

Renovation through transition: Postindustrial clusters in Charentsavan city, Armenia

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Abstract In the former political-economic context, new types of small settlements called “avan,” and sometimes entire cities, were constructed around factories to supply and service industries and industrial areas. Following the dissolution of this formation, most of the land plots occupied by former industries lost their supply chain connections and importance, becoming gaping voids—territories of decaying industrial enterprises. These enterprises, having lost their primary functions, became abandoned areas with no new purpose. Meanwhile, nearby highly urbanized residential areas lack space for expansion. The most effective global solution to this situation is considered the renovation of degrading industrial facilities and the territories they occupy, repurposing them for new functions. The transition to the dominance of service production over goods production, including “social services” (education, healthcare, household services, entertainment) as opposed to “services to producers,” has been studied, focusing on defining the characteristics of postindustrialism. These characteristics are related to changes in employment structure, with a significant shift toward the service sector. Additionally, the selection of strategic directions for Charentsavan's urban planning complex development has been examined. This involves sustainable community development, creating a safe and healthy biosphere for living, ensuring the preservation of natural and cultural heritage, and developing more efficient internal reserves through the reconstruction of former industrial zones, adapting them to meet citizens' needs.

Keywords: architectural appearance, degraded industrial areas, restructuring, adaptation, sustainable development, environmental impacts

1. Introduction

The aim of this research is to study the objects of the industrial past, which, for various reasons, have not become part of the modern multifunctional system of human-city interaction and, since not being used for a long time, have decayed, broken and discerned the architectural appearance of the urban area. The main goal based on the results will become the development of more efficient ways of using urban areas, elaborating a number of measures directed to effectively revitalize individual degraded objects or irrationally used spaces.

When carrying out the reconstruction of industrial zones, it is quite important to consider the possibility of restoring the balance between the urban planning of settlements and industrial policy.

The scientific innovation is the development of a methodology for the reuse of a significant number of abandoned or degraded industrial areas in the territory of the Republic of Armenia.

As an expected result of the study is the creation of a methodology that will help manage the process of restructuring industrial areas in RA settlements, and the conceptual proposal developed for the selected industrial area of Charentsavan city and as a good practice can be used for restructuring, modernization, reorganization, and reuse of other similar zones throughout the country, which allows efficient use of urban areas and ensures their sustainable development.

The changes in industrial zones are a fostering factor that allows for obtaining financial, social and environmental impacts, as full, partial and superficial restructuring can be distinguished.

"The town of Charentsavan is situated on the Hrazdan River, just 38 kilometers from Yerevan (Figure 1). Located in the province of Kotayk, the town of Armenia was formerly known as Lusavan before its name changed to Charentsavan in 1967. Charentsavan was named after the famous Armenian poet Yeghishe Charents, and the town is quite proud of this, as evidenced by the numerous statues, museum, and other items honoring him" (About Charentsavan, 2022).

"With just under 20,000 residents, the Kotayk's town Charentsavan was traditionally known for its industry, including the well-known Gyumush hydroelectric power plant in the USSR" (Kotayk Province, 2017; About Charentsavan, 2022).

The town expanded after numerous other industrial firms moved in, although it was initially constructed to accommodate factory employees.

An almost identical situation was created in almost all post-Soviet republics (Amiraghyan, 2007): as a result of the collapse of a single "mechanism", its individual elements lost their viability due to the inability to act separately, the privatization of state property of industrial zones and the elimination of the consumption market (The master plan of Charentsavan city, 2007; Manufacturing, 2022).



Figure 1 Main view of city Charentsavan.

Source: <https://en.wikipedia>.

These phenomena caused significant changes in the economic life of the settlements and in the planning-urban fabric. With the provision of sanitary protection zones, different functional zones of the settlement formulated self-sufficient clusters with infrastructure to meet all vital human needs. Even the population size was determined by the strength of the industrial zone in the city, which often involved internal migration, the flow of people from different settlements of the country, which in turn gathered people of different cultures in one place (Figure 2).

With the loss of the mentioned main function, at the same time, the development of other, new areas of activity with the need for sustenance naturally dictates the reorganization of the areas that have exhausted the function and the infrastructure related to it. Even the number of the population, which was unnaturally increased due to the environment dictated by the previous function, is also subject to review; therefore, the settlement acquires its optimal dimensions and the need for new infrastructures corresponding to the newly assigned functions (resource extraction, IT, creative technologies) (Figures 3, 4).



Figure 2 Functional structure of urban fabric-central square as a focal point of composition.

Source: <https://www.facebook.com/charentsavanmunicipality>



Figure 3 Abandoned train station in Charentsavan.

Source: <https://absolutearmenia.com/charentsavan/>

It is also important to mention that the aesthetic component was obligatory even for industrial buildings, given its historical or architectural significance, including just buildings or subsidiary parts such as fences and gates (Figure 5).



Figure 4 Fragment of the entry gate of the factory in Charentsavan.

Source: <https://urbanista.pageflow.io/postindustrial#196153>



Figure 5 Fragment of the entry gate of the factory in Charentsavan.

Source: <https://urbanista.pageflow.io/postindustrial#196154>

2. Materials and Methods

Based on the abovementioned analysis of the current situation, adaptation methods for the adaptive reuse of industrial territories via reconstruction have become urgent. Due to scarce territorial resources, mainly with a unified urban planning solution and the most convenient placement of all zones providing optimal conditions for human activity, certain elements of the plan structure, due to both the abovementioned territorial scarcity and insufficient funding as a result of the change in the ownership of such areas, have become neglected and therefore become unusable. In fact, such an important component of the urban structure as the public space has been partially or fully appropriated for other urban planning purposes.

Therefore, the function of the abovementioned areas acquires a new meaning: reserve areas "hidden" in the internal plan structure of settlements, which also contribute to preventing further territorial expansion of settlements, protecting agricultural lands from urban development appropriation and ensuring a compact plan structure of settlements, short movement distances and a small stretch of infrastructure.

3. Results and Discussion

3.1. Adaptive reuse of former industrial territories

Due to the current urbanization processes, the attractiveness of the settlement, the favorable accessibility zone of the capital city and the possibility of using the main workplaces in a short period of access, the production areas occupying a significant part of the settlement have completely exhausted their functions without reassigning the place to anything new. Consequently, because of poor technical conditions as a result of long-term inoccupation, urbanization gaps have appeared in the city plan structure—white dots that give the appearance of ghosts to the given part of the settlement.

The industrial hub of Charentsavan consists mainly of the metal smelting sector and the scientific research sector. The predominant parts of the buildings are production and administrative buildings built from prefabricated factory elements. In accordance with current trends, it was proposed to divide the area into separate sections by functional zoning, assigning a new function to each one, considering residential, industrial, educational, and public functions (Gorgolewski, 2017). In that process, the following approaches to building modernization can be considered (General information - Kotayk regional administration, 2017).

In this regard, as a result of the above analysis, the cities of Charentsavan, Kotayk Marz, and RA, as a result of the complex analysis, were identified (Figure 6):

1. Zoning of production zones in the city structure according to the following criteria (Figure 7):
 - the presence of building constructions,
 - their technical condition,
 - the value,
 - the possibility of further adaptive reuse.
2. The opportunity provided by the size of the land, in the plan structure of the settlement, in particular, with the outlining of the corresponding newly assigned and maintained priorities.
3. By evaluating the physical condition of land areas in the context of including urban economy.
4. Development of a complex of measures in the case of derelict lands in order to return them to the urban economy.

Some parts of the territory, as well as the ecological corridors that play an important role in the plan structure of the city/s, which in the context of global warming make the settlements into cities with a favorable microclimate to live in, while ensuring public-social contacts, can be reorganized as a unified green zone, giving the settlement a new aesthetic quality.

3.2. Study result

The results and recommendations of the complex analysis made for the city of Charentsavan can be proposed and serve as an example for many similar cities of the Republic of Armenia, because the industrial hubs of the latter, formed in almost the same period and serving the same complete industrial complex, have almost the same problems in the environment of urbanization of settlements, therefore the solutions will also have a general character.

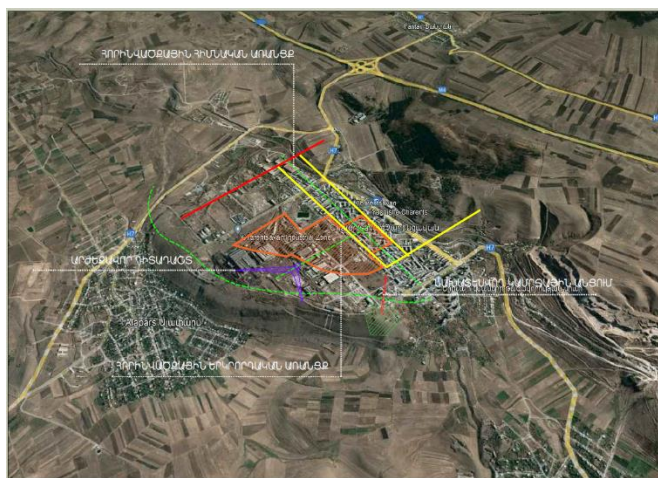


Figure 6 Multifunction analysis of the industrial abandoned hub (prevention of new agricultural lands from urban expansion).



The only difference can be related to the assessment of the buildings and structures values, as in general, the buildings of the industrial zones have the character of objects assembled from the prefabricated elements according to the function determined by their capacities (Hampel, 2020). However, in the administrative-social buildings of the industrial zones, and even sometimes in the industrial buildings, an expression of the local construction art, materials, art peculiarities can be found as well. As one of the most obvious examples are the industrial and factory areas of Gyumri city (which has historic and architectural significance) (Figure 8). The wastewater separate cleaning system apart from the city sewage system had been worked out as well as a tool for ecologic sustainability (Spanjers, 2021).

4. Final considerations

Summarizing the results of the thorough study, in which the buildings are to be evaluated by classified grading (as high valued, low valued or bothering without any historic or architectural value) of the industrial heritage the following conclusions can be done (Harald & Oevermann, 2017):

- a. To fully preserve factory buildings by assigning them a new and functionally appropriate structure through new architectural means and internal reconstructions and designs.
- b. Partially preserve and adapt the buildings to modern requirements and newly attributed functions through new measures.
- c. Completely demolish the existing buildings, rehabilitate the area and organize a completely new construction in accordance with modern requirements and assigned function.

Ethical considerations

Not applicable.

Conflict of interest

The author declares no conflicts of interest.

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Figure 7 Adaptive reuse of the industrial cluster in Charentsavan.



Figure 8 "Chulochni"-stocking factory in Gyumri. Source: <https://dzen.ru/a/Y6QadccZl5mCNjQT>



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