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Culture and Environment as Generators of Sustainable Design: the Case of Hoachanas Village, Hardap Region, Namibia

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ABSTRACT: The concept of rural settlement development and improved community living standards is shrouded in dichotomous phenomena. Today, we live in a world commonly dubbed the "Global Village", which term implies the breakdown of cultural and geographical boundaries between peoples. Normally, development upgrades people's lifestyle but in tandem eliminates global cultural diversity. This dichotomy often leads to ecological destabilization with consequent environmental malaise.

This paper attempts to explore and establish a sustainable development model for Namibia rural settlements based on the principles of respect for culture, and adherence to proven environmental conservation dogmas. The thesis is that while contemporary human settlement development is inevitable, sustainable design paradigm can provide the tool to direct the process of rural development and ensure cultural and environmental integrity. The paper posits that active user community participation in design is critical for the realization of a sustainable rural settlement development.

The Namibia-German Special Initiative Programme (NGSIP) in rural Namibia, provided ground for testing the hypothesis. The Hoachanas Multi-Purpose Community Centre (MPCC) design, involved the Polytechnic of Namibia Architecture students. The NGSIP project experience forms the basis for this research paper. It was established that sustainable design, informed by cultural and environmental imperatives, is key to mitigating the apparent impacts of rural development.

Conference Theme: Design for sustainability
Keywords: culture, environment, sustainable design, rural settlement

1. INTRODUCTION

1.1 The Village as a Rural Settlement

In this era of unprecedented urbanization dynamics, the desperate socio-economic environment and living conditions of world rural communities, especially of developing countries, are hardly given due recognition. Yet, they constitute a major concern for the affected earth based communities and their "governments". Normally, the leadership is desirous of addressing the development question to uplift the community's living standard, but may not have the means to the desired end. Although true in urban communities, this scenario is most chronic in the rural settlements of developing economies. The villages of Namibia, and in particular Hoachanas Village in Hardap Region (Fig. 2), experience the same scenario.

Gopaul (2006) opines that African village settlements remain some of the most impoverished societies in the world. Access to employment, education, land, housing, health services and other essential services remain very limited as compared to their urban counterparts. Most village communities live in severe poverty with little developmental activities. There is huge dependence of villagers on support from a few relatives in urban centers to eke out a living. In some rare cases, households rely on a pensioner's skimpy earning for survival.

Fig.1 Map of Southern Africa showing Namibia, with boundaries defined by Kunene River in the North, and Orange River in the South source: Wikipedia

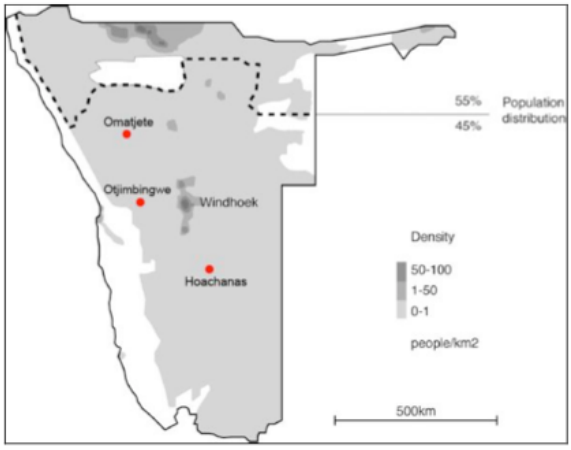


Fig.2 Map of Namibia showing Village locations and population densities Source: Wikipedia

In Hoachanas, 39% of the female population was unemployed (2001 Census). 15% of the population were retired and on pension of some sort. Only 2% of the Hoachanas population is engaged in active farming. Thus, hunger and malnutrition are prevalent. This could be avoided through improved farming method for vegetables, tomatoes, potatoes, etc. and through sales of the products. On the average, 33% rely on some kind of a wage or salary; and 15% rely on cash remittances from relatives in the urban centres (Fig 3). Most young people are jobless because they lack post school skills training. As a result, they engaged themselves in alcohol and drug abuse.

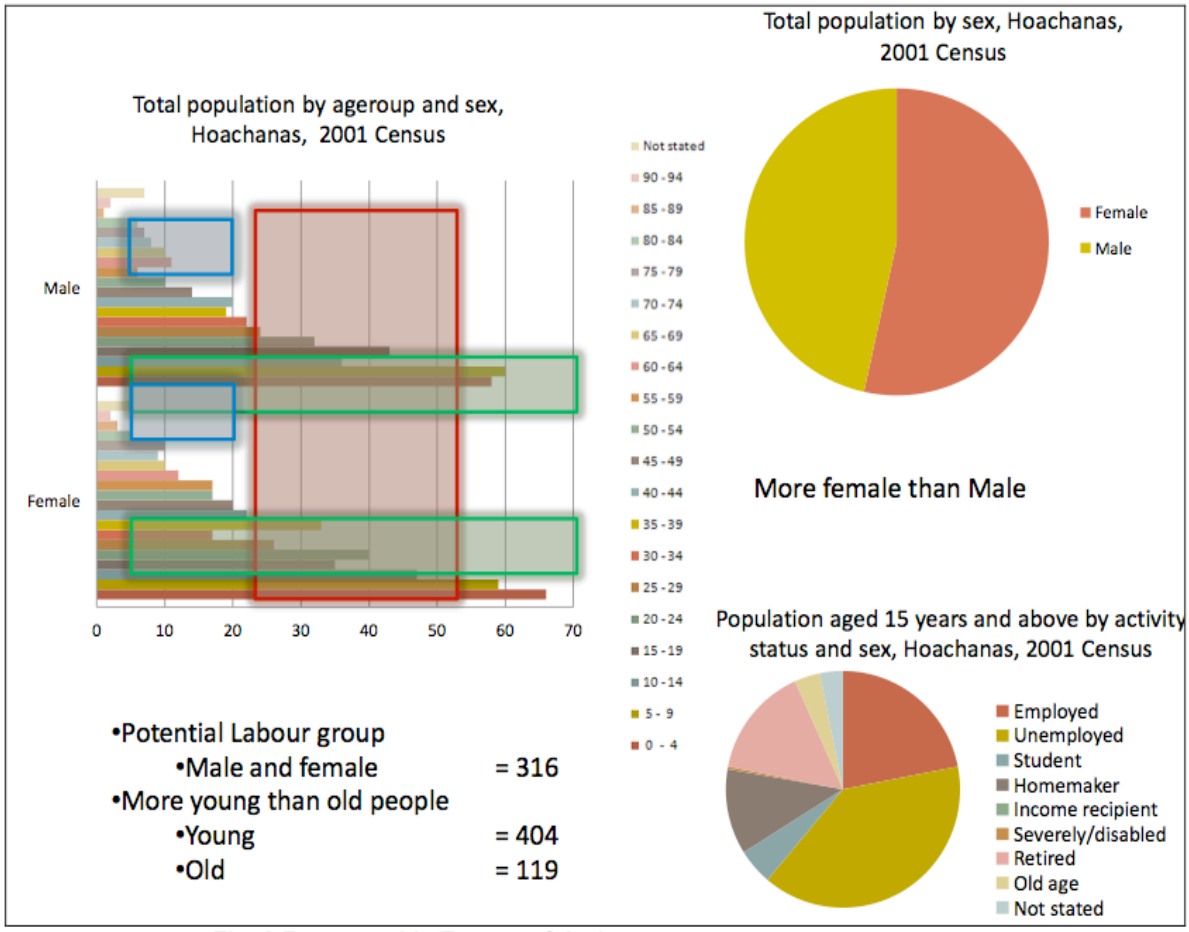


Fig. 3 Demographic Factors of design. Source: Students' Research work

According to the World Commission on Environment and Development (1987), some aspects of rural agricultural practices are unsustainable resulting in a dysfunctional relationship between humans and the environment. These include shifting cultivation, wanton cutting down of trees and bush fires, over glazing, uncontrolled fishing and hunting, etc., leading to the destruction of habitats and ecosystems.

Therefore, concern for environmental deterioration is equally acute. Besides, although breadwinners and heads of households, women in rural areas are subjected to severe poverty, hostility, abuse, neglect and hardship (Gopaul, 2006) and lack the means to achieve improved living conditions.

In this paper, rural is defined as the sparsely populated areas where people farm and depend on natural resources (Reconstruction and Development Programme, 1997). Accordingly, rural implies settlements, whose level of basic infrastructure development falls below those of towns and urban centers. Village development should therefore involve a process, designed to create conditions of economic and social progress for and with the active participation of the whole community (Abbot, 1995). A main goal of rural development should be to enhance individual skills and community solidarity. Development should encourage the community's self reliance and build confidence in its ability to control its welfare. These define the basis on which the design intentions for the Hoachanas Village MPCC were anchored.

1.2 Hoachanas Village - Socio-Cultural Geography and History

Hoachanas is the main settlement of the Khailkhaun (Red Nation), which is the most important sub-tribe of the Nama people. It has been inhabited since 1695, and is currently ruled by the 17th dynasty of chiefs, all of which had their main residence in the village. It is also the home of the famous anti-apartheid activist, Reverend Markus Kooper, the veteran who travelled to the UN headquarters in New York to campaign for the independence of Namibia. Unfortunately, there is little or nothing in written records about the life of most of these early leaders, the people they governed and the architecture they built.

Fig.4 The form of the traditional Nama huts seems to mimic the surrounding hills Source: Wikipedia – Nama People

Fig. 5 – True Nama Art of construction Source: Wikipedia - Matjieshuis

Fig.6 Old Lutheran Church changing the Village architectural skyline Source: Author's photo

The traditional Nama dwelling called |Haru oms in Nama language, or portable rush-mat covered domed hut reflects of a nomadic way of life, offering a cool haven against the blistering heat of the sun. It was easy to pack and move if grazing lands become scarce. Although the genealogy may not be readily traced, the dwelling form could not be accidental. On the landscape, it takes the semblance of the shape of surrounding hills (Fig. 4). Today, these huts are made of beautifully woven reed mats in a beehive shape (Fig 5). It really is a dwelling for all seasons - cool and well ventilated in the hot summer, naturally insulated by the grass mats in winter, and protected from the rain by the porous stalks that swell up with the water. Because all materials are organic and not over-harvested, this is a dwelling that respects the environment. Today, there are no remnants of this traditional architecture. Most of the Nama art and architecture were destroyed during the Herero and Nama wars with the Germans. With all land and livestock confiscated by the Germans, the Namas were displaced all over the country and beyond, even up to former German colonies of Togoland and Kamerun (now Cameroon).

Namibia is a vast, arid and sparsely populated country. Hoachanas itself falls within the region of Namibia with population density of 1person/km2 (Fig 2). In summer, the average maximum temperature is between 32o – 34o C. In winter, it drops to an average minimum temperature of 3o – 5o C. The diurnal range is extreme, reaching as far as 20o C. Humidity averages 10% to 20% on a daily basis with an average annual rainfall of 21mm. The primary climatic concern in Namibia is heat during Summer.

Following prolonged wars, Namibia achieved its independence in 1990 and remains an industrially under-developed country. Focus on rural settlement development was a later, post independent reality. The question of the cultural, environmental and technological consequences of human activities was to be a much later event, urban centers inclusive. Indeed environmental conservation questions for the rural areas other than those earmarked as nature reserve areas for tourism are yet to be seriously asked. Due to various reasons such as the urge for the so called "modernization" of the rural areas, lack of adequate communication and information dissemination systems, pre- and post independent governments ignored or failed to appreciate the threat which human actions pose to the rural ecosystems. Any design proposals for Hoachanas Village development must therefore be culturally and environmentally sensitive.

1.3 Development: the Human-Environment Dimensions

It should be noted, that currently, villages and settlements in Namibia are distinguished by the status the Government has vested in them: places with a village council are villages; they are the smallest entities of local government. All other places except cities and towns are not self-governed, they are called settlements. However, whether rural or urban, the human settlement question is about development. Literarily speaking, development implies transforming the status-quo environment, through premeditated human actions, into a state, considered in the now of the moment, to be appropriate for the community living comfort, productivity and coexistence. There are certainly very many other reasons for the insatiable human settlement development intentions. Suffice it to say, that human settlement development is all about the modification and manipulation of space, the building of structures, the shaping of landscapes and management of regions and the Earth (McClure and Bartuska, 2007). From another viewpoint, it is about the dual human-environmental dimension of design. As we design to develop the village settlements to enhance the quality of life of the folks and in-tandem reduce the disparity in social and infrastructure provisions in rural and urban communities (Umenne, S. 2004), are we cognizant of the need for the conservation of the same rural environment through the protection of indigenous flora and fauna and the geological features of the landscape", which form part of the people's cultural heritage, their identity? On another, but related aspect, are we selfish about the environmental legacy we inevitably hand over to future generations? In relating the impression on astronauts, who observe the earth from outer space, McHarg (2007) describes humans as planetary disease, busy creating blemishes and lesions on the earth tissue, and thus continuously inflicting death on the world's life body (earth). Suffice it to say, that the end product of all these human activities will normally be the built environment. It is the concern of this paper that not enough care is taken to weigh and evaluate this product, not just in terms of its satisfactory performance as a life enhancing, man-made infrastructure in the now of today, but also in its long term impact on the ecology of the environment, of which we are a constituent part.

As we take a critical look at the built environment product of human activities, numerous questions could be asked, ranging from quality, in terms of its ability to satisfy all human functional and psychological needs, to its visible and virtually invisible impacts on the natural surrounds and systems. For example, is the inevitable process of interaction between the built environment and the surrounding natural ecosystems harmonious or discordant? What are the energy, materials, economic, methodical, etc implications of the technology of construction? What are the heritage and place making values of the built environment product?

These questions benchmark the triad relationship between culture, environment and technology, vis-à-vis design sustainability (Fig 7). They equally highlight the dichotomous nature of human activities for settlement development, and the understanding that they are like the double-sided sword, which create more problems as they solve others. This demands the interrogation of the sustainability of the built environment product by determining how environmentally sensitive, socio-culturally compatible and economically and technologically viable they are. The demand becomes more pressing if we consider the natural rural environment as an endangered "wilderness", seen as the custodian of ecological balance, which must be protected.

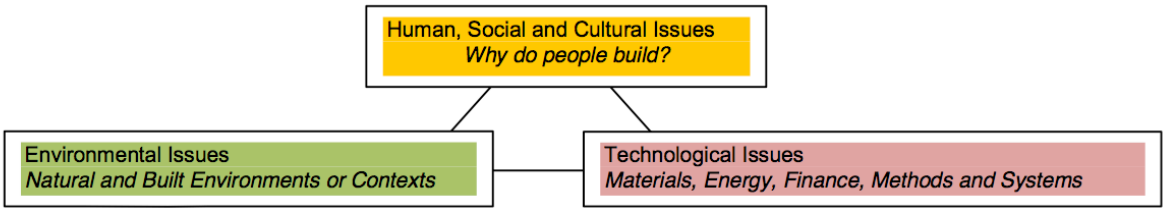


Fig. 7 The Triad Relationship Sketch. Source: Author

The fore-goings provide the theoretical framework for the Hoachanas MPCC design inquiry, which posits that rural development is sustainable if environmental, economic and social well-being of the community is guaranteed for today and tomorrow.

2. THE EXPERIMENT IN RURAL DESIGN INQUIRY

The Hoachanas Village MPCC project provided the laboratory for testing the conceived human-environment relationship thesis. It is a mixed use development, expected to provide a new impetus to the living conditions of every household. The agreement between NGSIP and Polytechnic of Namibia Department of Architecture, to collaborate on the MPCC project did not come smoothly, partly due to the departure of the first technical adviser, Mr Rob Fielding. The Department of Architecture, having been recently established, was in the process of formulating its research for development focus. In keeping with its delivery policy, the Department was keen to expose the students to life projects. The proposed project, with a real site and with real problems, would provide an opportunity for students to experience real life challenges by engaging with real clients. In any case, the MPCC project was aimed to empower rural communities through infrastructure facilitation. The experiment was therefore a win-win situation where students as well as the community would benefit.

To facilitate interaction with the communities, NGSIP trained a team of locals referred to as the animators. The training, attended by the students, introduced the animators to the basic principles and objectives of a successful

project proposal and the concepts of costing, amongst others. The animators were also expected to participate in guiding the process of conceiving the clients brief, interpreting their intentions to enable the students develop a viable design brief within the budgetary limitations. The training was also to capacitate the animators in their eventual role as managers to ensure the sustainable exploitation of the MPCC. Unfortunately, the 5-days training failed to yield the desired results. This was largely because the trainees were hurriedly hand-picked and were not psychologically prepared for the "stay" in distant Windhoek. Besides, the training time and financial budgets did not include a vital hands-on field practice to accompany the theories. In any case, the Department was running out of time to implement its academic programme as per the institution's calendar. And we were obliged to move in and conduct field survey with the assistance of the formally untrained Village Project Committee.

Originally, the intention was to develop six proposals, as models for the identified three Villages, where environmental and socio-economic contexts permit. The Villages were Omatchete, Otchimbingwe and Hoachanas. Three groups of students were tasked to come up with two proposals for each Village. Following successful reconnaissance site visits by the studio staff, a clearer picture was obtained for focused input lectures to the students. However, due to logistical problems, Omatchete and Otchimbingwe villages were dropped in favor of Hoachanas. And students were once again regrouped into four; each charged to focus their proposal on specific problems.

Through extensive field survey with careful observation, students recorded primary data about daily activities and lifestyle, bldg materials and practices. They employed focused interviews and target group discussions with household heads and youths for data on community's mode of engagement, hobbies, perceptions and aspirations. They were encouraged to collect secondary data through literature and District Council archives, etc. When time permitted, participatory approach was experimented by Group 3 with a student, who spoke the local Nama dialect.

Group 1 researched on culture and socio-economic issues. They observed, amongst others the total absence of any semblance of contemporary building practice with the traditional Nama dwelling, the IHaru oms (Fig. 4). Group 2 dwelt on practices regarding traditional and contemporary construction materials and methods. They observed that about 50% of the 2,298 population (2001 Census) live in traditional houses of which 37% are constructed of brick and mortar and 14% in improvised materials such as 'cut out metals, tyres, black polythene plastics etc., some of which are extremely inadequate for the climate. There were evidences of use of sun dried or charcoal fired clay bricks in the Village. Groups 3 and 4 were engaged in existing Village infrastructure and services. They recorded the followings: primary and high schools, safe water and electricity supplies, the Old Lutheran Church, cemeteries, historical landmarks such as the Dog Fountain, Peace Treaty Site, etc. There were no recreational facilities, and very few retail and waste disposal facilities were available.

The first field survey presented the first opportunity for the students to directly interact with the community, represented by the Senior Councilors, Project Committee and representatives of the NGSIP. From the onset, it was resolved that the paradigm of client's active participation in the design process be adopted. The strategy was to capture the community's commitment to ownership of the project and to the management of the facility ultimately. The full participation of the community, was considered critical for successful design undertaking. From the survey findings, the Community stressed the following concerns:

- Poverty was the major problem in the village;
- Unemployment was high; although there were a high number of young people, their level of skills was very low. As a result, they engaged themselves in alcohol abuse practices. Due to frequent food shortages, cases of malnutrition are common as most households could barely feed themselves.
- The community's rich cultural heritage was gradually disappearing with nothing left for future generations.
- There was chronic lack of community infrastructure and services. They were anxious to have the state of the Peace Treaty Site, the Dog Fountain and the Community Hall, the Monument to Reverend Markus Kooper upgraded to a level to attract both domestic and international tourism.
- Rebirth of Hoachanas as the commercial and political centre of the surrounding communities. These would enhance creation of jobs and improvement of household income. All the above informed the community's preference for a multi-purpose community center because such a facility would provide variety of activities including tourism, skills training, entrepreneurship and heritage site development. And they expressed gratitude to the Namibian and German Governments for the initiative and challenged the students to find design solutions to their social, cultural, economic and environmental problems.

Fig. 8. Arial view of Hoachanas Village, at the junction of the roads Source: Local Council Archive

Fig. 9. Shelter in cut metal sheets. There is water and electricity. Source: Author's Photo

3. SITE ANALYSIS AND BRIEF INTERPRETATION

The community's involvement in the project commenced with their collective choice of the project site. After due preliminary research, including precedent studies and focused interviews, the choice of site was commended. The site, which slopes gently towards the sports ground in the East, has an existing incomplete Community Hall at the highest point in the West (Fig. 11). A main advantage is the site's accessibility locally and regionally. It is close to the main tourists' route to such historical landmarks (Fig. 10).

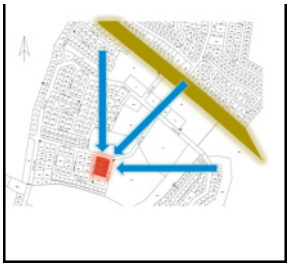


Fig.10. Project Site – Accessibility. Source: Adapted from Students work

Fig 11. Site and existing landmarks. Source: Adapted from Students work

Fig. 12 The Dog Fountain Source: Author's photo

The site is a rectangular piece of land measuring 5015m and located within the Traditional Authority area, with the longer axis running approximately North – South. The TA building accommodating the Chief's Offices is on the southern end of the site. The site is accessible from all sides with a proposed access road in the East separating it from the extensive sport ground, also adjoining an agricultural land in the east. It includes the existing community hall. It is very close to historical sites such as the Dog Fountain (Fig. 12), Peace Treaty and the Rocky Valley sites. To the east exists a primary school with its sports fields. There is also an old mission secondary school whose buildings are now being used as temporary accommodation for visitors. The southern side of the site is bound by a marshy and water logged area adjacent to the community football field. On the northern and western sides, the site is mostly surrounded by residential houses.

4. SUSTAINABLE DESIGN STRATEGY AND UNDERLYING PRINCIPLES

With the community problems identified, client's brief formulated and site surveyed and analysed, the design strategy was determined - to provide Hoachanas Village with a facility, which would become the cornerstone of its development, and restoration of its lost glory as the centre of commerce and culture for the surrounding Villages and Settlements. The MPCC was therefore conceived as a work of optimum socio-cultural, environmental and economic value, channelled towards the sustainable enhancement of the well-being, pride and identity of a people with urgent needs. When fully realised, the MPCC would significantly contribute towards raising awareness and developing skills amongst the youths.

Based on the budget provided by NGSIP and the possibility for a phased project development, the followings were included in Phase I brief: (i) Vocational Training Centre for training young people and women in the skills of Arts and Crafts, building trades and carpentry, computer skills, etc. (ii) Arts and Craft stalls where the produce of the Vocational Training Centre would be displayed for sale to the public (iii) Small and Medium Enterprise (SME) Workshops for the display, storage and sale of groceries and farm produce. (iv) Community Library, a Computer Training center and a conference facility (v) New Start Centre for consultation/counseling for AIDS patients (vi) Self Catering Guest Rooms for visitors to the Village (vii) Ablution Blocks for all the facilities. The sports ground, the Dogs' Fountain, the Peace Treaty Site and the Rocky Village were recommended for development in Phase II, when the MPCC should have generated revenue.

4.1 Culture, Environment and Design

Culture formed a major component of the design moderator variables. This is in response to the need for a renaissance of the Hoachanas culture, intricately linked to that of Nama people. For instance, the long lineage of Chieftaincy leadership, which dates back to the 17th Century has a value to be recreated and re-cultivated for our time. To this end, the layout scheme was defined by three main cultural axes namely: i) the Cultural display diagonal axis, ii) the MCH axis, and iii) the Traditional Cuisine Café axis. The Diagonal NE – SW axis ties the central cultural performance arena with the community Library and the Arts and Crafts kiosk. The circular performance arena is delicately protected from direct sun with a light dome structure pillared to the base. The concept was derived from the traditional burn fire in winter under a tree with a dancing group, entertaining an audience, which may include the Chief and his distant visitors.

The crystallized client's brief included: Multi-Purpose Community Hall with Conference facilities, Cultural and Entertainment arena, Computer Training Centre, Art and Crafts Workshop and Stalls, Self Catering Lodge, New Start Centre, Community Library, Farm produce stalls. The facilities layout followed the zoning concept (Fig13).

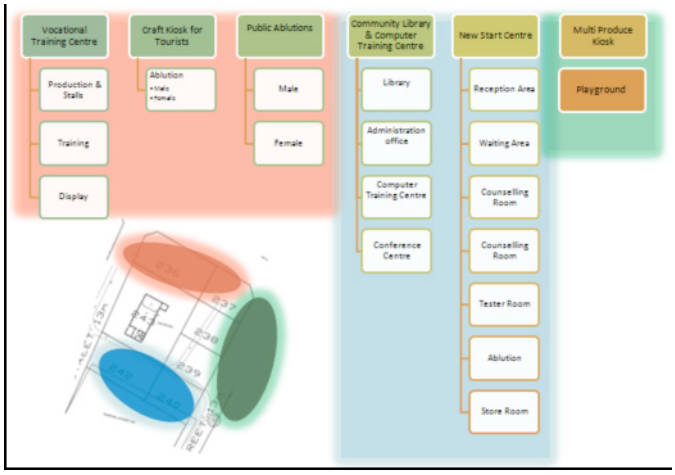
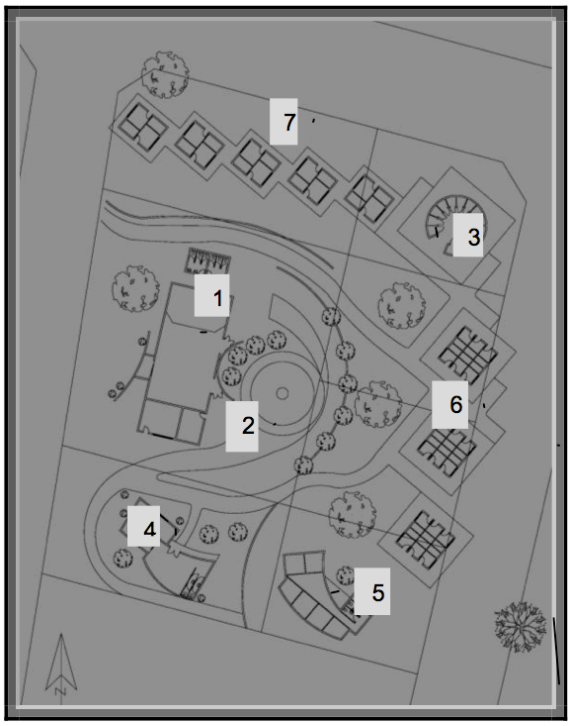


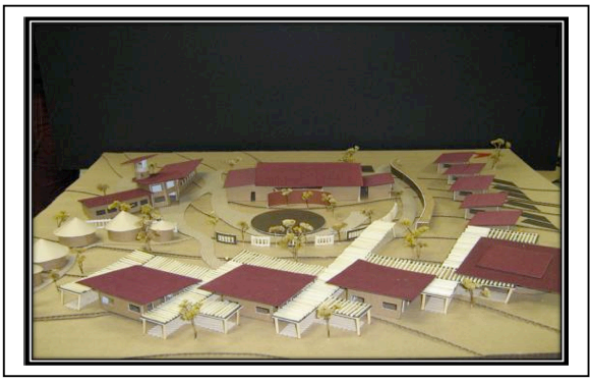
Fig. 13 Facilities Layout by Noise Gradient Zoning Concept. Source: Adapted from Students work

The MCH axis runs from West to East and terminates with the linear arrangement of the commercial multi-produce kiosks, which spatially demarcates cultural zone from the sports ground. Finally, the traditional cuisine axis connected at the base of the diagonal axis links the Library and the traditional cuisine block. Environmentally, the design proposal upholds the principle of development which respects the rural character and protects it. The idea is not to urbanize the rural environment, but to sustainably enhance its ecological quality and integrity. To this end, proposals for intervention on the landscape were critically evaluated. Although there was no formal environmental impact assessment, most of the six principles of green architecture and sustainability, according to Vale and Vale (1996) were upheld. These include: respect for site, respect for users (the Community), design with climate, minimize use of new resources, energy conservation.

In every aspect, the design proposal for the MPCC was respectful of the site. The communities wish for designing the facility around the existing MCH was respected. Its location at the highest point of the site topography was exploited for effectiveness of view and accessibility.

Designing with climate entails buildings, which satisfy both functional and human comfort needs at no extra energy cost than passive systems can provide. Essentially, the buildings must exploit the positive aspects of climate for performance efficiency. This would enhance ecological integrity and environmental sustainability. Energy conservation paradigm demands sustainable use of fossil fuel during the life span of each building. Thus the design explored use of renewable energy sources.





1. Existing incomplete MCH & Conference Facility
2. Cultural performance arena
3. Art and Crafts Kiosk
4. Community Library & Computer Training Centre, New Start Room
5. Traditional Cuisine Café and Guest Rooms
6. Multi produce Kiosks
7. Art and Crafts Workshop

Fig. 15 Facilities' Layout. Source: Adapted from students' proposal

The proposed design embodied conscious attempt to achieve a sustainable response to a community's contemporary needs. How sustainable are the proposed solutions? Ernst Heinrich Haeckel (1866) states that systems powered by renewable energy, tend to grow to a mature state and then slow their growth and develop hardy species and environmental connections (e.g. redwood forests). On the other hand, systems powered by non renewables grow rapidly to a point where growth and their structure can no longer be sustained and eventually die. The proposed design solutions are all based on the former concept and not the later. They are compliant with sustainable design principles.

Although not accommodated in the core MPCC, proposals for the heritage sties suggest infrastructure development, which would not only preserve the culture and history of the site but would also promote tourism. This would ensure generation of fund for a sustainable management and maintenance of the MPCC as well as the cultural infrastructure. Similarly, the workshops, Vocational Training Centre, Computer Training Centre and Craft Centres were all aimed at skills development especially with regard to the many jobless youths in the community. The community library, the conference centre and the museum were proposed for archival and information dissemination functions. The facilities were meant to be centers of learning and sharing of information for the advancement of culture. Thus various career opportunities will be available for the youths. The crafts and SME stalls, self catering accommodation and vendor stores/shops were meant for selling varieties of products e.g. agricultural produce, arts and crafts, groceries and all those items necessary for day to day living and recreation. These activities would ensure income generation for the community hence improved well being. They were also considered relevant for entrepreneurial skill development for individual and community self sustenance.

To encourage passive cooling, especially during the hot summer periods through cross ventilation, the buildings are designed to avoid deep spans. Positive outdoor and courtyard spaces are created to reduce heat gains and to promote cooling through garden plants and water bodies. Shading devices are provided through strategically located tree canopies and overhead protrusions from buildings. Locally available and recycled materials and labor are recommended for energy consciousness. In this regard, natural lighting and ventilation, low cost cooling and heating are employed. In the same thinking, low cost renewable technologies such as solar energy, are recommended for lighting and electrical appliances, and would also be employed for water pumps. Biogas technologies are recommended using human and animal waste. These renewable technologies are expected to enhance environment conservation and sustainability.

5. SUMMARY AND CONCLUSION

The all inclusive paradigm for design, embraced in the MPCC project ultimately yielded the desired results. The final trip to Hoachanas Village enabled the students present their four scheme design proposals to the Hoachanas community. It was a singular opportunity for the students to listen to the community's views on their proposals. For the community, it was an opportunity, never accorded them before, to be involved in the trajectory of an architectural design inquiry as users. Without fail, they capitalized on this opportunity: participated in the brief formulation, made constructive inputs with valuable feed-backs towards further design development. Indeed,

the Community listened attentively to the presentations, deliberated extensively and voiced their views, expressing delight and acknowledging the students hard work. Their choice was Group 3 Proposal (Fig. 16) with minor modifications. The students happily noted the specific areas for attention during the next stage of the design development.

Fig. 16 Group 3 Students' Proposal presentation
Source: Author's photos

Fig. 17 Group 2 Students' Proposal presentation
Source: Author's photos

Fig. 18 Chief Kooper and his Project Committee Representatives view Students Proposals with satisfaction.
Source: Author's photos

The Community's preferred elements were mechanically picked from each of the 4 Group works. To put these successfully together in one single architectural design proposal was a mammoth task. On the whole, the two group proposals, which excelled by the Juror's assessment also, received the community's acknowledgement (Figs. 17 & 18). They achieved most of the objectives identified early in the design process. The cultural and environmental factors of design, as well as the materiality and methods enhanced the design sustainability. The triad of human, socio-cultural and environmental issues of sustainability, which can be achieved when the MPCC project is fully realized, may be summarized as follows:

- Unemployment and Poverty reduction
- Economic and Social Empowerment of both men and women through improved level of household income
- Diversified economic activities e.g. rural tourism, eco-tourism, and entrepreneurship.
- Renaissance of tradition, cultural practices and lifestyle through upgraded heritage sites, beliefs and values.
- Community engagement and participation in development projects e.g. active involvement and taking responsibility for their own development
- Ability to self-mobilize themselves for a particular cause, e.g. taking initiatives independent of external institutions or develop contact with external organizations so as to mobilize resources

Admittedly, there exist rooms for advancement of case for culture and environment as generators of sustainable design. Examples can be found in energy conscious and zero waste design paradigms for environmental conservation and sustainability within the renewable technologies framework. Unfortunately, 8 weeks of students class work cannot be enough for a finished inquiry into the sustainable design questions. These and more should challenge the professional architect, who is expected to take over the MPCC design to its production drawings stage.

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