

# **ASSESSING THE AWARENESS OF THE EFFECT OF PHOSPHATES ON THE ENVIRONMENT AND THE IMPACT OF PHASING OUT OF PHOSPHATES IN SUCH DETERGENTS IN JAMAICA**

## **EXECUTIVE SUMMARY**

As the primary Agency responsible for the protection of Jamaica's natural environment, the National Environmental and Planning Agency (NEPA) has recognised the need to address the impact of phosphate-based detergents on the country's water system. The issue of the use of phosphate in detergent has become a serious environmental concern that has led to strong debates about substituting phosphate-based detergents with other less damaging alternatives. Phosphates act as builders that remove water hardness and disperse dirt and surfactants, which lift dirt off the surface of the fabric.

Recognising the impact of a phase-out of phosphates in detergents on manufacturers, importers, retailers and end users, NEPA commissioned a study aimed at assessing the awareness of the current problem and the potential impact of a phase-out.

*Here's what you, the public, had to say.*

Stakeholders felt that the phase-out should be gradual and that it was important for NEPA to communicate constantly with stakeholders throughout the process.

Some of the major challenges to be faced by NEPA in driving this process will include the timing of the change over, the timeframe for replacement, the current economic conditions and the coordination between NEPA and other entities during the process.

Stakeholders recommended a number of approaches that could assist NEPA in achieving the phase-out with minimal disruptions. These include:

1. the development of a public education campaign for consumers
2. the development of an effective communication strategy
3. the monitoring & management of consumers concerns and expectations
4. Clear labelling of detergents to assist consumers in making choices
5. an advertising and promotional campaign

While positive results from the phase-out cannot be guaranteed NEPA is confident that strict adherence to the recommendations will increase the likelihood of success..

## **INTRODUCTION AND BACKGROUND**

The National Environment and Planning Agency, NEPA, is initiating a phase-out of the use of phosphates as an ingredient in detergents in Jamaica. A study was commissioned in 2007 of the detergents market among stakeholders, to determine the likely impact of such an action and the level of awareness of the issue among the population.

The use of phosphate-containing detergents has become an environmental issue especially in relation to the disposal of the wash-water generated and its negative impact on the receiving water bodies.

The Jamaican market is comprised of a number of retailers of detergent, a large manufacturer, a number of smaller manufacturers, environmental groups and consumers (business and household), and these would constitute the stakeholders of this industry. Based on data from the Statistical Institute of Jamaica, the export, importation and use of detergents are considered relatively high. Importation of detergents amounted to approximately J\$428 million in 1998 and \$497.2 million in 2000.

## Overall Purpose of study

The purpose of the study was:

- To assess the awareness of the effect of phosphates on the environment and the impact of phasing out such detergents on key stakeholders in Jamaica.

## **HISTORICAL PERSPECTIVE OF THE PHOSPHATE DETERGENT DEBATE**

In the 1960s and 70s, the contamination of an increasing number of rivers and lakes, and the growth of algae plants, therein, gave rise to the debate surrounding the high levels of phosphorous in these water sources. The main source of phosphorous waste identified in these water sources then and still now, was the phosphate used in laundry detergent (Knud-Hansen 1994). This led to a strong dispute surrounding the elimination of phosphates from detergent, suggested primarily as a ban on phosphates.

All detergents are comprised of three main components:

- Surfactant – a wetting agent
- Builders – to tie up cations which would otherwise interfere with the surfactant and is particularly necessary in ‘hard’ waters (Hammond, 1971, cited by Knud-Hansen, 1994);
- Other miscellaneous ingredients such as perfumes and brighteners

In detergents, phosphates, as builders are excellent for lifting the dirt and eliminating other substances, with minimal toxicity. According to Revelle & ReVelle (1988) cited in Knud-Hansen (1994), without the builders, manufacturers would have to add more surfactants, which would make the soap more expensive. However, the presence of algae in water sources, makes water treatment more expensive, increases corrosion of pipes and can affect the odour and taste of potable water. In addition, secondary wastewater treatment only removes a small amount of the phosphorous, leading to stream and river contamination.

By the end of 1959, detergents in the US market all contained phosphate builders, some up to 30% phosphate. However, the realization of the extent to which one pound of phosphorous could grow 700 pounds of algae (Beeton, 1971) fuelled the debate on the ban on phosphates in detergents.

The emphasis on reducing the phosphorous content in water sources led to the development of non-phosphate detergents (such as *Fantastik*), and was supported by the introduction of legal and environmental restrictions on the use of phosphorous. One school of thought, however, counters the notion of eliminating phosphorous through treatment of water supplies, indicating that treatment does not eliminate the phosphorous content in its entirety.

In response to this debate, countries such as the USA, Germany, Italy and Switzerland implemented improved systems of wastewater treatment and the removal of phosphorous-based detergents. Replacements such as Zeolite A and Sodium Tripolyphosphate (STPP), were recommended. The use of these chemicals was supported either by established laws or by voluntary agreement to implement suggested builders as a critical ingredient of detergent products.

The implementation of phosphate-free detergent has been on a phased basis in most countries. France introduced phosphate free detergents through a voluntary agreement between the French Environment Ministry and the International Soap and Detergent Association (AISD) through a series of actions to target the problem. The agreement suggested for example, that each detergent manufacturer sells one phosphate-free detergent and that a committee be established to examine the environmental effects of phosphorous. Some countries have signed international conventions guiding their use of phosphorous-based detergents and reinforcing their commitment to controlling environmental pollution.

The Jamaican market is comprised of one large manufacturer and a number of smaller manufacturers and a number of retailers of detergent. In addition, environmental groups and consumers (business/industrial /

commercial and household), would help to constitute the stakeholders of this industry. Based on data from the Statistical Institute of Jamaica, the importation and use of detergents is considered relatively high. Importation of detergents amounted to approximately J\$428 million in 1998 and J\$497.2 million in 2000 (most recent period for which we were able to acquire data). This makes the detergent industry an important and growing one, in which any change to the product, may significantly affect demand, and could be catastrophic to the manufacturers and retailers.

## **RESEARCH METHODOLOGY**

### **Literature Review, Survey Design and Implementation**

The existing secondary literature was examined to assess what is currently known about phosphates in detergent. This provided insight that guided the development of the survey instrument. The instrument was pilot tested using a group of students at the University of the West Indies to ensure the capture of relevant data. This phase of the methodological process consisted of seven main components:

- a. Preliminary review of existing literature on phosphates in detergent
- b. Development of an analytical framework to guide the study
- c. Development of the sampling frame
- d. Development of the survey instrument
- e. Pre-testing of the questionnaire
- f. Execution of survey instrument among identified stakeholder groups in Jamaica.
- g. Execution of one-on-one interviews with stakeholders
- h. Facilitation of focus group discussions on the identified issues

### **Analysis of Data from Survey, Interviews and Focus Groups**

The data was analysed to produce both descriptive and inferential statistics to determine the significance of varying issues of interest to NEPA. These included:

- a. The usage, attitude and perceptions of stakeholder groups

- b. The impact of environmental awareness on decision-making
- c. Assessment of the challenges of NEPA in phasing out the use of phosphates in detergents
- d. The cost implications of the phase out for key stakeholders
- e. The economic impact of the phase out on users

### **Determination of Sample Frame**

The population was stratified according to the stratification system developed by STATIN (stratification of Jamaica into six regions). A systematic sample technique was applied to reflect population variances and to show general household consumers. The approach used here was similar to a mall intercept survey.

### **Sample**

#### **Sample population**

- 1. Households across Jamaica
- 2. Wholesalers and retailers of detergents

#### **Sample Size**

Based on the nature of the study and the assumed level of usage of phosphate-based detergents, a sample size of 544 respondents was determined to be necessary in order to maximize the accuracy of the results. The actual number of surveys collected was 469. The data collection process was affected by one major challenge, an unprecedented 3 months of rainfall between September and November 2007. This affected our ability to collect data in the western parishes.

#### **How we Calculated Sample Size**

The sample size was determined from the formula,

$$n = \frac{\hat{p} \hat{q} \left( \frac{z}{d} \right)^2}{(1 - \hat{p})}$$

$$= .85(1 - .85) \left( \frac{1.96}{.03} \right)^2$$

= 544 respondents.

This is based on the following assumptions.

- The level of precision (d) required is a margin of error of  $\pm .03$ .
- The confidence level (CI) will be 95%.
- Assuming the data is normally distributed we expect the z value associated with the confidence level to be 1.96

An approximation of 85% of Jamaican households was assumed to use phosphate-based detergents. Based on this assumption, the estimated P value was 0.85. The P value represented the variability in usage between phosphate-based and phosphate-free detergents. In the absence of such information a 50/50 (0.5) ratio would normally be applied, but our knowledge of the market indicated that a 0.5 ratio would be incorrect. A more accurate view of the variability of use in the Jamaican marketplace was gained through conversation with supermarket retailers and general consumers, and an examination of the availability of phosphate-based and phosphate-free brands on the store shelves.

### **Focus Group**

Discussions were held with representatives from key segments using an approved discussion guide and an experienced moderator. Respondents were screened and recruited using an approved screener. The structure of the focus groups was as follows:

Two focus groups with decision-makers/purchasers from consumer segments

- SEG: BC Middle-Upper Class Women who purchase and use detergents
- SEG: CD Lower-Middle to Lower Class Individuals who purchase and use detergents (single male who lives alone and washes his own clothes was included in these groups)

## **Individual Interviews**

Instead of a focus Group with representatives from major users, phone interviews were conducted instead at their request (preference). Eight phone interviews were conducted with various representatives of the Major User segment. Interview numbers were expanded to ensure a good representations from the sub-categories were maintained.

- Hospitality, e.g. Hotels
- Car Wash
- Laundry/Cleaning Service, e.g. Dry Cleaners and Laundry Service
- Restaurant Fast Food Restaurant Chain
- Hospital
- Supermarket

Interviews either in person or via telephone with a Major Manufacturer and Retailers were also conducted. The number of persons per focus group was between 7 and 10. The Number of persons interviewed from the Major Users group was eight (8). These were 1:1 phone interviews averaging 20-25 minutes.

### **Participants were screened based on the following criteria:**

- Must not have participated in research in the past 6 months
- Participants or anyone in their household not be employed to a manufacturer / distributor of soaps, Market Research/Marketing / Media House or Advertising/Public Relations firms.
- Must be regular consumers of laundry detergents and specifically soaps which contain phosphates.
- Must be a decision maker/purchaser or influence the selection of laundry detergent for the household.
- Must be a decision maker/purchaser or influence the selection, manufacturing or purchase of soaps for the major retailer, distributor or manufacturer.



**Areas for the focus groups included:**

- The usage, attitude and perceptions of each stakeholder group
- The relationship between environmental awareness and decision-making
- Likely challenges to be faced by NEPA in phasing out phosphates in detergents based on stakeholder attitudes
- Various approaches to the phasing out of phosphates in detergents
- The cost implications of the phase out for key stakeholders
- Likely economic impact of the phase out on users
- A segmentation profile of current users in terms of their environmental awareness

## FINDINGS AND ANALYSIS

### 1. THE LEVEL OF AWARENESS OF THE PRESENCE OF PHOSPHATES IN DETERGENTS

#### - IA – GENERAL KNOWLEDGE

The knowledge of phosphates among respondents was considerably low, with only 15% of the sample indicating that they had heard about phosphates prior to the survey. Among those respondents who had heard of phosphates, the knowledge of phosphates was prominent, first among residents in St Ann (30%) followed by residents in St Catherine (25%) – Table 1. (The Western Parishes were not represented because of the unprecedented rains which affected the interviewers ability to travel to these locations).

Table 1: Percentage Distribution of Parish by Respondents' Knowledge of Phosphates

Parish of Residence	Frequency	Percentage Distribution
Kingston & St Andrew	10	17
Clarendon	5	8
Manchester	4	7
St Ann	18	30
Portland	6	10
St Thomas	1	2
St Mary	1	2
St Catherine	15	25
Total	60	100

The relatively high knowledge of phosphates among residents in St Ann may be attributed to the status of the parish as a tourist destination and the incidence of respondents who may be hotel workers or associated with the hotel industry. In the hotel industry, environmental awareness is high, as many hotels vie for the Green

Globe Environmental awards, and do position themselves on the market as being environmentally friendly and aware. This finding may not be significant given that 85% of respondents were not aware.

Where knowledge of phosphates existed, the specific knowledge varied. The primary details of their knowledge (as reported ) included phosphates as a chemical, as an ingredient in soap, as a skin irritant, an ingredient listed on detergent labels, a chemical that softens water and a potentially harmful pollutant, among others. Of note, is the fact that the knowledge of the attempt to eliminate phosphates from detergent exists, though in a small proportion of the sample.

## **IB.KNOWLEDGE OF SPECIFIC ISSUES RELATING TO PHOSPHATES**

### *Phosphates as builders*

At one end of the spectrum, a little over 65% of respondents in the consumer category were not aware that phosphates are used primarily as a ‘builder’ that softens the water and helps to eliminate/isolate dirt and grease. Based on the survey results, Just over 7%, though relatively small, were aware of phosphate as a ‘builder’.

### *Phosphates being marginally toxic*

The knowledge of the marginal level of toxicity of phosphates was also low. A similar percentage, 64% of consumer respondents were very unaware of the marginal levels of toxicity in phosphates, with only 11% having any knowledge of phosphates being marginally toxic.

### *The ability of secondary water treatment to remove only a small percentage of phosphates from water*

Again, the majority of consumers (64%) were not aware that secondary water treatment could remove some amount of phosphates from water sources.

### *Phosphates released into water bodies*

The issue of phosphates released into water bodies was not widely known among respondents in the consumer category. Just over 58% indicated their lack of awareness of a high percentage of phosphates released into water sources. This is critical, as one of the main justification for the removal of phosphate-based detergent will be the contamination of water sources by phosphorous.

## **FOCUS GROUP DISCUSSION**

Consumers and major users spontaneous recall (top of mind) of cleaning agents is driven by current usage. End-users, albeit consumers or major users, have specific reasons for using their cleaning agent of choice that is primarily driven by price and effectiveness. Consumers tend to use cake-soaps for pre-treatment, liquids for delicates and babies clothes, and powders for 'regular' wash and are aware of more efficient and effective brands but refrain from purchasing due to high price.

Manufacturers and distributors develop detergents based on cost, effectiveness and end-user/customer demand. Most consumers recalled seeing the word 'detergent' but could not say what it meant whereas 50% of major users along with all distributors and manufactures could accurately define detergent. Not all consumers could define 'phosphate'; few stated they had seen/heard the name but did not know what it meant; whereas most major users and all distributors and manufacturers had heard of the word phosphate. All consumers and major users were unaware if their detergent of choice or others they used contained phosphates, however distributors and all except one manufacturer stated that their detergents contained phosphates.

The manufacturer interviewed advised that some of the detergents produced were phosphate-free. All consumers, major users and distributors stated they did not know the impact of phosphates on the environment until they read the passage shown in this study about the topic. All consumers and major users were concerned about the impact and steps to control contamination. Whereas distributors said they would look into their formulations or speak with their chemists about it, the sole manufacturer who informed that

his products did not contain phosphate thought it to be a 'necessary evil'. All segments said they would be willing to try an alternative / phosphate-free detergent if it were effective. They thought that the government and Bureau of Standards could lead the change in the current scenario concerning phosphates in detergents but that everyone had a part to play.

## **2. THE IMPACT OF THE PHASE OUT PROCESS OF PHOSPHATES IN DETERGENT ON KEY STAKEHOLDERS**

The three primary stakeholders that are most likely to be affected in Jamaica by a phase out of phosphate-based detergents are manufacturers, retailers and consumers. With very few manufacturers, if any, the retailers/large distributors will no doubt feel the effect of a phase out if the replacement detergent receives negative responses by consumers. Close to 74% of the retailer respondents felt that they would be negatively affected by the phase out both in terms of sales as well as through the link between detergents and other products. Consumers, on the other hand, expressed concerns about the increased costs they would face as well as the ability of the alternatives to clean well.

### **Impact on Manufacturers**

The manufacturer we interviewed indicated that his company had begun the process of actively working to reduce the level of phosphate in his detergent. He argued however, that the alternative raw material is more expensive and will affect manufacturing cost, which will eventually be passed on to the consumers. He pointed out that green products are not highly demanded therefore, there is really no urgency in producing such a product. This issue of cost would only become unimportant if global demand for such green products were to increase. The impact on the manufacturers would be determined by consumers' response to any increase in price. If consumers react negatively to any price increase, then the impact would be negative and the manufacturer may be forced to absorb some of the increases thus reducing profitability levels.

## **Impact on Retailers/Distributors**

Two main areas of impact given by retailers were as follows:

1. Customers preference for a soap that suds: There is a general belief that the replacement of phosphates will reduce the ‘sudding’ or bubbling quality of the detergent, which appears to be an important decision criterion rather than grease-cutting, for example, in the purchase of soap.
2. Retailers expect to see reduced sales because of consumers’ preference for detergents with sudding capabilities. They felt that this could be minimized if sufficient replacement is found that can meet the public demand.

The retailers who felt they would be positively affected (18%) attributed this feeling to the thought that as long as the soap cleans the clothes consumers will buy the product. This comes against the background that just about 40% indicate the primary use of detergent as laundry.

Given that retailers indicated that on average their weekly sales of detergent was approximately J\$11, 230.00, they expressed grave concerns about the impact of such a phase out on their profits. According to retailers, in order to minimise such potential losses it is important for NEPA to manage the transition very well. Sixty-one percent (61%) of the retailers in the sample indicated that the phasing out of phosphates would result in reduced sales. It is noted that retailers believe their impact is directly related to the response of the consumers to the phase out.

## **Impact on consumers**

In terms of impact, consumers and major users are likely to be the most critical group. Consumers have expressed concerns about the likely increase in costs although many have indicated a willingness to pay more, up to 30% based on our focus group discussions. Consumers would also be affected in terms of their cultural practices and their brand preferences especially if existing brands used do not conform with any proposed changes to the legislation regarding phosphates. Any potential increase in price needs to be managed

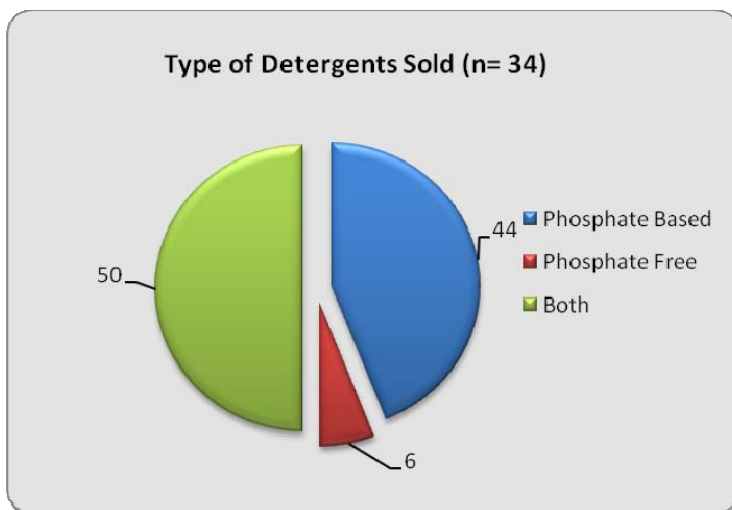
carefully; anything else will lead to consumer resistance. If price changes are higher than consumers expect then negative reactions to the change may encourage manufacturers and distributors to continue to import and produce phosphate-base detergent illicitly.

### 3.THE COST IMPLICATIONS OF THE PHASE OUT TO EACH STAKEHOLDER GROUP (MANUFACTURERS, RETAILERS, MAJOR USERS, ORDINARY CONSUMERS)

#### Retailers

Of thirty-four (34) retailers surveyed, 50% indicated that they sold both phosphate-based and phosphate-free detergents; forty-four percent (44%) of retailers indicated that they sold phosphate-based; and 6% sold phosphate free.

Chart 1: Type of Detergents Sold

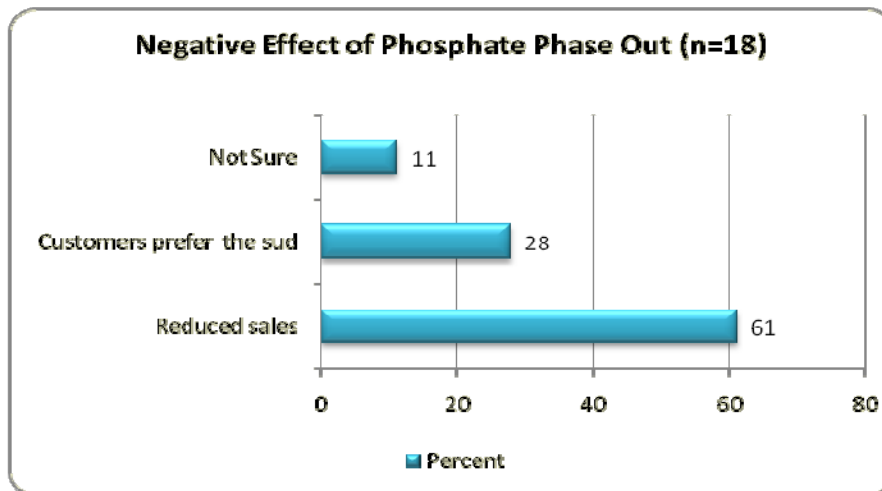


Retailers indicated that on average, their weekly sales of detergent totalled J\$11, 230.00. Liquid detergents represented 30.5% of their sales while the powder detergents represented on average 75.4% of their overall sales. The retailers also estimated that phosphate-based detergents represented 75% of their sales.

Approximately seventy-three (73.5%) of the retailers believed that they would be negatively affected by a phasing out of phosphate-based detergents in Jamaica. They indicated that a phase-out would result in

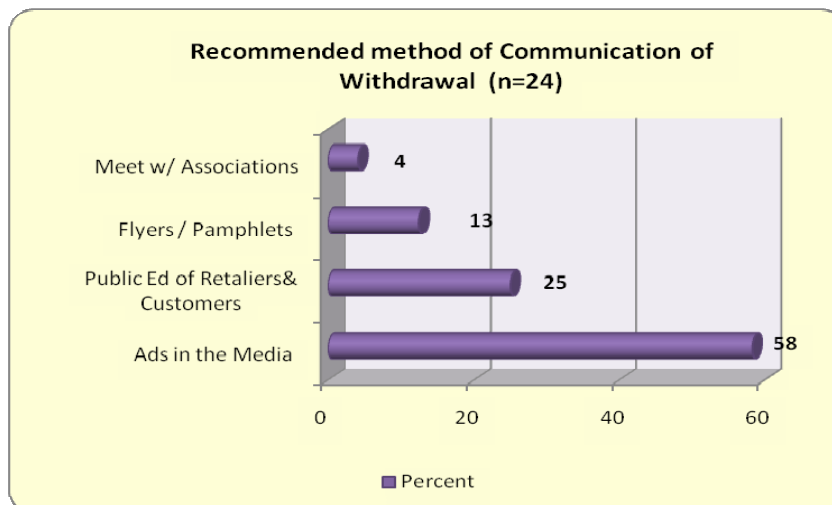
reduced sales (61% of 18 responses) and that their customers would be affected due to the preference of detergents with high suds (28%).

Chart 2: Negative Effects of Phosphate Phase-out



Retailers recommended the implementation of an advertising campaign (58% of 24) and public education of stakeholders about phosphates if an environmentally based withdrawal is to be pursued.

Chart 3: Recommended Method of Communication of the Withdrawal



The cost implications are mainly tied to the reduced sales of detergents anticipated by small and large retailers. With an average of 75.5% of detergent sales being phosphate-based, (based on the survey) any change would



create a significant impact on the sale of detergents. Reported weekly sales by retailers ranged from J\$500.00 to J\$42,500.00, with average weekly sales of J\$11,230.00.

Overall, no real concerns were expressed about the price of the phosphate-free products. The general anticipation was that of reduced sales, subject to the points raised above in respect of suds. However, with a gradual phase out of phosphate-based detergents, and the existence of some brands of phosphate-free detergent on the market, a gradual phase-out coupled with public education should present some control over the potential financial impact. With an approximate average ratio of powdered-detergent to liquid of 7:3, and with powdered soap sales accounting for close to 75% on average, the emphasis should be on the phased withdrawal of powdered soap and the gradual ease into the market of phosphate-free detergent.

### **Manufacturers**

The cost implications to manufacturers are likely to result from the increased cost of raw materials to produce phosphate-free detergent. Due to the lack of volume on a global scale, phosphate substitutes are likely to come in at a higher price than phosphates. Manufacturers are also likely to incur cost increases based on necessary changes to the formulation of the product. The sole manufacturer interviewed indicated a possible 5-10% increase in costs resulting from change in formulation.

#### 4. THE LEVEL OF AWARENESS OF ANY NEGATIVE IMPACT OF PHOSPHATES IN THE NATURAL ENVIRONMENT

Overall, respondents were not aware or not sure of the effects of phosphates on the environment. The majority of the respondents (72% of 433) were aware of the importance of oxygen to the maintenance of water quality and preservation of marine life. Awareness of the impact of phosphates on water quality and the environment was comparatively low.

##### *The effect of excessive dumping of phosphates into water sources, on water quality*

The level of awareness of the negative impact of phosphates on water quality among consumer respondents was 25%. Another 15% were marginally aware (scale 4 on the 5-point scale) Just under 50% indicated that they were not aware of the effects of excessive dumping of phosphates. Given prior responses to other awareness questions, it appears that consumers may be thinking about the dumping of other elements into our water sources (e.g. Garbage, plastic bottles, and effluent) and relating these to phosphates. Still the lack of awareness of the impact on our water quality by the dumping of any substance is a cause for serious concern. Given the size of this group, there could be a challenge in the phase out process. It is believed that the success of the phase out is dependent on a justification based on the negative impact on water quality, despite the existence of water treatment options.

##### *The growth of algae because of the presence of large amounts of phosphates in water bodies*

The growth of algae is facilitated by the presence of phosphates and this renders water of little domestic use. This was known by approximately 20% of the consumers who responded to the survey.

##### *The ability of algae blooms to block out sunlight and the effect of a lack of oxygen in water on humans, livestock and wildlife*

While close to 30% of the consumer respondents knew that algae blocked out sunlight and caused oxygen imbalances, a significantly higher percentage (72%) were aware that a lack of oxygen kills other organisms. If a connection can be made between the presence of algae in water and the resultant negative effect on nature

then communicating with consumers about this would be relatively easy. This ease of communication could then aid the replacement of phosphate-based detergent with non-phosphate based detergent.

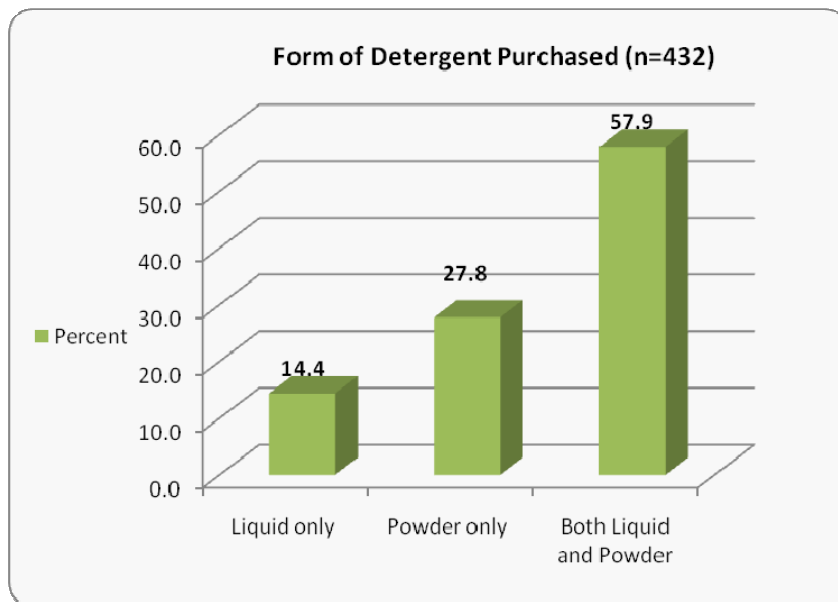
Table 2: Selected Results on Awareness of Phosphates on the Environment

<b>Awareness of the Effects of Phosphates on the Environment</b>	<b>Not Aware</b>	<b>Not Sure</b>	<b>Aware</b>	<b>N</b>
<b>Secondary water treatment removes a small percentage of Phosphates from waste water</b>	69.9	10.3	19.8	<b>429</b>
<b>A high percentage of Phosphates is released into water bodies (lakes, streams etc)</b>	66.9	8.1	25	<b>432</b>
<b>Excessive dumping of phosphates into streams, lakes or rivers can cause drastic changes in water quality</b>	53.8	6	40.2	<b>433</b>
<b>If too much phosphates gets into waterways, algae and phytoplankton feed on it and reproduce in massive numbers</b>	71.8	8.2	20	<b>429</b>
<b>Algal blooms block out sunlight and cause oxygen imbalances in a body of water</b>	60.4	8.8	30.8	<b>432</b>
<b>Lack of oxygen in water can kill other organisms and make the water unsuitable for humans, livestock and wildlife.</b>	18.2	5.3	72.5	<b>433</b>

## 5. ASSESSMENT OF CONSUMER USAGE PATTERNS AND ATTITUDES AND PERCEPTIONS TOWARDS PHOSPHATES IN DETERGENT

The consumers surveyed indicated that they primarily used detergents in the home (90.3% of 414) for doing laundry (93% of 435) and dishwashing (62% of 435). Some respondents (57.9% of 432) indicated that they purchased both liquid and powdered detergents, while others purchased powdered only (27.8%) and liquid only (14.4%).

Chart 4: Forms of Detergent Purchased



The most commonly used detergents were Breeze (23.7%), Sud Sud (19.5%) and Ariel (11.2% of 432 responses).

Table 3: Most Frequently Used Detergents

<b>Brand</b>	<b>Frequency</b>	<b>Percentage</b>
Breeze	214	<b>23.7</b>
Sud Sud	176	<b>19.5</b>
Ariel	101	<b>11.2</b>
Blanca	78	<b>8.6</b>
Springtime	58	<b>6.4</b>
Palmolive	53	<b>5.9</b>
Ajax	47	<b>5.2</b>
Tide	35	<b>3.9</b>
Sudsil	29	<b>3.2</b>
Pal	25	<b>2.8</b>
Soflan	12	<b>1.3</b>
Lasure	8	<b>0.9</b>
Bulk	7	<b>0.8</b>
Fresh	7	<b>0.8</b>
Pinesol	6	<b>0.7</b>
Gain	5	<b>0.6</b>
Gold Power	5	<b>0.6</b>
Super Sweet	5	<b>0.6</b>
Clorox	4	<b>0.4</b>
Fabuloso	4	<b>0.4</b>
Arm & Hammer	3	<b>0.3</b>
Dawn	3	<b>0.3</b>
Jet	3	<b>0.3</b>
Melaleuca	3	<b>0.3</b>
Xtra	3	<b>0.3</b>
Classic	2	<b>0.2</b>
Comfort	2	<b>0.2</b>
Bounty	1	<b>0.1</b>
Cheers	1	<b>0.1</b>
Fab	1	<b>0.1</b>
Harpic	1	<b>0.1</b>
<b>Total</b>	<b>902</b>	<b>100.0</b>

Eighty-five percent (85%) of consumers surveyed indicated that they were not aware of the presence of phosphates in detergents. When asked about the properties of detergents purchased however, 63.5% of 326 respondents indicated that they used a combination of phosphate and phosphate-free detergents. Response to this question probably represents a guess on the part of the consumers based on the level of knowledge of

phosphate and whether they have ever used them [q E1, E3]. Twenty-five percent (25% of 435) did not answer this question.

Chart 5: Awareness of the Presence of Phosphates in Detergent

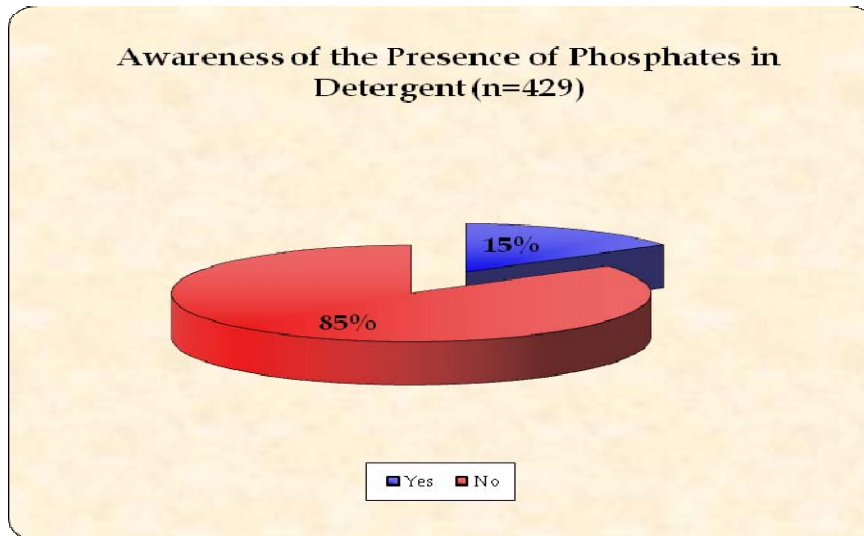
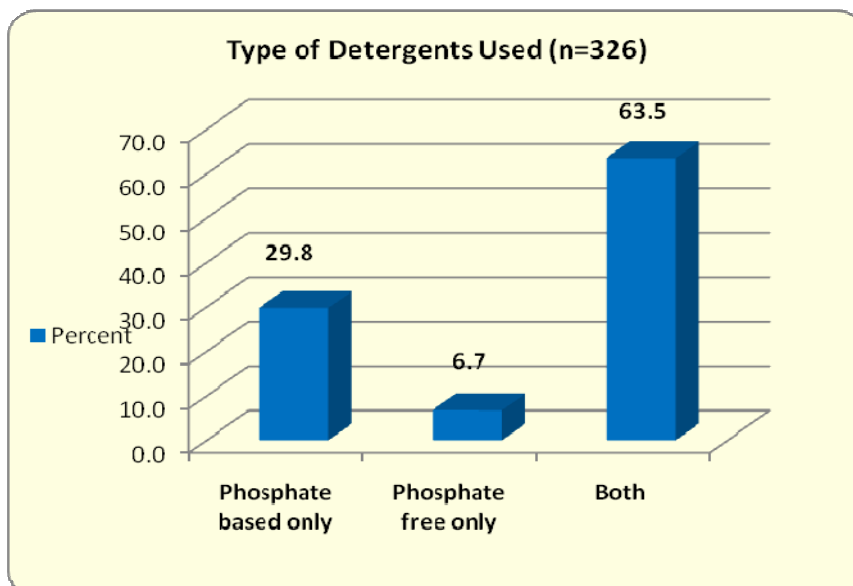


Chart 6: Types of Detergent Used



## Attitude

A number of questions were posed to assess the current level of attitude towards water pollution in general and phosphates in detergent in particular. Question 1 dealt with the issue of the role of government in protecting our water sources from pollution. Here consumers strongly agreed to this question. In terms of the other questions posed however, we found the responses to be weak in favour of concerns for the environment. In other words consumers had no strong attitudes when dealing with issues relating to phosphate pollution. This may be due to their lack of knowledge of and exposure to phosphates and the damage that can be created from its use. A significant percentage of the survey participants ranging from 40-60% felt that:

- a. phosphates from detergent posed no serious threat
- b. concerns about phosphates are exaggerated
- c. there will always be pollution
- d. another way to increase costs

This raises serious concerns about the need to ensure a strong awareness campaign complete with demonstrations of the way in which phosphate damages the environment.

Table 4: Important Role of Government

### Government should play an important role

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	19	4.4	4.4	4.4
	Disagree	11	2.5	2.5	6.9
	neither agree nor disagree	22	5.1	5.1	12.0
	Agree	71	16.3	16.4	28.5
	Strongly Agree	309	71.0	71.5	100.0
	Total	432	99.3	100.0	
Missing	System	3	.7		
	Total	435	100.0		

Table 5: No Serious Threat

**Phosphates from detergents pose no serious threat**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	31	7.1	7.3	7.3
	Disagree	107	24.6	25.1	32.4
	neither agree nor disagree	108	24.8	25.4	57.7
	Agree	97	22.3	22.8	80.5
	Strongly Agree	83	19.1	19.5	100.0
	Total	426	97.9	100.0	
Missing	System	9	2.1		
Total		435	100.0		

Table 6: Phase-out of Phosphates

**Phosphate detergents should be phased out to protect the environment**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	33	7.6	7.7	7.7
	Disagree	39	9.0	9.1	16.7
	neither agree nor disagree	76	17.5	17.7	34.4
	Agree	148	34.0	34.4	68.8
	Strongly Agree	134	30.8	31.2	100.0
	Total	430	98.9	100.0	
Missing	System	5	1.1		
Total		435	100.0		

Table 7: Paying More Money

**Paying more money for phosphates free is a small price**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	38	8.7	8.9	8.9
	Disagree	43	9.9	10.1	19.0
	neither agree nor disagree	76	17.5	17.8	36.9
	Agree	128	29.4	30.0	66.9
	Strongly Agree	141	32.4	33.1	100.0
	Total	426	97.9	100.0	
Missing	System	9	2.1		
Total		435	100.0		



Table 8: Concerns Overblown

**Concerns about phosphate are overblown**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	28	6.4	6.6	6.6
	Disagree	57	13.1	13.5	20.1
	neither agree nor disagree	115	26.4	27.2	47.3
	Agree	95	21.8	22.5	69.7
	Strongly Agree	128	29.4	30.3	100.0
	Total	423	97.2	100.0	
Missing	System	12	2.8		
Total		435	100.0		

Table 9: There will always be Pollution

**There will lways be pollution**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	24	5.5	5.6	5.6
	Disagree	50	11.5	11.7	17.3
	neither agree nor disagree	51	11.7	11.9	29.3
	Agree	64	14.7	15.0	44.3
	Strongly Agree	238	54.7	55.7	100.0
	Total	427	98.2	100.0	
Missing	System	8	1.8		
Total		435	100.0		

Table 10: Increasing Detergent Costs

**Another way of increasing detergents costs**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	39	9.0	9.9	9.9
	Disagree	74	17.0	18.7	28.6
	neither agree nor disagree	84	19.3	21.3	49.9
	Agree	86	19.8	21.8	71.6
	Strongly Agree	112	25.7	28.4	100.0
	Total	395	90.8	100.0	
Missing	System	40	9.2		
Total		435	100.0		

## Perception

In terms of the perception of the consumers, two things are clear:

- a. consumers are very strong in their belief that the phasing out process should be gradual
- b. the need for NEPA to launch an awareness campaign.

Consumers are not in favour of a sudden withdrawal of phosphates from the shelves, an environmental levy on phosphate-based detergent or the imposition of legal restrictions on the sale of phosphates in detergent.

Below are some selected results on the consumer perception of phosphates.

Table 11: Gradual Phasing out of Phosphate-Based Detergents

**Gradual phasing out of phosphate based detergents**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	39	9.0	9.2	9.2
	Disagree	46	10.6	10.8	20.0
	neither agree nor disagree	81	18.6	19.1	39.1
	Agree	122	28.0	28.7	67.8
	Strongly Agree	137	31.5	32.2	100.0
	Total	425	97.7	100.0	
Missing	System	10	2.3		
Total		435	100.0		

Table 12: Sudden Withdrawal of Phosphate-Based Detergent

**Should there be a sudden removal of phosphate based detergents**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	157	36.1	36.6	36.6
	Disagree	80	18.4	18.6	55.2
	neither agree nor disagree	81	18.6	18.9	74.1
	Agree	55	12.6	12.8	86.9
	Strongly Agree	56	12.9	13.1	100.0
	Total	429	98.6	100.0	
Missing	System	6	1.4		
Total		435	100.0		

Table 13: Phosphate-Based Detergents Allowed on Shelves

**Phosphate based detergents should be allowed to remain on shelves**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	92	21.1	21.7	21.7
	Disagree	49	11.3	11.6	33.3
	neither agree nor disagree	73	16.8	17.3	50.6
	Agree	126	29.0	29.8	80.4
	Strongly Agree	83	19.1	19.6	100.0
	Total	423	97.2	100.0	
Missing	System	12	2.8		
Total		435	100.0		

Table 14: Environmental Tax on Phosphate-Based Detergents

**Environmental tax should be placed on phosphate based detergents**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	138	31.7	32.6	32.6
	Disagree	71	16.3	16.8	49.4
	neither agree nor disagree	73	16.8	17.3	66.7
	Agree	80	18.4	18.9	85.6
	Strongly Agree	61	14.0	14.4	100.0
	Total	423	97.2	100.0	
Missing	System	12	2.8		
Total		435	100.0		

Table 15: Impose Legal Restrictions on Phosphate-Based Detergents

**Impose legal restrictions against the sale of phosphate based detergents**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	127	29.2	30.1	30.1
	Disagree	61	14.0	14.5	44.5
	neither agree nor disagree	72	16.6	17.1	61.6
	Agree	87	20.0	20.6	82.2
	Strongly Agree	75	17.2	17.8	100.0
	Total	422	97.0	100.0	
Missing	System	13	3.0		
Total		435	100.0		

Table 16: Launch Awareness Campaign

**Phosphate based detergents should launch an awareness campaign**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	22	5.1	5.2	5.2
	Disagree	14	3.2	3.3	8.5
	neither agree nor disagree	37	8.5	8.7	17.3
	Agree	53	12.2	12.5	29.8
	Strongly Agree	297	68.3	70.2	100.0
	Total	423	97.2	100.0	
Missing	System	12	2.8		
Total		435	100.0		

## **6. AN ASSESSMENT OF THE VALUE OF ENVIRONMENTAL AWARENESS AS A PURCHASE DECISION CRITERIA AND THE LEVEL OF WILLINGNESS TO PAY MORE FOR ENVIRONMENTALLY FRIENDLY PRODUCTS**

### **Previous use of Phosphate Free Detergents**

Of 420 respondents 8.3% reported that they had used phosphate detergents in the past. Significantly, 85.7% of the respondents were not aware if they had used phosphate free detergents in the past. Of the respondents who indicated that they had used the phosphate-free (32) 47% believed that the phosphate free detergents were more effective, 34.4% believed the functioning was the same and 18.8% believed they were less effective.

### **Willingness to Use Phosphate-Free Detergents**

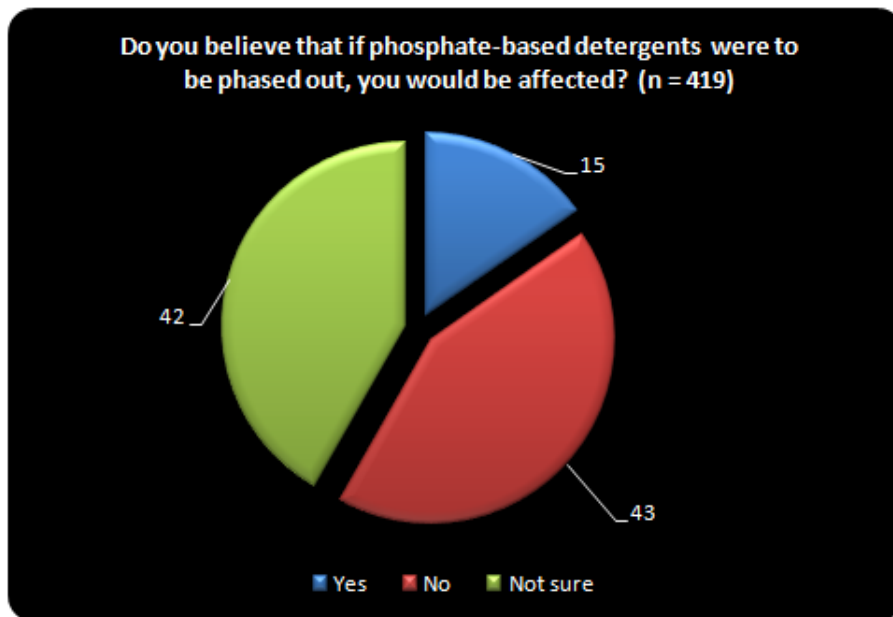
71.8 % of respondents were not aware that phosphate-free detergents were available. A similar proportion of respondents (71.6 % of 422) reported that they were willing to use phosphate free detergents. Twenty-seven percent (27%) of the consumers indicated however, that they were unsure about using phosphate free detergents. With regard to the replacement of phosphate-based detergents with more expensive but environmentally friendly detergents, 63.7% indicated that they were willing to purchase, 28.4% were not sure and 7.8% would not be willing to purchase (see table below). Of consumers surveyed, 65.6% agreed that phosphates should be phased out to protect the environment and 66.1% believed that paying more for detergents was acceptable to ensure the protection of the environment.

Table 17: Views about Pollution

<b>Views about Pollution and Phosphates</b>	<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly Agree</b>	<b>N</b>
The Government should play an important role in protecting our water from pollution	4.4	2.5	5.1	16.4	71.5	<b>432</b>
Phosphates from detergents do not constitute an important threat compared to other forms of water pollution	19.5	22.8	25.4	25.1	7.3	<b>432</b>
Phosphate detergents should be phased out to protect the environment	7.7	9.1	17.7	34.4	31.2	<b>430</b>
Paying more money for no phosphate detergents is a small price to pay for the protection of the environment	8.9	10.1	17.8	30	33.1	<b>426</b>
Concerns about phosphates and its effect on the environment are overblown	30.3	22.5	27.2	13.5	6.6	<b>423</b>
There will always be pollution of the environment so why worry about it	55.7	15	11.9	11.7	5.6	<b>427</b>
This is just another way to increase the cost of detergents	28.4	21.8	21.3	18.7	9.9	<b>395</b>

Regarding the introduction of phosphate free detergents in Jamaica, the consumers favoured a gradual phasing out of phosphate detergents (60.9%). Half of the consumers surveyed indicated however, that the phosphate detergents should remain on the shelves. Half of those surveyed also disagreed with the introduction of an environmental tax on phosphate detergents. Forty-four percent (44%) of consumers also disagreed with the imposition of legal restrictions on the sale of phosphate-based detergents. The introduction of a public education programme was viewed as a positive step by 82.7% of consumers. When consumers were asked if they would be affected by a phasing out of phosphates, 15% of 419 responded positively, 43% responded negatively and 42% were not sure.

**Chart 7: Affected by Phosphates Based Detergent**



There is some level of uncertainty among consumers on this question and represents a potentially troublesome situation if not handled correctly. Much will depend on the replacement products in terms of functionality as well as cost.

### **FOCUS GROUP DISCUSSION**

Whereas distributors said they would look into their formulations or speak with their chemists about it, the sole manufacturer who informed that his products had phosphate as an ingredient thought it to be a 'necessary evil'. All segments said they would be willing to try an alternative / phosphate-free detergent if it were effective. They thought that the government and Bureau of Standards could change the current scenario but that everyone had a part to play though the government must lead.

Consumers stated they would be prepared to pay between 0-30% increases for a phosphate free detergent where as businesses stated they could tolerate a range of 5-10% increase in costs. This increase is assuming that the phosphate free detergent met the market expectations/requirements for effective cleaning.

Summary of attributes of an effective phosphate-free detergent:

- Cleans well...as effective a cleaner as the replacement detergent containing phosphates
- Whitens white clothes and does not fade colours; lifts dirt and leaves it in water
- Should be cost effective, e.g. not requiring a lot to be effective for consumers and major users; allows for competitive positioning for distributors and manufacturers
- Have a pleasant odour/smell
- Does no harm to environment
- Gentle on hands
- Multi-purpose, e.g. can be used for a number of different substrates and uses

If phosphates are legislated, most stakeholders stated that they would conform. Conformance, however, is dependent on:

- If phosphate free detergents lives up to expectation and are perceived to be 'effective'.
- Whether manufacturers /distributors are responsive to complaints about phosphate-free detergents if they provide less than expected performance and act to provide 'improved' variants.

## **7. CHALLENGES TO BE FACED BY NEPA**

The challenges that will be faced by NEPA while not insurmountable will have to be managed carefully if the changeover is to be successful. A number of these challenges are:

1. Timing of the change over
2. Timeframe for replacement
3. Economic conditions
4. Levels of awareness
5. Cultural practices



## 6. Coordination between NEPA and other Entities including the Government

### **Timing of the changeover**

The point at which NEPA decides to announce the change over will need to be determined carefully and should be done only after extensive consultations with the key stakeholders in the industry. This will ensure that the organisation has the support from these stakeholders especially as it relates to the response of the public in respect of the critical issues of pricing, the suds capabilities of the replacement products, their cleansing effectiveness and the impact on the environment.

### **Time Frame for Replacement**

In addition to the timing of the change over, it is also important that NEPA communicates clearly the timeframe for change over. It is clear from the research conducted that consumers will not react too well to a sudden change. The process must be clearly outlined and communicated so that people can understand and follow the process and have concerns and queries addressed before the full change occurs.

### **Economic Conditions**

The current economic conditions will make it extremely difficult for the change over to be made now or in the near term (3 to 6 months) especially as it will potentially lead to an increase in the price of the end-product. Although the share of wallet controlled by soap is not very high, the cumulative effect of increases in the cost of food, transportation, gas, license fees could make such an increase difficult for consumers to accept at this time. The awareness campaign and the consultations with key stakeholders to prepare them for the change over will be critical.

### **Level of Awareness**

Building the level of awareness among consumers and other key stakeholder groups will be critical to the success of this change over. The research has demonstrated quite clearly that the level of awareness is very

low which we believe is a positive thing as it allows NEPA to create a positive awareness through its own activities / initiatives. This will make the change over much smoother than would otherwise obtain.

### **Cultural Practices**

The most difficult challenge facing NEPA will be the expected change in consumer behaviour and expectations associated with the many activities involving the use of detergent. Acceptance of phosphorous free detergents will require changes in the mindset of consumers as they go about their daily lives. For example, NEPA clearly in its communication task must address the issue of sudding. NEPA should also use this opportunity to address other cultural issues relating to the use of detergents that puts the environment at risk. The whole issue of washing cars either by households or roadside stands or in steams in some rural communities must be addressed as well.

### **Coordination between and other Entities including the Government**

NEPA must take the lead in coordinating and managing the relationship between itself and the Government as well as with other government agencies such as the Bureau of Standards to ensure a smooth transition. The committee that has been formed to address this issue will be critical in ensuring that all key stakeholders are aboard when the phase-out timelines are established and communicated.

## 8. RECOMMENDATIONS

**1. Public education of consumers** – Consumers have low knowledge about the presence and the effects of phosphates in detergents. This has made it difficult for some consumers to make an informed choice when selecting detergents. Public education is critical as consumers reported that they were generally willing to purchase more environmentally friendly detergents, even at a higher cost. A public education programme would be very fruitful as consumers can drive / encourage retailers to stock more environmentally friendly products. (i.e using a pull strategy)

### **2. Effective Communication Strategy Required**

- a. Get experts, e.g. environmentalists, global manufacturers who have gone 'green' to speak with authority about 'the path' of improving Jamaica's environment.
- b. Identify government agencies that together will act as 'watch dogs', to inform, audit and enforce legislation.
- c. Provide Consumers with easy access to information so that they too can advise/inform to ensure compliance, e.g. crime watch.
- d. Provide to the public a list of all detergents currently manufactured locally and imported that comply with the legislation.
- e. Include demonstrations of known brands versus phosphate free brands to convince consumers of their effectiveness.

### **3. Monitoring & Managing Consumers Concerns and Expectations**

- a. Informed consumers should have the ability to communicate / complain directly to manufacturers, major distributors, the trade associations and an overseeing government agency about the quality of phosphate free detergents if they do not meet expectations. (An agency similar to OUR with Utilities) However, such an agency must demonstrate effectiveness and efficiency in handling customer concerns.

- b. Expectations of the performance, cost and availability of phosphate free detergents will need to be managed carefully. Honesty will minimise rejection from consumers especially if phosphate free detergents will cost more.
  - c. Without a monitoring and management programme of key stakeholders then those who would want to resist will get the opportunity to do so, especially if expectations are not met.
  - d. Encourage manufacturers to mix or blend old and new soap to improve performance.
  - e. Encourage consumers and major users to identify and report sale of phosphate based detergent once the ban takes effect.
- 4. Clear labelling of Detergents** – To complement the public education and any phased removal of phosphate based detergents, NEPA could require manufacturers to conspicuously label detergents as phosphate based or phosphate free so that it is readily visible to the consumer. The consumers surveyed were largely unaware of the chemical properties of their detergents and as such, clear labelling would make an environmentally based selection easier.
- 5. Advertising and promotional campaign** – NEPA will need to pursue an advertising campaign about the planned removal of phosphate-based detergents that will effectively communicate the timetable for removal.
- a. Educate the public (using advertising, sales promotions, website) about the short and long term effect of using detergents containing phosphates on the environment
  - b. Target households and specifically females and children (going into schools just like the toothpaste companies).
  - c. Provide information on detergents in the market that contain phosphates and those that do not contain phosphates so consumers know and can choose.
  - d. Make available free samples of alternatives or detergents without phosphates during promotional efforts and educational seminars.

- e. Conduct promotions that demonstrate the effectiveness of phosphate free detergents.
- f. Provide consumers with time, say 1 year's notice, to adjust from point of notification to implementation of a phosphate free market.
- g. The Bureau of Standards should be empowered to educate producers, retailers, distributors of the change and advise on measures for conformance.

**6. Communication with Retailers** – Communication with retailers will be important to the success of the withdrawal campaign. A close alliance with retailers and manufacturers should be fostered to help them identify low-cost replacements for popular brands. A major concern of retailers is reduced sales therefore if suitable alternatives are identified the transition will be easier for both retailers and consumers.

**7. Gradual removal of phosphate – based detergents**– Consumers were generally in favour of a removal of phosphates – on a phased basis. A phased removal will allow the retailers and consumers to make preparations for the changes that the removal will bring. It is important to consider consumers' regular use of certain brands and the type of uncertainty or frustration that an immediate removal could cause.

## **8. Legislation & Enforcement**

Jamaican consumers are totally reliant on The Government, or its agencies responsible for the well being of its citizens, to inform them of the negative impact of Phosphates on the Environment.

Legislation will require, auditing, enforcement inclusive of 'penalties' to ensure compliance by: Manufacturers, Major Distributors, e.g. significant fines and revocation of license or conversely tax breaks for compliance. Attention should also be given to the trade, e.g. supermarkets and wholesalers who are customers of Major Distributors and Manufacturers, e.g. fines for purchasing & confiscation

(big stick) or conversely, endorsement or advertising list of approved trade which sell Phosphate-free detergents and or tax breaks.

## LIMITATIONS

A major limitation of the study was the inordinate amount of rainfall between September and December 07. The heavy rainfall corresponded with the data collection period and limited our ability to collect data in primarily in western Jamaica.

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