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# Relations between Urbanization and Industrialization in Hunedoara Municipality

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## ABSTRACT

Urbanization, as an effect of forced industrialization during socialism, characterizes industrial cities in Romania, most of them evolving through the industrial activities that gave a certain structure and function, which also determined an urban crisis as a result of the industry restructure, and redefining the role that industry have had in the national economy during transition. Hunedoara city, a mono-industrial city by excellence, evolved a little bit different from most of the country's industrial cities, meaning that, when the urban systematization process began, this city had already a certain industrial tradition and a high urban development. Therefore, we can correlate the evolution of the industrial platform with the gradually urban growth. "The explosion" in Hunedoara, between 1956 and 1977, dictated the actual model of functional and spatial organization, during these times the population had a growth rate of 116.2%, and the built space expanded 60%. Even today, industry, through restructuring, dictates a new process for reorganization of the urban space, geo-demographical and social movement. This article analyses those processes determined by industry both in socialist systematization period and the restructure period after 1990.

## 1. INTRODUCTION

Industry, through the industrial process is capable to organize the geographic space using a series of other processes: orienting the feeds for the raw material, labour force and finished products, the appearance of some polarizing centres, but also new peripheries.

Hunedoara can be considered the most typical industrial city that developed as a result of the accelerated evolution of iron metallurgy becoming the biggest steel-city in the country, over 80% of its population activating in the industrial branch. The city of Hunedoara had the advantage of position potential, state policy and the polarizing role that was held in the urban network. The geographical components affected by industrialization in this perimeter, as a result of their interaction, is shown through the analysis of each "wave of industrialization" [1], that gave a certain functional and special model for the urban organism.

Hunedoara inhabitants' perception, regarding the state and evolution of the industrial site, is important because "industrial restructure isn't just an economic transformation but also a cultural one" [2], and the actual and future way for constructions utility, can take multiple forms so it would be in the advantage of urban regeneration.

## 2. THEORY AND METHODOLOGY

This material wants to analyse the industrialization-urbanization process based on the effects of those processes over the urban space. It is tried to identify, quantify and highlight the city's transformation in its dynamics by analyzing the available data (both historical and statistical) but also through a vast field research. The analysing scale for this study starts from the whole city all the way to detailed structures (e.g. industrial platform) which give important data concerning the entire urban organism.

### 3. INDUSTRIALIZATION AND URBAN EVOLUTION

The modern era of metallurgy in Hunedoara, started with building the first furnace in 1884 in the south-western part of the actual city on the left side of Cerna River. The strategic position comes from two aspects: being near the raw material of iron ore from Ghelari and Teliuc and being situated close to a water stream which grows accessibility and offers the water supplies required for the industrial process. Between 1884 and 1912 there are built other four furnaces for obtaining cast iron. This period marked *the localization step of metallurgic industry in the city of Hunedoara*.

War World I period, is characterized by a stagnation of the industrial evolution in Hunedoara, the reason for this, being found in those times problems and the limited possibilities for investments. As a direct consequence of the war, the reduction of cast iron production is registered, from about 74.000 tonnes to 24,000 tonnes per year. This stagnation had effects over the other components of the urban space, aspects which are going to be analyzed in the next rows.

During the interwar period, the *consolidation of industry in Hunedoara* happened as a result of qualitative development. This explains the rhythm, sustained during the “great crisis” 1923-193, when the city of Hunedoara became a national important steel

centre, with a complex production cycle from iron ore, iron cast, steel and mouldings to high-technical finished products. In 1938, Hunedoara Plants and Călan owned 61.3% of the productions capacity for iron cast from the entire country.

*The industry dispersion stage* in Hunedoara begins after 1940 when a series of cities start to develop their industrial function.

Therefore, two industrial zones appear: the carboniferous in the south and steel-metallurgy in the central part. In 1970 in Hunedoara County were active over 100,000 employees and 80,000 workers a lot more than in 1955 when there were 65,000 employees and 55,000 workers [4]. There are also given for usage, over 8 production units in Hunedoara and over 10 in the county's space.

Until 1990 the city's industry keeps growing, irreversibly, changing the urban space. The industrial plants expand along the Cerna River and the main communication artery for about 6-7 km long.

Based on the principal that “industry generates industry”, other types of industry arise, especially, to absorb female labour force.

A knitwear factory is opened in 1976 and a shoe factory in 1979. Together they had over 2000 employees, mostly women. However the city remains in the gigantic industrial sphere, which proves to be very dangerous for the restructure process.

Table 1. Correlation between industrial dynamics – urban dynamics.

Stages	G.r.* (%)	Industrial dynamics	Urban dynamics
1882-1912	55.5	4 furnaces for obtaining cast iron	The expansion of the old neighbourhood
1912-1920	-7.9	The cast iron decreases	Stagnation
1940-1956	526.1	The construction of the first agglomeration Over 3000 employees	The construction of Buituri, O.T and O.M. neighbourhoods
1956-1977	111.1	The Siemens-Martin Steel-Work number 1 The Pitch factory	Micro (III, IV, V and VI)
1977-1992	-12.2	Modern production units The Siemens –Martin Steel-Work number 2 After 1990 Siemens-Martin number 1 is closed.	Micro VII neighbourhood
1992-2012	-19.4%	Gradually closing factories Only the continuous casting and a few section still work, but their production is just for export	The suburban villages (Răcăştie, Peştişu Mare, Groş, Boş) are integrated as neighbourhoods.

\*demographical growth rate

Data source: *The Development Plan of Hunedoara Municipality*

After 1990 starting with the industry restructure process and suburbanization in Romania, the industry in Hunedoara starts to toss. The main cause is found in the change of the political regime, but this process could not be avoided in an era where services and informatics take control. We can now talk about *industry mobility*, “which determines the industrial hierarchy to change at higher levels and also new types of spatial organization” [3]. Gradually, Deva takes over the function as a polarizing centre, being a city of services, with a capacity to adapt the changes brought by the transition period.

After 1992, the demand for steel was reduced drastically, so this can be considered the starting point of the economic and social regression in Hunedoara. A series of discharges between 1993 and 2003 mark a period with massive waves of layoffs, industry having a 27% of the working populations in 1992 and a 19.8% in 2003.

In 2006 *the new industrial park* is being built. Its surface is about 19.3 ha and is composed by 15-20 firms. It has complex utilities for any kind of investment, primarily, in industry: electricity, drinking water, gas, sewage, cable, parking lots, and the terrain is ready for another industrial constructions. Nowadays only the continuous casting and a few other sections are still working, exclusively for export, but considering the times, those are also supposed to be shut down shortly.

### 3.1. Industry and the evolution of the population

Demographic growth of the cities was a result of the industrialization. As mentioned before, the growth of production units required a new labour force, which also required fundamental needs such as those for living. It is closely correlated with the population’s evolution, urban growth, urban network extension and spatial and functional remodelling.

Until World War I, a large number of people from the nearby rural area became residents and workers in Hunedoara. Therefore, it can be noted as a *passing from rural to urban*. It is also registered the population’s growth rate of 55% during 1882-1912, Hunedoara residents being concentrated in the south-western part.

Industrial development stagnation from World War I, is very well shown by the populations dynamics which had also a growth rate of -7.9%. Most probably the deduction of population was caused by the movements in those times.

The next significant period for the demographic evolution of the industrial giant, is between 1948 and 1956 when the so called “explosion in Hunedoara” takes place, this stage of building new production units was in the same time as the demographic explosion and urban expansion.

Expanding production units required new labour force which couldn’t be sustained only by the population in the rural areas nearby. Therefore, the unprecedented demographic growth was determined by a series of processes as in most industrial cities in Romania.: population movement from rural to urban from all over the county, the inclusion of some villages in the urban space and their declaration as neighbourhoods (Buituri 1941), high natural growth, the movement of the population from poor areas (like Moldova – Ceangăi Neighbourhood). The first demographic explosion took place in 1956 when Hunedoara had 37,719 inhabitants opposed to 7018 inhabitants in 1950 so, population grew 6 times and had a growth rate of 437.4% between 1950 and 1956. The second wave for demographic growth determined a new dubbing for the number of inhabitants reaching in 1977 a number of 79,630 citizens with a growth rate of 111.1% during 1956-1977. Between the years 1977-1992, the population drops with -12.2% and between 1992 and 2012 with -19.4%. In both cases, the main cause was the industrial restructure after 1990.

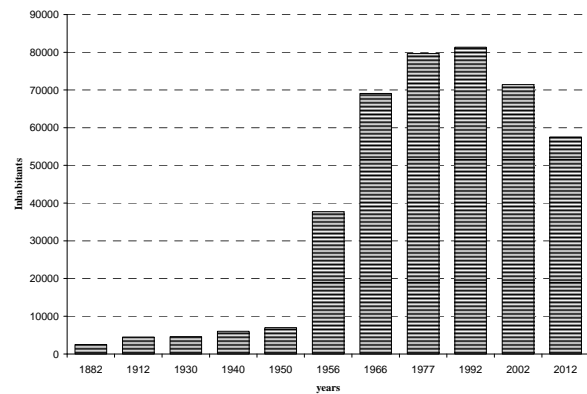


Fig. 1. Demographic evolution of Hunedoara municipality between 1882 and 2012.

Depending on the demographic growth, the number of employees in industrial sector grows from 3,262 people in 1965 to approximately 18,000 in 1973 and to 22,000 in 1992.

After 1992 the discharging starts again, which led to a series of geo-demographical and social movements. The first process is *the change of weighting for different economic branches*. If until 1989 the industry represented over 80% of the economic activities structure, in 1992 this drops until 27%, and in 2002 to 20.1%. In 2003 over 5,000 employees are fired this also being the most aggressive wave of layoffs.

The descendent evolution of the population in Hunedoara after 1990 was caused, on one hand by a negative natural growth but also by the negative migration balance determined by the movement of the urban population to the nearby villages or other cities not affected by the restructure. Also a large number of

citizens left for other European countries hoping to find a job.

Both in 1992 and in 2002, the natural growth value was below 0 but with a slight recovery in 2010. So in 1992, the natural growth had values of -2.5‰ and -2.3‰ in 2002 and 0.9‰ in 2010. The main cause for the positive natural growth is a lower mortality rate and a higher birth rate. As a first consequence for this demographical situation is the age groups structure degradation, emphasising demographical aging process. When we refer to the aging population, we talk about a long process which modifies the age groups structure, in favour of old people, in parallel with the deduction of young and adult people, and it's a phenomenon with deep social and economic implications. As mentioned above Hunedoara municipality confronts with such an obvious process.

If in the year 1992 the young population's group (0-19 had 28.4% it dropped to 19.5% in 2010, with only 0.2% higher than the percentage for the adult population's group. Even though this aging group hadn't registered significant changes over two decades, we can notice that the aging group structure is determined by the growth of old people from 9.6% in 2002 to 19.3% in 2010. This is the result of the fact that those people capable of working grew old and were not replaced by the young generation anymore. Maintaining this rhythm the adult population won't be able to sustain the economic process. Starting with 1992 young people knew a descendent evolution which seems to be aggravating: 28.4% in 1992, 26.6% in 2002 and 19.5% in 2010. Imbalances in the geo-demographical structure, for the analysed urban system are given by gender structure which reveals an accentuated feminization between 1992 and 2002 with a slight recovery in 2010. So in 1992, women had 52.8% from total population, this situation being considered problematic, because differences higher than 2% between genders are a geo-demographical risk factor. In 1992, the feminine share in the population structure grows to 56.3% which can be explained by the migration of men outside the city for finding a job, the economic restructuring process affecting mostly heavy industry. In 2010, the difference in gender share is improved with 3.4%, but this value is still considered to be a risk for the demographical process.

All this structure modification both in aging groups and gender, are caused by the territorial context and socio-economic conditions. Closing up the steel platform brought along a series of consequences over the demographical system. The lack of jobs led to high criminal rate and a significant deduction of the population as a result of the emigrations to more prosperous areas. We can also talk about another important cause for demographical decline, the continuous growing migratory balance. Unlike the natural growth which had lower values than 2002,

migratory balance grew very much. After the census in 2002 there has been a territorial mobility rate of -5.5‰ and in year 2010 it had a value of -8.3‰, and considering the actual state it is expected to grow even more.

Taking into account the above, the general demographic balance for Hunedoara municipality, doesn't look very good, being in an advanced demographical regression.

### 3.2. Urban dynamics during industrialization

The urbanization process typical for the socialism is tightly bound with the industrialization process.

*Socialist cities model* and urban planning practices was characterised through some important aspects:

- the excessive control of state, over the buildings and housing allocation;
- urbanization from industrialization;
- functional area with exclusive functions.

The first urban concentration in the city of Hunedoara, developed in the south-western part around the old plant, and Corvineștilor Castle, on the left side of the Cerna River. Gradually, the city changed its rudimentary aspect through the construction of a minimal urban infrastructure, which sustained following evolution and supported the necessities for an accelerated urban development (railroad Simeria - Hunedoara, street network is being consolidated and in 1905 a power station is built). The construction of new furnaces determined the "old city" to expand along the river and the railroad, and in the northern part, new production units caused the appearance for new urban forms (Buituri - suburban village, Ceangăi - workers neighbourhood). During this time over 350 apartments are being built for those who worked at the plant.

Starting with 1950, because of the population's growth, an expansion was needed for the residential area to support the continuous growth. At the end of 1985 two functional areas are formed: an industrial one in the south along the river and in north, and a residential one in the east on the right side of the river. *Functional specialization* for different areas in the city, is felt along with the construction of new residential spaces. In 1952 "Orasul Muncitoresc" [Labour City] is being built, with houses like villas, and it's inhabited by the upper class. This neighbourhood continues to develop; therefore, in 1954 "Russian blocks" (with four floors) are being built. Nearby the "new city" centre is outlined by building some institutions for public utility.

The urban systematization continues with building other neighbourhoods around those existent: Micro III in 1958 along the railroad, Micro IV in 1965, and Micro V, Micro VI and Micro VII, are built after 1975.



Fig. 2. Urbanization stages in Hunedoara city.

After the end of the “great” urban systematization in 1975 a spatial model concerning the location for different functional areas and redefining the functions for older areas, is starting to be outlined.

As a result of this fact, the centre is moved in an area with a high density of public utility institutions, (around The Culture House), and those intended for commerce. The Old Centre remains the historical centre, dominated by the castle’s walls and architectonic assemblies.

The city’s centre is not the centre only because of its function, but also a centre from geographical and territorial approach, becoming a movement factor from the urban space periphery. Closely to the centre are the residential neighbourhoods with houses and forth floor blocks, with the highest real estate value. The third “envelope” is the one with residential neighbourhoods with a medium real estate value, for the middle class (Micro II, Micro III and Micro IV). This is followed by the one of the peripheral residential neighbourhoods, for the lower class, mostly workers from the industrial plant. These neighbourhoods are characterised by collective buildings with medium comfort. The last concentric circle is occupied by the industrial zone

which expanded from the southern part to the north, beyond the city’s outlet.

At the end of urban systematization as a result for building between 1950-1985, it’s been estimated a real estate renewal index of 67%. The speed at which these locative assemblies were built corresponded with the development and expansion of the iron plant, but also with an extraordinary demographical growth for that period.

Regarding the city’s physiognomy, every city is defined by a certain regularity or irregularity in its spatial organization. Hunedoara city has a regular plan as a result of the direct effect of anthropogenic intervention during that period.

Urbanistically speaking, in the “Plant-city” we can identify certain aspects specific for other cities that were systematised during socialism. The centre of city has large boulevards, shadowed by arboreal vegetation curtains, opposed to the residential and peripheral neighbourhoods where streets are narrow because of the high concentration of the buildings. The intensity of urban territory usage drops from the centre to the periphery because of the integrated and centralized organization for the socialist city.

Around the end of 1990, the city could be divided in two distinctive areas, which had close bonds: the industrial western area and the eastern residential area. Although, the industrial platform continued to expand to the north side, the city expands to the eastern side, where the relief was proper and the other environmental components were not affected by the industrial process.

So the post-industrial city is being outlined, where the industrial areas are relocated and its effects are being felt both in the socio-economic plan and the functional-aesthetic plan.

**4. SOME ACTUAL ASPECTS REGARDING THE URBAN SPACE**

Organizing the territory of an urban settlement is differentiated by the physical-geographical conditions, the socio-economic profile and the development level. Each city has its own landscape, defined by multiple fundamental functions for outlining a good organization for the urban space. Inside of the settlement are

distinguished different functional areas. These areas don't have certain limits, their dimensions ranging depending on the development level of an urban organism in time.

*The industrial zone* in Hunedoara, occupies 665 ha, which is 41% of the entire surface of the city. Although it has a strategic position near the raw materials and water supplies, the location in the western part of the city may be considered a weak position, according to the urban planning principals, because the pollution from the industrial process is being taken to the residential areas in the eastern part.

The analysis over the actual usage of the industrial plant reveals the extremely damaged character of the site and the weak functional reintegration. Only 20% of the total surface is occupied by other firms the rest is left for degradation.

The old production unit buildings represent "a job" for the poor population, as a source of income from the selling of the bricks and iron left after the demolition.

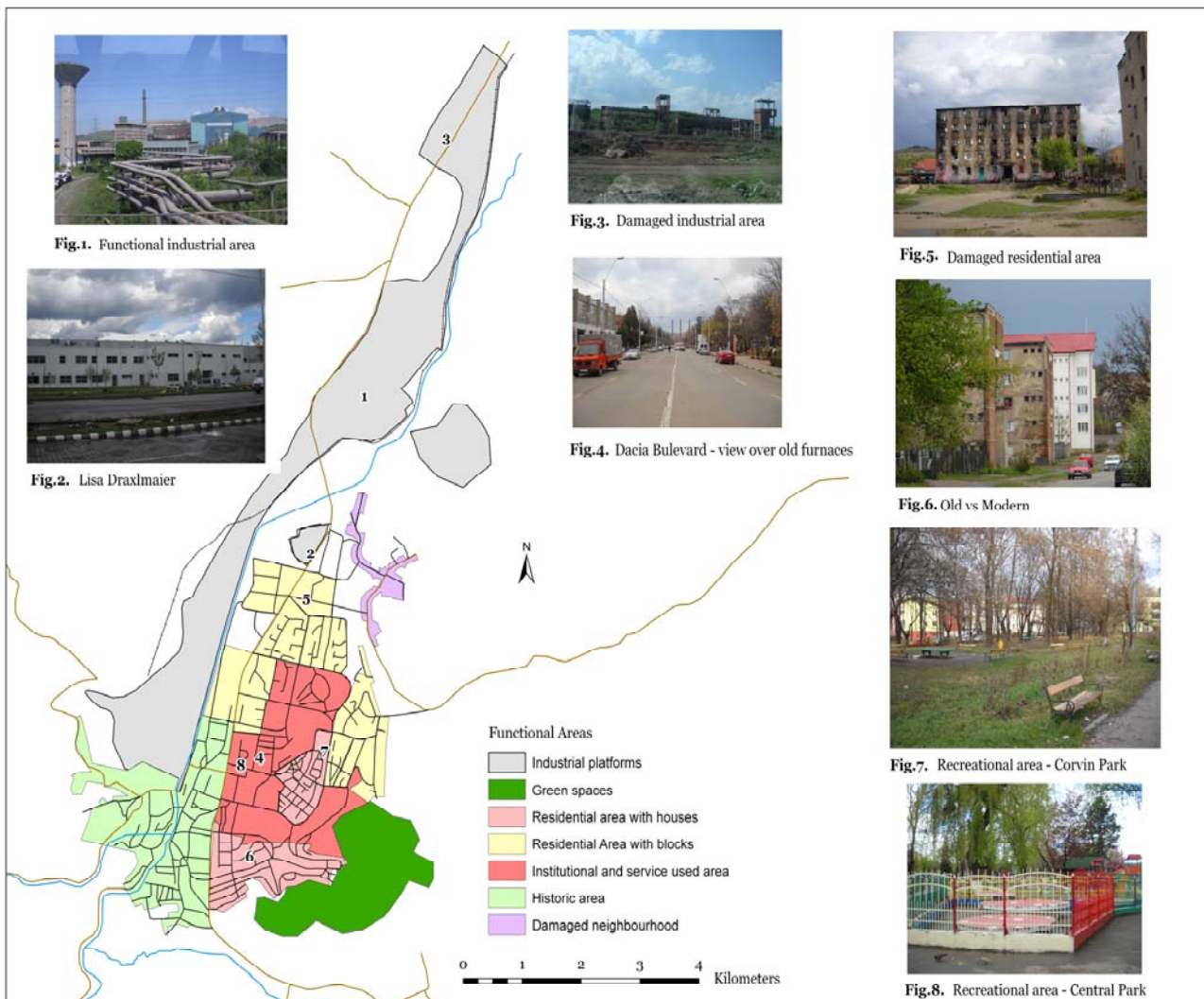


Fig. 3. Functional areas and some aspects of the city development.

Although, the industrial site represents a part of the culture in Hunedoara, not even a building was transformed in a museum, and the greening plans predict the complete demolition of the industrial unused buildings.

The following development of the economy of Hunedoara should take into account the possibilities of functional reintegration of the industrial area capitalizing its potential: space, spatial segregation, accessibility, and the pre-existent features.

*Residential area* is very expanded territorially, occupying 8 out of the 11 neighbourhoods of Hunedoara. Regarding the aspect, each neighbourhood is different, being built in different periods of time, and the development level varies. Micro II, Micro III and Micro IV are more developed opposed to Micro V, Micro VI and Micro VII with lack of minimal living conditions being inhabited mostly by Roma ethnics. So we can talk about socio-spatial segregation inside the residential neighbourhoods. This is also a result for the position inside the city, neighbourhoods Micro V, Micro VI, and Micro VII being situated at the periphery. The high poverty degree, lack of financial resources and jobs, pushed the poor ones to the periphery. Not even the real estate market help them, the real estate's prices in Micro II, Micro III and Micro IV are very high, so not everybody can afford to live there. At this moment the neighbourhoods from the periphery are low rated, considering the low living conditions, the misery and a high criminal rate.

An obvious process for the residential neighbourhoods situated nearby the centre is the *elimination of the exclusive character of living* each one starting to have its own centre. A series of commercial units and services grow over the ground floors, transforming the streets in circulation axes to which the entire city gravitates.

In Hunedoara, like in other cities from Romania, *the central zone is divided in two parts, the old centre and the new one*. The Old Centre is being located at the periphery, nearby the Corvinești Castle, and it's the municipality's historic zone. Here there are still some public utility and private institutions, being the first urban nucleus in Hunedoara. Nowadays it is in an advanced stage of degradation, the population moving towards the new centre or other neighbourhoods. Living conditions and the growth of the Roma population led to this process. From this, the castle also suffers by losing a lot of its touristic potential. It is a dirty place most like all the other peripheral neighbourhoods.

Micro I neighbourhood was built in 1952 with a few boulevards, gradually taking over the functions of the old centre, nowadays also being called The New Centre or The Civic Centre. As the time passed by, a lot of residential assemblies were built, the value of the real estate and terrains growing. Here are also placed the

first commercial spaces for the necessities of the population from the nearby neighbourhoods (Micro II, Micro III and Micro IV). After the 1990 the centre becomes highly rated and most of the institutions and commercial societies settle here. In about 10 years it strongly developed, now all the ground floors being transformed in shops, medical facilities, bars, etc. So we can talk about *a gradual gentrification of the centre*.

Hunedoara municipality was once known as a city of flowers, and today managed to be a city of dirt and misery with an accelerated urban degradation. This is very well shown by the actual state of the green spaces and recreational spaces. In the present time, we can't talk about green spaces, approximately 80% of the old vegetation being cut off and replaced by buildings or playgrounds. Parks are supposed to be recreational spaces, quiet spaces but this is only a memory for the citizens from Hunedoara. All 4 great parks were destroyed being replaced with buildings and urban furniture for almost 85% of the total surface. Playgrounds are unorganised and not well located; today you can't distinguish the recreational space and the playground.

Regarding the urban furniture we can talk about some artesian fountains which are surrounded by metallic fences and it is the only city in the world that has something like this. Such urban malpractice can be seen in all green spaces in Hunedoara: restaurants being built in the middle of the park, cutting down trees along the streets, the bad location for the playgrounds. The only green space left intact is the Chizid forest which is a botanical reservation, a valuable phytogeographical document about forestry levelling and ecosystems diversity.

The industry depravity caused the appearance of some *damaged urban forms* situated at the periphery of the city. This is the case for the suburban neighbourhood Buituri which today is abandoned approximately 80%. Just some Roma families live there in some dirty houses without minimal living conditions, and this deepens the social and spatial segregation excluding the Roma ethnicity from health and education public services. A very important aspect for Hunedoara is the transport network state, which proves to be problematic, especially, for the railroad transportation. Starting with the year 2009 the railroad between Simeria and Hunedoara is shut down, today there is no train that leaves or comes to Hunedoara station. Everything, both passengers and merchandise, were taken by the auto transportation.

## 5. CONCLUSION

From the previous analysis, it appears to be a gradual urbanization in Hunedoara, as a result of industrialization. We now face a process that takes place: the gradual urban depravation. Obviously, both

processes were determined by the same cause – industry.

We can now talk about a necessity for urban renewal to be able to manage the new challenges of evolution for a sustainable development.

Urban renewal proves to be an important strategy mostly for deprived cities or in decline. A successful urban renewal must include politics for environmental, social and economic developments integrated in a perfect logic and a staged process.

As a result for the actual problems in the city, there can be identified some main directions for solving them:

*a). Reconditioning the physical environment.*

Greening the industrial plant, eliminate the spatial segregation in the residential neighbourhoods, renewal of both central areas, greening the slag mountain, and other bad forms of storage, regularization of the river Cerna inside the city, restoring the castle and maintain its surroundings, reconditioning the buildings facades, revival of the abandoned urban areas.

*b). Reconditioning the social environment.*

Eliminating the social segregation, especially the Roma, accessibility to educational and health services for all ethnicity, professional reconversion, facilitate access to information and culture.

*c). Reconditioning the economic environment.*

Functional reintegration of the industrial platform, diversity of economic activities, maintaining economic and cultural values, capitalization of the touristic resources.

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