SOME PHYSICAL CHARACTERISTICS OF BUILDINGS IN THE TIN-MINING REGIONS OF THE JOS PLATEAU

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ABSTRACT

This paper seeks to examine some physical characteristics of buildings within the Tin-mining region of the Jos plateau. The data employed for the study include income levels of residents, house ownership status, housing types, materials used in construction, availability of facilities and utilities in houses. The data were obtained through structure questionnaire administered and field observation. Tabular techniques and simple percentages were the tools used in the analyses. these are those on socio-economic characteristics of the inhabitants, physical conditions of the houses, neighborhood facilities and building materials. The data obtained are qualitative and quantitative in nature obtained from primary and secondary sources. The instruments used to obtain this data were field observation, reconnaissance survey, and the structured questionnaire. Ten settlements were drawn from the Tin-mining region with a population of 3,000 three thousand households 10% was used as sample and 350 questionnaires were administered and 300 retrieved which form the basis for the analyses. The findings revealed that that the residents are low to medium income earners with 82% of the houses owned by individuals. The housing types are predominantly bungalow (61%), constructed with mostly cement block (58%). Component on houses include metal, wood and aluminum. Most of the roofs were found to be of corrugated iron sheet (60.8%) and majority of the houses have closed bathroom types (76%) with few houses having the close type. The kitchen facility is mostly found inside the building (69%) with few buildings having theirs outside. Toilet facilities are mostly pit latrine (45%) and majority of the houses are connected to power/electricity (52%). This also allows us to conclude that the residents have taken advantage of their proximity to tin-mining sites where electricity was already available to connect their settlements.

KEY WORD: Physical characteristics, Buildings, Tin-mining regions

INTRODUCTION:

There is no gain saying that the need for housing is one of man's most fundamental requirements. After satisfying ones need for food and clothing, shelter is needed for protection from the natural weather elements such as rain, sun, storms animals, (Finkel, 2005).

Housing is not narrowed down to the use of buildings but encompasses all the social services utilities and public infrastructure that goes along with its physical and structural conditions within the environment. Over the years, these have changed over time due to technological advancement. For instance sticks, mud and clay bricks, thatch roof among others, were used as materials were, changed with sophisticated, improved and modern ones such as iron rods, corrugated iron sheets, long span roofing sheets , aluminum sheets etc, thus changing the quality, aesthetics and durability of buildings over the years.

The continuous struggle by man over time to provide housing has been a major problem. For instance buildings put up by primitive men were built primarily for the provision of shelter.

In Nigeria a number of housing policies were made to address the problem of housing in the country. The implementation of these policies at various levels have had little or no impact, (because it was below expectation) i.e specific target of housing units were supposed to be made available to meet the housing need and demand, of the population but the number of dwelling units provided were grossly inadequate to meet the ever increasing population in the country in general. More so, series of ad hoc programmes have been launched by various administrations at the three tiers (levels) of government (federal, state, and local governments' areas). But due to poor conceptualization and partial implementation, low success was achieved (NHP, 1981, 1991, 2006).

The 1991 and 2006 national housing policies have their ultimate goal as 'ensuring that all Nigerians own or have access to decent accommodation at an affordable cost by the year 2000 A.D'. It is now 2009 and the story is still the same, owing to the failure of these policies, and these have become issues of concern to government and organizations all over the world (Buckley et al,2005). The importance of housing cannot be over emphasized as it relates to the provision of accommodation for good health and welfare of its inhabitants. Despite man's progress in industry, education and services, the simple refuge affording privacy and protection against the forces of nature is still beyond the reach of many especially the poor and the disadvantaged.

Good housing is a crucial part of a nation's economy, which is enhanced by the availability of social amenities, basic infrastructure, facilities and utilities. Studies have shown that these are lacking in most developing countries. For instance studies have shown that developed countries in the early 1960s had problems of sub- standard housing as suffered by most developing countries including Nigerian cities Onibokun (1990), Omole (2001) and Ivan (2004). The problem of sub- standard housing as suffered by most developing countries including Nigerian cities is a long standing one and as such needs attention. Generally housing conditions are issues of great concern. These are both of quality and quantity. Finance to a great extent determine the quality of building materials and the quantity of the housing, as well as a good sanitary not just shelter, it is the totality of the immediate physical environment, which encompasses all the socio-cultural facets, infrastructural utilities built on the foundation of funding and affordability (Quigley, 2001).

These materials that have been transformed through technology have improved the Quality, aesthetics and durability of housing, which in turn has influenced the physical and structural conditions of buildings within the environment. Physical characteristics of Housing in most developing countries are not usually considered and the buildings instead of providing shelter are now death traps for many. Thus for a building to provide shelter, its structure needs to be at least strong, and stable against the harsh conditions of weather and climate. In this region, most buildings will seem to be physically and structurally sound, thereby making it suitable for human habitation (residential). But is it the actual thing? The problems of inadequate funding, poor building materials, and a derelict this has lead to poor housing which is a major characteristic of the tin mining region of the Jos plateau.

AIM AND OBJECTIVES

The aim of the study is to examine some physical characteristics of the buildings in the Tin-mining regions of the Jos plateau. In view of which the following objectives were put forward;

- ✓ To analyse the income levels of residents in the region and home ownership status;
- ✓ To identify the housing types and examine the materials employed in construction of houses within the region and
- ✓ To examine the facilities and utilities available in the houses within the region.

LITERATURE REVIEW

To place this study in the related view to the physical characteristics of houses within the Tin mining region of the Jos Plateau, some concepts were considered. The basic concepts that relates to the physical characteristics of buildings in the developed and developing nations include: affordability, type of building materials, provision of basic and social amenities among others. Problem of substandard housing is a worldwide phenomenon. The people live in substandard and unacceptable houses built with substandard materials making these dwellings dangerous to its inhabitants which are perceived differently by different people. Thus good quality housing is achieved when there is reasonable standard, for hygiene, comfort, utilities and services. The United Nation has declared that it is a right for every family to be resident in a decent home at a reasonable cost in a desirable community, provided with the necessary physical and social infrastructure.

In most settlements the percentages of the population of the people living in sub standard houses or very poor housing condition are about 60-80 % compared to those living in acceptable standards of fair and good amounting to about 15-20% of the total population as obtainable in most developing countries. This is so because housing is all about affordability and many here live on less than one dollar per day, (United Nations, 2005).

Housing condition can be referred to as total state of the physical environment and the satisfaction level of the inhabitant of a particular dwelling unit, measured against some variables that make it live able at a particular time (Omole, 2001). In rural areas the problem of housing is not only that of quality but that of inadequate infrastructural facilities, such as roads, drainages, water, power supply etc, while housing quality is the reflection of the values of the social group to which the residents in a specific housing unit belong, this attribute is adequately considered in

developed worlds where choice of housing is made base on educational opportunities and value offered to their children.

Thus in an area where abandonment is experienced due to unfavorable conditions or factors the case could be worst off. In the second national development plan it was observed that, housing deficiency was in both qualitative and quantitative terms and as such a peculiar problem in the country is anticipated. It is characterized by overcrowding, congestion, due to inadequate housing stock, building dilapidation, and an increasing house rents Onibokun (1990).

Housing issues are best settled mainly by economic realities. Though very small proportion of inhabitants can afford good housing. This is because the income to buy a home of their own is inadequate, thus the available building materials are not reliable, durable and genuine to support the structure of most settlements. This determines the quantity or quality of housing condition in any given area.

Onibokun, (1990) in his study of housing condition/ quality identified the following as variables that determine housing characteristics;

- The age of dwelling
- Type of materials used in their construction
- The variety and inadequacy of facilities provided in the dwelling and
- The mode of handling various aspects of housing as a process and product in site preparation, such as foundation lying, walls construction and roofing alignment.

Poor housing characteristics in the urban centers is mostly associated with the low income that forms the bulk of the population in developing countries it is worse in rural areas because the areas have been abandoned for the urban areas. Most rural areas are characterized by poverty, poor sanitary condition, dilapidated structures, lack of basic amenities/ facilities and generally poor environmental condition (Onibokun,1990; Gotom, 2005).

Housing condition/quality is measured by the facilities provided such as electricity, pipe born water, flush toilet and access road, (Umeh,1988). The federal office of statistics (FOS, 1995 and 1996) in its housing survey identified the following as having major influence on the housing condition in Nigeria, electricity, refuse disposal, toilets, sources of water supply, average persons per household e.t.c

A number of concepts can be used in the assessment of the characteristics of buildings generally they include: perception concept, quality concept, standard scaling concept, environmental quality concept, single and value concept among others. Thus the standard scaling concept was considered for clarification in the assessment of building characteristics.

METHODOLOGYS

The data employed for the study include income levels of residents in the study region, materials employed in construction of houses and facilities provided in the houses. Data for this research work was basically obtained from two major sources. These include primary and secondary sources. Furthermore the data are both qualitative and quantitative in nature.
Primary data formed the major source of data gathering. It provided information directly from the field through Reconnaissance survey, field observations and measurements, questionnaire,

and oral interviews. Extensive literature review was carried out employing previous publications, published and unpublished materials, textbooks and journals among others.

Three hundred (300) questionnaires were administered; field observation and oral interviews conducted to obtain the required data for the study. The settlements used in the region for the study include; Mazza, Russo, Naraguta, Sabon Gidan Kanar ,Tangchol, Topp Rayfield, Gana Ropp, Dorowa, B/ladi, Tabwang, Maikatako ,Kuba. Considering the peculiarity of the study certain considerations were adapted to ensure a categorization of the buildings in the study area. Data analysis was achieved by employing tabulation technique and percentages analysis.

FINDINGS AND DISCUSSION

Income of Respondents

The monthly earnings of the respondents have been categorized into different income groups as presented in table 1

Table 1: Monthly Income of Respondents

S/No	Monthly income categories in '000	Frequency	Percent %
1	1,000-9,000	32	9.27
2	10,000-19,000	90	29.42
3	20,000-29,000	75	26.42
4	30,000-39,000	35	12.65
5	40,000-49,000	22	7.18
6	50,000-59,000	12	3.80
7	60,000-69,000	12	3.80
8	70,000-79,000	6	1.69
9	80,000-89,000	9	2.63
10	90,000-99,000	-	-
11	100,000 and above	7	2.10
	Total	**300**	**100**

Source: Authors field work 2007.

The table shows that a large proportion of the respondents are in low and medium income groups with about 65.11% of the respondents earning between N11, 000-N29, 000 naira, while only about 35% earn between N30, 000-N100, 000 naira. This suggests that the region is not prosperous with a larger proportion of people live below the poverty level. Housing provision, affordability and maintenance would be challenged in the area due to short supply of finance.

Home Ownership Status

Home ownership status is presented in table 2. This shows the level of the contribution of individuals, organizations and the government to housing provision in the area. Ownership of houses has a significant influence on the way occupants maintain their house.

Table 4.5 Ownership Houses

House Ownership	Location											%
	Dorowa	Gana Ropp	Kuba	Maikatako	Mazza	Russo Naraguta	Sabon Gida	Tabgwamg	Tangchol	Topp Rayfield	Total	
Personal	12	21	14	14	13	24	16	14	10	23	115	82
Family	11	11	4	7	20	2	4	13	6	4	82	12
Government/companies	2	7	2	2	-	4	5	4	10	21	67	6
Total	25	39	20	23	33	30	25	31	26	48	300	100

Source: Authors field work 2007

The table shows that the houses in the study area are owned by individuals, family and government/companies. It is interesting to note that inspite of the low incomes of respondents private/personal ownership accounted for the highest (82%) while family ownership was second and the government contributed about 6% only. This suggests that individuals may be engaged in personal savings schemes of the meager incomes to enable them raise buildings and maintain them. This however is common in rural areas (Onibokun 1990).

Housing Types

Table 3 shows the type of houses according to the settlements, it can be seen that some types of houses are more prevalent in some settlements while others are non-existent. For instance rooming houses are common and available in the settlement especially in Mazza,Russo Naraguta,Sabon Gida,Gana Ropp and Tabgwang accounting for 22% of the total sample. These are some of the rural mining settlements while the larger proportion identified by, this study was the bungalow accounting for 61%, while a unique scenario of storey buildings and blocks of flats were largely identified in Ray field which is located in the richest zone of the city.

Table 3: Housing Types

Types of Dwelling	Location											%
	Dorowa	Gana Ropp	Kuba	Maikatako	Mazza	Russo Naraguta	Sabon Gida	Tabgwamg	Tangchol	Topp Rayfield	Total	
Room	9	14	8	10	33	23	20	14	10	1	142	22
Storey	-	-	-	-	-	-	2	-	-	13	15	7

Block of Flats	-	-	-	-	-	2	1	2	4	27	36	10
Bungalow	15	24	12	13	-	5	1	15	12	8	107	61
Totals	**24**	**38**	**20**	**23**	**33**	**30**	**25**	**31**	**26**	**50**	**300**	**100**

Source: Authors field work 2007

Age of the Buildings;

Age of building is a major determinant of housing condition, because houses show their ages, with constant exposure to harsh weather condition over time, the exterior and interior decoration eventually wear out. The rate of deterioration is influenced by the quality of materials, quality of finishing, and maintenance of the building. The ages of buildings is presented in table 4.

Table 4: Ages of Buildings

Ages of buildings (Yrs)	Location											%
	Dorowa	Gana Ropp	Kuba	Maikatako	Mazza	Russo Naraguta	Sabon Gida	Tabgwamg	Tangchol	Topp Rayfield	Total	
0-10	4	10	6	6	6	4	10	3	15	15	79	26
11-20	4	3	-	-	-	-	-	-	-	2	9	3
21-30	2	4	2	-	2	1	1	2	-	1	15	5
31-40	7	6	2	2	6	11	8	15	6	9	72	24
41-50	1	2	2	1	4	1	4	1	5	7	28	9
51-60	3	4	4	4	13	8	2	8	-	6	52	17
60 above	3	6	-	1	2	2	-	2	-	8	24	8
Total	**24**	**35**	**16**	**14**	**33**	**27**	**25**	**31**	**26**	**49**	**300**	**100**

Source: Authors field work 2007

From table 4.7, 26 % of the respondents live in houses that were built in the last 10years ago,24% of the houses were built 30years ago, 17% of the buildings built forty years 50yrs ago, 8% reside in houses built about 60yrs ago, 5% of houses were built 20 years ago. The ages of these buildings in the study area shows that constant renovation, rehabilitation, construction and reconstruction have continued to be carried out to improve on the condition of housing and increase their life span.

This could be a major indicator to the condition of the buildings, especially when a building, begins to age, it begins to dilapidate, especially when the materials used are sub-standard and lack constant attention

Materials Used for Construction

Studies have shown that materials used in the construction of buildings affect their condition. The critical parts of the building that determine the building condition include the foundation, walls, roof, and floor, doors, windows and ceiling.

Foundation

The materials used for the foundation in the study area include; mud blocks, cement blocks, stones among others as presented in table 5

Table 5: Materials Used For Foundation

s/n	MATERIALS	FREQUENCY	PERCENT %
1	Mud blocks	2	0.66
2	Cement blocks	175	58.33
3	Stones	113	37.66
-	**Total**	**300**	**100**

Source: Authors field work (October) 2007.

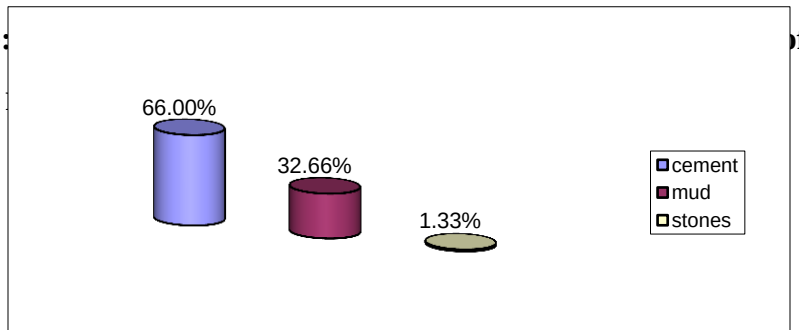
From table 5, about 58.33% of the foundations were made of cement blocks, and 37.66% were constructed using stones. 0.66% of buildings have mud block foundation from these over 90% percentage of the buildings had foundation built with good materials. It also indicates that the materials used though locally sourced, yet durable and a clear reason why the buildings, though old are 100% strong, with sound foundation.

Walling Materials

Figure 1 shows that 66% of building walls were made of cement blocks (concrete), about 33% were made of mud blocks (clay products), while the remaining 1% were constructed with stones. The study revealed that cement is the most common material used for the walls in the study area. According to the respondents, cement though expensive, is more durable than mud and more easily used than stones. Moreover, those that fashion stones for buildings are not readily available, even though it is less expensive, compared to cement.

Figure: ...f Walls

Materials Used For ...



The floor is the surface above the foundation of the building that mostly suffers from movement in the house. This is pertinent to the study because the materials used for finishing have significance not only to the condition of house but also to its quality. See figure (5)

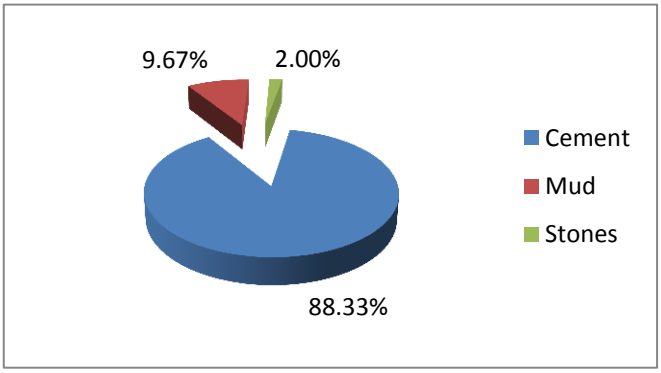


Figure 2: Relative percentage of Material Used for Floor

Materials used for Doors.

Table 6 presents the materials used for doors in the selected settlements. 54.88% of the materials used for the doors in the selected settlements were materials such as zinc and wood, zinc and metals, while others used aluminum. About 23.88% used wood for their doors. While the remaining 22.34% used metals for their doors.

Table 6: Materials used for doors in the selected settlements.

Materials used for doors	Location											%
	Dorowa	Gana Ropp	Kuba	Maikatako	Mazza	Russo Naraguta	Sabon Gida	Tabgwamg	Tangchol	Topp Rayfield	Total	
Metal	2	6	2	2	3	4	6	14	6	23	68	22.3
Wood	11	11	4	7	10	2	4	13	5	4	71	23.9
Others	10	18	10	10	15	20	10	3	10	15	123	44.9
Aluminuim	2	3	4	4	5	4	5	1	5	6	38	10.0
Total	**25**	**39**	**20**	**23**	**33**	**30**	**25**	**31**	**26**	**48**	**300**	**100**

Source: Authors field work 2007

Materials used for windows.

Table 7 present the materials used for windows in the selected settlements. 25% of the materials used for the windows in the selected settlements were Aluminum. 17% used wood for their windows. 22% of the materials used were metals and 22% of materials used glass for their windows.

Table 7: Materials used for Windows in the selected settlements.

	Location											
Materials used windows	**Dorowa**	**Gana Ropp**	**Kuba**	**Maikatako**	**Mazza**	**Russo Naragut a**	**Sabon Gida**	**Tabgwamg**	**Tangchol**	**Topp Rayfield**	**Total**	**%**
Metal	8	11	4	7	10	4	6	4	6	4	64	22
Wood	5	6	2	2	3	2	4	13	5	10	53	17
Aluminum	5	5	5	5	7	10	10	6	8	15	76	25
Glass	5	5	5	5	8	10	5	4	7	10	64	22
Others	2	10	4	4	5	4	5	4	5	9	52	14
Total	**25**	**39**	**20**	**23**	**33**	**30**	**25**	**31**	**26**	**48**	**300**	**100**

Source: Authors field work 2007

Materials Used for Roof

A roof is the top covering of a house and very important component of a building. Therefore, the materials used for roofing a building also affect the condition of the building. In the study area, majority of the roofs of buildings are made of, asbestos, long span (aluminum) sheets, corrugated iron sheet as presented on table 8

Table 8 Materials Used For Roofing

S/N	MATERIALS	FREQUENCY	PERCENT %
1	Corrugated iron sheet	182	60.80
2	Asbestos	32	10.70
3	Thatch	40	13.38
4	Longs pan (aluminum)	46	15.05
	Total	**300**	**100**

Source: Authors field work October (2007)

The study shows that majority of the buildings were roofed with corrugated iron sheets which accounted for 60.80%,while longs pan (aluminum) had about 15.05%, and thatch roof had about 13.38% , asbestos was the least and also accounted for 10.70%. The improvement of buildings and their conditions is ensured as few cases of leaking roofs were reported, though looking rusty due to age, are in good condition with a few cases of leaking roofs for some buildings. The use of these materials in the roofing of most building enhances the condition of buildings.

Materials Used for Ceiling

Ceiling forms a basic component of the roof. The materials used also affect the condition of buildings. Below are some of the materials used in ceiling of buildings in the area. See fig (6),

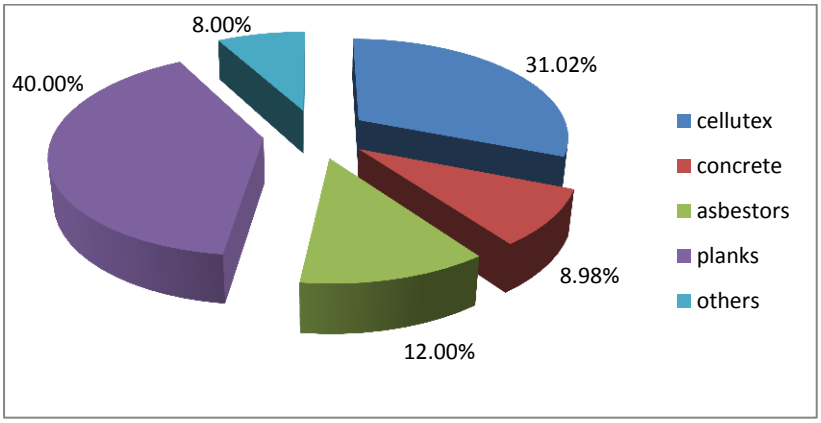


Figure 3: Materials for Ceiling

Figure 3 revealed that 40.00% of the buildings ceiling were made of planks, 31% made of cellulux board while about 12% were made of asbestos, 9% made of concrete, and 8% were

made of other materials such as corn stalk, sticks soft wood, plywood, raffia, palm fronts among others for ceiling.

The materials use in the construction and the maintenance of the buildings enhance the durability of the structures. Most structures were renovated at different periods thereby enhancing their condition. Omole, (2001) observes that factors that militate against building materials include weather, location, and topography among others. He explained that all these determine the condition of buildings.

FACILITIES AVAILABLE IN THE BUILDINGS

The facilities examined were limited to bathroom, toilet and kitchen only.

Bathroom facility

The availability bathroom facility in dwellings affects the living conditions of occupants. The study discovers that all the buildings in the study area have bathrooms, (100% availability) but the nature and conditions of the bathrooms varied and therefore affected the condition of the buildings. Table 9 present the types of bathrooms available houses examined in the study area. 76% of the buildings have closed bathrooms, while 24% have open bathrooms. This is an indication of high level of hygiene, and sanitary condition. Some of the bathrooms are open while others are close.The open bathrooms are those created as temporary structures either attach to buildings or not but for taking bath. Most at times the do not have roofs, and are made of light materials. The close bathrooms are those built inside or outside the building with roofs and made of solid materials. The number of bathrooms available is very important as it determines the sanitary condition of buildings as well as the environment.

Table 9: Types of Bathrooms available

	Location											
Types of Bathroom	**Dorowa**	**Gana Ropp**	**Kuba**	**Maikatako**	**Mazza**	**Russo Naragutta**	**Sabon Gida**	**Tabgwamg**	**Tangchol**	**Topp Rayfield**	**Total**	**%**
Open Bathroom	**4**	**10**	**6**	**3**	**20**	**5**	**6**	**5**	**10**	**3**	**72**	**24**
Close Bathroom	**20**	**29**	**14**	**20**	**13**	**25**	**19**	**26**	**18**	**45**	**228**	**76**

Totals	**24**	**39**	**20**	**23**	**33**	**30**	**25**	**30**	**28**	**48**	**300**	**100**

Source: Authors Field Work October 2007

Kitchen facility

This facility is very essential, as it is a place where food is prepared. Modern houses make provision for internal cooking and dining sections. However, the use of numerous types of fuel wood for cooking have always determined the location of the facility and as well affects the physical condition of the buildings. This facility has a direct relationship with other parts of the entire building.

Table 10: location of kitchen

Location of kitchen	Location											%
	Dorowa	Gana Ropp	Kuba	Maikatako	Mazza	Russo Naragut a	Sabon Gida	Tabgwamg	Tangchol	Topp Rayfield	Total	
Kitchen outside	**3**	**10**	**6**	**3**	**20**	**5**	**6**	**5**	**8**	**3**	**69**	**23**
Kitchen Inside	**18**	**20**	**14**	**18**	**13**	**25**	**16**	**20**	**18**	**45**	**206**	**69**
Without Kitchen	**3**	**9**	**-**	**2**	**-**	**-**	**3**	**6**	**2**	**-**	**25**	**8**
Totals	**24**	**39**	**20**	**23**	**33**	**30**	**25**	**30**	**28**	**48**	**300**	**100**

Source: Authors Field Work October 2007

From table 10 about 68.7% of the buildings in the study area have kitchen facilities inside the buildings, while about 23% of the houses have kitchens available outside the buildings, and the remaining 8.3% do not have kitchens at all. This suggests that they cook within their rooms especially in rooming houses.

Toilets facility:

The availability of toilet in a dwelling is very essential for sanitary purposes. This is so because it affects the health of the occupants. When human wastes are not adequately disposed, the health condition of the people is affected. Table 11 shows the type of toilets available in the study area.

Table 11: Types of Toilets

	Location

Types of toilet	Dorowa	Gana Ropp	Kuba	Maikatako	Mazza	Russo Naraguta	Sabon Gida	Tabgwamg	Tangchol	Topp Rayfield	Total	*%*
Water closet	**3**	**7**	**3**	**8**	**3**	**6**	**3**	**7**	**6**	**25**	**71**	**24**
Pit latrine	**6**	**22**	**10**	**5**	**9**	**15**	**16**	**15**	**14**	**20**	**136**	**45**
Outside/in the bush	**15**	**10**	**7**	**10**	**16**	**9**	**7**	**8**	**8**	**3**	**93**	**31**
Totals	**24**	**39**	**20**	**23**	**33**	**30**	**25**	**30**	**28**	**48**	**300**	**100**

Source: Authors Field Work October 2007

Table 11 shows that majority of the houses use pit toilets, the account for about 45%, while about 31% have no toilets but depend and use the near- by- bush to pass their feaces. This is quite detrimental to the health of the inhabitants as well as the environment. The inappropriate disposal of human faeces lead to environmental and air pollution, odour, poor aesthetics and may lead to outbreak of diseases such as cholera, dysentery etc.

UTILITIES AVAILABLE

The utilities considered are limited to power/electricity and water supply sources

Power Supply (Electricity)

Several sources of electricity were identified in the study area as shown on the table below. In this study, conventional public utility companies are used as well as other sources.

Table 13: Sources of Power/Electricity

Sources of power/ electricity	**Location**											**%**
	Dorowa	**Gana Ropp**	**Kuba**	**Maikatako**	**Mazza**	**Russo Naraguta**	**Sabon Gida**	**Tabgwamg**	**Tangchol**	**Topp Rayfield**	**Total**	
NESCO	10	18	16	10	-	-	13	22	12	31	132	44
PHCN	-	-	-	-	-	25	-	-	-	-	25	8
Solar	-	2	-	-	-	-	-			10	12	4
Generator	7	6	-	4	7	2	9	4	6	6	51	17
Lanterns	5	10	4	9	25	3	3	4	9	1	73	24
Others	2	1	-	-	1	-	1		1	-	6	2
Totals	**24**	**39**	**20**	**23**	**33**	**30**	**25**	**30**	**28**	**48**	**300**	**100**

Source: Authors field work (October) 2007

Table 13 shows that significant proportion of houses use electricity. Other sources include lanterns, generators among others. The data revealed that about 44% of the houses are connected to NESCO and therefore received supply from the company. This is not surprising since NESCO was the company that provided electricity since the period of active Tin mining in the region. The settlements still enjoy the benefit. Supply of electric power is almost constant, according to respondents, that NESCO is the major source of power.

Water Utility Supply

Water supply provision is a major development goal of the Millennium Development Goal (MDGs) to the rural areas. In the light of the above different conventional public utility, companies and other sources are engaged in the supply. The sources of water in the selected settlement are presented in table 14

Table 14: Sources of water

Source of Water	Location											
	Dorowa	**Gana Ropp**	**Kuba**	**Maikatako**	**Mazza**	**Russo Naragutta**	**Sabon Gida**	**Tabgwamg**	**Tangchol**	**Topp Rayfield**	**Total**	**%**
Borehole	3	4	2	3	4	3	3	3	3	6	34	12
Pipe Borne	-	-	2	2	3	3	3	3	3	5	24	10
Well	12	20	11	13	13	12	10	12	11	19	133	40
Stream	9	15	7	9	11	11	9	11	10	18	99	38
Total	**24**	**39**	**20**	**23**	**33**	**30**	**25**	**30**	**28**	**48**	**300**	**100**

Source: Authors field work 2007

Table 14 shows that majority of the respondents source their water from the well and this account for about 40.00%, while 38% use borehole and only 12% use pipe borne water. From these sources, about 88.96% of the respondents have adequate water supply, while the remaining 11.04% do not have adequate water supply for domestic use.

CONCLUSION:

From the findings, the study concluded that large proportions of residents in the tin mining region are low and medium income earners. 82% of the houses are individually owned with similar percentages held on family basis and government and company's owned. The housing

types are predominantly bungalows with few room-type housing. Block of flats and bungalows constitute smaller percentages of the housing types. Materials used in the construction of houses include; mud, cement, and stones, with some metal, wood and aluminum components. Roof of houses are mostly corrugated iron sheets, asbestos and aluminum. Facilities such as bathrooms are mostly opened type, with few houses having closed type. Toilets facilities are mostly pit latrine type, with fewer houses using water closet. Some residents however, do not have toilets at all and often resort to open field defecation. Most of the houses have their own kitchens located inside their houses while others have theirs outside. Minute percentages however, do not have kitchen facilities at all. Electricity/ power was found to be available in most settlements, which allow for concluding that that residents took advantages of their proximity to tin mining sites where electricity was available to get connection. Source of water supply include well, stream, borehole and pipe borne water.

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