

# POTENTIAL DEMARKETING STRATEGY APPLICATION IN ELECTRIC POWER CONSUMPTION RATIONALIZATION: A FIELD STUDY IN ADEN, YEMEN

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## Abstract

*This research aims to investigate potential demarketing alternatives towards rationalizing electricity consumption in Aden, Yemen. A descriptive-analytical method was employed to attain the study objectives and evaluate the research hypothesis with questionnaires distributed to 400 study samples. Resultantly, a relationship was identified between demarketing strategy implementation and electricity consumption rationalization in Aden, Yemen. Additionally, this research proposed a programmed and phased utilization of demarketing strategies and enhancing awareness and educational programs towards electricity consumption rationalization with various social media platforms in the Aden Governorate.*

**Keywords:** Demarketing Strategies, Electric Power, Consumption, Power Demand, Alternative Power Sources.

## INTRODUCTION

Demarketing has recently been regarded as one of the most essential and advanced marketing notions following the substantial attention garnered by various institutions, particularly in elevating certain products demands and irrational overconsumption. In this vein, demarketing denoted a contrary marketing strategy (emphasizing marketing mix components) as appropriate demarketing strategies permanently or temporarily minimized product needs. For example, marketers strived to decrease product demands when the need was higher than production capacity. Hence, demarketing strategies served to increase rates and minimize promotional activities (advertising), product advantages, or distribution costs. As such, demarketing did not undermine needs but the strategy reduced the demands to complement organizational production capability.

Occasionally, marketers strived to minimize product needs for specific markets, specifically in the presence of one market and lower profitability than other counterparts for the same product (when production cost or product advertising was higher in one market than other counterparts). In the study context, demarketing strategy implementation involved rationalizing electric power consumption. For example, demarketing strategies encompassed price increase, upfront announcements justifying product risks, promotional costs and minimal sales volume, sales representatives' time reduction, agent and distributor discounts, product

distribution, point reduction, increased purchases and duration, low product quality, alternative-setting, and inappropriate purchasing process environments.

civil war in Yemen has severely impacted Yemeni infrastructure, such as the electric power industry. The challenge was faced by the Aden Governorate (the second Yemeni capital and a coastal city with high temperatures that required perpetual electricity consumption). Inadequacies in electricity generation methods resulted in high power consumption (at domestic, national, or commercial levels), thus prompting electricity consumption rationalization and subsequent alternatives in the Aden Governorate (demarketing strategies and instruments). The subsequent implementation minimized permanent or temporary product needs as an adequate alternative to rationalize consumption, codify product needs, and utilize the implementation in a regulated manner for consumers' enhanced consumption process (individually, collectively, socially, environmentally, and financially). As electricity consumption rationalization denoted optimal electricity usage without excess, demarketing was considered to be one of the electricity consumption rationalization instruments in the governorate.

### *2.1 Study problem*

The civil war in Yemen impacted essential infrastructure, specifically the electricity sector. Following high electricity consumption and potential (albeit unattainable) resolutions in the Aden Governorate, much consideration was required to investigate the phenomenon and subsequent causes. The recent electricity demands have urged scholars to examine the possible reasons through the following questions: (1) Is the high demand typical or exceptional? and (2) can demarketing strategies be utilized to solve the complexity?

### *2.2 Study importance*

1- The research garnered importance from the topic of essentiality (electric power intricacies in the Aden Governorate, Yemen).

2- The study importance was denoted by research scarcity (lack of local studies on the subject matter).

3- The study raised demarketing implementation awareness in the Yemeni power sector.

### *2.3 Study objectives*

This study aimed to:

1. Identify demarketing strategy effectiveness in electricity consumption rationalization within the Aden governorate.

2. Identify if excessive electricity consumption involved risks and damages (public resource wastage) and whether demarketing strategy implementation facilitated waste reduction.

### *2.4 Study hypothesis*

This study intended to test the following hypothesis:

There is a statistically significant relationship at level 0.05 between demarketing strategies and electricity consumption rationalization in the Aden governorate.

### *2.5 Study Methodology*

Theoretically, the research depended on descriptive and exploratory techniques to analyze and interpret the gathered data.

### *2.5 Study limitations*

1. Spatial limitation: reflected in the Yemeni governorate of Aden.

2. Human limitation: the governorate population sample.

3. Time limitation: The research was performed between August 2020 and February 2021.

## 2.6 Study tools

A novel two-part questionnaire was structured to attain the research objectives and hypothesis-testing. The first section entailed the demographic details of the study sample population, whereas the second part denoted different demarketing alternatives and subsequent impacts on electricity consumption rationalization within the Aden governorate. Furthermore, this section was categorized into five axes: (1) axis one heightened awareness of consumers' electricity utilization culture, (2) axis two implied the electricity cut-off programmed policy, (3) axis three involved high electricity processing rates, (4) axis four denoted consumers' loyalty and tolerance of electricity management procedures, and (5) axis five indicated electricity consumption rationalization.

### *Testing the study tool validity and stability*

The questionnaire content validity was assessed using arbitrators from Aden University and Taiz University for validity measurement. Comments on specific paragraphs were made and duly regarded. A half-division approach (to denote the number of paragraphs categorized into odd and even numbers) was utilized to assess the questionnaire stability. Specifically, the division points were identified by odd and even paragraph numbers with a high stability coefficient of 0.89 using the Spearman correlation coefficient.

### *Study sample and population*

The study population encompassed 400 arbitrarily-selected Aden governorate residents following the complexities in choosing bigger sample size. The study questionnaire was distributed to respondents in September 2020.

## LITERATURE REVIEW

Despite insufficient research on demarketing strategies for electricity consumption rationalization in Yemen, specific demarketing-oriented research was identified in other sectors as follows:

[1] intended to examine the fundamentals of employing demarketing policies involving electricity usage rationalization in Dohuk, Iraq. The study emphasized demarketing policies and the instruments facilitating electricity consumption rationalization. Meanwhile, [1] attempted to demonstrate specific implementations that induced demarketing in soft drinks through reduced consumption. Saleh (2019) suggested the need to incorporate demarketing approaches into service sectors (restaurants) to rationalize unhealthy food consumption and shift to healthy counterparts. On another note, [2] strived to indicate demarketing as one of the most efficient strategies in rationalizing particular product consumption and controlling the needs with particular techniques. [3] intended to identify demarketing strategy fundamentals in water consumption rationalization and the subsequent preservation of natural resources. [4, 5] proposed the need for demarketing techniques as an instrument to minimize particular product consumption that proved hazardous to health and the environment. Meanwhile, [6, 7] attempted to determine demarketing strategy roles in rationalizing drug consumption with sound demarketing approaches to rationalize the usage of medicines. [5] strived to investigate potential demarketing approaches in water consumption rationalization and summarized that demarketing significantly influenced consumer education on water conservation fundamentals.

As past studies were performed in various areas and topics excluding the current subject matter, this research was distinct from past counterparts regarding the subject matter (electricity consumption rationalization) and location (the Yemeni governorate of Aden)[2, 4].

## APPLIED STUDY RESULT ANALYSIS

### *Study sample description*

Table 1 presents the following details:

1- The percentage of male and female respondents was 80% and 20%, respectively, in line with the nature of society and social attributes, practices, and rituals;

2- The study sample age ranged under 20 years old (31%), between 21 and 40 years old (59%), and above 41 years (59%). Resultantly, most study samples exceeded 21 years old and were rational decision-makers in evaluating the offered service level;

3- Notably, 63% of the study samples held public posts in government sectors, whereas 32% worked in private sectors. Meanwhile, the unemployment ratio was 5%. Resultantly, most governorate population reflected public sector employees who relied on monthly wages.

4- The percentage of high school holders from the study sample was 50%, followed by bachelor's degree holders (36%), and postgraduate studies (14%). Thus, the nature of society, educational and cultural circumstances, and citizens' awareness involving the governorate were positive indicators.

*Table 1*; The frequency distribution of study sample by personality characteristics

Variable	Category	Number	Per cent (100%)
<b>Gender</b>	Male	320	80%
	Female	80	20%
<b>Age</b>	Below 20 years old	125	31%
	Between 21 and 40 years old	237	59%
	Above 41 years old	38	59%
<b>Occupation</b>	Government employee	252	63%
	Self-employed	127	32%
	Unemployed	21	05%
<b>Education Level</b>	High school	200	50%
	Bachelor's Degree	142	36%
	Postgraduate	58	14%
<b>Total</b>			<b>100%</b>

### *4.2. Descriptive measures of study sample responses towards demarketing strategy variables*

The study sample response to demarketing strategy application was distributed as follows:

Table 2 ; High electricity processing rates

No.	Variable	Mean	Sd. Deviation	Rank
1	High prices will reduce electricity consumption	4.103	0.857	1
2	Electricity pricing is preferred based on the activity (commercial/industrial/service/home).	3.954	0.928	3
3	It is preferable to distinguish electric power rates following current electric equipment.	3.548	0.996	4
4	It is preferable to offer discounts to consumers committed to rationalizing electricity.	4.025	0.796	2
<b>Total</b>		3.865	1.218	

Based on Table 2, the first paragraph ranked first with an arithmetic mean of (4.103) and a standard deviation of (0.857), thus demonstrating that high electricity rates minimized consumption. The fourth paragraph ranked second with an arithmetic mean of (4.025) and a standard deviation of (0.796), hence highlighting the essentiality of discounts in consumption rationalization. The study samples acknowledged the importance of distinguishing electricity service pricing by activity (commercial, industrial, service-related, or home-based) with an arithmetic mean of (3.954) and a standard deviation of (0.925). Furthermore, the study samples recognized the need to distinguish electric power-pricing based on the current equipment with an arithmetic mean of (3,548) and a standard deviation of (0996). The study samples conceded that high electricity rates potentially minimized consumption with an arithmetic mean of (3,865) and a standard deviation of (1,218).

Table 3; Raising awareness and enhancement of the electricity consumption rationalization culture

No.	Variable	Mean	Sd. Deviation	Rank
1	Educational advertising programs potentially increase consumers' electricity awareness.	4.324	0.761	1
2	Advertising methods illustrate electricity rationalization advantages (healthcare, economic, and social).	4.035	0.832	2
3	The activation of civil organization roles enhance the electricity consumption rationalization culture.	3.631	1.340	4
4	Publishing and promoting electricity appliance investments minimize electricity consumption.	3.841	0.952	3
<b>Total</b>		3.987	1.201	

Resultantly, the study samples acknowledged that elevating consumers' awareness of the electricity consumption culture resulted in electricity consumption rationalization within the governorate with an arithmetic mean of (3.987) and a standard deviation of (1.201). Specifically, the essentiality of public and educational programmes in attaining electricity consumption awareness was accepted with an arithmetic mean of (4.324) and a standard deviation of (0.761). The second paragraph ranked second with an arithmetic mean of (4.035) and a standard deviation of (0.832), thus demonstrating the importance of advertising in raising awareness. The fourth paragraph ranked third with an arithmetic mean of (3.841) and a standard deviation of (0.952) highlighting the importance of utilizing consumption-reducing tools. The third paragraph ranked fourth with an average calculation of (3,631) and a standard deviation of (1.340) to indicate the importance of civil organizations in enhancing the electricity consumption rationalization culture.

*Table 4; Using programmed electricity cut-off policy*

No.	Variable	Mean	Sd. Deviation	Rank
1	Programmed electricity cut-off policy success relies on implementation fairness.	3.724	0.962	2
2	Government departments encompass various activities following the programmed electricity cut-off policy.	4.209	0.849	1
3	Excessive electricity consumption leads to the programmed electricity cut-off policy application.	3.014	1.024	3
4	The programmed electricity cut-off policy resolves excess electricity demand issues.	2.86	1.366	4
5	Protective devices facilitate minimal damages to electrical appliances.	2.641	1.428	5
<b>Total</b>		3.169	1.095	

Notably, the average total of paragraphs was (3.169) with a standard deviation of (1.095) and highlighted that the programmed electricity cut-off policy rationalized consumption to some degree. For example, the fourth paragraph implied that the policy considerably resolved excess electricity need issues with the arithmetic mean of (2.86) and standard deviation of (1.366). The second paragraph ranked first with an arithmetic mean of (0.849) and a standard deviation of (4.209), hence demonstrating the need for justice in utilizing the programmed electricity cut-off policy involving various government sectors. The outcome corresponded to the first paragraph with an arithmetic mean of (3,724) and a standard deviation of (0.962). The result was also in line with the third paragraph by affirming that excessive consumption led to programmed electricity cut-off policy implementation for electricity supply services with an arithmetic mean of (3.014) and a standard deviation of (1.024).

*Table 5;* Customer loyalty and acceptance of electricity consumption rationalization procedures

No.	Variable	Mean	Sd. Deviation	Rank
1	Regular, safe, and continued control insurance increase consumer loyalty to the offered service.	4.334	0.627	1
2	Consumers empathize with electricity conservation procedures by the Electricity Department.	3.025	1.054	3
3	Electricity rationalization is a social responsibility that is not solely limited to one individual.	4.016	0.798	2
4	Consumers explicitly express discomfort towards electricity cut-offs.	2.969	1.321	4
<b>Total</b>		3.602	0.968	

Perceivably, study samples conceded that customer loyalty was essential in tolerating governorate electricity consumption rationalization procedures with the arithmetic mean of (3.602) and standard deviation of (0.968). The first paragraph ranked first with an arithmetic mean of (4.334) and a standard deviation of (0.627), thus affirming that secure, stable, and perpetual power-generation elevated consumer loyalty towards electricity. The third paragraph ranked second with an arithmetic mean of (4.016) and a standard deviation of (0.798), thus denoting electricity consumption rationalization as social accountability. The second paragraph ranked third with an arithmetic mean of (3.025) and a standard deviation of (1.054), hence reflecting consumers' empathy towards electricity conservation procedures. The fourth paragraph ranked last with an arithmetic mean of (2.969) and a standard deviation of (1.321), hence indicating that consumers did not explicitly express reluctance towards electricity cut-offs.

*Table 6;* Study sample responses to the electricity consumption rationalization variable

No.	Variable	Mean	Sd. Deviation	Rank
1	Complete download of household appliances when utilized.	3.001	1.038	5
2	Convert to alternative sources (solar and wind).	4.530	0.659	1
3	Intensive awareness campaigns for optimal electricity usage.	4.213	0.864	2
4	Develop effective monitoring methods to minimize illegal electricity leakage.	4.096	0.795	3
5	The public use of legislative authorities to launch the controls for rationalized electricity consumption.	3.808	0.967	4
<b>Total</b>		3.905	0.899	

Resultantly, the study samples' responses to the electricity consumption rationalization variable were high with an arithmetic mean of (3.905) and a standard deviation of (0.899), thus indicating the essentiality of electricity consumption rationalization. The second paragraph ranked first with an arithmetic mean of (4,530) and a standard deviation of (0.659), hence emphasizing the importance of conversion and alternative power sources. The third paragraph ranked second with an arithmetic mean of (4,213) and a standard deviation of (0.864), thus highlighting the importance of intensive awareness campaigns towards electricity usage rationalization. The fourth paragraph ranked third with an arithmetic mean of (4.096) and a standard deviation of (0.795), thus highlighting the importance of efficient controls to minimize illegal electricity usage. The fifth paragraph ranked fourth with an arithmetic mean of (3.808) and a standard deviation of (0.967), thus affirming the importance of government authority and the development of regulations and controls towards electricity consumption rationalization. The first paragraph ranked fifth with an arithmetic mean of (3,001) and a standard deviation of (1.038), thus asserting that a complete load of household appliances resulted in irrational electricity consumption.

**4.3 Study hypothesis testing**

Following the study hypothesis, a statistically-significant correlation at level 0.05 was identified between demarketing strategies and electricity consumption rationalization in the Aden governorate. The hypothesis was tested as follows:

1. Conducting a simple and multiple correlation tests to examine the degree to which demarketing strategies (as an independent variable) facilitated electricity consumption rationalization (as an acceptable variable).

*Table 7; Study variable correlations*

No.	Electricity Consumption Rationalization (Dependent Variable) Y Demarketing Strategies (Independent Variable) X	Correlation Value
1	Raising awareness and enhancing consumers' electricity culture (X1).	0.268
2	Use programmed cut-off policy for electricity (X2).	0.163
3	Increasing electricity processing rates (X3).	0.564
4	Consumers' loyalty and tolerance of electricity management procedures (X4).	0.647
<b>Total</b>		0.536
Sig = 0.05; N = 400		

The following outcomes were revealed based on Table 7:

(a) A medium correlation was determined between raising awareness and increasing consumers' electricity culture and rationalizing electricity consumption with a correlation coefficient of (0.268) at a moral level of (0.05);

(b) A weak correlation was identified between using the programmed electricity cut-off policy and rationalizing electricity consumption with the correlation coefficient of (0.163) at a moral level of (0.05);

(c) A positive correlation was identified between demarketing strategies (reflected by high electricity processing rates and shifts in consumers' loyalty and tolerance of electricity management procedures) and electricity consumption rationalization with the correlation coefficients of (0.564) and (0.647), respectively, at a moral level of (0.05).

(d) An overall positive correlation was determined between demarketing strategy and electricity consumption rationalization with a correlation coefficient of (0.536) at a moral level of (0.05).



Given the strong relationship identified between demarketing strategies and electricity consumption rationalization at a moral level of (0.05) in the Aden governorate, the study hypothesis was supported.

2. A simple and multiple regression tests were performed to determine the degree to which demarketing strategies impacted electricity consumption rationalization.

*Table 7*; Relationships between demarketing factor determinants in electricity consumption rationalization

No.	Electricity Consumption Rationalization (Dependent Variable) Y	B	B1	R <sup>2</sup>	F		Sig.
					Calculated	Tabulated	
1	Raising awareness and increasing consumers' electricity culture (X1).	3.010	0.184 (1.83)*	0.042	2.969	2.601	0.000
2	Using the programmed electricity cut-offs policy (X2).	3.431	0.163 (1.74)*	0.396	2.774	2.498	0.000
3	Increasing electricity processing rates (X3).	2.003	0.637 (3.99)*	0.319	21.214	2.649	0.000
4	Consumers' loyalty and tolerance of electricity management procedures (X4).	1.748	0.720 (5.42)*	0.425	30.583	2.630	0.000

\*t-calculated values; N = 400; Tabular t-value = 1.82; Sig = 0.05  
Table 8 illustrates the influence analysis outcomes as follows:

Strategic factor impacts on demarketing strategies were reflected by x4 x2 x1 in the electricity consumption rationalization variable at the calculated moral level of (0.00) that was below the default value of (0.05). The factor impacts stated under the electricity rationalization variable affirmed that the scheduled (f) value proved lower than the counterparts calculated for the aforementioned factors (see Table 8). As the tabular (t) values were lower than the counterparts calculated in Table 8, the study hypothesis was valid and stipulated a statistically-significant correlation at the moral level of (0.05) between demarketing strategies and electricity consumption rationalization in the Aden governorate.

### CONCLUSIONS

Following the study outcomes and hypothesis-testing, demarketing policies facilitated electricity consumption rationalization in the Aden governorate. Among the employed strategies = were increased awareness of the electricity consumption culture, high electricity processing rates, consumers' loyalty and tolerance of electricity management procedures, and programmed electricity cut-off policies. Additionally, present government-subsidized electricity rates induced consumers to disregard wasted electricity units. Electricity wastage was not only restricted to domestic usage, but the waste was also observed in government offices and departments. Furthermore, active advertising programs to increase consumers' electricity awareness remained scarce.

As insufficient advertising media failed to clarify electricity rationalization benefits (healthcare, economic, and social), a set of engaging legislations sought to guide the community to embrace the electricity consumption rationalization culture. For example, strategic plans for big-scale electricity-generation projects could be actualised by

monitoring high economic equilibrium in line with the governorate development. Additionally, the need to employ alternative power sources (solar and wind), intensive awareness campaigns towards optimal electric power utilization with social media and TV channels, and demarketing techniques should be eventually incorporated following the communal reality in Aden.

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