

**LOCALLY DERIVED SOLUTIONS: HOW CULTURALLY
SENSITIVE ARCHITECTURE MAY EMPOWER RURAL
POPULATION IN BOTSWANA**

by
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for the degree of Master of Architecture

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DEDICATION

In loving memory of dear and loving sisters Anto and Logi.

With adoration to a loving Dad for the short time we had together.

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ABSTRACT

Through the design of housing in Otse, Botswana, the thesis project proposes a design that relies on the spirit of community as the driving force of development in an African village. By focusing on the household as the basic unit of human existence, the project explores rural life and day to day existence and searches for ways of using intrinsic familial values as the driving forces for development.

This thesis examines the contentious issue of development, focusing on the growing disconnect between the local community and the solutions applied to local problems. It casts a light on the elusive nature of progress and questions the debatable indicators used to measure it in the context of a developing world. Questions are posed as to who is more qualified to advance development to the developing world, and who is better positioned to make judgment on the progress made in human development.

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And finally, a special thanks to the Ministry of Education for all the financial and logistical support.

RATIONALE FOR DEVELOPMENT

Introspection

The thesis has set out to explore development dilemmas emanating from perception, triviality, and external influences that are widespread in Botswana. Many communities have been swayed into perceiving Northern practices as the paramount standards against which progress must be measured and consequently, their own innovative solutions are being trivialized to a point where they are considered irrelevant in some quarters. This is largely due to external influences generated by global development trends. Without analysis of these trends and understanding them in a proper perspective, it is increasingly going to be difficult for communities to hold onto and maintain their social, economic, and cultural integrity. Development that is shaped by external forces poses the risk of devaluing local communities' quality of life and risk undermining their resilience to poverty. Meaningful development cannot take place unless it is grounded on local knowledge and understanding accumulated over centuries and passed on from generation to generation. Having lost grasp on this fundamental principle, many communities find themselves introducing solutions that are in conflict with inherent values of the people: solutions that inadvertently confuse the identity of these communities.

Traditionally, communities in Botswana operated within a framework of vertical and lateral integration on social, economic and cultural grounds. People understood that their quality of life was dependent on their ability to maintain a healthy balance between social-economic and

cultural networks. They had an understanding of the connectedness of life, knowing that their livelihood was strengthened by harmonious living both within themselves as a community and with the environment around them.

Having negated these important values, modern-day developments in rural areas in Botswana have the unfortunate effects of disrupting social structures, economic systems, as well as upsetting cultural and environmental reverence. Invalidating these values, development trends are creating new desires and new dependencies based on shifting value systems. More emphasis is increasingly being placed on increased purchasing power and individual identity as indicators of progress and empowerment.

Such trends have erroneously found a way of redefining the simplicity and modesty of means prevalent in rural communities as a reflection of backwardness. Having been influenced by this ideological thinking, a lot of developments taking place in villages have been discounting their indigenous values in favor of the technological and economic proficiency of the North. The adverse effect of this trend is that as these local cultures get introduced to new value systems, they are rapidly alienated from their understanding that man's significance and meaningful development is made richer if grounded on his heritage. Communities that used to be enterprising are slowly being disenfranchised and impoverished by having to rely on indiscriminate external input. These communities are held back by having to look beyond their borders for validation of their own agendas. This momentous shift has trapped them into placing too much value on external assistance to the detriment of their local interests.



Simplicity of means:
preparation of morning tea
in the outdoor cooking area



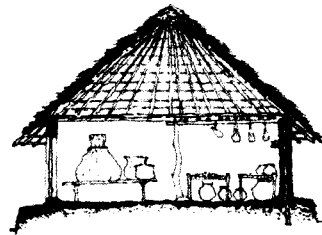
Simple elements creating
a social gathering and
retail space

Objective Approach

Vernacular traditions as the source for inspiration are reviewed with the knowledge that tradition is always in a state of flux, adapting to changing technological, social and economic standards of life. In like manner, contemporary lifestyles are valued in order to appreciate their contribution in shaping local conditions. The arguments raised are not meant to sentimentalize traditional practices and exalt them above modern technological ingenuity, but they are made with the understanding that we have so much to gain by allowing societal transformations to be informed by the wisdom of our past. Rather than being allowed to fizzle away in order to make room for progressive modernity as man continues to take giant strides towards meeting his ever-elusive needs, cultural and societal values need to be seamlessly assimilated into today's changing environments in order to minimize social, economic and psychological distraction. If development trends abandon indigenous values, people who used to pride themselves in ingenious innovations to meet their needs will tend to embrace attitudes of indifference towards their own expertise.



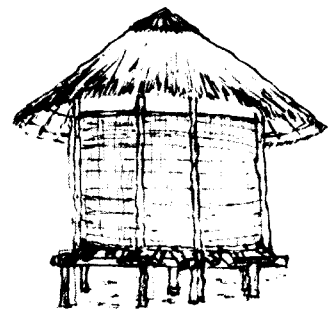
Sleeping arrangement and household furnishings allowed for several family members to share small spaces



Spatial organization and use of natural tools as household furnishings

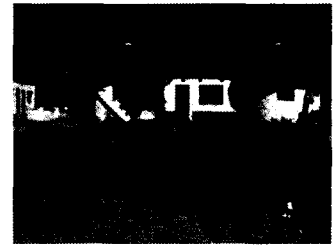
Mitigating the Economic Forces

In order to develop these divergent views, a deliberate point of view has been adopted: a view to suppose that the forces of world economies and global markets can be balanced by conscientious development initiatives. Anchored in cultural conventions, and tempered with contemporary vision, village livelihoods can be empowered to chart a path to prosperity while escaping the trappings of dominant global clutches. Some of the views may be in direct conflict with domineering economic models which



Granary: simple and cost effective storage of crop produce

gain momentum from increased market activity. In order to maintain their value, large economies are constantly devising strategies to pull informal and localized practices into the global economic mould. Through both robust and subtle ways, development agendas market advanced and industrialized technologies, which may or may not meet the needs of local communities, and these are established as a standard to which developing communities should be aspiring to. In order to gain global recognition, and maybe even align themselves with international aid opportunities, developing states are finding themselves coerced onto the technological treadmill, judiciously or otherwise. Some of the technologies introduced become white elephants and the thesis looks at ways of mitigating such trends.



Embracing the traditional and the contemporary

Foundation for Building Resilient Communities

The thesis focuses on the development of the household as the foundation for developing self-sustaining and resilient communities. It questions the current societal trends that have stripped the rural household of its role as the nucleus of development. The importance of the household has been watered down and it is relegated to simply being a place of retreat after a long, hard day at the workplace. This trend is stripping the dwelling place of its contribution to the economic welfare of the community. Traditionally, the homestead played a major role as a production unit. It was customized to accommodate and facilitate the productive activities of the family. In essence, it was a microcosm of the larger socio-economic system of the community and an establishment for social and economic growth.



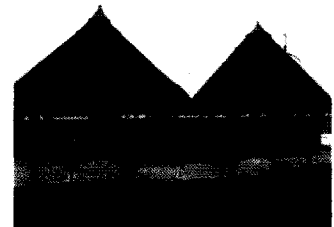
Fusion of traditional and modern building systems

Sustainable development may benefit from reintegrating the dwelling place into the economic instruments of a community. Strengthening the homestead creates a stable environment upon which other developments may be cultivated. An empowered homestead has the potential to translate into an empowered people who take participatory roles in championing development agendas for their communities. This thesis is studying a practical approach to poverty alleviation by advocating for sweeping changes on something that has by and large been overlooked: the household as the primary building block of a village. Elements of interest are the household as a community and technology as a means towards sustainable living.

Modern Versus Traditional

Industrialization has coerced village architecture into aligning itself with energy-intensive practices while casting aside traditional building techniques. In most cases, reasons advanced to justify these developments are based on efficiency. But for the most part, efficiency is defined in the narrow narrative. Analysis considers efficiency in material sense, carrying out cost benefit analysis with more emphasis placed on financial benefits. It is unimaginable to suggest considerations of efficiency in psychological benefits rather than financial ones. It suffices to say that efficient systems have afforded many communities the tools for improved living. But this only points to the resiliency of communities in adapting to devices they are surrounded with. The question though is at what cost?

Housing has shifted away from the empowering Tswana setup that minimized the negative impact on resources while appropriating spaces for maximum productivity. The



Architecture that embraces culture and the climatic conditions

shift which can be attributed to the high regard for modernity has cast aside this proficiency, rejecting it as a reflection of inferiority. Rejection of such highly refined technological practices is regarded as a sign of social enlightenment. With government and financial institutions buying into these prevailing perceptions, the trends are making inroads in most rural communities' economies. A viewpoint that technological modesty of rural communities is not deliberate but a result of deficiency of means only serves to impoverish minds that were content with modesty. Equating material acquisition with personal satisfaction promotes an economic fantasy that entices communities towards a culture of consumerism. This keeps them in a state of perpetual dependency. The Machiavellian processes formulate to accomplish this impoverishment are well articulated by Joseph F Kennedy:



Elegance of African architecture

Traditional societies are euphemistically called pre-industrial, underdeveloped, or developing. The terms redefine a present modesty of means as imminent or eventual wealth... Subsistence is another word commonly used to describe traditional societies... This term distinguishes societies without high capitalization from those whose market economies are growing. Employed mostly by economists keen on maximizing systems - exchange of materials, services, goods, and money - the term implies a non-cooperative withdrawal or an inability to face and join a dynamic world. Further the word suggests meagerness, a sense of barely enough, of hanging on to life with fragile resources.¹

¹ Joseph F. Kennedy, *Building Without Borders: Sustainable Construction for the Global Village* (Gabriola Island: New Society Publishers, 2004), 36.

It is unfortunate for rural communities to routinely abandon their resourceful and responsive undertaking in favor of indiscriminate adoption of trends from the advanced North. It is evident that in order to carry out state of the art developments, advanced nations aggressively consume disproportionate amounts of natural resources with little regard to the adverse impact on human life. In this fast paced race towards technological advancement, human values and quality of life are largely compromised. It is even more unfortunate as one realizes that this drive is not based on tangible evidence that shows improved quality of living when compared to the indigenous lifestyle being castigated.

This thesis aligns itself with the growing voices that question the value of living systems that disrupts the social, economic and environmental equilibrium of life. The growing disillusionment has been brought about by ongoing studies which indicate that the faith we have in industrial, high-tech building practices to improve people's quality of life may be misplaced as these practices are found to be harmful to both human health and environmental resources. The financial exorbitance of this way of living compounds the negative setbacks. Self-reliant and non-consuming traditional societies may be well served by mitigating their gravitation towards chronic dependency on industrial solutions as this only serves to place a stranglehold on their resourcefulness and weaken their resilience to poverty. By re-considering this standpoint, perhaps rural communities can open new possibilities for revitalizing sustainable and interactive practices in rural living, rooted in the enterprising African way of living.

BACKGROUND OF BOTSWANA

Botswana is country with a relatively small population of about 1.7 million people.² Almost half of the population resides in rural areas where they derive most of their livelihood from agriculture. The country has a semi-arid climate with a mean rainfall ranging from 650 mm in the northeast to less than 250mm in the southwest (Ibid). Low, unreliable rainfall and endemic droughts constrain farming. These conditions diminish the ability of the agricultural sector to meet the country's objective of food security, rural poverty alleviation and employment creation.

When Botswana gained independence in 1966, the agricultural sector's contribution to Gross Domestic Product was about 40%. That contribution has since declined to about 3%.³ Despite this decline, the sector's role in Botswana's economic development has not diminished. Agriculture continues to be of significance in the rural economies. It is an important source of food, income, employment and source of capital for most people residing in rural areas. Despite this importance, agriculture is being looked shunned by the youth, who view it as backwards. Consequently, farming has gradually become the charge of an increasingly aging population. This is a major limitation in terms of sustainability and development of rural livelihood.

² Central Statistics Office, *Botswana Demographic Survey 2006*, (Gaborone: Government Printer, 2006), 20.

³ Ministry of Agriculture, *National Master Plan for Agricultural Development: Main Report*. (Gaborone: Government Printer, 2000), http://www.cso.gov.bw/images/stories/Agric/2004agriccensus_report.pdf.

Background of Otse Village and the People

Geographic Setting

Otse village is located mid-way between Lobatse and Gaborone, which is one of the fastest growing cities in Africa⁴. This proximal location between these two urban centers has resulted in spillover of urban complexities into the village.

Population

Census survey put the population of Otse village at 6,275 people⁵. An additional 1,100 people are estimated to live in the lands and cattle-posts that are closely linked to the village. The village is experiencing an influx of people who are migrating from other parts of the country and would like to settle in the southern region of the country for economic reasons. In a reverse manner, a sizeable number of the village population migrates to urban centers in search of improved living conditions. This leads to a pronounced change in the demographics of rural households and has an impact in sustained village development. Over the years, younger people have left rural life in search of what they perceive to be a more secure urban-based livelihood. As a result, older and less literate villagers who are less able to adopt new and innovative farming technologies are left with farming responsibilities.

⁴ Happy K.Siphambe, Nettem Narayana, Oluyele Akinkugbe, and Joel Sentsho, *Economic Development of Botswana: Facets, Policies, Problems and Prospects* (Gaborone: Bay Publishing, 2005), 13.

⁵ Central Statistics Office, *Botswana Demographic Survey 2006*, (Gaborone: Government Printer, 2006), 20.

Culture

Communities in the village are going through a transformation. Modern education systems have not always been popular, with families preferring their sons to rear livestock while daughters carried out domestic duties and assisted in plowing. As societies transform, emphasis has shifted to schooling and other developments that come with it. Notable impact of these transformations is evident in the economic outlook of the village.

Economic Development

The village's major economic activities are public administration and farming. However, the amount of land tilled for farming as well as the annual yields has been declining over the years. Manufacturing, construction and retail are also experiencing limited activity.⁶

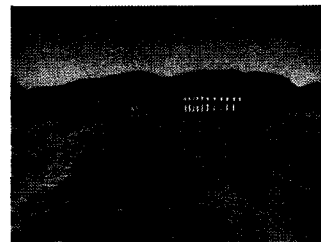
A considerable amount of employment in the village comes from informal sector. Employment, both formal and informal is not confined to activities located in the village. Because of its close proximity to urban centers, a significant number of people commute to work in these centers.

The trickledown effect from economic activities in these centers can be felt in the village. In addition to this, the urban centers also provide an extended market for local entrepreneurs and locally produced products.

⁶ South East District Development Committee, *South East District Development Plan 6: 2003 – 2009: Sustainable and Diversified Development Through Competitiveness in Global Markets* (Gaborone: Government Printer, 2003), 6.

Unemployment and Underemployment

The employed populace is mainly on low-income earning activities or in the temporary relief intervention programmes provided by the government. This leaves a considerable number of the population living in substandard conditions. Unemployment, poverty and low income levels are especially skewed towards women. For them, their job opportunities are largely characterized as being domestic in nature.



There are limited tarred roads across the village

Infrastructure Development

As with many villages, Otse has a tribal administration centered around the *kgotla*, which is the chief's kraal. In terms of infrastructure, the village has a substantial clinic, two primary schools, one junior secondary school and a senior secondary school. The village is well serviced with telecommunication, electrical power services, as well as portable water, albeit from Gaborone. The village is a home for Camphill community which is a non-government project that affords sustainable livelihood to the people with limited physically and mental abilities. A railway and a highway run through the village connecting it to Gaborone and Lobatse.



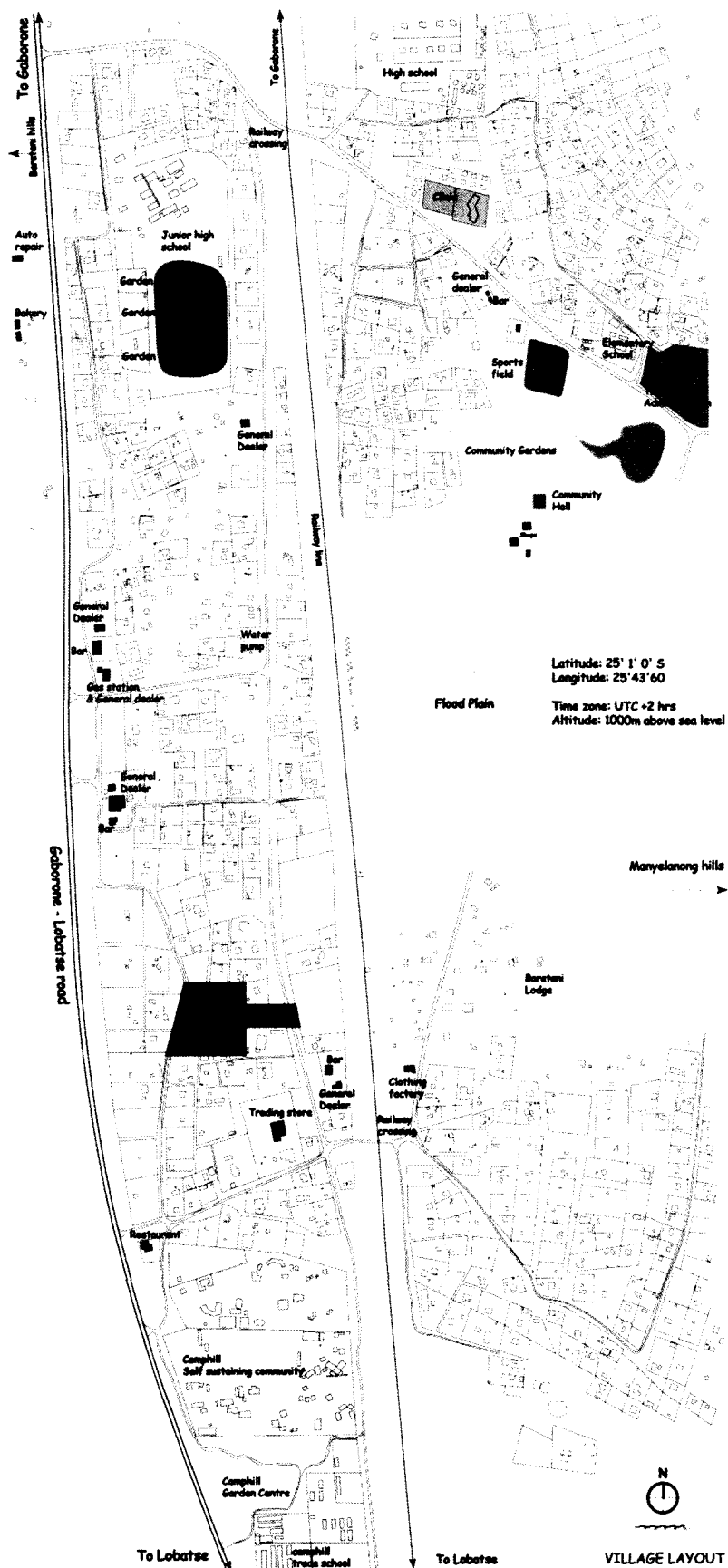
Railway line cutting across the village and connecting to Gaborone and Lobatse

Institutional Arrangement

Tribal administration has responsibility over policies governing the village while council looks over local roads, schools and clinics. Committees such as village development committees charts and implement some developments needed in the village.



Clinic facility in the village



Layout of Otse village highlighting the institutions and infrastructure around the village

Environmental Assessment

The village is rich in underground water resources but this water source has been declared polluted and inconsumable⁷. The pollution has been attributed to extensive use of pit latrines compounded by the high water table. Indiscriminate disposal of hazardous waste has also contributed to this pollution.



Use of pit latrines is one of the practices that led to contamination of underground water resources

Extensive use of fuel wood is another environmental problem which has led to deforestation and degradation of land. In addition to this, there is the problem of overgrazing. Damages to the quality of soil affect gains in agricultural ventures. Farmers are slow to heed the advice to comply with stocking rate and the advice to feed their livestock with livestock feed to ease pressure on the environment.

Environmental problems are worsened by the fact that the village has experienced uncontrolled extraction of sand and gravel. During the construction boom of the early 1990's, the village suffered extensive loss of land as it became the unsolicited supply of sand to construction projects in Gaborone and Lobatse. This also damaged riverbeds and left open pits which invite illegal dumping and continued degradation of the environment.

Continued existence of these problems indicates a *laissez-faire* approach by the community towards development of the village. Understanding the roots of this apathy might open new avenues for renewed involvement of villagers.

⁷ South East District Development Committee, *South East District Development Plan 6: 2003 – 2009: Sustainable and Diversified Development Through Competitiveness in Global Markets* (Gaborone: Government Printer, 2003), 21.

Availability of Land

Population growth put pressure on the available land resources. There is a significant imbalance between supply and demand as the need for land outweighs its availability. This has largely been brought about by the demand for land to accommodate population spill-over from Gaborone and Lobatse. This is likely to change the socio-economic pattern of the village. A number of urban developments are sprawling from Gaborone and Lobatse into freehold farms within the village. For this reason, agricultural sector competes for land with other such developments as residential, commercial and industrial developments.

Climate

Climate in the region is semi-arid with summer rainfall of about 475 – 525mm per annum. Rainfall comes in short, high intensity spells. A few occasions of heavy rain account for the bulk of the annual precipitation. In general, the rainfall is inadequate and unreliable. There is therefore shortage of water both for human and livestock consumption.

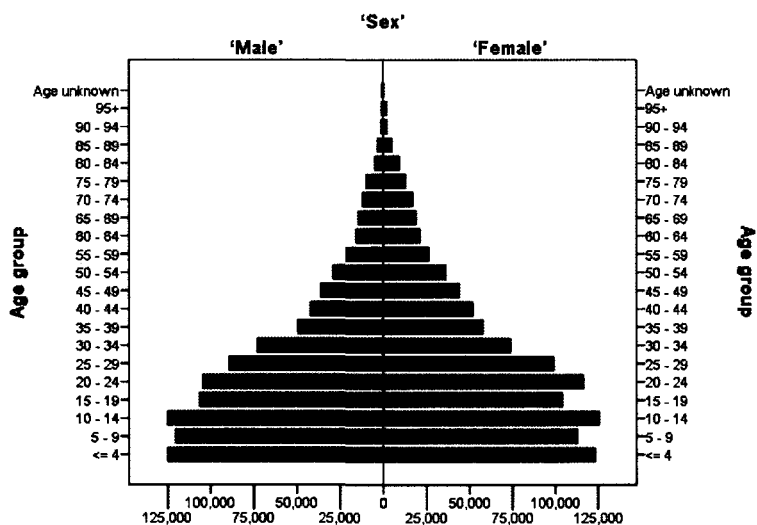
Temperatures exhibit high annual and diurnal ranges. Mean temperatures range between 19.6 degrees Celsius and 40 degrees Celsius in summer.⁸ In winter, temperatures only get to go below zero degrees during extreme cold winter nights.

⁸ South East District Development Committee, *South East District Development Plan 6: 2003 – 2009: Sustainable and Diversified Development Through Competitiveness in Global Markets* (Gaborone: Government Printer, 2003), 30.

Agriculture

Low and erratic rainfall, endemic droughts and uneven distribution of land resources hamper rain-fed farming and rearing of livestock. In addition to these natural constraints, other problems that render the agricultural sector ineffective and unreliable as a source of income are high input costs, lack of supporting infrastructure and low impetus towards embracing appropriate technology.

There has also been out-migration of able-bodied labor force to urban centre leaving the agricultural sector to be manned by ageing labor force and this contributes to the decline in crop and animal production. Farming has also declined in popularity due to people's unfavorable views towards farm activities.



Outmigration of youths to urban centers leaves a small pool of the aging population to be in charge of food security in village. Image courtesy of Central Statistics Office, http://www.cso.gov.bw/images/stories/Agric/2004agriccensus_report.pdf (accessed March 7, 2009).

Social Infrastructure

HIV/AIDS is still a major threat to the society and continues to reverse the social and economic gains that have been attained across the country as a whole. The pandemic is evasive and difficult to fight because of its highly secretive and stigmatized nature. Support structures such as Counseling and Day Care Centers for affected members of the community have been established in the village. Provisions of safety nets such as orphan care programmes and destitution programmes have been set up to cushion the hardships felt by those who are economically disadvantaged.

Development Agenda by Village Authorities

Strategy for rural development aims to improve livelihoods by mobilizing communities and encouraging them to take the initiative and run local projects of their own to generate income. The community based strategy for rural development was approved by Rural Development Council in 1997 and its implementation is expected to gain momentum.

In addition to creating an enabling environment for local communities, Rural Development Council has identified servicing of commercial and industrial plots as a strategy towards attracting external investment to the district in general. The targeted investments are from the two urban centers and it is hoped that they will improve industrial and commercial activity and create employment. Location of Botswana Police College 7 km west of Otse is expected to contribute to the economic development of the village as it is expected to attract private investors into the area.

Authorities see housing as something that may not exclusively combat poverty, but rather as a socio-economic empowerment programme limited to improving the livelihoods of people through provision of habitable housing.

This is indicative of committees responsible for planning and development. A lot of emphasis is placed on commercial and industrial development as the vehicle towards sustained development. Housing is viewed as a part player in the long-term development strategy of the village. This thesis study challenges this conclusion. It questions why the household has been overlooked as a vehicle for change. And why its ability to stimulate enthusiasm for development has been overtaken by other interests.

Erosion of Self-Reliance

Studies have shown that people's willingness to volunteer their efforts towards activities that develop the village has been weakening⁹. People are more inclined to take part in activities that promise monetary incentives. This is a shift from the village culture of collective cooperation and it is an erosion of self-reliance and cooperative fiber of the village. This weakening dependence on fellow community members is being replaced by dependence on government. Many of the government programmes that were established to inject resilience into the village economy have in turn become hand-out programmes, creating a dependency cycle.

⁹South East District Development Committee, *South East District Development Plan 6: 2003 – 2009: Sustainable and Diversified Development Through Competitiveness in Global Markets* (Gaborone: Government Printer, 2003), 26.

SETTLEMENT PATTERNS

Families in Botswana maintain three distinct but interlinked settlements namely the village, the cattle-post and the farmland. The town or city may come in as the fourth setting even though they are not that well integrated into the productive system of village life. Linking the urban centers back to the village setting is a fairly new phenomenon. The three settlements mentioned represent three distinct zones, contributing distinct roles in the life of a village household. The village is designated as the place of residence and trading, offering opportunities for various social activities throughout the year. The farmland is primarily a place for farming activities while the cattle-post is for rearing of cattle. These three settlements come together to define village life, telling the story of how traditional life maintained a balanced and harmonious living for generations.

The cattle-post and the farmland are usually located not too far away from the village and it is normal for people to commute to these places on foot. Occupancy between these settlements varies with seasons. Rearing of cattle for beef, milk and draught labor takes place all year round while farming activities increase in intensity during rainy season. The village household experiences vibrant life after all the farming activities have been completed, and crop produce brought in from the farmland.

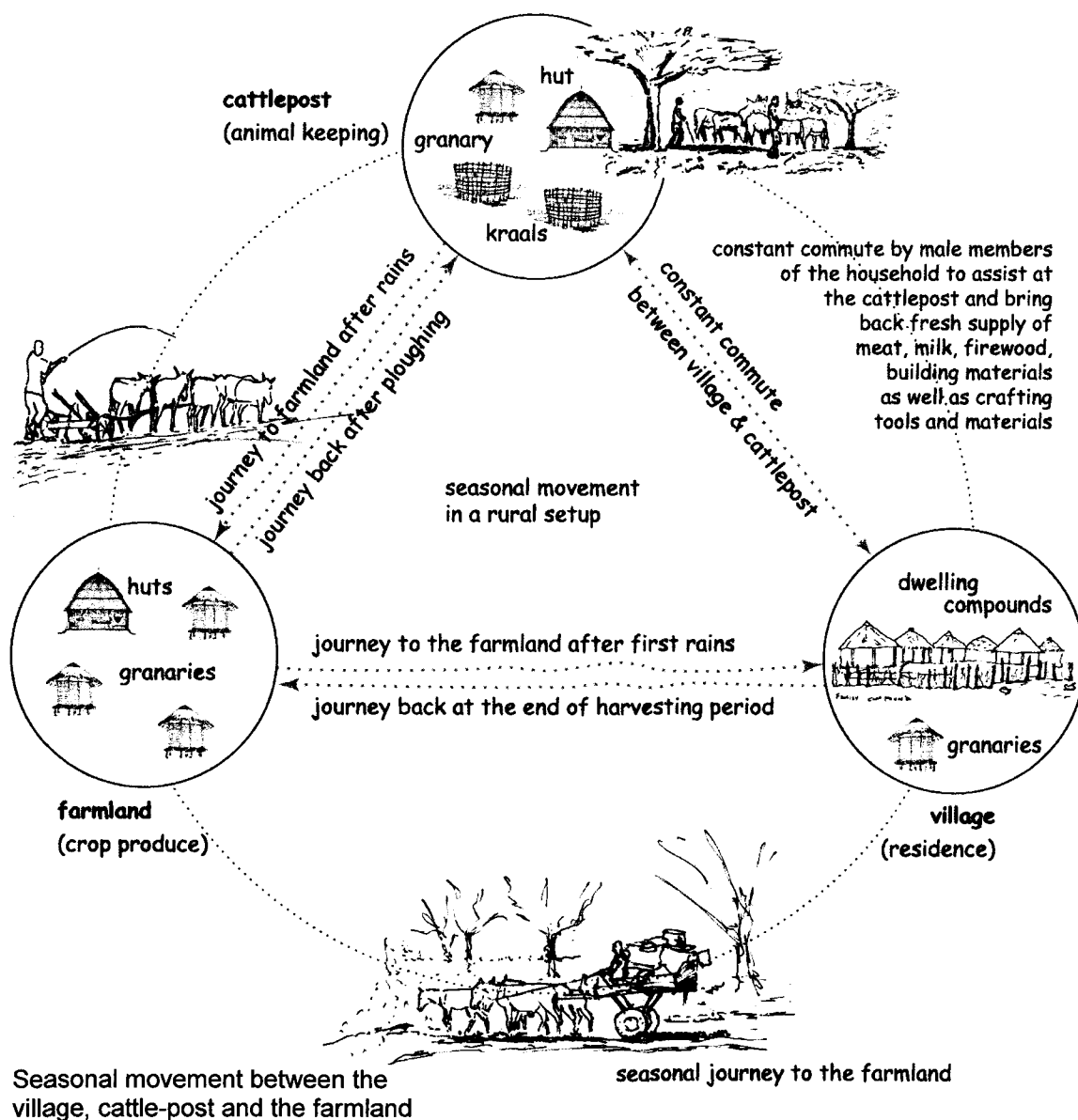
Activities in the cattle-post are relatively constant all year round. Whenever the need for firewood, building materials, or wood for furniture making arises in the village household, draught labor in the cattle-post would be utilized.



Normal commute between the village, the farmland and the cattle-post

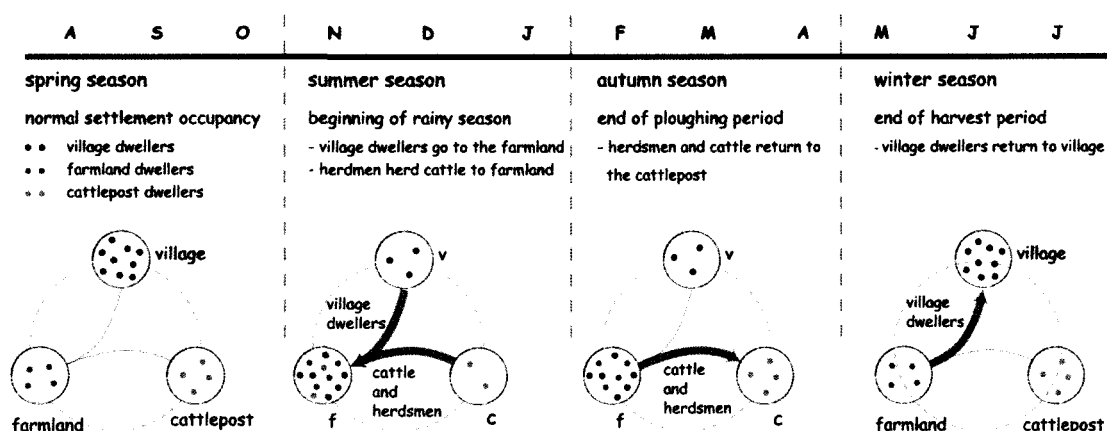
Seasonal Movement between Settlements

The rainy season begins in the month of December and at this time, family members relocate from the village to the farmland to partake in farming. Simultaneously, herdsmen herd cattle from the cattle-post to the farmland for draught labor and for daily provision of milk and occasional collection of firewood. During this relocation, only a few household members stay behind for safekeeping of the village residence and the cattle-post respectively.



At the end of the plowing period, cattle and herdsman return to the cattle-post while members from the village will continue living at the farmland through the weeding and the harvesting period after which they transport the farm produce to the village, leaving behind a small portion for those staying behind for safekeeping of the farmland. This integrated system was the lifeline of many households, catering for the basic needs of life. A break in this cycle would have significant impact in the livelihood of a village household.

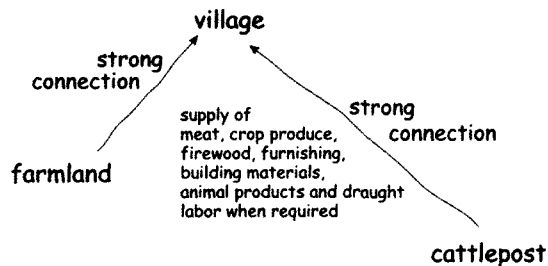
For coordination, the village chief announced when people could begin heading out to farmland for farming activities. This was marked by a celebration called *letsema* held at the village's main *kgotla*, an official gathering place in the village located near the chief's compound. A similar celebration called *dikgafela* was repeated after harvest and households brought supplies of crop produce for storage at the *kgotla*. This supply was held in stock so that during lean periods, there would be food supply for the village. This supply was also used to assist the less fortunate in the society. This dynamic lifestyle guaranteed the sustenance of rural communities.



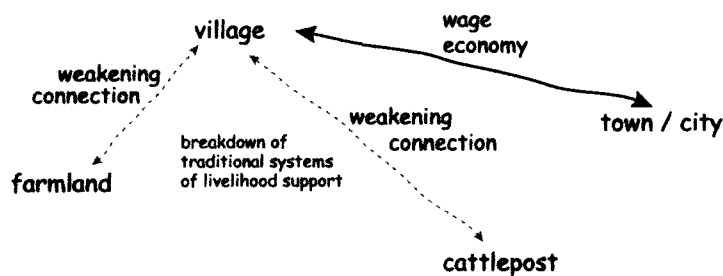
Seasonal change in the demographics of rural settlements

Weakening links between Settlements

As lifestyles change, the importance of the cattle-post and the farmland is waning. Their links to the village are replaced by new connections with urban centers. As activities in the farmland decline, food provisions are compromised. Reduction in food supplies means that villagers resign themselves to sourcing out finances to buy supplementary food supplies from retail stores. This adds to the burdens of poverty and dependency, and it fuels the disempowerment of rural households.



Life support system in rural setting indicating the productive structures that support village life



Transition of rural life showing a weakening of connections between support systems which sustained rural communities

This economic transition from subsistence living to wage earning economy is happening at a pace that overwhelms rural economy. The thesis explores a bridge that might cushion this breakdown of living patterns in the village.

STUDY OF VILLAGE SETTINGS

Setup of a Village Ward

In a traditional village setting, individual homesteads are arranged such that they form a horse-shoe formation, creating a sheltered communal space shared by several households. This collection of homesteads forms a ward.

The communal space plays a major role in harmonious living. It is the place where households come together in unity, be it through social meetings, collective celebrations or through cooperation in craft activities or in simple act of watching children at play. A large shade tree gives character to this communal space. The shade becomes a focal point where social gatherings take place. It is common for elderly men to take ownership of this space. Women congregate within the compound for the most part.

Throughout generations, there has been a steady transformation in living patterns because of changes in the way of life and because of influences from contact with other cultures. Village life has harmoniously incorporated these external influences into its way of life while maintaining its identity.

In recent times however, this harmonious assimilation of external influences has been under threat as the waves of developments reaching the village arrive at a pace and intensity that threatens to overpower the village's ability to accommodate them without altering the social and economic support systems of village life.



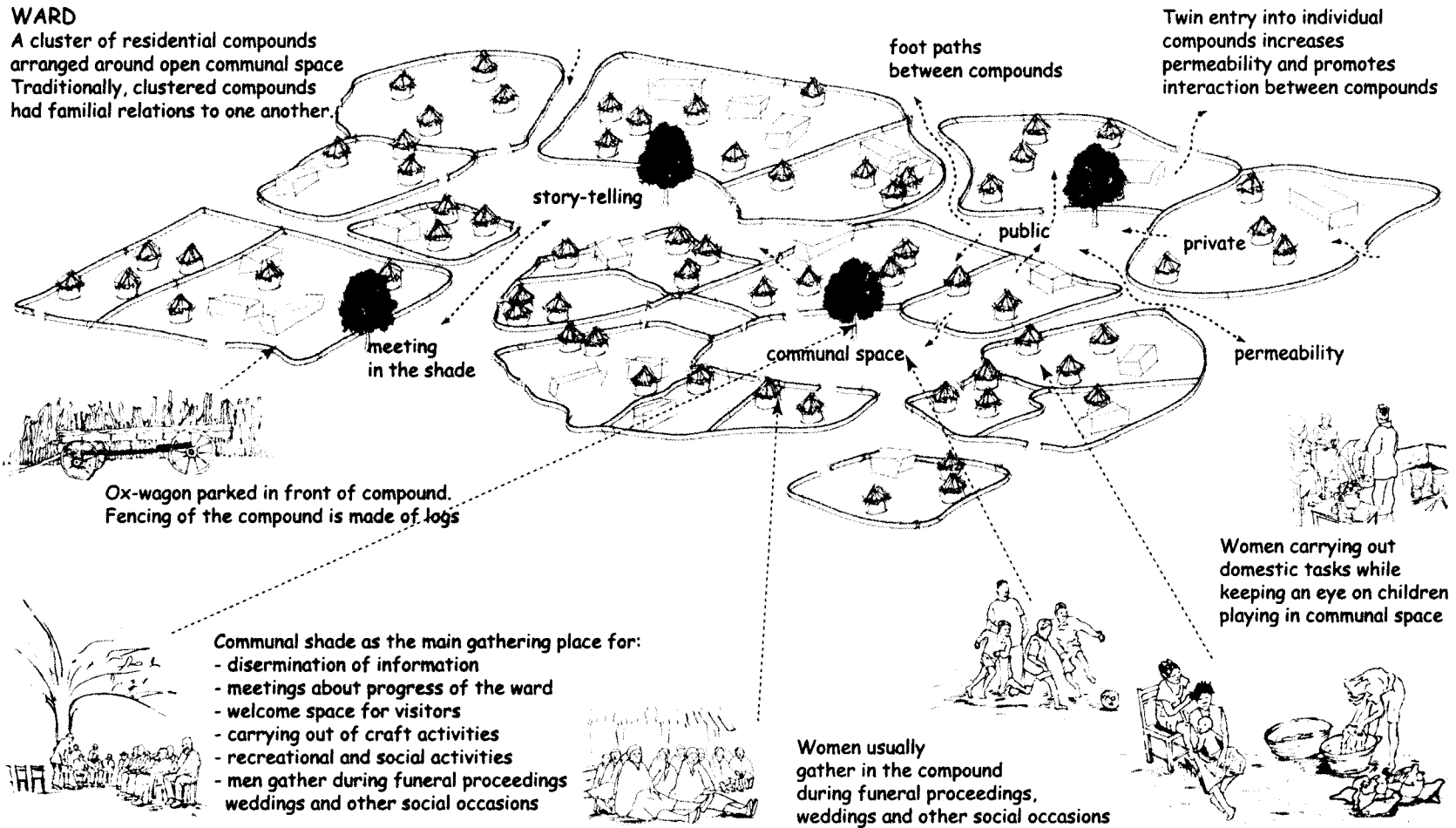
Communal space as a natural gathering space for the surrounding community



Keeping livestock within the communal space increased its usability

WARD

A cluster of residential compounds arranged around open communal space. Traditionally, clustered compounds had familial relations to one another.



Traditional Tswana Ward

Setup of a Tswana Compound

A Tswana compound comprises several detached huts. Each of these huts is built for a particular purpose. One of the prominent elements in the compound is *lolwapa* which is an open forecourt defined by a knee-high earthen wall. This forecourt is a natural gathering place for social meetings and a place for receiving and entertaining guests. The main hut opens onto this forecourt, and one or two more huts may also be built around this forecourt.



Social meeting within the inner courtyard

Other huts are built around the compound and may have smaller forecourts of their own. The huts are clustered according to family lineage. As the need arise and depending on the availability of funds, more units are added to the compound. Absentee son may build a hut within the yard which is to be used in his absence and made available to him whenever he comes around.



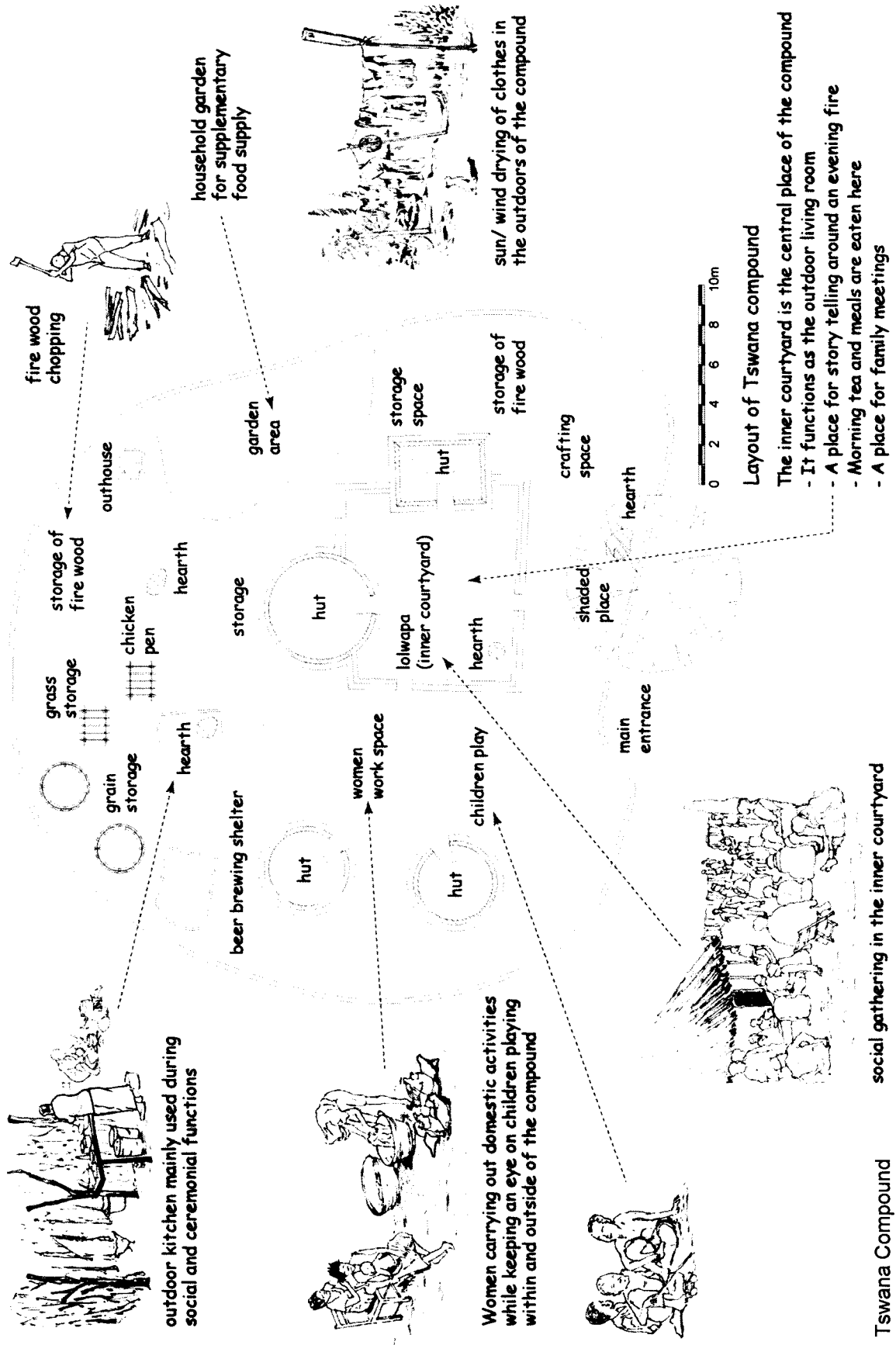
Traditional huts within the compound. Trees provide shade for outdoor activities

Another prominent element of Tswana compound is the outdoor and open kitchen demarcated by saplings, reeds, or brushes, depending on the availability of materials. In addition to meal preparations, this area is used as a communal space for storytelling in the evening and a place for coming together for morning tea.

Typically a large shade tree marks the entrance of the compound. The shade offers a welcome reprieve from the searing sun and creates a leisurely space for social coming together and for welcoming and entertaining visitors. Occasionally, elderly men use this space to carry out their crafting activities. The entire compound including indoor and outdoor spaces constitutes a dwelling place.



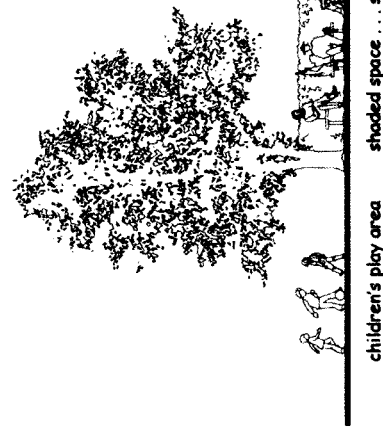
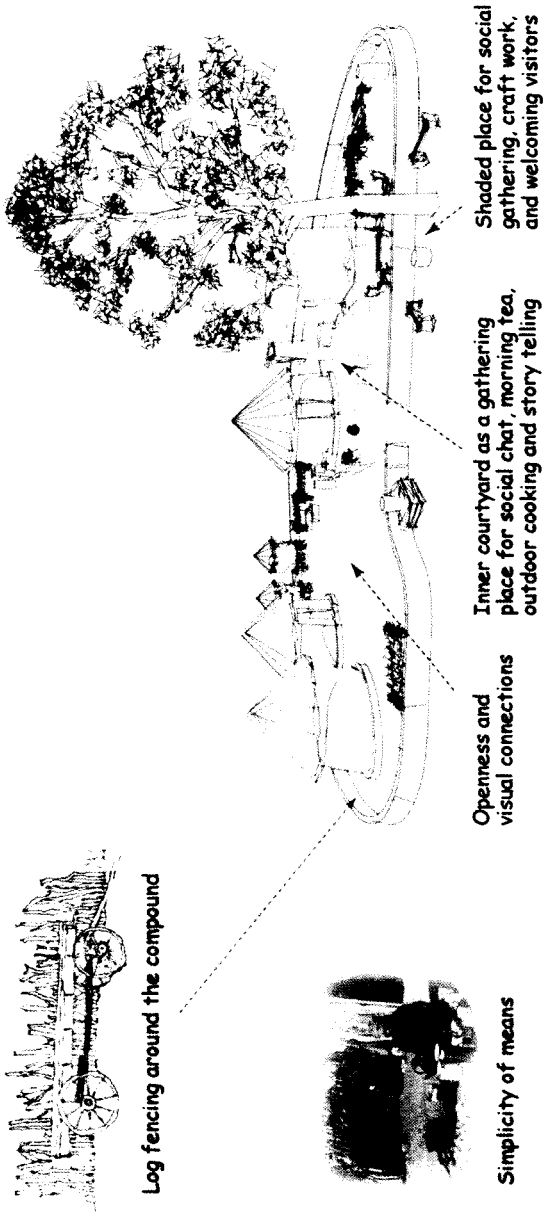
Outdoor kitchen sheltered by reeds



Compound

A collection of detached huts each of which has a specific purpose. Compounds are bounded by log fencing. The main huts are arranged around a low mud walled inner courtyard called *lolwapa*. Quality of life in the dwelling place is enhanced by making provision for outdoor living and allowing spatial arrangements to be easily adapted to the Tswana way of life.

Reducing the significance of outdoor spaces limits functionality of the compound

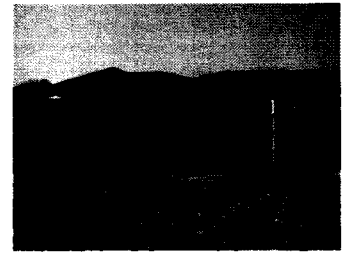


Spatial arrangement of the compound - indoor and outdoor use of space in a traditional Tswana compound

Traditional Tswana Compound

Changing Settlement Morphology

Due to shortage of land, authorities encourage densification within the village. Physical constraints and shortage of land restricts growth of the village. Being surrounded by hills, the village can only expand into freehold farms. Expansion of Gaborone has also seen acquisition of some of these freehold farms and converting them into residential development.



Architecture that is less embracing of the village community, introducing an element of seclusion

Due to this pressure, communal and courtyard spaces between compounds are gradually being filled up with houses to accommodate the housing needs. The nucleated settlements are gradually being turned outward as they line up in linear and grid patterns. The collective model of settlement is transforming into individualistic setup.

Housing Supply

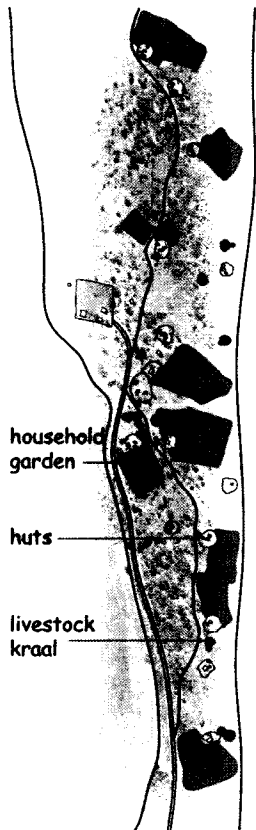
Residents are continuously upgrading their residences from a traditional look to the modern type of housing. Until recently, housing in the village has mainly been through individual savings or inheritance. Recognizing limitations for some Batswana to provide housing for themselves, the government has decided to complement their efforts as a way of ensuring that rural residents live in safe and decent environment. The government extended the Self Help Housing Agency (SHHA)¹⁰ programme to rural areas. The houses have to conform to defined housing requirements set by land board authorities.



Boundary walls surrounding individual households are becoming a common feature.

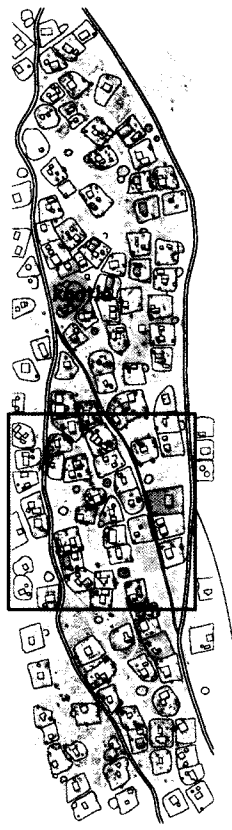
¹⁰ Self Help Housing Agency was instituted by government in the early 1970's to facilitate provision of affordable housing to low income households on subsidized basis.

farmland (sakutswane)

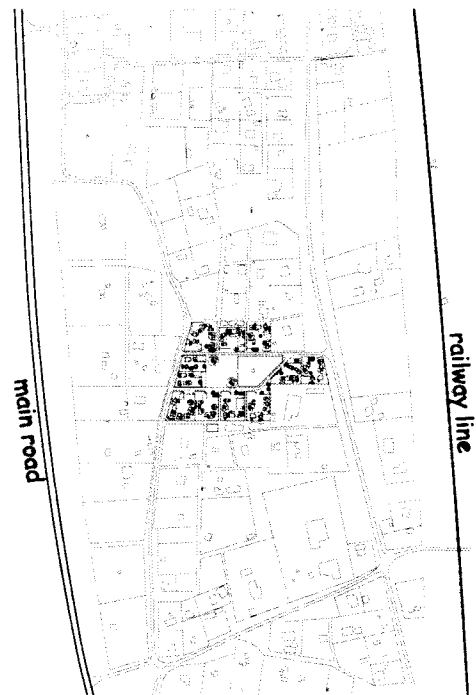


0 50 100 150 200 m

remote village (mogobane)



village (otse)



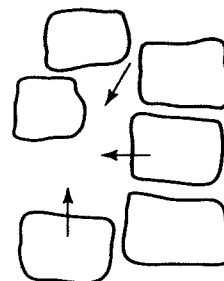
As the village population grows, communal spaces between compounds are built over. This densification sacrifices social and economic interaction between households, killing the collective spirit of the community

foot paths

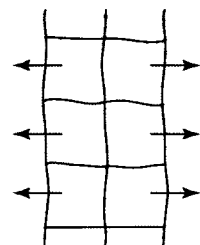
homesteads

communal space

communal kraal



collective model



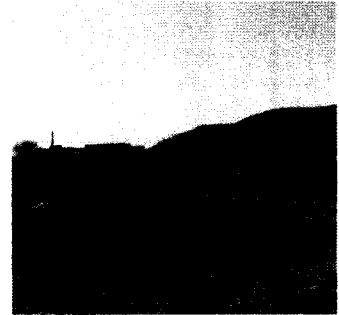
individualistic

Transition of rural settlements over time. Settlements begin as remotely populated places with vast farming land. In time, the population increases and some of the farmland makes way for residences and the process continues as the transition is allowed to go unchecked.

DEVELOPMENT AND POVERTY

Extent of Poverty in Botswana

Eradication of poverty in rural areas is a significant component of empowering rural communities. Understanding the extent of poverty in these areas strengthens and substantiates development initiatives. The complexity of working towards eradicating this social ill is made difficult by the fact that poverty is not a one dimensional problem. Once immersed in poverty, all the setbacks come together to compound the problem, making it difficult for households to break free from it. Understanding the conditions and elements that draw people into poverty in the first place may help in understanding how to bring down the barriers that prevent these individuals from rising above it.



Lack of income results in substandard housing for those experiencing poverty

Dimensions of Poverty

For some time, poverty has been measured in terms of income alone but increasingly, organizations are recognizing that there are broader indicators of poverty than income alone. The narrow view of poverty has resulted in development strategies that overlooked significant structures that needed to be in place before sustained progress could take root. In addition to material deprivation, poverty encompasses lack of social and institutional participation and as well as poor capability structures. Consideration of the broader dimensions of poverty sheds a light on how these incapacitating elements interact and reinforce each other in ways that circumvent initiatives to eradicate the problem.

In his literature, Happy Siphambe¹¹ provides a broader perspective on three elements of poverty namely income poverty, capability poverty and participatory poverty.

Income Poverty

Findings from Botswana Institute of Development Policy Analysis (BIDPA) show that 47 percent of Botswana or 38 percent of all households were living below the poverty threshold of P100 per person per month in 1993/94.¹² 62 percent of the poor were found to be living in rural villages. These numbers have improved over the years since 1994, but the levels are still high enough to be of concern to rural economies. Poverty in villages has a gender dimension as shown by the lower success of female headed households in getting out of poverty than the male-headed households.

Capability Poverty

Another element of poverty encompasses deprivation in areas of health and education. There is correlation between lack of access to health and education and the hardships experienced by the poor. When people are subject to low infant mortality, low life expectancy, and with children likely to drop out of school, chances of improved standard of living are slim.



Uninformed choice of building systems worsens state of the poor



Household with limited resources for shelter

¹¹Happy K.Siphambe, Nettem Narayana, Oluyele Akinkugbe, and Joel Sentsho, *Economic Development of Botswana: Facets, Policies, Problems and Prospects* (Gaborone: Bay Publishing, 2005), 203.

¹² Botswana Institute of Policy Analysis, *A Study of Poverty and Poverty Alleviation in Botswana, MFDP* (Gaborone: Government Printer, 1997), 16.

Botswana has made commendable advances in this area as shown by positive changes in health and education indicators. The country's Human Development Index was 0.611 in 1985 and steadily rose to 0.673 in 1994. This encouraging development was however been slowed down by the blight of HIV/AIDS. HDI began to decline in 1998 and was estimated at 0.536 in 2002.¹³

Enrolments in schools are high but the setback is that the workplace is unable to absorb the yearly increases in the labour force from students who could not gain access to higher education. These are individuals who are more likely to fall behind in economic and social standing, and become trapped in the cycle of poverty, especially if they are unable to acquire any useful auxiliary skills. This problem is compounded by school drop outs especially by children coming from underprivileged background.

Participatory Poverty

This type of poverty is related to people's limited opportunities to participate in decision making processes that affect their lives, rendering them voiceless and powerless. Traditionally, Botswana has had a development system that encouraged public participation. At the apex of this is the Tribal *kgotla* system which provided a forum where the Chief and his advisors communicated important matters to the villagers and listened to their views. Everyone was welcome to express their views in this forum.



Kgotla, a forum for open discussion

¹³ SARIPS, *SADC Regional Human Development Report 2000* (Harare: SAPES Trust, 2000), 41.

These forums are still in place. Local councillors and members of parliament explain government programmes and solicit feedback in the *kgotla* and other public gathering places like freedom squares.

There are however limitations to public participation. Some of these arise because of the limited capacity of some members of the community to comprehend some of the policies being presented and discussed. Other limitations arise from public indifference to meetings. The arena is set for public participation but the limitations undermine effective input especially from those who are in the lower echelons of society.

Benefits of a Broader Perspective on Poverty

The multidimensional view of poverty allows for multipronged strategies. Creating enabling environment for improved standards of living is enriched if development strategies cover wide ranging issues to eliminate as many of the setbacks associated with poverty as possible. The complexities associated with identifying indicators of poverty prove that development is something that is even more meaningful if the initiatives are derived from local conditions. A multipronged view of poverty enriches one's understanding and raises the sensitivity that is essential in dealing with human development.

Government's Development Initiatives

Botswana's effort to reduce poverty has been anchored on several areas of intervention some of which are aimed at diversifying the economy and moving from heavy reliance on the mining sector.

Most efforts are aimed at assisting entrepreneurs to enhance their productivity and create employment. The most publicized scheme is the Citizen Entrepreneurial Development Agency (CEDA) which is geared towards encouraging citizen entrepreneurs with their business ventures. Even though this initiative promises success, it faces problems which undermined other schemes before it which include abuse, fraud, and the inability of some businesses to live beyond the subsidy era.¹⁴ Some of these setbacks reveal the prevalence of a culture of handouts in certain instances.

Another area of development relates to government programmes targeting employment creation in rural areas. One of these include the Remoter Area Development Programme and Arable Lands Development Programme. This programme is aimed at enhancing rural incomes through supporting productive activities and creating employment for the rural area dwellers.

These have been deemed successful, albeit to a limited extent. Like many government initiatives, they are criticised for creating a dependency syndrome on government.

In addition to these developments, the government has developed safety nets for people who are less capable of benefiting from the other government initiatives.

¹⁴Botswana Institute of Policy Analysis, *Financial Assistance Policy Fourth Evaluation, Final Report for MFDP* (Gaborone: Government Printer, 2000), 39.

Assessment of Poverty Alleviation Strategies

Since gaining independence in 1966, Botswana has made tremendous efforts in poverty reduction. The country was ranked number one in Africa in the World Economic Forum's 2003-2004 Global Competitiveness Report. The assessment was based on key factors that contribute to an enabling environment for sustained growth.¹⁵

To maintain this positive development, a constant re-evaluation of development strategies and elimination of structural rigidities and poorly functioning institutional structures will help. Various strategies have had limited impact on poverty reduction because the programmes were subject to abuse and tended to create unsustainable dependency on government. Some of these initiatives failed because of this and yet new programmes plagued by similar problems continue to be rolled out.

It is this realization that set the basis for undertaking this thesis study. It is generally accepted that a major part of poverty alleviation will come from pro-poor growth, facilitated by employment creation. Policies and strategies have been designed to develop and empower people with relevant skills to get to work. In terms of equality, enabling environments are being created to provide equity to women whose participation in the job market has been marginalized.

¹⁵ Happy K.Siphambe, Nettem Narayana, Oluyele Akinkugbe, and Joel Sentsho, *Economic Development of Botswana: Facets, Policies, Problems and Prospects* (Gaborone: Bay Publishing, 2005), 204.

Overlooked Opportunity

What is conspicuous about these strategies is the lack of confidence in the household as the institution upon which developments is to be structured. It wasn't too long ago that food store for the village was supplied primarily by individual households. Most of the food and material supply needed for lean periods were provide for by individual households and placed under the care of ruling authorities. Prevailing development strategies fail to look back in history and take note of this self-sufficiency. The thesis aims at contributing to the debate on broadening the scope for development.

Vision of the Government on Development

The government of Botswana acknowledges that there is an unprecedented change in social values. This has been accelerated by the pace of urbanization and globalization. The government's vision is for people to adapt to the challenges of global influence while retaining the positive aspects of their cultural values as these distinguish them from other nations. To carry this forward, the government has put together its aspirations and adopted them as a vision for the country. This Vision which is referred to as Vision 2016 was formulated in 1997 to be a guide to strategic thinking and policy making.¹⁶

¹⁶ Presidential Task Group on a Long Term Vision for Botswana, *Vision 2016: Towards Prosperity for All* (Gaborone: Government Printer, 1997), 5.

The tenets of the Vision are:

1. An educated and informed nation
2. A prosperous, productive and innovative nation
3. A compassionate, just and caring nation
4. A safe and secure nation
5. An open and, democratic and accountable nation
6. A moral and tolerant nation
7. A united and proud nation¹⁷

These are unique in nature and define the kind of society envisaged by the government as the country moves forward. These are grounded on cultural heritage. The main driving force of Vision 2016 has been envisaged to be the citizens themselves because some of these goals cannot be legislated.

The vision calls for self-examination at the level of the individual, community, business enterprise, political, social and professional organization, as well as at national level. In its call to arms, the Vision 2016 committee points out that Batswana are to be dedicated to shaping the destiny of their country, pointing out that failure to look and move forward now could condemn the country to social, economic and cultural stagnation, and long term underemployment.

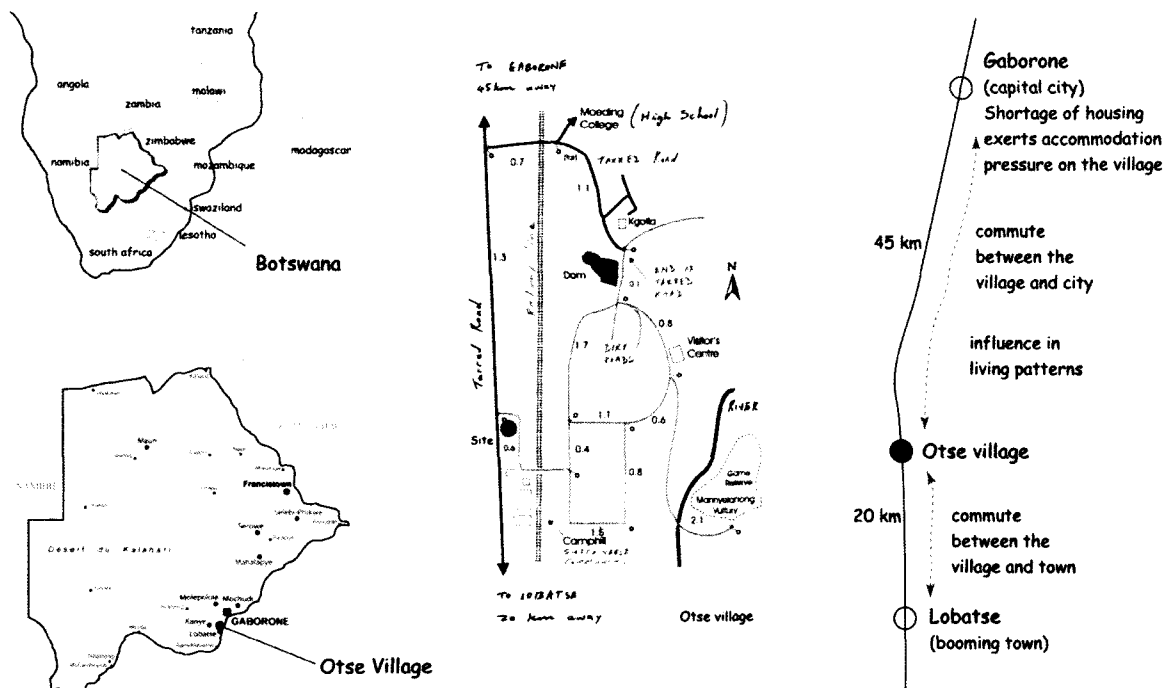
¹⁷ Presidential Task Group on a Long Term Vision for Botswana, *Vision 2016: Towards Prosperity for All* (Gaborone: Government Printer, 1997), 5.

DESIGN CONTEXT

Place and Context of Study

Otse village is located 45 km south of Gaborone, the capital city of Botswana. The village is set between two hills and stretches in a North - South orientation. The settlement began at the foot of the hill where the chief and his lieutenants set up their compound. The hill acted as a fortress providing protection against invading armies. From this location, the settlement radiated southward as the population increased.

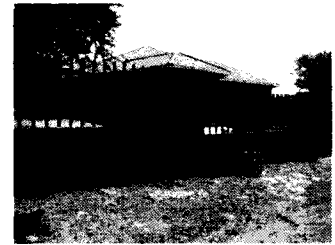
As with most villages in close proximity to urban centers, Otse is largely influenced by Gaborone and Lobatse. These influences are noticeable in settlement patterns, housing style, building technology, and lifestyle patterns.



Location and context of the project, indicating siting within the country, the village and its location between the two urban areas, Gaborone and Lobatse.

Influence from Urban Centers

Living patterns in the village mirror those patterns established in urban centers. These new trends are appreciated by village authorities because they recognize their value in bringing progressive outlook for the village. But while appreciating these benefits, they are apprehensive of the alienating aspects associated with these developments.



Boundary wall around the household introduces levels of seclusion

Instead of aligning themselves with the vernacular, new developments have the transformation effect, altering the village's social understanding and changing the villages' support systems. The spirit of collective and community interest is making way for a life that places the interest of the individual above that of the community. Village planning and architecture that used to reinforce a collective living is making way for a new architecture that shifts this perspective to housing patterns that reinforces self instead of collective dependency.

This development fulfils the aspirational desires for those with resources to support the demands of this standard of living. But conversely, the benefits are reversed when living systems are casually introduced into a rural setting. The city life by definition generates its energy from the consumer culture that keeps the economy going. In rural settings, this culture disrupts survival systems, and exacerbates poverty by tearing down the communities' collective resourcefulness and a sense of collective ownership. What is missing in the current development outlook is a balanced planning and design approach that embraces contemporary living while being sensitive to the social and cultural understanding of the village.



Lower economic status still maintains vernacular way of life

OVERLOOKED RURAL VALUES

Cultural and Societal Understanding

Tswana cultures had a way of seamlessly integrating vocational, social, and recreational activities into their living environments. Such environments created opportunities for sharing knowledge and skills, and enhanced communal relationships that strengthened self-sustenance. This integration of life was evident in all facets of life and in all village institutions beginning with the household and the village ward. When replicated at a larger scale, it created an opportunity for people from varying social and economic backgrounds to create a common ground that allowed them to positively contribute into each other's needs.



Blending of social and domestic activities

For women, activities such as going out to fetch water and doing laundry by the river side was an occasion for them to meet for a social interchange and share ideas. Tending to cattle by men was an opportunity to spend time with the young boys teaching them the valuable lessons of manhood. Young boys and girls had perfected their skills in carving out playful moments while carrying out their daily tasks, be it watering small stock by the well or carrying out domestic chores.



during ceremonies can be a social event for women

Even though these moments were not programmed, they appeared to be choreographed into systems of life. They happened in simple and unsophisticated but well thought of manner. This simplicity and spontaneity does not imply that they developed by chance. Certain elements have been established over time and having these in place help to sustain such natural way of doing things. At first glance, it might appear as though traditional societies didn't promote



Water collection as a collective effort and an opportunity to socialize

recreation but a closer look reveals that these were integrated within the vocational activities: an efficiency of means that prevailed in traditional societies.

This balance begins to fall apart following the introduction of formal approach whose success is set on programming and appropriating routines of life. As wage earning economies begin to take root in rural settlements, this integration is dismantled by segregation of the work place, social places, and leisure and recreation activities. Formalizing life in villages breaks the fluidity of natural integration of life. But conforming to a capitalist system seems to demand a clearly identifiable demarcation of life's activities through the day so as to be able to categorize such things as billable and non-billable hours. With this approach in mind, the informal and subsistence living that integrates everything thus seems unmanageable due to the complexity of regulating such existence.

Coexistence of the formal and informal in rural setting builds upon the traditional principle of self-reliance and developing the community through collective effort. Every member of the community was a teacher and a student of life, passing on the knowledge to the younger generation through the integrated learning environment.



The Disconnect of Learning Institutions

In contemporary village setting, integrated learning that used to take place within the household is limited. The household has been disabled as a learning institution and has relegated its teaching tools to the school. As schools are increasingly seen as authorities and agents of change, the grassroots knowledge that children learn from their households is generally devalued and represented as temporal. This becomes a missed opportunity to pass on the skills that used to be the lifeline of rural households.

With schools imparting knowledge geared towards formal work, there is disincentive for one to invest effort and energy in learning the household operations as these are considered temporal. This compromises the basic structure which was critical in survival and empowerment of rural communities. Short circuiting domestic learning leaves elderly men and women in the village hesitant to teach the younger generation the enterprising knowledge that has kept African communities surviving for generations. Their wisdom is being rejected as immaterial and irrelevant in modern day living.

To compound this setback, learning through schools is contentious as there is a disconnect between curriculum and the practical realities of rural living. Rather than the curriculum being adapted to social, cultural and economic realities, they are an imposition divorced from functioning of the village. To a rural life, the benefits of educating children are hardly realized as upon completing their training, they inevitably leave the village in pursuit of the promised benefits of education elsewhere. By and large, those unable to pursue further education remain in the village,

and the task of pioneering village development falls upon them. But with the aforementioned disconnected training, they lack the resourcefulness to champion meaningful development within their community.

A Case for Developing the Homestead

In light of this erosion and transformation of rural structures, the household needs to be reconfigured as an institution to bridge the development gap in rural living. The proposed design approach attempts to mitigate against the common failings that relegate people who fail to secure wage earning jobs to a life of limited input to their community. Designed properly, living environments can engage people into understanding day to day operations and contribute to productive functioning of the household and subsequent productivity of the wider community. This will enable their immediate contribution to society despite the difficulty of interpreting their formal education into their immediate living environments.

Training that is tailored for formal work place instead of community life can be supplemented in the homestead. The reality of rural life is that formal work is a supplementary source of income, not the prime source of income. Healthy rural learning engages the community, integrating all facets of life. Doing otherwise is doing a disservice to the traditional learning structures that had the elderly and the young constantly exchanging experiences that ensures healthy development of communities.

Participatory Engagement within Households

Housing trends that are being adopted in the village offer limited flexibility and limited opportunities for adaptation to the household needs. The buildings forms have limited consideration to rural activities and as such household activities have to adapt to the built structures instead of it being the other way around.

The alternative design creates dwelling units that are transparent and engaging in their function. Integrating working spaces and spaces of leisure within the built structures brings about the interaction between occupants and the building. Through this transparent engagement, occupants adapt the building structures to suit the needs of their various activities thereby increasing efficiency and reducing redundancy. Use of natural building materials improves this flexibility. Their ability to be made into household furnishings such as ovens, cooking stoves, foundry, grinding blocks, and sleeping beds adds to cost saving measures that improve efficiency. Their simplicity allows for repair of any breakdowns using the readily available knowledge.

Changing Spatial Organization

Spatial arrangement within the compound affects the socio-economic and psychological welfare of the family. A traditional Tswana compound was laid out to have separate rooms strategically spread around the homestead. The rooms were specific in purpose, catering for the various household needs. Outdoor spaces between these rooms were as important as indoor spaces. They were programmed for productive, social and recreational uses.

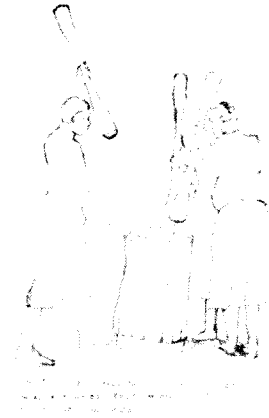


Multi-roomed housing is increasingly being adopted in village architecture, replacing the detached house planning

With the advent of the multi-roomed house, spaces have been consolidated under one roof. In that process, various outdoor activities have been brought indoors and efforts have been made to adapt to these changes. The indoor environment becomes the focal point of the household as it has become the place where cooking, socializing and refreshing takes place. In the process, the outdoor spaces become residual spaces and most of the tasks taking place outdoors take on a discredited feel and lose their appeal. In moving some of the outdoor spaces to the indoors, important social, cultural, and psychological benefits have been compromised.

Economic Benefits

Changing perceptions towards some household activities means that spatial programming within the compound is critical. Some activities and tasks have picked up negative connotation and as such, carrying them out has a social stigma associated with it. Even though some of these tasks are still as important now as they have ever been in their contribution to productive quality of a household, they can easily be rejected if their spatial programming places them in a areas that exposes them to public scrutiny. This dilemma can easily be exacerbated by spatial planning that relegates these activities to left over spaces. This in essence gives credence to existing negative perceptions and thereby discounts the worth of these tasks. Proper spatial organization arranges the spaces in a way that facilitates a seamless integration of all household activities. Such seamless integration enhances smooth and natural functioning of the homestead.



Pounding millet is an important household activity that can easily be overlooked



Location of outdoor kitchen has an impact on how useful it becomes in household activities



Open and semi-sheltered space with flexible program

Social Benefits

For generations, extended families have been able to live together within the same compound but indications are that this is increasingly becoming a contentious arrangement. An investigation in the effect of the adoption of multi-roomed housing in village architecture might reveal a connection between confined spatial arrangements, enclosed environment, the limited room for reprieve and these familial contentions.

In contrast, the living spaces of Tswana compound were liberating and allowed people of different dispositions to live together. The old and the young generations had a subtle way of sharing common spaces. By and large, men and women had separate spaces and yet, they had open and unifying common ground. The spatial arrangements allowed members to have the much needed social connection and collective living while having the freedom afforded by a liberating spatial planning. This was an important aspect in maintaining social coherence when multiple families and different generations live together. The balance between the individual and the collective strengthened the identity of the household.

In the thesis project, opportunities are being created for both social interaction and private contemplation. The compound layout is set to encourage visual and active interaction between family members, neighbors, and passers-by. This is the aspect of the thesis which investigates how architecture can create an environment that fosters and encourages sustainable harmony within the household environment.

Psychological and Collective Benefits

With, multiple families living within the same compound and sharing activities, opportunities are created for sharing of resources and cutting on costs. The compound layout takes into consideration the cycle of material resources. Maximum efficiency is achieved if waste from one activity becomes a useable resource for the next activity. As such, a cycle is created to minimize wastage of resources. Collective living brings together people who can be resourceful in the use of resources.

Collective living brings with it the knowledge that close relatives are within close range and this realization offers a sense of comfort as well as providing social security for improved wellbeing.

Incremental growth of the compound allows families to live within their means and only add to their homes as funds become available. Large families living in the same compound provide the needed manpower necessary for a productive household.

Family Structure as a Fundamental Unit

The family unit as the pinnacle of Tswana society is at the center of the proposition aimed at rethinking the design of the homestead. Family structures in a typical Tswana family expand and shrink constantly depending on economic and social factors. Typically, a rural household family consists of elderly parents as the heads of the household. Normally the children live in until they are ready to establish their own households whereby the women would leave to join the husband's household. Men may

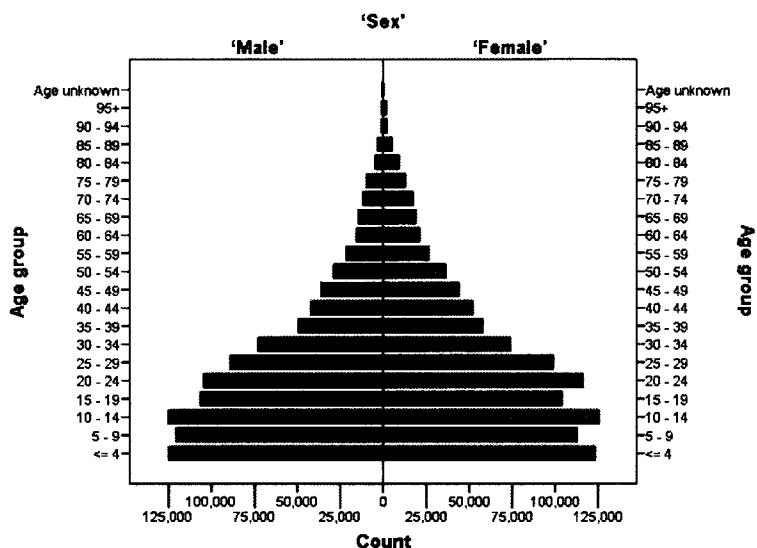
choose to establish their household within the parents' compound or establish one within the same ward. This decision may depend on the financial status of the man. Unless they are married, women would usually establish their household within the main compound.

Generally, sons and grandsons reside at the cattle-post taking care of livestock while daughters and granddaughters generally reside in the village and at the family farmland attending to domestic charges. Understanding this family structure provides a base upon which to re-establish the household as a productive unit of the community.

Women and the Household

For generations, the homestead has been the domain of women. Being the backbone of the productive elements of the household, women prided themselves in the smooth running and the well keep of the homestead. Man's contribution was to hunt, gather and care for livestock, a domain largely outside the confines of the home.

As time and events changed and the wage earning economy took credence, households have begun to rely more on wages rather than depending on domestic productivity. This has changed the dynamic of the household, disempowering the women's contribution in the domestic welfare. As the source of household supply increasingly came from outside, women's contribution in the economic welfare of the family has lost power. This is worsened by the fact that employment is skewed against women.



Half the population is disenfranchised. Demographics between male and female indicate that empowering women can have a significant impact in rural economies. Image courtesy of Central Statistics Office,
http://www.cso.gov.bw/images/stories/Agric/2004agriccensus_report.pdf (accessed March 7, 2009).

This begs a question of whether it is reasonable to allow a unit that used to be central to the productive faculty of a community to be thrown into dysfunction. Statistics show that not enough people in rural areas are engaged in the wage earning economy. And for the employed few, their proceeds are not enough to sustain the welfare of a sustainable community.

LOCALLY DERIVED SOLUTIONS

Development that is focused on rejuvenating a community's belief in its resourcefulness gives rise to emergence of economies that stimulate each other. With a view of supporting the village economy, buildings constructed using materials harvested from local agricultural produce serve as an example of one industry stimulating another enterprise.

Strategic and conscientious choice of building systems determines how effective this initiative becomes. As one of the most intense consumers of materials, the building industry can generate a new market for local enterprises by incorporating local products and byproducts in the building systems. An inventory of some of these products indicates the value of such an undertaking. The use of strawbale in wall constructions can support extensive growth of wheat, corn and sorghum, while increased use of cow dung and horse fur in earth construction may significantly improve the incentive for livestock rearing. Roofing with thatch material may spur yet another crop farming to benefit the agricultural sector. Interconnectedness of the systems ensures long-term sustainability. As one trade feeds off another sector, this also ensures minimal wastage of resources while maximizing economic returns on operations.

Such development facilitates a sense pride and ownership. A set of network is established by a chain linking products and services within the community. Micro-circles of suppliers and consumers take shape as these links are established.

Guiding Principles

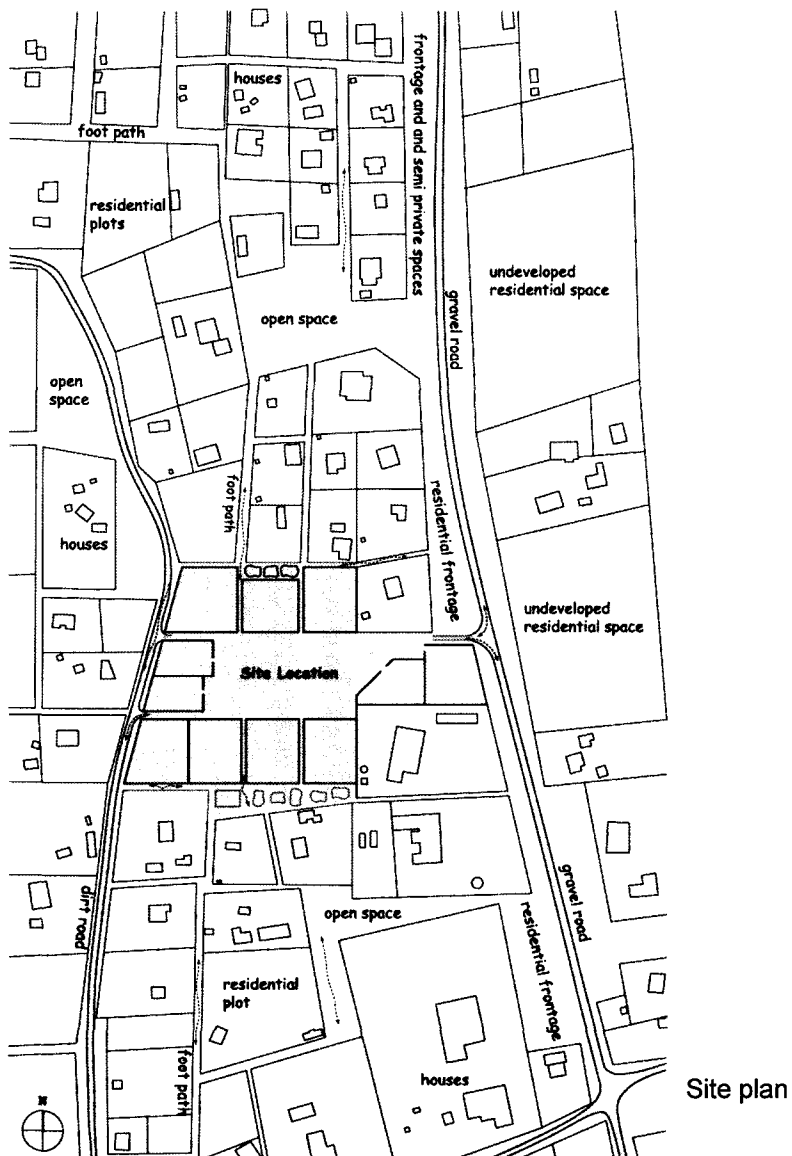
Many factors contribute to the disintegration of life in rural households and the factors that are being considered in this study are just one of the many diverse factors which include rapid population growth, imbalance in trade, and use of agricultural lands for non-agricultural purposes. There is a correlation between degradation of social structures and rural poverty. Unchecked collapse of the agricultural sector contributes to the decline in rural economies. Declining productivity in the farmland and a growing dependency on food imports makes it imperative to evaluate other avenues to remedy the situation.

History has shown that once certain train of events has been set in motion, it is difficult to reverse them despite their negative impact. It is rather more productive to cushion the negative impact by working within the forces driving the changes. The danger of cultural nostalgia is that it creates mindset of cultural and institutional rigidity in the face of globalization. Without adapting to changes resources get locked up in traditional activities by mindsets that are unwilling to accommodate the changing trends. This rigidity usually makes it justifiable for external forces to come in and work against the collective interest of the rural community with the promise of bringing beneficial developments. An example may be the reclamation of arable land for housing development once it has been justified that the poor yields renders the land less valuable unless its use changes to residential holding. But such decisions are made on short term benefits discounting the future costs and effects of these actions.

DESIGN PROJECT

Site

The project is located within a mixed neighborhood comprising of low, medium and high income households.



Site plan



Open space for the project



Unserviced roadways are common through the village

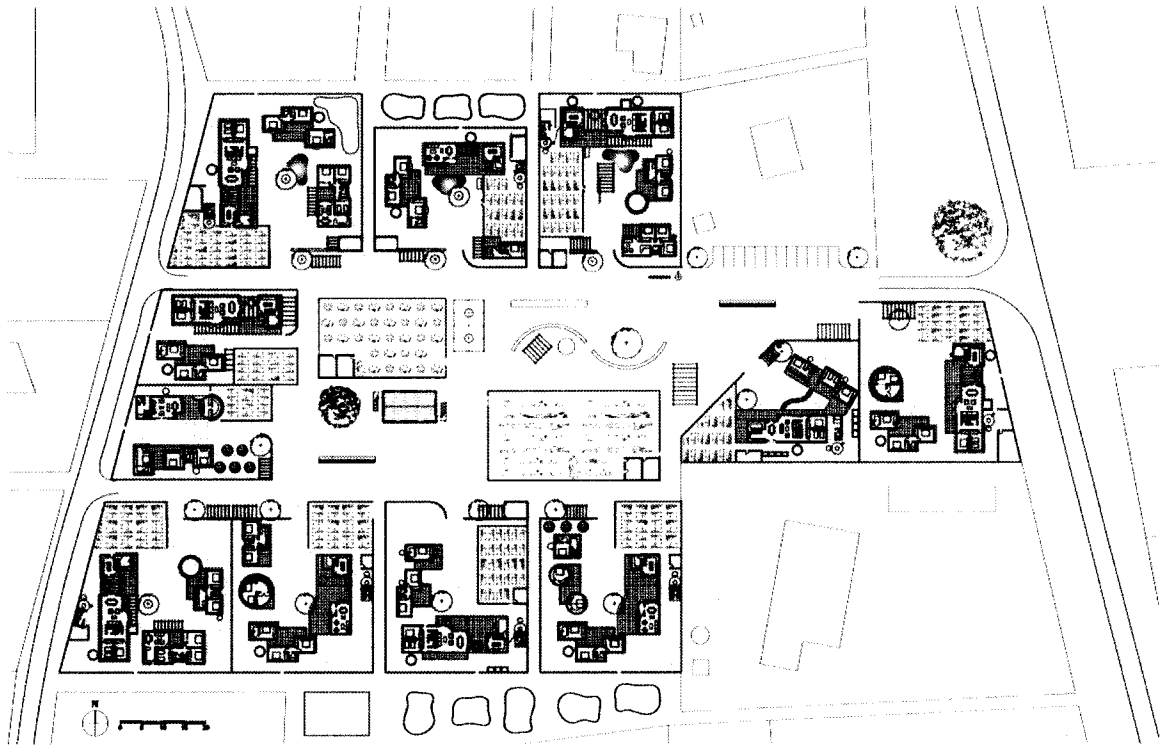


Some households in the village keep small stock

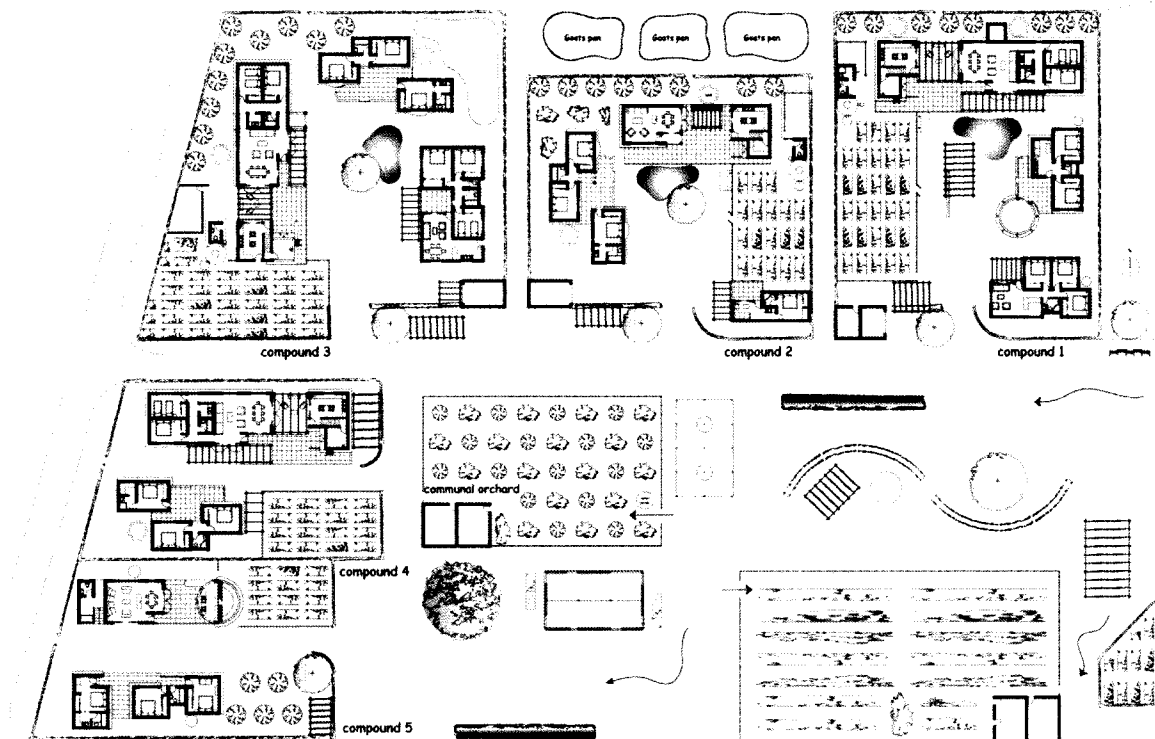


Design Strategy

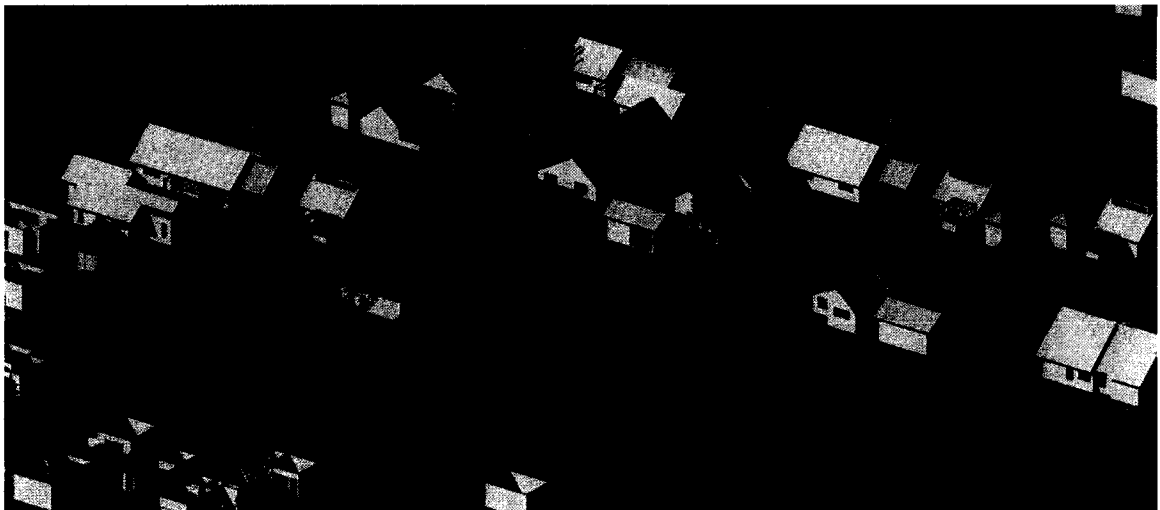
The design shifts in scales from neighborhood scale to compound scale and to dwelling unit scale. Within these scales, the common elements are the communal courtyard spaces that are the collective spaces where members of the community come together for a common purpose.



Spatial organization of the compound and programming of spaces enhances the productivity of the communal courtyard as an income generator



Semi-private work spaces between adjacent compounds creates opportunities for sharing of resources and communion. This space shelters workshops and men's work space



Communal setting that creates a sheltered collective courtyard that is used for various purposes according to the needs of families.

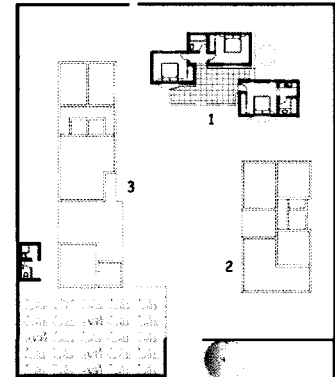
Compound Strategy

The design of the compound enhances a sense of community and allows for phased expansion over time. As family members increase in numbers, the need arise for some members to establish their own households. With the view of having several households being set up in the same compound, the layout makes room for that and accommodates varied personalities to living together. This is achieved by allowing spaces for collective living as well as creating spaces for solitude and privacy which is important for individual identity in such an environment.

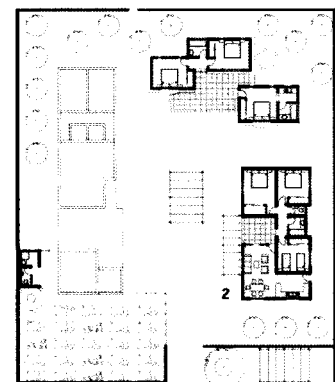
There is a central interaction space to which all members of the compound have access. This space comprise of the living and dining area, working area and the cooking area. Other spaces in the compound such as the sleeping quarters are arranged to relate to these areas through visual connection.

The layout of the compound takes efficiency into account. A garden is located in close proximity to cooking areas and women's social spaces. This arrangement takes into account the fact that woman are the primary caretakers of food production within the household. To increase efficiency in gardening, chicken pen and goats' pen are located within close proximity for collection of garden manure. Workshop areas are located around spaces that easily lend themselves to communal gathering so that crafting becomes a social and inclusive act.

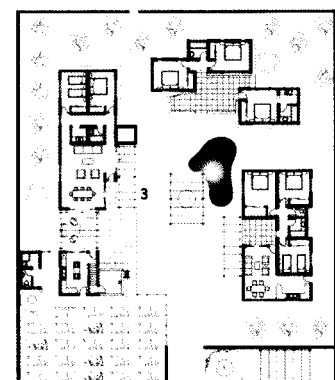
The orchard is organized to provide shading within the compound and working spaces are organized around the orchard to take advantage of the cooling effect provided.



Initial stages of the compound



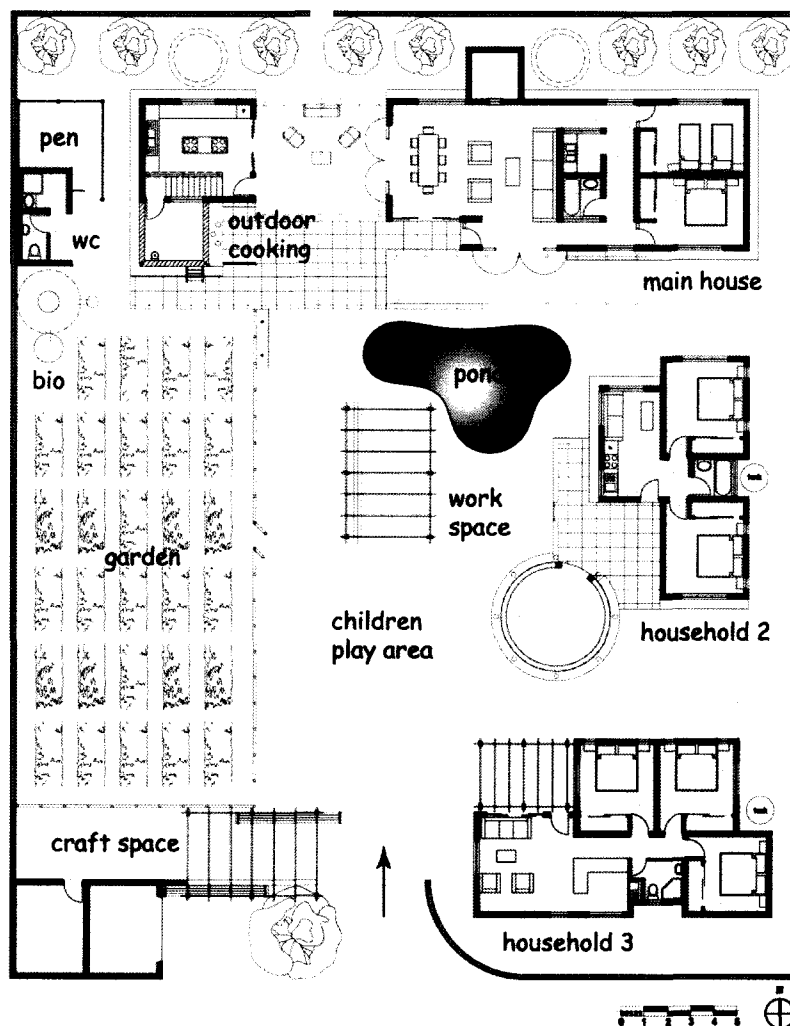
Growth of the compound



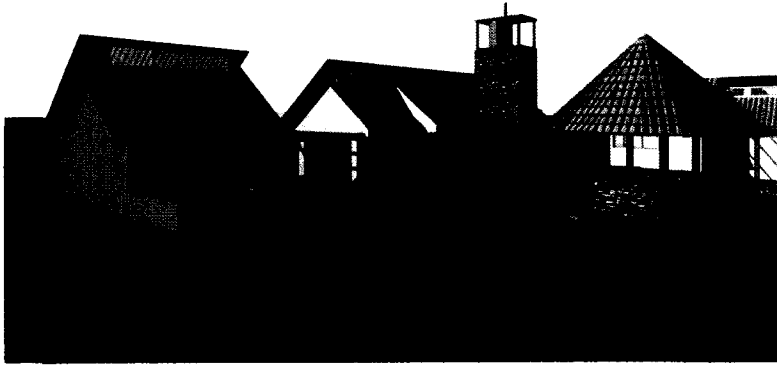
Final stages of compound

Housing Strategy

The layout of individual buildings create shaded outdoor work spaces scheduled for various day to day chores such as laundry, pounding of maize and sorghum, drying of garden produce and crafting. The primary outdoor living space is located between the living room and the cooking area. The main house is designed to be the main collective space for all members living within the compound.



Fully developed compound



The enclosed court yard located between the living room and the kitchen flows into the larger open space. The arrangement caters for dynamic social ceremonies such as weddings, funerals and social parties. The openness and of this space introduces ventilation qualities into the kitchen, the dining and the living spaces.

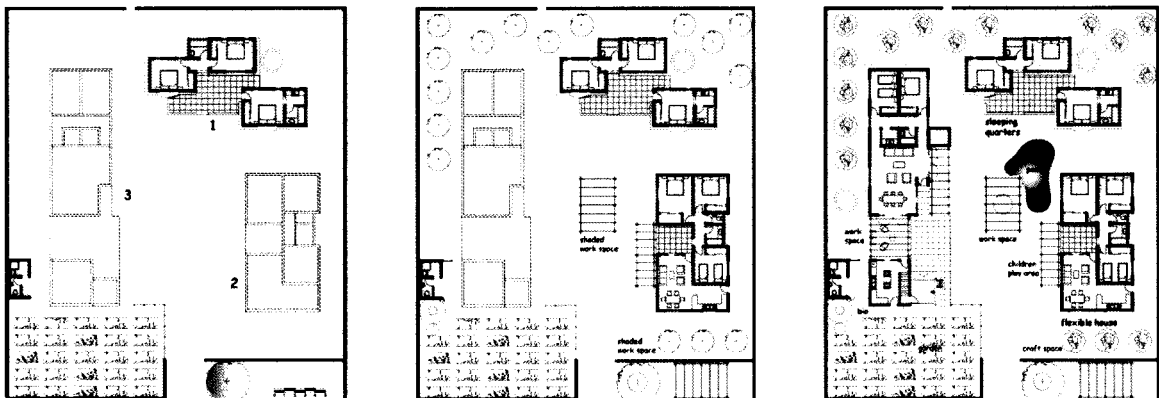


Outdoor ablution block has become a useful element of the homestead. In addition to being used by household members, it is more convenient during social occasions and festivities to cater for the needs of increased number of people. It is common in Tswana culture for relatives to come from afar for social ceremonies. It becomes the responsibility of the respective household to offer accommodation and other amenities to the guests and the openness of the design lends itself to accommodate such moments.



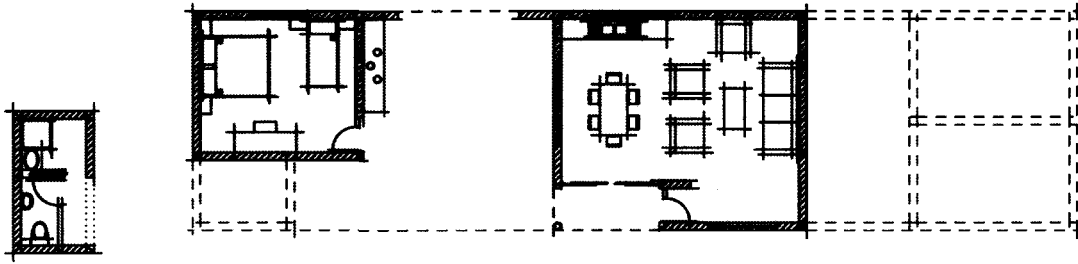
For efficiency in carrying out outdoor activities, spaces are designed to have a coherent spatial relationship. The ablution block, the biodigester, the chicken pen and outdoor storage space are designed to reflect this arrangement.

Outdoor cooking space is located next to the kitchen. This space is used extensively all year round. The spatial organization enhances cooking as a social activity by setting up opportunity for interaction. The indoor and outdoor cooking spaces relate with the covered outdoor living space.

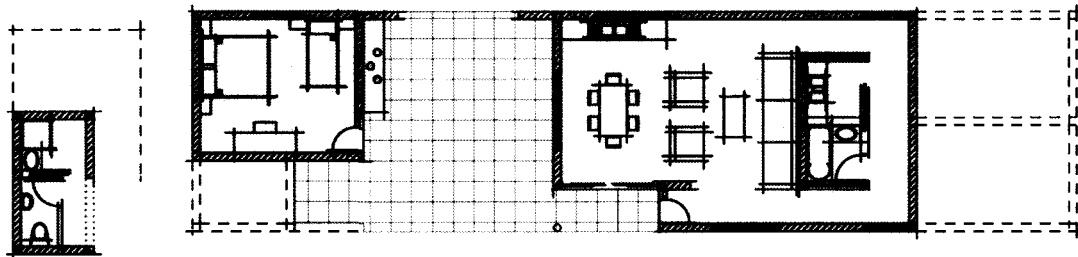


Phased development of the compound

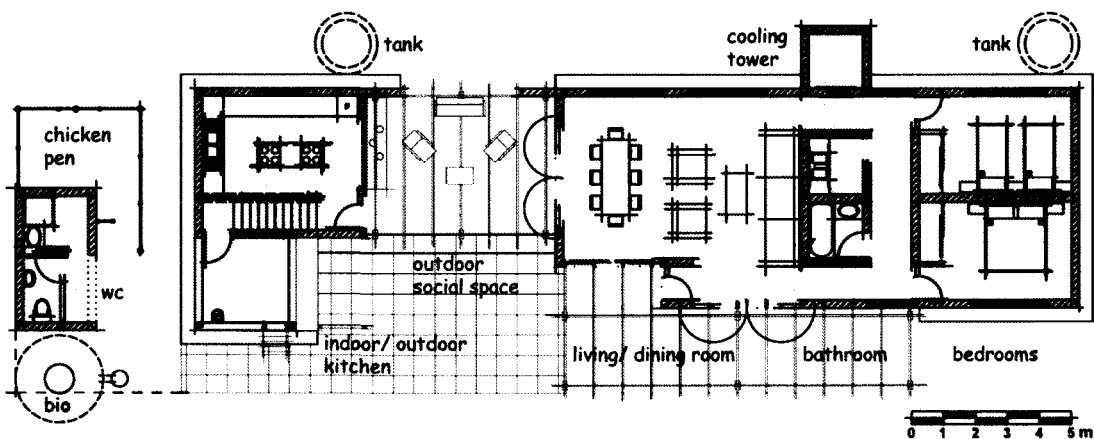
Phased Development of the House



Early stages of the main house. The outdoor space is important early on in the phase of planning the living spaces.



Addition of indoor bathroom. The house has been planned to accommodate economical extensions to the living spaces.



Final stages of the main house. The living spaces has a contemporary feel while accommodating the living patterns customary to Tswana culture

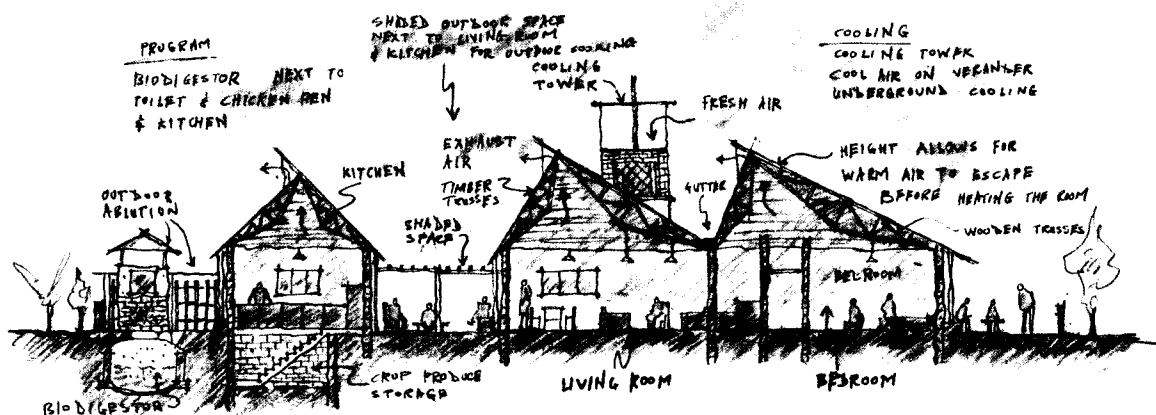
RELEVANT TECHNOLOGY

The primary aim of the applied technology is to maximize recycling and reuse of household resources while minimizing intake of resources from outside. Minimizing throwaway waste from the household and finding ways to maximize use of available resources goes a long way in reducing the cost of living.

In terms of energy, attempts are made to reduce use of mechanical systems in preference to natural resources that nature has in abundance for people to tap into.



Taking advantage of the readily available natural resources



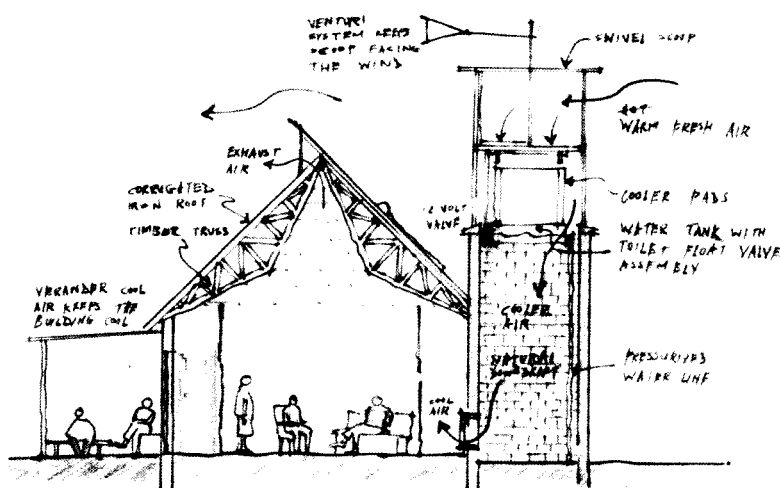
Section through the house showing passive cooling systems through the building

Cooling Towers

Cooling towers moderate the temperatures of incoming air through evaporative action. A swiveling scoop at the top of the tower catches wind and directs air down the tower. This air is cooled as it passes through cooling pads and a bowl of water. The cooled air is drawn towards the bottom of the tower by draught which is primarily caused by exhaust system designed into the building. Cooled air flows into the building through air vents at the bottom of the tower.

Exhaust vent built onto the roof of the building faces away from the wind. As wind blows past the vent, it creates a low pressure at the mouth of the vent and this low pressure becomes responsible for drawing the stale exhaust air from inside the building.

A combination of stack effect and draft action keeps cooled and fresh air circulating through the building. The system is complemented by cross ventilation and shading effect provided by the varendah.

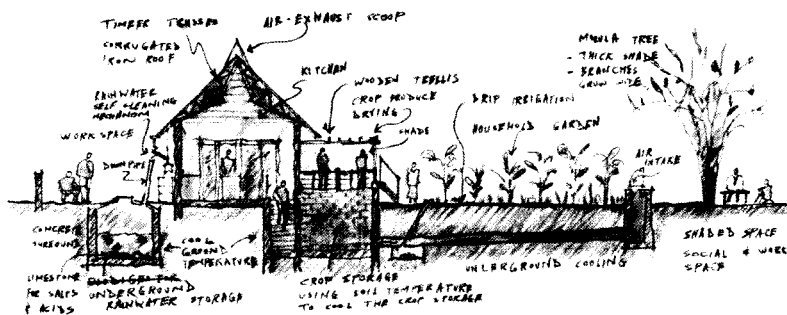


Cooling tower cools the incoming air before it goes into the house.

The Verandah

In addition to providing a shaded area for social gathering, covered verandahs cool down the hot air before it is drawn into the building. Warm air that passes through the verandah is cooled down a few degrees. This cooled air then cools the adjacent spaces inside the building, and these happen to be the living and the dining rooms.

Underground Tubes



Fresh air is cooled as it flows through ground tubes located below the cooler garden earth.

The storage of garden produce is partly sunken into the ground to take advantage of cooler soil temperatures below ground. Underground cooling tubes are installed into the ground and draw in fresh air through protected air inlet. The tubes pass below the garden and the moist soil help in reducing the temperatures even further. With lengths in excess of 20m, the air flowing through the tubes is cooled as it loses its warmth to the cooler ground.

As rodents and other reptiles can be a problem with garden produce, the storage is designed to deter infestation. Grills are placed in the intake openings to keep away reptiles.

Refrigeration and Crop Produce

The garden is the primary source of food for the homestead. For vegetables to stay fresh for extended period of time, they require cool environment. One economical way of doing so is by taking advantage of the evaporative effect of clay pots. One system that might be used is pot in pot refrigeration method which is two clay pots built within each other with a thin space between them. This layer of space is filled with water. Because of the material nature of clay, water from this space evaporates and as it does so, vegetable that are kept within the pot are kept cool.



Drying of Crop and Animal Products

Many households in Botswana still maintain the age old practice of sun-drying meats, vegetables and fruits to preserve them from spoiling. Incorporated into the design is a space specifically for this purpose. This space is designed as a trellis above the half sunken storage room that is built off the kitchen. The space is elevated from the ground to keep it safe from animal reach and blowing dust. When not used for drying food products, the space functions as a shelter to sit underneath.

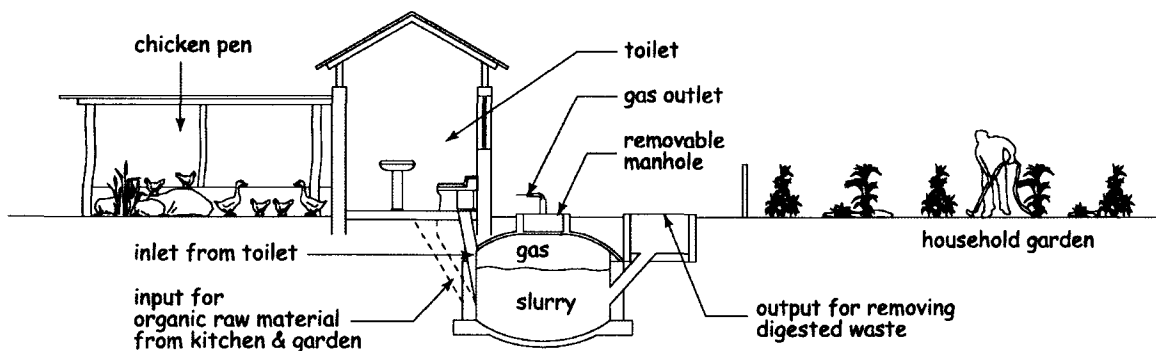


Passive Heating

Roof overhangs are designed to allow winter sun to penetrate into the buildings while blocking summer sun. To reduce heat loss, exhaust openings at the roof top are reversed so that most of the heat is retained within the house. Hot water is provided by rooftop water heaters.

Energy and Waste Recycling

Methane gas from biodigestors provides the much needed energy for household cooking. Manure from composted waste is used as a fertilizer in the garden and orchard. Organic materials that are not suitable for the biodigestor are composted separately in compost bins.



Spatial relation between the toilet, the biodigester, the garden and the chicken pen

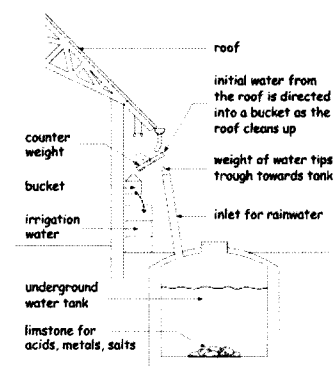
Sanitation

Use of pit latrines in the village has lead to pollution of the underground water source. Composting toilets are a solution to this pollution problem. An even better solution is the use of biodigester whereby energy and fertilizer are the usable by-products of the system.

Rainwater Collection

Due to scarcity of water in the village, conservation of water is of notable importance. Rainwater is collected from the rooftops and stored in underground tanks for later use. Underground storage keeps water at cool temperatures.

A self cleaning mechanism is built into the water collection system to ensure that water flowing into the storage tank is free of debris which might have collected on the roof top. Initial water runs off the roof and is directed into a bucket that slowly drips water into a secondary container. The water is discharged at a low pace, allowing the bucket to fill up. As it fills up, its weight tips the spout and re-directs the flow of rainwater into the underground water tank. This water is used for domestic purposes and limestone is placed in the tank to controll acidity and metals in the water. Some time after the rain stops, water empties from the bucket and the spout is tipped back to its initial position.



Rainwater collection with clean up mechanism

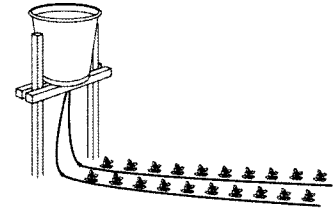
Rainwater collection system with self cleaning mechanism

Grey Water Harvesting

Water from the kitchen, bathroom sinks and laundry is distilled into grey water collection tanks for secondary use. When used for irrigation, the water is used on crops whose edible parts don't come into direct contact with the water.

Drip Irrigation

Simple irrigation mechanism is used in the household garden. Because of high temperatures in the area, drip irrigation is the preferred system since it reduces chances of evaporation. A large container of water supported one meter from the ground provides enough pressure to water a row of plants. Hoses are connected to this container of water and lined up along a row of plants. 30 Meters of pipe will water 100 to 200 plants.



Efficient irrigation system that conserves water

Landscaping

Most of the earth that is used in construction is dug from within the compound. The dug-up area is incorporated as an integral part of the landscape strategy for the homestead. It is turned into a water pond for growing leguminous plants that are fed to small stock. Harvested grey water is used to feed this pond. The pond provides a cooling effect to the surroundings. It is located such that draft that passes over it can cool the nearby buildings and outdoor sitting spaces.

COLLECTIVE DEVELOPMENT

Communal Courtyard

For their livelihoods, it is common to have families engage in income generating initiatives from within their homesteads. Some of these income generators include leather tanning, weaving and knitting, and processing of sour milk. As they become more established, some of these initiatives may outgrow the confines of the homestead and may even require collaboration with other community members to grow them even further. It would be counter-productive to continue operating within the restrictive environment of the household while moving the venture to a commercial space further out in the village might be a challenge for most households. As a common ground, the public courtyard space shared by all homesteads provides the much needed reprieve and room for expansion. The spatial arrangement accommodates small businesses and is open to allow people from the wider community to feel welcome to the space.



Simplicity of the vending space. The shading tree is a natural gathering place ensuring success of this venture

Community Garden

The garden within the courtyard is another opportunity for collective effort. As a means towards food security, the garden is maintained through collaboration by members from surrounding homesteads. This is a place that can provide opportunity for research and finding ways of improving the quality to garden produce. Done at a community scale, it allows for opportunity to cut costs through collaboration in installing irrigation system that may also benefit individual homesteads as well.

Communal Well

And elephant pump within the garden draws ground water for irrigation. For convenience purposes, pipes are connected from this pump to individual compounds for crop irrigation. The communal well is the common place of contact for the surrounding homesteads. Because of its daily use, it becomes the anchor of point where people may establish regular contact with each other.

Communal Space and Small Scale Enterprises

In the middle of the communal space several shaded spaces are provided for recreation and crafting purposes. This space lends itself to being used as an attraction for community members who may prefer a more public setting to engage and interact with other members of the community. The space provides an opportunity to expand small businesses that may have started as home business. These small scale businesses that may take place here include auto repair and garage workshops, street vending stalls and several kinds of crafting workshops.



Communal space used for small scale enterprises

Small Stock and Animal Keeping

Goats and sheep are kept in the collective kraals on either side of the ward. The animals are sent out for grazing in the nearby hills during the day before being brought back for keep at night. They are an integral part of the household produce as they are kept for milk, garden compost and meat.



Kraal for goats and sheep

Local Resources and the Associated Challenges

One of the major challenges associated with natural materials is the need for constant maintenance. Earthen floors and wall finishes need constant re-finishing while mud walls are susceptible to erosion by rainwater. Before they can gain wide acceptance, there is a need to demonstrate a contemporary approach when using natural materials. The materials need to result in high performances buildings that meet the conveniences of twenty first century living.

Research in natural building technology is increasingly addressing the disparity between high-tech and low-tech materials by coming up with products that offer the conveniences and comfort that we have come to expect from buildings: thermal and acoustical comfort, ease of maintenance, and good aesthetics. While anchored to the traditional building technologies, researched materials make use of selected modern technology to create excellent hybrid structures. These hybrids have greatly improved strength and durability, while using locally available, energy efficient, and earth friendly products.

Most low-tech construction systems typically emphasize the use of labor-intensive rather than capital-intensive inputs but their advantage is that they are readily applicable in low skilled and low budget environments. Rural settings have manpower available for such ventures which are actually a welcome gesture as they encourage communal engagements. By and large, majority of people living in villages and rural communities have limited formal education. As such, opportunities to engage in collective ventures using simple technology are welcome.

Traditional building practices have generally allowed the economically marginalized the right to house themselves. When properly built and maintained, traditional structures have lasted for decades. It is only an erroneous reasoning that would redefine this potential for self-sufficiency as sub-standard. This has established idealistic standards that are out of line with socio-economic needs of the local population have compromised people's ability to continue building upon their local technology. More efficient and adaptive to local climate, culture and environment, traditional building technology promotes self-reliance and sustainable living practices.

Materials

The primary building materials for the walls is adobe whose use allows for participatory building process due to its forgiving nature and the simplicity of building technology. Likewise, earthen floors are used through the buildings. For outdoor spaces, saplings are weaved into lattice structures and trellis to provide the much needed shading from the sun.

Commendable Local Institution

A nongovernmental organization called Camphil established a self-sustainable community that has been running for more than a quarter of a century. This community continues to go from strength to strength and can be a model for the rest of the community on how they can meet the needs of their households while maintaining minimum expenditure and in the most energy efficient and environmentally friendly way.

CONCLUSION

The term development has been used advisedly throughout this study with the understanding that development is a relative term guided by one's experiences and environment. What may be perceived as a need in one culture may actually be an integral part and a life enhancing way of living in another culture. The desire to improve a community's living standards is sensitive in this regard. Injudicious intervention has the potential of disintegrating the spirit of a community and setting in motion events that may lead to disempowerment at social, economic and cultural levels.

Life in rural villages is still by and large in touch with the elements that bring a sense of purpose to people's daily interactions with nature and with one another. Development strategies that do not safeguard this fundamental connection may dismantle the very fiber that matters the most in communities. Emphasis on moderation, preservation, and gradual growth discourages conspicuous growth patterns inconsistent with local values. Respecting these values celebrates the unique benefits offered by rural living and allows them to add value and diversity to life.

Countless indicators have labeled Africa as a continent lagging behind in developing its people. One element that might be contributing to this is the relative ease at which communities surrender their innovative and enterprising aptitude in favor of the standards influenced by the global community. These standards are usually implemented without due diligence and the consequence is that they eventually alienate and relegate villagers to spectators on developments taking place in their own environment.

Villages continue to abandon their locally derived technologies and spatial organization perceiving them to be ancient and outdated. This has significant disempowering pull as villagers lose faith in their own abilities to carve out a productive lifestyle from the resources they have available to them. Increasingly government agencies have to set up social security nets to compensate for the disintegrating support structures.

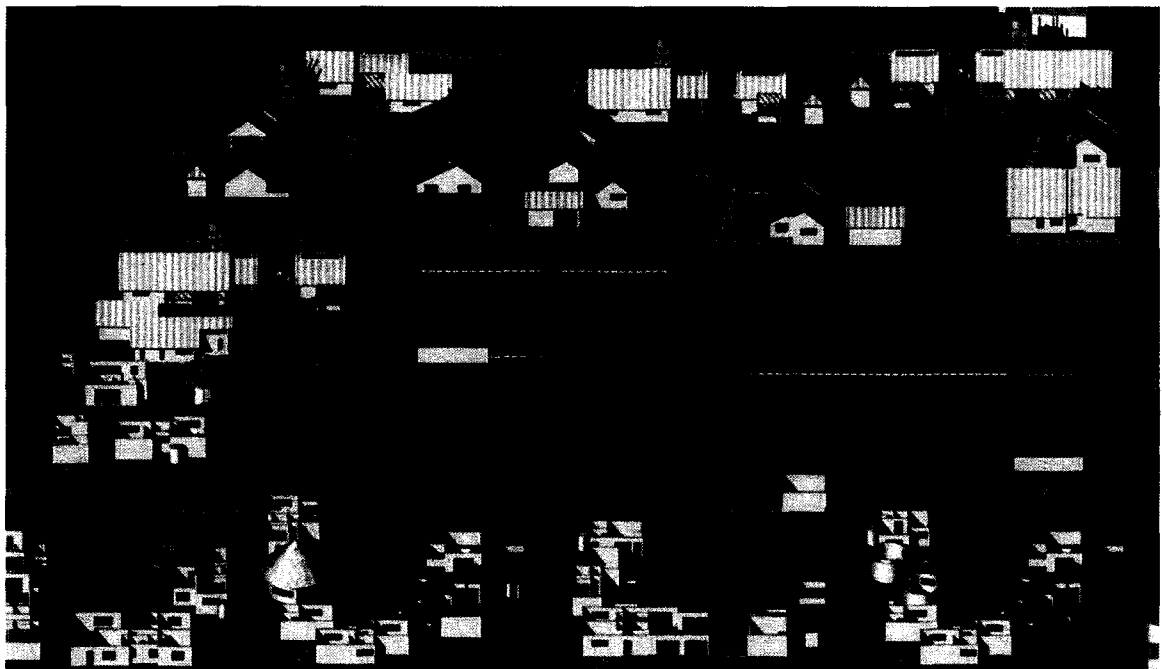
One has to test the universal belief that the technologically advanced Northern ways and systems are superior to the slow paced communal village living so much that villagers need to abandon their way of living in favor of a living system alien to their societal values. A proposition to ground all developments on local knowledge, skills, culture, and material resources can prove to generate living environments that will support the community welfare. For a true revival of living systems that villages will take ownership of, it might be worthwhile to channel energies into re-evaluating development strategies in rural Botswana. The rural household might be strengthened to become a central building block of society.

Success in doing this may have far reaching benefits one of which might include helping in decentralization activities and processes. As individual households are empowered, village wards may be structured to set up local support systems that enable them to sustain development initiatives and establish a culture of self reliance.

At a larger scale, small communities may come together to devise means of improved productivity and ways of adding value to their produce. Coming together for a purpose strengthens the collective spirit and builds up a community.

Exchange of local enterprising ideas encourages the momentum and belief within the community's ability to sustain its technological advancement. With that approach, local enterprises stand a chance to establish concrete foundations upon which development is built.

Empowering households reduces the burden on local governments who are being looked upon as the source of support for individual households. A more efficient setup would see these households seeking assistance from their local groupings before seeking assistance from the local authorities, and thus improving self reliance and better use of resources. This is the spirit of a village which has kept communities surviving for generations. And this is the spirit that may be adapted for contemporary village lifestyle.



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