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Research Article

Evaluating the Effectiveness and Benefits of Corporate Social Responsibility Initiatives by Maps Kalpakkam

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Abstract: This paper aims to explore the effectiveness of Corporate Social Responsibility (CSR) projects implemented by Madras Atomic Power Station (MAPS) Kalpakkam, with a particular focus on the satisfaction levels of the local community. The primary objective is to analyze the pre- and post-implementation effects of the "Artificial Reef" CSR project to assess its impact on the local community. Additionally, this study evaluates the community's satisfaction with various CSR initiatives undertaken by MAPS Kalpakkam, identifying key factors that contribute to trust and goodwill between the organization and the local population. To achieve these objectives, the study employs the One Sample Wilcoxon Signed Rank Test to measure the effectiveness of the "Artificial Reef" project by comparing conditions before and after its implementation. Furthermore, the satisfaction levels of the local community regarding different CSR projects are assessed through percentage analysis, Chi-square analysis, and Weighted Average analysis. The findings provide valuable insights into the impact, perception, and overall reception of CSR initiatives within the local community, highlighting areas for potential improvement and continued engagement.

Keywords: Corporate Social Responsibility, Artificial Reef, local community, satisfaction levels.

INTRODUCTION

Corporate Social Responsibility (CSR) refers to the practices and policies undertaken by corporations aimed at positively influencing society. Companies engage in CSR initiatives not only to enhance their brand image but also to fulfill ethical obligations toward society. CSR activities may include environmental sustainability efforts, volunteer programs, and charitable contributions. While CSR is often associated with large corporations, small businesses also engage in community-focused CSR activities. The movement towards CSR has led to improvements in sustainability, ethical labor practices, and overall corporate accountability.

An artificial reef is a man-made structure placed in the ocean to create a habitat for marine life. They can be made from concrete, steel, rocks, and other materials. Materials used to construct artificial reefs have included rocks, cinder blocks, and even wood and old tires. Nowadays, several companies specialize in the design, manufacture, and deployment of long-lasting artificial reefs that are typically constructed of limestone, steel, and concrete. most artificial reefs have been developed in areas that are largely devoid of irregular bottom topography.

Environmental sustainability may be a precise corporate strategy that was created both to satisfy the requirements of increasingly attentive consumers through Corporate Social Responsibility activities.

OBJECTIVES OF THE STUDY

a) To analyze the pre- and post-effects of the CSR project "Artificial Reef" to determine its perception and impact on the local community.
b) To assess the satisfaction levels of the local community regarding the CSR projects provided by MAPS Kalpakkam.
c) To evaluate the benefits of CSR activities and the factors that promote trust and goodwill among the local community.

SCOPE OF THE STUDY

a) The study aims to identify factors influencing social acceptance, trust, and goodwill within the local community.
b) The findings will highlight the impact of CSR initiatives on the local community.
c) The study will help in identifying the key factors that support the effectiveness of CSR activities.

NEED FOR THE STUDY

a) To identify and strengthen the factors that enhance trust and goodwill among the local community of MAPS Kalpakkam.
b) To attain social acceptance for the sustainable and continued operation of the power plant.

LIMITATIONS OF THE STUDY

a) Human errors may arise as respondents might not provide accurate responses.
b) The study is limited to a specific geographical area and a smaller sample size due to time constraints.
c) Some respondents may hesitate to share accurate data.
d) The study's scope is restricted due to challenges posed by the COVID-19 pandemic.

LITERATURE REVIEW

- **Cheney George, Steven May, and Roper Juliet (2017):** Companies must manage both operational quality and societal impact, but not all well-performing companies contribute equally to social welfare. **Carroll (2014):** Proposed a four-part CSR model—economic, legal, ethical, and philanthropic responsibilities. **Maignan & Ralston (2012):** Discussed various CSR behaviors, including cause-related marketing, charitable donations, and environmental initiatives.
- **De, I., & Sinha, S. K. (2022)** Their article critically examines the CSR models of companies and their engagement with community leading to long term capacity building. They conducted case studies of CSR projects by reputed public and private sector enterprises. They reveals that many of the projects attempt to deliver public service through very high investments. But they do not build the capability of the community. Due to lack of community engagement, they may not be able to achieve the major objective meaningfully.
- **Alam Aguilar Platas (2008):** Examined external conditions influencing CSR adoption and proposed strategies for wider CSR implementation.**Porter Michael E. & Prahalad C.K. (2003):** Argued that companies must address societal issues to ensure sustainable business success.
- **LT Nguyen, PD Tran, KQ Nguyen (2022)** Study investigated the effectiveness of Artificial coral reefs (ACRs) in the coastal resource restoration and showed that fish species diversity, abundance, biomass, and individual numbers have been increased following 2 years of deployment. A total of 44 marine living species belonging to 26 families were recorded in the baseline survey. This increased to 193 species from 87 families after 1 year, and 237 species and 95 families after 2 years since ACRs.
- The findings of **Jose B. Ballesteros (2020)** reveal that communal participation in safeguarding the vicinity of the reefs emanating at the barangay level is evident; the community folks had gained an understanding of the role of coral reefs in the ecosystem and school of fishes shoaled in the vicinity. Thus, this coral reef project drew positive attention, reduced minimalistic attitudes, and increased environmental awareness. The artificial reefs now serve as natural habitats.
- **AB Paxton, DN Steward, KJ Mille, J Renchen (2024)** calculate the physical footprint (seafloor extent) of artificial reefs in the US ocean using spatial data from all 17 US coastal states with ocean reefing programmes. Their research revealed that purposely sunk reef structures such as ships and concrete pipes occupy 19.23 km^2 of the ocean through 2020. The intentional reef footprint increased 20.85-fold (~1,980%) Over the past five decades (1970–2020), but this rate of increase slowed in the past decade (2010–2020) to 1.12-fold (~12%). Their findings will inform that the sustainable use of built marine infrastructure and generation of ecological functions.

METHODOLOGY OF RESEARCH

Research Design: Descriptive
Target Respondents: Local community near MAPS Kalpakkam
Population Size: Infinite
Sample Size: 103
Sampling Method: Cluster Sampling
Data Collection:

- **Primary Data:** Collected through interviews and questionnaires
- **Secondary Data:** Gathered from websites, books, and search engines

Tools for Analysis:

- Wilcoxon Signed-Rank Test
- Weighted Average Analysis
- Chi-Square Test

The study employs statistical tools via the SPSS package to analyze the data, ensuring accuracy and reliability in evaluating the effectiveness of CSR initiatives by MAPS Kalpakkam.

DATA ANALYSIS AND INTERPRETATION

Wilcoxon Signed Ranks Test-1

Null hypothesis (H0): there is no improvement in the situation before artificial reef project and after artificial reel project.

Alternate hypothesis (H1): there is improvement in the situation before artificial reef project and after artificial reel project.

Ranks

		N	MeanRank	Sum of Ranks
1. Marine life improvement after artificialreefproject-1.Marinelife improvement before artificial reef project	NegativeRanks	0[a]	.00	.00
	Positive Ranks	103[b]	52.00	5356.00
	Ties	0[c]		
	Total	103		
2. Erosion (Higher / lower waves) after	NegativeRanks	0[d]	.00	.00

artificial reef project - 2.Erosion(Higher/lowerwaves)before artificial reef project	Positive Ranks	103[e]	52.00	5356.00
	Ties	0[f]		
	Total	103		
3. Attracts tourists and occasional fishingafterartificialreefproject-3. Attracts tourists and occasional fishing before artificial reef project	NegativeRanks	0[g]	.00	.00
	Positive Ranks	103[h]	52.00	5356.00
	Ties	0[i]		
	Total	103		
4.Incomeandsalesafterartificial reef project - 4. Income and sales before artificial reef project	NegativeRanks	0[j]	.00	.00
	Positive Ranks	103[k]	52.00	5356.00
	Ties	0[l]		
	Total	103		
5.Coastalprotectionafterartificial reef project - 5. Coastal protection before artificial reef project	NegativeRanks	0[m]	.00	.00
	Positive Ranks	73[n]	37.00	2701.00
	Ties	30[o]		
	Total	103		
6.Fishingquantityafterartificialreef project - 6. Fishing quantity before artificial reef project	NegativeRanks	0[p]	.00	.00
	Positive Ranks	103[q]	52.00	5356.00
	Ties	0[r]		
	Total	103		
7. Quality of fish (Health & Growth) afterartificialreefproject-7.Quality of fish (Health & Growth) before artificial reef project	NegativeRanks	36[s]	39.26	1413.50
	Positive Ranks	23[t]	15.50	356.50
	Ties	44[u]		
	Total	103		
8.FinancialStatusafterartificialreef project - 8. Financial Status before artificial reef project	NegativeRanks	0[v]	.00	.00
	Positive Ranks	93[w]	47.00	4371.00
	Ties	10[x]		
	Total	103		
9.SocialStatusafterartificial reef project -9. Social Status before artificial reef project	NegativeRanks	0[a]	.00	.00
	Positive Ranks	64[b]	32.50	2080.00
	Ties	39[c]		
	Total	103		
10.Livelihoodafterartificial reef project - 10. Livelihood before artificial reef project	NegativeRanks	0[d]	.00	.00
	Positive Ranks	94[e]	47.50	4465.00
	Ties	9[f]		
	Total	103		

s

1. After artificial reef project<Before artificial reef project
2. After artificial reef project>Before artificial reef project
3. After artificial reef project= Before artificial reef project

Test Statistics

	Z	Asymp.Sig. (2-tailed)
1.Marinelifeimprovementafter artificial reefproject-1. Marine life improvement before artificial reef project	-10.055[b]	.000[a]

2.Erosion(Higher/lower waves) after Artificial reefproject-2.Erosion(Higher/ lower waves)before artificial reef project	-9.287[b]	.000[a]
3.Attractstouristsandoccasionalfishing after artificial reef project - 3. Attracts tourists and occasional fishing before Artificial reef project	-9.209[b]	.000[a]
Income and sales after artificial reef project-4.Incomeandsalesbeforeartificialreef project	-9.075[b]	.000[a]
5. Coastal protection after artificial reef project-5.Coastal protection before artificial Reef project	-9.150[b]	.000[a]
6.Fishingquantityafterartificialreef project -6.Fishing quantity before artificial reef project	-9.086[b]	.000[a]
7.Quality of fish (Health & Growth) after artificial reef project - 7. Quality of fish (Health & Growth) before artificial reef project	-4.079[b]	.000[a]
8.Financial Status after artificial reef project	-8.712[b]	.000[a]
8. Financial Status before artificial reef project		
9.Social Status after artificial reef project	-8.000	.000[a]
10.Livelihood after artificial reef project	-8.666	.000[a]

a.Wilcoxon Signed Ranks Test
b.Based on negative ranks.
c.Based on positive ranks.

INFERENCE: The P-value (0.000) and significance value 0.05 (0.0<0.05). Since P-value is less than significance value, thus accept H1. Hence there is an improvement in the situation before artificial reel project and after artificial reel project for all the factors that is taken into consideration.

WEIGHTED AVERAGE ANALYSIS

Satisfaction level of the local community for the CSR projects provided by the organisation.

Sno	Factors	Highly Dissatisfied	Dissatisfied	Moderately Satisfied	Satisfied	Highly Satisfied	Weighted Average	Rank
1	Multi- Purpose hall	X1=0 W1=1 (X1*W1) =0	X2=0 W2=2 (X2*W2) =0	X3=20 W3=3 (X3*W3) =60	X4=11 W4=4 (X4*W4) =44	X5=72 W5=5 (X5*W5) =360	∑W=15 Y= (464/15) =30.933	1
2	Artificial limb/wheel chair for disabled	X1=0 W1=1 (X1*W1) =0	X2=0 W2=2 (X2*W2) =0	X3=11 W3=3 (X3*W3) =33	X4=30 W4=4 (X4*W4) =120	X5=59 W5=5 (X5*W5) =295	∑W=15 Y=(448/15) =29.866	2
3	Medical camp (Eye& Dental)	X1=0 W1=1 (X1*W1) =0	X2=0 W2=2 (X2*W2) =0	X3=8 W3=3 (X3*W3) =24	X4=63 W4=4 (X4*W4) =252	X5=32 W5=5 (X5*W5) =160	∑W=15 Y=(436/15) =29.066	4
4	Skill	X1=0 W1=1	X2=0	X3=18 W3=3	X4=40 W4=4	X5=45 W5=5	∑W=15	3

	development training	(X1*W1) =0	W2=2 (X2*W2) =0	(X3*W3) =54	(X4*W4) =160	(X5*W5) =225	Y=(439/15) =29.266	
5	Tailoring training& issue of sewing machines	X1=0 W1=1 (X1*W1) =0	X2=0 W2=2 (X2*W2) =0	X3=28 W3=3 (X3*W3) =84	X4=43 W4=4 (X4*W4) =172	X5=32 W5=5 (X5*W5) =160	∑W=15 Y=(416/15) =27.733	5

INFERENCE: The above weighted average table for the satisfaction level of the local community for the CSR projects provided by the organisation, from the analysis for the projects provided are weighted with respect to the satisfaction level and were the factor is multi-purpose hall ranked-1, were as the factor artificial limb/wheel chair for disabled ranked-2, similarly the factors Skill development training and Medical camp are ranked 3 & 4. Since the factor Multi-purpose hall is ranked-1 it's considered as the highly satisfied.

CHI-SQUARE TEST

Null hypothesis (H0): there is no association between age & adore the development in your neighborhood by the CSR projects of Maps Kalpakkam.

Alternate hypothesis (H1): there is association between age & adore the development in your neighborhood by the CSR projects of Maps Kalpakkam.

	Value	df	Asymp.Sig.(2-sided)
Pearson Chi-Square	.994[a]	3	.803
Likelihood Ratio	1.139	3	.768
Linear-by-Linear Association	.061	1	.805
No of Valid Cases	103		

INFERENCE: The P-value(0.803) & significance value 0.05 (0.803>0.05). Since P-value is greater than significance value, thus accept H_0. Hence there is no association between age & adore the development in your neighbourhood by the CSR projects of Maps Kalpakkam.

FINDING

- 83% of the respondents are under the age of 41-60years, 10% of the respondents are under the age of 21-40years, 6% of the respondents are under the age of above 61years and 4% of respondents are under the age 1-20years.
- Majority 88.3% of the respondents are male and 11.7% of respondents are female.
- Income of the employees were61.2% of respondents get income of 30,001-40,000Rs, were 22.3% of respondents get income of 20,001-30,000Rs and were 8.7% get income above 40,000Rs.
- The marine life table specifies about the marine life before artificial reef project were 60.2% of respondents said average and were 39.8% said below average.
- The erosion (higher waves) before the artificial reef project and in this data majority42.7% of respondents said average, were 30.1% of respondents said moderate and remaining 27.2% of respondents said below average.
- The tourists attracted and occasional fishing before artificial reef project, were 71.8% of the respondents said average and were 28.2% of the respondents said below average.
- The income & sales before artificial reef project were 57.3% said average, 25.2% said below average and 17.5% said disagree.
- The costal protection before artificial reef project were 52.4% of the respondents said average, were 29.1% said moderate and 18.4% said below average.
- The fishing quantity beforeartificial reef project, were 59.2% of respondents said average, and were 31.1% of respondents said moderate and 9.7% of respondents said below average.
- The quality of marine life's (fish) health & growth before artificial reef project were the majority41.7% said moderate and were 33% of respondents said average and 25.2% of respondents said good.
- The financial status before artificial reef project were the majority 68.9% of respondents said moderate and were 31.1% of respondents said average about the financial status.
- The social status before artificial reef project were 80.6% of respondents said moderate and were as 19.4% of respondents said average for social status before artificial reef project.
- The livelihood before artificial reef project were majority 66% of respondents said moderate and 18.4% of the respondents said average and were 15.5% of the respondents said below average.
- Majority 63.1% of respondents said very good for marine life improvement and were as 36.9% of respondents said good marine life improvement after artificial reef project.

- The livelihood development after artificial reef project were majority 39.8% of respondents feel moderate, 32% of respondents said very good and were as 28.2% of respondents said good for the livelihood development after artificial reef project.
- The multi-purpose hall table specifies the classification about satisfaction level of multi- purpose hall were majority 69.9% of respondents are highly satisfied, 19.4% of respondents are moderately satisfied, 10.7% of respondents feel satisfied for the multi- purpose hall.
- The artificial limb/wheel chairs for disabled persons were majority 57.3% of respondents are highly satisfied, 32% of respondents feel satisfied and 10.7% feel moderately satisfied.
- The medical camp (eye & dental) were majority 61.2% of respondents are satisfied, 31.1% are highly satisfied and 7.8% feel moderately satisfied for the medical camp.
- The skill development programs were majority 43.7% of respondents feel highly satisfied, 38.8% fell satisfied and 17.5% feel moderately satisfied for the skill development programs.
- This specifies the classification about the beneficial level of the artificial reef project by maps were majority 75.7% of respondents feel highly satisfied, 13.6% of respondents said satisfied, 10.7% are moderately satisfied for the beneficial level of the artificial reef project by maps.
- This specifies the classification about the improvement of your livelihood due to the projects by maps were majority 63.1% of respondents feel highly satisfied, 25.2% are satisfied,11.7%aremoderatelysatisfiedfortheimprovement of your livelihood due to the projects by maps.
- In the Wilcoxon signed rank test, the P-value is (0.000) and significance value is 0.05 (0.0<0.05). Since P-value is less than significance value, thus accept H1. Hence there is an improvementinthesituationbeforeartificialreelprojectandafterartificialreelprojectfor all the factors that is taken into consideration.
- In the weighted average test for the satisfaction level of the local community for the CSR projects provided by the organisation, from the analysis for the projects provided are weighted with respect to the satisfaction level and were the factor is multi-purpose hall ranked-1, were as the factor artificial limb/wheel chair for disabled ranked-2, similarlythe factors Skill development training and Medical camp are ranked 3 & 4. Since the factor Multi-purpose hall is ranked-1 it's considered as the highly satisfied.
- In Chi-square test, the P-value (0.803) & significance value 0.05 (0.803>0.05). Since P-value is greater than significance value, thus accept H0. Hence there is no association between age & adore the development in your neighbourhood by the CSR projects of Maps Kalpakkam.

SUGGESTIONS

As almost majority of the CSR projects of MAPS were highly satisfied, satisfied and moderately satisfied. Therefore the factorsthat haveleast satisfaction could beimproved further for much more improvement in future. Even though majority of the local community were satisfied and there is no dissatisfaction among the people but still a small fraction of the people feel moderately satisfied, and so the factors for which all having lower satisfaction level could be improved further.

It's clear that the CSR activities by MAPS is generating trust and good will among the people towards the organisation, thus by continuing these activities would maintain the loyalty of the local community towards the organisation in future also.

CONCLUSION

The effectiveness and benefits of the CSR projects provided by MAPS to the local community, were the analysis is done byusing Wilcoxon signed rank test to analyse the before and after situation of the artificial reef project to identify the improvement in that location bythe artificial reef project byMAPS, this is done based of the factors selected for the analysis. As from the result of this analysis it is found that all the factors show positive results statingthat there is an improvement in lifestyle in terms of both financial and non-financial status for the local community of MAPS. Therefore the artificial reef project by MAPS has a positive impact and thus generated good will among the people towards the organization.

From the weighted average analysis we see that majority of the projects were satisfactory among the people and there no project that has dissatisfaction among the people, thustheseprojectshavecreatedpositiveimageandgainedtrust amongthepeoplethatMAPS care for their local surroundings and help them for their life's betterment in every possible way.

Therefore it is clear that CSR activities of MAPS kalpakkam generate trust and good will to the local community towards the organisation.

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