

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/310607008>

The economic effect of urbanization to sustainable food production and development

Article · April 2016

CITATIONS

0

READS

55

3 authors, including:



Ifeanyi Okoli

Godfrey Okoye University, Enugu

18 PUBLICATIONS 9 CITATIONS

SEE PROFILE

Some of the authors of this publication are also working on these related projects:



Organisational Justice and organisational citizenship behaviours among academic staff of private universities in Southeast Nigeria [View project](#)



The Economic Effect of Urbanization to Sustainable Food Production and Development

¹Okoli, Ifeanyi Emmanuel, ²Okoro Blessing Chineme and ³Adekitan, Rasheed Akanfe

¹Department of Business Management, Godfrey Okoye University, P.M.B. 01014 Enugu State, Nigeria. Tel: +2348065140347 email: eokoli76@yahoo.com

²Department of Business Management, Godfrey Okoye University, P.M.B. 01014 Enugu State, Nigeria. Tel: +2348067958377 email: chinemeokoro2001@yahoo.com

³Department of Business Management, University of Nigeria Enugu Campus, Nigeria. Tel: +2348155572148 email: rasheed.adekitan2012@gmail.com

Abstract – In this study, effort were made to address issues that are related to the problems, causes, effects, challenges, practice and solutions to the future management as it concerns man and his environment and his economic system, health security as well as food through Agriculture and its related sectors. Urbanization has been underpinned by the rapid growth in the world economy and in the proportion of gross world product and of workers in Agricultural and service enterprises. Globally, Agriculture has met the demands from this rapidly growing urban population, including food that is more energy-, land-, water- and greenhouse gas emission-intensive. However, urbanization has been the problem of the world today especially in Anambra State it has taken its stand through the regional development which was enhanced by Evolution of Agricultural Technologies, coupled with migration population movement of the people, which contributed grossly to the problem facing food and Agriculture in the state. These has been found as the major causes of food scarcity, disease, hunger and other related environmental hazards across the state. Furthermore, there is need for a legend attention to be given as to arrest its havoc and by so doing, create a good system of equitable redistribution of technological method to Agricultural sector, provide funding to all the sectors and to check mate the raising hazard which Urbanization Constitutes in our environment today.

Key words: Urbanization, Agriculture, food production, Economy and development



The Economic Effect of Urbanization to Sustainable Food Production and Development

¹Okoli, Ifeanyi Emmanuel, ²Okoro Blessing Chineme and ³Adekitan, Rasheed Akanfe

¹Department of Business Management, Godfrey Okoye University, P.M.B. 01014 Enugu State, Nigeria. Tel: +2348065140347 email: eokoli76@yahoo.com

²Department of Business Management, Godfrey Okoye University, P.M.B. 01014 Enugu State, Nigeria. Tel: +2348067958377 email: chinemeokoro2001@yahoo.com

³Department of Business Management, University of Nigeria Enugu Campus, Nigeria. Tel: +2348155572148 email: rasheed.adekitan2012@gmail.com

Abstract: *In this study, effort were made to address issues that are related to the problems, causes, effects, challenges, practice and solutions to the future management as it concerns man and his environment and his economic system, health security as well as food through Agriculture and its related sectors .Urbanization has been underpinned by the rapid growth in the world economy and in the proportion of gross world product and of workers in Agricultural and service enterprises. Globally, Agriculture has met the demands from this rapidly growing urban population, including food that is more energy-, land-, water- and greenhouse gas emission-intensive. However, urbanization has been the problem of the world today especially in Anambra State it has taken its stand through the regional development which was enhanced by Evolution of Agricultural Technologies, coupled with migration population movement of the people, which contributed grossly to the problem facing food and Agriculture in the state. These has been found as the major causes of food scarcity, disease, hunger and other related environmental hazards across the state. Furthermore, there is need for a legend attention to be given as to arrest its havoc and by so doing, create a good system of equitable redistribution of technological method to Agricultural sector, provide funding to all the sectors and to check mate the raising hazard which Urbanization Constitutes in our environment today.*

Keywords: *Urbanization, Agriculture, food production, Economy and development*

1. Introduction

The word Urbanization are derived from the former word urban, which were mainly known as a place where different people with different interest from other parts of the services in Country or state exchange goods and services in Common, with higher concentration of people dwelling in such place for their enormous activities. However Urbanization is the increasing number of people that migrate from rural to urban area. It predominantly results in the physical growth of urban areas, be it horizontal or vertical. The United Nations projected that half of the world's population would live in urban areas at the end of 2008. By 2050 it is predicted that 64.1% and 85.9% of the developing and developed world respectively will be urbanized. Food production

and Agricultural Development are based on natural resources surrounding our environment. However it has been a problem based on inability to produce enough food materials and to the sustainability of its growth and development in our Society as enough consideration has not been given to our natural and physical resources in Agricultural sector. **Based on the problem, the researcher developed the following objectives:** To ascertain Agricultural and food production growth and development strategies in Anambra State, to create awareness of food scarcity and strategies for ensuring food security of the State and to encourage the people of the state and the Government to invest more on Agriculture.

However, due to high rate of Urbanization in Anambra State and its environs, most natural and physical elements that promote good health and Agricultural – occupational development of the economic well being of the people are easily neglected to Urbanization and its socio-politics-economic pursuits. Basically, the advent of technology which come to stay completed more people to focus on new ideas of sustaining a living, and people also began to develop by increasing mental knowledge, thereby creating more easy going jobs.

In any way, this did not go down well especially in Anambra State, because of lack of equal redistribution of technological ideas to different sectors, of the people. Even through among the institutions of higher learning, in the state, e.g. Chukwuemeka Odumegwu Ojukwu University, Igbariam and Nnamdi Azikiwe University, Awka. In these mentioned institutions there are faculties of Agricultural Science and Engineering, where brilliant students of this state are produced every year for agricultural practices, these brilliant students have been neglected and due to lack of motivation and support, some have gone beyond teaching and joined the train of get-rich-quick syndrome, as a result of failure to redistribute equally the dividends of technology to agriculture for growth and production development.

In fact, more reasons than earlier said brought in this problem on food production and agricultural backwardness in the state, to mention but a few, lack of manpower resources, poor plant and none recognition of the importance of agriculture by the authority in power. Even the existing places for food and Agricultural produce were exposed to environment disasters and insecurity to timber merchants through bush burning and deforestation and uncontrolled erosion took another stage. Rating does into so man heat in every state of the awareness on agriculture of all sector.

For instance, the operation Feed Nation were introduced and launched on every state of the Federation on September 1979, by the then Head of State Gen. Olusegun Obasanjo. The green revolution also was introduced followed by Operation feed yourselves. However the activities of this said programs did not in any way created any impact on food production and Agricultural development in the state because it either ended up on radio broadcast, news papers headlines reports and television broadcast news, why because it did not touch ground. Infact, it lacked mobilization, motivation, and direction of any aspect. There was no infrastructure mapped out in place to mutate these ideas being carried out to reach the people in their different local localities.

Most of the existing farms were only regional farms under Anambra State Agricultural development projects Created then by Federal government during the last board on Agriculture sector of economy in early 70's. These farms were located Omogho (Farm settlement site) in

Ayamelum L G A and Umueje farm site, respectively.

These farms were located to take care of food production in the eastern part of the country were not adequately equipped to meet the rising demand and supply of food and some Agricultural produce. Migration and political instability has turned these farms into individual efforts on production and subsistence farming took the role moreover, owing to urbanization and civilization migration of young ones to major cities brought a change into the number one economic foundation of the state and the nation as well. Going through the state of 14 local government areas with a teaming population of 2, 124, 974 as at 1991, with a projection number of 2,381, 113 persons as at 2006 population census, a total number in different occupation shows a collective number of 70,567,097 in 5 identified occupations, (U) professional technical and related workers, Administrative and managerial workers. Clerical and related worker, sales workers transport equipment's operators and laborers', as well as Agricultural, animal husbandry, forestry workers, fishermen, and hunters and other Occupations that cannot be adequately defined Investigation through research shows a very low rate of people's participation in Agriculture and its related sectors. An admiring law rate of about 8, 821, 87 number of participants given to Anambra state Agricultural and other related workers. This state of down wardens is a problem and challenges today given to the rising rate of food scarcity, which brought in hunger, disease, hunger malnutrition, death among the learning population of the citizens of Anambra State organ and their quest dwellers.

The State food Supply have decreased to a point where for and other Agricultural produce commodities are being supplied by other states like, Enugu state and parts of Northern, states local markets, in different towns and communities little or nothing to deliver to the state urban markets due to the diminishing factors of production like, initial capital support of man power, equipment's, as they still practice traditional method of farming, all this accounts, to urbanization, which geared every young and old, their educated and the uneducated either migrate to the bigger cities in pursuit of these activities that was brought in by urbanization and its socio-politico-economic drive, which today has dominated the entire race.

Today a lot of families can hardly afford three square meals, owing to high cost of food. Even with minimum wages paid to civil servant both in the state and federal has no value in our markets due to high cost of food commodities, why, because those who does not participant at all in Agriculture are greater in number, and even the remaining Agricultural workers are mainly the very aging one lets in some rural areas.

In most cases, the younger age of about 5-9 years in some rural areas were exposed to child labour and exploitation by their poor parents of mostly widows while the ages bracket of 15-39 and 40 to 50 are either engaging in other artisan jobs are trading, so as to meet up with the demanding rate of hand living. Those that keep the courage to participate fully as farmers are only to be dies courage owing to high cost of labour and poor output, because of their crude method and lack of manpower, thereby giving a low output of Agricultural and food production, for the circulation of the populace in Anambra State. These have become a dilemma of a people of rich Agricultural heritage owing to urbanization and its trends of development in Anambra State.

2. Research Questions

The following research questions are formulated to determine the direction for this study.

1. What are levels of people participation on these two developments, as regards to changes in occupation of the people?
2. What determines the real effects which urbanization could have caused food production and Agricultural development.

The word urbanization is the total change.

The future for urbanization and the implications for farming: We need to understand what has underpinned urbanization in the past and how this is changing and might change in the future to be able to consider its implications for Agriculture and food production. The history of urbanization and of the cities and towns it encompasses is a history of political strength and economic success. The spatial distribution of towns and cities is in effect the geography of the non-Agricultural economy since it is where Agricultural and service enterprises have chosen to locate. It is also a map of where people working outside Agriculture, forestry or fishing make a living. Changes in this spatial distribution reflect changes not only in the economy but also in how this is organized—for instance, how this is influenced by the growth of multinational corporations and how they are structured, by shifts in goods production to greater use of outsourcing and by economic changes underpinned by advanced telecommunications including the Internet.

The rural to urban migration flows that cause urbanization are mostly a response to these economic changes. Some migration flows might be considered exceptions—for instance, growth in places where retired people choose to live, or in tourist resorts; but this also reflects economic change because of the growth in enterprises there to meet the demand for goods and services generated by the retired people and/or tourists.

This close association between urbanization and political strength and economic success is not likely to change looking to the future, although the countries and regions that enjoy the greatest success will change. Economic success for most cities may depend more today on success in global markets than 50 years ago, although intense inter-city competition for markets beyond national boundaries has been an influence for most cities for many centuries (Bairoch, 1988; Clark, 2009). Urbanization has also been underpinned by the expansion of the state, although the scale of this depends on economic success. In addition, competent, accountable urban governments have considerable importance for economic success. Today, many of the world's largest cities are large not because they are political capitals but because of their economic success.

How urbanization is understood has a large implication for how its likely future influence on food and farming is perceived. If urbanization is regarded as a process taking place in almost all nations and as a driver of change, then it can be assumed that extrapolating past trends provides us with a likely picture of the world's future urban population. This is backed up by projections for all nations for their urban populations and their levels of urbanization up to 2025 and beyond (United Nations. 2008). These suggest that almost all nations continue to urbanize except for those already classified as 100 per cent urban. Within this assumption of

almost universal increases in urbanization, often there are references to urbanization being out of control because it seems to take place regardless of economic conditions. There is also uncertainty as to how to fit examples of de-urbanization into this broad picture of a world with almost all nations becoming increasingly urbanized.

But if urbanization is understood as a process that is deeply influenced by the scale and nature of economic, social and political change, then projections up to 2025 and beyond become more uncertain. How does one predict the absolute and relative economic performance of each nation up to 2025? Within this understanding of urbanization, there is an interest in the links between urbanization and economic change which prove to be robust and multi-faceted). Since the scale and nature of economic change varies so much between nations and within nations, there is an interest here in how differences in economic change are associated with (and often the main cause of) differences in the scale and nature of urban change (including urbanization). De-urbanization is more easily incorporated into this, as a spatial manifestation of economic decline or collapse. This paper suggests that there is a substantial but often overlooked evidence base for this second interpretation of urbanization—and that this also provides a more reliable basis for considering the current and future influence of urbanization on food and farming.

Urbanization and the loss of Agricultural land: Urban expansion inevitably covers some agricultural land while changes in land values and land markets around cities often result in land left vacant as the owners anticipate the gains they will make from selling it or using it for non-Agricultural uses. In most urban areas in low- and middle-income nations, the absence of any land-use plan or strategic planning framework to guide land-use changes means that urban areas expand haphazardly. This expansion is determined by where different households, enterprises and public sector activities locate and build, legally or illegally. In most instances, there is little effective control over land-use conversions from Agriculture to non-Agricultural uses. There may be regulations that are meant to limit this but these are often avoided by politicians and real estate interests (Hardoy, Mitlin & Satterthwaite, 2001). This unregulated physical expansion brings many serious consequences. These include the segregation of low-income groups in illegal settlements on the worst-located and the most hazardous sites (they would not be permitted to settle on better-located and safer sites) and a patchwork of high- and low-density land uses to which it is both expensive and difficult to provide infrastructure and services.

Urban centers often expand over their nation's most productive agricultural land since most urban centers grew there precisely because of highly fertile soils. Most of the world's major cities today have been important cities for several hundred years, so they became important cities before the development of motorized transport (and later refrigeration) that reduced cities' dependence on their surroundings for food and other agricultural products. Of course, for prosperous cities, the demand for Agricultural commodities has long-since gone far beyond what is or could be produced in their surroundings. They draw on large and complex global supply chains and have large ecological footprints, drawing on 'distant elsewhere's' for food, fuel and carbon sinks (Rees, 1992). The dependence of many very large concentrations of urban populations on long international supply chains for food, fuels and most intermediate

and final goods makes them vulnerable to disasters in locations that supply these or buy their products, and also to rising fuel prices.

However, the loss of agricultural land to the spatial expansion of urban areas is often exaggerated; one recent study suggested that only West Europe among the world's regions has more than 1 per cent of its land area as urban (Schneider, Friedl, & Potere, 2009). In addition, a declining proportion of land used for agriculture around a city may be accompanied by more intensive production for land that remains in agriculture (Bentinck, 2000) or intensive urban agriculture on land not classified as agricultural. In most locations, governments could and should restrict the loss of agricultural land to urban expansion. But this can also bring serious social consequences if it pushes up land and house prices and reduces still further the proportion of households that can afford a legal housing plot with infrastructure.

Approximately 25 per cent of the world's terrestrial surface is occupied by cultivated land (Cassman, *et al.* 2005). Urban growth is more likely to reduce arable land availability if it takes place in this zone. But an analysis of the percentage of urban and rural population in the cultivated zones in each region found no evidence of urban populations concentrated in cultivated zones (Balk, McGranahan & Anderson, 2008).

Of course, the expansion of urban land uses is not just the result of urbanization but also (in most cities) of natural increase and of declining urban densities (Angel, Sheppard, Civco, Buckley, Chabaeva, Gitlin, Kraley, Parent & Perlin, 2005). Since urbanization entails fewer rural people as well as more urban people, it may reduce rural building and so, in part, counteract the effects of urbanization expanding over cultivated land.

3. Research Design

A combination of a case-study and survey research design used in this study helped a long way to obtain relevant information from the general public, agricultural agencies, government organizations, as well as individual farmers, and other institution under study and also from the responses used for the study. The case study is an intensive study geared towards a thorough understanding of a given socio-politico-techno and natural economic and developmental development in Anambra State. The Socio-political units are individual groups, institutions, like government, students Traders, politician, workers, artisans of every kind in our villages, towns, communities and local government areas of Anambra State, that promote the activators of Social and political and technologies development in their given environment. While natural and physical economic units are the elements of natural environments while promote natural economic developments in our areas.

Sample and Sampling Technique: The composition of diverse interest groups and with the total number 125 questionnaires distributed to the above groups of about 60%. For convenience and to ensure consistence of the sample for this study were drawn from past and present records of events going in the state.

Going through institutions of government, like National population Commission, Anambra State agricultural development agencies publications on past and current affairs, farmers, Anambra State urban and rural development authority, traders, politicians suppliers, local and urban markets, and personal interactions and observations.

Considering the target expanse and diversified perspectives of the above aforementioned group a pilot survey was first carried out to determine the success of using it for study. This actually helped the researcher to determine the sample size that was used. The top man formula, the pilot survey showed that there is about 8% success in using the farmers, in rural areas of Anambra state.

$$Z = \frac{Ps_1 - qs_2}{\sqrt{\frac{Ps_1 qs_1}{n_1} + \frac{Ps_2 qs_2}{n_2}}} \cdot \frac{1}{Pq}$$

Where n - sample size

p – Probability of success

q - Probability of failure

e - Tolerable error 0.05

z - Value of z – score = 1.96

$$\text{Sample size } n = \frac{1.96 \times 0.80 \times 0.20}{0.05} = 2.18$$

4. Result, Analysis and Presentation of Data

Efforts are made to utilize analysis and present relevant data collected through the questionnaire used for this study. In this distribution of questionnaire 6% of the group of each respondent were administered with questionnaire. At collection about 91% returned their questionnaire. The following tables present the total number of questionnaire distributed and returned.

For the purpose of this analysis the various group of professionals and authorities will be group as follows

Group Professionals and authorities

- A Traders on food Commodities
- B Farmers
- C National population Commission
- D Anambra state rural and urban development authority
- E Anambra state Agricultural Development program
- F Civil Servants
- G Individuals
- H Current affairs, test books on Agric Science
- I Members of the public (Consumers)

Sources: Facilitators.

Table A: Total Number of Questionnaires Distributed and Returned by these Selected Groups of Professionals and Authority

Group	Total No of each group	Total No Questionnaire	Total No Returned	% No
A	20	20	5	90%
B	50	65	30	91%
C	40	25	15	91%
D	50	30	10	91%
E	50	35	20	90%
F	30	15	10	90%
G	30	10	5	91%
H	50	20	10	91%
I	40	15	5	90%
Total	360	125	110	

To determine the causes and spread of urbanization in Anambra state by using Likert scale of; strongly agree, Agree, disagree and strongly disagree. The following list items below administered to the respondents, with an option to tick on any of the above option.

Table B: Measuring the responses of respondents Opinion.

		SA	A	D	SD
A	Evolution of Agricultural technology and its Complex induced incentives	50	15	5	5
B	Regional development allocations	20	20	5	4
C	Poor planning and Implementation on the side of the governing authority	30	10	2	-
D	Migration of people to Urban Cities	40	10	3	2
E	Creation of states and Local governments	10	5	10	10
F	Sharing of already established assets by the newly created states, which	5	2	20	15
	Gave room to new developments as replacement.	155	52	45	37

The above Summary table shows a highest response of these, who voted on the Option as strongly Agree (SA) and Agree (A) with about 5.61% and 5.55% to the fact urbanization spread due to regional allocation development and more creation of states and local government areas, but that evolution of agricultural technology has been the major foundation which enhanced migration, but then, that lack of poor planning and implementation of existing polices caped it up.

This group, believe that the above reasons stated are the major causes of urbanization, which brought the problem to agricultural development in the state while the option from the others on Disagree (D) and SD strongly disagree are of low option with 0.06 and 0.08. They were of the option that evolution of agricultural technology has the incentives of creation easy and fast method of corvine at the needed results, but depends on the set mind of the people

towards directing their technological functions. The research wants to know the level of awareness of the general public and government on this topic under study.

Table C: Awareness Level of the Public and Government

AREA	SA	A	D	SD
A	59	52	-	-
B	60	58	-	-
C	58	60	-	-
D	61	59	-	-
E	50	54	-	-

The above question was asked to know the level of awareness of the presence of urbanization and its problems taking food and Agricultural development in Anambra State, her local government Areas and within the state capital metropolis. 100% responses by respondents show that the topic under study has an impact in the society. The awareness level is necessary for a guide attention to be given to the above problems in Anambra state.

The researcher wants to know the level of the people's participation towards food and Agricultural development among different groups under research data.

Table D: Level of Participates in Agriculture, Food Production and Developments

Area	Farmers	Civil Servant	Politicians	Traders	Artisans	Other related Technical workers
A	20	2	2	5	5	-
B	20	5	-	2	5	1
C	10	10	3	1	2	1
D	10	3	2	5	5	-
E	20	3	-	5	3	1
F	30	2	1	2	1	1
G	20	-	-	2	1	1
H	30	2	2	1	1	-
I	-	-	-	-	-	-
	160	27	10	21	23	5

The above summary table shows levels of participants. It indicates that among this group of workers 6.16% participants' fully agricultural occupation, while the least group has a very low percent of patronage with about 0.02%.

This indicates that among the working groups there is a relatively high rate of people participating in other occupation.

Comparing with the number of population of people of the state and their quest dwellers, very few has been left to work in farms for rest of such alarming number of consumers.

5. Testing of Hypothesis

To test this hypothesis table B which is the analysis of question of the causes and spread of urbanization in Anambra state using the pass method, we test as follows measuring the responses of respondent’s opinion.

Table E: Hypothesis Analysis of the Questionnaire

Group	Number of respondents		
SA/A	207	155 (75%)	52 (25%)
SD/D	82	45 (54%)	37 (46%)

Where

Ps1 = 75%

Ps2 = 54%

Qs1 = 25%

Qs2 = 46%

N1 = 207

N2 = 82

$$Z = \frac{Ps1 - ps2}{\sqrt{\frac{Ps1 \cdot qs1}{ni} + \frac{Ps2 \cdot qs2}{ni}}} = \frac{75 - 54}{\sqrt{\frac{75 \times 25}{207} + \frac{54 \times 46}{82}}}$$

$$= \frac{21}{\sqrt{\frac{1875}{207} + \frac{2484}{82}}}$$

$$= \frac{21}{\sqrt{9.057971 + 30.292683}}$$

$$\frac{21}{\sqrt{69.35}} = \frac{21}{8.3277} = 2.52$$

Calculated value = 2.52

Critical table value = 1.96

Decision 1.96 < 2.52 Reject 52

6. Discussion of Findings

The discussions of findings were based on the observations, analysis and questionnaires results developed during the process of the research. Anambra state were urbanization following the sequence of major development before the State was created, which gave room to the spread of Urbanization today. These includes regionalization, agricultural technologies and its complex induced incentives, poor economic development planning, migration of people, creation of states and local government areas. These factors have different ways of spreading urbanization in the environment of the states, towns, communities and villages as well as the metropolis of the capital city.

A. Anambra as a State in Nigeria

These are the major route of urbanization, in Anambra prior to accommodation of environmental development factor, which were not only meant for the growth of the capital state and its indigenous citizens as in this case study. Anambra state, being the part of the east central states, then were overtaken by the regional development of infrastructure, and other development activities, which attracted a high number of population of people of diverse interest and culture and believe who came in and established in different areas of their own interest.

B. Migration

Migration of people from different areas of their locality to the state are however the main backbone of urbanization, why because these people are the major contributor to work force, which create some activities that attracts different interest group from other parts of the state to join as quest dwellers, thereby generating population rate in the state.

C. Creation of States and Local Government Areas.

Creation of additional states followed by creation of local government council, this gave to the sharing of assets, that affected the already built or designed plans toward sustenance of early developments on ground following this division of assets, the new and young state like Anambra continued on yet more development program, which has to replace the ones that have been parted to other sister states, and owing to accumulation of development infrastructure already in place, it went ahead to spread to towns, communities and village, so as to put more instruments on ground and through these ventures urbanization centuries.

7. Findings

The followings are the findings of this study, they are:

- a. Urbanization affects agricultural farming to a large extent towards development of infrastructures.
- b. Green emission is totally absent from the urbanized areas because of deforestation of lands for building infrastructural edifices.
- c. Nature has totally changed because of development and deforestation the bush animals are totally chased away to another place hence bridging the gap between man and nature.

References

- [1] "Urbanization". MeSH browser. National Library of Medicine. Retrieved 5 November 2014. The process whereby a society changes from a rural to an urban way of life. It refers also to the gradual increase in the proportion of people living in urban areas.
- [2] "Urbanization in 2013". Demographic partitions. Retrieved 8 July 2015.
- [3] "UN says half the world's population will live in urban areas by end of 2008". International Herald Tribune. Associated Press. 26 February 2008. Archived from the original on 9 February 2009.
- [4] "Urban life: Open-air computers". The Economist. 27 October 2012. Retrieved 20 March 2013.
- [5] Angel S., Sheppard S. C., Civco D. L., Buckley R., Chabaeva A., Gitlin L., Kraley A., Parent J., Perlin M. 2005 The dynamics of global urban expansion. Washington, DC: World Bank.
- [6] Bairoch P. 1988 Cities and economic development. London, UK: Mansell.
- [7] Balk D., McGranahan G., Anderson B. 2008 Urbanisation and ecosystems: current patterns and future implications. In The new global frontier: urbanisation, poverty and environment in the 21st century (ed. Martine G. et al.), pp. 183–201. London, UK: Earthscan.
- [8] Bentinck J. 2000 Unruly urbanization on Delhi's fringe: changing patterns of land use and livelihood. Utrecht/Groningen: The Netherlands Geographical Studies.
- [9] Cassman K. G., et al. 2005 Cultivated systems. In Ecosystems and human well-being: current status and trends (eds Hassan R., Scholes R., Ash N.), pp. 745–794. Washington, DC: Island Press.
- [10] Clark P. 2009 European cities and towns 400–2000. Oxford, UK: Oxford University Press.
- [11] Hardoy J. E., Mitlin D., Satterthwaite D. 2001 Environmental problems in an urbanizing world. London, UK: Earthscan.
- [12] Hasan A. 2006 The scale and causes of urban change in Pakistan. Karachi, Pakistan: Ushba Publishing International.
- [13] Rees W. E. 1992 Ecological footprints and appropriated carrying capacity. Environ. Urban. 4, 121–130. (doi:10.1177/095624789200400212)

- [14] Schneider A., Friedl M. A., Potere D. 2009 A new map of global urban extent from MODIS satellite data. *Environ. Res. Lett.* 4, 044003. (doi:10.1088/1748-9326/4/4/044003)
- [15] United Nations. 2008 World urbanization prospects: the 2007 revision, CD-ROM edition. New York, NY: United Nations Department of Economic and Social Affairs, Population Division.