

Consumer perceptions about E10 fuel in Zimbabwe: managerial implications

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Abstract

This study contributes to an understanding of how consumer misinformation, leading to negative perceptions, can encourage the anti-consumption of some green products. Multiple methods were used to gather data, with the intention of bringing multiple points of view to the emerging misinformation surrounding the consumption of E10 fuel.

The market acceptance and uptake of Zimbabwe's E10 has remained pessimistic, yet elsewhere in the world, the same blend has been packaged as a 'premium, super brand'.

The study utilizes methodological triangulation to generate richer data, and deeper insights about the socially constructed meanings surrounding the commercialisation and consumption of blended fuel. The study uncovers a host of misinformation patterns and misconceptions ranging from technical issues concerning the fuel's composition, engine compatibility, mixed pricing views as well as policy-related issues. Revealing how blended fuels have succeeded elsewhere, the study shows how blended fuel misinformation can be handled through mandatory blending and market education on E10 economic benefits. The study's findings contribute to an understanding of how consumer misinformation spread through the market and in turn, how such misconceptions can negatively affect a product's image, sales and market share. Thus in managing these misconceptions, the study underpins the need for adequate consumer education and improving market access of E10 as the project has the potential for creating jobs, improving fuel supply in Africa, while upholding a green environment.

Key phrases

commercialisation; consumer misinformation; E10 fuel; perceptions; Zimbabwe

1. INTRODUCTION

Consumer researchers have explored the role of consumer misinformation, as well as socially and culturally constructed meanings of consumption (Brown, McDonough & Shultz 2013). Most of this work has drawn insights from consumers in well developed economies, who are often surrounded with an abundance of choice for consumer goods.

Bringing the case of Zimbabwe to this theoretical debate is interesting because of the economic uncertainties surrounding the supply of basic goods including fuel. In fact, the dawn of Zimbabwe's independence saw the government dedicating substantial resources towards the establishment and capacity building of centres for innovation, with the intention of creating demand and making basic goods and services locally available.

It is within this context that the development and advocacy of the use of bio fuels emerged. A local newspaper in Zimbabwe reported that "for more than a decade, during the 1980s, all petrol sold in Zimbabwe was blended with ethanol, with the ethanol percentage at times reaching 20 percent. No one minded. All cars worked as designed ..." (Mugabe 2012:2). In 2011, more than thirty years' post-independence, the government revived the bio fuel sector, a move that was targeted at increasing energy independence, creating jobs in rural areas and combating climate change.

Of particular significance is the fact that up to 20 percent of Zimbabwe's fuel imports were to be replaced by biodiesel and sugarcane ethanol. Approximately US\$600 million was invested into the mammoth ethanol project at Chisumbanje in the eastern part of Zimbabwe thus the project was awarded a National Project Status by the Zimbabwean Government (Statutory Instrument 144 of Zimbabwe 2011).

E10 has however come with a multitude of commercialisation challenges on the market, ranging from technical issues concerning the fuel's composition (10:90 of ethanol and petrol respectively) to mixed pricing perceptions. Given the increasing need for evidence-based policy making, there is a need for research that could aid policy makers, fuel distributors, and consumers to understand the true nature of E10 fuel. It is against this background that the researchers undertook to investigate the socially constructed meanings and misinformation engulfing commercializing and consumption of E10 fuel.

Given this background, the study postulates that marketing must focus on the benefits of using E10 that can help to reduce consumer misinformation and misconceptions about the socio-culturally constructed meanings of E10 fuel in terms of its quality, pricing, efficiency, reliability and technicalities which can lead to positive response from the public and then increase the sales of the product.

2. LITERATURE REVIEW

2.1 Consumption of blended fuel

Research reveals that there are several developed economies that have adopted more of ethanol-blended fuels than unblended fuels (Balat & Balat 2009:2278). Rising oil prices and apprehension about global warming have prompted governments to rethink their energy supply policies (Orellana & Neto 2006:Internet). Not all countries have however adopted 10% ethanol. For example, Brazil has adopted up to 20% in some of its applications. Such countries include USA, China, Australia, India and Brazil (the world's top producer), among many others.

Within this, there is an interest in Brazil's applications. For example, Japan's interest in Brazil's ethanol was prompted in 2004 when the then Prime Minister Koizumi visited an ethanol production facility in Brazil and said his country was interested in the alternative fuel as a means of meeting the demands of the global environmental agreement signed under the Kyoto Protocol. It is quite interesting to note that Japan serves as the major source of Zimbabwe's second hand cars (Matimairé 2014).

While Japan has successfully advocated for the use of ethanol, the Zimbabwean market seems resistant even though measures have been taken to ensure engine compatibility with the ethanol fuel. In fact, Japan has adopted ethanol-blended fuel since 2005 (Orellana & Neto 2006:Internet). Therefore, this study sought to understand why there is consumer resistance to the E10 fuel in the Zimbabwean market. Equally important is to understand whether there are lessons that Zimbabwe can learn from developed economies such as Japan, and how this can help to improve the adoption of ethanol blended fuel.

According to Durgee (1988:532), "people tell stories to each other in order to share each other's experiences" i.e. vicarious enjoyment and they also enjoy the suspense awaiting the outcome or climax (Benjamin 1969). To this end, Levy (1981:61) argues that shared folklore and socially, and culturally constructed meanings promote group solidarity, and provide self-esteem and status to those who tell the story. Such has been the case with the marketisation of E10 fuel in Zimbabwe.

2.2 The Zimbabwe situation

Despite the enormous scarce resources invested into the ethanol project, the market's response in adopting the product has remained very low. Few Zimbabwean motorists and fuel distributors

appear interested in the E10 fuel. Those driving into service stations frequently find a queue at the unblended petrol pump while the E10 (blend) pump is occasionally unattended or attended, but very few vehicles. So they ask each other in storytelling and share their misconceptions in the fuel quality, price, efficiency etc. So motorists waste time, money and the same fuel they are looking for with the last drop in the tank in search for unblended import fuels.

Thus Zimbabwe is still depending on the expensive imported fuel regardless of huge stocks of a locally produced fuel. The company producing ethanol for the blended petrol, Green-Fuel Ltd, has since suspended production as it ran out of storage space after it reached its 10 million litres full capacity. As a result, the company has retrenched about six hundred employees (The Standard 2012:Internet) after the two year old plant was shut down. Several stories have been told about E10 fuel in Zimbabwe – some consumers have doubted its composition and compatibility on local cars, some have questioned its impact on car performance, others have sold the news that the fuel gets used up quickly, while others simply do not believe in the product.

2.3 Consumer misinformation

Through the history of qualitative consumer research theory, there are two main types of responses given by respondents: perceptions and stories (Durgee 1988; Levy 1981). These make up socially and culturally constructed meanings. In fact, Levy (1981) suggests that the purpose of socially and culturally constructed meanings is to provide a logical model capable of overcoming contradictions or paradoxes in natural and social experience. In similar terms, Thompson (2004:170) suggests that market socially constructed meanings are a collection of “discourses that seeks to channel consumers’ identities and lifestyles in a particular ideological direction”.

Further, Holt (2004:102) suggests that socially constructed meanings of simple living resolves the cultural contradictions by providing the individual with a toolkit of authentic (sub-culturally-legitimated) social meanings to counter the hegemonic ideology. Some recent studies have attempted to revisit the subject thus they talk of the environmental cost of misinformation (Carrico, Spoden, Wallston & Vandenberg 2013:433). This study measures consumer perceptions about the socially constructed meanings, and misinformation surrounding the consumption of E10 fuel in Zimbabwe.

3. METHODOLOGY

The study was approached from an exploratory perspective since the researchers intended to establish the realities surrounding E10 commercialisation, that is, what is really causing E10's failure in the Zimbabwean market. This helped in clarifying the researchers' understanding of the research problem (Saunders, Lewis & Thornhill 2009:133). This study adopted methodological triangulation in order to achieve the study's objectives.

Data for this study were gathered in four phases, and using multiple methods. Multiple methods are increasingly being recognised for their ability to bring multiple points of view to research, taking advantage of the strengths of each of the qualitative components to explain or resolve complex phenomena or results (Chitakunye & Takhar 2012:914). The first phase involved an appreciation of the status quo through a non-systematic review of diverse publications including newspapers, tracking relevant websites and participatory observations. The researchers followed through the E10 news from the time the product was rolled out for commercialisation. Participatory observations were made by randomly driving in to service stations where E10 was and was not being distributed.

The second phase involved holding 32 key informant interviews with conveniently sampled service stations' staff. During this phase, short, but structured interceptive mall interviews were held with 150 motorists randomly intercepted at these service stations. In order to participate in this research, respondents had to be aware of, or have been engaged in the usage of E10 fuel.

The interceptive interview guide was divided into three sections: the first section dealt with motorist evaluations based on their experience with E10 (if any); the second section asked the respondents to rank the attributes (in the first section) in order of preference (regardless of past experiences), while the third section was concerned with their perceptions of E10 fuel and what they thought could be done to improve the situation. The third phase involved a key informant telephonic interview with one of Green Fuel Ltd. management staff who preferred anonymity for the purposes of success of this research. It is during this interview that the research problem was confirmed, while technical issues involved in E10 fuel were clarified.

During the fourth phase, the researchers reviewed some success stories of E10 uptake in other countries. This involved an examination of publications on how those countries have managed to gain Ethanol fuel acceptance in their respective countries. The researchers reviewed cases from

Japan, U.S.A, Brazil and China – who are on the lead regarding the adoption of blended fuels. The information gathered from the reviews, together with data collected from phases 1 and 2, were used to establish a roadmap for the Zimbabwe’s situation. Table 1 below justifies the multiple-stages in gathering data for this study.

TABLE 1: Justification of multiple data collection techniques

OBJECTIVE	MULTIPLE DATA SOURCES
To understand the nature of E10 commercialisation and uptake challenges	Published material Participatory observations
To create an in-depth and rich account of E10 uptake and issues arising	Key informant interviews with fuel distribution (service stations’) staff (32)
To confirm the research problem and gain technical insights of E10	Key informant interview with Green Fuel Ltd. (1)
To appreciate customer perceptions on E10 fuel vis-à-vis their expectations.	Short interceptive mall (service station) interviews (150)
To explore the possible way forward.	Success stories reviews A combination of all methods above

Source: Developed by the authors

During data collection, respondents were not forced to partake in the study. Instead, the researchers had to first clarify the need for the research and how the study would impact the future of the country, the region and the world at large. Consent was thus obtained from the respondents before their participation in the study. Data were summarized using descriptive statistics and analysed qualitatively.

4. RESULTS AND DISCUSSION

4.1 The distribution of E10 fuel

Out of a total population of 197 service stations in Harare (ZERA 2012), the study returned that E10 was distributed in 59 stations, which represented 30% of service stations in Harare, Bulawayo and Mutare, and on one service station each in Chegutu, Gweru, Marondera and Rusape. It was also established that the first distribution point of E10 fuel in Zimbabwe (as at

November 2012) was in Mutare, which is about 200km from the plant, a clear indication that the product has not been sufficiently marketed or has not been accepted within its immediate locality, possibly due to unstable socio-economic relations between the firm and the community (All Africa News 2012:Internet). E10's overall market coverage in Zimbabwe stood at +/-17% as at November 2012). The exploratory phase revealed that there were no E10 supplies to Harare satellites, Chinhoyi, Karoi, Kariba, Plumtree, Beatrice to Beitbridge as well as from Murewa to Nyamapanda, a clear indication that E10 distribution is constrained. Naturally, consumers' degree of product trial tends to increase if the product is accessible (Aggarwal, Cha & Wilemon 1998:361).

Asked why they do not distribute E10, 83% of the service stations who participated in the study indicated that though they would like to, they learnt from the current distributors of the product that E10 does not sell quickly; hence a slow sales turnover. 76% of the service stations indicated the need for a third E10 fuel pump since they only have two pumps for unblended petrol and diesel only; while 14% were of the view that since it is not mandatory, they had the right to distribute what they felt is marketable. Of the respondents, 10% raised reservations on E10 price, which they felt was too close to that of unleaded fuel. As at November 2012, the E10 price ranged between \$1.43 and \$1.49 / litre versus \$1.45 - \$1.52 / litre (for unblended petrol) depending on location.

Research has long established that where brands are perceived as heterogeneous, the higher priced national brand offer the greater reduction in purchase risk (Laplaca 1974:12). Unit pricing more clearly identified, even though there is a slight difference in prices, the higher priced unleaded fuel attracted more buyers. This was the more likely due to the fact that naturally, consumers would expect a 100% local product to be clearly cheaper than the import if they are to attach value to the product.

Ninety percent of the service stations distributing E10 indicated that they do so because they felt that the product is environmentally friendly compared to unleaded fuel. Another reason cited was that the product is 100% Zimbabwean, and as such, it needed their support. Providing consumers with a set of choices was also a reason for stocking and distributing E10. About 60% of these service stations expressed their satisfaction with E10 sales. These were located in low-

densities especially in Harare (e.g. Avondale, Belgravia and Borrowdale). 40% of the service stations selling E10 fuel indicated that they were not impressed with E10 sales.

For instance, one service station in Harare City centre indicated that they sell a daily average of about 20 litres of E10 fuel, compared to an average of +/-500 litres of unblended petrol. These findings were consistent with insights that emerged from the study's participatory observations. The findings also confirmed Laplaca's (1974) conclusions that correlation coefficients of income versus change in preference and/or choice support the hypothesis that there is a positive correlation between income and shift toward the higher unit priced item. Assuming that E10 was being considered expensive, we found that the high income earners, assumed to be staying in Zimbabwe's low density areas, found joy in purchasing and consuming that which was deemed "expensive" by the market. The study postulates that the high demand in such areas is certainly correlated with income.

4.2 Consumer perceptions and misinformation

The study was mainly aimed at understanding consumer perceptions and misinformation about E10 fuel. Of the 150 respondents, 113 (75%) identified themselves with at least some level of awareness of E10 fuel while 37 (25%) were not aware of the product. Interestingly, these 25% were mostly from outside Harare. Of the 113 who were aware of E10, 31% have used and / or are using E10 while 69% have never tried using E10. Asked why they have not used E10, 99% of the motorists indicated that they have "heard" that E10 "destroys engines" and also "gets used up quickly". Further asked if they have proven these claims, none of the motorists have proven anything, a clear indication that market education is needed. The study noted that some flyers advertising E10 were at very few service stations. It was also observed that these were in service stations located in low density areas at the expense of service stations located in medium density and high density areas where sales are still problematic.

The study also returned that some companies, as users of E10, have revised their company policies to stop their drivers from fuelling and / or re-fuelling company vehicles with E10. This was thus a clear indication of how the misapprehensions about E10 fuel in Zimbabwe had filtered across different types of user groups, including individual consumers, and different organisations. Thus these findings confirm the power of Word of Mouth (Buttle 1998:241; Keller 2007:448; Libai,

Lemon & Hogan 2004:272) and peer influence on the attitudes, thoughts, and actions of an individual (Bristol & Mangleburg 2005:79).

Of the 31% who have used and / or are still using E10, 95% expressed their satisfaction with E10 performance and indicated that they would recommend others to use the product; In fact, the study established that about 60% of these E10 advocates felt the product deserved positive word-of-mouth. The E10 advocates had the following “top three” reasons to adopt E10:

- *E10 cleans your engine, tank and carburettor*
- *“I can alternate E10 blend with Unblended petrol anytime”*
- *The whole world is going “green”, why not rally behind?*

Reservations were however raised in terms of E10 price. The E10 advocates felt the product is relatively expensive. When reminded that Ethanol was only 10% while 90% is still imported cost, the E10 advocates were of the view that the country should move to higher ethanol blends (such as E15, E20, E25 up to E85) as long as that will lead to “lower price” and also as long as that will reduce the nation’s dependency on imported fuel.

Following from this, 53% of E10 advocates expressed their loyalty with the ethanol blend such that they indicated that they would not have any other fuel in their vehicles as long as E10 is still available elsewhere. However, in the event of fuel shortages, 100% of the motorists who participated in this study disclosed that they would go for E10 fuel, at any price, if there is to be no alternative. This is in support with literature which argues that brand choice and decision-making under uncertainty in turbulent consumer goods markets are limited by circumstances (e.g. Erdem & Keane 1996:1,5; Saren 2013:1427).

The analysis was followed by identifying the expectations of potential customers of E10 fuel, to “guarantee” its uptake. These are those factors that motorists perceived they could consider in making an initial purchase of E10, and they included pricing, safety, compatibility, uniqueness, and ‘switchability’, communication / assurance, availability and market support, as illustrated in Table 2. Using a five point Likert scale, respondents were asked to either agree or disagree with a set of evaluative statements where SA = strongly agree; A = agree; NS = not sure (neither agree nor disagree); D = disagree; SD = strongly disagree.

For the purposes of this study, uniqueness relates to an innovation or product of its own kind. While an innovation could be unique, that may not guarantee its quality i.e. durability and fitness for intended purpose (Kotler, Armstrong & Tait 2010:186-200). Communication is taken to relate to the degree to which the E10 is promoted and awareness programmes. Availability relates to the respondents' rating on their access to E10 fuel. Relative price refers to the consumer perceptions with regards to E10 market price in comparison with unblended petrol, while market support relates to post-E10 launch activities such as reminder promotions, customer service – back-up, follow-up, guarantees and warranties (Lamb, Hair & McDaniel 1996:189).

TABLE 2: Motorists' perceptions on E10 fuel

E10 characteristics							
Response	Uniqueness / Originality	Compatibility / Quality	Communication/ Assurance	Safety & environment	Availability	Relative price	Market support
SA	0.49	0.50	0.09	0.10	0.11	0.05	0.07
A	0.29	0.18	0,05	0.40	0.07	0.06	0.11
NS	0.12	0.05	0.17	0.15	0.14	0.20	0.10
D	0.04	0.17	0.49	0.08	0.41	0.52	0.42
SD	0.06	0.10	0.20	0.27	0.27	0.29	0.30
Total	100	100	100	100	100	100	100

Source: Developed by the authors from survey data

While 73% of the respondents associated with E10 confirmed that the product is unique and of quality and is environmentally safe (50%), it is disheartening to realize that nothing much has been done to communicate and / or promote and fully educate the market of E10 and its usefulness. This has been evidenced by higher aggregates of respondents who disagreed with regard to communication (79%), availability (68%), and market support (72%). The majority (81%) of the respondents perceive E10 pricing as unjustifiably too high for an indigenous innovation. This has thus doomed the successful commercialisation and subsequent market uptake of E10 in the country, though with vast potential.

Agreeing with the views of Levy (1981:53), and Thompson (2004:164), the authors take the idea that these socially and culturally constructed meanings are ways of organizing perceptions of realities, of indirectly expressing paradoxical human concerns, they have consumer relevance because these realities and concerns affect people's daily lives. Similarly, these perceptions of E10 help to form stories that are repeated in the daily lives of motorists in Zimbabwe. These emerging stories eventually become generalized and universal, as the grand socially and culturally embedded meanings. Consequently, this shapes consumption behaviour within the Zimbabwean context.

4.3 Overcoming consumer misinformation

The researchers went on to review blended fuel characterisation and international standards, followed by a review of the success stories of the blend worldwide. These reviews were meant to deduce some lessons that could be applied in improving E10 fuel marketisation and usage in Zimbabwe.

The current study realizes that the fundamental character of a social meanings points to its universal mode of thought, the way these meanings can be used as a basis of consumer misinformation. However, it emerged from the study's findings that consumers managed to overcome some of this misinformation.

3.3.1 Ethanol fuel characterisation and international standards

Ethanol intended for fuel use has to meet certain standards. In the United States of America, fuel ethanol must be anhydrous (less than 1 percent water). It must also be denatured (i.e. is made unfit for human consumption), usually prior to transport from the ethanol production facility, by adding 2 to 5 volume percent petroleum or conventional motor gasoline. In many countries, ethanol fuel is used principally used for blending in low concentrations with motor gasoline (petrol) as an oxygenate or octane enhancer. In high concentrations, it is used to fuel alternative-fuel vehicles specially designed for its use (World Ethanol Production 2012:Internet).

On the other hand, Green Fuel Ltd's E10 is indeed anhydrous, meaning that moisture content is removed to achieve a 99,6% fuel grade ethanol that meets international standards (Green Fuel 2012:Internet). This provides an opportunity for Zimbabwe's E10 to be available for local consumption, and also for export, thus an assurance Zimbabwe's E10 is an internationally

standardized product. Thus the fact that blended fuels are increasingly becoming preferable worldwide (Balat & Balat 2009:2278) leaves Zimbabwe's ethanol marketers with a challenge to create real identity rather than a global identity full of misinformation.

4.3.2 Ethanol usage and rankings

Blends of E10 or less were used in more than twenty countries around the world by 2011, led by the United States of America (U.S.A.), where almost all retail gasoline sold in 2010 was blended with 10% of ethanol. Blends from E20 to E25 have been used in Brazil since the late 1970s. E85 has been commonly used in the U.S.A. and Europe for flexible-fuel vehicles. Hydrous ethanol or E100 is used in Brazilian neat ethanol vehicles.

Thus the U.S.A. together with Brazil account for the majority of bio fuels operating capacity in the world, (Biofuels Digest 2011:Internet) together accounting for 87.1% of world production of 22.36 billion US gallons (84.6 billion liters) (Tomsk 2006:Internet). In their world Ethanol Fuel analysis and outlook, Berg and Licht (2008) postulate that the usage of ethanol fuel has grown over the years because of its environmental friendliness; reduction in overreliance on oil producing companies, and fuel imports; advancement of local technologies and knowledge base; and improved ethanol fuel technologies. The top 10 ethanol fuel producers are shown in Table 3.

TABLE 3: Top 10 world ethanol fuel producers

Rank	Country	'000 barrels per day
1	USA	867.44
2	Brazil	486.01
3	China	37.00
4	Canada	24.00
5	France	18.00
6	Germany	13.00
7	Thailand	7.50
8	Australia	6.50
9	Colombia	4.80
10	Sweden	3.50

Source: RFA 2012:Internet

In world rankings, Zimbabwe occupies position 30 in the top 40 world rankings while the 4th position is occupied in Africa, of the only four African countries internationally recognized in terms of ethanol production – Sudan, Malawi, Ethiopia and Zimbabwe (RFA 2012:Internet).

4.3.3 Key success factors for ethanol fuel adopters

Strong incentives, coupled with other industry development initiatives, are giving rise to fledgling ethanol industries in countries such as Australia, Canada, Central America, China, France, Germany, India, Spain, Sweden, and Thailand (Renewable Fuels Association 2012:Internet).

Over and above this, the following have been some of the secrets in the success stories of the top-ranked ethanol producers and users:

- capital cost support;
- direct price support;
- income enhancing subsidies – for example income tax concessions;
- guaranteed (captive) markets – for instance all government departments become captive market for e10;
- price guarantees.

Surprisingly, Zimbabwe's ethanol production is relatively low. Paradoxically, the country has an abundance of resources to produce E10 fuel, and yet, they also face challenges of fuel shortages.

4.3.4 Zimbabwe's import car sources vis-à-vis E10 usage

China and Japan are undoubtedly Zimbabwe's major sources of new and used car imports respectively. Matimaire (2014) reports that more than half of the vehicles driven in Zimbabwe are imported cars and these have in turn, negatively impacted on the local motor industry. Ex-Japanese vehicles have flooded the Zimbabwean roads and market since dollarisation of the economy in 2009, such that the general price level of cars has taken a downward trend. Apparently, China is ranked World's 3rd in ethanol production (RFA 2012:Internet), a clear indication that the self-contained country is advanced in ethanol advocacy.

Japan is successfully advocating for the use of Ethanol, and it has forged successful strategic alliances with Brazil, the world ethanol leaders, to supply the much needed product into the Japan's fuel pipelines. As noted earlier on, the Brazil-Japan ethanol relationship has grown

significantly since the formation in 2005 of the Brazil-Japan Ethanol Company; a partnership between Petrobras and Japan's Nippon Alcohol Hanbai. In June 2012, Japan's local media reported that the Niigata Prefecture (Japan) pioneered the sales of a mixture of gasoline and bioethanol made from rice for animal feed (RIA Novosti 2012:Internet). During the same month, Japan Airlines found and proved that biofuel is more efficient than Petro-Fuel in a Test Flight, a move that has seen the airline joining a steadily expanding number of airlines trying to green their fuel usage (McDermott 2009:Internet).

4.3.5 Mandatory blending of ethanol: the worldwide perspective

Due to the huge role played by ethanol in enhancing economic development of any country that handles the ethanol-blending projects well, some top ranked ethanol-producing (and even non-ethanol-producing) countries have mandatory blending policies that support the many benefits of ethanol. Zimbabwe's neighbouring, South Africa can be referred to as the latest case to introduce 'regulations regarding the mandatory blending of bio fuels with petrol and diesel', documented August 23, 2012 (Department of Energy S.A. 2012:5).

- In India, mandatory blending started in 2003, though country-wide blending surfaced in 2004 (Fuels & Lubes 2012:Internet): what can be picked from this experience is that if Mandatory blending is to be introduced in Zimbabwe, already with mixed feelings – mostly political (Sunday Mail 2012:1-2) some preliminary resistance is likely to occur, but acceptance may eventually follow.
- Since 1976 the Brazilian government has made it mandatory to blend ethanol with gasoline, and since 2007 the legal blend is around 25% ethanol and 75% gasoline (E25) (Fuels & Lubes 2012:Internet).
- Similar to the dispensation in Australia, Thailand's mandatory blending was supported by tax reductions and investment subsidies. This has seen Thailand being ranked in the top ten world ethanol producers, pumping out about 75 000 barrels per day (RFA 2012:Internet).
- China has mandatory blending in some regions that had some preliminary distribution and uptake challenges (RFA 2012:Internet).
- Japan's Environment Ministry intends to fight global warming and surging oil prices by requiring that all vehicles on the road be able to run on an environment-friendly mix of

ethanol and regular gasoline by 2030. The new policy has been hailed by leading automakers including General Motors and Ford Motors. In line with this policy, all vehicles produced by Toyota Motor Company, already meet the 10% standard (Associated Press 2006:1).

- Back in Africa, Kenya has an E10 mandate in place in Kisumu, the country's third largest city. Malawi has also has an E10 ethanol mandate in place, but is dependent on availability (Biofuels Digest 2011:Internet).

5. MANAGERIAL IMPLICATIONS AND CONCLUSION

Based on the study's findings, the researchers make the following recommendations to management if the intended fruits of the mammoth project are still to be enjoyed:

5.1 Improve consumer access to E10 fuel

The study proved that E10 is not readily available throughout the country. The study found out that most motorists are loyal with specific service stations unless there is a fuel crisis. Thus confidence could be built in such loyalists if E10 is being sold through their 'favourite pump'. Thus E10 distribution should be improved through liaison with the distributors concerned. If possible, Green Fuel could integrate forward vertically towards the activities of its resellers i.e. open their own distribution centres nationwide thus improve E10 access.

5.2 Market education and consumer awareness

E10 advertisements rarely feature in the local media. A few pamphlets were only noted in some select service stations in Harare. Consumer awareness should be improved. E10 distributors could do this through:

- Trade fairs.
- The use of public information dissemination in print and electronic media.
- Engaging the industry in forums and workshops. Offer them "Trial fuel" and encourage them to make some comparative experiments, give feedback thus helping Green fuel make improvements (adjustments) if need be.
- Make use of testimonials: The study proved that E10 commands a clientele base, composed of motorists who have become advocates of the product, especially the high class segment – why not use the satisfied consumer to convince another potential consumer.

- Engaging into nationwide *Green Movement Campaigns*, educating the community on the benefits of using E10.

The authors recommend market education in line with Wood and Lynch, Jr. (2002:416) who empirically established that (prior) knowledge plays a critical role in new product learning thus in turn, enhancing (new) product adoption.

5.3 Clarifying technical misconceptions

This could be done by pasting engine specification posters on service stations i.e. clarify all technical issues involved in the use of Ethanol Fuel. Specify engine compatibility issues and clear up all the misconceptions held by the market. For instance, E10 to E15 can be safely used in 2001 and newer passenger vehicle models and flexi fuel vehicles (RFA 2012:17).

The researchers strongly recommend a wide cross-media campaign to educate car dealers, motorists (drivers), technicians, journalists and other relevant stakeholders to dispel misinformation about E10 and to highlight its benefits.

5.4 Addressing E10 pricing issue (blend-price variations)

Green Fuel Ltd. should ensure that its position on price is clearly justified – 90% of the cost is still imported unblended petrol: this could be clarified during the consumer awareness campaigns. Alternatively, vary the ethanol blends to suit varying prices from, E5, E10, right through to E85. For instance, the study established that 75% of ethanol fuel advocates would not mind using higher blends as long they justifiably pay less. However, this decision must take into cognizance the compatibility of different models with the ethanol blend variations.

5.5 Segmenting the market

Europe and Australia have managed to package E10 as a 'premium super brand' thus it fetches a higher price than unblended petrol due to its performance and green benefits (Green Fuel 2012:Internet). Advocates for Zimbabwe's E10 seem to be from middle to high class, arbitrating from the type of cars that fill and re-fill with E10. Thus Green Fuel could segment and target those locations where these classes reside and/or refill.

5.6 Mandatory blending

Before the closure of the ethanol plant, Green Fuel had created over 4 500 jobs and empowered local village farmers by improving access to irrigation and contracting them to produce sugar cane for the plant (Pamushana News 2012:Internet), thus the company would meet the nation's domestic requirements and export the excess, while generating about 120 megawatts of electricity.

For a nation faced with a heavy fuel import bill, over 80% unemployment, critical electricity shortages; any efforts to create jobs and generate electricity should be seen as a positive development.

Thus mandatory blending could be the lasting solution in the Zimbabwe's circumstances, not neglecting the prior recommendations. This study has established that mandatory blending has been implemented in different parts of the world and it has worked. Preliminary resistance might occur but that should not derail the move, especially in view of the overwhelming benefits of the mammoth ethanol project.

5.7 Green Fuel Ltd. – government - industry relations

Given the 'national status' of the project (S.I. 144, 2011), it could be to the best interests of the all stakeholders involved to convert the project into a Private-Public-Partnership (PPP). Research has suggested that there is need for innovative research institutions, government and industry to establish linkages (Tomsk 2007). Based on the research findings, it is the researchers' view that the Green Fuel partners with the Government and / or key Oil Marketing Companies (OMCs) to enhance the E10 development and commercialisation efforts. This move could help overcome the anticipation that any mandatory blending would benefit 'an individual' since the project becomes co-owned.

5.8 Target export market

Ethanol is produced by Zimbabweans for Zimbabweans, using Zimbabwean sugarcane. When all else has failed to improve its uptake locally, the researchers suggest that Green Fuel forms strategic alliances with leading regional oil companies to forge its market in countries such as South Africa and others where mandatory blending has been documented. This comes from the

realisation that while some innovations may not do quite well locally, they could be having a “good” market waiting in another country.

6. CONCLUSION

As can be noted from the reviews executed, world ethanol production will continue to grow at an increasing rate. The fact that Zimbabwe is counted in the world rankings implies that the country has great potential. Results from the study show that there is a gap on market education on E10. This was evidenced by 99% of the motorists, who were aware of E10, but indicated that, they “heard that E10 ...” This implies that wrong information is circulating in the market. It can be concluded that the majority of E10’s ‘would-be-buyers’ hold wrong perceptions and misconceptions about the performance of the product. The study also established that Zimbabwe’s E10 pricing is perceivably unjustified and too high for an “indigenous innovation”. This has caused much resistance by the market as motorists prefer the ‘expensive’ unblended petrol than E10, which “*is only 3 to 5 cents cheaper*”.

Accordingly it can be concluded that consumers perceive this difference as insignificant. And this is against the background of minds pre-occupied mixed (negative) perceptions and misconceptions on the performance of the product. It can also be concluded from the study that E10’s access by customers, especially those outside Harare, is very limited. This has been caused by reluctance by fuel and wrong perceptions and misconceptions of the product’s potential sales by the distributors.

Thus, socially and culturally constructed meanings of consumption in the African context sell faster and people believe it more than facts at times. It is in Africans’ culture. Innuendoes, lies and fabricated half truths sell faster than the truth. The truth is harder to believe – “it’s too true to be true”. Such has been the case with Ethanol fuel usage in Zimbabwe and other African countries.

REFERENCES

- AGGARWAL P, CHA T & WILEMON D. 1998. Barriers to the adoption of really-new products and the role of surrogate buyers. *Journal of Consumer Marketing* 15(4):358-371.
- ALL AFRICA NEWS. 2012. Zimbabwe: Chisumbabje’s good start. [Internet: <http://allafrica.com/stories/201209260295.html>; downloaded on 2012-09-03.]

- ARNOULD EJ & THOMPSON CJ.** 2005. Consumer Culture Theory (CCT): twenty years of research. *Journal of Consumer Research* 31:868-82. March.
- ASSOCIATED PRESS.** 2006. Japan to require cars to run on ethanol gas. [Internet: <http://www.msnbc.msn.com/id/13610746/ns/business-autos/t/japan-require-cars-run-ethanol-gas/>; downloaded on 2012-06-13.]
- BALAT M & BALAT H.** 2009. Recent trends in global production and utilization of bio-ethanol fuel. *Journal of Applied Energy* 86 (11):2273-2282.
- BENJAMIN W.** 1969. *Illuminations*. New York, NY: Schocken.
- BERG C & LICHT FO.** 2008. World ethanol fuel: analysis and outlook. [Internet: <http://hoachat.tvh68.com/Ethanol.pdf>; downloaded on 2012-10-12.]
- BIOFUELS DIGEST.** 2011. Biofuels mandates around the world. [Internet: www.biofuelsdigest.com/bdigest/2011/07/21/biofuels-mandates-around-the-world/; downloaded on 2013-01-12.]
- BRISTOL T & MANGLEBURG TF.** 2005. Not telling the whole story: teen deception in purchasing. *Journal of the Academy of Marketing Science* 33(1):79-95.
- BROWN S, MCDONOUGH P & SHULTZ CJ II.** 2013. Titanic: consuming the myths and meanings of an ambiguous brand. *Journal of Consumer Research* 40(4):595-614.
- BUTTLE FA** 1998. Word of mouth: understanding and managing referral marketing. *Journal of Strategic Marketing* 6(3):241-254.
- CARRICO AR, SPODEN M, WALLSTON KA & VANDENBERGH MP.** 2013. The environmental cost of misinformation: why the recommendation to use elevated temperatures for handwashing is problematic. *International Journal of Consumer Studies* 37(4):433-441.
- DEPARTMENT OF ENERGY.** 2012. Regulations regarding blending of biofuels with petrol and diesel: South Africa. [Internet: <http://www.info.gov.za/view/DownloadFileAction?id=173022>; downloaded on 2012-11-30.]
- DURGEE JF.** 1988. Interpreting consumer mythology: a literary criticism approach to odyssey informant stories. *NA - Advances in consumer research*, 15 eds. HOUSTON M.J. Provo, UT: *Association for Consumer Research*:531-536.
- ERDEM T & KEANE MP.** 1996. Decision-making under uncertainty: capturing dynamic brand choice processes in turbulent consumer goods markets. *Marketing Science* 15(1):1-20.
- FUELS AND LUBES.** 2012. India to implement mandatory blending. [Internet: <http://fuelsandlubes.com/flw/india-to-implement-mandatory-blending-of-5-ethanol-in-gasoline/>; downloaded on 2012-11-29.]
- GREEN FUEL.** 2012. E10 fuel information pamphlet. Harare, ZW: Green Fuel.
- HOLT DB.** 2004. *How do brands become icons: the principles of cultural branding*. London, UK: Harvard Business School.
- INDEX MUNDI.** 2012. Country facts. [Internet: <http://www.indexmundi.com/?country=se&product=ethanol&graph=production>; downloaded on 2012-11-14.]
- KELLER E.** 2007. Unleashing the power of word of mouth: creating brand advocacy to drive growth. *Journal of Advertising Research* 47(4):448.
- KOTLER P, ARMSTRONG G & TAIT M.** 2010. *Principles of marketing: Global and Southern African perspectives*. Cape Town: Pearson Education.
- LAMB C, HAIR I & MCDANIEL C.** 1996. *Marketing*. 3rd ed. New York, NY: International Thomson.
-

LAPLACA PJ. 1974. The effect of unit pricing on product demand and perceived product satisfaction. in *NA - Advances in Consumer Research* Volume 01, eds. WARD S. & WRIGHT P. Ann Arbor, MI: Association for Consumer Research: 9-16.

LEVY S. 1981. Interpreting consumer mythology: a structural approach to consumer behavior. *Journal of Marketing* (45):49-61.

LEVI-STRAUSS C. 1963. *Structural anthropology*, Book I. New York, NY: Basic Books.

LEVI-STRAUSS C. 1969. *The raw and the cooked: introduction to a science of mythology*, 1. New York, NY: Harper & Row.

LIBAI B, LEMON KN & HOGAN JE. 2004. Quantifying the ripple: word-of-mouth and advertising effectiveness. *Journal of Advertising Research* 44(1):271-280.

MATIMAIRE K. 2014. Cheap car imports killing the motor industry. *The Financial Gazette*. 4 July.

MCDERMOTT M. 2009. Japan airlines find biofuel more efficient than petrol-fuel in flight test. [Internet: <http://www.treehugger.com/aviation/japan-airlines-finds-biofuel-more-efficient-than-petro-fuel-in-test-flight.html>; downloaded on 2012-11-12.]

MUGABE T. 2012. Fuel prices marginally slashed. *The Herald*. 27 June.

ORELLANA & NETO. 2006. Brazil pumps ethanol to Japan. [Internet: http://www.upi.com/Business_News/Energy-Resources/2008/12/30/Analysis-Brazil-pumps-ethanol-to-Japan/UPI-53741230681428/#ixzz1xfNYu4Wv; downloaded on 2012-06-13.]

PAMUSHANA NEWS. 2012. Why mandatory blending is key: the untold green fuel story. [Internet: <http://pamushana.com/mandatory-blending-key-untold-green-fuel-story>; downloaded on 2012-11-30.]

RENEWABLE FUELS ASSOCIATION. 2012. Accelerating Industry Innovation - 2012 ethanol industry outlook. [Internet: http://ethanolrfa.3cdn.net/d4ad995ffb7ae8fbfe_1vm62ypzd.pdf; downloaded on 2012-07-06.]

RFA see **RENEWABLE FUELS ASSOCIATION**

RIA NOVOSTI. 2012. Japan starts sales of bio fuel made from rice. [Internet: <http://en.rian.ru/world/20090718/155556467.html> - downloaded on 2012-06-13.]

SAREN M. 2013. Deception in the marketplace: the psychology of deceptive persuasion and consumer self-protection. *Journal of Marketing Management* 29(11-12):1424-1425.

SAUNDERS M, LEWIS P & THORNHILL A. 2009. *Research methods for business students*. 5th ed. Delhi, IND: Prentice Hall/ Financial Times.

STATUTORY INSTRUMENT OF ZIMBABWE. 2011. *Statutory Instrument (S.I.) 144 of Zimbabwe*. Harare, ZW: Government Printers.

TAKHAR A & CHITAKUNYE P. 2012. Rich descriptions: evoking informant self-reflexivity in marketing and consumer research. *Journal of Marketing Management* 28 (7-8):912-935.

THE STANDARD. 2012. Zimbabwe's ethanol project threatened with collapse [Internet: <http://harare24.com/index-id-news-zk-13044.html>; downloaded on 2012-11-29.]

SUNDAY MAIL. 2012. E10 expensive compared to international prices. [Internet: www.sundaymail.co.zw/index.php?option=com_content&view=article&id=28801:xxxxxxx&catid=41:business&Itemid=133; downloaded 2012-11-30.]

THOMPSON CJ. 2004. Marketplace mythology and discourses of power. *Journal of Consumer Research* 31:162-180. June.

TOMSK. 2006. Developing university-industry technology transfer: a joint workshop sponsored by Organization for Economic Cooperation and Development (OECD) and Tomsk State University (TSU), October 12-13.

WOOD SL & LYNCH JG (Jr.) 2002. Prior knowledge and complacency in new product learning. *Journal of Consumer Research* 29 (3):416-426

WORLD ETHANOL PRODUCTION RANKING. 2012. World ethanol production ranking list for 2012. [Internet: http://www.globalbiofuelscenter.com/NM_Top5.aspx; downloaded on 2012-11-30.]

ZERA see **ZIMBABWE ENERGY REGULATORY AUTHORITY**

ZIMBABWE ENERGY REGULATORY AUTHORITY. 2012. ZERA Statistics. Harare, ZW: Government Printers.