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Evaluation of the EIA process in Zanzibar: the participation of stakeholders in public and private projects

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Abstract
Stakeholder participation is expected to influence decision making toward project design and final environmental impact assessment (EIA) reports. Failure to address stakeholder concerns and satisfaction can significantly reduce the social and environmental impacts, resulting in project failures. This study aims to assess the relationship between participation and satisfaction of stakeholders in the EIA process through thirty selected public–private projects of Zanzibar Island. It employed the use of interviews with stakeholders, questionnaires, reports and consultations as instruments of data collection. The satisfaction of stakeholders was mean scored and then modeled using multilinear regression (MLR) and ordinal logistic regression (OLR). Results indicated that the majority of stakeholders (55%) were not involved in the EIA decision-making process. The local communities and NGOs have poor influence despite their very high interest in the EIA process, which justifies their limited public participation in the EIA stages. The overall satisfaction of stakeholder was basic. Their increase is influenced by the sufficient information and their involvement in the EIA. It would be recommendable to involve the stakeholders from the earliest stages of the EIA process and provide information and knowledge regarding the project development.

Keywords Environment impact assessment (EIA) · Information · Influence-interest · Public participation · Stakeholder satisfaction; Zanzibar Island

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1 Introduction

Environmental Impact Assessment (EIA) has become an anticipatory tool for environmental and sustainability management and decision making in project planning, which success depends on the level of public participation or involvement of stakeholders (Aryal et al., 2020; O'Faircheallaigh, 2010). The EIA process contributes to the successful implementation of projects, optimizes the interests of the stakeholders, increases the reliability of the project and foresees or advocates actions to mitigate any identified environmental risks to an admissible level (Hasan et al., 2018; O'Faircheallaigh, 2010). Since the enactment of the National Environmental Policy Act in 1970 in the USA, the efficiency of the EIA has been determined by the legal structure in each country, which includes a clear definition of administrative protocols with strong and sufficient institutions (Ahmed & Ferdausi, 2016; Suwanteep et al., 2016). Numerous reports on EIA's effectiveness have addressed aspects of governance such as stakeholder participation, EIA procedure legislation, capacity building and institutional structure (Clarke & Vu, 2021; Wayakone & Makoto, 2012).

Recently, developing countries, including low and middle countries (LMCs), have adopted environmental laws after the 1992 UNCED Rio conference and EIA practices are new in most African countries (Al-Saqri & Sulaiman, 2014; Hasan et al., 2018; Kolhoff et al., 2018). The EIA system's procedural and functional efficiency are both considered poor in most LMCs, with weak performance in East and West Africa (Kolhoff et al., 2018; Marara et al., 2011). In Tanzania, academics and technocrats are often the representatives of the local population in the EIA process, as their participation is believed to (1) constrain the project because it is technical and (2) increase the cost by implementing (Institute of Resource Assessment et al., 1995). In Nigeria, negative perceptions of the public process have limited public participation and consultation in the EIA process (Silas, 2013). Community participation was barely included in the planning and design of various transportation projects in South Africa (Aregbeshola, 2009). Therefore, it was argued that non-participatory approaches in the EIA process, including a lack of sufficient information to promote public participation and stakeholders' involvement in decision making, contribute to stakeholders' dissatisfaction and the failure of projects' development (Aregbeshola, 2009).

Stakeholders' satisfaction (e.g., construction industry) is described as meeting stakeholders' pre-project expectations in the actual result, quantifiable at various stages of the project (Li et al., 2013). Stakeholder satisfaction information has a greater impact on strategic value than project or company performance information (Eweje et al., 2012). Furthermore, it may be driven by management processes (e.g., information dissemination, consultation and participation) rather than particular project purposes, including time, cost and quality (Leung et al., 2004). Considered as a key determinant of several critical factors such as communication, team, technical, organizational and environmental factors, the satisfaction of stakeholders mediates the success of small and medium-sized projects (Maqbool et al., 2020). High communication or experience of information both before and during the projects is suggested as a predictor of high satisfaction among stakeholders (Hietbrink et al., 2012). However, the quantitative relationship between the satisfaction and stakeholders' participation is limited.

The present research aims to evaluate the EIA process in Zanzibar through the participation levels and satisfaction of stakeholders in public and private projects. First, it focuses on the importance, involvement, interest-influence and the social network

of stakeholders in the EIA decision-making process. Second, draw the relationship between the satisfaction of stakeholders and key determinants such as sufficiency of information and involvement of stakeholders. Our findings show that increasing stakeholder participation in the EIA process improves stakeholder satisfaction.

2 Background

2.1 Stakeholder interest and influence

The stakeholders are referred to as organizations that are interested in a project or that may be influenced or affected by the focal organization's project in achieving its goals. The baseline of stakeholder theory came from the democracy theory, stating that authorities must involve all affected community and they should have a voice in the decision-making that concerns them. All key stakeholders' interests must be protected and included in the law through negotiation and cooperation. Therefore, the affected community's interests have to be protected and presented (Glicken, 2000). As result, these stakeholders can have a significant impact on project outcomes (Oppong et al., 2017). The notion of stakeholders has since been discussed in four main areas: strategic, incorporate social responsibility, organization theory and theory system (Elias et al., 2002).

Stakeholders' theory has ability to identify the key stakeholders and how will they deliver and make decision based on the available policies. The different between external and internal stakeholders conducted so as to analyze the power of each stakeholder. The controller of the EIA procedure is internal stakeholder while external stakeholders are those who are going to be affected by the decision made by the internal stakeholders. Stakeholder approach must consider the interest of internal and external stakeholders during the decision-making process and all stakeholders concerns must be included and not excluded and be empowered in a different way (Del Furia & Wallace-Jones, 2000).

2.2 Stakeholders' participation in the EIA Process

In creating compelling reasons for key stakeholders to participate in EIA process, this can be seen in EIA process that certain views or concerns were missing. This can be seen in EIA reports, where certain views or concerns were missing during the hearings and many of the questions posed by the public were left unrecognized. Information must be relayed or recorded in an honest manner and with integrity. In order for the projects to be successful and sustainable, techniques for allowing the flow of information in various projects should be used by the central government, local government, institutional level, community. Currently, stakeholder participation that influences or informs the EIA decision-making process is limited.

Stakeholders' involvement helps the community and other stakeholders to get clear information and enable them to raise their concerns, which will facilitate the distribution of costs and project development. For the project to be successful, it requires the full commitment of all parties. Furthermore, by giving communities a chance to raise their concerns and provide them with needed knowledge and information, that will be an effective empowerment of the communities (Reed, 2008). This was among the most important factors to ensure the peaceful and sustainability of the project. All projects in the past which

are sustainable had involved stakeholders and had less environmental impacts, those who did not succeed did not take part in the selection process (Bass et al., 1995).

The involvement of stakeholders is critical in both outcomes and active involvement in environmental assessment would result in fewer disagreements, the approval of the project development, and the project developer is the actor with the greatest potential for public engagement in the Environmental assessment (Árnadottir, 2002).

Participation of stakeholders in environmental reviews acknowledges the need of involving different stakeholders in the formulation of policies and decision making that could affect them. In order to solve the issue of poor environmental management problems, the community has to participate in the formulation of policy and decision-making process (Ogihara et al., 2016). There are many obstacles to participation, in the overall impact assessment. Lack of scientifically needed date is one of the main challenge of the poor technology (Miller & Tyler, 2002). The community will distrust the government if such kind of poor information is presented (Mitcham, 1997). The community get frustrated if their concerns are not incorporated (Árnadottir, 2002). There are different stakeholders' conflicts between economic approaches and environmental values, there is a chance of not getting community concerns and that people can continue with their activities (Árnadottir, 2002). Also, stakeholders concerns can affect other project development and other stakeholders (Árnadottir, 2002). UNEP listed five points for effective involvement of stakeholders: clear provision of information, identification of key stakeholders, the discussion between internal and external stakeholders, the accuracy of the information, and examining public views and how you are going to implement them (Palerm, 2000). In environmental issues, the involvement of public is complicated and inherit problems, but they have to be embraced (DETR and Regions 2000). In addition, the involvement of stakeholders is not an easy task and has to be conducted at different levels of EIA.

Several EIA studies for Middle Eastern and North African countries (MENA) were conducted and published (Djoundourian, 2012). That means that stakeholders will have a big effect on project outcomes (Oppong et al., 2017). The notion of stakeholders has since been presented in four main areas: corporate planning, systems theory, corporate social responsibility and the theory of organization (Elias et al., 2002).

Stakeholder participation necessitates the dissemination of sufficient information to all stakeholders in order to ensure the project's transparency (Wood, 2003). The government of South Africa needs environmental management plan (EMP) to be formulated in various projects in different stages of development such as operation, construction and decommissioning (Henisz et al., 2014). EMP consists of how resources will be executed and possible projected impacts, and how impacts can be minimized, reporting procedure, implementation schedule and institutional arrangement (Park, 2007). Project impacts and development decisions aligned together to improve environment. EMP smooths the EIA procedure by identifying the meaningful intervention and easing follow-up during the implementation (Hill, 2000). Environmental information has to be user friendly to the affected people for fruitful environmental management (Kakonge, 2006). Because of a lack of environmental legislation, public participation in planning projects and programs is uncommon in most African countries. A case study on ongoing projects in nine african countries, including South Africa, Botswana, Lesotho, Angola, Malawi, Seychelles, Namibia, Nigeria and Mozambique gave several insights about public participation. The difficulties encountered by the nine projects were representative of the difficulties encountered by community input in EIA in Sub-Saharan Africa. In particular, Sub-Saharan Africa was moving in the rights way towards undertaking successful EIA processes (Kakonge, 2006).

Participation of the public through public hearings prior to the preparation of the draft EIA report is thus encouraged but not mandatory. Public comments should be taken into account as review criteria for the EIA report—hence they are used in the approval of the report. Otherwise, there are no requirements for justification of approval of the EIA report or the project itself based on public comments.

3 Materials and methods

3.1 Study area

Zanzibar is a costal island located at 4º 45'– 6º 30'S and 39º05'– 9º55'E longitude (Fig. 1), which has a surface area of 2461 km^2 (Omar & Cabral, 2020). It is comprised of two major islands, including Unguja and Pemba, about 40 km off the eastern coast of Tanzania in the Indian Ocean (Myers, 2010). The current study was conducted on Unguja Island, which referred to as Zanzibar due to its dense population (546 hab./km^2). Zanzibar island (Unguja) occupies an area of some 1660 km^2, composed of fossilized coral and calcareous coral terrain which is porous and hydraulically linked to the ocean (Prendergast et al., 2016).

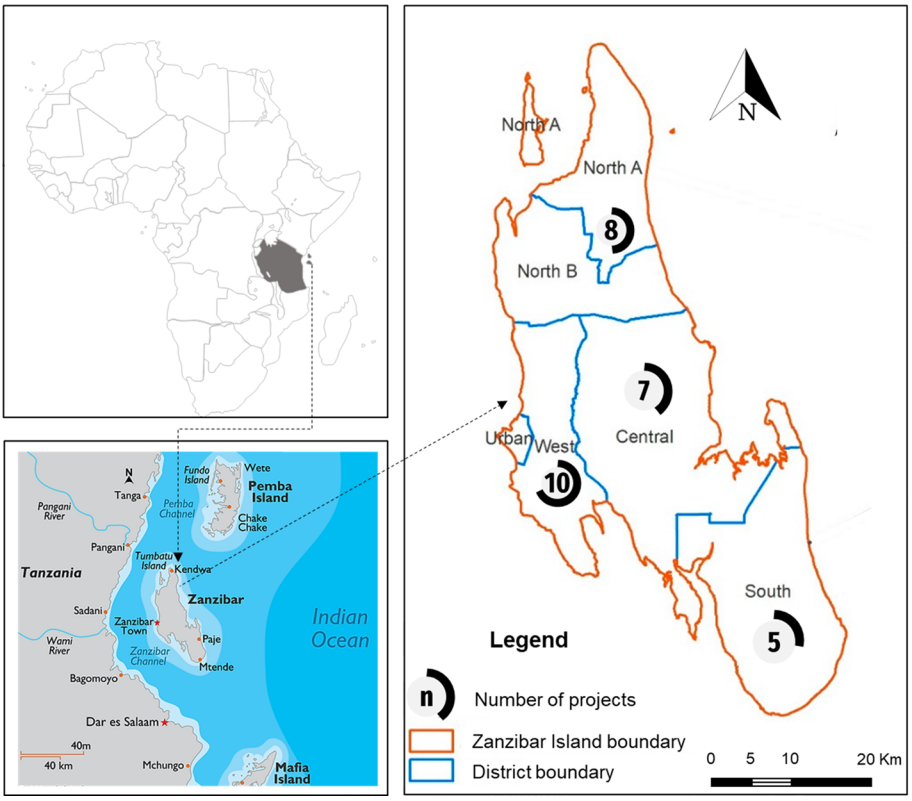

Fig. 1 Location of the Zanzibar Island

Administratively, Zanzibar is divided into six districts, including Urban, West, Central, North A, North B, and Central from three regions (Omar & Cabral, 2020). This research carried out the assessment of 30 projects (15 government projects and 15 private projects) in the island (Table 1).

3.2 Survey design and data collection

The methods adopted throughout this research enabled to acquire information in reviewing the EIA procedure by identifying how and to what extend the participation of the stakeholders can be implemented in both public and private projects. This research was conducted via (1) questionnaires and (2) personal interview qualitative-oriented manner with key informants who participated in EIA and carried out environmental consultancy activities (Cirella et al., 2018). Semi-structured questionnaires (Table 2) using open- and close-ended questions were designed to facilitate expert opinion and obtain explicit responses from the participants with easily quantifiable data (Bowyer & Royse, 2018). The questionnaire corresponding to the necessary sample size of 470 using a random sampling technique (Eq. 1), were administrated to ministerial officials, government agent institutions, registered EIA consultants, NGOs in the environmental sector, project proponents and local community (households).

$$\text{Necessary sample size} = \frac{(Z - \text{score})^2 \times \text{SdtDev} \times (1 - \text{SdtDev})}{(\text{Margin of error})^2} \tag{1}$$

where confidence level of 95% corresponds to Z-score = 1.96; standard deviation (StdDev) = 0.5 and margin of error = ±4.52%.

Complementarily to collected datasets, secondary information was gathered from the literature review and Zanzibar Management Authority offices and other lead agencies (i.e., Zanzibar Investment Authority, Zanzibar Water Authority, Local Government Offices, Shehias, Ministry of Land, Land Commission, Project Proponent, and other non-Governmental Organizations) (Fig. 2).

3.3 Variables and conceptual models

The respondents were asked about their level of satisfaction of the EIA process (dependent variable) scored on 5-point Likert scale, where 1 = very dissatisfied and 5 = very satisfied. The mean score ranking technique (Eq. 2) was used to determine the stakeholder satisfaction mean score, Ms (Li et al., 2013). Similarly, independents variables (need and purpose of the involvement, sufficiency of the information, involvement of stakeholders in EIA and the language understanding) were answered under the same scale from 1 = strong disagreement to 5 = strong agreement.

$$\text{Ms} = \frac{\sum (s \times n)}{N} \; (1 \le \text{Ms} \le 5) \tag{2}$$

where s is satisfaction score assigned by the respondent of a stakeholder group; n is the frequency of occurrence of each score; N is the total number of responses in the group.

Pearson's correlation analysis was conducted between dependent and independent variables and the satisfied indicators were consider when significant relationships occurred. A multiple linear regression was used to draw the relationship between these variables (Eq. 3), then

Table 1 Projects evaluated in the study

Zanzibar District	Type of project	Project
North A and B	Government	Zanzibar irrigation infrastructure project
		Proposed construction of the new port project
		Development of the Mkokotoni port and landing quay
		The proposed hydrological seismic survey in Zanzibar II
	Private	Karafuu hotel, Michamvi
		Princess salme beach resort and spa at Makangale
		The liquefied petroleum gas filling station
		Construction of the uzuri Zanzibar resort at Kendwa, Nungwi
South	Government	Construction of 2 and 7 storey buildings for the ZURA
		Construction of new Zanzibar high court building in Tunguu
	Private	Muyuni hotel and spa ltd, makangale
		Zanzibar adventure ltd, Kiembe Samaki
		Fumba uptown living project at Fumba, west district council
Urban and West	Government	Hydrological seismic survey in Unguja
		Sustainable management of land and environment II (smole)
		Development of Mwanakwerekwe market
		Development of Kijangwani bus terminal
		Zanzibar aviation services, Chukwani
	Private	The Zanzibar interconnector project
		Zanzibar aviation services, Shangani
		Family holiday resort, Chukwani
		St. Monica hotel, Mkunazini
		Abuso inn, Shangani

Table 1 (continued)

Zanzibar District	Type of project	Project
Central	Government	Office building of chief government station
		Indoor-residual spraying of insecticides against malaria vectors
		Zanzibar digital project
		The Zanzibar urban water distribution facilities improvement
	Private	Construction and operation of Zanzibar yacht club in Shangani
		The proposed construction of niara hotel
		Construction of Kilindi resort and spa

Table 2 Survey questionnaire

Information	Question	Level	Encoded data					
Background	1	Age	1 = 18- 25	2 = 26–35	3 = 36–45	4 = 46–55	5 = 55 +	
	2	Gender	1 = male	2 = Female				
	3	Education	1 = Primary	2 = Secondary	3 = Diploma	4 = Degree		
	4	Employment	1 = Formal	2 = Informal	3 = Business	4 = Student		
EIA process / projects	5	What category of stakeholder do you belong to?	1 = Proponent	2 = Community	3 = Government institution	4 = Consultant	5 = NGOs	
	6	What manner of information release is used?	1 = Radio/ Newspaper	2 = Witten document	3 = public meeting	4 = None		
	7	What was the main stage you were involved in?	1 = Screening	2 = Scooping	3 = Baseline survey	4 = EIA evaluation	5 = EIA approval	6 = none
	8	The information provided by consultant was sufficient?	1 = Strongly disagree	2 = Disagree	3 = Unsure	4 = Agree	5 = Strongly agree	
	9	Did you understand the needs and purpose of the project?						
	10	Is there any need to involve stakeholders in the EIA decision-making process?						
	11	Was the language used by the consultant well understood?						
	12	Is there any importance on the stakeholder's participation in the EIA process	1 = Not very important	2 = Important	3 = Very important			
	13	How would you rate the whole stakeholder's participation process?	1 = Very dissatisfied	2 = Dissatisfied	3 = basically satisfied	4 = Satisfied	5 = Very satisfied	

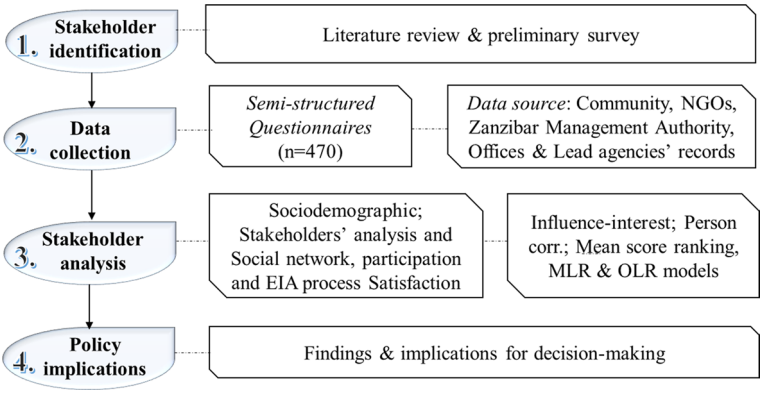

Fig. 2 Research methodology flowchart

we employed the ordinal logistic regression (ORL) (Eq. 4) as appropriate regression analysis when coming to categorical variables to confirm the results (Zhai et al., 2017).

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \varepsilon \tag{3}$$

$$\log it\,(y) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \varepsilon \tag{4}$$

where y is the satisfaction of the EIA process; β_0 is the intercept or estimate; $\beta_1, \beta_2 and \beta_3$ are the coefficients of regression; $x_1, x_2, and x_3$ are the predictors standing for Need and purpose of involvement, Sufficiency of the information and involvement of stakeholders in EIA, respectively.

3.4 Data analysis and statistics

Descriptive statistics were performed as percentages and frequencies. Data were presented as tables, pie charts, and bar graphs using SPSS 25. Mendelow's matrix with some modifications were used to analyze the influence and interest of the stakeholders (Mendelow, 1991). Ucinet6 software version 6.74.2 was used to draw the network structure of the stakeholders. Correlation and regression analysis were performed at α significance level of 0.05.

4 Results and discussion

4.1 Socio-demographic characteristics

The frequency of the main characteristics (Gender, age and Education) of 470 respondents from the Zanzibar Island was reported in Table 3. The majority of the respondents were men ($n = 296$, 63%). 73.9% of the individuals surveyed have an age of 45 years or younger. Most had attended high school education ($n = 250$, 53.2%), but fewer had gotten a degree ($n = 80$, 17.2%) or a diploma ($n = 100$, 21.3%). It was ascertained that most people had a high education attainment as they were able to comprehend and appreciate the EIA process

Table 3 Distribution of respondents' dimensions

Respondents' characteristics	Levels	Frequency (n)	Percentage (%)
Gender	Men	296	63
	Women	174	37
Age group (years)	18–25	60	12.8
	25–35	140	29.8
	35–45	100	21.3
	46–55	80	17
	56 or more	90	19.1
Education	Degree	80	17
	Diploma	100	21.3
	Primary	40	8.5
	Secondary	250	53.2
Employment	Formal	210	45
	Informal	70	15
	Business	170	36
	Student	20	4
Stakeholders (ratio of involved in the EIA process)	Community	230 (120)	48.9 (52.17)
	Consultants	20 (20)	4.3 (100)
	Government institutions	180 (130)	38.3 (72.22)
	Proponents	30 (20)	6.4 (66.67)
	NGOs	10 (0)	21 (0.0)

in connectivity with stakeholder involvement. Employment opportunities, and other socio-economic concerns influence the level of stakeholders' participation. Indeed, 45% of the respondents were in formal employment, 36% were self-employed and 15% were set in informal activities or were self-employed. The majority of stakeholders involved in this study were made of heads and members of local communities ($n=230$, 48.9%) and government institutions ($n=180$, 38.3%), and in less proportion of proponents ($n=30$, 6.4%), consultants ($n=20$, 4.3%) and NGOs ($n=10$, 2.1%).

4.2 Stakeholder analysis and social network

On one side, stakeholder engagement can be enhanced when their attribution within the process is clearly accessible and inclusive. The EIA system engages multiple key stakeholders, each of whom contributes significantly to the credibility of the overall process (Shah, 2013). In Zanzibar, some key groups of stakeholders are mandated in facilitating and issuing legal documents (local authorities or government agencies), conducting the EIA process (consultants and proponents) or other groups like NGOs undertake core functions of raising awareness in communities for their active participation (Table 4). EIA practitioners, i.e., consultants who provide credibility in order to secure the EIA report, are instrumental in linking the proponent, the regulatory authority and the communities. Few stakeholders, including government agencies, consultants and proponents have considerable legitimacy indicating they have the power to influences several decisions (Betsill et al., 2020). Although, the function of local communities has not been clearly defined in

Table 4 Stakeholder core function in the EIA process

Stakeholder	Roles	Legal mandate
Zanzibar Management Authority (ZEMA)	Facilitating the EIA process, coordinating all stakeholders, issuing an EIA certificate before the project execution	Facilitate and coordinate the EIA decision-making process, issuing EIA certificate
Zanzibar Investment Promotion Authority (ZIPA)	Issuing certificates of investment, and making sure the proponent follows environmental procedures before issuing the certificate	Issuing Investment certificate
Zanzibar Water Authority (ZAWA)	To protect water resources and infrastructure, and supplying water to the proponent	Supply water and protect water resources and infrastructure
Zanzibar Electricity Company (ZECO)	Supplying electricity, and controlling the proponent to follow the procedure before connected with the electricity	Supply electricity
Municipal Council (MC)	Guide and control proponent to follow government laws and regulations of the area before and after the implementation of the project	Collect government revenue, issuing construction license
Land Commission (LC)	Surveying the land and issuing title deeds to the proponent	Survey and issue title deeds
Occupational safety and Health Department (OSHD)	Guide and monitor proponent on the protecting employee safety and health	Protect workers from any harm
Community and Shehias (Com)	Raise their concerns about the project so as to come up with the best alternatives to reduce or remove project impacts	Raise their concerns
NGOs	Educating communities on the rights to participate in the EIA decision-making process	None
Consultant Company (Cslt)	Conducting EIA on the behalf of the owner according to the laws and regulate	Conduct Environmental Impact Assessment
Proponent (Prpnt)	The developer of the project	Ensure the EIA certificate was gotten prior the execution of the project

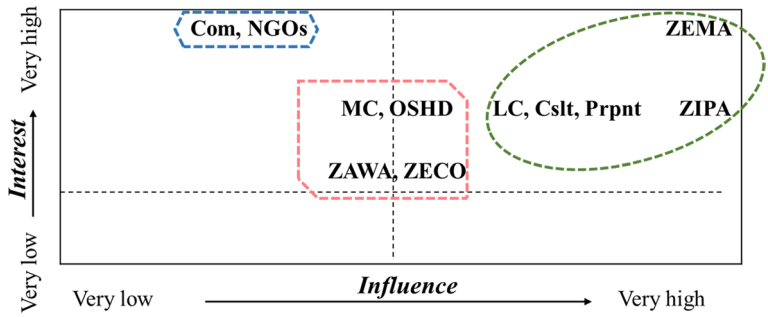

Fig. 3 Stakeholder influence-interest classification

Zanzibar, they could play a legitimacy role when they intervene in project planning and implementation (Mekuria et al., 2021). Meanwhile, the NGOs are strongly networking stakeholders which increase the EIA legitimacy to overcome barriers to participatory practice, including limited or no access to information, insufficient resources to ensure participation, temporary lack of women's participation, geographic remoteness, and lack of transportation and communication infrastructure (Hasan et al., 2018).

On another side, stakeholders are characterized as having a vested interest in the proposed project and trying to influence its implementation so as to guard their individual interests (Li et al., 2013). In this study, most of the stakeholders depicted moderate to very high interest in EIA process of Zanzibar public–private projects (Fig. 3). However, these stakeholders showed three different degrees of influence. Five of the stakeholders were influential at several points suggesting their importance in the process of planning, validation and execution of the projects. Four other stakeholders were influential on certain aspects, including supply resources, apply regulations and ensure safety. The last group made of the local communities and NGOs had a little influence suggesting that private sector is passive and is not in decision-making process (Mekuria et al., 2021). The synergy between multiple stakeholders with substantial interests is necessary for inclusive EIA decision making. Furthermore, social network analysis (SNA) was employed to explore the strength and quality of relationship among the project provider (prnt), government service providers (ZEMA, ZIPA, ZAWA, ZECO, MC, LC and OSHD), private service providers (Cslt), local community (Com) and NGOs in an objective way (Fig. S1, Supplementary Information). The government service providers were found to have a strong social network among themselves and also with the project owner at the center of that network. This seems corroborating the power of their influence on the projects. Likewise, the local community may create both weak and strong network with the proponent, consultant and some of the governmental services, thereby meeting one of the project objectives which is to encourage social welfare. The weak relationships of NGOs in SNA correspond to their lack of influence in the EIA process as determined by stakeholder analysis, suggesting a positive correlation between the decision-making power and the density of the relation network in given projects.

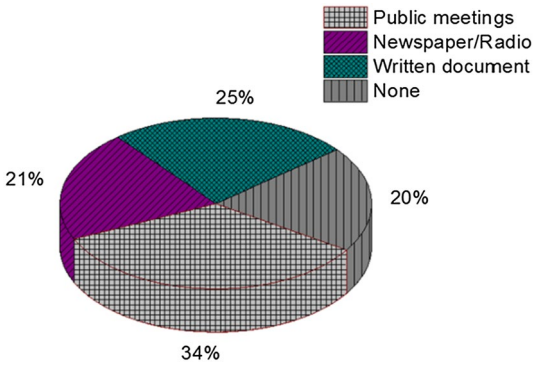

Fig. 4 Manner of participation in the EIA

4.3 Stakeholders' participation and decision making

Projects cannot succeed without the dedicated participation from its stakeholders. A stakeholder could have a very different view of the issue at stake depending heavily on the project background, its needs, priorities and values. Therefore, participatory approaches have been continually recommended for successful project implementation (Edelenbos et al., 2017).

The majority of the respondents (88.0%, data not shown) mentioned that stakeholder participation in the EIA process was important. This emphasis on stakeholder participation in EIA is likely to facilitate understanding of stakeholder perceptions, conflict resolution and contributions to consensus (Cirella et al., 2018). Moreover, respondents take part in the EIA through consultative meetings [newspapers/radio (21%) and written documents (25%)] and public participation meetings (34%) employed by project initiators (Fig. 4). Shareholders' consultative and public participation meetings are therefore ideal for public participation involving environmental matters as they give a chance to the affected members of the population to air their views more openly and present their needs and fears (Wetang'ula 2010). Thus, public participation enables the interests of the various stakeholders are systematically taken into account and integrated into the final project, which should contribute to improved long-term sustainability and community benefits (Li et al., 2013).

4.4 Stakeholders' involvement in EIA process and satisfaction

Prior to EIA process, general guidelines on clear needs and purpose of a project is necessary to ensures public effectively deliverables. Most of the respondents (72.0%) agreed that the necessity and objective of the project were clearly stated when the EIA process started (Fig. 5). However, in a study done in 2009, participants pointed that even when the needs and purpose of a project are explained at EIA process starting, the public is either not given an adequate chance to participate, play a passive role, or unaware of what is happening (Marara et al., 2011). Consequently, measures should be put in place when the EIA process begins to help the stakeholders to raise valid queries and give applicable feedback as per the parameters of the project. In addition, Fig. 5 indicated that respondents' thought that stakeholders were not involved in the decision-making process (56%), the information regarding the project process were insufficient (62%)

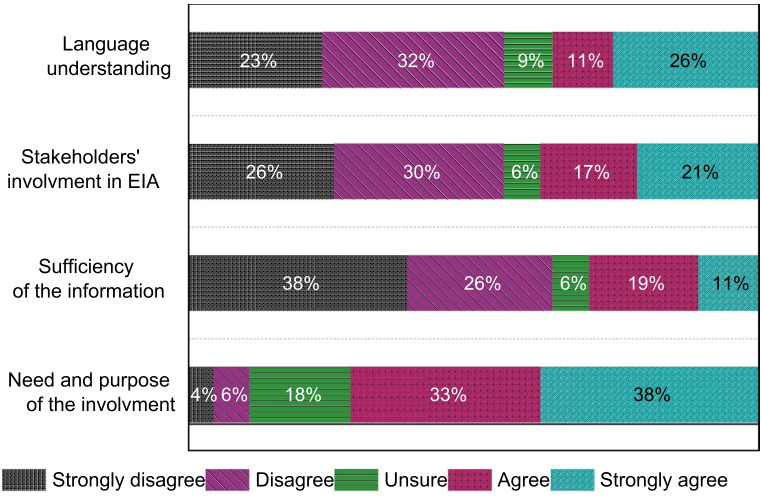

Fig. 5 Stakeholder involvement in decision-making

and the language used by the consultants were not well understood (55%). The aforementioned facts are consistent with top-down decision-making processes frequently dominated by governance, the EIA proponents' unfavorable assessment of stakeholder participation, the ideas from the majority of stakeholders deemed irrelevant and opinions inconsiderable (Chi et al., 2014; Cirella et al., 2018; Kahangirwe, 2011). Accordingly, the responsible authority should put more effort to ensure that stakeholders participate as much as possible in decision-making during the EIA process. One approach that the government may use is giving stakeholders sufficient time to allow the assessment of the implications of the project and submission of the stakeholders' concerns.

Table 3 shows that 61.7% of respondents participated at least in one of the EIA processes of Zanzibar private and public projects and proportionally to the stakeholders surveyed, consultants, government institutions and proponents were highly involved. Moreover,

Figure 6 reveals that in Zanzibar, the involvement of stakeholders in EIA stages was limited. For instance, communities were not involved in the screening, the first stage of EIA. The communities are not much involved in the EIA process because the government think they don't have much impact on the project but each stakeholder has a stake in the implementation of the project. The Government has to make sure equal involvement of the stakeholders depending on the nature of the project. It is also worth noting that improving effective stakeholder involvement will not only assist project stakeholders in efficiently collaborating with one another, but it will also play a role in facilitating the possibility of a decrease in negative environmental impacts and increasing the project's economic sustainability and quality.

The overall satisfaction level of the stakeholders in the EIA process in Zanzibar indicated a basic satisfaction (Ms = 3.13, Table 5). However, there is a disparity in satisfaction levels between stakeholder groups. Communities and consultants were dissatisfied (Ms = 2.26 and 2.5, respectively), NGOs were very dissatisfied (Ms = 1.0), proponents were basically satisfied (Ms = 3.0), and government institutions were satisfied (Ms = 4.44). Such result is due lack of usage of participatory approach as mean of stakeholder involvement in

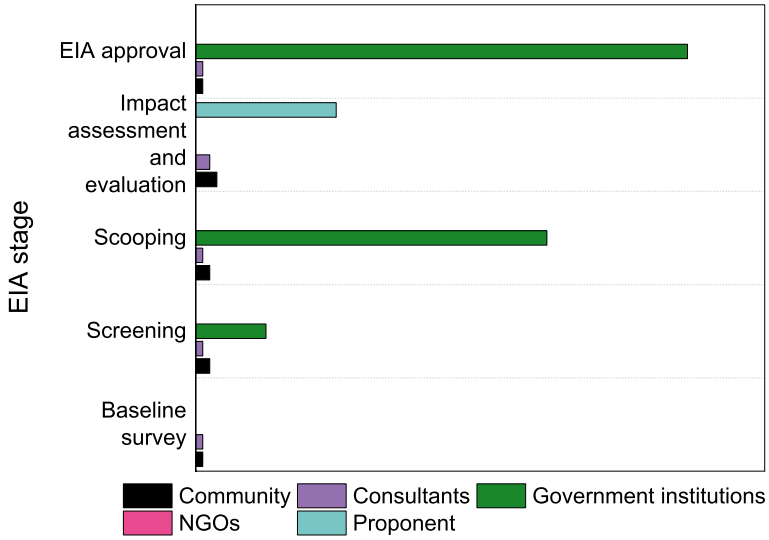

Fig. 6 Involvement of stakeholders across EIA stages

Table 5 Satisfaction mean score ranking

Stakeholder groups	N	Ms	Rank
Community	230	2.26	2
NGOs	10	1.0	1
Proponent	30	3.0	4
Consultants	20	2.5	3
Government institutions	180	4.44	5
Overall	470	3.13	-

the EIA stages (Hasan et al., 2018). Although the overall satisfaction level sounds acceptable, the top-down decision-making process is still lead by the government (Li et al., 2013).

4.5 Modeling the satisfaction of stakeholders

The research conducted the quantitative method to analyze the relationship between variables, namely: the need and purpose of the project, the sufficiency of information and the involvement of stakeholders in the EIA and their implications on the satisfaction of the EIA process, to improve the level of stakeholder participation in the entire EIA process.

Table 6 reveals that the Satisfaction for the EIA process is highly correlated with the Sufficiency of the information ($r = 0.84$) and the Involvement of stakeholders in EIA ($r = 0.69$), while negatively associated with the need and purpose of the project ($r = -0.27$) when the cutoff value is 0.05. In addition, the correlation between the Sufficiency of the information and Involvement of stakeholders ($r = 0.59$) suggests the needs of the government departments involved in the EIA to ensure the accessibility, clarity and simplicity of the information. Thus, all stakeholders are adequately informed about

Table 6 Pearson correlation analyses between variables

	Need and purpose of project	Sufficiency of the information	Involvement of stakeholders	Satisfaction of the EIA process
Need and purpose of the project	1	−0.31**	−0.26**	−0.27**
Sufficiency of the information		1	0.59**	0.84**
Involvement of stakeholders			1	0.69**
Satisfaction of the EIA process				1

**p value < 0.01

Table 7 Multilinear regression (MLR) analyses of Satisfaction for the EIA process

Parameters	Coefficients	Std. Error	t	p
(Constant)	0.23	0.19	1.19	0.23
Need and purpose of the project	0.02	0.04	0.67	0.51
Sufficiency of the information	0.8	0.04	23.6	0.00**
Involvement of stakeholders in the EIA	0.33	0.03	10.42	0.00**

**p value < 0.01

Table 8 Ordinal logistic regression (OLR) analyses for Satisfaction for the EIA process

		Estimate	Std. Error	Wald	df	Sig
Threshold	[Satisfaction for the EIA process = 1]	5.94	0.70	72.8062	1	1.4E-17
	[Satisfaction for the EIA process = 2]	10.15	1.04	95.8912	1	1.2E-22
	[Satisfaction for the EIA process = 3]	12.55	1.10	129.67	1	4.8E-30
	[Satisfaction for the EIA process = 4]	13.46	1.13	141.307	1	1.4E-32
Location	Need and purpose of the involvement	−0.07	0.12	0.33518	1	0.56
	Sufficiency of the information	3.23	0.26	156.74	1	5.8E-36**
	Involvement of stakeholders in the EIA	1.51	0.16	94.1315	1	3E-22**

**, which indicates p value ≤ 0.05

the need and purpose of the project at its inception with supplemental translation document (Swahili in the present case). The positive correlation between involvement and satisfaction of stakeholders support the relationship between the level of participation and the satisfaction (Msomphora, 2015).

Regression models of stakeholder's *Satisfaction for the EIA* process was drawn by applying 3 independent variables paired with a single dependent variable as detailed in Tables 7 and 8. The R-square of the MLR model ($R^2 = 0.763$) fits well the values and the regression equation was highly significant ($F = 500.272$, $p = 0.000$). Table 7 shows that the satisfaction was significantly influenced by 2 variables including sufficiency of information (β_2=0.8, $p = 0.00$) and stakeholder's involvement of information (β_3=0.33, $p = 0.00$). For instance, the increase of one unit of information could improve the satisfaction by 0.8 unit and consequently the involvement of stakeholders does.

Moreover, OLR model was statistically significant [$x^2(3) = 730.36$, $p = 0.00$] and exhibits a good fit to the data [p (PearsonandDeviancex^2) = 0.00]. Similar to MLR model the 2 above mentioned variables were also significant predictors of the satisfaction ($p = 0.00$) in the ORL model (Table 8). In fact, for each one unit increase on information and stakeholder involvement practice, there is a predicted increase of 3.21 and 1.51, respectively, in the log odds of stakeholders being in a higher satisfaction for the EIA process.

Detailed and informative knowledge related to the project and application of the participation approach will exert conducive influence on satisfaction with publicly project success. Hietbrink et al. (2012) suggested that the communication of the information need to be managed effectively both before and during the projects and can predict the satisfaction of the stakeholders. A body of literature pointed out that stakeholder involvement results in stakeholder satisfaction (Verweij et al., 2013). Consistent with the results (Tables 7 and 8), it is suggested that when stakeholders are satisfied with the EIA process, facilitated by good communication, are likely to become more involved or inversely (Msomphora, 2015).

5 Conclusion

Stakeholder participation, which results in informed decision-making during the EIA process, can influence stakeholder satisfaction and facilitate project development. The study found that local communities and NGOs have very limited influence on the EIA process and are not involved in all stages. The overall satisfaction of stakeholders was basic and varied between groups. A good relationship exists between stakeholder involvement and satisfaction. Stakeholders who have sufficient information about projects or the opportunity to be involved or participate are likely to be satisfied with the EIA process. The study suggests an increase in public participation in decision making for greater satisfaction.

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