COMMAND-AND-CONTROL INSTRUMENTS

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SUMMARY: Waste recycling in South Africa is largely industry driven with the focus to date having been on pre-consumer recovery and recycling from business and industry. With a very young pro-environmental consciousness in South Africa, limited post-consumer separation at source and recycling has occurred. Any post-consumer recovery which has taken place has largely been supported by a large informal recycling sector which is dependent upon the income stream associated with informal collection. Waste recycling statistics for South Africa suggests an average growth rate of 23.7% over the past few years in the percentage of recyclables recovered and reprocessed. However, this progress is not the direct result of implementing waste legislation, which prior to 2008 focused on the control of waste disposal at landfill and did not require waste separation at source or recycling. The waste management hierarchy was first introduced into South African environmental law in 1998 as the only means to achieve sustainable development (Matete and Trois, 2008). This paper reports on a preliminary assessment of the drivers of recycling in South Africa, looking at both ends of the spectrum, from post-consumer recycling (as generators of the ‘waste’) to the recycling industry (as the recipients of a ‘renewable resource’). The findings suggest that financial incentives are the main drivers for recycling from an industry point of view while environmental awareness supported by convenience are factors influencing post-consumer household recycling behaviour.

1. INTRODUCTION

Waste recycling is not new to South Africa. Collect-a-Can, the beverage can recycling company, was established in 1976 (Nampak, 2002) with reports of waste sorting facilities in the cities of Johannesburg and Pretoria (suburb of Centurion) operating in the 1970s (Noble, 1976). An estimated paper recovery rate of 23% for South Africa was reported for 1973 (Brooks, 1977). Matete and Trois (2008:1481) quote a 1996 Memorandum to the Portfolio Committee of the National Assembly stating that South Africa “*has a well established recycling industry*”.

Post-consumer waste recycling (defined for the purposes of this paper as the recovery of reusable materials from residential and commercial waste, excluding industrial process waste material which has not reached a consumer) was initiated and continues to be developed as a private sector, market-driven initiative (DWAF, 2001). Recycling has had limited community participation and government involvement in South Africa (Fiehn and Ball, 2005) however high

unemployment rates and associated levels of poverty, have seen the spontaneous development of informal salvaging and reclamation of valuable waste materials (Fiehn and Ball, 2005). The recovery of recyclables started informally at landfills, but more recently has spread to kerbside reclamation by informal collectors in urban areas (Fiehn and Ball, 2005). The informal sector plays a significant role in diverting recyclable materials from waste in developing countries (Sembiring and Nitivattananon, 2010). *“The situation in industrialised countries is very different, since resource recovery is undertaken by the formal sector, driven by law and a general public concern for the environment, and often at considerable expense.”* (Zurbrügg, 2002).

Environmental legislation and, in particular pollution and waste legislation, is fairly young in South Africa, with the majority of environmental legislation having only been passed since 1998 (Figure 1). Godfrey and Nahman (2007) identified at least three on-going phases in the public administration of pollution and waste in South Africa.

The first targets for waste management in South Africa were set in 2001 in the Polokwane Declaration (DEAT, 2001). These targets, which set a long-term goal of zero waste to landfill, were not legislated and have become a contentious issue within the South African waste sector. It is anticipated that regulations containing revised targets, as proposed in the Draft National Waste Management Strategy (DEA, 2010), will be promulgated under the National Environmental Management: Waste Act, 2008 (Republic of South Africa, 2008) that came into effect on 1 July 2009.

The purpose of this paper is to report on findings from preliminary research pertaining to potential triggers for recycling initiatives in South Africa in the absence of command-and-control instruments for recycling. A better understanding of these triggers is required to enable government and industry to further improve on recycling rates, and in particular support the proposed move towards post-consumer separation and kerbside collection of recyclables (DEA, 2010).

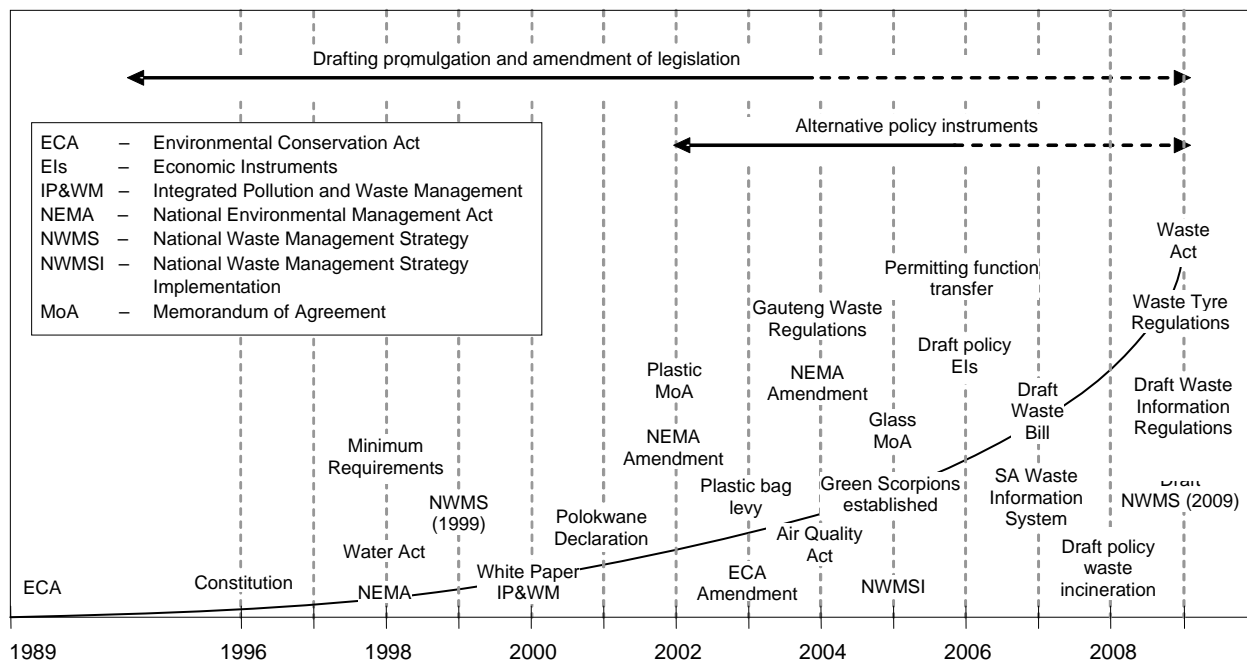


Figure 1. History of pollution and waste policy interventions in South Africa (1989-2009) (adapted from Godfrey and Nahman, 2008)

2. METHODOLOGY

A desktop survey of waste recycling in South Africa was undertaken to review trends in the recycling of specific waste streams. The desktop survey included a literature review and telephone interviews with key players in the recycling industry. Recycling rates are reported as percentage recovery rates of recyclable materials unless otherwise indicated.

A preliminary assessment of recycling behaviour was also undertaken as part of this research as a first step towards a South African country wide waste recycling behaviour project to be initiated during 2010. The research on recycling behaviour was qualitative and a self-administered questionnaire consisting of limited open-ended questions, was distributed via email to 228 employees of the Council for Scientific and Industrial Research (CSIR). Short, open-ended questions allowed for personal points of view to be expressed.

In analysing the data, responses were divided into two groups, those responses received within 24 hrs of the questionnaire being sent out (n=27) and those received after 24 hrs (n=10). This analysis was undertaken to assess whether early responses were skewed towards those persons with a strong tendency towards recycling waste. Open-ended questions regarding factors driving recycling behaviour in industry were also sent per e-mail to key players (n=9) in the recycling industry to determine their views from an industry perspective.

3. RESULTS AND DISCUSSION

The sample group represents a fairly environmental conscious proportion of the public and this should be borne in mind when reviewing the preliminary research findings. A total of 37 responses (16% response rate) were received, which is considered on the low side, even for self-administered questionnaires and especially considering the perceived environmental awareness of this sample group. A total of three responses (33.3% response rate) were received from key industry players.

3.1 Recycling trends

Statistics obtained from the Packaging Council of South Africa (PACSA, 2005) indicate an increase in the recycling of paper (22.9%), metals (42.5%), plastic (14.5) and glass (14.9%) in South Africa over the past 20 years (Figure 2). It is of significance that this increase in recycling does not follow the development of command-and-control instruments as illustrated in Figure 1. There has also been a significant increase in the recovery rate of used beverage cans between 1994 and 1998 with a more gradual but steady increase ever since (Figure 3).

A steady increase in the recovery rate of recoverable paper has also been reported by the Paper Recycling Association of South Africa (Figure 4). Of the 38% recycled in 2000, 24% was post consumer paper comprising 20% from the wholesalers and retailers, 2% domestic and 2% offices. It was estimated that the potential for additional recycling from wholesalers and retailers is 19% (362 tpa), for domestic sources 17% (317 tpa) and 10% (194 tpa) from offices (DEAT, 2000).

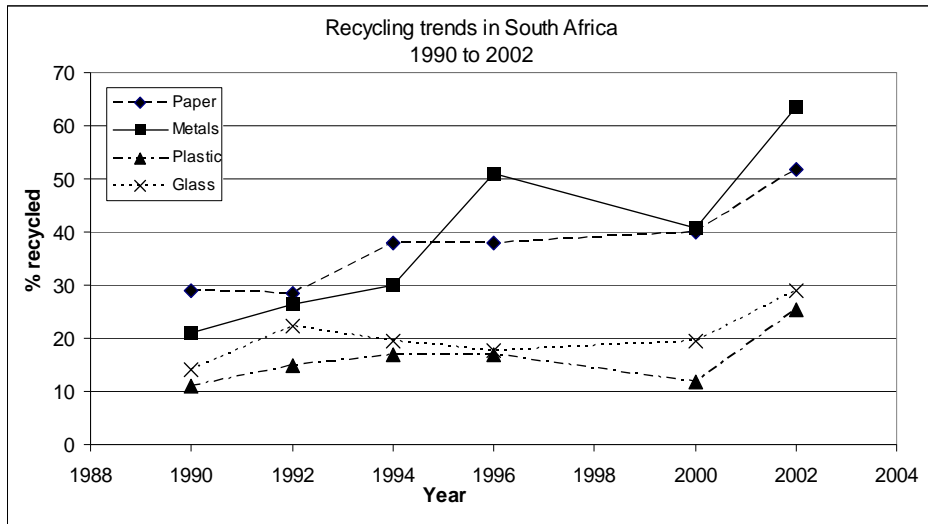


Figure 2: Recycling trends in South Africa for the period 1990 to 2002 (source: PACSA)

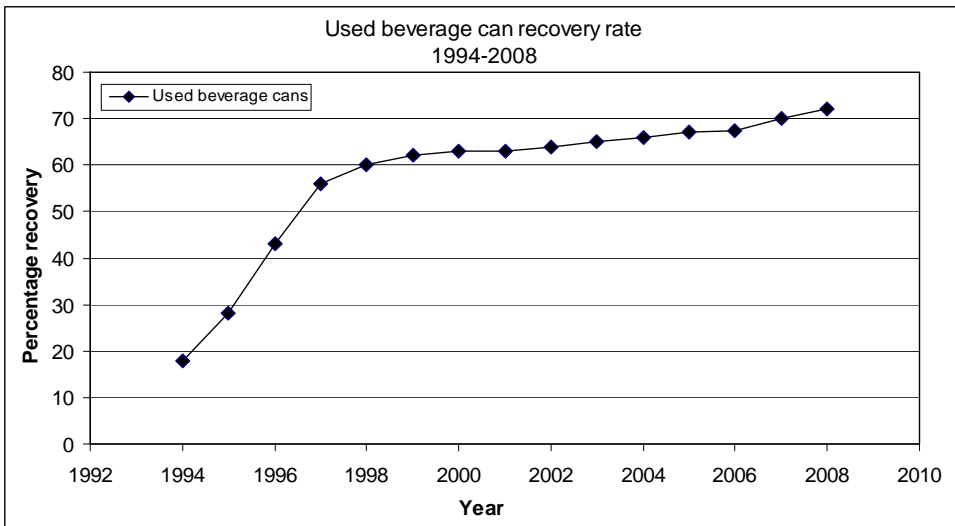


Figure 3: Used beverage can recovery rate 1994-2008 (source: Collect-a-Can)

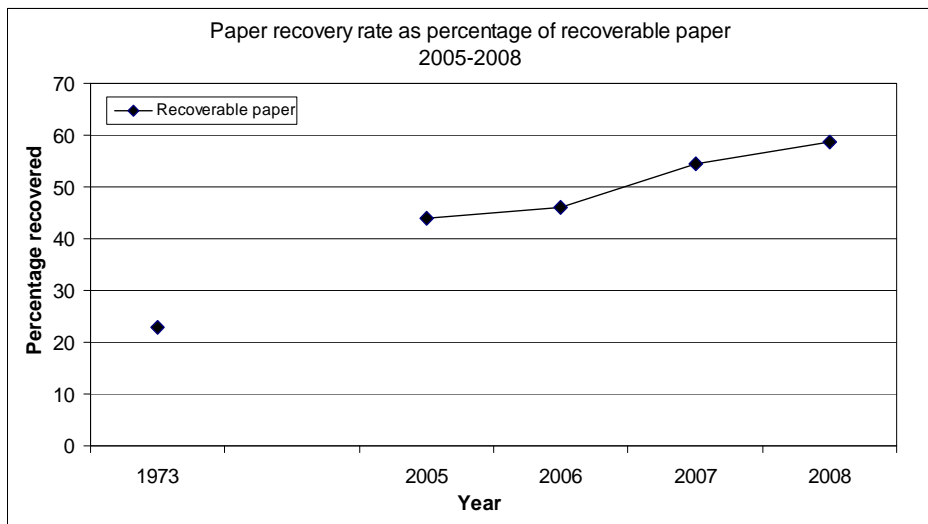


Figure 4: Paper recovery rate as percentage of recoverable paper 2005-2008 (source: Paper Recycling Association of South Africa)

3.2 Drivers for industry

In developing their recycled markets, the various sectors of the recycling industry - paper, glass, plastic and metal - have had several drivers including financial, competition in the market, energy saving, water consumption and environmental responsibility (personal communication Andrew Marthinusen, 2010; Annabé, Pretorius, 2010). However, a common driver to all, throughout the last decade, has been an underlying threat of regulatory action, i.e. government imposing recycling targets onto the recycling industry, if industry was not pro-active. There is a general belief within the recycling sector, that industry can develop more effective, sustainable and less costly solutions than government imposed regulations. This is also aligned with the South African government's neo-liberal economic policies, such as GEAR (South Africa's macro-economic policy, the Growth, Employment and Redistribution plan) which aim to reduce the direct "interference" of government in private business. Possible further regulations such as deposits on some one-way packaging, shortly after the plastic bag regulations, was an impetus for sectors such as glass and certain plastics streams to speed up the implementation of their plans (personal communication: Andrew Marthinusen, 2010).

Other drivers for the recycling of waste in South Africa, have been more economic (personal communication: Annabé, Pretorius, 2010; Ursula Hennebury, 2010). The supply of waste paper is an important input for the paper industry in a water scarce country such as South Africa, where further forest expansion is limited. The financial attractiveness of recyclate is often linked to the stage of the commodity cycle, as recycled fibre in some cases competes with virgin fibre (personal communication: Annabé, Pretorius, 2010). When the commodity cycle is down; virgin prices become depressed, placing recycled fibre under stress to compete (personal communication: Andrew Marthinusen, 2010).

Some recycling industries started to develop markets for recyclate as a competitive response to other materials. For example: the steel beverage can in South Africa was faced with a threat of an aluminium alternative twenty years ago (personal communication: Andrew Marthinusen, 2010).

3.2.1 Paper

Brooks (1977) noted that South Africa was to experience fibre shortage by the mid 1980s if consumption patterns did not change. *"Recovery and reuse of waste paper contributes to a saving of foreign exchange, and effectively reduces the demands placed on local timber resources"*(Brooks, 1977). DEAT reports that the paper industry was equipped to recycle a maximum of 720,000 tonnes in 1999 (DEAT, 2000). *"The main incentive for the paper industry to recycle is to reduce the cost of paper that is generated at the mills in order to compete more competitively in the international market"* (DEAT, 2000). Market prices in 2000, resulted in converters buying paper from international manufacturers at prices equal to, or lower than, the cost of paper in South Africa (DEAT, 2000).

3.2.2 Glass

Despite being 100% recyclable, approximately 25% of all non-returnable glass containers produced annually is retrieved for recycling in South Africa. This figure is relatively poor compared to international rates (www.container-recycling.org). Energy saving is a driving force for recycling glass since recycled glass melts at a lower temperature than virgin material and thus saves energy and also produces a more malleable molten glass (DEAT, 2000).

3.3 Post-consumer behaviour

To further increase recycling rates in South Africa, efforts should focus on post-consumer recycling by households to improve the quality of recyclate recovered. The CSIR is embarking on a country wide research project in 2010 to assess post-consumer recycling attitudes and behaviour to inform future recycling systems. As the first step towards preparing the more detailed questionnaire to be used in the further research, a readily accessible sample population was targeted at the CSIR to gather preliminary data. This was further supported by the availability of a recycling drop-off centre on the CSIR premises.

The very preliminary findings are presented below. The results should not be used to represent the general waste recycling behaviour in South Africa, since the questionnaire targeted a very specific sample of environmentally aware, well educated South Africans. A response rate of 16.2% was obtained from the e-mailed questionnaires.

The results do not show a significant difference between early and late responses (Table 1) in terms of the profile of questionnaire respondents. As such, the discussion put forward below is based on the total sample profile (Table 2a). Of the responses received, 29 people (78%) are currently recycling one or more waste stream (paper, plastic, glass, tin). The profile of those recycling (Table 2b) shows a strong tendency towards females (76%), white South Africans (79%) and respondents with a post-graduate degree or diploma (90%), i.e. who are currently employed within the science, engineering and technology (SET) sector of the sample organisation. Socio-demographic factors are known to influence recycling behaviour. Barr (2007) found young, female, high-income earning, well-educated persons to be more participatory in waste recycling activities.

The main reasons given for engaging in recycling (Table 3) are environmental awareness (62%) (which is expected given the bias in the sample population). This was followed by a sense of social responsibility to recycle (27%); and conserving landfill airspace (23%). Barr et al. (2001) identified three predictors of behaviour, namely, environmental values, situational variables and psychological variables. They report that recycling behaviour is likely to be influenced by convenience, knowledge and access to a kerbside scheme. Tonglet et al. (2004) identified “*concern for the community*” as a “new factor” influencing recycling behaviour.

Table 1. Profile of questionnaire respondents (divided by early and late responses)

		Early (<24hrs)		Late (> 24hrs)	
		n	%	n	%
Responses		27	73.0	10	27.0
- Gender	Female	20	74.1	7	70.0
	Male	7	25.9	3	30.0
- Race	White	21	77.8	5	50.0
	Black	6	22.2	5	50.0
- Occupation	SET	22	81.5	9	90.0
	Admin	5	18.5	1	10.0
Recycling	Yes	21	77.8	8	80.0
	No	6	22.2	2	20.0

Table 2(a). Profile of questionnaire respondents (b) Profile of those respondents recycling

		n	%		
Responses		37	100%	29	78.4
- Gender	Female	27	73.0	22	75.9
	Male	10	27.0	7	24.1
- Race	White	26	70.3	23	79.3
	Black	11	29.7	6	20.7
- Occupation	SET	31	83.8	26	89.7
	Admin	6	16.2	3	10.3
Recycling	Yes	29	78.4	29	78.4
	No	8	21.6	-	-

Table 3. Personal reasons given for recycling waste

		Responses	
		n	%
Environmental protection		16	61.5
Social responsibility / spiritual awareness		7	26.9
Conserve landfill airspace		6	23.1
Resource conservation	energy	4	15.4
	natural resources	4	15.4
Job creation / support recycling industry		2	7.7
Encourage behaviour in children		2	7.7
Financial reasons (e.g. savings)		2	7.7

Only 8 of the respondents (22%) indicated that they are not currently recycling waste. The reasons provided for not recycling included a lack of knowledge, lack of financial incentives, and inconvenience. A number of respondents mentioned that the waste volumes generated in a single-person household were too low to consider recycling and the associated effort. This perception was also observed by Grodzinska-Jurczak et al. (2003).

The results suggest that by increasing knowledge, providing financial incentives and improved convenience, recycling behaviour can be stimulated. This is in line with international findings, that households would be more prone to recycle if: “*they could benefit financially*” (a recycling behaviour study conducted in Gaborone, Botswana) (Bolaane 2006); and “recycling services [were] reliable, convenient and easy to use” (Malaysian study) (Omran et al., 2009). Knowledge of separation at source and how the recycling service it is operated in the local area is also necessary for successful implementation of a recycling campaign (Omran et al., 2009). The relationship between knowledge or increased awareness and recycling behaviour has been shown by Oskamp et al. (1991), Gamba and Oskamp (1994) and Mosler et al. (2008).

4. CONCLUSIONS

There is a steady improvement in recycling rates in South Africa over the past 20 years, but it is still far from what it should be to significantly reduce waste disposal to landfill. Recycling trends in South Africa do not follow trends in regulatory development although the threat of increased regulation by government, and in particular the legislating of recycling targets, acted as an

incentive for industry to initiate their own steps towards increased waste recovery and recycling, evident in the recycling rates since 2000. Reports in literature also suggest that having recycling targets stimulate recycling rates (Landis, 2005). Financial (business) incentives for industry seem to be one of the main drivers for the growth of the South African recycling industry, while the informal recycling sector is driven by poverty and high unemployment levels (Schübeler, 1996; Visvanthan and Trankler, 2003; Rankokwane and Gwebu, 2006; Gutberlet, 2008; Noel, 2010). In this regards, South Africa is reported to have an unemployment rate of 25.2% (Statistics South Africa, 2010). The increase in recyclables recovered by the informal sector have “flooded the recycling market and market prices on recyclables have dropped as a result” (Fiehn and Ball, 2005). Recycling seems to be a priority area for job creation in South Africa (Fiehn and Ball, 2005) as recognised by the Department of Trade and Industry in their 2010–13 Industrial Policy Action Plan.

While very preliminary research suggests that household recycling behaviour could be supported by environmental awareness and convenience, further, more detailed research to be undertaken during 2010 will provide more insight into post-consumer recycling behaviour in a developing country such as South Africa. Although the results are preliminary and not representative of the South African society, these findings suggest that similar drivers, as observed in literature, could be relevant in South Africa. However, acknowledging the cultural and economic diversities in South Africa, more work is required towards stimulating recycling behaviour in all communities.

ACKNOWLEDGEMENTS

The authors are thankful to all respondents who took the time and effort to complete the questionnaires. A special word of thanks also goes to Ursula Henneberry, Andrew Marthinusen and Annabé Pretorius for their assistance in providing an industry perspective. Linda Godfrey is also acknowledged for her comments which improved an earlier version of the paper.

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