

Protect from Decay Threat

Reconstruction of the German Boma, Bagamoyo

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Abstract

The method and the capacity to construct building evolved differently according to the nature of the place. Each age has had an approach to building since antique times, depending on the different materials, environmental needs and on the evolution of the technical “knowledge”. This paper describes the current status of German Boma, its previous and current value to the society, and the need for restoration. Specifically, it provides the details of the problems such as the structural failure, missing drains, defective openings and flaking plasters. It intends to ensure sustainability of Old Boma for continuity of use and to create awareness on its importance to the society, by articulate the possible "regeneration" of the built elements, while respecting the preexistence and the processes of evolution of the modern requirements. The study employed the use of questionnaire, desk study and personal interview conducted to various stakeholders. The findings indicated that there is a great need for restoration of Germany boma based on its importance to the Bagamoyo residents and the country as a whole.

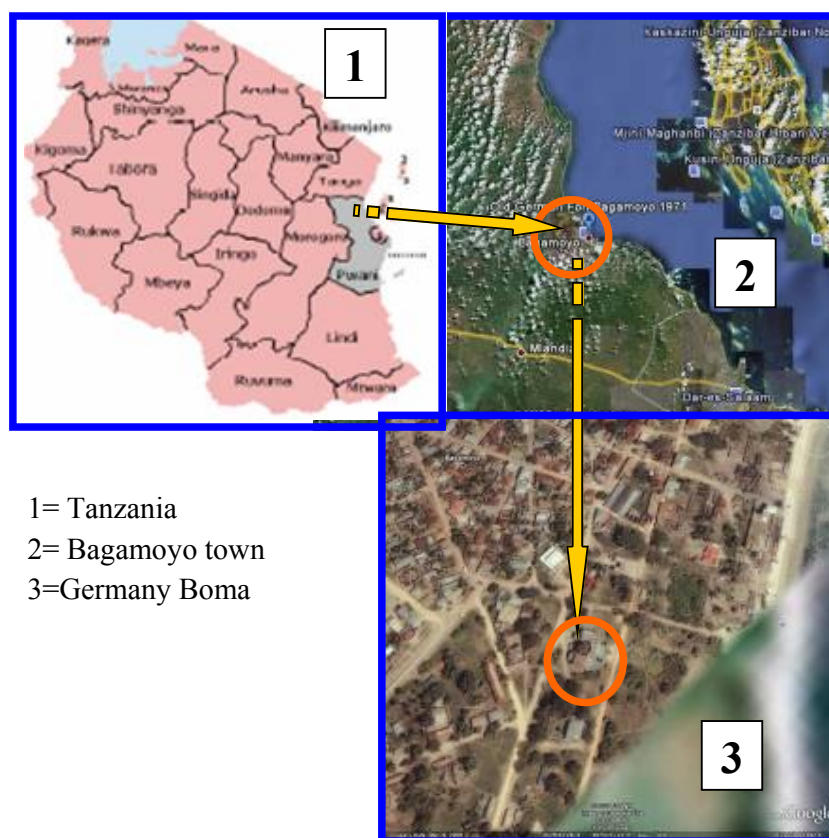
Introduction

Recovering our building heritage has a fundamental role regarding the renewal process, since it constitutes one of the strategies for urban and territorial balance. According to Vitruvius, (2005) “Building recovery, in the broadest sense of the word, means the renewal of precious constructions which have decayed or are outdated but could be renewed”. In other words, recovery is a subject which solves the probable damages in a building, trying to bring it back to its original living conditions; otherwise it refers to the intervention which confronts the damages provoked by the weather and, more often than not, by the absence of maintenance.

Background

Location

The town of Bagamoyo, Tanzania, was founded at the end of the 18th century. Bagamoyo is located at 6°26'S 38°54'E / -6.433, 38.9. It lies 75 km north of Dar-es-Salaam on the coast of the Indian Ocean, close to the island of Zanzibar. It was the original capital of German East Africa and was one of the most important trading ports along the East African coast. Besides, this town was the most important trading entrepot of the east central coast of Africa in the late 19th century. Bagamoyo's history has been influenced by Indian and Arab traders, by the German colonial government and by Christian missionaries. It was the German headquarters of the German East Africa between 1886-1891. Today the town is the capital of the District of Bagamoyo together with the central slave zone it is being considered for declaration as a world heritage site.



- 1= Tanzania
- 2= Bagamoyo town
- 3=Germany Boma

Figure 1 : Location of old Germany Boma

History

The Old German Boma is one of the outstanding built heritage in Bagamoyo historic town. It was built by the colonial administration in 1897. It served as the east African regional administration for both the

German and British colonial rules. Initially, the building was designated for office use and residential functions for the German Governor. Since, 1961 the building was used as a residence and office for the District Commissioners of Bagamoyo Township till its partial collapse in 1998. In 2000 SIDA (Swedish International Development Agency) rehabilitated the roof by covering the building with corrugated iron sheet to protect it from further deterioration. In 2004 the government invited some investors to inter into a joint venture with the government under Public Private Partnership (PPP) to renovate the building. The idea was initiated by the Antiquity department with the aim of receiving rehabilitation funds from private investors as government budget on rehabilitation and maintenance of historical building is not enough. The investors fail to meet the demand of the Antiquity Act (1979) and the Environmental Management Act (2004) which limit the use of modern material and other natural resources respectively. The situation led to termination of the contract with the Government. In 2008 the Germany government agreed to provide funds for the restoration of the German Boma.

Building context


Most of the buildings surrounding the German Boma bear the same architectural language and were constructed using the same techniques and materials. The land use of the contextual area is institutional and all buildings are protected as they are within the conserved area. The German Boma is a landmark in the conserved area due to its monumental nature the architectural value and language used, though dying, its aesthetic character remains intact. Depending on the ownership (ranges from individual to government bodies), priority and financial capability, the surrounding buildings are currently having different rehabilitation status. Most of them are in better condition than Germany Boma.



Figure 2: Decorative paints on corridor walls

Material and Construction Techniques

Table 1: Original material and construction techniques.

| Element | Description |
|-----------------------------|--|
| Foundation and Floor | <p>The foundation walls are assumed to be of strip type, whose width, depth and thickness could not be easily established. However, the actual parameters and type of foundation, investigating beneath ground floor can be determined in later stages of assessment prior to the start of the building conservation. The ground floors are cement screeded but the floors of the large conference room in the ground floor, the central rectangular block, the corridor and the south wing residence of the D. C. of the first floor are finished in glazed striated floor tiles.</p> |
| Wall | <p>Walls of the building are made of coral stones with mainly lime mortar, rendered in lime/ sand mortar and finished in assorted colours of emulsion paints. The main structural framework comprised masonry coral stone walls measuring approximately 650mm wide with exception of few internal walls which measure slightly less. Internal wall decorations paints have been observed in corridors and in some rooms as shown in figure 2 and 4.</p> |
| |  |
| | <p>Figure 4: Original Wall decorations in rooms</p> |
| Openings | <p>A combination of glazed windows and polished wooden jalousies are provided. The windows are arched but have been treated as the door openings, and provided with square headed frames.</p> <p>All the doors are arched but these have been filled and provided with square headed frames. Glazed, polished with wood lacquer and painted with enamel wooden panelled doors with fanlights are used. All openings were originally painted green.</p> |

| Building Element | Description |
|---|--|
| Suspended floor slab and ceiling | Floor slabs are made of series of small vaulted forms reinforced with steel I – beams. I – beams which are fixed at 1000mm centre to centre. |
| Staircase | The building has 3 staircases, two in the central block and one in the southern wing. The staircases are of concrete reinforced with steel I – beams. Treads and risers are 300mm and 160mm respectively. |
| Roof | Originally, the roofs were flat presumably made of coral concrete and sealed-off with lime screed and supported by steel I-beams which form the ceiling below. The people who saw the picture of the building in early 1960 said that the roofing slab was previously protected with pitched roof covered with rood iron roof sheets. Originally, there were six blocked 4-inch (4") diameter cast iron down pipes leading from the parapet gutters on both the north and south wings for draining the roof. |
| Utility services | Two water closets are provided on the both floors and on either sides of the main entrance to the open courtyard. These have galvanized service pipes and fittings. No storm drainage system was found. |

The Functional and Aesthetic Status of the Building

External environment

A semi-circular bastion extends to the east and is separated from the main block. It has 13 short pyramidal shaped columns projecting above the bastion. Fixed in the outer wall towards the east are four large bronze plaques bearing the names of German officers dating from 1889, thus suggesting that the bastion is a commemorative monument to the honour of those officers whose names appear on the plaques.



Figure 5: Oceanic view from the building

Architectural style

The Boma is a monumental building with an impressive U shape of two – storey height. It is a combination of Gothic and Romanesque architecture. The dominant features are pointed arch in the ground floor and crenelations. Also the building has some element of renaissance style such as symmetry, proportion and regularity of parts. Likewise it has classical architectural style with borrowed Swahili¹ architecture incorporated with Teutonic elements, thus producing a unique architectural style of its own kind. The building has two wings, which have been set back from the façade of the main rectangular block and symmetrical in form and plan. It has two projecting towers above the roof of the main rectangular block on the north and south ends with lancet openings and turrets at the four corners. The style is carried to the north and west facades of the building and is continued on the first floor.



Figure 6: The Front Facade

¹ Swahili Architecture comprises of a building with outdoors verandah, doublebanked room arrangement, internal corridor and a backyard.

Main entrance

There are six concrete steps leading to the arcaded façade. The arcaded façade facing India street has a veranda and leads to the main entrance which opens on to a large hall and a long arcaded corridor running in a north to south axis to connect the two rectangular wings. An entrance in the outer wall of the corridor leads on to an open courtyard at the rear or west end of the building. An enclosed porch extends from the south wing thus making the wing slightly projected than the north wing.

Ground and First floors

Basically, these floor are typically designed with variations only in the functional uses of the floor spaces. The floors on the north and south wings are divided into a number of rooms serving as offices and the large hall in the central block serves as a conference or meeting room (see Figure 7&8)

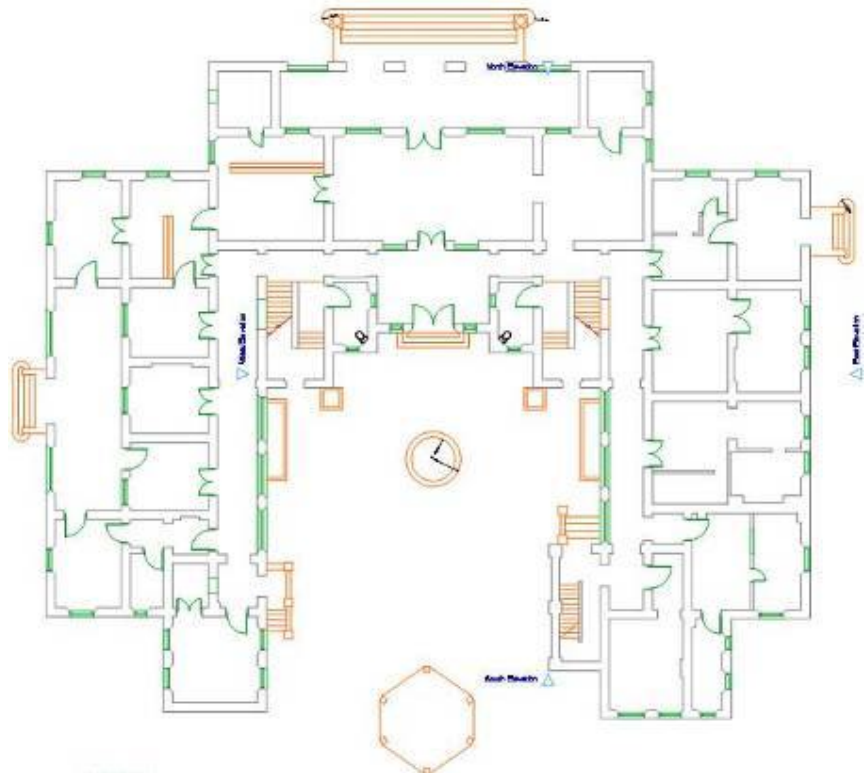


Figure 7: Ground floor plan

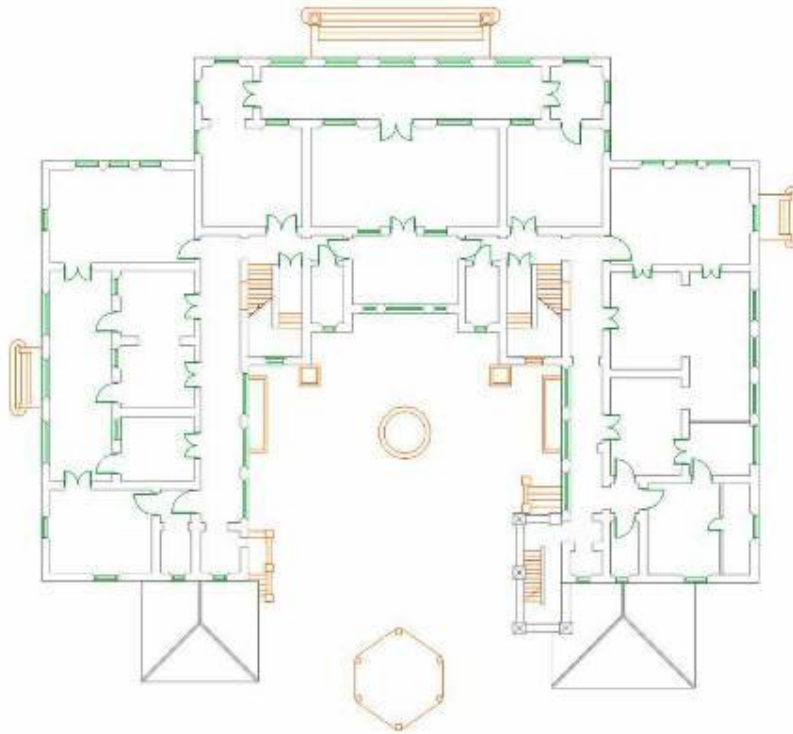


Figure 8: First floor plan

Analysis

Stakeholder's analysis

The future function and use of the building is still unknown. However, the quick door to door survey revealed varying opinions among the stakeholders (residents, government officials, staff of Antiquity Department, investors) on the future use of the building². The demand analysis revealed that there is economical, technological, antiquity and social cultural demand. The following are the key proposals.

1. A State lodge, where the President will be accommodated whenever s/he visits Bagamoyo;
2. A cultural Centre;
3. A colonial Museum;
4. A library and archives centre.

² In total 30 people were interviewed, 26 from bagamoyo districts and 2 from antiquity department head office in Dar es salaam and 2 business persons (investors)

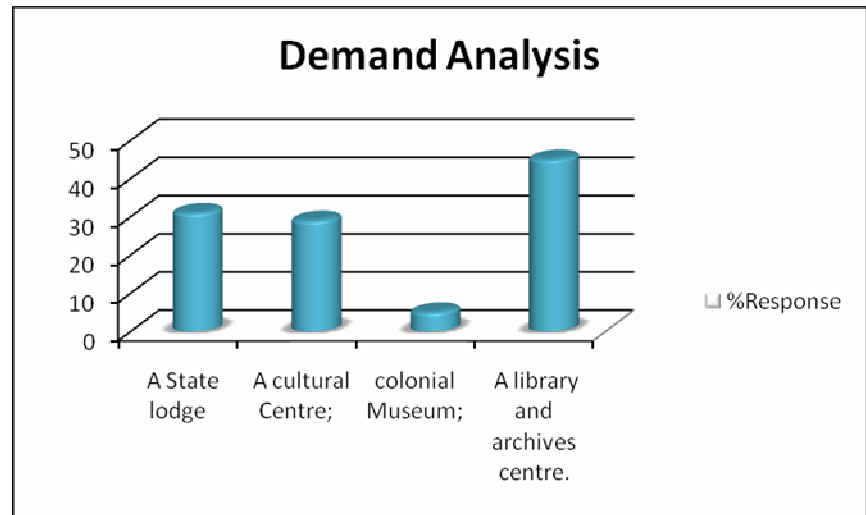


Figure 9: Demand analysis

Each of the above proposals has benefits and drawbacks. For instance, some respondents observed that, if the German Boma is converted into a state lodge, maintenance and repairs will be guaranteed, while others contend that a cultural centre will give it much more value, though intangible, in enhancing the culture of the place. Yet others prefer a library and archive centre due to absence of this facility in the area. The colonial museum is the least required in the above mentioned proposals the reason being reduction of the authenticity value of the building, existence of colonial museum and the community (who are majority of the respondent) knowledge on colonial museum which is very low.

SWOT Analysis



Figure 10: SWOT analysis

Having been located in a world heritage site the German Boma receives protection from Government and international organisations and receives funds from national and international organisation to facilitate its maintenance programmes. Another opportunity is availability of funds from government of the United Republic of Tanzania and the German government. Lack of maintenance culture among the residences, ongoing vandalism of old buildings and government neglect of historical monuments are threats that are facing this building in the future. Introduction of the Environmental Management Act (2004) that restrict the use of materials like mangrove sheets and coral stones, the primary building material for this building is another threat for this building

Analysis of building values

Table 2: Building values

| VALUE | DESCRIPTION |
|---------------------|---|
| Historical | The first monumental building in the area. Exhibit the strong existence of the German in Tanzania during the early 20 th century. |
| Architecture | The combination of Gothic, Romanesque architecture and renaissance style such as symmetry, proportion and regularity of parts provide architectural style of its own kind. |
| Technical | The old way of construction and using of local building material. Thick walls, lime washed paints, non existence of cement block except the use of coral stone and sand stone with lime mortal. |
| Cultural | Combination of Indian Arabic and Swahili culture. This can easily be depicted from the windows and door style as well as in inside balcony “msana wa ndani” and outside balcony “msana yuu” |
| Symbolic | Symbolises German power through its historical use, monumental nature , aesthetic, strategic location and uniqueness and sophistication in its architectural language. |
| Identity | The building can be recognised from far, it is a landmark in a conserved area and standout well to its context . |
| Economic | The building has been one of the centres for tourist attraction for years, it can contribute to the national income through tourism, if properly conserved. |
| Pedagogical | Historians, Archaeologists, Researchers (within and outside the country), students from different universities have studied this building in their learning and research activities. The building has high pedagogical value. |

| | |
|---------------------|---|
| Authenticity | One can easily recognise the historical layers from naked eye observation of the building. |
| Patina | Can be traced in some building elements such as along door side, on walls and in window shutters |
| Nominal | The building has been neglected for long time without any maintenance and now it is abandoned this reduces its nominal value. |

Analysis of Building Elements

The Old Boma has been subjected to a continued deterioration³ primarily due to neglected maintenance. The situation is worsened by the collapse of the front balcony and subsequence structural members⁴ was due to prolonged absorption of water which leads to expansion of floor slab and rusting of I beams. This makes the building unsafe and led to abandonment.

During the survey for this study, it was learned that several attempts were initiated by the Antiquities Division of the Ministry of Natural Resources and Tourism (MNRT) to save the structure from this undesirable situation without any success; However, the following defects are noticed and if not immediately taken care of, may eventually cause greater damage and possible collapse of the whole structure, (see also Figure.19 and 20)

Floor

Floors have developed lateral cracks at the positions of buried I – beams especially on the floor slab at the first floor. Some floor tiles at some rooms of the first floor have been stolen. The remaining is dirty and need cleaning and repolishing. The floor structure is sagging, threatening to collapse. The I - beams support are seen to bend downwards. The balcony at the front of the fort fell in and the parts of the suspended slab inside the building show clear signs of sagging and almost falling in. There are also undulations in the glazed striated tiled floors of the hall and corridor. The undulations follow the lines where the I – beams are buried suggesting excessive rust of the iron beams. It would be desirable to remove a few of the glazed tiles for further investigation of the floor beneath the tiles.

³ This could be also from lack of maintenance culture generally, limited resources for maintenance and repairs and inadequate awareness on the part of owners on the importance of conservation of historic buildings.

⁴ In this case structural members are load bearing walls, beams and slaba



Figure 11-: The poor condition of floor slab and floor finish

Openings

These are wooden jalousies and are in a very poor condition as far as the paint finishing is concerned. However, the wood structures are still strong. Though the double leafed enamel painted panel doors are in good conditions. Some glazed wooden casement windows are in good condition. Doors and windows are cracked with missing timber louvers and broken glass. This building has being shorn of its doors and windows. The entrance door to the tower and door to the roof opening are also missing.

During the field survey it was revealed by the Bagamoyo residents that the vandalism is by jobless youths constitute a real threat, mostly these are from outside Bagamoyo, they sell the items to tourists and to some of the hotel owners in the area. The latter normally display them in their hotels as an attraction for tourists. Decorated external doors are intact but most of the internal ones were all stolen as seen during field visit.



Figure 12 : Absence of window panel, broken windows and flaking painting in existing openings

Walls

The building facade are generally in bad shape with cracks running virtually across the walls which seem to have originated from the rusted I – beams and the paint work is flaking off. The flaking off paints revealed the different layers of paints (see Figure 11), which provides evidence of almost 100 years in which decorative paints expressed their power (see Figure 3&4). An attempt to repair the cracks using cement mortar failed, because these walls have already cracked all the way down into the foundation. The continuous algae growth has completely turn the white washed lime paint into black and grey in some areas (see Figure 14). There are also termites on some walls.

*Figure
naints*



Figure 14: External and internal wall defects

Staircases

The I – beam at the head of the stairwell is in poor state due to advanced state of rust, at the end that enter the wall resulting in numerous cracks. The wooden stairs leading to the roof are also rotten.



Figure 15: Cracks and mortar peeling off on main staircase balustrades.

Ceiling

There are traces of fungal growth, flaking paint, rusty I – beams and exposed mortar show on the ceiling and these occur at the places with buried metals. The ends entering the walls are more rusted and have caused cracks to develop.



Figure 16 : Poor condition of ceiling vaults

Roof

Roof Structure

Roof structure is very unstable due to collapsed steel I – beams and timber in some parts. A timber trussed lean to corrugated sheets roof have been super imposed in the original flat roofs on the north and south wings. The trusses have been badly spaced thus causing the roof to sag in the middle most likely because of great span⁵. The reconstruction of roof structure is necessary.

Roof drainage

There are heavy cracks in the cement flashing provided at the joints between the roofing sheets and parapet walls. In some places thin strips of mar glass and bitumen haven been ridiculously applied to seal off cracks in the roof parapet. These defects coupled with virtually nonexistent drainage system for the roofs allow penetration of water in great quantities into the fabrics of the building.

⁵ The problem comes from the initial structural design. Means any additional load would lead to the problem. In this case the absence of proper roof drain leads large quantity of water been absorbed by roof slab and increase its load beyond the one it was designed to carry.

Thermal effects

The corrugated iron sheets roof constructed over the original coral concrete roof absorbs and transmits much thermal heat onto the coral concrete roof thus causing varying effects on the roof slab.

Roof over the main rectangular block

Like other building components, this part is badly maintained. There are virtually no “falls and cross falls” for fast and effective drainage of the roof, the sealing materials used are bituminous felt mar glass and cement screed, all have cracked due to poor workmanship. The flashing between roof slab and walls has also cracked.

Roof over stairwell

This was constructed with hardwood boards, bituminous roofing felt and covered with corrugated iron sheets. All nails are corroded hence allowing rain water on to the felt and boards.



Figure 17: The peeled off of bituminous felt on the roofing slab

Fixture and fittings

There is a carved antique settee, a cupboard and a side board in one of the rooms of the main block. This interesting set of furniture needs to be protected and preserved. The WCs are in poor condition. The piping system is non-existent after being worn out over time and some are stolen. However, the remaining galvanised pipes should be replaced with PVC to arrest eventual rust.



Figure 18: Unused sanitary appliances in very unhygienic condition

Water reservoirs

The are two (2) galvanized water tanks on the north and south wings which are serviced by a one-inch (1") exposed/ surface built galvanized pipes. There is evidence of leakage from the pipes and tap valves on the roofs. The pipes also show signs of rust.

Utility services

The building has no electrical services currently.

Outdoor built environment

As noted earlier, the building has no storm water services around and rather it is surrounded by long uncared grasses and waste. The ancient garden surrounding the Germany Boma is also falling apart having been neglected for years. One can however, still trace its existence due to the type of the remaining flowers, ancient species of trees and grasses.

Expected needs of restoration

- Windows will be renovated repainted and a new glass placed at the inside to gain the indoor climate as a contrast to the old element the new one will have a modern approach;
- Materials to be used in restoration will be chosen to blend with the existing materials of the building;
- New illumination together with sound equipments will also be tried out;
- The facades will be replastered and lime washed in the same colour as previous;
- The roof cover and roof structure will be replaced with material resistant to salt air. The roof slab will be provided with downward pipes to drains storm water, and
- The cracks will be opened up and examined before filling in with wire mesh, depending on the extent of the problem some walls and slab will be demolished and rebuilt.

- Consolidating the Old Boma building by keep its originality, maintain the architectural identity, strengthening the local identity and contextuality;
- Measuring the congruence between the semantic and the material value of the building;
- Estimating its degradation risks through conditional survey;
- Decreasing its vulnerability degree, that is “redeem it” by repair all defective areas;
- Protecting it and giving it back to the history that has conceived it, and finally, and
- Impacting the knowledge of conservation to local craftsman that is threatened to disappear.

Proposal

Given the importance and the values of the German Boma, it is my opinion that it should be conserved/ restored. This complements the Government of the United Republic of Tanzania efforts, which through its Ministry of Tourism and Natural Resources, the Antiquities Division, plan to rehabilitate several historic building sites. Some of those in the plan are in Bagamoyo, Kilwa and Biharamulo.

The need to rehabilitate and therefore conserve the German Boma is called for upon since some few point renovations have not had the intended impact because it has not been done properly and most of what has been done is already worn out: painting peeling off, roofing sheets not in place, etc. During the survey, it was learnt that, some of the reasons leading to this undesirable trend is insufficient skills, weather/ climatic changes and different materials.

To ensure the continuity of use and up keep of historical and architectural heritage the building shall be used as a state lodge. This will ensure availability of fund from the central government each year for maintenance and repair. Additionally, for security reasons the installation of IT surveillance system is necessary. The climate change also necessitates the use of passive energy in cooling the indoor areas so the installation of those facilities especially in office areas is crucial. Another big change for aesthetic and technical reasons is the roof cover from corrugated iron sheet to Derca roofing tiles. The reason being the rusting of corrugated iron sheet caused by salt air from the Indian Ocean.

Method

The following is the methodology employed in approaching this project;

- Searching for necessary information regarding the old Boma

literature on various aspects of the Bagamoyo Township and on the history of the German Fort was extensively reviewed.

Through these, information was obtained on the history of the building and its initial use. Materials used and their availability then and now are well described from the literature. Government policies and regulations that guide restoration and conservation of historical buildings were reviewed and happen to be very useful in conclusion for this study.

A list of guiding questions were prepared and administered in a way of semi structured interview guideline and unstructured interviews. Some of the key informants interviewed were:

- The Bagamoyo privately practicing Architect;
 - The conservationist at Bagamoyo, who is an employee of the MNRT, Antiquities Division;
 - Elders and youth who reside in the area
 - An engineer with the Ministry of Infrastructure, Building Unit, the latter is the overseer of the conservation works for all Government buildings.
- Conducting conditional survey
A close observation of the building and its components, as an initial stage in determining its condition and the need for repairs was done. This way the building materials and technology used was established, the state of the building element generally, particularly finishings internally and externally were investigated.

Physical measurements of dimensions for the German Fort was taken and presented in drawings using a CAD Software. Some of the measurements done and drawings prepared were the floor plans, selected building components, elevations and external works.

Photographs were taken systematically, as a way of documenting the spatial qualities, particularly in relation to the building status.

- Undertaking feasibility study (study the client requirements, prepare drawings based on the ultimate use of the building);
- Safeguarding the building site;
- Consolidating the building to stop further deterioration and collapse of the building;
- Saving all building component which still exist;
- Preparing programme of work, and

- Preparing cost estimates based on the resource requirement (human, financial, material and time).

Budget

The overall budget is not yet known because the investigation of the structural foundation is yet to be done and absence of building specification is not yet known

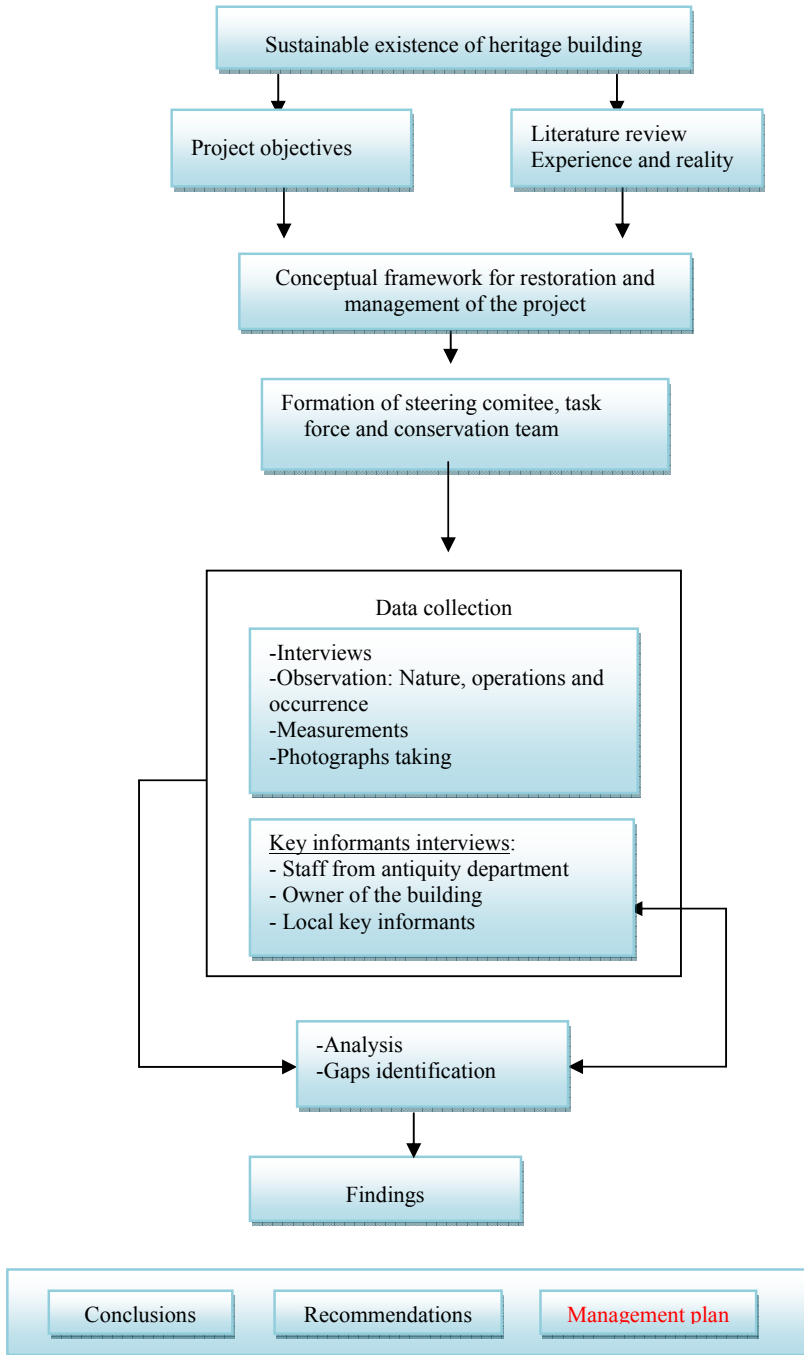


Figure 21: Study approach plan

Current status of the work

The project for rehabilitation and conservation of the German Boma has not yet started, though the researcher was informed that the work is scheduled to commence any time, considering that all plans were almost in place at the time of writing this report (January 2009). Very few items of work are still outstanding, one being the future use of the building, which have / do not have a great impact on the method/ scope of rehabilitation.

The following are accomplished tasks

- The feasibility study was undertaken, it established that the building is at present unsafe for human habitation. The building has several cracks and its structural stability seems very weak to protect it from further structural damage. The Antiquity Department provided wooden poles to support the structural slab and beams (see figure 22).



Figure 22: Efforts to protect the building from further deterioration

- Preparation of the client programme/(requirements),
- Preparation of relevant drawings based on the existing condition of the building condition,
- Preparation of budget for building consolidation and structural investigation.
- Building consolidation

The ongoing tasks are;

- Preparation of manning schedule and other resources needed
- Preparation of activity (work) schedule and

-The preparation of budget for implementation.

Discussion and Conclusions

During the study, the major issues observed which are of relevance in rehabilitation and conservation of historic buildings (directly or otherwise) were:

1. Improper or missing documentation of the German Boma documents, such as drawings and other written information,
2. Contradicting/ lack of sufficient information passed orally by interviewees;
3. Contradictory legislations. I found out, and as stressed more by one of the key interviewees that, the Antiquity Act (1979) contradicts the Environmental Management Act (2004) for some few but very crucial cases. A cited example is that in which the Antiquities Division favours the use of locally available materials, or rather, the originally used building material, such as coral stones and mangroves. Meanwhile, the Environmental laws prohibit the extraction of any of these materials as the coral reefs are breeding grounds for fish and the mangroves are one of the protected species as they protect the coastal ecosystem. This was noted as a problem, despite the Antiquities Division allowing the minimal use of modern materials while rehabilitating historic buildings.
4. It has been observed that, the building which was restored very recently (like 2 years back) its externally walls are changing to yellow followed by algae growth which are greenish in appearance and as it dries, it turns to black. The internal side of these buildings has a serious problem of peeling off far before their intended lifetime.
5. Institution challenges: there is a problem on how views of other stakeholders be incorporated in the final decision as until now it is difficult to identify who is has the final say about the use.
6. Negative attitude about the conservation of old building (among decision makers/politicians and bureaucracy) in favour of the modernity as historical heritage is referred as devastating clearance of old building in the city.
7. Resource constraints especially among the individuals owning historical building near the Old Boma not able to fund and conserve as per antiquities specification and standards.

Recommendations

1. Establish a conservation authority to effectively manage the resources. Such an authority has been observed to efficiently work in Zanzibar, under the Stone Town Conservation Project;
2. The conservation Architect or team leader for the project, whenever it takes off, should ensure that the aspect of rehabilitation while conserving the historical aspect is achieved. The selection and harmonization of building materials used should be done with maximum care;
3. It was found out during the study that precious building components such as doors, windows and temporary roofing elements have disappeared. It is indeed very difficult if not impossible to acquire similar components (which were imported from Germany then). Thus, responsible authorities should make sure the remaining components are guarded against theft and be reused during rehabilitation and conservation

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