Journal of Engineering and Applied Sciences
MEDWELL PUBLICATIONS

Urban Poverty-A 'Complex' Resulting from the Inability of Governments to Keep up with Urbanization

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Key words: Urbanization, expanded polystyrene, concrete, environmental degradation, potential, possessions, homelessness

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Page No.: 3599-3604
Volume: 15, Issue 21, 2020
ISSN: 1816-949x
Journal of Engineering and Applied Sciences

Abstract: Urbanization is popularly known as the migration of people from rural to urban areas. This process is sparked by a number of push and pull factors. The biggest pull in urban areas for those living in rural areas is the promise of employment and potential prosperity. Urbanization has also brought with it the unintended manifestations of poverty and environmental degradation. This has led to a phenomenon called 'urban-poverty'. Urban poverty is the sustained lack of income or material possessions for those who reside in urban centres. Urban poverty is also largely characterized by homelessness and shanty dwellings. Such deprivation has led researchers to consider more innovative ways to make common building materials such as concrete easily accessible even for low-income households. One such concrete innovation is Expanded Polystyrene (EPS) concrete. Although, EPS concrete is highly beneficial in its various forms and uses in construction, this study forms on-going research into improvements of its technical characteristics. This study highlights two immediate areas to be considered as the research progresses. The first area relates to the use of various density types of EPS beads in EPS concrete instead of one type as more commonly used. The second area is the aspect of considering EPS beads asa partial replacement for the coarse aggregate.

INTRODUCTION

One of the biggest challenges that urbanisation has brought is that of the lack of housing[1]. This enormous deficiency in both developed and developing cities has created an enormous appetite for the use of concrete. Increased urbanisation has resulted in 'Urban poverty'[2]. Urban poverty can usually be defined in two ways. The first definition according to Anonymous[3] is that it is an "absolute standard based on a minimum amount of income needed to sustain a healthy and minimally comfortable life". The second definition according to McDonald and McMillen[4] is that it is a "relative standard that is set based on the average standard of living in a nation". Figure 1 shows a popular display of urban poverty that is synonymous with many developed and developing cities across the world.

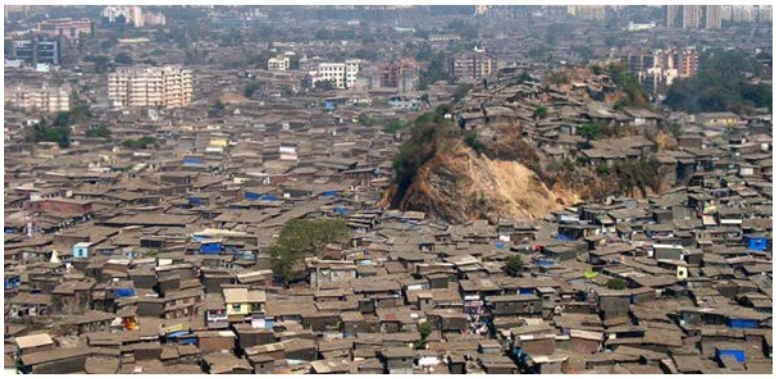

Fig. 1: An infamous display of urban poverty is slums that border many towns worldwide[5]

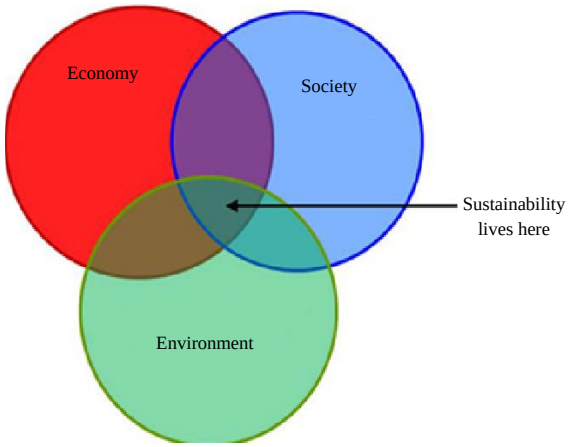

Fig. 2: The three overlapping circle model of sustainability

The strained relationship between urbanization, sustainability and environmental friendliness: The most common quality of urbanized cities is that sustainability and environmental friendliness remain a growing problem. Concrete being the most popularly used material in the modern age, remains one of the biggest offenders in this relationship[6]. At the core of the crisis between sustainability and environmental friendliness lies a number of issues that continue to cause strain between the two. For a very long time civilization has viewed the environment as something that is peripheral instead of co-existing proportionally with humanity[7]. A Promethean outlook propagates that technology and the knowledge of humanity is capable of overpowering any environmental or naturally occurring pressure[7]. This has proven to be incorrect particularly when viewing the many contemporary environmental pressures that currently exist. These include global warming, loss of biodiversity, ozone depletion, inappropriate waste disposal as well as pollution. Singh and Singh[8] state that most of the environmental problems which currently exist can be attributed to the unsustainable use of natural materials. A much-neglected impact of the growing difficulties that exist between sustainability and the environment is the disease burden that has gripped the world[9]. Lack of sustainability in how resources are used has led to air pollution, unsafe drinking water as well as poor hygiene and sanitation conditions[9]. The best way that sustainability should be approached is through the three overlapping circles model as shown in Fig. 2. Sustainability is driven by a careful balancing act between the economy, society and the environment. If one of these contributors grows beyond the set limits, it ultimately affects the sustainability of all three. Different government leaders globally prefer the three-overlapping circle in Fig. 2 to rather be in a manner that reflects the economy as being bigger, followed by society then lastly as a small circle ending with the environment[10].

Such government leaders do this in ignorance of the type of dependency pattern that exists between these three. Perrings[10] explains the intimacy that exists between the economy, society and the environment as shown in Fig. 3. Figure 3 shows that it is the environment which engulfs and carries both the society as well as the economy.

THE TRIGGERS OF URBAN POVERTY

As urbanization continues to spread, it is important to note that with the growth of urbanization also comes the growth in the complexity of the various triggers that trigger urban poverty[11]. There are two themes in the arena of urban poverty that are likely to cause the biggest impact and they are ‘proactivity versus reactivity’ as well as ‘the readiness of countries to absorb urbanization’.

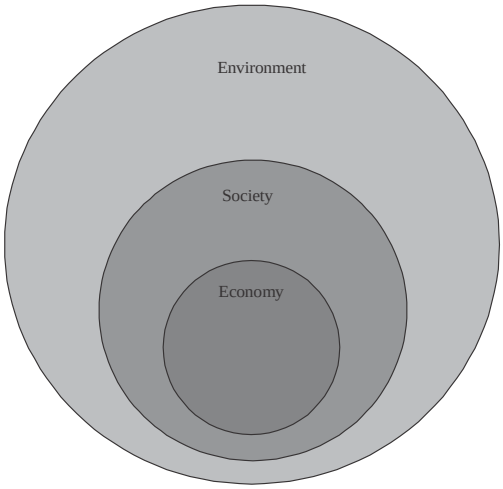

Fig. 3: The interdependency of the environment, society and the economy

Proactivity versus reactivity: Scholars have argued that urbanization is sporadic and therefore entirely impossible to adequately plan for but modern day research is showing the contrary[12]. As modern day research is beginning to show contrary findings, it is becoming clear that the scale and profundity of poverty is underestimated by most governments and international agencies across the world and this helps reinforce ineffective policies[13].

We are living in what is frequently described as the 'urban century'[14]. Most of the world's economy and more than half its population are now in urban areas. The current factors that affect urban dwellers in informal settlements are as follows[15]:

- Poor quality, overcrowded housing
- Risk of forceful eviction
- Lack of safe, readily available, water supplies
- Poor provision for sanitation, drainage and solid waste collection
- Lack of access to healthcare, emergency services and policing
- Difficulty accessing government schools and
- Locations at high risk of disasters and with risk levels increasing because of climate change

Global patterns suggest that people from different countries continue to move around to various other countries in the world. This form of movement is broadly called 'migration'. There are various types of migration and causes for migration. United Nations Department of Economic and Social Affairs[16] shows that the types of migration are mainly:

- Political migration-based on the political limits and the boundaries crossed
- Internal migration-Migration occurring within a country from crossing political boundaries
- International migration-Migration occurring across country boundaries
- Movement pattern migration-Migration based on the classification of people according to their social status, travel points and periodicity
- Step migration-Migration initiating from a small settlement and moving to a larger in the urban hierarchy
- Circular migration-cyclical migration experiences between an origin and a destination with at least one migration and return
- Chain migration-Migration of families at different stages of the life cycle from one location to the next

According to United Nations Department of Economic and Social Affairs[16] an estimated 881 million urban residents across the world live in slums. This figure has increased by 28% over the past 24 years. This is evidence that globally the world continues to hold onto the stance of reactivity in its approach to dealing with urbanization.

The readiness of countries to absorb urbanization: Many countries around the world are still not geared to absorb the effects and the requirements of urbanization. This is mainly because researchers have not yet sufficiently been able to demonstrate the link between 'urbanization' and 'urban infrastructure'. Urban Infrastructure can be said to be access to water facilities, telephone ownership and access to sanitation facilities. A plausible way to counter the adverse effects of urbanization is to always keep the rate and availability of urban infrastructure ahead of urbanization. One such country which has made a significant effort towards achieving this is China. In Fig. 4, Li[17] it can be seen that access to both water and sanitation facilities remains much higher than the urbanization growth rate percentage. Another observation which can be made is the decline in telephone line ownership after 2005. This reflects the adoption of mobile telecommunication devices.

Unfortunately, many countries across the world do not resemble a similar graph as China. This is due to the lack of readiness of various governments across the world to confront the phenomenon of urbanization. It's for this reason that globally the urbanization rate far exceeds the growth rate of urban infrastructure.

NON-INFRASTRUCTURE CONSIDERATIONS THAT CONTRIBUTE TO URBAN POVERTY

A common overlooked non-infrastructure consideration that contributes to urban poverty is the

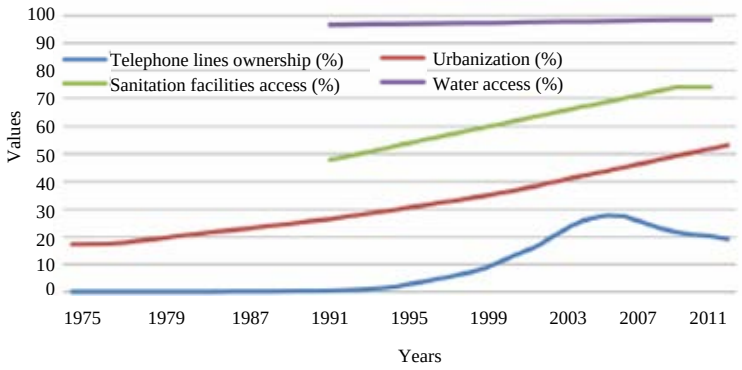

Fig. 4: Urbanization and Urban Infrastructure Development in the PRC, 1975-2013[17]

global use of inappropriate poverty lines. The draft Sustainable Development Goals (SDG) poverty line set the line for extreme poverty at $1.25 USD per day[18]. It is clear that such a pronouncement is far from what reality demands. Statistical researchers are still struggling to ensure that the set poverty lines reflect the reality of both food and non-food costs across the various regions of the world. This ought to begin with the realization that in urban locations, all goods as well as services are commodified.

Although, other researchers have argued that the definition for poverty is relatively new, hence, the misguided approaches to defining it; this assertion remains incorrect. It was in 1990 where an officially accepted international definition of poverty was published. It was published by the World Bank in their flagship publication, The World Development Report[19]. The World Bank adopted a $1-a-day line in the 1990 edition[19].

The use of concrete as a means to solving a large part of the urban-poverty crisis: Although, income is a key dimension of poverty, it has many other dimensions. This can also be seen in the definition of 'Absolute Poverty' as promulgated by the World Social Summit Programme of Action in 1995[20]. The definition states that:

"Absolute poverty is a condition characterized by severe deprivation of basic human needs, including food, safe drinking water, sanitation facilities, health, shelter, education and information. It depends not only on income but also on access to social services".

The most durable material currently available to build both the shelter and the social services infrastructure referred to in the definition of absolute poverty is concrete[21]. Concrete is an age-old material that is naturally water resistant but is also virtually fireproof[22]. It is a material that consists of very basic materials, namely; fine and coarse aggregate, water and cement. The cement in the concrete is meant to play the role of a binder. It forms the glue between all three constituents. Freshly mixed concrete in its fluid form has the ability to adopt a hardened shape of whatever mould that it is placed in. Upon hardening, the density of the concrete is generally 2400 kg m^{-3}[21].

Concrete has multiple applications and can be manufactured in a number of different settings. These often range from informal to formal settings. A single individual can mix concrete for domestic purposes such as for the construction of a concrete apron around the house or a number of individuals working at a batch plant can mix large tonnages of concrete to batch for large construction corporates. It is possible to attain consistent quality levels when the mixing is done in a controlled environment such as at a batch plant, however the risk of inconsistent mixes is higher when mixing is being done manually.

As much as concrete has superb structural properties, it still remains largely expensive and inaccessible to a lot of low-income families[23]. The structures that families from low-income households often resort to is shown in Fig. 5.

Following the inaccessibility of concrete to most low-income families, researchers have looked into the substitution of the basic constituents of concrete with other more commonly available materials. This has resulted in the manufacture of concretes such as Expanded Polystyrene (EPS) concrete being formed. Expanded polystyrene concrete is not only lightweight but it is also used for many specific construction industry applications. EPS Concrete does not pollute the environment because the manufacture of EPS particles consumes minimal energy and the particles are non-poisonous. According to EPASA[24], other characteristics of EPS concrete are that it is highly

Table 1: Urbanization development and prospects, worldwide and in major regions, 1970-2050[16]

	Population in urban areas (millions)			Urban growth rate (%)		Urban share (%)
Variables	1970	2010	2050	1970-2010	2010-2050	2010
World	1332	3495	6398	2.4	1.5	50.6
More developed regions	652	925	1071	0.9	0.4	75.0
Less developed regions	680	2570	5327	3.3	1.8	45.3
Least developed countries	41	254	967	4.5	3.3	29.4
Africa	86	412	1234	3.9	2.7	39.9
Asia	485	1770	3486	3.2	1.7	42.5
Latin America/Caribbean	164	471	683	2.6	0.9	79.4
Northern America	171	286	401	1.3	0.9	82.1
Europe	412	530	557	0.6	0.1	72.6
Oceania	14	25	37	1.5	1.0	70.6

Fig. 5: Corrugated sheet and traffic signs used as materials for low-income household houses[25]

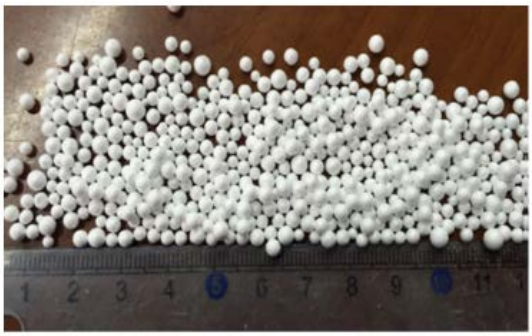

Fig. 6: Expanded Polystyrene beads[24]

economical, environmentally safe and it also results in a lot of energy savings. The EPS beads are shown in Fig. 6.

However, existing research has adopted a singular focus on EPS concrete that relates predominantly to the use of one density type for EPS beads in EPS concrete. The current on-going research explores how different bead densities affect all the different concrete characteristics in EPS concrete. In previous studies of EPS concrete, researchers have also only looked at the aspect of EPS beads being a replacement for the fine aggregate in concrete but never as a partial replacement for the coarse aggregate (Table 1).

CONCLUSION

As urbanization continues to strain many cities across the world, it remains fundamentally important that more exploratory studies are conducted into innovative concrete initiatives. Table 1 shows that from 2010-2050, the global population in urban areas is expected to double. Table 1 Urbanization development and prospects, worldwide and in major regions, 1970-2050[16]. Furthermore, as stated by the United Nations Department of Economic and Social Affairs[16] to deal with the challenge of affordable housing, cities need to:

- Explore opportunities to repurpose unoccupied space, apartments or underutilized buildings in the city for impermanent or long-term housing of migrants
- Balance their transport infrastructure, so, migrants can live in locations spread throughout the city yet still travel anywhere in it easily and reach employment opportunities
- Look upon housing as a human right and explore the housing challenge from that perspective

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