

RECORDING THE CULTURAL HERITAGES OF SAMOA AND FIJI ISLANDS

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ABSTRACT: During an joint excursion of the Institute for History and Theory of Architecture and Historic Buildings Survey of the University of Technology Vienna and the Institute for Social and Cultural Anthropology (Ethnology) - University Vienna the traditional architecture of the Samoan and Fijian island have been surveyed by methods of architectural building survey and photogrammetric usable recording.

The architectural cultural heritage of the islands of Samoa and Fiji are very special in their way of showing the culture and tradition of their inhabitants and be a mirror of their way of living. The wooden skeleton structures of the buildings are unique and provide a very good adoption to the climatic conditions of the region. But the traditional architecture is declining rapidly in the region of the South Pacific as more and more people like to build their houses in a “modern” western style, which provides more comfort and more privacy in some ways.

The aim is to create a comprehensive description of the structures of the different types of traditional buildings as long as they are still available. For that purpose it was necessary to use fast and efficient recording methods and procedures. Photogrammetric recording may be a sufficient way for solving this problem. But conventional photogrammetric methods using metric cameras suffer the lacks of: being too sensitive for the climatic conditions in the region, can be handled by photogrammetrists only and finally of just being too costly.

One of the excursion’s aims has been to prove the use of non-photogrammetric recording done by architects using the „3 x 3 Minimum Rules of Architectural Photogrammetry“ for recording wooden skeleton constructions. Several objects of different buildings types have been recorded from their outsides and also their interiors. For that purpose it was necessary to adapt the „3 x 3 Minimum Rules of Architectural Photogrammetry“ for the recording of rooms inside a building.

The implementation of guidelines to record interiors into the „3 x 3 Minimum Rules of Architectural Photogrammetry“ and the description of the interdisciplinary workflow for the photogrammetric restitution between photogrammetrists and architects are described in this paper.

1. INTRODUCTION

1.1 Task

The Institute for Comparative Research in Architecture was founded in autumn 2002 to offer a base for scientists who are interested in working in interdisciplinary projects concerning architecture and the interaction between the built and the natural environment.

With an excursion to the Pacific island groups of Samoa and Fiji started a project for the documentation of the architectural heritage of the Pacific region. Representatives of the Institute for Social and Cultural Anthropology, of the University Vienna, the Institute for the History and Theory of Architecture and Historic Building Survey and the Institute for Photogrammetry and Remote Sensing, University for Technology Vienna visited the islands to record traditional building structures an the interaction between the social life and the built environment.

1.2 Traditional Architecture Samoa and Fiji

The cultural heritage is a part of our identity. What the house is for the family, villages and cities are for municipal communities. Buildings and their arrangement form a frame of memory that just in absence as "home" is felt. Especially the architecture of the South Pacific region mirrors the culture and the art of life of its inhabitants.

The indigenous architecture of Samoa and Fiji are showing house forms, which are unique in their structure and form worldwide. The separate construction types differ not only in their form and size, but also by independent construction ways. Valid principles of architecture can generally be derived from the typological sequence of the simple wall-column structures about the complex frame construction up to high-complicated suspended constructions, which contribute to an extended understanding of the architectural development and the interrelations between building and society.



Fig.1: Fale Tele, Samoa

Whereas in Samoa open structures are representing the open characteristic of the society in Fiji closed forms are dominating.



Fig.2: Mbure, Fiji

The wooden skeleton structure that build the base for buildings on both islands show high skills in handy craft and a good knowledge about materials. But these traditions are declining. The hot and damp climate limits the durability of the buildings to approximately 20 years. Steady and complex renovation work extends the life span of the fragile architecture. But the number of people who can afford costly and work intensive procedure is inclining steadily. As there is no direct need, also the knowledge about the building process, the static features and the handy craft is sinking into oblivion. It is a matter of generations that the unique architectural heritage of Samoa and Fiji is lost forever. For a comparative recording of the traditional architecture, from purely technical point of view to its cultural value and the influence and relation to the social structures an interdisciplinary approach is needed. This paper shows a possible solution for a discipline overlapping research work.

2. INTERDISCIPLINARY DOCUMENTATION

A good co-operation with local institutions enabled the group to visit different villages. By living with the people, staying in their house and in long intensive discussions, a lot of information could be gathered.

2.1 Anthropological research

The anthropologists, who have knowledge about the customs, introduced the group to the people. Both in Samoa and in Fiji for the admission to a village one has to follow special welcome ceremonies. The central part of this is the preparation and the drinking of “Cava”. Cava is a drink, made of the pulverised root of a pepper shrub and water. In former days the village virgins performed the making of the cava. Today the chief consigns young untitled men with this task. After the welcome ceremony people may walk free around the village. As all villagers took part at the welcome ceremony they knew the intention and invited the scientists into their houses. In interviews a lot of traditional ceremonies around the building of a house were explained. Often young people functioned as translators as many of the elder don't speak English. In that way they also learned about traditions that are not performed any more. Many young ones were astonished about the value and importance historic buildings still have in the lives of their grandparents.



Fig.3: Interview with a carpenter

From builders and construction workers the anthropologists learned to know why the traditional style of housing and building is declining. A very important reason is the fact that young people who look for higher education have to go overseas. Influenced by the life style of the countries they are living in for quite a while their every day life is changing and with it also their standards and values are different from the ancestors. The importance of property and privacy is rising, which makes the traditional open structure of the Samoan Fale unpractical. Nowadays people like to close their rooms and lock their belongings. Nevertheless the traditional way of living together in extended families is still kept up high. Students returning from USA, Australia or New Zealand come back home and follow the rules of the traditional way of life, obey the elders and take on even painful rituals like the traditional tattooing. The interest of the young generation in their cultural heritage may be a chance also for a survival of the interesting vernacular architecture in the Pacific Region.

2.2 Architectural Research

The building types of the Samoan and the Fijian are unique in their art and style. Wooden skeleton structures are the base of the architecture in both countries. Fetched palm leaves build the walls of the Fijian “Mbure” whereas the Samoan “Fale” is characterised by its openness.

At first the architects concentrated on the different types of Fale. The simplest form is the Fale o’o.



Fig.4: Fale o’o

Its ground plan is small and composed of a rectangle with two adjoining half circles. A wooden platform is fixed on poles above the ground. On top a simple fetched roof protects against sun and rain. Fale o’o are used for storage and cooking. More detailed and complex structured are the “Fale āfolau”, the “Long House”. These houses are used as residential and guesthouses and for meetings of the family. A platform is build at the finish of the construction work functions as a protection against bugs and humidity. Its height represents the status of its owner. Eye catching are the bindings, which fix the wooden

beams. Another representative elements are the carvings on the centre roof bars.



Fig.5: Fale āfolau

A different shape shows the so-called “Fale Tele”, the “Big House”. It is an approximation to the type of the “Round House”. But its unique construction progress from top to bottom shows, that it is not really a round house, but a further development of the Fale āfolau that rectangular centre is minimized to three centre poles. As that construction is that special it is explained here.



Fig.6: Construction of a Fale Tele

At the beginning a temporarily scaffold supports the positioning of (mostly) three centre poles. Really eye catching are the bindings of coconut fibre, which are used for the assembling of all parts of the construction. The characteristic shape of the roof forms out of the bending of the wooden rafters with the help of a second scaffold. The positioning of the border stacks completes the construction of the centre part. Next the apses are erected. Auxiliary scaffolds stabilize the hanging construction during the building progress.

A very important element of the Fale is the platform of stone. It functions as a protection against bugs and humidity. Apart from that the height of the platform serves as an architectural element of representation.

The procedure of the construction of a self-sufficient hanging roof is unique for a wooden skeleton construction. It is an example for the highly developed

2.3 Expedition photogrammetry

Using the “3x3 Rules for Photogrammetric recording of architecture” different buildings were documented in a photogrammetric usable way. The task was to hand out the 3x3 rules to students of architecture and find out if the explanations are clear to receive sufficient results without too much support from photogrammetric experts. At first the first point for the geometric rules had to be enlarged for the description of the planning of the pictures for the interior of a building. The figure below shows a recommendation for the Fale āfolau.



Fig.7: Taking of the interior

Traditional welcome rules and customs did not allow taking the pictures at best light conditions. So – funny to watch for the villagers – the students walked around in groups of three: one with the camera, one drawing the sketches and one protecting the camera against back light with an umbrella.

Other aggravating circumstances were the heat, tropical rain showers and the narcotising effect of the welcome drink “Cava”. Some missing pictures and large picture scale now and then resulted of the unusual conditions. But within the progress of the journey and with some routine the recording results improved.



Fig.8: Taking pictures

Students of Photogrammetry and Remote Sensing produced the photogrammetric computation at the University of Technology Vienna. The program “ORPHEUS” was used for measurement and orientation.

Following procedure was used and can be recommended for further computations on similar objects:

To start with the definition of a local coordinate system by using shapes (x-y - plane, z - axis) with many points. After that a sub block should be adjusted sharing points of the definition of the coordinate system. To adjust the entire block a consecutive adjustment is advised always adding one or two further neighbouring pictures into the adjustment.



Fig.9: Photomodel of the Fale

Students of architecture finally measured the points and plotted the wire model of the object. The co-operation between students of different subjects offered them the possibility to learn the needs and work of the other disciplines. In that way better way for interdisciplinary communication shall be opened for future tasks.

The measurement and the computation of the example above showed again the complexity of the work with amateur photogrammetric recordings. With the growing market of digital cameras and rising interest of people in cultural heritage there is a growing demand for the engagement with the photogrammetric restitution of amateur recordings.

One conclusion of the project is the recommendation for a hybrid recording using common procedures of building survey and photogrammetric usable pictures to get an accurate and photo realistic result.

3. NAVALIS – THE NAVALA VILLAGE INFORMATION SYSTEM

One outcome of the excursion to Samoa and Fiji is this project. In discussion with lecturers at the University of the South Pacific the idea for NAVALIS started. In the moment co-operation talks are in progress and the rising for funds has been started.

3.1 Navala

The village of Navala situated in the Nausori Highlands, Viti Levu, Fiji is unique for the region of the South Pacific. It is the only village, which remains its traditional way of building and living as a result of the decision by the village committee, to build all houses only in the traditional way. This decision affects the everyday life of the village and also its future development. The traditional lifestyle of Fijians lived in an indigenous surrounding is of interest for Tourism on one hand but also for importance for the whole South Pacific Region. As Tourism can be the most important income factor in the future, which enables the village to set up their settlement, and its surroundings in a way to make it most convenient for its inhabitants and best adapted to its environment. The special situation of the village can be used as an example to demonstrate the possibility to keep tradition visible for everyone in architecture and also inside the society.



Fig.10: Navala

To invent new ideas and projects there is a need for comprehensive planning tools that build the base for every reasonable development. The project NAVALIS will provide the first parts of a comprehensive interdisciplinary collection of materials, information and data about the region of Navala.

3.2 Objectives

The aim of NAVALIS is to build up a comprehensive collection of material available of the settlement and its surrounding areas and to put it into a geo-referenced context. This information system can be used for future projects for the development of the village.

Base of the system will be a digital terrain model in connection with data concerning

- **Inhabitants**
Base for every development project is the knowledge about the people. To know about the needs, the ideas, the visions of the inhabitants are the most important factor for any development.

That fore NAVALIS will collect the demographic status of the village, will put together the output of interviews with the villagers about their present life and their future objectives and will show up the population development.

- **Architecture**
Architecture serves not only the purpose of housing, it is also an expression of the lifestyle, it is the vivid symbol for the history of its owners, users and a part of the cultural heritage of the whole village.
NAVALIS will collect the information about the houses of Navala. Architects will survey the structure of each house. In combination with the information about the used material, the way of construction and maintenance these data will provide a vivid description of the buildings. This will provide the possibility to construct new houses in the traditional way and will keep the knowledge of this important part of the cultural heritage of the Fiji Islands.
- **Biodiversity**
The knowledge about the biodiversity is the initial point for further research work concerning new ways of agriculture. It is important to know which flora and fauna is present in an area to decide which new developments in planting and farming may be invented without disturbing the natural environment. NAVALIS will combine the results of research works of scientists working in the field of botanic and zoology and make their statistics available in the information system.
- **Geology and Geomorphology**
A well-founded cognition about the geology and the geomorphology of a region offers the numerous possibilities for projects concerning urban and regional planning, water supply and disposal and any development, which is influenced by and influences the environment. NAVALIS will show the geological and geomorphologic structures of the mountainous surrounding area of Navala within the digital terrain model of the geographic information system.
- **Climate**
Statistics about the micro-climate in a region may be of use for agricultural or water supply related researches as well as developments concerning the production of energy e.g. with photovoltaic.
NAVALIS will summarize available data and implement it into the context of other environmental data, so it can be of use for future developments for the power supply for the village of Navala.

3.3 Method and Organisation

Basic idea of NAVALIS is build up a comprehensive archive of available data about the village of Navala and it's closer environment. The data will be collected in a database and geo-referenced within a GIS. This system will be used for modelling future scenarios for different infrastructure measures. Finally these models have to be transformed in a way that is understandable and useful for the inhabitants of Navala.

The project NAVALIS will be a joint project of the Department of Geography of the University of the South Pacific, SOPAC, South Pacific Applied Geosciences Commission, the Mineral Resources Department, the Forestry Department (Maff – Colo-i Suva), the MET (Meteorological Station) Nadi with support of the National Trust for Fiji and the Fiji Land Information System (FLIS) in Fiji and the Institute for History and Theory of Architecture and Historic Buildings Survey of the University of Technology Vienna and the Institute for Social and Cultural Anthropology of the University Vienna, the Institute for Forest

Growth and Yield Research, University of Agricultural Sciences, Vienna and a private Company in Austria.

A project manager supported by office-staff will coordinate the project. One institution at Fiji will provide the co-ordination on site. Each institute will name a team leader who will coordinate the work within the responsible group and will be the contact to the project management.

The agenda for the project will follow different phases each finalised with a presentation of the results of the progress. Final result of the project is the system, which will be handed over to an organisation in Fiji, who will use it in future.

4. CONCLUSION

Cultural heritage is a part of our identity. What the house is for the family, villages and cities are for municipal communities. Buildings and their arrangement form a frame of memory that just in absence as "home" is felt.

Architecture stands at the intersection of technology, art and society. It refers to all ranges of the human life - the public like the private. In that way it cannot be seized per se and by definition by only one scientific discipline.

Projects like the excursion to Samoa and Fiji show that the interdisciplinary approach to the built cultural heritage offers new possibilities for understanding in each subject. Some construction details, which seem of no use, make sense, if you understand their ritual or symbolic meaning. Anthropologists, who often are very concentrated on the people, their customs and their behaviour, get a new view on the value of architecture in the life of the people. In that sense the Institute for Comparative Research in Architecture plans to initiate more projects with multidisciplinary participation.