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The Development of Colonial Architecture in the Former German East Africa

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“When the author mentioned in a conversation with the then President Mwinyi that the conservation of "monuments of German colonialism" did not necessarily receive a sympathetic response from the German public he countered this argument by pointing out: "They got it all wrong. For us these buildings are now part of our national heritage, part of our history. Were you not once occupied by the Romans? And what are you doing now with what they left behind?"

German Ambassador Dr. Heinz Schneppen: The Origins of the Ocean Road Hospital Dar Es Salaam, National Museum of Tanzania, Occasional Paper No 14, Dar es Salaam 2000

Preface

German colonial architecture in East Africa developed in a different way than it did in, for example, South West Africa. The reasons lie in the climatic differences and the history of the culture. The climate in South West Africa allowed a building style almost like in Central Europe. Moreover, there was no indigenous solid construction system that could be integrated. The parts of East Africa where the Germans first settled were along the coast. The climate here is humid and this creates problems, whether the space is used as a living area or an office. In addition, there was the indigenous architecture of the Swahili coast, with solid construction based on its own structural design. These buildings almost never corresponded with the European minimum of hygiene and comfort but could be modified for their own needs. So, the history of German colonial architecture was different than in other colonies.

The architecture founded by the European colonists has its roots in the former Persia (Shiraz), Oman and Yemen as well as in the peripheral areas of these modern-day states. Researching this history is thanks to the British Institute in East Africa, especially Peter Garlake¹, Neville Chittick², G.S.P. Freeman-Grenville³ and Sir John

¹ Garlake, Peter (1966) *The Early Islamic Architecture of the East African Coast*. Nairobi/London: Oxford University Press for the British Institute of History and Archaeology in East Africa.

² Chittick, Neville (1974) *Kilwa: An Islamic Trading City on the East African Coast, Volume I*. Nairobi: British Institute in Eastern Africa.

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Gray⁴. But their initiatives did not begin until the 1950s. As archaeologists, they were able to analyze the development of construction within the framework of the history of the East African coast.

The situation is worse regarding the existing sources about the building history of the German colonial era. This may seem surprising at first, since the time interval of little more than a hundred years is very small. Therefore, a few remarks on this are necessary. First, the files of the DOAG (*Deutsch Ost-Afrikanische Gesellschaft* or German East Africa Company) remained in Zanzibar after the Reich ultimately took over the government in 1891, and for a long time, what is still left of these was not accessible. In 1892 already, all government documents were brought from the temporary capital Bagamoyo to Dar es Salaam. The file registry was reorganized in 1901/02, since the previous order of classification was too coarsely meshed. During World War I, the files travelled next to Morogoro and then further to Tabora. Here, parts of the archive were buried in different places, which wasn't always good for them, as would become evident after the war.⁵ In addition, it must be taken into account – especially in the construction sector – that while the government had planning sovereignty, the financing had to be

³ Freeman-Grenville, G.S.P. (1962) *The East African Coast. Select Documents from the First to the Earlier Nineteenth Century*. London: Clarendon Press.

⁴ Gray, John (1951) "A History of Kilwa (Part I)", *Tanganyika Notes and Records*, Volume 31/1; Gray, John (1952) "A History of Kilwa (Part II)", *Tanganyika Notes and Records*, Volume 32 /11.

⁵ Franz, Eckhart G. and Geissler, Peter (1984) *Das Deutsch-Ostafrika-Archiv, Inventar der Abteilung "German Records" im Kolonialarchiv der Vereinigten Republik Tansania, Dar-es-Salaam* [The German East Africa Archives, inventory of the German Records Division in the colonial archives of the United Republic of Tanzania, Dar es Salaam], 2 Volumes, Marburg, Vol. 1, pp. 38–58.

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checked in detail and approved by the Imperial Colonial Office or its predecessor. The funds were transferred from Berlin. In the archives of the Imperial Colonial Office in Berlin there are therefore no building or design plans except for a few freehand drawings. However, there is extensive correspondence about the building costs of individual projects. It is certainly apparent that especially the early government buildings were designed and planned in Germany but I haven't had any luck in finding relevant documents. Whether this situation only speaks to the German Reich's lack of experience in building the administration of a colony or to a general disinterest in building development in the colonies is difficult to judge. However, it must be food for thought that all the expert literature in this area consists of less than a dozen articles in various journals. The state of preservation of the remainder of the colonial files in the Tanzania National Archives in Dar es Salaam is poor due to poor archive management and improper storage, which is the responsibility of the administration there.

And even more unfortunate: during the time when what was then Tanganyika was a British protectorate, an English architect who had evidently taken a great interest in the German colonial buildings – especially the bomas – had compiled a collection of plans for the German fortified buildings, including some that he had measured himself. Before his return to England, he gave this collection to various Tanzanian places, as well as a copy to the German embassy in Dar es Salaam. Of this diligent work presented in bound form, only the table of contents is still there.

Precolonial construction

The history of East African coastal architecture goes back to about

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the year 700. The shape and floor plan are determined by the type and availability of the building materials. These are primarily coral rag and logs. Almost the entire coast and a strip of varying width in the sea consist of a coral-stone base which, on land, is covered by a layer of sand of varying thickness. The knowledge that building lime can be burned from coral rag as well as the technology that developed from this knowledge made solid structures possible. To burn the lime, wooden stakes were piled in a circle and filled with coral fragments of varying sizes (Fig. 1).



Fig. 1: Burning lime in Zanzibar (historical depiction), Source: Von der Decken, Claus (1869) Reisen in Ost-Afrika [Travels in East Africa], Leipzig/Heidelberg: Winter'sche Verlagshandlung.

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As a result of the burning process, small pieces disintegrated into lime powder, which fell into the ashes of the wood fire. The bigger pieces were preserved. Everything, whether powder or burnt stones, was placed in a pit and rinsed with water. This slaked lime could remain underwater for years, until it was needed for making mortar when building a house. The knowledge that the slaking process is slow and that storing the lime underwater does not mean a loss of quality, even after years, is reflected in Swahili tradition. For example: “When your son is born, that is the time to dig the lime.”⁶

Sand is added as an aggregate to the slaked lime in order to obtain mortar. Attention must be paid to the quality of the sand. Grain size is a consideration but more important is the salt content of the sand. The cleanest sand was and is always found in the immediate vicinity of the shore but where it is heavily contaminated by salt, due to the tides. It is unknown which method was used to determine salinity.

The mass masonry was done by piling the coral rag in an open casing where the cavities were filled with mortar. It was an iron rule never to raise a stretch of wall more than 70 to 80 centimetres in height during one work cycle. The necessity for the material’s smooth setting was known and led to the long construction times (Fig. 2).

⁶ Knappert, Jan (1980) “Stone and Clay”, *Kenia Past and Present*, Nairobi, p. 8: “Mwanamume wako azaliwapo ndipo mafusizi yafukuliwapo – When your son is born, that is the time to dig the lime. Thus says the Swahili proverb: dig the lime up and then bury it after proper treatment, so that when the boy approaches manhood, there will be good lime ready to build his house for him and his bride to live in.” Cf. Siravo, Francesco and Pulver, Ann (1986) *Planning Lamu: conservation of an East African seaport*, Nairobi, Part 5, p. 47.

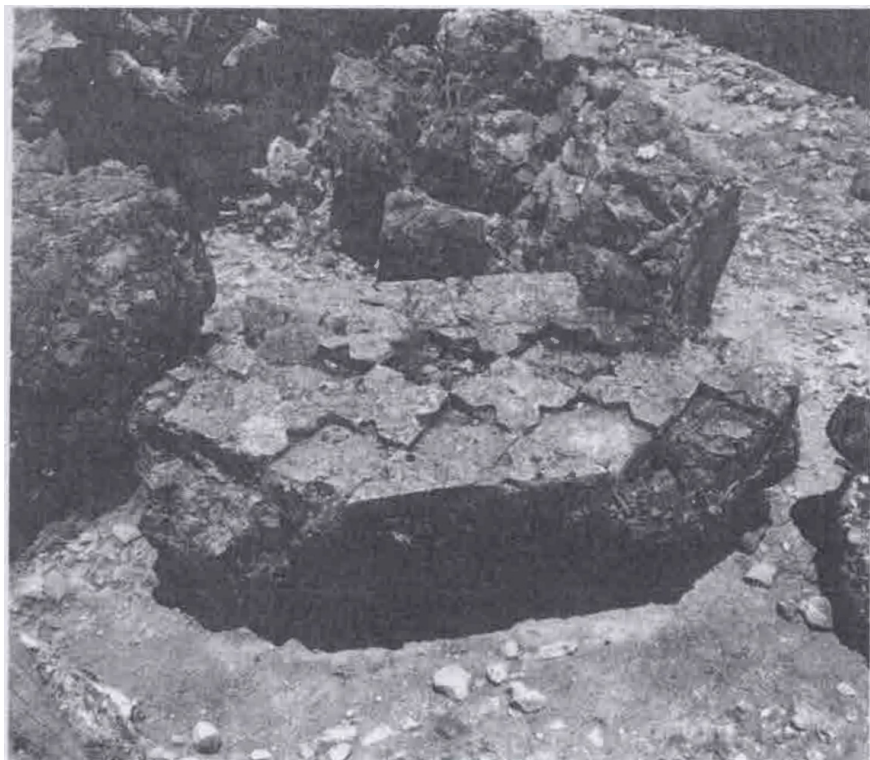


Fig. 2: Ornament cut in soft coral stone, Source: Author's records.

In addition to the mass masonry, there were the decorative parts of a building. This was especially true for representative buildings like palaces and mosques. The mihrub (the apse-like alcove facing Mecca) and the mimbar (a sort of pulpit for the imam) in the mosques, the casings of passageways and entrance doors, etc. were often left unplastered, with decorative stones. Coral rag wasn't used for this but instead, fresh coral stone from the sea, which is particularly easy to work with. This material, taken from green coral stone, could be worked smoothly and at an angle with saws and similar tools, so that we can still recognize the individual blocks

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today. These methods were also a prerequisite for making arches and domes. The coral stone extracted from the sea is soft at first and can therefore be worked easily but over time it hardens and attains the consistency of coral rag. When fresh, it allows for carving the calligraphic and ornamental reliefs (Fig. 3).



Fig. 3: Erection of mass brickwork of coral rag, Source: Archive of the Leipzig Institute for Regional Geography.

In addition to the masonry technology, the structures were particularly limited by the timber available. Due to their hardness and availability, trunks from the mangrove forests of the coastal area made an ideal timber which, however, had a major disadvantage. Straight trunks of over 2.80 metres in length weren't available.⁷ So,

⁷ Garlake, *The Early Islamic Architecture of the East African Coast*, p. 11: "The planning of every building is restricted by the span of the timber rafters – which never exceeds 2.80 m. This places the plans in a dimensional 'strait

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the size and shape of the rooms was determined by whether they could be covered. In the better constructed buildings, the ceiling beams were laid at intervals of about 0,30 metre and the space between them was filled with neatly struck rubble stones. In these cases, the undersides were often plastered, resulting in them looking smooth from below. This construction also applied to the roofs. The top was then covered with a layer of mortar 30 to 50 centimetres thick, to which smaller coral pieces were added as well.⁸ After hardening, this cover was like a primitive concrete surface. In the simpler form, the then mostly raw ceiling beams lay as logs closer together and the spaces in-between were filled with coral rag and compressed with mortar. The construction of the roofs, which probably originated in Yemen, Oman and Iran, proved not to be very resistant to the tropical rains along the East African coast. The water spouts protruding from the low cornices didn't help much either.⁹

These buildings found by the German colonists suffered essentially from two construction defects. Once there was next to no foundation. Ten centimetres of masonry below ground level, mostly the same width as the rising masonry of 30 to 50 centimetres, had to be enough to support double- and multi-storey buildings. This and the inadequately designed ceilings of the building resulted in a

jacket' so restrictive that it is a universal feature of every space – even the vaulted buildings conform to it.”

⁸ Chittick, *Kilwa: An Islamic Trading City on the East African Coast, Volume I*, p. 23: “Above the blocks was poured a thick (30–50 cm) layer of concrete composed of coral chips and small rubble mixed with sand and lime. The upper side of this was rendered with a layer of plaster that makes it watertight.”

⁹ Garlake, *The Early Islamic Architecture of the East African Coast*, p. 26: “Rain water was discharged clear of the building by extremely characteristic rainspouts of dressed coral.”

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construction that had little resistance to vibration. Also, because the coral rag could not be bricked up in the bonding, there was no possibility of interlocking two adjoining walls at the corners of the building in such a way that they could absorb at least small tensile stresses. In addition, there is the need to protect the masonry – especially the crowns – from the ingress of water through constant maintenance work. This too was negligible in the country of origin of this building construction. Coral rag, however, tends to expand when exposed to moisture, which leads to cracking.¹⁰ Constant repairs to plaster and screed is the prerequisite for durable constructions. Where this was not kept up, for example in socialist Zanzibar in the Seventies and Eighties of the 20th century, it led to collapse of especially multi-storey buildings.

The architectural design

The way of life and social structure along the East African coast are strongly influenced by Islam. This significantly influences the architecture. The solid, Arabic-style constructions on the coast are unadorned, except for the entrance doors, which are adorned with ornaments. Along the northern Swahili coast, for example in Lamu, the houses often don't feature any window to the street or to the

¹⁰ Wilhelm, Norbert (2000) "Zur statisch-konstruktiven Sanierung von historischen Bauten aus der Kolonialzeit in Entwicklungsländern" [For the static-constructive renovation of historic buildings from the colonial era in developing countries], *Bautechnik* [Construction Technology] 77/7, pp. 471–747; "There are cracks that start at the top of the wall without identifiable load concentration. They are explained as follows by the swelling and drying processes: First, the masonry is dampened from above and swells. Then the top area (the wall crown) dries out. Tensile stresses arise there and at the inhomogeneous point, the first crack appears."

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neighbours. The reason for this is to shield the women from the eyes of strange men. These buildings are accessible only inwards towards the courtyard.¹¹ Further south, along the coast of the former German East Africa and on the island of Zanzibar, the courtyard still plays a role but windows are quite common (Fig. 4).

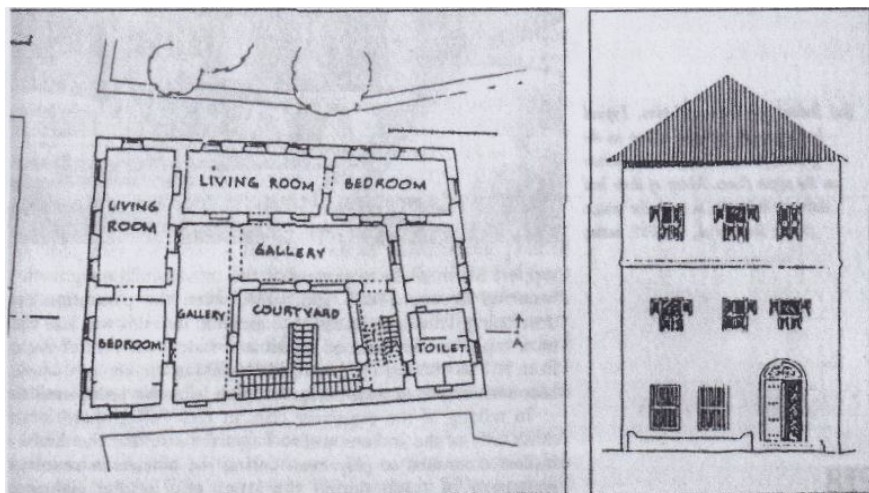


Fig. 4: Floor plan and aspect of an Arabic house Source: Sheriff, Abdul (1992) The History and Conservation of Zanzibar Stone Town, London: James Currey.

In some buildings, oriels in the form of balconies can be observed, where a dense wooden lattice above the parapet shields from looking in – but not out – and at the same time allows for ventilation. This detail is also common in North African architecture. Simple plaster

¹¹ Siravo and Pulver, *Planning Lamu: conservation of an East African seaport*, p. 47: “The interior courtyard or kiwanda is the focus of all daytime activities and it is the building’s source of light and air. Windows are unnecessary and, for cultural reasons, they are also impractical because they would reduce privacy in a society which seeks to keep women in seclusion or purdah.”

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bands, raised or set back, often mark the height of the particular storey. In the open construction, the existing windows are almost always arranged symmetrically. They appear as standing, rectangular openings, in an identical format of about two metres in height. They are an essential element of the façade design, have one or two wings and are divided horizontally below the middle. The bottom part acts as parapet but can also be opened. Practically all windows are thus designed as window doors. Usually there is a parapet bar and underneath it some iron bars, probably to prevent accidents. The reason why the windows can also be opened in the parapet area lies in enlarging the ventilation opening, which occasionally even allows cross-ventilation with window doors on the opposite side.

The flow of air hitting the body brings relief in the hot, humid climate. In dry climates, vertical ventilation is sought, sometimes with additional humidification of the air. Since the possibilities for vertical ventilation in this architecture are very limited and rather random, this also points to the origin of the construction method in the hot and dry areas of the Gulf region. The floor plans of the buildings differ vastly not only in terms of space but also in terms of time. Historical floor plans, some of which can be traced back over centuries, are more likely to be found on Lamu and along the northern coast of Kenya. Here, too, decoration in the form of stucco work is common in the buildings, while the 19th-century architecture of Zanzibar and the southern coastal towns shows this only to a small extent. That decoration in the form of stucco work is rather rare here seems to be due to a lack of gypsum. Since larger deposits of gypsum aren't detectable along the north coast either, the question about the origin of this building material remains unanswered for the time being. The courtyard or courtyards – there are sometimes two in a building – are also used for ventilation since they generate vertical

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air flow through the chimney effect. For one thing, the necessity of the courtyard but above all restricting the room width to 2,50 metres – the “straitjacket”, as Peter Garlake calls it – form the framework for the floor plan of the house and sometimes leads to unsightly solutions.

Exterior decoration of the building was unusual, with the exception of the entrance doors. These are double-winged and are often carved works of art. The origin of this architectural element is unclear because of how widely distributed it is.¹² The design of the door makes statements about the home owner. Thus, there are doors that point to an Indian background; others that point to an Arabic background (Fig. 5).

¹² Mwaum, Mwalim A. (1998) *Doors of Zanzibar*, London: HSP Publications, p. 3f.: “The tradition itself originates from the countries around the Persian Gulf and spreads through Afghanistan to Punjab in India where they were reported in the first half of the 12th Century. In East Africa they were described in Kilwa and Mombasa circa 1500 AD by the renowned traveller Duarte Barbarosa ... the doors are of wood well carved with excellent joinery. But they really got a boost during the era of Sultan Barghash, the third Omani ruler.”

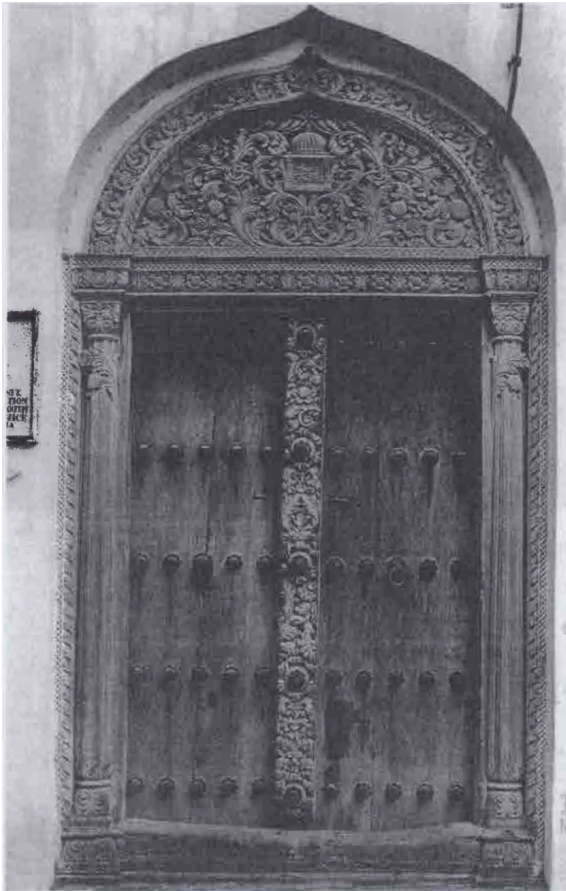


Fig. 5: Entrance doors of a building of the German East Africa Company in Zanzibar, Source: Mwalim, Mwalim A. and Rau, Uwe (1998) Doors of Zanzibar, London/Zanzibar: HSP Publications.

There are very elaborately carved doors and door frames, which in turn allow conclusions to be drawn about the wealth of the homeowner. The two door wings close onto a mullion which is firmly connected to one of the wings. The carving is limited to the mullion and the door frame.

The arrival of the Germans

When, after 1885, the first DOAG (German East Africa Company) officials moved from Zanzibar to the mainland, only such solid buildings as had been erected by Arabic, or rather Persian (Shirazi) merchants were still found in Bagamoyo, Pangani and Sadani. In most cases, the early colonists rented these houses and modified them as much as possible to suit their needs. One of the earliest examples, and one of the few that survives, is the fort in Bagamoyo.¹³ With increasing demand, different methods were applied to procure living and usable space. There is an eyewitness report from May 1887 about the necessity of using indigenous building materials. The head of the station in Dar es Salaam, Captain August Leue, describes how after four weeks, six of eight white people were so ill from suspected malaria that they had to return to Zanzibar. And further, “Since I attributed the mass illness among the Europeans mainly to our awful living conditions, I first ensured a better house.”¹⁴

¹³ Hasse, Rolf (2005), *Tansania: das koloniale Erbe* [Tanzania: the colonial heritage], Augsburg, p. 24.

¹⁴ Leue, August (1903) *Dar-Es-Salaam. Bilder aus dem Kolonialleben* [Dar es Salaam: images of colonial life], Berlin: Süsserott, p. 9: “I had some coloured bricklayers and carpenters come from Zanzibar and with them, renovated an Arab house that was placed at our disposal, which was located directly at the harbour and which today forms the western building of the fort. Actually it was a ruin of which only the four walls were still intact. Ceilings and stairs had partially collapsed and the ground floor was full of rubble. However, the expansion went relatively quickly. In a few months, the beams were replaced, the doors and windows were put in and the floors were stamped. After only half a year, the house could be cleaned up and moved into. We lived in heaven when we finally lived in the new house. ... Day and night, the sea breeze refreshed us and with the coolness, our sense of well-being also increased. We felt as if we had been living in a sultry

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The examples of converted buildings of the local merchants of the time that still exist suggest that two constructive improvements were made to probably all buildings utilized by Europeans. The flat roofs were covered again with corrugated iron.¹⁵ Galvanized sheet iron, rolled into a corrugated shape, was the first modern building material used in the colony. Rooms were enlarged by removing dividing walls and absorbing the ceiling load through steel girders (Fig. 6).

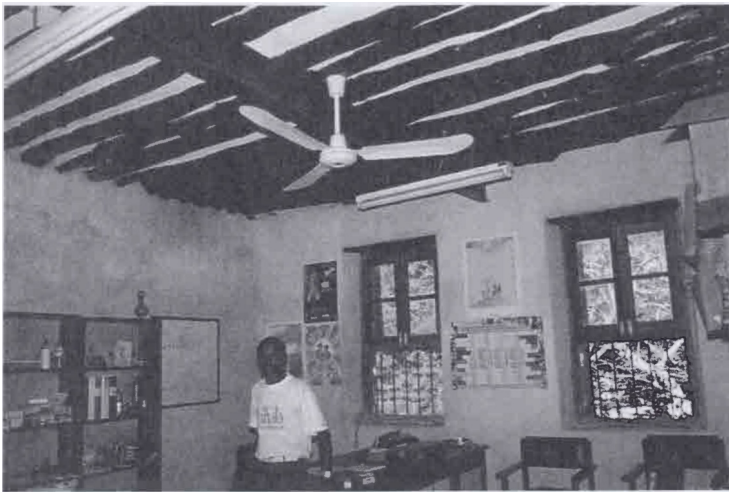


Fig. 6: A steel beam instead of a wall supports the ceiling load.
Source: Author's records.

Sometimes there were buildings on whose flat roofs lightweight, shed-like constructions were erected and then covered by saddle roofs (Fig. 7).

swamp until then. The malaria which we couldn't shake off in the old apartment was as if blown away and at once, our spirits lifted again."

¹⁵ Becker, "Das Deutsche Landhaus in Ostafrika [The German country house in East Africa]", *Das Deutsche Landhaus* [The German country house], Berlin, p. 204–211.

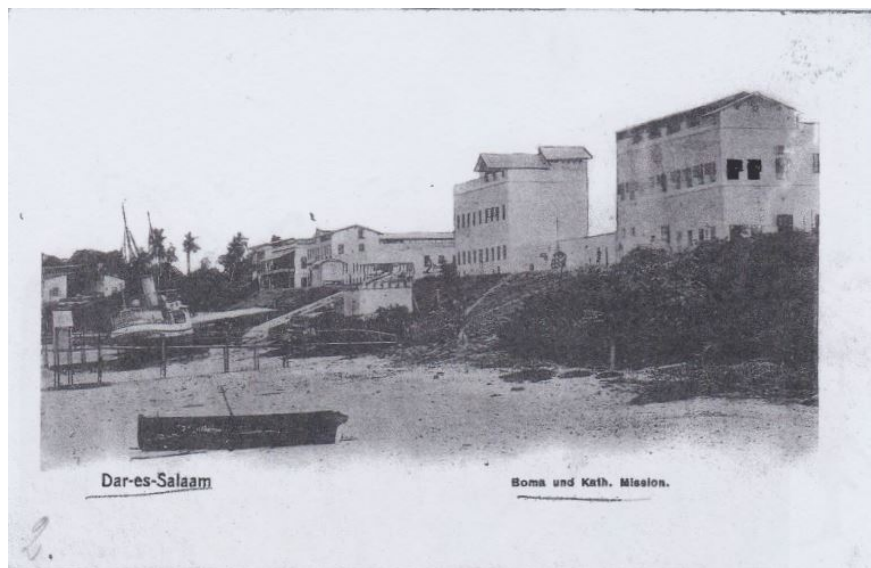


Fig. 7: Gable roofs on Arabic buildings in Dar es Salaam

Source: Author's archives.

These were then drained over the edge of the flat roof. Constructions of this type, eventually also without closed rooms but with the corrugated iron roofs only placed on supports, were soon recognized as advantageous and spread along the entire coast. Even today, the roof houses or rather covered terraces are found from Lamu to Zanzibar and even where they were unnecessary for structural reasons (concrete construction), they have been preserved as airy, shaded areas. During the early colonial period, the desire to remodel the existing buildings sometimes produced strange fruit. The Ratu House, which was important in Bagamoyo's colonial history, was acquired for 3,100 rupees in 1902 and for 8,650 rupees, it was so

thoroughly remodelled by 1905 that it was no longer recognizable.¹⁶ However, these methods were only available at the coast and even then not everywhere, since simply not enough buildings could be rented, confiscated or bought.

New buildings are erected as fortifications

The lack of available building stock but also the increased need for protection led to the first new buildings. After Wissmann's troops defeated those of Abushiri and Bwana Heri in 1889, accommodation had to be created for them everywhere too. This was the birth of the boma, today also known as the German boma. The term "boma" comes from Swahili, where it is a vague term for any defensive or protective enclosure. Thus, the wall of thorns that the Maasai place around their dwellings is called a boma, just like a massive fort is. In the course of development, German buildings often changed from pure military use to administrative and residential use. Eventually, in the final years, purely administrative buildings without any special defences were built. However, these buildings too are today often called "German boma". The quality of the buildings depended largely on the available materials, technically qualified construction supervision and the timing of their construction.¹⁷ This already shows that there were big differences in quality, which is why some

¹⁶ For this: Invoice in Tanzania National Archives (TNA), German Records G/27.

¹⁷ Wiskow, August (1896) *Zentralblatt der Bauverwaltung* [Central journal of building administration], No. 14, p. 154: "Often with rifles on their backs, worried by constant attacks, soldiers and workers erected the buildings with great haste. During this period, the stations of Tanga and Pangani, the fort in Quadja, the strongholds at Sadani and Bagamoyo were established in the north ... In the south in Kilwa an extensive fort arose, like in Lindi and Mikindani."

of these buildings from the early years don't exist anymore while others are still in usable condition – and are still used – today. Especially building in the hinterland required improvisation.¹⁸

Due to the special material used, for example quarry stone, this sometimes had a very positive effect on the lifespan of the building – especially after the transition to training the Askari protection forces as construction workers.

Tembes as interim solution in the hinterland

However, because of the relatively long construction times, interim solutions had to be found, especially in the hinterland. What often happened here was the tembe building mentioned by Prince. This involved adopting a design like that developed by the Wahehe and the Wagogo.¹⁹ The most important advantage was the short construction time, the most immediately available building materials for the site and the availability of experienced craftsmen. The technology is simple and allows various solutions. The walls consist

¹⁸ Prince, Tom (1895) “Marsch nach Kilimatinde [March to Kilimatinde]”, *Deutsches Kolonialblatt* [German colonial paper], Volume VI, p. 544: “A lot of corrugated iron had been sent from the coast but only a little had arrived; the little was only enough to protect the fabrics and the office from the rain. The building of tembes was prohibited because of the low demand for grass (probably supply of grass; R.H.) because of the difficulties in procuring the necessary amounts of wood quickly on one's own accord. Stone was the only building material left. And even if there were unlimited quantities of that at hand, it soon turned out that given the extraordinary strength of the granite and the lack of suitable hammers, it was not possible to build quickly with this either.”

¹⁹ Kesby, John D. (1977) *The Cultural Regions of East Africa*, London: Academic Press, p. 250.

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of poles set into the floor, evenly spaced, with the spaces in-between filled with wickerwork which is then coated on both sides with mud.²⁰ The load-bearing ceiling beams rest on posts, the tops of which consist of branch forks. This results in flat, sometimes slightly curved roof surfaces. The roof cladding consists of shrubbery and a thick layer of mud. For the Wahehe and other traditional users, there were two advantages associated with this design. First, the high risk of fire associated with the thatched roofs of other peoples was greatly reduced; second, the roof surfaces were also well suited as defensive measures in case of war.

Although tembe buildings still occasionally appear today, the heyday of this construction method was probably the mid-19th century to the start of the 20th century. The basic requirement was always the availability of timber, mud and grass or palm leaves. When the Arabs settled in the Tabora area and in Ujiji on their trade route to Lake Tanganyika, they built using the tembe method. These buildings, which were also designed as fortifications, always had one storey but occasionally also had walls made of air-dried mud bricks or compacted clay. The inner courtyards were not visible and the buildings sometimes had no windows to the outside. The elements of their architecture, rooted in their way of life and their religion (shielding the women from the gaze of strangers), was adopted into the architecture of the tembe. The great travellers of the 19th century, from Livingstone to Cameron and Stanley, have all lived in these houses, often for extended periods of time.²¹ In addition to clean

²⁰ Denyer, Susan (1978) *African Traditional Architecture: An Historical and Geographical Perspective*, Lusaka: Africana Publishing Company, p. 138; as well as *Guide to the Village Museum* (1966), National Museum of Tanzania.

²¹ Longland, F.A. (1936) "A Note on the Tembe at Kwihara Tabora", in:

handling and regular care of what existed, the lifespan of these constructions depended on the presence of termites. Of the forerunners (temporary buildings) of various German boma buildings, images of the tembe building method still exist, such as those of Tabora, Mpwapwa and Bukoba (Fig. 8).

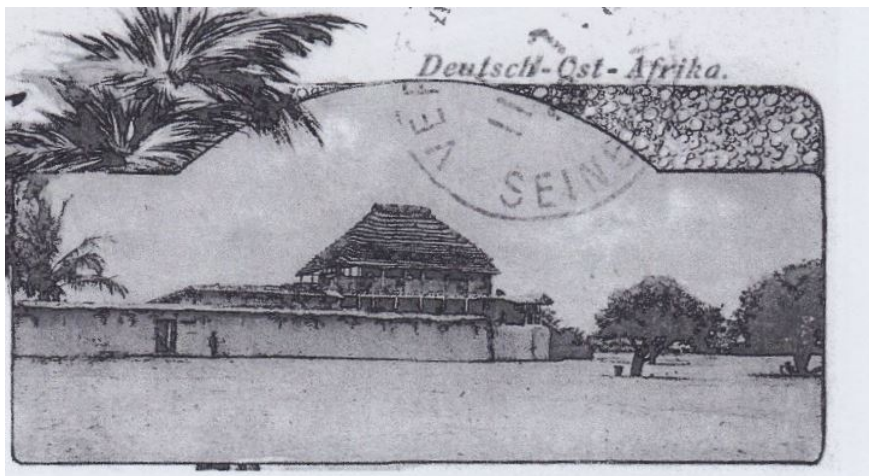


Fig. 8: Temporary boma in Tabora in the tembe construction method
Source: Author's archives.

Assembled buildings

In the last third of the 19th century, the endeavours of the European and especially the German construction industry increased, to offer prefabricated constructions. In itself, the idea of prefabrication or

Tanganyika Notes and Records, 1/84, pp. 84–86: “It is remarkable that Said bin Salim’s mud brick tembe should have sheltered both Livingstone and Stanley ... By then Livingstone had been an imprisoned tenant of Said bin Salim’s house for 189 days. He left Kwiwara on his last journey on Sunday, 25th August 1872.”

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assembled buildings is very old and was already practised by the Romans, as marine archaeology off the Mediterranean coast of Africa could prove.²² The interest in prefabricated constructions that now began was prompted by the colonial movement and its need for quick solutions. In principle, there were two different systems: the post-and-beam or half-timbered building and the panel construction method. A third method, buildings made of transportable individual rooms, does not seem to have caught on – at least not in German East Africa, possibly due to the high cost of transportation capacities. The colonial press at the time was peppered with advertisements from companies trying to sell their constructions as suitable for the tropics or even tropics-proof, without being able to show any experience.

Half-timbered construction, based on centuries-old experience, was an early choice in Central European building history. The historic half-timbered construction method is already an assembly design. All of the structures are cut to size and prepared on the so-called drawing floor. Ready-to-assemble components then arrived at the construction site. So, it was only natural that this historic technology would be used. For the construction projects in East Africa, however, there were two major problems. One was that European coniferous wood was normally used for cost reasons. However, this had no resistance to insect infestations and in particular, it seemed to be the preferred food for termites. Add to that the general disadvantages of softwood in unfamiliar climates. High humidity leads to warping. The second weak point was the filling material for the compartments. Here, long and ultimately successful experiments were carried out

²² Stiller, Adolph, “Das Haus als Ware – Stationen auf dem Weg zur Produktion [The house as a commodity – stations on the way to production]”, *Baukultur* [Building culture], 1/1998, p.46.

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with plasterboards. Even before the colony was taken over by the Reich, the DOAG had been forced to import half-timbered buildings. Probably after the first bad experiences with termites and field mice, constructions were developed in which the wooden stands were equipped with specially made metal feet with a casing around them. These casings could be filled with turpentine and this presented an insurmountable obstacle for all kinds of pests. Buildings of this type have not survived but the special metal feet, mostly made of cast iron, could still be viewed in the year 2001 in Bagamoyo and 2007 in Lindi.²³

However, the limited success of the first prefabricated half-timbered buildings could not stop the trend towards assembly construction because there were only a few building specialists in the colonial territory who were able to build conventional houses. In addition, such a construction method was usually not possible due to the considerable amount of time involved. After the government moved from Bagamoyo to Dar es Salaam, the administration expanded considerably and the need for space suddenly increased. At the same time, however, the need for living space for Europeans also increased. In order to create living and office space for the administration, which was still being set up, flexibility was needed. The decision was made to use prefabricated buildings with a multifunctional floor plan. The aim was to connect living space with office space in such a way that each of the two uses could be shifted as required.

The only remaining buildings from this period along the Kivukuni Front (formerly Wilhelmsufer) in Dar es Salaam are a good example

²³ Hasse, Tansania, p. 49.

of this practice. Of particular note here is the original house No. II from 1891 (Fig. 9), a courthouse, which between 2000 and 2002 was thoroughly restored after a fire.

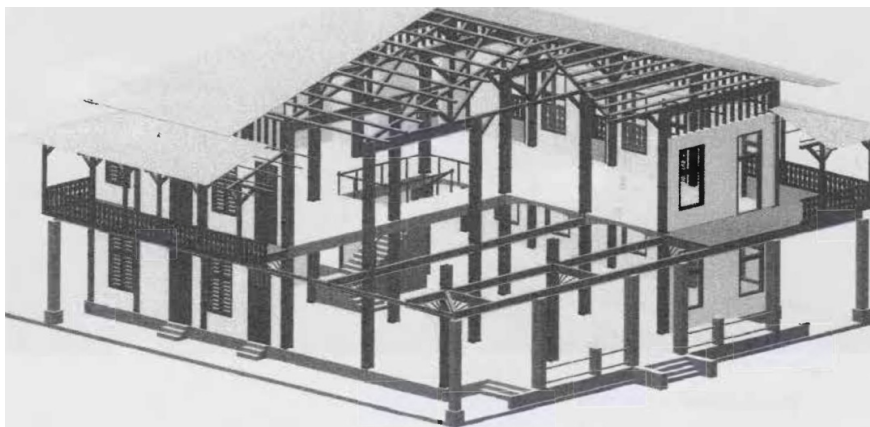


Fig. 9: Assembled building House No. 2, courthouse in Dar es Salaam, Source: Author's records.

This provided the opportunity to study the design and technology because now the subsequent installations and alterations have been removed and the actual architectural details emerged clearly once again. These were large buildings of over twenty metres in length in front and corresponding spans on the inside. On the upper floor, the veranda had a width of three metres and went around three sides of the building. The aim was to shade the ground floor walls but this wasn't achieved entirely, since the lower floor had a clear height of up to five metres. The upper floor was shaded by the roof overhang, which ended at the outer edge of the veranda. On the upper floor, all windows were designed as terrace doors and adapted to the room height, as well as being equipped with blinds in louvred doors up to 2.80 metres in height. The exterior design of these houses was largely characterized by the wraparound verandas on the upper floor,

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which rest on steel brackets. These brackets, where they were supported by the loaded pillars on the ground floor, were able to cope with the load of the wide verandas without bending, despite their large span. It was different where they met dummy sockets without corresponding loads on the ground floor. On this side, the construction led to the lowering of the verandas. This could be the reason why wherever this design was chosen, buttresses were subsequently added to prevent the verandas from sinking. How little these pillars were originally planned can also be demonstrated by the development of the governor's villa.

Another detail that was important for the external appearance of the building was created by dividing the main roof areas with horizontal ventilation slots. Ventilation of the roof space, which was closed off at the bottom with a suspended ceiling in wooden formwork but suffered from considerable heat build-up because the roof panel was made of corrugated iron on wooden shuttering formwork, should be ensured by the ventilation slots.

It was used in such a way that large parts of the ground floor were intended for administrative purposes, including those open to the public. Other rooms could be used for these purposes and ultimately, this use could be extended to the entire floor. As long as this was not the case, the rest of the space was used for residential purposes by the administration, which consisted mainly of bachelors. The surface of the top floor could be divided in such a way that it could accommodate either two families or four bachelors or offices. As the administration expanded, it eventually came to be fully utilized by them. The building, as well as some others, were constructed in Altona by the Franz Heinrich Schmidt Company and shipped to Dar es Salaam in 1891. Unfortunately there are no more documents about

these buildings other than the handwritten copy of a contract that the Schmidt company entered into with the carpenter Ch. Backhaus for the construction of the buildings on site.²⁴ Structurally, these houses were up to date. A mixed construction of wood and steel was chosen, plus a five-metre-wide vaulted ceiling with turnbuckles between the abutment beams and a light metal mesh to reinforce the concrete top.²⁵ The governor's villa in Dar es Salaam was built in the same way, in the same year. Today, this technique would probably be referred to as partially prefabricated assembled construction.

First initiatives for climate-appropriate construction

The Europeans suffered a lot in the hot and humid climate on the coast. It was known that ventilation at 29 degrees and humidity above 80% promised relief but no further information was available. According to an encyclopaedia from 1896, a tropical building must “be located and constructed in such a way that as few malaria germs as possible get into the rooms.”²⁶ That is not surprising because it was not until 1898 that Robert Koch was able to broaden the English knowledge of how the disease spread through the *Anopheles* mosquito. He succeeded in proving that the danger of disease transmission by mosquitoes depends on the altitude.²⁷ From

²⁴ National Archives of Tanzania, German Records, Volume 1, G 7/122; Becker, *Das deutsche Landhaus*, p. 206.

²⁵ Hasse, *Tansania*, pp. 96–100.

²⁶ *Brockhaus Konversations-Lexikon* (1893/97) Volume XVII, p. 984f.; cf. Voepel, Otto, (1905) “Kolonialstil [Colonial style]”, *Bautechnische Zeitschrift* [Structural engineering magazine], 20, pp. 217–220.

²⁷ “Berichte über die Ereignisse der Expedition des Geheimen Medizinalrathes Dr. Koch [Reports on the events of Dr. Koch's expedition of the secret medical council], *Deutsches Kolonialblatt* [German colonial

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November 1895 to November 1903, Friedrich Gurlitt (government master builder, later building director) was the building officer for the German East Africa colony. At the turn of 1898/99 he undertook a study trip to India and Ceylon and then implemented the knowledge he had gained there in East Africa.²⁸ Gurlitt was primarily concerned with climate-appropriate construction. When considering his work, it should not be overlooked that up to that point, the German colonial administration and their master builders had had no experience in tropical construction. Gurlitt's recommendations or instructions can be summarized as follows: the ground floor should be about one metre above ground level. The building must be designed to ensure the greatest possible cross-ventilation. This meant breaking up the façade largely through open arches and avoiding closed walls as much as possible. The partition walls should be replaced with easily removable dividers, maintaining a ventilation distance from both the floor and the ceiling and, where possible, are fitted with adjustable slats. With roof tiles on wooden formwork, the roofs were to provide significantly better isolation than the usual corrugated iron roofs. Where possible, a suspended ceiling should form a space between the roof panel and the living area, which also has an isolating effect and is vented. Great importance was attached to the shading of the outer walls to prevent them from heating up. Just the latter requirement led to considerable design effort.

paper], Volume IX, No. 7, 1.4.1898; and Dr. Robert Koch (1898) "Ärztliche Beobachtungen in den Tropen [Medical observations in the tropics]" speech in: *Verhandlungen der Deutschen Kolonial Gesellschaft 1897/98* [Proceedings of the German Colonial Society], Special edition, Berlin.

²⁸ Gurlitt, Friedrich (1899) "Bericht des Baudirektors Friedrich Gurlitt über seine indische Reise [Report by building director Friedrich Gurlitt on his Indian journey]", *Deutsches Kolonialblatt* [German colonial paper], Volume. X, No. 15, 1.8.1899, pp. 515–518.

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According to today's knowledge, these instructions are not so sweepingly fitting in tropical areas anymore. No distinction is made between building in hot and dry and hot and humid areas. This could be explained by the fact that almost the entire German East Africa initially consisted of a stretch of coast of varying width and a hot and humid climate prevailed here. As a result, considerations of a hot and dry climate were not relevant for building director Gurlitt. Simply put, in a hot and dry climate, shading the outer walls is of greater importance than in hot and humid areas, where the type and intensity of cross-ventilation is the essential criterion for comfortable living.²⁹

Friedrich Gurlitt continued to pursue his objectives, based on the knowledge that he had gained in India and Ceylon. This was evident in the area southwest of Robert Koch Street (now Luthuli Road) in Dar es Salaam. A number of residential buildings were built here which, with different external designs, consistently realized the high level of comfortable living as protection against climate stress. It was primarily housing for senior officials and government employees. The utilization concept remained variable, as with the large prefabricated buildings which were now imported more frequently. All double-storey houses were divided in such a way that they offered comfortable living conditions for several single men as well as for one or two families with children. In contrast to the prefabricated buildings, he attached great importance to roofing with baked roof tiles. However, since these could not be produced in the Dar es Salaam area, they were imported from India, which was said to be quite inexpensive (Fig. 10 and 11).

²⁹ Lippmeier, Georg (1969) *Tropenbau* [Building in the tropics], Munich: Callwey, pp. 82–87.

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Fig. 10: German colonial building according to Gurlitt's rules in Dar es Salaam, Source: Author's records.

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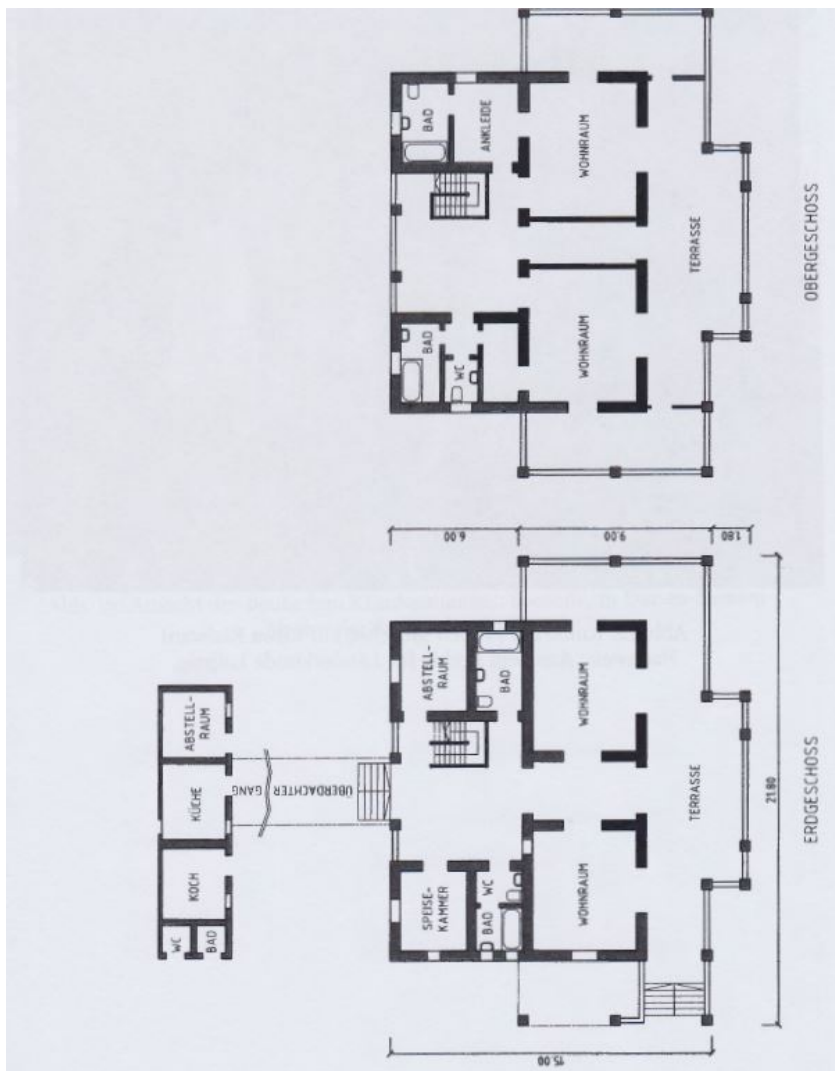


Fig. 11: Floor plan of the colonial building in Dar es Salaam
Source: Author's records.

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Gurlitt's residential buildings in Dar es Salaam – around 30 alone in the area around Ocean Road Cancer Institute and the governor's villa, of which more than a dozen were still in use by the end of the Seventies – are among the better ones that German colonial architecture has produced. Although the design varies greatly, the principles of climate appropriateness are adhered to in all buildings.

All houses are oriented in such a way that most of the sunny sides have wide verandas going around them. The core of the building is in the shade at all times of day, which indeed prevents overheating but has the unfortunate side effect of creating dark rooms. The latter is particularly annoying with cloudy skies.

It is noticeable that all of these houses had a separate kitchen building. The reason for this is probably primarily that unpleasant smells were avoided in the heavily ventilated buildings. In addition, the problem of attracting vermin has always been associated with the storage of food. Should drastic measures to combat this become necessary, this wouldn't affect comfortable living either. At the same time, these practical reasons made it possible to keep the African staff at a distance without having to use overtly racist arguments.

The question of style

After 1900, there can be even less talk of a uniform development of German colonial architecture in East Africa than before. Early on, private investors appeared, which had not existed before. With these, construction professionals also established themselves.³⁰ The latter adopted the stylistic elements of the architecture of the early years

³⁰ Becker, *Das Deutsche Landhaus*, p. 206.

for their commercial and private buildings. As a result, depending on what the builder and the architect liked, either climate-related construction or matters of representation were paramount. Only a few managed to reconcile the two influences: a development that was also evident in other colonial areas during the 19th century.³¹

The question of whether the German East Africa colony had its own architectural style must be answered in the negative. At the beginning of the 20th century, some essays were written in the ardour of national pride, believing that they had discovered a German colonial style.³² From a historical perspective, it seems that only the government's building authority thought about an architecture that was stylistically appropriate to the place. In any case, the printed pointed arch appears as a design element almost exclusively in his buildings. However, the printed pointed arch is the supporting construction and design element of the Swahili coast. It is clearly of Islamic oriental origin. What is important for East Africa, however, is that while it did not originate here, it was used early on already. The greatest example is the ruins of the Great Mosque of Kilwa on the island of Kilwa Kisiwani (Fig. 12).³³

³¹ Krieger, Martin (2009), "Koloniale Wohnkultur an der Koromandelküste zwischen 17. und 19. Jahrhundert. Von der Faktorei-Epoche zur territorialen Expansion [Colonial domestic culture on the Coromandel Coast between the 17th and 19th centuries: From the trading-post epoch to territorial expansion]", in North, Michael (Ed.), *Kultureller Austausch, Bilanz und Perspektiven der Frühneuzeitforschung* [Cultural exchange, balance and prospects of early modern research], Cologne/Weimar/Vienna: Böhlau, p. 421.

³² Voepel, *Kolonialstil*, pp. 217–220; Henninger, Hans (1938) "Koloniale Baukunst [Colonial architecture]", *Deutsche Bauzeitung* [German construction newspaper] 6, pp. 186–190.

³³ Garlake, *The Early Islamic Architecture*, p. 26.



Fig. 12: Ruins of the Great Mosque of Kilwa Kisiwani
Source: From the Archive for Geography, Leipzig

In German architecture of East Africa, the printed pointed arch occurs with such regularity – and indeed always in government buildings – that one can speak of a borrowed stylistic element. The printed pointed arch was used, among others, in the district office buildings of Mikindani and Tanga, Kilwa Kivinje, Lindi and Bagamoyo, often in connection to the raised pointed arch. The most prominent example, however, is the German hospital from 1897, now the Ocean Road Cancer Institute in Dar es Salaam, which was renovated in 2000. This building is by far the most successful construction in German East Africa. Successful not only because of the very elegant façade design and organizational structure but also because of the climate-appropriate execution (Fig. 13).



Fig. 13: View of the German Hospital, seaward side, in Dar es Salaam, Source: Author's archives.

Summary

The founders of the German East Africa colony found a solid construction method on the coast, that was based on Arabic architecture. However, the technology was limited by the available or easily accessible materials. Decisive was the availability and the use of coral stone – as quarry for masonry but especially for the burning of building lime. These two factors, combined with mangrove wood, led to multi-storey buildings that could be used by the Europeans. In the hinterland, where coral stone was not available, technology used by the Wagogo and the Wahehe served as a temporary solution until solid structures were completed. The Arabs

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had already known how to use this for themselves too and had improved on it. Even before the turn of the century, prefabricated buildings were imported to a considerable extent. Here, the technology was based on historical experience with European half-timbered construction. The utilization concepts were always variable. There was administrative use and housing use. Building director Gurlitt undertook a study trip to India in 1898/99 and there he studied the climate-appropriate construction method developed by the English. This then led to a number of high-quality housing developments for government employees and officials in Dar es Salaam. The application of these design criteria to the private buildings that were then created was based on the priorities of the builders and later architects. Representation was often more important than climate-appropriate design. It was seldom possible to combine the two.

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Tansania. Das koloniale Erbe. DIN A 4 Querformat, 207 Seiten,
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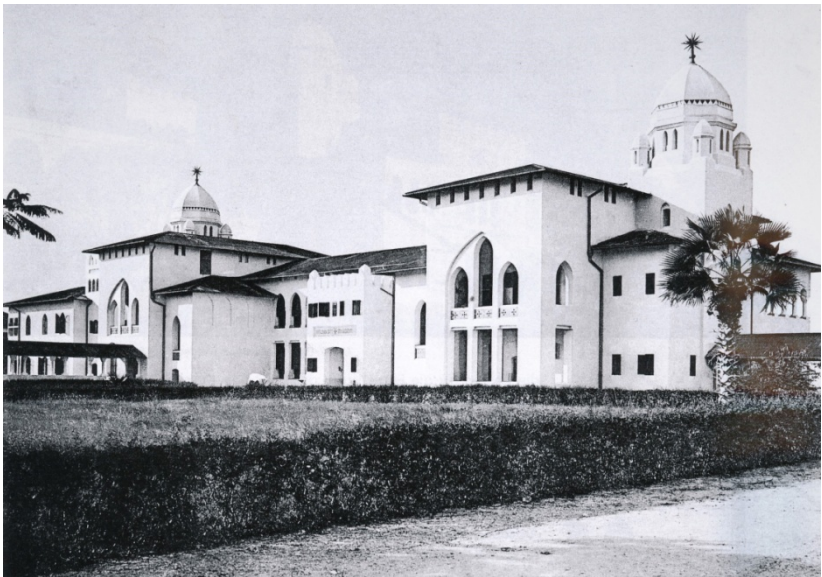
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Website

<https://kolonialeserbe.rushwa.de>



Boma Arusha after restauration 2002



Ocean Road Hospital, Dar es Salaam 1905



Boma Mikindani after restauration (Hotel) 2004



District Office, later Town Hall, Dar es Salaam 1903



Protestant Church, Dar es Salaam 2004



Railway station Kigoma (End of Central Line) 1999

