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# The Technical Endowment of the Rural Space Integrated into the Cluj-Napoca Metropolitan Area (1<sup>st</sup> stage)

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## The rural space integrated into the Cluj-Napoca Metropolitan Area in the first stage of its constitution

The Romanian rural space is characterized by great differences comparing it to the urban space as the level of comfort is concerning.

The preoccupation for the development of cities during the communist period has produced a disturbance in the development of villages, by disfavoring the peripheral rural space and favouring the periurban one. Even in this context, the discrepancies between the comfort offered by the cities and that offered by villages located in their immediate proximity are still clearly visible in the territory.

The rural space in the immediate proximity of a city represents a distinct category. It is a space of transition between the proper rural space and the urban one, being the most dynamic of all one as its main function is to reduce the disequilibrium created by the city in its surrounding space, to compensate the material, human and energetic deficit and to take over the informational surplus (Melinda Căndea, Florina Bran, 2001, p. 403).

The Economic Development and Cooperation Organization, taking into consideration the capacity of the rural space to integrate itself into the national economy, includes this type of space into the category of economically integrated rural areas, characterized by a numerical population growth, the presence of workplaces and of a higher-developed infrastructure. The influence of the neighbouring cities is crucial in outlining their evolutionary route as they mainly depend on the cities' needs.

Act 2/1968, art.6, par.2, using the following wording: “the communes that belong to Bucharest municipal city, to the other municipal cities are called suburban communes”, has included this category of rural space into a special juridical category, under the subordination of a city, with a planned role of supporting the process of *urbanization*. The constitution of the suburban communes was made, however, in a controlled and selective way “without a thorough correspondence in the socio-geographical reality” (Nicolae, 2002, p. 341) and implied the loss of the rural space specificity.

After 1990, this juridical category was abolished and the newly enacted legislation permitted the creation of a local autonomy. This way, the urban and rural communities got the possibility of coordinating by themselves the activities on the territory under their jurisdiction, by taking into consideration the local possibilities, resources and competences and the inhabitants' interests, with the purpose of modernizing it. By *modernization* is to be understood “the process of constant increase of the living standard with the purpose of satisfying the human necessities of some specific communities” (Nicolae, 2002, p. 342). Thus, modernization and urbanization must be seen as two different concepts.

The project regarding the constitution of the Cluj-Napoca Metropolitan Area offers exactly the opportunity for the rural settlements in the proximity of Cluj-Napoca to increase their living standard. The mayors of the communes keep their administrative attributions but they have the possibility to associate themselves and collaborate with the metropolitan centre in order to diminish the existent disequilibrium.

According to the information provided by the Cluj County Council, in the first stage of its constitution, the metropolitan area is to be extended up to 30 km from the centre of the municipality. It includes Cluj-Napoca and seven communes: Apahida, Baci, Ciurila, Chinteni, Feleac, Florești and Gilău. In 2004 this area totaled 339.164 inhabitants on an area of 78.270 ha. The rural space included 41.158 inhabitants and an area of 60.318 ha. The project was initialized in 2004, but its implementation will take place during March 2006 and July 2007.

One of the benefits these communes may obtain, a fact that the mayoralties took into consideration in the moment they signed the protocols with the Cluj County Council, was the possibility of attracting funds in order to improve the technical endowment of the territory, an important premise in the process of improving the standard of life.

### The technical endowment of the territory

In order to work out the strategies for improving the technical endowment of the communes taken into consideration, it is necessary to evaluate the present-day situation by analyzing some statistical indicators. A good evaluation and a comparison between the communes is possible if we analyze the indicators having in view the area, the number of inhabitants and dwellings that exist in each of these communes. The statistical data from the 2002 census and the settlements' record of 2004 were used in this respect.

Table 1. The area, the number of inhabitants and the number of dwellings of the analyzed communes in 2002 and 2004.

Commune	Area (ha)	Number of inhabitants		Number of dwellings	
		2002	2004	2002	2004
Apahida	10.602	8.785	8.956	3.554	3.593
Baci	8.751	8.139	8.179	2.565	2.613
Chinteni	9.800	2.786	2.833	1.329	1.342
Ciurila	7.222	1.509	1.597	991	1.010
Feleac	6.169	3.810	3.656	1.811	1.825
Florești	6.092	7.470	7.888	2.489	2.646
Gilău	11.682	7.861	8.049	2.955	3.000
TOTAL	60.318	40.360	41.158	15.694	16.029

*The water supply network.* One of the most important services provided to a settlement is a sufficient and of a good quality water supply. The water needs of a settlement, greater and more varied nowadays, can't be satisfied anymore, either quantitative, or qualitative, only from local water resources. From a hydrographic point of view and due to the specificity of the water sources, the seven communes taken into consideration are situated in four different subzones:

1. The Someșul Mic Corridor: Apahida, Florești, Gilău and the Nadăș Corridor: Baci.
2. The Someș Plateau (Cluj and Dej Hills): Chinteni.
3. The Feleac Massif: Feleac.
4. The Apuseni Mountains: Ciurila.

From this point of view, the communes situated in the Someșul Mic and the Nadăș corridors are more advantaged, having an easier access to the water supply sources, especially to the main water supply pipeline situated in the Someșul Mic Corridor, to which Cluj-Napoca, Gherla and Dej are connected.

The water supply network has two main water sources (G.U.P. - General Urban Plan, Cluj-Napoca):

1. The Florești source is situated approximately 3 km upstream Cluj-Napoca, in the Someș meadow. The water is collected from the phreatic aquifer stratum, enriched by bank infiltrations, through drilled and dug wells (H=8-10 m) and through low-depth drains. At the moment, the source provides a flow which ranges between 500 l/s and 700 l/s due to the artificial enrichment of the phreatic stratum.

2. The Gilău source consists of a water inlet placed in the Gilău reservoir, which takes over a certain amount of water from the water storage dam and provides a flow of 2.570 l/s. The water treating plant, which has a capacity of treating the water of 2.070 l/s, is 300 m downstream. A current problem in providing the necessary water is the advanced silting of the

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Gilău reservoir and the partial obstruction of the inferior water inlet. Of the 43 villages that are being analyzed in this paper, only seven, representing 16,3%, are connected to the Florești-Gilău water supply system. These settlements receive the following water supply flows:

No.	Village	Water supply flow (l/s)
1.	Gilău	40,0
2.	Florești	18,0
3.	Luna de Sus	7,5
4.	Baciu	16,0
5.	Apahida	15,0
6.	Sânnicoară	6,0
7.	Dezmir	4,0

**Table 2. The water supply flows of the villages connected to the Gilău-Florești water supply system.**

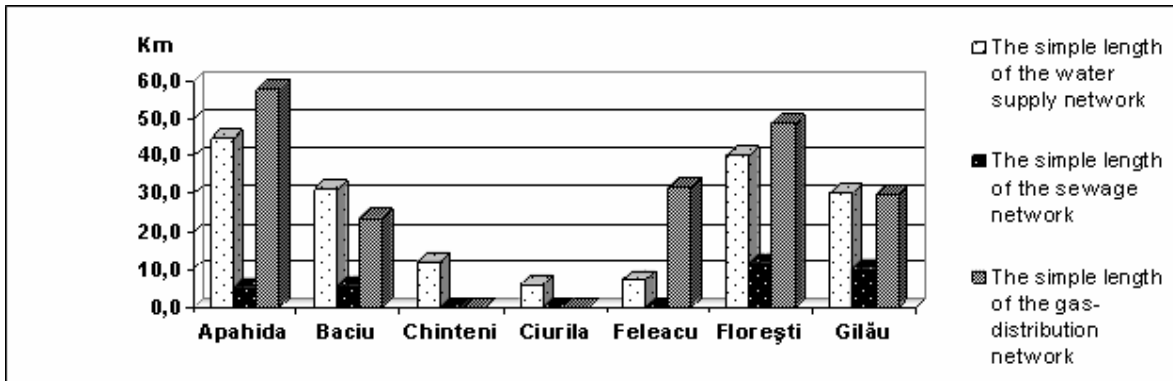
In the other villages, the water supply is provided by local water supply sources or on groups of households, the proportion of the dwellings that benefit by water supply in centralized system is

relatively low. As the data of the 2002 census indicate, four villages, representing 9,3% of the total number of villages, don't have any dwelling endowed with inner water supply. These are Pădureni, Sălișteea Veche and Satu Lung (Chinteni commune) and Casele Micești (Feleac commune). If we take into consideration the length of water supply network that each commune is endowed with, in 2004 there was the following situation:

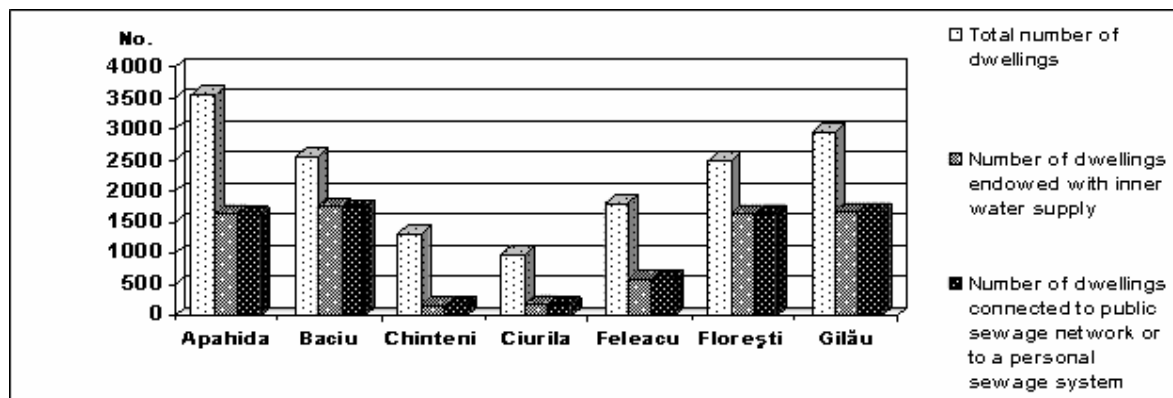
No.	Commune	The simple length of the water supply network (km)
1.	Apahida	45,5
2.	Baciu	31,0
3.	Chinteni	12,0
4.	Ciurila	6,2
5.	Feleac	7,3
6.	Florești	40,3
7.	Gilău	30,3

**Table 3. The simple length of the water supply network (2004).**

Analyzing figure 1 and table 3, it results that Apahida, Baciu, Florești and Gilău communes are far better endowed with water supply network than the other three communes.



**Figure 1. The simple length of the distribution networks (2004).**



**Figure 2. The ratio of dwellings endowed with water supply and sewage facilities (2002).**

They also own the greatest ratio of dwellings endowed with water supply (figure 2): Baciú 68,1%, Florești 66,0%, Gilău 56,5% and Apahida 46,6%. Feleac with 32,1%, Ciurila with 18,0% and Chinteni with only 11,7% of the total number of dwellings follow them.

*The sewage network.* As regarding the sewage and the sewage treatment, a much shorter network is to be noticed, if we compare it with the water supply network (figure 1 and table 4). This situation creates a profound discrepancy between the analyzed rural area and the urban area.

No.	Commune	The simple length of the sewage network (km)
1.	Apahida	5,2
2.	Baciú	5,6
3.	Chinteni	0,0
4.	Ciurila	0,0
5.	Feleac	0,0
6.	Florești	11,5
7.	Gilău	10,0

Table 4. The simple length of the sewage network (2004).

Thus, it appears that only Apahida, Baciú, Florești and Gilău communes are endowed with public sewage network. Moreover, besides Cluj-Napoca, only Baciú, Florești and Gilău villages are connected to the mechanic-chemical treatment plant,

which has a capacity of 1.600 l/s and is situated in the eastern part of the city (P.U.G. Cluj-Napoca). Nowadays, the overflows and the domestic sewers nearby the overflows confront an advanced silting, a part of the sewage being thus evacuated directly into the surface runoff causing its pollution. In Apahida is currently being built a treatment plant of its own. The only treatment plant situated in the analyzed rural space, is the one from Florești, having a low capacity of sewage treatment. Although there are few dwellings connected to the public sewage network, there are many dwellings connected to a personal sewage system. In this situation, the domestic and pluvial sewage get directly into the phreatic water or into the surface water without being properly treated. It is necessary that this situation shouldn't become a problem in the new tourist areas in the Someșul Cald and Someșul Rece valleys. In this respect, the sewage treatment must be achieved together with the introduction of the water supply and the sewage networks. Figure 2 indicates a certain correlation, with small differences, between the number of dwellings endowed with inner water supply and those connected to public sewage network or to personal sewage system. The four communes stand out again: Baciú 67,9%, Florești 66,0%, Gilău 56,4% and Apahida 45,5%, while Feleacu, Ciurila and Chinteni have only a ratio of 22,2%, 17,6% and respectively 11,7% dwellings connected to public sewage network or to a personal sewage system.

*The gas-distribution network.* In the analyzed area there is a main gas-distribution network including Apahida-Cluj-Napoca-Baciú-Florești-Gilău, with ramifications. The natural gas, having a caloric power of approximately 8.000 Kcal/Nm<sup>3</sup>, is transported through gas pipelines from the Transylvanian Plain. There are two independent sources that supply the necessary gas for the area: Ceanu Mare, which provides gas through two major gas pipelines, one of 300 mm and the other of 500 mm diameter, and Turda, which uses a 300 mm gas pipeline. The connection of these major pipelines is made between the two adjustment-measurement-distribution stations that supply the city by using two high-pressure pipelines (over 6 bars) of 300 mm and respectively of 400 mm diameter. There are also several adjustment stations and high, moderate and low-pressure pipelines that supply the necessary gas for different types of consumers. Baciú, Apahida, Dezmir, Pata, Sânnicoară, Feleac, Florești and Gilău already benefit by this gas-distribution network. Chinteni and Cojocna also requested to be connected, but they haven't received the approval yet.

As figure 1 indicates, in 2004, the simple length of the gas-distribution network was distributed as following:

No.	Commune	The simple length of the gas-distribution network (km)
1.	Apahida	58,2
2.	Baciú	23,7
3.	Chinteni	0,0
4.	Ciurila	0,0
5.	Feleac	31,6
6.	Florești	48,9
7.	Gilău	29,6

Table 5. The simple length of the gas-distribution network (2004).

*The heating network.* The heating network is underdeveloped in the analyzed communes as it restricts only to some collective housing units. The number of households endowed with personal central-heating systems is also very low.

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The four communes, Apahida, Baci, Florești and Gilău, stand out again as they are favored by the fact that they are connected to the gas-distribution network (figure 3).

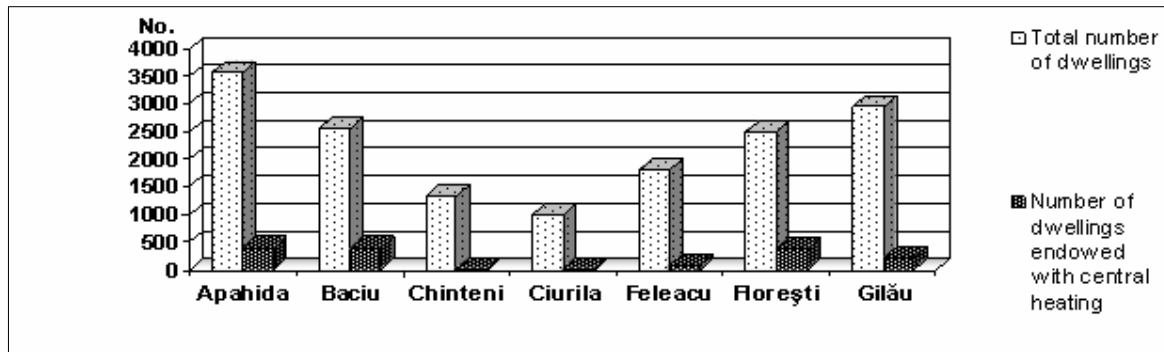


Figure 3. The ratio of dwellings endowed with central heating facilities (2002).

The same thing is observed at the village level, as there is a greater ratio of dwellings endowed with central heating facilities in the villages connected to the gas-distribution network: Baci 29,6%, Sânnicoară 18,7%, Florești 18,4%, Apahida 14,2%, Gilău 10,1%, Feleac 6,7%, Pata 5,6% and Dezmir 5,7%.

*The electric power supply network.* The necessary electric power in Cluj-Napoca and the seven analyzed communes is being supplied by using a transport and distribution network.

In accordance with P.U.G. Cluj-Napoca, there are two electric power supply stations in the proximity of Cluj-Napoca:

1. The Cluj Est transformer station (400/110 KV-1x250 MVA), situated in the eastern part of Cluj-Napoca, is connected through a 400 KV aerial electric line to the 400 KV Gădălin connection station. In its turn, the latter is connected with Iernut gas-based thermolectric power station.

2. The Cluj Vest-Florești transformer station (220/110 KV-2x200 MVA), situated in the western part of Cluj-Napoca, is connected to the following electric power sources:

- Mintia thermal power station, situated 169,2 km away;
- Iernut thermal power station 117,6 km away;
- Mărișel water power station 25,3 km away;
- Târnița hydroelectric power station 13,5 km away;
- Someșul Cald hydroelectric power station 13,2 km away.

Besides these there are a series of transformer stations (110/10 KV) supplied with electric power through a moderate-tension network. The low-tension network is generally made up of cable-distribution network and aerial-distribution network. They supply the private consumers and the public lighting system, using a distribution tension of 380/220 KV.

Thus, the electric power supply is sufficient, presenting possibilities of increase if necessary.

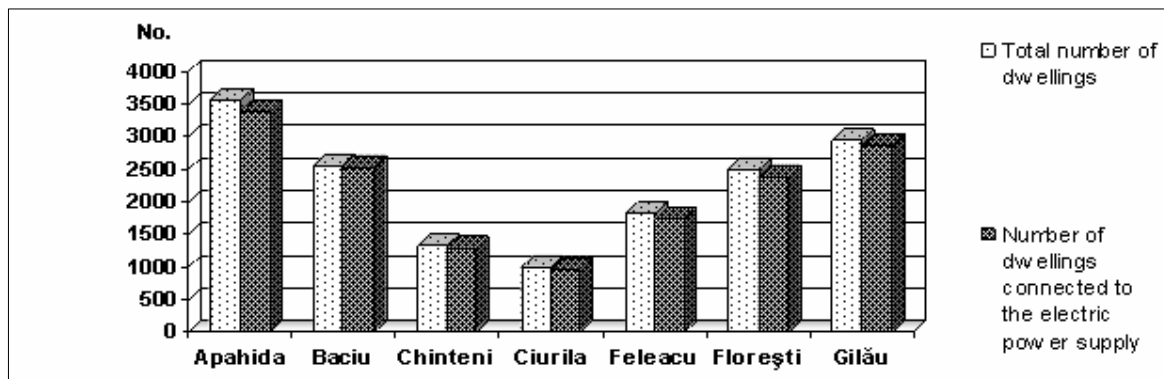


Figure 4. The ratio of dwellings connected to the electric power supply network (2002).

Unlike the above-mentioned endowments, the degree of power supply in the analyzed communes is very high, over 95%: Baciú 98,8%, Ciurila 96,9%, Chinteni 96,8%, Gilău 96,4%, Florești 95,5%, Feleac 95,1% and Apahida 95,0%. On the whole, from the total number of 15.694 dwellings in 2002, 96,2% were connected to the electric power network.

*The telephony network.* There is a continuous development of the urban, interurban and international telephony system, being the most dynamic component of the technical infrastructure.

The entire analyzed area benefits of a modern telephony network as a result of developing both fixed and mobile networks.

If the number of the mobile phone users is difficult to be specified because of the numerous companies that provide the mobile telephone services, the number of fixed phone users is quite reduced, indicating a deficit of telephone sets.

In 2004 there were 1.698 Romtelecom users in Florești, 1.500 in Apahida, 1.086 in Baciú, 1.122 in Gilău, 393 in Feleac, 282 in Chinteni and only 14 in Ciurila.

The telephonic links between the users and the telephone offices are set both through underground and aerial telephone cables. The telephone cables are distributed on the main streets direction, with ramifications towards the users.

*The transport network.* The extension and modernization of this category of technical infrastructure sustain the economic development of the analyzed area, which explain the efforts made by the local officials for attracting funds in this purpose.

The geographical position, mainly in the Someșul Mic Corridor, functions as a favourable factor in establishing various and complex transport network, formed by an important road and railway network. The air transport is added, with specific technical equipment on Cluj-Napoca territory.

*The road network.* Four national roads make the link with the neighbouring counties and with the entire country.

a) The most important thoroughfare is *DN 1 (E 60)*, which makes the link between Bucharest – Prahova Valley – Brașov – Sibiu – Alba Iulia – Turda – Cluj-Napoca – Huedin – Oradea – Borș and crosses the territory of Feleac, Florești and Gilău communes. From DN 1 a series of national and county roads branch out.

b) Thus, *DN 1C (E 58)* starts from Cluj-Napoca and follows the Someșul Mic valley and then the Someș valley towards Gherla – Dej – Baia Mare – Satu Mare, passing through Apahida.

c) In Apahida, *DN 16* branches out from DN 1C and crosses the Transylvanian Plain eastwards, connecting the Someș valley and the Mureș valley, respectively Cluj-Napoca and Reghin.

d) The fourth national road is *DN 1F*. It branches out from DN 1 in the North-Western part of Cluj-Napoca and it connects Cluj-Napoca and Zalău, after crossing the territory of Baciú commune.

The territory taken into consideration is endowed with a series of county roads, branched out from the national roads:

a) *DJ 105 T* Cluj-Napoca – Popești – Corușu – Sălișteá Nouă;

b) *DJ 109 A* Cluj-Napoca – Chinteni – Deușu – Vultureni – Așchileu Mare – Jibou;

c) *DJ 161 A* Apahida – Cojocna – Ceanu Mare;

d) *DJ 107 R* Cluj-Napoca – Ciurila;

e) *DJ 107 M* Luna de Sus – Vlaha – Săvădisla – Băișoara;

f) *DJ 107 S* Gilău – Someșu Rece – Măguri – Răcătău;

g) *DJ 107 B* Gilău – Someșu Rece – Someșu Cald – Mărișel.

From the above-mentioned county roads, only *DJ 107 M* and *DJ 109 A* are entirely asphalted, the others have important gravel road sections.

None of the rural roads is entirely asphalted, thus having a reduced viability. The majority are gravel or raw roads. In these circumstances, some activities of road improvement are extremely necessary. In order to reduce the heavy traffic in Cluj-Napoca and the pollution generated by it, several projects regarding the construction of alternative roads have been made so far.

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The construction of these roads requires the use of land provided exactly by the communes in the proximity of Cluj-Napoca. In accordance with P.A.T.J. - County Territorial Administrative Plan- Cluj, there are three belt highways proposed to be created:

a) the east belt highway (DN 1-DN 1C), with the following direction: Vâlcele – Gheorghieni – Dezmir railroad over crossing in Cluj-Napoca – Apahida (km 16) Dej, of 23.621 km long;

b) the north belt highway (DN 1C-DN 1F), from the southeast belt highway – Cluj-Napoca intraurban limit – Apahida – Baci – DN 1F, of 20.600 km long;

c) the west belt highway (DN1 – DN 1F), from DN 1, at the DN1 and DJ 107 M crossing point – the Someș river over cross downstream Florești 2 reservoir – DN 1F, of 11.488 km long.

The link between the north belt highway and the Brașov – Cluj-Napoca – Borș highway was also approved.

The term for implementing the investments is stipulated from 2005 to 2009.

A detour road is also planned in order to reduce the traffic through Cluj-Napoca. The southeast detour road (DJ 103 G-DJ 105 S and a new 4,8 km road section between Aiton and Pata) is to take over the heavy traffic between Turda and Dej. The road, 24, 8 km long, is to cross the following villages: Tureni, Aiton, Boju, Pata, Dezmir and Sânnicoară.

*The railroad network.* Two railroad lines cross the analyzed rural space:

a) no. 300 Bucharest – Prahova Valley – Brașov – Teiuș – Câmpia Turzii – Cluj-Napoca – Huedin – Oradea – Episcopia Bihorului, which crosses the territory of Apahida and Baci communes and has two railway stations in the rural area (Apahida and Baci);

b) no. 401 Cluj-Napoca – Dej, which crosses the territory of Apahida and has one railway station in the rural area (Apahida).

The officials have in view the electrification and the modernization of the Episcopia Bihor – Cluj-Napoca – Teiuș and Cluj-Napoca – Dej – Satu Mare railroad sections.

## Conclusions

The analysis of the current technical endowment highlights an important difference between the communes situated in the Someșul Mic Corridor (Gilău, Florești, Baci, Apahida) and the ones situated in the northern (Chinteni) or the southern part of Cluj-Napoca (Ciurila, Feleac) (figure 5), the former being more advantaged and as a result, more developed. The development is however insufficient when comparing it with the residential comfort or the technical endowment of Cluj-Napoca.

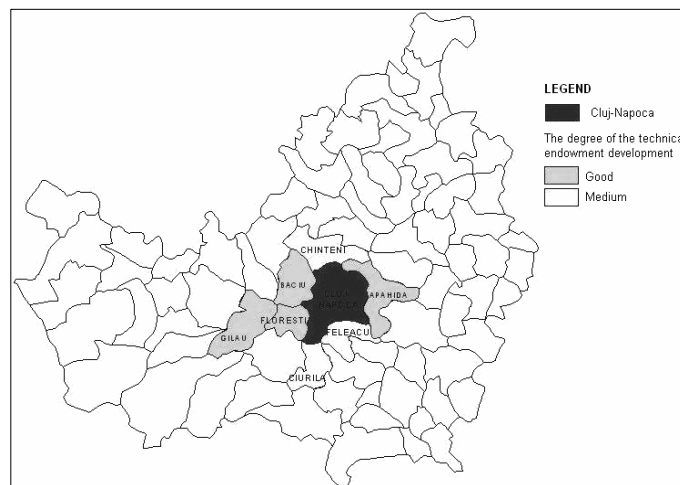


Figure 5. The degree of the technical endowment development (2002).

Taking into consideration the momentary advantages, almost all the investments connected to new industrial or commercial units found their location either in the municipal city or in its immediate proximity, between Cluj-Napoca and Apahida, Cluj-Napoca and Baci, Cluj-Napoca and Florești. This situation has a negative impact in the development of the other communes.

In these circumstances, some major investments are required in order to extend and modernize the technical endowment of these communes.

Having in view the proximity to Cluj-Napoca and the existence of common supply sources and networks, a co-operation with the municipal city on one side, and between the communes on the other side, within the framework of a metropolitan area and in the conditions of an efficient management, could solve this problem easier.

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