

Issues and Challenges of Street Vendors in Dimapur, Nagaland

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Abstract

Rapid urbanization has led to massive rural to urban migration where a large majority of the urban population is engaged in the informal sector. Street vendors form a large part of the informal sector. They sell variety of products and goods to the public in the street and pavements through carts, cycles or temporary space. From selling fruits and vegetables to hosiery goods, large part of Indian household relies on their services for meeting their needs. Street vending was illegal in urban India for more than six decades until the passage of street vending act in 2014. Despite the law having legalized the activity, however, the default policy in most cities across India is to clamp down on street hawkers. Yet street vending remains a viable source of employment for many. So the present study is undertaken to understand the problems faced by these vendors in the markets of Dimapur, Nagaland. The present study found out that most street vendors in

Dimapur town carry out their business through self-finance and work six days a week for more than ten hours daily. Basic infrastructure facilities like drinking water, electricity, provision for shed, public toilets etc. are much required for these vendors.

Keywords: Street vendors, problems, challenges, informal economy.

Introduction

A street vendor is broadly regarded as a person who offers goods for sale to the public at large without having a permanent built up structure from which to sell (Meneses-Reyes and Caballero-Juárez, 2014). The Street vendors may be stationary in the sense that they occupy space on the pavements or other public/private spaces or, they may be mobile in the sense that move from place to place by carrying their wares on push carts or in baskets on their heads. Street vendors sell variety of goods and products through carts, cycles or temporary space. Street vending is a global phenomenon and is the most visible aspect of the informal sector. These informal workers have strong linkages to the formal economy as many customers work in formal jobs. Like other informal sector, street vending is characterized by low level of income, ease of entry, self-employment and it involves large number of people (Jaishankar and Sujatha, 2016). According to the Ministry of Housing and Urban Poverty Alleviation, there are 10 million street vendors in India (Street Vendors Act, 2014).

Street vendors play a very vital role in the urban informal economy of India by providing employment, income and goods and services to urban poor and marginal working class.

They sell various kinds of goods such as hosiery, clothes and various household necessities, which are manufactured in small-scale or home-based industries. Apart from non-agricultural products, street vendors also sell vegetables and fruits. Thus, they provide a market for both home-based manufacturing products and agricultural products supporting small-scale and home based workers as well as agricultural workers. Therefore, several factors and types of labors are linked with the street vendors.

The Street Vendors (protection of Livelihood and Regulation of Street Vending) Act, 2014 legalized the activity. The Act aims to protect the livelihood of the street vendors and provide them with a conducive environment for carrying out their business. It covers all varieties of vending. The act mentions vending in “street, lane, sidewalk, footpath, pavement, public park, or any public place or private areas.” A minimum vending age of 14 has been prescribed. The Act not only provides protection to street vendors but also imposes regulations on them. The regulations allow vendors to carry out business in their designated place, but no vendor can step into area earmarked as a “no-vending zone.”

In a city like Dimapur where there is lack of production units and corporate sectors or hardly any other employment generation activities to sustain livelihood, it is a viable option for people to opt street vending profession, especially those who lack proper formal education and required skills to get themselves accommodated in the formal sector. Neikule Doulo, editor, Katalyst Entrepreneurs Associates (EA), while briefing the gathering of the Women street vendors in Dimapur, stated that street vending creates “rural economy with the urban” as the two are inter-dependent (Ambrocia, 2019). The importance of this sector cannot be undermined,

especially considering that the Government does not have the capacity to provide jobs to the thousands of unemployed and underemployed people in Nagaland. This means that most people in Nagaland have to fend for themselves. The sector contributes significantly towards the local economic growth and development of the urban economies. Street vendors provide valuable services to the urban masses while making out a living through their own enterprise, limited resources and labor. People in informal sector ought to be encouraged to grow and prosper if the Government wants to reduce unemployment and poverty in our country. They reach the consumers at convenient locations, without whom people would have to travel long distances to produce as well as get these goods.

Nagaland ex-Governor PB Acharya stated that the Street Vendors Act, which aims at providing social security and livelihood rights to street vendors, should be implemented in Nagaland at the earliest. He advocated for providing kiosks for women vegetable vendors to promote clean and secure business. The Government of Nagaland was set to implement the Nagaland Street Vendors (Protection of Livelihood and Regulation of Street Vending) scheme and Rules 2019 with effect from July, 2019 (*Eastern Mirror*, May 5, 2018).

Area of the Study

Dimapur is the commercial hub of the state of Nagaland. It was constituted as a town on August 8, 1954 with the promulgation of the Constitution of Town Committee Rules, 1954, when Nagaland was administratively under Assam state as Naga Hills District. Dimapur attained the status of an urban area only in 1961 when the census records designated it as a town with a population of 5753 persons (Census of India,

1961). Ever since the statehood of Nagaland in 1963, Dimapur has been experiencing a rapid flow of a heterogeneous mix of people from all over India for which it is also known as “mini India.” According to 2011 Census Report, Dimapur Municipal area houses 27165 households under 23 wards consisting of 87 colonies with a population density of 4809.47 sq.km.

Objectives

The objectives of the study are to examine the followings:

- i) The socio economic characteristics of vendors in Dimapur city.
- ii) The issues and challenges of footpath vendors in Dimapur.

Literature Review

Poverty and lack of gainful employment in the rural areas and in the smaller towns drive large numbers of people to the cities for work and livelihood. These people generally possess low skills and lack the level of education required for the better paid jobs in the organized sector. Besides, permanent protected jobs in the organized sector are shrinking and hence even those having the requisite skills are unable to find proper employment. For these people, work in the informal sector is the only means for their survival. In most Indian cities, the majority of urban poor survive by working in the informal sector (Sekar, n.d.). This has led to a rapid growth of the informal sector in most of the larger cities. The informal sector represents an important part of the economy and the labour market in many countries. Especially in developing countries, it plays a major role in employment creation, production, and income generation. It is estimated that more than two thirds of total employment and more than one third of the total Gross Domestic Product (GDP) of the nonagricultural sector in Asia

is contributed by the informal sector (Adhikari, 2012). Many migrated unskilled workforce engages themselves in street vendors (Widiyastuti, 2013). For most urban poor, street vending is one of the major means of earning a livelihood, as it requires low initial investment, and efforts in searching a job and the skills involved are low (Panwar and Garg, 2015). In recent times, street vending and hawking have become one of the principal means to make a living for the urban poor in India (Bandyopadhyay, 2009).

According to Tiwari (2000), often the side roads and pedestrian paths are occupied by people selling food, drinks and other articles which are in demand by road users. A careful analysis of the location of vendors, their numbers at each location and the type of services provided clearly shows that they are needed since they work under completely 'free market' principles. Road and city authorities, however, view their existence as illegal.

Subratty, Beeharry and Chan Sun (2004) surveyed the hygiene practices among food vendors in rural areas in Mauritius. It was found that generally food vendors were quite aware of hygienic conditions. But majority of them were not implementing their knowledge into practice. They perceived that their products were of low risk to customers. It highlights the need for further health education of food vendors.

Jaishankar and Sujatha (2016) found out that there is a significant relationship between the problems faced by the respondents and their overall perception about the street vendors. They suggest that since management plays an important role in success of any activity, there should be proper management in street vending also. They opined that street vendors are not only trying to earn a livelihood but also

provide valuable service to urban population. Hence, they suggested that the state government should protect the rights of these segments of population.

According to Kaur and Kaur (2017), street vending is a critical factor to the poor employment statistics. However, it was observed that there is a lack of credit sources to the street vendors. The vendors operate with no fixed place and majority of them have low level of income. They suggested that the government institutions, credit providers and law enforcers should try to frame better operational structure and credit framework.

Nirathon (2006) conducted a survey on 744 street vendors and found that it assures livelihood for new generations of less privileged people and also provide opportunities to fight poverty. Many of the respondents were impoverished farmers with limited formal education. Around 70 percent of the vendors were from agricultural sector.

Boakye (2009) established that the vendors chose this occupation as it does not require any formal skill and huge capital. They also chose this occupation because it was the only job available for them. The vendors were also found to be suffering from various health issues.

The study of Saha (2009) revealed that the vendors in Mumbai constitute one of the most vulnerable and miserable sections of the urban working poor. They earn their livelihood in hostile circumstances and face daily impositions from all quarters: the civic authorities, the police, the citizens' groups, the local leaders and the money lenders. It is only through the joining of hands that they can exert themselves and realize their demands. The low rate of active union membership outlines the fact that awareness among vendors of their rights

and responsibilities is generally lacking. Intermediaries take advantage of the looseness of associations among the vendors and exploit them to the maximum capacity.

Kumar and Pillai (2017) probed into various issues faced by street vendors. According to their findings, economic instability, social insecurity, weather fluctuations, barriers towards credit facility, health issues, discrimination, working instability, feeble implementation of Government policies and programs, lack of awareness about legal rights etc. are the major issues faced by the street vendors.

Prasad (2018) found out that street vendors do not have adequate infrastructure facilities at their working place. The social security programs of the government do not reach them properly and they were not aware about those programmes. He recommended that as the street vendors are harassed by police and municipality authority, the government should legalize and organize the vending activity.

According to Kumar (2015), street vendors face constraints like lack of access to credit, adequate infrastructure, sufficient social security coverage and many other resources. The study also found that the street vendors depend on the money lenders for credit accessibility as well as for social security purposes. The result also showed that the street vendors are forced to borrow at exorbitant rates of interest that often lead them to fall into a debt-trap situation, which calls for immediate vendor's protection. All vendors are surviving either by their meager savings or by borrowing from others at high rate of interest. The study also revealed poor working condition in terms of excessive working hours in a day in addition to unhealthy and unsafe conditions at work place.

Data and Methodology

For the purpose of analysis, a primary survey was conducted during February-March, 2020 in the study area. Data is collected from 9 areas in Dimapur Municipal namely: Lhomithi colony, Lengrijan, Oriental colony, City tower, Signal sam bazar, Notun Basti, Station Road, New Market, Marwaripatti. The sampling is selected by using convenient sampling and the sample size is confined to 50. The present study selected street vendors who are selling vegetables, fruits, fast foods, shoes and garments, accessories and home appliances.

Thereafter, the data are presented in suitable tables and figures to visibly portray the status of the street vendors in the study area.

Results and Discussions

In an urban sprawl like Dimapur, the informal sector including street vending plays a major role in the economy. It is a main source of employment generation for a large number of people.

i) The socio economic profile of the vendors

A brief socio-economic status of the respondents reveals that majority of them are in the age group 41-50 (44 per cent) and are barely literate having studied up to 8th standard (Table 1). They have fairly large families (4-8 members) and most of them earn a daily income of about INR 200-500 (54 per cent). Majority of them have been in the street vending business for 10-20 years (48 per cent). It is observed that majority of the respondents are females (52 per cent), married (72 per cent) and belonging to Non-Naga community (63 per cent). The study also reveals that majority of the vendors (60 per cent) operate without a proper trade permit.

Table 1: Socio-economic characteristics of the respondents (in percentage)

<i>Variable</i>	Characteristics			
Age	Below 20	20 - 40	41 - 50	50 & Above
	8 %	40 %	44 %	8 %
Education Level	Illiterate	Up to Class 8	Class 8 & above	
	22 %	44 %	34 %	
No. of family members	Up to 4	4 - 8	8 & above	
	34 %	58 %	8 %	
Daily Income	Below Rs. 200	200 - 500	500 - 800	800 & above
	2 %	54 %	30 %	14 %
Years in business	Below 10	10 - 20	21 & above	
	42 %	48 %	10 %	
Gender	Female	Male		
	52 %	48 %		
Trade Permit	Yes	No		
	40 %	60 %		
Marital Status	Married	Unmarried		
	72 %	18 %		
Community	Naga	Non-Naga		
	37 %	63 %		

Source: Field Survey Conducted during Nov. 2019 – March 2020.

ii) Types of Vendors

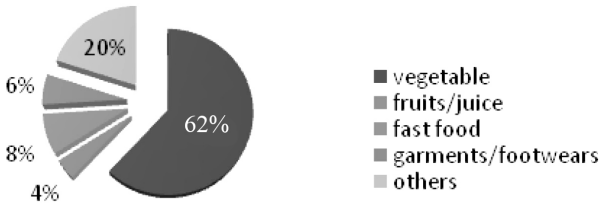
Vendors sell different types of goods in the study area. The present study shows that a major proportion of the respondents (62 per cent) sell vegetables followed by a distant number of vendors selling “others” (20 per cent).

Table 2: Distribution of Respondents According to Type of Vendors

Types of Vendors	Numbers	Percentage
Vegetables	31	62%
Fruits/juice	2	4%
Fast food	4	8%
Garments/foot wears	3	6%
Others	10	20%

Source: Field Survey Conducted during Nov. 2019 – March 2020.

Figure 1: Types of Vendors



Source: Table 2.

iii) Problems

The study reveals some very pertinent problems faced by the people in this sector. Despite its growing importance, infrastructural facilities, policies, regulations, financial supports, etc. are not adequately available for this profession. In addition, the street vendors face many obstacles and hurdles during the course of vending. Some of the common problems faced by the street vendors are discussed below:

- a) Due to lack of other gainful employment opportunities, many of the urban poor people enter into street vending business. The study reveals that street vendors spend majority of their time in their businesses and hardly get any time for rest or to pursue any other economic activities. About 46 per cent of the vendors work for more than 10 hours a day (Table 3). The survey also reveals that a great majority (90 per cent) of them work for 6 days in a week.
- b) Street vendors need to purchase goods and take to their vending place to carry out their business. While for some, who sell in close proximity from the place of purchase, no transportation cost is incurred. But the vendors who sell their goods at a far distance or purchase goods from far distance, they normally spend a high amount on transportation cost

which significantly reduce their profit margin. The study reveals that about 64 per cent of respondents spend more than Rs. 80 on transportation per day (Table 4).

Table 3: Distribution of Respondents According to Working Hours and Working Days

Working hours in a day	No. of Respondents	Percentage
Up to 6 hours	13	26%
Up to 10 hours	14	28%
More than 10 hours	23	46%
Working days in a Week		
Up to 5 days	3	6%
6 days	45	90%
7 days	2	4%

Source: Field Survey Conducted during Nov. 2019 – March 2020.

Table 4: Distribution of Respondents According to Transportation Cost Incurred

Transportation cost	No. of Respondents	Percentage
No cost	7	14%
Up to 80	11	22%
81-150	18	36%
150 and above	14	28%

Source: Field Survey Conducted during Nov. 2019 – March 2020.

c) The fragility of security of the street vendors is also visible in terms of the location of business. The present study reveals that 48 per cent of the street vendor respondents move from place to place. About 28 per cent of the respondents pay rent for vending in front of some other permanent shops on temporary arrangements.

Table 5: Distribution of Respondents According to Type of Location

Type of location	No. of Respondents	Percentage
Rent (Short term)	14	28%
Permanent	12	24%
Moving (no fix place)	24	48%

Source: Field Survey Conducted during Nov. 2019 – March 2020.

d) Lack of storage facilities is another major problem. The study shows that about 52 per cent of the street vendors lack storage facilities (Table 6).

Table 6: Distribution of Respondents According to Availability of Storage Facilities

Storage facilities	No. of Respondents	Percentage
Yes	24	48%
No	26	52%

Source: Field Survey Conducted during Nov. 2019 – March 2020.

e) Proper sanitation around the vending areas is indispensable for the health of both vendors and customers. However, the study reveals that sanitation facilities around the vending place is bad (30 per cent) or has no sanitation at all (32 per cent).

Table 7: Distribution of Respondents According to Sanitation Quality

Sanitation in vending place	No. of Respondents	Percentage
Good	14	28%
Bad	15	30%
No sanitation	16	32%
Can't say	5	10%

Source: Field Survey Conducted during Nov. 2019 – March 2020.

f) Seasonal variations also have its impact on street vending. According to the study, 76 per cent of the respondents are affected by seasonal variations (Table 8). Only 16 per cent of the vendors said that there is no impact of seasonal variations on their sale, while 8 per cent choose not to comment. During summer perishable goods gets rotten very fast and vendors incur huge amount of loss. The vendors lacking shed in vending place, face a huge problem during rainy season.

Table 8: Distribution of Respondents According to Impact of Seasonal Variations

Affected by Seasonal Variations	No. of Respondents	Percentage
Yes	38	76%
No	8	16%
Can't say	4	8%

Source: Field Survey Conducted during Nov. 2019 – March 2020.

- g) Street vendors lack access to proper formal credit system. While most of them start their vending profession by using the meager earnings or savings they have (46 per cent), others borrow either from money lender (26 per cent) or family/relatives (22 per cent). The survey shows that only 6 per cent of the surveyed responded have availed Bank loans.

Table 9: Distribution of Respondents According to Primary Source of Capital

Primary Source Of Capital	No. of Respondents	Percentage
Banks	3	6%
Money lenders	13	26%
Family/relatives	11	22%
Self	23	46%

Source: Field Survey Conducted during Nov. 2019 – March 2020.

- h) Sudden weather changes also affects the sale of the vendors according to 88 per cent of the respondents in the present study (Table 10), as the vendors are not prepared for the sudden unpredictable weather change. This is primarily due to lack of proper shelter suffered by the street vendors.

Table 10: Distribution of Respondents According to Effect of Sudden Weather Change

Sudden Weather Change	No. of Respondents	Percentage
Yes	44	88%
No	6	12%

Source: Field Survey Conducted during Nov. 2019 – March 2020.

i) One common problem most street vendors face is space problem. There is lack of sufficient space for vending. Vendors occupy a small place on the roadside, near the shop, outside other's house or shops, pavements etc. This leads to a lot of congestion. For some vendors selling small or less goods, narrow space may not be a major problem. But there are some vendors who prefer to sell more goods but due to the space problem, they are bound to sell only the amount of goods their space can accommodate. The study reveals that 54 per cent of respondents face space problem in doing business (Table 11).

Table 11: Distribution of Respondents According to Space Problem

Space Problem	No. of Respondents	Percentage
Yes	27	54%
No	23	46%

Source: Field Survey Conducted during Nov. 2019 – March 2020.

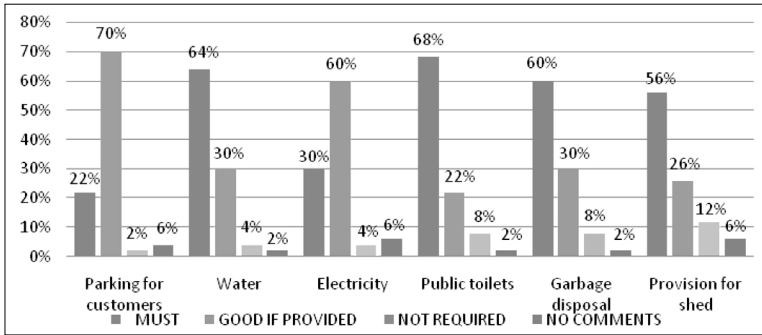
j) There is lack of basic workplace amenities like proper shed, water facilities, parking facilities, electricity, etc. in the vending place. The present study shows that street vending profession lack basic infrastructure facilities which makes vending profession a difficult task to make a living. Most of the respondents expressed the necessity for provision of these basic amenities around their vending locations (Table 12 and Figure 2).

Table 12: Distribution of Respondents According to the Need of Infrastructural Facilities

Infrastructure Facilities	Must	Good If Provided	Not Required	No Comments
Parking for customers	22%	70%	2%	6%
Water	64%	30%	4%	2%
Electricity	30%	60%	4%	6%
Public toilets	68%	22%	8%	2%
Garbage disposal	60%	30%	8%	2%
Provision for shed	56%	26%	12%	6%

Source: Field Survey Conducted during Nov. 2019 – March 2020.

Figure 2: Required Infrastructure Facilities



Source: Table 12.

iv) Conclusion

The present study found that most street vendors in Dimapur town carry out their business through self-finance and work six days a week for more than ten hours daily. It is found that seasonal variations greatly impact their business negatively. The study also found that sudden change of weather negatively affect their earnings to a great extent since they mostly work in open spaces and lack sufficient space. Basic infrastructure facilities like drinking water, electricity, provision for shed, public toilets, etc. are very much needed. Provision of these infrastructure facilities or basic amenities can make a huge difference in carrying out this profession. Hence, these infrastructure facilities have a significant impact on the lives of street vendors. The infrastructure facilities can be provided by the government. There is an urgent need of government support for the welfare of the street vendors.

Policy Recommendations

From the results of the present study, certain policy recommendations have been put forward.

1. Basic amenities like water facilities, both for drinking and other purpose, good public toilets, electricity, sheds, etc. must be provided to the street vendors.
2. Efforts must be made to set up proper financial credit institution for the vendors.
3. Awareness campaigns, seminars and other such programmes must be organized to educate the vendors about various government provisions, and their rights and responsibilities.
4. Government must work to promote the welfare of the street vendors.
5. More studies should be carried out to look into the matters of the problems faced by the street vendors and find means to mitigate their problems.

References

- Adhikari, D. B. (2012). Income generation in informal sector: A case study of the street vendors of Kathmandu Metropolitan City. *Economic Journal of Development*, 13, 1-14.
- Ambrocia, M. (19 February, 2019). EA, building a strong street vending workforce in Nagaland. *EastMojo*. Retrieved from: <https://www.eastmojo.com/news/2019/02/19/ea-building-a-strong-street-vending-workforce-in-nagaland/#bypass-sw> on 11/02/2020.
- Bandyopadhyay, R. (2009). Hawkers' Movement in Kolkata, 1975-2007. *Economic & Political Weekly*, XLIV (17), Notes, 116-119.

- Bhatt, B.J. and Jariwala, A.D. (2018). A Study of street vending activities in the South East Zone of Surat. *International Journal of Civil Engineering (IJCE)* , 7 (3), 1-10.
- Boakye, N.Y.G. (2009). *The Street is Only a Stepping Stone: Street Vendors Account of Goals, Strategies and Obstacles*. Regional Institute for Population Studies, University of Ghana. Retrieved from: https://www.ilo.org/wcmstp5/groups/public/---asia/---ro-bangkok/documents/publication/wcms_bk_pb_128_en.pdf on 24/02/2020.
- Eastern Mirror. (May 5, 2018). Acharya backs Street Vendors Act in Nagaland. *Eastern Mirror*. Retrieved from: <https://www.easternmirrornagaland.com/acharya-backs-street-vendors-act-in-nagaland/on-2702/2020>.
- Government of India, *Census of India 1961*, New Delhi.
- Government of India, *Census of India 2011*, New Delhi.
- GOI, *The Street Vendors (Protection of Livelihood and Regulation of Street Vending) Act, 2014*. Retrieved from: <https://legislative.gov.in/actsoparliamentfromtheyear/street-vendors-protection-livelihood-and-regulation-street-vending-act-on-23/03/2020>.
- Jaishankar, V. and Sujatha, L. (2016). A Study on Problems Faced by the Street Vendors in Tiruchirappalli City. *SSRG International journal of Economics and Management studies (SSRG-IJEMS)* , 3 (9), 40-43.
- Kaur H. and Kaur S. (2017). A Study on Quality of Work Life of Street Vendors of Khanna. *Biz and Bytes* , 8 (1), 59-63.
- Kumar, P. (2015). Socio- Economic features of street vending enterprises in Kerala. *International Journal of Management and Commerce Innovations*.3 (1), 750-756

- Kumar, S.S. and Pillai, N.M. (2017). Problems of Street Vendors in Kollam District. *International Journal of Informative & Futuristic Research*, 4 (9), 7378-7382.
- Meneses-Reyes, R. and Caballero-Juárez, J.A. (2014). The right to work on the street: Public space and constitutional rights. *Planning Theory*, 13 (4), 370-386.
- Nirathron, N. (2006). *Fighting Poverty from the Street: A Survey of Street Food Vendors in Bangkok*. Bangkok, International Labour Office.
- Pawar, A.M. and Garg, V. (2015). Issues and Challenges Faced by Vendors on Urban Streets: A Case of Sonipat City, India. *International Journal of Engineering Technology, Management and Applied Sciences*. 3 (2), 71-84.
- Prasad, B. (2018). Issues and Challenges of the Weekly Market Street Vendors in Telangana: A Special Reference to Hyderabad. *Economic Affairs*, 63 (1), 45-51. DOI: 10.30954/0424-2513.2018.00150.6
- Saha, D. (2009). Decent Work for the Street Vendors in Mumbai – A Distant Vision! *Journal of Workplace Rights*, 14 (2), 229-250.
- Sekar, H.R. (undated) Insecurities and vulnerabilities of informal sector vendors with special focus on street vending children of NOIDA, *V.V. Giri National Labour Institute*, NOIDA.
- Shibulal, A.L. (2018). *Needs and Problems of Street Vendors: An inquiry*. Saintgits College of Engineering, Kottayam.
- Subratty, A.H. Beehary, P. and Chan Sun, M. (2004). A survey of hygiene practices among food vendors in rural areas in Mauritius. *Nutrition & Food Science*, 34 (5), 203-205.

- Tiwari, G. (2000). Enchoachers or service providers? *Street vendors: a symposium on reconciling people's livelihood and urban governance*. Retrieved from: <https://www.india-seminar.com/2000/491/491%20geetam%20tiwari.htm> on 13/02/2020.
- Widiyastuti, D. (2013). Transformation of public space: social and spatial changes: A Case Study of Yogyakarta Special Province, Indonesia. Technical University of Dortmund. (Doctoral dissertation).
- Winter, B.C. (2017). Reappropriating Public Space in Nanchang, China: A Study on Informal Street Vendors. *PhD Dissertation*, University of South Florida. Retrieved from: <https://scholarcommons.usf.edu/etd/6982>