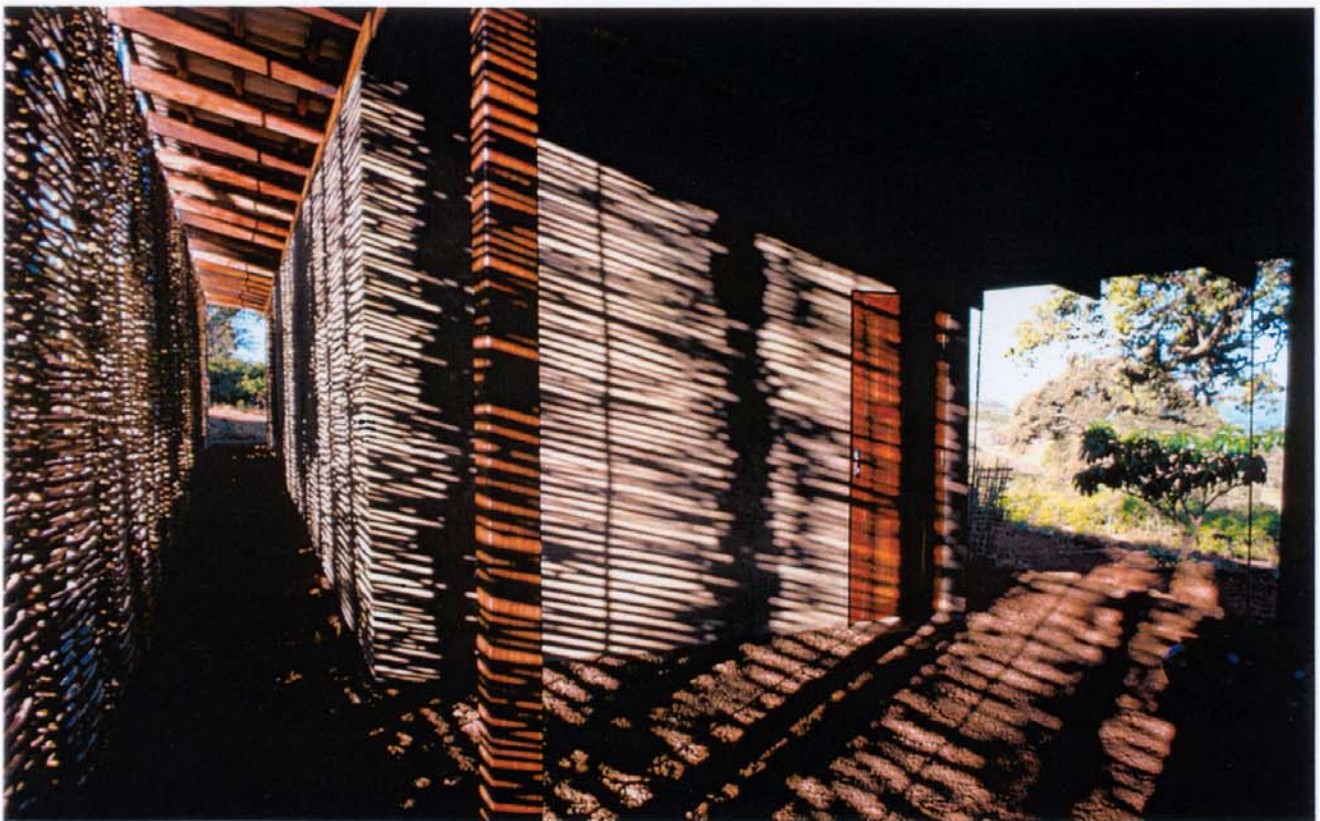




by Fernando Varanda

Villa Eila

Mali, Guinea



Architect
Heikkinen & Komonen Architects

Client
Eila Kivekäs

Design
1993

Completed
1996

Villa Eila

Mali, Guinea

I. Introduction

Villa Eila is the house built by a wealthy and cultivated Finnish woman, Eila Kivekäs, in the town of Mali, set in the Futa Djallon Mountains of the Republic of Guinea. It was there that, in 1989, Eila Kivekäs founded a non-governmental organization (NGO), Indigo, which aimed to develop traditional crafts and to assist with the general improvement of the living conditions of the population. The house was designed by the Finnish architects Heikkinen-Komonen who combined their native familiarity with timber structures with local materials, improved using simple technological advances. The house was the second of five projects designed by these architects for this client using a similar programme and materials.

II. Contextual Information

a. Historical background

Eila Kivekäs's first direct contact with the culture of Guinea was in Helsinki. Because she was able to speak French, she became the interpreter for Alpha Diallo, a Guinean agronomist who had been invited to visit Finland after translating into Fulani the Finnish epic poem *The Kalevala* while he was a postgraduate student in Hungary. They became friends. Alpha died while he was in Finland, in 1984. Eila arranged for his body to be sent back to Guinea to be buried in his home town, Mali.

Eila knew of the project Alpha had conceived with his friend and uncle, Bachir Diallo, a vet, to create a poultry farm to counteract the chronic protein deficiencies in the Guinean diet with the high levels of the nutrient provided by chickens. So, in 1984, Bachir, who was in Canada at the time, received a telephone call from 'Madame Eila', as she became known, proposing that he return to Guinea and initiate, with her support, the poultry farming project. They met in Guinea and the poultry farm was started in 1986, near Kindia, 120 kilometres inland from Conakry.

Through the establishment of the poultry farm, Eila met one of Bachir's relations, Suleymane Diallo. Eila explained to him that, besides opening the poultry farm, she wanted to collect material from West Africa to present at handcraft exhibitions in Finland. She asked Suleymane to accompany her and in 1985 they began travelling throughout West Africa.

In 1988, on their way overland to the Republic of Mali, where she was going to gather material for an exhibition on the Dogon, they stopped in the town of Mali (in Guinea), Suleymane and Alpha's home town. Mali town has a population of two thousand people, who live at an altitude of almost 1,500 metres in a mild climate, surrounded by beautiful scenery. Eila was very taken with the town and became extremely interested in the local crafts, particularly those of the women – including indigo cloth dyeing and pottery – and in the local Women's Centre, whose director she met.

The next year Eila went back to the town of Mali and made a personal gift of money to repair the Women's Centre. Thus began her direct involvement with development in Mali town, which, in parallel with the organization of four exhibitions in Finland, caught the attention of friends, family and the Finnish government and led to the establishment of an NGO, Indigo.

Indigo was launched in 1989, with Suleymane Diallo as Eila's counterpart and director in Mali town, and had diverse objectives in the fields of infrastructure, health, education and environmental conservation, and the development of local crafts, particularly through the Women's Centre, which supported women's self-help. Primary schools were built in two villages: Madina Kouta, some 40 kilometres from Mali town, involved the construction of a road – Indigo's first infrastructural work – enabling quicker access to Senegal; and Boundou Koura, located 12 kilometres away. Environmental concerns took two major forms. The first, directly related to the rural and natural context, was reforestation and the establishing of nurseries; the second sought to reduce the use of wood as fuel in the building-construction process. The use of solar energy was promoted, with the installation of a battery of photovoltaic cells to power the main water pump in the centre of the town.

When Eila first saw Mali town, the soft forms of thatched, raw-earth conical houses were giving way to angular buildings of cement-rendered fired brick with hipped tin roofs, that had little to offer in the way of visual attraction and climatic comfort. Bricks were fired in small kilns which consumed disproportionate amounts of wood. Eila took a keen interest in experiments undertaken by other non-governmental development agencies in the region, using stabilized earth-blocks.

There was a need to develop and create an example of a cost- and energy-saving building using local materials that gave improved climatic performance. The town already had a hospital and a health centre but an opportunity arose when plans were made to construct a small dispensary, to provide medical assistance to villagers. (The dispensary was short-lived for reasons of compatibility, competence or both, and re-opened recently as a hostel, mostly for visitors and tourists brought in by Indigo.) Eila went to Finland and came back with a design by the Finnish firm of architects, Heikkinen-Komonen. The project, built in 1993, introduced the material principles that would be applied to Villa Eila and the other projects sponsored by Indigo, adapting structural principles common in Finland to local craftsmanship, and introducing innovative techniques using local materials, such as stabilized earth-blocks. A group of masons was sent to be trained in making these blocks by Essor, a French NGO. The dispensary itself became the training and experimentation ground for crafts, from masonry and carpentry to roof- and floor-tile production, which were used in subsequent projects.

Villa Eila came next. Eila would come to Guinea two or three times a year for a month or six weeks, staying in friends' houses. She had vacillated between building a house in Kindia (closer to the poultry farm) or in Mali town. She made her decision in 1993 and chose Mali town. The experimental construction process would continue with this project, a small house for herself and for Indigo's guests, set in an inspiring location on a slope looking onto extraordinary sunsets behind shadows of mountains, turned misty by the haze of forest fires. Construction began in 1995.

In 1997, the primary schools were built: for Madina Kouta thatch and bamboo were used for the roof, while Boundou Koura was a wooden structure with a tin roof. The next year saw the construction of the Kahere Poultry Farm School, and the market in Mali town, this last project being designed by the architect Ville Venermo, who had worked as a supervisor in Kahere for Heikkinen-Komonen.

Eila Kivekäs died in Finland in October 1999 at the age of sixty-eight. The Indigo project has continued, with Suleymane Diallo as the local director, supported by periodic visits from Finnish officials. However, its future seems uncertain.

b. Local architectural character

This is Fula country, and examples of its characteristic form of dwelling still exist, even inside the town. Schematically, the dwellings are round constructions made of raw earth-blocks with conical thatched roofs. They have three distinct purposes: sleeping-cum-common room in large structures, cooking in smaller structures, and male socializing in covered areas without walls. These three structures are grouped around an open space, usually with a large tree in the centre, where all the household activities take place, such as the preparation of food, cooking, washing of clothes and indigo dyeing. A woven-walled enclosure, constructed on a spiral plan, may be found slightly offset, accommodating a latrine and private ablutions. This basic scheme is adopted elsewhere in the country, with small variations. In this region, however, certain formal characteristics are notable: the stepped thatching on the largest structures, the regularly disposed wooden poles supporting the projecting edges of roofs, and fencing to form enclosed compounds.

Coexisting with this type, even in the countryside, is the most ubiquitous model, introduced as a result of colonization and urbanization. This comprises a building with a rectangular plan, hipped roof and a porch, which may wrap around the house but is usually restricted to part or all of the front. This porch may be an extension of the roof slope or a separate lean-to. In recent years, an 'American roof' has become popular, which consists of staggered pitched roofs. Simple joists between end walls can support the covering, with no need for trusses. This model is simple and cheap to erect and has become popular. A porch with two or more arches is typical.

Corrugated sheets made from an alloy of aluminium and zinc (now produced in Guinea) have rapidly become the preferred material for roofs, despite their deplorable insulation qualities. The most usual material for walls in these houses is still earth-bricks, fired in local kilns. The bricks (which are about 10 by 20 by 25 centimetres) are laid on the narrowest side and are frequently held together by a rudimentary concrete. The walls are finished with concrete rendering. Climatic conditions inside these buildings are poor, although they improve with the introduction of ventilation holes in the space between the roof and the ceiling on the end walls, common in buildings with an 'American roof'.

The plan of these houses usually follows a simple scheme, with the common room opening directly onto the porch, and sleeping rooms disposed on either side of a corridor that runs

from the common room. Houses may be equipped with modern bathrooms with all the fixtures, even though running water is not guaranteed. There is often a round hut for the kitchen, although the main activities of the household continue to take place in the tree-shaded yard in front of the house.

Fired bricks are produced using a similar method to that found elsewhere in the country. Blocks of earth, excavated nearby, are shaped using a wooden mould, dried in the sun, and then arranged in cubic piles, several spaces being left at the bottom for burning wood. Finally, they are sealed with mud and the fires lit. Two days after the wood has completely burned, the bricks are removed. Those which are not well baked are fired again. The quality of the finished material is not very good and the amount of fuel needed is considerable.

While there are a couple of buildings from colonial times made from reinforced concrete, concrete blocks are still rare in Mali town, although public buildings constructed with foreign aid, are mostly built from this material and covered with corrugated metal roofs. An exception to this is the library, which is made from stabilized earth-blocks.

c. Climatic conditions

The climate is mild, with temperatures in the upper 20s (°C) in the hottest months (April and May), falling as low as 3°C in the coldest months (December and January). The rainy season begins in June and lasts for three months, with incessant rain for days at a time, peaking in August at around 500 millimetres.

d. Site context

Villa Eila is set in a large tract of land at the northern edge of Mali town, on a slope facing west-by-north-west, with an average incline of 20 to 25 per cent (10–15°). The house stands on a concrete platform raised about one metre above the lowest point. The yard in front is roughly terraced.

e. Site topography

Mali town is set at an altitude of 1,460 metres, the highest settlement in the Futa Djalon. The town spreads across a small plateau, with gentle elevations and excellent views of the surrounding peaks.

III. Programme

a. Objectives

The history of the client's involvement with Mali town explains the thinking behind the programme. Eila Kivekäs and visiting officials needed a house, but it appears that Eila also wanted to continue setting an example, stimulating the activity of local craftsmen and exploring the potential of combining local materials with good design. Her background gave

her a familiarity with architecture and architects, so it is not surprising that she secured the services of highly regarded Finnish architects.

b. Functional requirements

In the case of Villa Eila, the programme was even simpler than that of the dispensary. Eila seems to have wanted very little in the way of added comforts to basic shelter, so the spatial programme for the house differs little from the traditional hut layout described above.

IV. Description

a. Project data

The project evolved around two major issues: the exceptionally picturesque qualities of the site and the requirement to use local materials, improved by means of simple technologies.

The house is set on a long, narrow platform (6.7 by 33.5 metres), terraced along the contour lines of a 25 per cent west-facing incline, which meets the slope on the eastern side. It is raised about one metre above the yard on the western side. The building layout is similar to that of the dispensary: a continuous covering of 200 square metres spreads across the platform and shelters separate walled-in areas of 76 square metres with shaded areas (porches) in between. These porches act as areas for most everyday activities.

The walled-in spaces correspond to a very simple programme and their function is formally identified: round volumes at either end of the complex are guest rooms, each measuring 10 square metres; a quadrangular volume, measuring 13 square metres, is for services (storage, latrine and bathing area); a rectangular structure is the owner's living-sleeping area comprising a 17-square-metre bedroom connected to a common room, measuring 26 square metres, with a counter and cupboards at one end for the preparation of meals. The continuous roof extends over these volumes by 1.2 metres at the front and the back and is 40 centimetres higher than the round rooms. The front covered area, which faces west, is the main circulation route for all the rooms. The back gives access to the latrine and bathrooms and is sheltered from the adjacent slope by a continuous bamboo screen, which turns the passage into a corridor. Behind the screen, a well-defined ditch separates the platform from the slope and collects run-off rainwater.

Climatic comfort is provided by the shade of the continuous roof over the detached volumes, by the properties of the wall and roof materials, and by cross-ventilation at roof level, with air circulation between the tiles and the straw ceilings. The bamboo screen on the eastern side was also intended as a climate-control device, to filter the morning sun and wind and rain.

b. Evolution of design concepts

The design reads, above all, as a plan, a drawing. In this it shows the same approach as the dispensary. Rectangles and circles are defining elements and adherence to geometry is a compositional rule. On a basic module of 1.2 metres, the wooden structure sets a grid of 2.4

by 3.6 metres, 2 by 3 modules, inscribed in the rectangle of the platform, leaving 1.2 metres all around. The proportion of this rectangle is 1:5, if the width of the retaining wall is considered; in net surface, it is 5 modules wide and 28 modules long. Within the first four modules from the north side of the platform, a circle is inscribed, centred on the diagonal of the rectangle made between the two lines of structural posts, and with a diameter of 3 modules. Next to this is the square walled area, with sides 3 modules long, which can be inscribed in a square drawn from the point of intersection of the second (rear) line of posts and the western edge of the platform. This square is the first of five into which the rest of the platform can be divided. Next to the walled square, 4 modules define the service porch. These three areas span 10 modules within the grid made by the posts. The next walled rectangle covers another 10 modules; 4 modules are left without walls (dining porch), and the next 2 modules centre the last circle.

Variations in the proximity of the elements enliven the rhythm, while the round circles at the ends cancel the appearance of grid-like rigidity. Evocations of traditional forms and uses are apparent, but the actual forms and positions follow different rules. The traditional layout, with functions divided into separate structures disposed around a central area, is converted to a single longitudinal structure open to a wide space.

The angle of the covering is noteworthy: 14°, roughly the slope sufficient for a roof in conditions of moderate rainfall and no snow. As a result, the roof is parallel with the slope. The bamboo screen, defining the eastern boundary of the house, is used for both climatic reasons and with reference to local traditions: bamboo is still a common material, especially for fences. The structure is, however, in itself, the creation of the architects, a metaphor for the textures and the structural skeletons of roofs before the thatch is laid on. Justification for the screen may be found in the shadows it makes more than in the need for shade.

The openings within the walled structures are of three kinds: squares of 30 by 30 centimetres with fixed glass, usually placed high up, on the eastern walls; a panoramic glass door-cum-window in the living room and a smaller window of the same type in the main bedroom; and doorways with solid wooden doors.

The choice of finishing materials was determined by the products of local crafts – glazed tiles for the floor of the main structure (the other rooms are cemented) and straw ‘mats’ for the ceilings. The floor of the circulation and open spaces between the rooms is red laterite gravel, a choice probably dictated by formal considerations as much as by the convenience of having a permeable surface. The stabilized earth-block walls are rendered with concrete left its natural colour. The fibre-cement tiles are also uncoloured.

Little is known of the original user requirements. It can be gleaned, from accounts of those who knew Eila that she was acutely aware of social inequalities – ‘our world is divided in two: there is the world of abundance and the world of poverty,’ were her opening lines in the catalogue for the last exhibition she organized on Dogon crafts – and was determined to live frugally in spite of her considerable wealth. Her son claims that she did not even want electricity; photovoltaic cells were apparently used for the house because they were left over from the installation at the dispensary. The same down-to-earth attitude and an acute

sensitivity to conserving natural resources may explain the absence of running water and the primitive nature of bath and toilet facilities. Perhaps Eila also wanted to recreate, to some degree, the style of life in a traditional dwelling.

The present users, Eila's son and his Malinké wife from nearby Labé, who have come for short stays, seem to have adapted to the existing conditions. For them, this was Eila's house and it naturally reflects her idiosyncrasies. However, several aspects were found to be impractical: for example, the long spaces between the areas for cooking, eating and washing-up, and the inadequate protection from wind and rain provided by the bamboo screen.

The treatment of outside spaces was essentially limited to a small retaining wall in front of the house, defining a yard as wide as the footing platform, marked at one end by a large, existing tree which has a semicircular bench around it, similar to an arrangement in the dispensary's yard. Plant life consisted of the existing species, but a recent fire destroyed most of the vegetation.

c. *Structure, materials, technology*

The structure of the building combines Nordic familiarity with wooden elements – posts and rafters joggled and fastened by simple steel components – with walls made of single-thickness stabilized earth-blocks. In order to resist strong winds, the roof overhangs on the west and east sides are tied to the edge of the footing platform with thin steel rods and tensors hooked on loops anchored into the foundation, those on the eastern side also supporting the bamboo screen wall. The rods on the west side are covered with rope coiled along their length.

The roof tiles are made of a 3-millimetre thick mixture of cement with glass or plant (sisal) fibre, moulded on site. Ceilings in the northern guest room and in the main block with the master bedroom and common room are made of woven straw. In the service area the tiles are exposed and the southern guest room has masonry plates between the rafters and the tiles.

Floors are of laterite gravel in the covered area outside the rooms while in the guest rooms and service block they are cemented. The main living space – bedroom and common room-cum-kitchen – is paved with local glazed ceramic tiles, as used in the dispensary.

The stabilized earth-blocks are made from a mixture of an appropriate earth and a small quantity of cement (3 to 5 per cent). At the optimum level of moisture (12 per cent), blocks of 15 by 15 by 30 centimetres are moulded in a hand press (the most efficient model is imported from Belgium). These are made one at a time, but a team of six people can produce between seven hundred and one thousand blocks a day. Their climatic performance, which is dependent on mass, is better than that of raw earth-blocks.

Local opinion identified traditional raw-earth construction with poverty and primitiveness; fired bricks seemed like a step forwards in terms of building quality and status. Experiments using stabilized earth-blocks in buildings had been promoted by Belgian and French NGOs, both in this region and the lowlands, and the results were convincing. It seemed likely that

this material would compete favourably with the production of fired bricks, which are not only inefficient but illegal. Furthermore, fired-brick walls need to be rendered in concrete whereas stabilized blocks, which are hard and have a good finish, can be left exposed (although those of the dispensary and Villa Eila were rendered). The production of stabilized bricks in Mali, however, has not developed to the extent it has in other parts of the country, particularly near Conakry, where large enterprises have recently been established.

Public utilities in Mali town are virtually non-existent. Water is carried from wells and boreholes; electricity is confined to a few places served by private generators, the main objective being to power televisions; telephones are limited to public institutions and services.

Villa Eila has no running water. Water carried from a well on the property is used for washing and is stored in plastic containers in the toilet and bath compartments and decanted using a cup or a kettle. Drinking water is from a borehole nearby, reputed to have very good water, and is stored in clay jars to keep it cool. The kitchen in the counter-and-cupboard area of the common room is equipped with a tabletop two-burner range fuelled by bottled gas. Both washing-up and laundry are undertaken in the porch next to the main bedroom. Dirty dishes and kitchenware are carried there, either along the passageways outside the rooms or through the bedroom. Electricity is limited to an hour a day, supplying two small neon tubes, one in each porch, which are otherwise powered by an inadequate photovoltaic cell.

d. Origins of technology, materials, labour force, professionals

The Finnish architects introduced the technology of wood-frame construction which locally had been limited to roof trusses in the older hipped-roof houses.

When local masons were trained by Essor to work with stabilized earth-blocks they were also instructed on the construction of dry-stone walls, which are used around the yard of the house. The head carpenter, from a local family, was called in from Conakry to make the formwork for the foundations and then to undertake training to work on the wooden frame, this being his first contact with this type of structure. When the plans arrived, a two-month course was organized by the architects' representative and site supervisor, Bjorn Julin, during which the plans and the form of construction were thoroughly studied by the building team. All the labour was local.

The glazed floor tiles were made by six women from a nearby village, Coloci, with moulds built by the carpenter. They brought the clay from Coloci and worked on site. The tiles were fired using a traditional method: first they were sun dried in their moulds for a week, then an open fire was laid and the tiles piled on top. After two hours of firing, the tiles were ready to be used the next day. After the project, the production of these tiles took place in the village, the moulds being sent there and the finished tiles being packed in boxes. The tiles are attractive but they do not wear very well, particularly outdoors as the glaze tends to flake off.

Wood – hard mahogany (*acajou*) for the structure and softer *samba* for the doors – came from the Guinea forest and was bought in Labé, the main town of the region, and in Conakry. Cement, steel and glass were brought in from Conakry.

V. Construction Schedule and Costs

a. History of project

The project was commissioned in 1993 and construction began in 1995. The house took one year and five months to be completed, including the initial two-month course and a break for the rainy season.

b. Total costs and main sources of financing

No information was available on total costs. A rough estimate made by the construction-team leaders (the head mason, the carpenter and the tile maker) placed the cost at about GNF 40 million (USD 23,000), funded by the Indigo association.

VI. Technical Assessment

a. Functional assessment

This house can be seen in two different lights. The first is that of the design framework, with its references to an understanding and appreciation of the site and to geometry. The design was tailored to a fairly simple set of structural options, bearing in mind the priority of using local materials and a relatively unspecialized labour force, trained on site. The other is performance, in terms of comfort and functionality.

The living spaces for the permanent residents seem adequate in area, climatic comfort and natural light, but the round guest rooms are meagre (with a net area of 8 square metres) and, for their proportions, were felt to be more like dungeons than huts. As these rooms have solid wooden doors as the main openings, they have no natural light or views of the landscape unless the doors are left open and the interiors are fully exposed to the main passageway. If the door in one of these rooms is closed, the occupant is left in a space that is minimally lit and poorly ventilated. In evoking a traditional form of dwelling – round, with a single door – the architects seem to have forgotten that, not only are the doors of traditional houses usually lower than eye level, but they are also preceded by their own porch, so that, although the door will be permanently open during the day, no one will come intrusively close to the interior to circulate to other parts of the complex. The round form of the rooms coupled with the limited space makes it difficult to fit conventional furniture, as is presently used, inside. It seems to have been suggested at the design stage that customized furniture could be made, but this was not put into practice.

b. Climatic performance

The climate of the region is never too hot but it can be rather cold in the cooler months. In the main quarters of the house, single-block walls and top ventilation were sufficient to keep the interior temperature at acceptable levels during hot weather, although the circular rooms were stuffy if the doors were closed. The performance of the rooms during the cold season could not be evaluated. The porches, very comfortable at the hotter hours of the day, were cold in the morning and in the evening, even during the hot season. It was felt that the bamboo screen, for all its picturesque qualities, was an obstacle to what should have been an advantage, the morning sun. The toilet/bath area, opening onto the passage on the bamboo-screen side, is permanently in shade. In cold weather and with the existing facilities, taking a bath must be a Spartan experience (an Indigo project worker who lived in the house after Eila Kivekäs built a sauna beyond the yard). On the other hand, the screen provided flimsy protection against wind and rain coming from the east, allowing them to penetrate well into the porches.

c. Choice of materials, level of technology

It seems slightly absurd that, although there was access to the technology of solar energy, its installation in the house was limited to an inadequate sample. The primitiveness of the toilet and washing facilities seems like a rejection of elementary improvements in water supply and waste disposal that have been tried elsewhere, and would have been possible on the site. This seems particularly strange in view of the high incidence in the area of endemic diseases that come from unsanitary conditions. It could be expected that, with the desire to present the house as a progressive example, this aspect should not have been neglected.

d. Ageing and maintenance

After five years, the house shows various signs of wear: sagging woven-straw ceilings; roof tensors too loose to fit into their ground loops and with rotten rope coverings; warped doors to the bath and toilet compartments, mostly due to the rain that penetrates the bamboo screen; the bamboo screen itself dried out and broken in parts. There are signs of leaks through the roof – in the dry season it was not possible to evaluate the extent of this problem – probably due to hairline cracks in the tiles or to the roof pitch being insufficient to withstand the periodic heavy rains.

VII. Users

a. Beneficiaries of the programme

Eila Kivekäs, her family and guests were the beneficiaries of the programme, along with guests and workers of the Indigo organization.

b. *Response to project*

The response to the project varies. The dispensary and Villa Eila were presented by the architects in the architectural magazine *Domus* as 'examples of European architecture...which show in an astonishing way that the fundamental principles of a comprehensively responsible way of building are universal'. Its uniqueness is appreciated by those who have worked in it as well as by local visitors and the present occupants, Eila's son and daughter-in-law. However, questions of comfort, as described above, met with less enthusiastic answers. The head mason sees the house as a monument to Eila's memory – as long as the house exists, people will think of her.

VIII. Persons Involved

Eila Kivekäs: client and user and founder and director of Indigo, represented, after her death, by her son, Antti Utriainen.

Suleymane Diallo: local director of Indigo and coordinator of the works with Eila.

Markku Komenen, Heikkinen-Komonen Architects: architect.

Bjorn Julin, Heikkinen-Komonen Architects: architect and site manager.

Mohammed Kandara Souaré: head mason

Suleymane Souaré: head carpenter

Moustapha Souaré: master tile maker

The women potters of Coloci

A body of local masons, carpenters and helpers.

Fernando Varanda

May 2001

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