

Assessment of the Quality of Urban Roadside Walkway Environment: *the Case of Assosa Town, Benishangul Gumz Regional State of Ethiopia*

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Abstract:

Good quality pedestrian's infrastructure supports walking as a viable mode choice and encourages healthy physical activity. Urban and transport planners mainly emphasized on the problems of motorized vehicles and they give little attention on the planning and maintenance of the pedestrians' infrastructures in Ethiopia in general and in Asosa town in particular. The main objective of this study was to evaluate the quality of the roadside walkway environment of Asosa town. Questionnaire surveys with 108 respondents were conducted to examine the roadside walkway environment of Asosa town based on identifiable criteria for the pedestrians' walkway environment. In the study purposive sampling technique was used to interview the roadside walkway users. Primary and secondary sources of data were used. The primary data was employed through questionnaire interview and observation survey. Data analysis was conducted by using Microsoft-excel and statistical package for social science soft wares (SPSS). The result of the study indicated that the pedestrians were not satisfied with the roadside walkway environment in general. They showed high negative satisfaction with connectivity, safety, and attractiveness; however the walkers showed a positive satisfaction with hindrance and illegal parking. The findings will contribute to the factors that are very important to evaluate the quality of the roadside walking environment in a developing country's town with some attributes. This can be achieved through operationalizing master plans for the town which

will be beneficial both for the governmental and non-governmental organizations.

Key words: Asosa town, Qualitative Evaluation, Roadside Walkway, Walkway Environment

INTRODUCTION

The role of transport in our daily activities cannot be overemphasized and without it, the necessities of life would be difficult to achieve. Sidewalks, on the other hand, are a critical part of sustainable transportation systems. Good quality pedestrian infrastructure supports walking as a viable mode choice and encourages healthy physical activity. Presence and quality of sidewalks have been found to be significant predictors of perceived safety and general.

Sidewalk performance may assess by many ways, such as based on physical geometry, pedestrian/vehicle traffic, environmental and users' perception. Most of previous sidewalk performance studies were performed using quantitative variables such as pedestrian space, pedestrian and/or vehicle traffic, and sidewalk widths.

Pedestrians' options can be used to determine adequate level of service from the walkers' perspective. Some previous studies on pedestrian walkway environment show that a pleasant and comfortable walking environment in town centre, sidewalks and cross walks should be designed according to pedestrian's perception and by considering the concept of sensibility ergonomics that is defined as engineering approach to apply human sensitivity to product (Lee, 2009). Sustainable mobility can be achieved if urban environment offers comfortable and barrier free walkways for the pedestrians in the town centre of any country. Satisfaction of a pedestrian in town centre depends more on emotional perception. Khan (2006) has reported that if the surface of the walkways is not

well maintained, if the effective of the walkway width is not continuous and if the walkways are full of waste and hindrances, pedestrians do not feel comfortable to walk. Therefore, smooth walking with easy access is a desirable criterion while designing the walkways. Barrier free walkway and walker's friendly walkway can allow pedestrians a high level of comfort (Pushkarev & Zupan, 1969).

Many of Ethiopian cities and towns are not friendly to the pedestrian movements. In the country, urban and transport planners mainly emphasized on the problems of motorized vehicles and they give little attention on the planning and maintenance of the pedestrians' roadside walkways. Absence of sidewalk wherever necessary, deteriorated conditions of footpath; encroachments of footpath are some of the problems in the urban areas of Ethiopia. Several types of walkway obstructions need to make pedestrians shy way. The obstructions may be permanent (e.g. improper utility poles, billboards, store displays, etc) or temporary (e.g. garbage stations, dustbins, parked vehicles and bicycles, etc). The present study is an attempt to aware researchers, professionals, practitioners and stakeholders to take advantages of knowing the walkway environment in the cities and towns of Ethiopia. This study specifically evaluates the quality of the roadside walkway environment of Asosa town, in Benishangul Gumz Regional State. To explore the qualitative level of comfort of the pedestrians, five fundamental categories of criteria have been observed and fixed during the researcher's field survey and these are: i) safety, ii) Illegal parking iii) Hindrances, iv) connectivity, and v) attractiveness by some specific facilities. In the study, qualitative data have been collected from observation survey whereas the walker's responses have been recorded through questionnaire survey and their results quantified to assess the existing problems of the roadside walkway environment.

STUDY OBJECTIVES

General Objective

The main objective of this study was to investigate the existing quality of the roadside walkway environment of Asosa town and to suggest recommendations that will help to make this sector function more efficiently.

Specific Objectives

- i. To evaluate the existing problems of the roadside walkway environment
- ii. To identify factors affecting the quality of roadside walkway environment at the study area
- iii. To assess the satisfaction level of the pedestrians with respect to the roadside walkway environment
- iv. To propose a methodology for quick assessment of roadside walking environment in medium-sized towns

STATEMENT OF THE PROBLEM

In the developing countries, a large number of urban planners assume that if they are able to only figure out the traffic problem, they will accordingly have answers for the most problems of cities and towns. The result of this belief is to have cities and towns that are constructed only for cars, not for people.

Ethiopia is a developing country with a poor quality and consideration and provision of pedestrian walkway infrastructures. Many of its cities and towns are not friendly to the pedestrian movements. And in some emerging towns of the country pedestrian walkway infrastructures are not known at all.

The steep growth of traffic in Asosa town in recent years has caused an increment in traffic congestion and the rate of accident. Many people in the town want to walk for utilitarian, health, exchanging commodities or recreation purposes, but are discouraged from doing so due to the poor quality of pedestrian

walkway environment in terms of attractiveness, safety, connectivity, encroachments and hindrance.

In addition, due to poor management of pedestrian walkway and insufficient maintenance a significant part of the pedestrians' walkway is highly deteriorated. In most parts of the town the roadside walkways are covered by unwanted materials like mud, soil and dust particles. This has resulted in negative impacts on the satisfaction level of the users and discourages the walking people to walk on the roadside walkways rather they use the carriage way. That's why in this study the qualities of roadside walkway environment are going to be analyzed using different criteria emphasizing on the real pedestrians of the town.

MATERIALS AND METHOD

The Study Area

Asosa is a town in the south western part of Ethiopia, at a distance of 662km from the country's capital Addis Ababa. It is the capital city of Benishangul Gumz Regional State. As it is the capital of the regional state, there have been massive changes in all activities including its actual size, infrastructures, population growth, and other socio-economic status.

Within the last three decades, Asosa like many other urban areas of Ethiopia has witnessed tremendous population increase. The urban population growth rate is estimated to be 3.2 per cent per annum (Central Statistical Agency, CSA, 1994). The reason for such a high growth rate could be due to migration from other regions for job opportunity and resettlement in the sparsely populated areas of the region, influx of people to the town from the nearby rural and settlement areas in seeking safety, job opportunity and for a better living standard. This phenomenon of increase in the population over the years has put more pressure on

pedestrians' walkway infrastructure, which is the principal mode of transportation in the town.

Asosa is circumscribed by four administrative units (*Kebeles*). These Administrative units offer different characteristics like: shopping area, residential area, business centres, administrative areas, mixed use area and transit area. For all of these, the pedestrian's level of service could be different. But the sidewalks have some major problems which will be discussed in the analysis part of this paper and in the major findings.



Figure 1: Map of the Study Area

Source of Data

This study is a qualitative type of research that is based on primary and secondary sources of data. Two main sources of primary data were employed, namely, questionnaire and observation surveys. In the first time, referring some related literatures seven criteria have been fixed to assess the walking environment in city centre of Asosa. But, considering the landscape, urban structures, socio-economic composition of city dwellers, weather condition, standard of the town and mobility pattern, five basic criteria have been fixed, these are

1. **Safety**: indicates pedestrian perception about safety while walking in the city centres
2. **Illegal Parking**: indicates the parking of vehicles illegally on pedestrian sidewalks and also illegal encroachments on sidewalks

3. **Hindrances:** indicates the appearance of different items on sidewalks. In mostly cases, hindrances are being considered as electric or telephone switchboard on walkways, signboards, trees and street furniture, dustbins and unwanted elements or any items on sidewalks offer unpleasant walking environment.
4. **Connectivity:** physical units and spaces are located beside each other connectedly and finally an integrated texture is appeared. It indicates the access to pedestrian walkway connecting the road network
5. **Attractiveness:** it is the good-looking of the roadside walkways by combining colour, scale and balance, shape, street character, view to convey the positive visual attributes etc. for the pedestrians.

Methods of Data Collection

In the present study, semi structured questionnaire was carried out in the first three weeks of January 2016 to get information on the pedestrians' satisfaction level and perception on the walkways environment of Asosa town. A total of 108 questionnaires have been distributed by data collectors to interview the walkers and road users. Observation survey has also been conducted by the researcher at the same time to know the pedestrian volume, physical features on walkways followed by photographs that describe well the existing walkway problems in the study area.

Data Analysis and Presentation

In this study, the data collected from the questionnaire survey was processed using Statistical Package for Social Science (SPSS) version 15 software in addition to the usual Microsoft-excel and it was analyzed using descriptive statistics (frequency and percentage) to analyze and evaluate the quality of the roadside walkway environment in Asosa town. And finally, the results of the findings of the study data were presented in the form of tables, charts, figures and by photographs. In the

flowchart of methodology given below, describes the systematic procedure of the study.

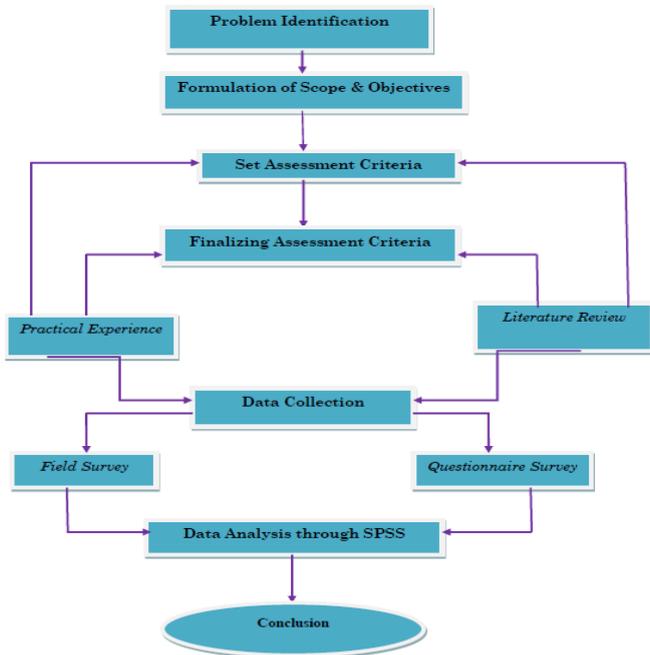


Figure 2: Methodology of the Study

RESULT AND DISCUSSION

Evaluating Problems of the Roadside Walkways

1. Safety Analysis

At the study area, the safety criterion is evaluated in terms of the availability of buffer, sight distance and accidents types. Based on the observational survey and respondents response, there are not buffers and sight distance at the study area.

The sight distance is totally absent in the town and the pedestrian collide with bi-cycles, motor cycles, vehicles and with another pedestrian. These decrease the safety of the walkers and exposed them to different types of accidents. Table 1 presents accident data as an evidence to know the safety situation of the pedestrians in Asosa town. The researcher

collected the information whether the walkers face any small or major injury in the last six months while using the existing sidewalks.

Table 1: Summary of Pedestrians' Accident types in Asosa town

Types Accidents	Respondents	
	Frequency	Percentage
While walking along Roadway	18	16.7
Intersection Rush	12	11.1
Crossing in front of Vehicles	8	7.4
While waiting for a taxi beside a walkway	11	10.2
Crossing behind a Vehicle (<i>back up</i>)	5	4.6
Collide with non motorized Vehicles (<i>like carts</i>)	15	13.9
Collide with other Walkers	14	13.0
Accident by a moving Vehicles	10	9.3
Multiple treats	12	11.0
Others	3	2.8
Total	108	100

Source: Field Survey Data (*February to March 2016*)

According to the data of table 1, 16.7% of the walkers claimed that vehicle accidents encountered while they are walking along the road way, 11.1% of the respondents claimed that they encountered accidents due to intersection rush, 10.2% of the respondents replied that they are faced to car accidents while waiting for a taxi or service buses on the walkways or just beside the walkway, 13.9% of the walkers replied that they collide with non motorized vehicles like carts, 13% of the walker replied that they collide with other pedestrians due to absent sight distance and sidewalk narrowness, 9.3% of the walkers said that they hit by moving vehicle while the walkers cross the streets to buy some food items from some vendors on the walkways. This accident is common at mixed land areas like bus station and market areas, and 11% of the respondents had multiple treats.

Most of the cases pedestrians who are not using the sidewalks due to some sort of problems are getting collided with some low speed vehicles or with the non-motorized carts. Based

on these results, it could be said that people do not feel comfortable with respect to safety condition at the study area.

2. Analysis of Illegal Parking and illegal Encroachments

Illegal Parking: this comes at as an acceptance level in the study area. But it is not at its best because observation survey clearly shows at some city centres that drivers park their cars longer times when they visit hotels, restaurants, bars and shops. It creates hindrances for the pedestrians and this implies less safety for them on sidewalks. This unwanted situation forces pedestrians to invade on adjacent traffic lanes. During the market day, many people are coming from the nearby settlement and rural areas for exchanging commodities , as a result of this the shopkeepers want to show their products to the walkers to promote their businesses and in some city centres they blocked the whole width of the roadside walkways (figure 3).



Figure 3: Illegal parking on the sidewalks

Considering figure 3, illegal parking has taken almost the whole parts of the sidewalk width especially at Bamboo Hotel, in front of Asosa bus station and other areas. The pedestrians put their impression in the scale and it implies that the authentic town of evaluation follows similar evidences in line with the observation survey.

Table 2: Summary of illegal parking at the study area

Illegal parking creates problems for walkers at the study area	N	19	25	2	29	33
	(%)	17.6%	23.1%	1.9%	26.8%	30.5%

Source: Own Field Data (February to March 2016)

According to data of table 2, among all respondent, 33(30.5%) of them strongly disagreed and 29(26.8%) of them disagreed that even though illegal parking happen sometimes it does not create problems for the them, whereas 19(17.6%) of the respondents strongly agreed and 25(23.1%) of them agreed that illegal parking a common phenomena and it creates a big problem while they are walking, and the rest 2(1.9%) of the respondents were neutral.

Encroachments: illegal encroachment of hawkers on the footpaths in the commercial areas (like bus station, market areas, on arterial roads) is serious problem. Vendors spread their wares on the footpath and eventually reduce the effective width of footpath. Besides encroaching on the sidewalks, having vendors along the roads also increases pedestrian traffic. Moreover, vendors and shoppers are often distracted and not fully aware of the vehicular traffic. Figure 4 shows observation views of illegal encroachments at some city centres of Asosa.





Figure 4: Illegal Encroachments by illegal Vendors on Sidewalks

On the other hand, encroachment of sidewalks by building materials is also a common occurrence in many parts of the town. There are a lot of large waste bins on the streets close to the footpath in most of the links observed in our study. These waste bins cause addition problem to pedestrians because the garbage stored in them often overflow onto the streets and footpaths thereby creating more safety hazards. Figure 5 represents the picture of building material encroachments of the sidewalks.



Figure 5: Illegal Encroachments on sidewalks by building materials

Observation survey reveals and as indicated in figure 5 that improperly allocated construction materials on the sidewalks can pose safety issues for pedestrians by blocking the sidewalk and creating alternate routes that are less accommodating for pedestrians. As it can be seen from the above figures, illegally dumped construction materials take almost the whole width of the sidewalks and create serious safety problems for the pedestrians. To know the views of the pedestrians for encroachments, we made questionnaire survey with the walkers and their impression can be presented in table 3.

Table 3: Summary of illegal encroachments at the study area

Encroachment of roadside walkway by illegal vendors	N	28	34	-	24	22
	(%)	25.9%	31.5%	-	22.2%	20.4%
Encroachment of roadside walkway by building materials is common	N	40	43	1	14	10
	%	37%	39.8%	0.9%	13%	9.3%
Availability of shoes makers, and people seeking a temporary living condition on the sidewalks	N	34	37	-	19	18
	%	31.5%	34.3%	-	17.6%	16.6%

Source: Own Field Data (February to March 2016)

Considering table 3, 28(25.9%) of walkers strongly agreed and 34(31.5%) of the respondents agreed on the statement that shopkeepers illegally show up their commodities on sidewalks, whereas, 22(20.4%) of the respondents strongly disagreed and 24(22.2%) disagreed on the statement. On the other hand, 40(37%) of the walkers strongly agreed and 43(39.8%) of them agreed on the availability of illegal encroachments of roadside walkway by building materials, but 10(9.3%) of the respondents strongly disagreed and 14(13%) of them disagreed on the statement, and 1(0.9%) were neutral.

Another cause of the reduction in the effective width of footpath is the presence of many other obstacles like, availability of shoes makers, and people seeking a living condition on the footpath. The availability of shoemakers on almost all the arterial roads of the study area is common, which creates reduction in the width of the sidewalks and causes for most of accidents. during the questionnaire survey, 34(31.5%) of

the respondents strongly agreed and 37(34.3%) of them agreed on the statement, whereas 18(16.6%) of the respondents strongly disagreed and 19(17.6%) of them disagreed on the availability of shoemakers and other homeless peoples on the sidewalks. During the interview of the walkers they replied that this number is increasing rapidly everyday and little attention has been paid by the concerned bodies of the town to regulating this road side hazard, source of driver distraction and contributor to hazardous pedestrian walking.

3. ANALYSIS OF HINDRANCES

The most common types of hindrance observed at the study area are trees, dustbins, utility poles (electric and telephones) and unwanted elements or items on sidewalks. The photo taken during the observation survey can be evidence for this study.



a) *Tree on Sidewalk*

b) *Utility poles on Sidewalk*



c) *Unwanted elements or items on sidewalks*

Figure 6: Common Causes of Hindrance at the Study Area

As it is observed in figure 6 (a & b) improperly allocated utility poles and trees almost makes it impossible to the walkers to walk comfortably on sidewalks. The pedestrians must down their heads to avoid the trees when walking on the sidewalk. This situation creates uncomfortable walking environment. In figure 6 C, unnecessarily placed concrete block makes the walkway environment uncomfortable for the walkers. In some areas, there is not enough lighting on streets. At night, these trees, electric poles and concrete blocks create even more inconvenient walkway environment.

It has been well justified from the observation survey that the pedestrian's impression about hindrances are not unusual. With respect to hindrance, the pedestrians were interviewed by the researcher and data collectors and result is presented in table 4.

Table 4: Summary of Identified Hindrances at the Study Area

	Frequency	Strongly agree	agree	Neutral	Disagree	Strongly disagree
Trees are improperly allocated on the sidewalks	N	47	44	2	8	7
	(%)	42.6%	43.5%	1.9%	7.5%	6.5%
Electric Poles and Signboards are improperly located	N	33	37	1	21	17
	(%)	30.6%	34.3%	0.9%	24.1%	22.2%
Improperly located dustbins on sidewalks	N	30	34	-	23	21
	(%)	27.8%	31.5%	-	21.3%	19.4%
Unwanted materials (items) are available on sidewalks	N	36	39	1	17	15
	(%)	33.4%	36.1%	0.9%	15.7%	13.9%

Source: Field Survey data (February to March 2016)

Data of table 4 shows that 47(42.6%) of the respondents strongly agreed and 44(43.5%) are agreed that trees are improperly allocated and protect them not make use of the roadside walkways, but 7(6.5%) of the walkers chosen strongly disagreed and 8(7.5%) of the respondents chosen disagreed on the statement. Considering on the improperly installed utility poles and signboards on the roadside walkways, 33 (30.6%) of

the respondents were strongly agreed and 37(34.3%) were chosen agreed on the statement, but 17(22.2%) of the walkers strongly disagreed and 21(24.1%) are disagreed on the statement. For hindrance because of dustbins, 30(27.8%) of the respondents were strongly agreed and 34(31.5%) were agreed on the statement. Whereas, 21(19.4%) of the respondents were strongly disagreed and 23(21.3%) were disagreed on the statement.

Considering on the appearance of unwanted materials (items) on sidewalks, 36(33.4%) of the respondents were strongly agreed and 39(36.1%) were agreed that unwanted elements like concrete and masonry blocks are placed at the centre of sidewalks. And the respondents claimed that if they are walking unconsciously especially at night, they will necessarily collide with this items. Whereas, 15(13.9%) of the walkers were strongly disagreed and 17(15.7%) disagreed that poorly located items are not the main hindrance at the study area, and 1(0.9%) of respondents was neutral.

4. ANALYSIS OF CONNECTIVITY

The assessment of connectivity among urban facilities and attractions with town centre is poor at the study area. The walkways are not well connected with shopping areas, offices, recreation areas and other city centre facilities. Observation surveys revealed that discontinuity of walkway pavements, present of potholes, patches and broken surfaces on sidewalks makes the walkers uncomfortable. On the statement that whether the pedestrian walkways are connected with urban residents or not, respondents or walkers interviewed and table 5 presents the results.

Table 5: Result of Pedestrian Roadside Walkways Connection with Urban Residents

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Frequency	35	39	3	17	14	108
Percentage	32.4	36.1	2.8	15.7	13	100

Source: Field Survey data (February to March 2016)

Data of table 5 shows that 35(32.4%) of the respondents strongly disagreed and 39(36.1%) disagreed that the pedestrian walkway is not installed in the road network connecting market centres (like Monday market and Friday market), recreational areas (like Mangology Recreational Centre), their residential neighbourhoods (almost all parts of kebele 03 and some parts of kebele 02, 03 and 04) and their work places. Similarly, 14(13%) of the respondents strongly agreed and 17(15.7%) of the respondents agreed that they have access to pedestrian walkway connecting the road network in their neighbourhoods or their work places. On the other hand, 3(2.8%) of the respondents had chosen to be neutral and gave no responses.

5. ANALYSIS OF ATTRACTIVENESS

A roadside walkway is said to be attractive if it is good in colour, scale, balance, shape, and on its street character etc. The walkway should be well organized in those aspects to attract more people to walk on it.

During the observation survey, it is seen that the surface of the walkways are damaged and offered muddy environment in the rainy season, covered by soil and presence of highly rough surfaces and difficult to identify from the roadway. As a result these problems the walkers use the carriage instead of the roadside walkways and they exposed to accidents. Besides, when rain drops the roadside walkways do not clear and drain the rain waters quickly rather storing the water on potholes and forming muddy condition. People cannot see if there is any small hole or broken surfaces which offer less safety in the

areas especially for children and older walkers. Figure 4 shows the existing surface conditions of the roadside walkways at the study area.



Highly rough sidewalk



Potholes on Sidewalks



Soil Accumulation

Figure 7: Poor Quality of pedestrian Walkways

As shown in figure 7, the roadside walkway is full of mud, soil and presence of wastes. In the first figure, it is covered by soil and difficult to identify from the road way. Based on this study, 56% of the walkers do not want to use the footpaths for walking in the town because of the presence of mud, soil, potholes & patches and highly rough surface. As a result of the stated factors, walkers do not use the sidewalks rather they feel convenient to use the road space and many accidents take place indeed.

Table 6: Summary of Pedestrians Satisfaction on Attractiveness of the walkways

Pedestrians Satisfaction on Attractiveness of the Walkways	Frequency	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
The roadside walkways are walkable	N	9	13	4	43	39
	(%)	8.3	12	3.7	39.8	36
The roadside walkway are pleasant &	N	3	5	2	51	47

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attractive to walk	(%)	2.8	4.6	1.9	47.2	43.5
The roadside walkways facades are beautiful	N	6	11	8	43	40
	(%)	5.6	10.2	7.4	39.8	37
Trees and landscape along the walkway are beautifully planted and designed	N	8	13	5	46	36
	(%)	7.5	12	4.6	42.6	33.3
During the winter (<i>Kirmt</i>) sidewalks are kept clear of mud, soil and water	N	5	8	2	52	41
	(%)	4.6	7.5	1.9	48	38
During the summer (<i>Bega</i>) the roadside walkways are free from dust, soil, silt and sand	N	10	14	7	39	38
	(%)	9.3	13	6.5	36	35.2
There are no interesting sights while walking	N	34	40	2	19	13
	(%)	31.5	37	1.9	17.6	12

Source: Own Field Survey data (February to March 2016)

According to data of table 6, 39 (36%) respondents strongly disagreed and 43 (39.8%) respondents disagreed on the walkability of the roadsides, 9(8.3%) strongly agreed and 13(12%) of the respondents agreed on the walkability of the roadsides; 4(3.7%) of the walkers gave no responses. On pleasantness & attractiveness of the roadside walkways, 47 (43.5%) of the respondents strongly agreed and 51(47.2%) agreed that the roadside walkways are not pleasant & attractive to walk on it. About 3(2.8%) of the respondents strongly agreed and 5(4.6%) agreed that the roadside walkways are pleasant & attractive to walk around their locality. Therefore, the roadside walkways are not attractive at the study area.

Considering the statement “landscape and tree shade of the walkways”, 36(33.3%) of the walkers strongly disagreed and 46(42.6%) of the respondents disagreed on the statement that trees and landscape along the walkway are beautifully planted and designed as per the standards. Also 8(7.5%) of the respondents strongly agreed and 13(12%) of the respondents agreed that the landscape and tree shade of the walkways are beautifully planted and fairly designed.

Considering on the statement that says the existing sidewalks are kept clear of mud, soil and water during rainy

season, 41(38%) of the walkers strongly disagreed and 52(48%) of the respondents disagreed on it. On the contrary, 8(7.5%) of the walkers strongly agreed and 5(4.6%) of the walkers agreed that the sidewalks are fairly free from mud, soil and pond of water on the potholes, 2(1.9%) of the respondents kept to be neutral. On the other hand, 38(35.2%) of the walkers strongly disagreed and 39(36%) of them disagreed that the roadside walkways are free from dust, soil, silt and sand during the summer (*Bega*) whereas, 10(9.3%) of the respondents strongly agreed and 14(13%) agreed on the statement. Finally, considering on the statement that there are no interesting sights while walking within the town, 34(31.5%) of the respondents strongly agreed and 40(37%) of them are agreed, but 13(12%) of the walkers strongly disagreed and 19(17.6%) of them disagreed on the statement and also 2 (1.9%) of the respondents were neutral and gave no responses.

Evaluating Pedestrians Utilization of Existing Roadside Walkway

Absence of pedestrians' walkway is a major characteristic of urban roads in Ethiopia. The situation in Asosa town is not different from other cities in the country. An assessment of pedestrian walkways at the study area reveals that only some parts of arterial and collector roads do have pedestrian walkways, the others do not have it. The overall assessment of pedestrians' utilization of the existing roadside walkway is presented in figure 7.

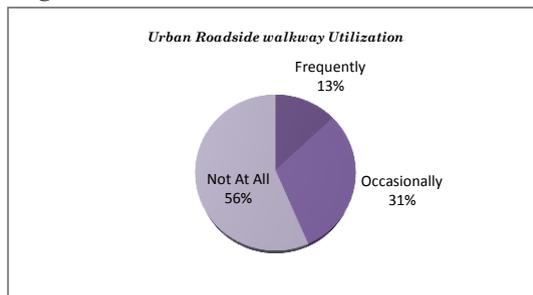


Figure 8: Utilization of the available Roadside Walkway at the study area

According to the study and referring figure 8, only 14 (13%) of the pedestrians of the town indicate that they frequently make use of the roadside walkway, while 34(31%) of the walkers in the town make use of the pedestrian walkway occasionally. Almost 60(56%) of the pedestrians interviewed claim that they do not make use of pedestrian walkway installed in the town. Some of the known reasons that prevent the walkers from using the existing roadside walkways are: availability of mud and silt during rainy seasons, concentration of soil and dust during dry time, illegal parking & encroachments, and absence of pedestrian walkways in some localities.

Table 8: Pedestrians Reasons for not using the Existing Roadside Walkways

Reasons for not using the Roadside Walkways	Frequency	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Presence of mud and silt during rainy seasons	N	7	9	2	47	43
	(%)	6.5%	8.3%	1.9%	43.5%	39.8%
Concentration of soil and dust during dry time	N	5	8	3	46	42
	(%)	4.6	7.4%	2.8	42.6	38.9
Illegal Parking & Encroachments	N	33	35	2	20	17
	(%)	30.6%	32.4%	1.9%	18.5%	15.8%
Absence of pedestrian Walkways	N	11	16	1	42	38
	(%)	10.2	14.8	0.90%	38.9%	35.2%

Source: Field Survey Data (February to March 2016)

As illustrated in table 8 and considering the presence of mud and silt during rainy seasons , 43(39.8%) of the respondents strongly agreed and 47(43.5%) of them agreed that it is their basic reasons for not make use of the installed walkway, but 7(6.5%) of the respondents strongly disagreed and 9(8.3%) of the walkers disagreed that the presence of mud and silt during the rainy season is not their reason, and 2(1.9%) of the walkers were neutral.

Considering on the concentration of soil and dust on the roadside walkways, 42(38.9%) of the respondents strongly agreed and 46(42.6%) of them agreed on this statement, whereas, 5(4.6%) of the respondents strongly disagreed and

8(7.4%) of the walkers disagreed that the presence of mud and silt during the rainy season is not their main reason that protects them for not using the existing roadside walkways, and 3(2.8%) of the walkers were neutral.

Similarly, 33(30.6%) of the respondents are strongly disagreed and 35(32.4%) disagreed that illegal parking and encroachments are not their main reasons, but 17 (15.8%) of the walkers strongly agreed and 20(18.5%) agreed that illegal parking and encroachments are their main reasons for not make use of the existing roadside walkways, and 2(1.9%) of the respondents were neutral at the interview.

On the other hand, 38(35.2%) of the walkers are strongly agreed and 42(38.9%) agreed that absence of pedestrian walkways are not their main reasons, whereas, 11 (10.2%) of the respondents strongly disagreed and 16(14.8%) disagreed that absence of pedestrian walkways in most parts of Asosa town are their main reasons for not using the existing roadside walkways, and 1(0.9%) of the respondents were neutral.

Evaluating Pedestrians Level of Satisfaction

To understand the pedestrian overall level of satisfaction on the walkway environment in the town, an interview survey has been made to the walkers that include safety, attractiveness, illegal parking, connectivity and hindrance at the city centres. The respondents prioritize the main problems on the roadside walkway of the town, and the result is summarized in table 9.

Table 9: Respondents Prioritizing the Main Problems on the Roadside Walkways

	Respondents		Ranking of the main problems from high to low	
	<i>Frequency</i>	<i>Percentage</i>	<i>Respondents' response</i>	<i>Field observation</i>
Connectivity	34	31.5	1 st	1 st
Safety	30	27.7	2 nd	2 nd
Attractiveness	28	26.0	3 rd	3 rd
Hindrance	9	8.3	4 th	4 th

Illegal Parking	7	6.5	5 th	5 th
Total	108	100		

Source: Own Field Survey Data (February to March 2016)

As illustrated in table 9 and interview with the walkers, among the 5 prescribed criteria, connectivity is very poor 34 (31.5%) followed by safety 30 (27.7%) and attractiveness 28 (26%) which were evidenced from the respondents' response and field observation.

Factors Affecting the Quality of the Roadside Walkway at the Study Area

Good quality pedestrian infrastructure supports walking as a viable mode choice and encourages healthy physical activity. According to Landis et al. (2005) the presence and quality of sidewalks have been found to be significant predictors of perceived safety and general satisfaction in the pedestrian environment. Planners recognize the benefits of providing a qualitative pedestrian infrastructure for accessibility, safety, and quality of life. Sidewalk presence, width, and surface condition are several of the pedestrian-scale data sources needed to accurately plan accessible pedestrian facilities and prioritize new infrastructure investment.

Based on the study conducted and respondents' response, the main factors affecting the quality of the roadside walkway environment at Asosa town include: poor infrastructures (poor roadside pavement condition, deficient street layout, construction backlogs, and road condition), lack of street furniture (signage, pedestrian lighting, and pedestrian seat) and poor maintenance.

Table 10: Factors Affecting the Quality of Roadside Walkway

<i>Factors</i>	<i>Frequency</i>	<i>Strongly Agree</i>	<i>Agree</i>	<i>Disagree</i>	<i>Strongly Disagree</i>
Poor infrastructures	N	49	33	15	11
	%	45.4	30.6	13.9	10.2

Lack of Street furniture	N	21	51	16	20
	%	19.4	47.2	14.8	18.6
Poor Maintenance	N	56	33	11	8
	%	51.9	30.6	10.2	7.3

Source: Own Field Survey Data (February to March 2016)

According to data of table 10 and interview with the walkers, 49(45.4%) of the respondents strongly agreed and 33(30.6%) agreed that infrastructures conditions (poor roadside pavement condition, poor design, quality of construction and road condition) are the factors for the bad quality of the walkways of the town, whereas, out of the respondents, 11(10.2%) of them strongly disagreed and 15(13.9%) of them disagreed on the statement

Regarding on the availability of street furniture', 51(47.2%) of the walkers agreed and 21(19.6%) of them strongly agreed that street furniture like lack of seating bench, absence of signage and pedestrian lighting are factors for the poor quality of the sidewalk.

On the other hand, 56(51.6%) of the respondents strongly agreed and 33(30.6%) agreed that poor maintenance culture of the concerned bodies made the existing sidewalks unworkable during the rainy season, whereas, 11(10.2%) of the respondents disagreed and 8(7.3%) of them strongly disagreed on the statement. The observation survey is also proved that the roadside walkways are rarely maintained and whenever maintenance is attempted it is done randomly. The financing of the maintenance, rehabilitation and conservation of the infrastructures had always been very small this is because of their lack of maintenance culture and poor management planning.

CONCLUSIONS AND SUGGESTIONS

This paper evaluates the roadside walkway environment of Asosa town considering the real pedestrians of the town. In the

study five important criteria that affect the quality of roadside walkway have been selected, defined and analyzed.

Based on the findings the study suggests that:

- The overall quality of roadside walkway is poor at the study area, therefore, the urban planners must give due attention for the pedestrians walkway environment because walkers feel discomfort due to its poor quality.
- The connectivity of the active town centres are at a poor condition and that needs due attention by the service providers by construction additional infrastructures.
- The attractiveness of the roadside walkway is extremely unpleasant and most of the walkers do not use the roadside walkway while walking, hence it needs improvements.
- The roadside walkways are covered by soil, sand, dusts and unwanted materials. Therefore, maintenance of the roadside walkway will give a better comfort for the pedestrian and encourage them to use the walkway.
- During the rainy season, the roadside walkways are full of mud, water and soil and the walkers feel uncomfortable to walk on it, therefore, it needs some improvement considering the quality of the roadside walkway structure, layout and the materials used for construction.
- Because of the absence of tree-shades in most areas of the town, the roadside walkways are unwalkable during the sunny days, therefore the municipality of the town give due attention by planting roadside trees at the appropriate places
- The vitality of quality is so comprehensive; it could be come true when the collections of criteria for qualities get existed in the roadside walkway. Hence it is highly recommended by this study to improve primarily the qualities of connectivity, safety and attractiveness.

- Accordingly, this study was done to be a base for firstly determining the current situation in terms of roadside walkway quality and then promoting these qualities in Asosa town. The study is concluded that the qualitative assessment produces a methodology for quick assessment of roadside walking environment in medium-sized towns. It can also be used by other researches in future as municipalities, town planning offices and students who want to study in this field.

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