

Urbanization Impact of Higher Educational *and Research Institutions on Rural Settlements Development in Ukraine*

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Abstract

The article discusses urbanization of towns and the impact of higher educational and research institutions on their development from their roots as local rural settlements. The urbanization effect is analyzed here with settlement examples from Ukraine's Lviv region (Dubliany, Obroshyne, Zymna Voda, Hriada) and Kher-son region (Askania-Nova). The construction of roads, residential buildings, cul- tural and service centers are considered here within the problems of urbanization. A particular attention is paid to the housing system of blocks of flats. This type of housing system foresees the settling a certain group of people in a rural locality who prefers an urban way of life. This article examines the trends of such settle- ments and their functioning, ways of community development, organization of public services, and utilities for residents, etc.

Keywords: *Higher Education, Research Institutions, Rural Settlements, Block of Flats, Town Planning Factor, Urbanization Impact, Architectural Complex*

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Introduction

According to official statistics the total global population now is over 7 billion people. The Fund of the Department of Economic and Social Information of the UN prognoses that in 2050 the population of the world will reach 9.1 billion (New York, UNFPA, 2011). About 75% of all people will be concentrated in cities. But large cities can not always satisfy all needs of a growing population. Overcrowded cities cause serious problems both with the natural environment and in society (spontaneous illegal settlements in the form of urban slums, transport overloads, mental health issues; social conflicts etc.)

One of the ways of solving this problem is through a foundation of town satellites. Similar to an university's impact on higher educational and research institutions where (campuses and rural settlements with academic centers) may get their distinguishing features. This can be different from the typical characteristics of urbanified suburban zones. Universities and various research institutions provide (relocate) local people (experts in certain scientific branches) to come from other localities to conduct their scientific activities and to live there. All these factors cause modifications in the social structure of settlements, resident's manners and customs, and local architecture/urban planning etc.

Higher educational and research institutions themselves are able to influence the architecture of local rural settlements by means of their research developments, public hearings, scientific publications etc. The settlement's public community may be formulated and developed under the guidance/protection of the school of higher learning or research institute situated in the given locality. Such an integrated community has a serious ability and responsibility in modifying and molding its transition to urban life.

Review of the Literature

The problem of planning university towns (campuses) and settlements with academic centers is rather popular in urbanistic philosophy, town planning and developments of agglomerations and architecture spaces.

A distinguishing feature of planning Ukrainian schools of higher education and research institutes is their orientation to real conditions and features of a specific town and the principles of regional systems in town planning in the Ukraine. One should also take into consideration the specific character of agglomeration forms of settlements because they greatly influence suburban zones. Agglomeration forms were in the focus of attention of many scholars: Yu. Blokhin, A. Dotsenko, M. Diomin, M. Kushnirenko, V. Nubelman, Yu. Pitiurenko, A. Stepanenko, H. Filvarov, I. Fomin, I. Roduchkin, Yu. Kliushnichenko, V. Timokhin, A. Rudnytskyi, B. Posatskyi, I. Rusanova, I. Borshosh and others. We should also mention here H. Kovalska, the author of a manual for planning university towns.

Nevertheless, the problem of the urbanization effects by higher educational and research institutions on local rural settlements is beyond these scholars' attention and, thus, it needs further discussion both in scientific publications and in public hearings.

Our research is aimed at the analysis of the impact of higher educational and research institutions on the urbanization of local settlements and their evolution from a primitive village to modern villages and towns.

Research Objectives

- To determine and discuss the factors causing urbanization impact on local rural settlements with higher educational and research institutions
- To examine the stages of town planning and settling transformations under the impact of extraordinary administrative and socially-economic modifications of the institution – including the settlements structure (examples of town and rural settlements)
- To analyze the elements of urbanization impact of higher educational and research institutions on the life in the local settlements (peoples well-being and way of living, cultural and service centers functioning)
- To determine current challenges causes by the formulation of fresh architectural and town planning decisions during the period of new social transformations in the country
- To discuss the experience of university towns in foreign countries with examples

Main Presentation

Higher educational and research institutions are usually situated either in large cities or in their peripheries. Their location in the center of the city causes serious territorial and resource restrictions for them. Therefore, such institutions in combination with their residential districts are frequently located a short distance from large cities. L'viv has several higher educational and research centers situated in its suburban areas. We shall focus on the group of them:

- village Hriada with the Branch of the Institute of Breeding and Genetics of Domestic Animals
- village Zymna Voda with Research Plant of Non-Standard Equipment
- village of an urban type Obroshyne with Research Institute of Agriculture of Carpathian Area
- town Dubliany with L'viv National Agrarian University

In our research we also used materials covering the village Askania-Nova with its Research Institute of Animal Husbandry of Steppen Area “Askania-Nova” named after M. F. Ivanov. The data on this research institute and the local village neighboring it were used to formulate some distinguishing features of the L'viv region settlements with the analogous settlement in Southern Ukraine on the basis of both historical and climatic characteristics.

Every settlement chosen by us for discussion was subjected to different urbanization impact in spite of their many existing common features. According to our determined level of urbanization impact, the settlements are vary in the range of discussion.

Hriada

The village of Hriada, Zhovkva district, L'viv region has quite a few public research centers: L'viv branch of the Research Institute of Breeding and Genetics of Domestic Animals; research farm "Hrida" of the Research Institute of Farming and Biology of Domestic Animals and Zhovkva Biotechnological Centre. The village also has a private research institution "Zakhidplemresursy" (Western Pedigree Resources) Ltd. Nevertheless, the local village does not have any serious impact of urbanization from so many research institutions. There are only two four-storied blocks of flats. One of them is modernized, another one looks rather outdated and gloomy. One can arrive at the conclusion that the research institutions function without any influence on the local village. And the village itself lives in isolation from both the district's network of roads (being located a long distance from it) and any associated urbanization processes. In summary, the presence of research facilities did not have much urbanization effect.

Zymna Voda

The village Zymna Voda, Pustomyty district, L'viv region is one of the largest villages in Ukraine (it is second after Kostiantynivka, in the Zaporizhzhia region). Currently its population is about 11,000 with its dwellers being mostly farmers (3.5 farmsteads in the village). In 1965 the village hosted the L'viv Experimentally-Research Plant of Non-Standard Equipment. This plant has the status of a closed joint-stock company and initiated the construction of the very first urbanized blocks of flats for its workers and managers. However, the urbanization processes here has not stopped. The village has witnessed the ongoing construction of new streets and districts of modern comfortable blocks of flats. Moreover the residential functions of these new buildings are frequently combined with socially-economic ones, whereby the ground and first floors are often occupied by business offices and other institutions. A case in point is the "Soniachnyi Krai" (Sun Homeland) block. For the settlement new businesses and service enterprises mean additional working positions for its residents and improved standards of living. New enterprises in combination with a research and production company producing non-standard or specialized equipment are not only a sufficient source of job creation, but can also be a powerful industrial or research complex able to dictate regulations and principles affecting the quality of life in the settlement. This village continues to grow, develop and improve due primarily to its favorable location economic stability and quality of life.

Obroshyne

The village of Obroshyne, Pustomyty district, L'viv region had the L'viv Research Station of Farming established there in 1945 mostly due to the location of the Palace of Bishops (architect J. Fontana) there within the residential complex of Ferdunandivka. The main purposes of the research station are the selection and seed production of grains, agro-machinery and chemistry, fodder-production, vegetable-growing, plant-protection, animal-husbandry, economy and farm production management. The research institute has been in a state of constant expansion. The present-day complex is comprised of many newer administrative and research buildings. These new buildings have not only diversified the plan of the village, but

also caused its gradual urbanization. In the most recent period, a whole district of flat blocks were accompanied by the construction of a number of new public institutions in the village. Currently the village continues to grow and at its boundary a new cottage town named AMBER neighbors it with traditional houses of the 1970s, diversifying and adorning it with fresh colors and trends. The influence of research facility expansion has been paired with flat block development.

Askania-Nova

“Askania-Nova” is an extra-ordinary, in many ways. It is an exotic research center of the same-named natural reserve in Kherson region. The village is home to the research institute, Askania-Nova and is situated 150 km from the regional center and 80 km from the nearest railway station Novooleksiivka. In 1828 this part of Southern Ukraine a German colony specializing in sheep raising was founded. Then in 1841 F. F. the duke Angalt-Keten-Pletskyi, the offspring of German colonists founded the Askania natural reserve which was named after his Askania estate in Germany (Hankevych, 2008). “Askania-Nova” is one of the seven Wonders of Ukraine with 30,000 hectares of area including a zoo and a dendropark. The village’s panorama of 1847 (the year of foundation of the Natural Reserve) (Fig. 1) contains the estate of the dukes and their mill which can be easily distinguished in the group of other objects.



Figure. 1 Panorama of the Askania-Nova village, 1841 (G. Bohme, 1850).

The population of Askania-Nova is 3,000. The village has a station of pedigree cattle with other livestock (sheep & pigs), an Ukrainian Research Institute of Animal Husbandry of Steppen Areas “Askania-Nova” named after M. F. Ivanov and a National Scientific Selective and Genetic Center of Sheep Raising. This institution’s history began in 1909 with a special physiological department for sheep-raising. The next year this institution grew into zoo technical station with its profile supported by the deep-rooted sheep-raising traditions of its local people from Germany.

In spite of its rather small population, its infrastructure is rich – comprising a hospital, school, kindergarten, a number of shops, etc. Many residents work in the various departments of the above research institution and usually live in the blocks of flats as joined to the separate districts. Silhouettes of these buildings can be distinctly seen from the windows of research stations (Fig. 2).

A characteristic feature of the residential districts of Askania-Nova (as, probably, in the majority of Southern regions of Ukraine in comparison with Western ones)

is the plantations of gardens, various bushes and flowers on the areas neighboring the blocks of flats to create separation and shadows.



Figure 2. View of the block of flats from the zoo (Askania-Nova, Kherson region).

Dubliany

A vivid example of a campus-satellite is town Dubliany located 8 km from L'viv. Presently it is a modern town with a population of 11,000. The town plan of Dubliany is organized with the L'viv National Agrarian University as its town-forming unit which influences the development of the settlement – initiating its evolution from the former village to a modern town. As a rural settlement, Dubliany was mentioned for a first time in 1440 in the Central State Historical Archive of Ukraine (Lviv, fund 146, description 53, right 710, sheet 44 appeals), though this fact of its history was not confirmed by recent cartographical documents. Dubliany, apparently, used to be a small-sized settlement located along the river coast by the oak forest. Thus, its name has the root “dub” that means oak in Ukrainian.

In our analysis of evolution of Dubliany from a primitive rural settlement to a modern town we determined there was five stages pre-Austrian, Austrian, Austrian-Polish, Soviet and Modern (Fig. 3). The first stage development is according to archive documents and maps of 1783. The map of Dubliany at that time characterizes it as a small-sized settlement with households. The village had a landlord estate, a church, four water pools and a mill. The settlement was crossed with a dense network of local roads with some of them lined with planted with trees.

Though the map of Fridrig fon Mih was used mostly in the Austrian period, it became a basic instrument guiding the reconstruction of territories. This pre-Austrian document – map provides the opportunity to get an idea of the earlier topography.

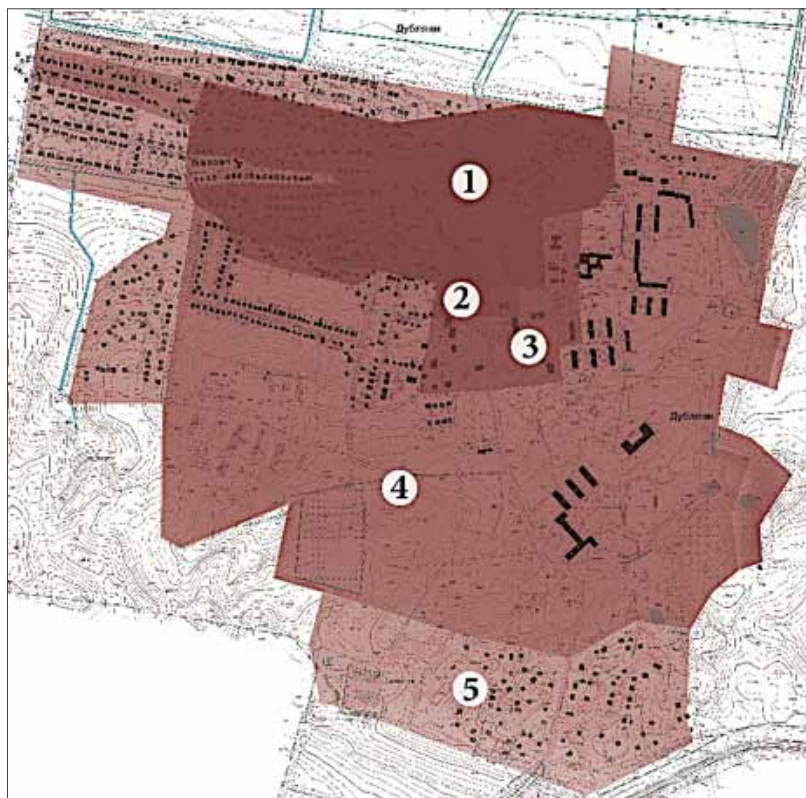


Figure 3. Town-building stages of Dubliany development: 1. Before the Austrian, 2. Austrian, 3. Austrian-Polish, 4. Soviet, 5. Independence period.

Though Austrian power was officially established in 1772 in Galicia, the start of Austrian period of construction in Dubliany is usually considered beginning from 1856 as it is the year of foundation of Dubliany agricultural school (the institution which proved to become the crucial factor of settlement's further planning, reconstruction and its evolution from a primitive village into a town).

The opening of an agricultural school in Dubliany was dictated by the global trend of formulating agrarian science in all developed countries (Schneider, 1922). In its early period, the Dubliany agricultural school had the status of a secondary professional specialized school (An institution with some features of higher education). The first buildings of the school were sheltered in the former structures of the landlord's estate. Therefore this new teaching center naturally needed qualified experts, new buildings, arable lands, etc. it became quite evident that one had to start constructing new buildings for the agricultural school.

The first stage of construction resulted in erecting two teaching structures (Fig. 4). The school's areas and buildings at that time were very limited. They were located far from the village's public center. Simultaneously, construction of other additional special teaching and research buildings began.

The new agricultural school in Dubliany also modified the structure of the village's population with the appearance of a new social/population group – the students of this agricultural school and their lecturers.



Figure 4. A map of Dubliany 1876, (Fund of the Lviv National Scientific Library of Ukraine named after Vasyl Stefanyk, 1876).

The first dwellings for teachers and their families were in the former landlord's building. The students rented rooms in the houses of local residents (Tokarskyi, 1996:77).

The third period of Dubliany's development as mentioned previously was, Austrian-Polish, after 1876, when the Austrian-Hungarian ministry of agriculture designated the Dubliany agricultural school it higher status as not only an educational institution, but also a research one.

At that time, the school had its own network of laboratories, experimental fields, research stations (seed-control, meteorological, botanically-agricultural, technical) and a botanical park. All of these above mentioned research structures considerably extended its territorial limits of both the agricultural school itself and the settlement of Dubliany. Dubliany's population saw an increase of 2.6 times (from 300 to 800 persons).

The architectural complex of an agricultural school from that period had areas for teaching, chemical buildings, fields, stations as well as a machinery block. The school expanded in both in both a Southern and an Easterly direction along the roads leading by its fields (Tokarskyi, 1996:236). Its architectural complex developed in a diversity of styles in a harmony with local environment (Fig. 5). The developer used a the town-planning module based on about 30 meters.

The intensive construction of the teaching complex in Dubliany was accompanied by a functional local brick yard which produced bricks for domestic needs of the settlement and construction of structures for the agricultural school. This period was also marked by the construction of a Latin cathedral and a number of new residential buildings for lecturers.



Figure 5. Panorama of L'viv agricultural in Dubliany. Photo of 1935.

A vital factor in the formation of town-planning structure of Dubliany was laying the of a new road in 1887-1888. This road gave the opportunity to connect the teaching buildings of school with another road leading to L'viv and with the railway station "Dubliany-Liashky." The traditional road connecting Dubliany with neighboring Malekhiv, therefore, lost its importance and it was used only occasionally by local people for making their way to an Ukrainian church in Malekhiv.

In 1901 the Dubliany agricultural school was granted the status of an academy and this induced further development of the village. Simultaneously, Dubliany completed its first students' hostel constructed in accordance with European standards (architect Yu. Tsibulski).

Consequently the village population increased dramatically to 1400 by 1935 and the number of students of the academy was 460. More and more households were erected along Dubliany roads in the Eastern and Western parts of the village while the Northern part saw the establishment of a Greek Catholic Ukrainian Church.

The Soviet stage of Dubliany's development marked the beginning of a radically new period of construction of an considerably larger scale and pace. The first structure of the post-war rebuilding was a students' hostel (now reconstructed into a block of flats).

In the 1950-1970s Dubliany witnessed another period of intensive construction of new teaching buildings and hostels. These buildings erected in the style of Soviet Functionalism presented new architectural features and trends (Fig. 6). In some respects, the Soviet manner of construction challenged and contrasted with the traditional architecture of Dubliany. The establishment and arrangement of teaching buildings in the rising areas was reluctantly accepted by experts as this architectural approach was motivated by the ideology of the period.



Figure 6. View of Dubliany architecture in the period of Soviet construction of teaching buildings, hostels and a district of blocks of flats.

In the 1960-1970s non-occupied areas neighboring the students' campus were taken for new residential districts following the module planning approach. A large group of the institute lecturers received flats and became Dubliany residents. All these factors provoked another stage of Dubliany's development and its receiving the status of a town in 1978.

During the Soviet period, Dubliany's population increased almost 4 times (from 2500 to 9000 people) and its infrastructure extended considerably. Dubliany established a kindergarten, a new secondary school and a block of services.

Dubliany also extended its one-family households which began to appear in the periphery of the Eastern, Western and Southern parts of Dubliany. The Northern part of the town was somewhat restricted in construction because of the presence of peat soils there. The Northern areas of Dubliany are currently pastures and private farmsteads.

Considerable areas of Dubliany are occupied by research fields of the university. Additionally, the residents of Dubliany frequently arrange their vegetable gardens close to them as urban blocks of flats with all their utilities are not able to completely satisfy the needs of its inhabitants.

In the early years of Ukrainian state independence Dubliany's development was not marked by any serious construction. The Dubliany area stayed within its traditional borders. Then from 1990-2000s when the number of students decreased one of the students' hostels was modified into a 12-story residential building for

lecturers and workers of the university. Unfortunately at any given moment, not all agrarian students can be provided with a private dwelling where one-family building is for 8 - 15 people. Such type of arrangements are rather wide spread with Dubliany being popular.

The town of Dubliany continues to develop and grow due primarily to its close proximity to L'viv, its healthy ecology and favorable transport connections. Generally, to live in Dubliany is a prestigious one for agrarian university students who look for jobs in L'viv and the very residents of L'viv aimed at comfortable modern flats or individual houses.

This agrarian university has its own church of which locals also visit. Currently Dubliany is a modern town with its historical nucleolus (the teaching buildings of L'viv National Agrarian University). The university's buildings and structures have already become architectural monuments from different epochs.

The university students comprise 75% of Dubliany's population (11,000 people). The total number of the students at a current moment is about 9,000 persons.

The structure of the town's employment is rather diversified. In the districts of traditional farmsteads the Dubliany residents work is related to agriculture. Some residents are statesmen and others are involved in private businesses, but the prevailing majority of Dubliany residents are university employees.

At the beginning of the 21st century there may start a new sixth stage in Dubliany's development closely connected to Ukraine's integration into the European community. For an agrarian university this will likely mean uniting with other universities into a single unifying structure. Such unification will stimulate progress in the quantitative and qualitative picture of this higher educational institution functioning (increases in the student population, higher quality lecturers along with improved studying and work conditions and supportive services). These changes may change both the urban planning and architectural decisions related to new instructional facilities, research laboratories, hostels etc. The first stage of designing teaching and research centers will naturally lead to modification and reconstruction of the existing university ensemble.

An analogous situation connected with the formation of university towns in Europe, say in Great Britain and France of the 1980-1990s. The main element of such towns is a scientific/technical center. For example, in Great Britain quite a number of small towns maybe formed into research districts. The most popular district there became the so-called M4 Corridor (an area to the West of London-Bristol). This corridor with a length of 120 km and a width of 50-60 km is intensively impacted by scientific and research investments made under a set of prearranged conditions. The attractiveness of this "corridor" can be augmented by a well-developed network of high-speed transport (highways and railways connecting this corridor with the most important British airport Hethrow) as well as its close proximity to London and Oxford (Borshosh, 2009, 139-147).

The same principles are maintained in planning the scientific town (Cité Scientifique) in the area South-West of Paris. This town spatially is a historical collection of small towns and rural settlements. In total, it embraces over 90 settlements with 1350 inhabitants. In the 1980s the population there increased in 25%. Its transport infrastructure is comprised of a dense network of roads connected by two national highways, a high-speed railway line and the d'Orly international airport. This scientific town unites the most important French higher educational potential with seven research and industrial technological centers, two universities and the so-called "great" schools (Higher agro-industrial school, Polytechnic school, Higher School of Electrical Machinery). These institutions train engineers for industry. Twenty thousand young people enter them annually. Cité Scientifique is also home to some international companies. Nevertheless, 70% of them are on small land plots of less than 700m² for production needs and 300m² for administrative premises (Borshosh, 2009:139-147).

Conclusion

Having discussed the current state of Ukraine we can arrive at the conclusion that the financing higher educational institution becomes more and more problematic in our country. The experience of our foreign colleges prompts that scientific developments should be more actively advertised to find potential investors for university towns and evolution of universities. One must involve production opportunities into the investment of science and machinery through profile universities, the founding of centers of development and implement these developments in real life.

In conclusion, one may state that the basic town planning factors of Ukraine settlements are influenced by their higher educational and research institutions which proved to be a vital component for developing the economic and social potential of the country, though currently deprived of proper attention by the authorities. Modifications in the structure of production and the decreases in state investments into the build up of infrastructure demand rectifying actions of our state and authorities aimed at achieving successful development of rural settlements and small towns.

References

- Bohme G. LHASA, DE, Abt. Kothen, A 15b Nr.33Bl.11, 1850. <https://commons.wikimedia.org/wiki/File:AskaniaNova02.png> (accessed November 10, 2017).
- Borshosh, Ivan. *The Development Features of Small Cities: Foreign Experience*. Kharkiv: State Building, 2009.
- Center for Urban History of East Central Europe. "Lemberg Leopold Lovov Map of Lviv and the Suburbs of 1783." ND http://www.lvivcenter.org/en/umd/map/?ci_mapid=102 (accessed Nov. 20, 2017).
- Hankevich, Victor. Zadereychuk Alla. "History About the Sale Process of the Anhalt Colonies to F. I. Fein (Dedicated to the 180th Anniversary of the Foundation of the Askania-Nova Colony)." *Scientific Bulletin of the Chernihiv State Pedagogical University named after T. Shevchenko*. No. 52. 2008, 137-140.

Schneider, Bladimir. *Dissemination of Lower Agricultural School Through Educational Institutions and Extracurricular Way in Germany, France, Italy, Belgium and Russia*. St. Petersburg: Publishing house A. F. Devreen, 1911:142.

Tokarskyi Yuriy. *Dubliany: The History of Agrarian Studies of the Years 1856-1946*. Edited by Semkovich Alexander. Lviv: Ivan Krypiakevych Institute of Ukrainian Studies named after the National Academy of Sciences of Ukraine, 1996:384.

Ukraine Gov. Map of "Lemberg" Zone 6 circle. XXX - Fund of the Lviv National Scientific Library of Ukraine named after Vasyl Stefanyk. - QC 1655 \ 44, - 1876.

Ukraine Gov. Central State Historical Archive of Ukraine in Lviv, fund 146, description 53, right 710, sheet 44 appeals.

Ukraine Gov. Central State Historical Archive of Ukraine in Lviv, Fund 9, description 1, right 1, sheet 6.

Ukrainian Research Institute of Animal Husbandry of Steppen Areas. "Askania Nova". "Stages of Development." N.D. http://ascaniansc.in.ua/index.php?option=com_content&view=article&id=31&Itemid=77 (accessed Nov. 20, 2017).

United Nations Population Fund. *The World Population of the 2011. Report of the Department of Information and External Views of the UN Fund*. New York: UNFPA, 2011.132c.

