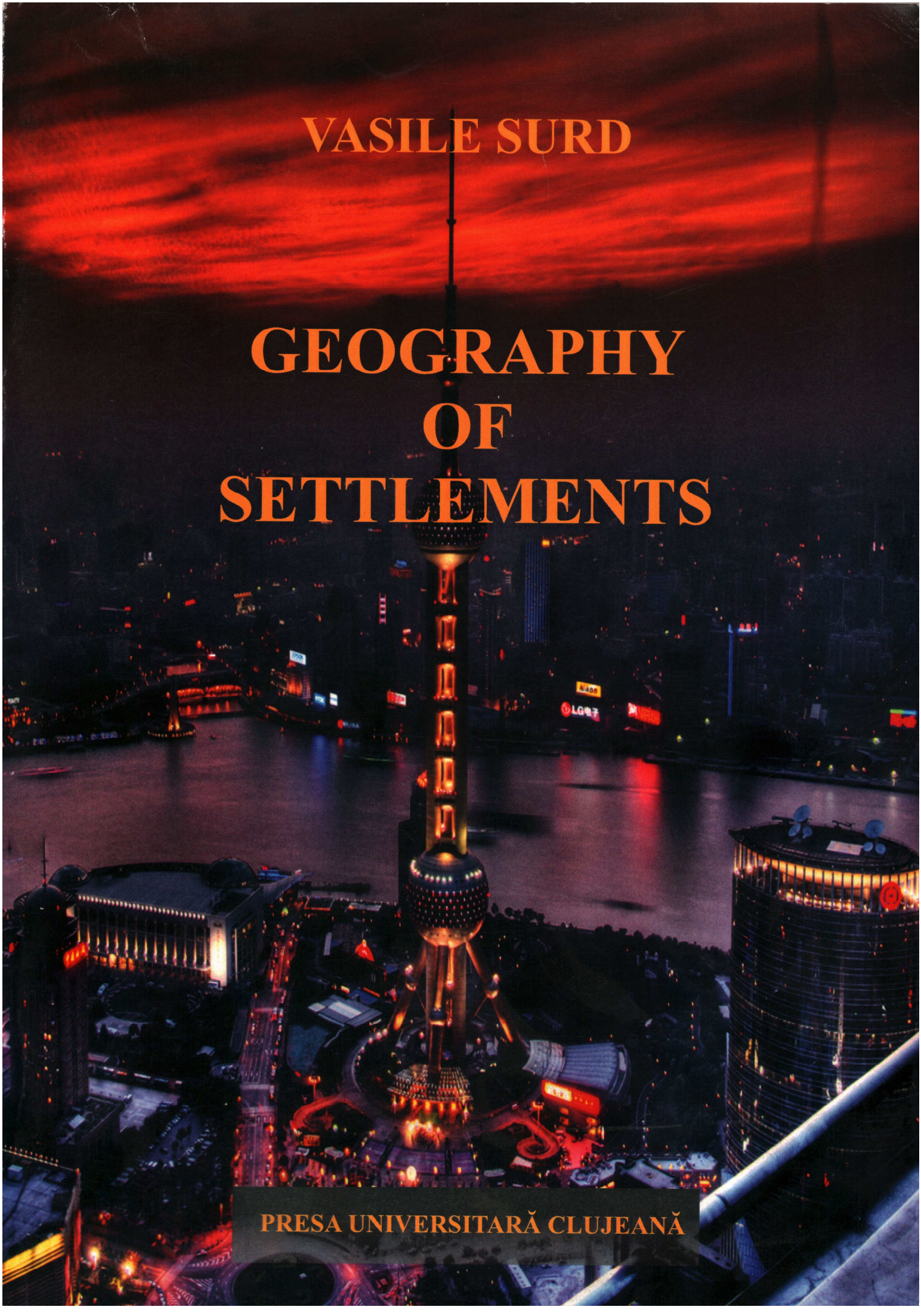

VASILE SURD

GEOGRAPHY OF SETTLEMENTS

PRESA UNIVERSITARĂ CLUJEANĂ

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PREFACE

The settlements represent the most dynamic structural components of the geographical space, true *"headquarters"* of the territorial organization. They also represent a synthesis of the ways of life, the historical and cultural experience of the people transposed in the great diversity of the world's physical and geographical system. The settlements are, for those more than 6 billion inhabitants of our planet, elements of personal identification.

The problem of settlements, its dynamism, diversity, the antagonist states and the trends of evolution represent the object of this book.

At the same time, we wish to present the settlements in the light of a correct understanding of their complexity and their primary role in the entire territorial network.

In addition, our study wants to be the starting point and also the crystallization of the practice of integrated approach in settlement study, in undeniable interdependence with the management of the geographical space.

First of all this book is addressed to the Geography scientists, but it might be useful to a larger spectrum of readers like those from the field of management and territorial planning, of public administration and urban-planning specialists, economists, servicemen, foresters, agronomists and the experts engaged in politics. In elaborating this paper we started our study from an extremely valuable material, which can be classified as a classic bibliography. In this respect we used mainly the information from the excellent treaty "*Urban Geography"* written by the French geographers *Jaqueline Beaujeau, Garnier* and *G. Chabot*, and translated in Romanian in the established scientific language, by professor *Virgil Gârbacea* in 1971. In a great extent we followed and used ideas from the structure of this paper. In the field of the Geography of Rural Settlements, the course of professor Ioan Şandru, *"Geography of Rural Settlements.* I, The Rural Settlement, Course Notes", lithographed and presented at the universities of Iaşi and Debrecen in 1970, was the base of our presentation of the rural settlements divided into the great geographical regions. Even more, we benefited of the clear and elegant synthesis of David Waugh, regarding the settlements, that we processed from the third edition of his Geography treaty (*Geography. An Integrated Approach, Surrey, U.K., 2000*). In a similar way, we used the information from professor *F.S. Hudson's* book "*A Geography of Settlements" Plymouth, 1976,* and *Fellman J., Getis A., Getis Judith's* book "*Human Geography. Landscape of Human Activities" 1990, Dubuque, USA.*

Regarding the structure of urban systems, the areas of influence of the settlements and the equilibrium of urban systems, we used as primary source of information the book of professor Ioan Ianoş "*The Cities and the Planning of Geographical Space"*, published by the Academic Publishing House in 1978, and the study of our colleagues from Cluj, *E. Molnar, A. Maier* and *N. Ciangă* "*Centres and Areas of Convergence in Romania", 1975.*

The synthesis from P.A.T.N., 1998 found in the chapter "Settlements", was taken from the volume "Territorial Management" by I. Bold and A. Crăciun, „Mirton" Publishing House, 1999. Of an indubitable documentary support was the collection of „Planning" Magazine, partially consulted in the libraries of Leicester and Glasgow Universities.

The information about the spatial distribution and the favourable factors for the development of the urban life we gathered from Professor C. Vandermotten and his collaborators' treaty „*Villes d'Europe. Cartographie comparative", 1999*.

We brought our own contribution to this book by presenting the intimate structures of rural settlements, the energetics of urban system and by defining some ambiguous terms.

Besides the vast informative scientific material, we selected a great number of cartographic materials, without which the explanatory process would become inoperable.

The author

1. GENERAL CHARACTERISTICS

By definition man is a social being, dominated by the group instinct. The rural way of life appeared at the beginning of the sedentary agriculture. The first villages appeared on the rivers' meadows that had extremely fertile soil and were easy to irrigate.

In Egypt and the Near East some rural settlements are over 8000 years old (dating from Neolithic). The need to work the land, to organize fishing, to irrigate, to defend from the wild animals and to divide the crops, among the members of the community represent the main factors the led to the grouping of the individuals. *"Generally, in hostile environments (forestry areas, swamps, etc.) people developed the habit of living in compact settlements in order to survive any kind of threats"* (F. Hudson, 1976).

"The real domain of the settlements" consists of the type of economical activities and the degree of development that together form the first cycle of identification of settlements. This determines the specific form of the living space and the possible levels of pollution of the environment and the control of the factors that create damage. The second cycle consists in the identity of the settlement, which is a result of the spatial placement, and the functions that motivates its birth. The third cycle consists in the identification of the relation between the number of the inhabitants and the volume of the resources that contributes to the sustaining and the optimal function of the territorial systems that include both rural and urban settlements. Depending on this relation and on the demographic dimension, the quantity and the resource diversity, we can estimate a certain level of traffic intensity and the necessary of the energy which insures the temporary stability of the settlements.

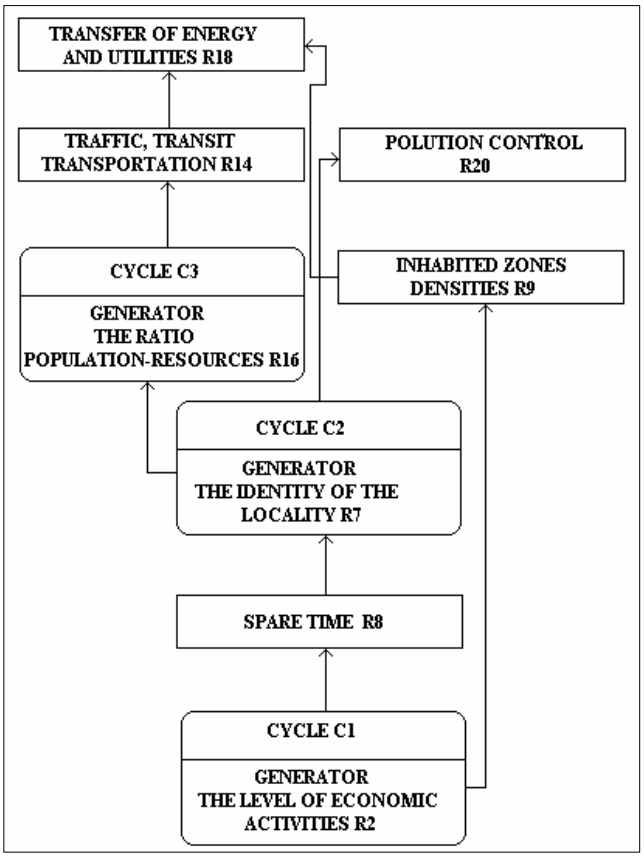


Figure 1. Identifying the structure of the real domain of the human settlements *(from L. Boldur, G. Ciobanu, I. Băncilă, 1982).*

On the global scale, the population is grouped in two major types of settlements: rural (villages) and urban (cities). Between those two "extreme" categories there are transition forms in opposite directions. In most cases the transfer from the category of rural to urban is realized rather gradually than suddenly, through a slow gain of population and through the development of the polarizing functions.

Both categories of habitat are a response to the man's need for shelter as a biological entity and social component. At the same time the concentrated expression of both the habitat forms, namely the precinct, also has a role in production. If the common elements of the rural and urban habitat are few, those that differentiate them give the dominant note, irrespective of the historical stage or the geographical localization.

Generally, the rural settlement has a smaller demographic potential than the urban one. The socio-professional structure of the population is marked by the prevailing of the activities specific to the primary sector. The physiognomies and the equipments of the rural settlements are inferior compared to that of the cities. In the rural environment, the rhythms of labour are mainly determined by the rhythm of biological processes, which cyclically turn into products necessary for living.

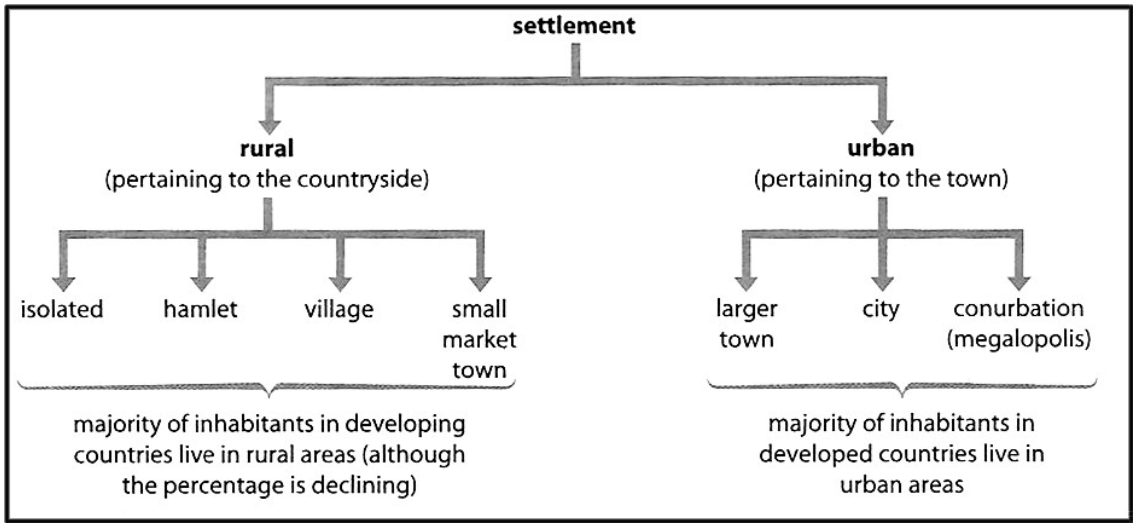


Figure 2. Main types of settlements *(from D. Waugh, 2000)*.

At the same time with the appearance of the city the distinction between *the village and the city* also appeared. As a result of these antagonistic relations it appeared transitional forms (village-city, city-village). This process of forming new categories of settlements with mixed features of village and city- takes place in two directions: through the transition of the village to the city from the physiognomic and functional point of view (rural-urbanization), and also through the fall of certain cities and their re-integration in the category of rural settlements. Such intermediate forms called by the French "*village-cities"*, and by Germans *"stadt-dorf"* are frequently met in Andalusia. They have a population of 7.000-14.000 inhabitants. Taking into consideration the number of population they should be considered cities. Their dominant function is that of agriculture. They developed near large landowner properties and they evolved in the direction of urbanization (Jaqueline Beaujeau Garnier, G. Chabott, 1971). Gabrielle Schwartz (citing Jaqueline Beaujeau Garnier, G. Chabott, 1971) uses for this category of transition settlements the term of "central spots", which through certain economical and commercial functions represent places of attraction for the near-by rural network. The most representative form of this kind of settlements is the fair. They represent the transfer from rural to urban, the transition from membership to non-membership which is accomplished rather gradually than suddenly. They have commercial and administrative functions. In Africa there are frequent *border fairs* situated at economic-geographic contact lines (between the desert and the savannah, between the agriculturists' and fishermen's areas).

In this category are also included the administration points from the former colonies, the settlements with commercial functions from Alaska and also some *"villages centres"* from Turkey, which through the endowments (schools, first aid centres, commercial units) polarize the villages up to 15 km distance (Jaqueline Beaujeau Garnier, G.Chabott, 1971). Approximately in the same category there are also the rural settlements from our country with supra-communal polarizing role.

The mining industry determined the appearance and the development of numerous villages, some dating from Antiquity. Their number grows in the XIX-th century with the discovery of new and various resources especially coal and oil. Those categories of rural settlements have a special evolution. At first the population working in industry lives together with the one working in agriculture. A process of massive industrial training takes place. The settlement gradually changes its functions' profile, its structure and its physiognomy and becomes a city (Jaqueline Beaujeau Garnier, G. Chabott, 1971). Examples are present in all the industrialized countries or in the developing ones where fuel and mineral resources are being exploited. Some regions went through a pre-industrial phase (Dombas, Ruhr), while others had an explosive development (Silezia, Lorena). This category of rural settlements with mining functions has a population formed of peasant-miners. According to the specialization of the workers they are called coal villages, oil villages, etc, in the geographical literature (Jaqueline Beaujeau Garnier, G. Chabott, 1971). In the former socialist countries a great part

of them have been included in the urban category. Their number is growing. They are very diverse depending on the economic profile and are spread on all continents, except Antarctica.

Besides the rural settlements with mining functions other rural settlements developed towards becoming cities like: communication junctions, rural settlements with touristic functions and those with *residential functions*. Sometimes there is a mixture of functions, especially in the case of *agro-commercial, agro administrative and agro-industrial settlements* (I. Şandru, 1970).

2. THE NOTION OF SETTLEMENT

The settlements represent human creations built in time, in different socio-economic conditions, in a continuous process of exploiting the geographic space.

These can be also defined as "*groups of dwellings and different utilities and of people that carry on their activity on a certain territory, whose aspect dependents on the socio-economic formation character and of the natural setting".*

In other words, the settlement represents *"the entire category of human groups that constitutes units of social life (from hamlet to town)"* (V. Mihăilescu, 1934).

According to DEX (1984) "*the settlement represents a group of dwellings and buildings that form a human environment".*

The first edition is complex and convincingly covers a large spectrum of the territorial and functional forms of manifestation under which the settlements present themselves as the Earth's surface.

In the case of the second definition, some categories of settlements are excluded, such as the sheepfolds, apiaries, huts and others though here a social life at a basic level is present. In addition, the economic exploitation of the space is excluded. Specific forms of social life are constituted in other circumstances such as in the huts from the mountain or deltaic areas, the Arctic and Antarctic research stations isolated astronomic observatories, farms, fisheries or the television relays placed at great distance from human agglomerations. Some of them have service functions and others exclusively production functions.

In such a context, we could define the settlement as being represented by an edifice with permanent or temporary function, inside of which social life units and productive or service activities form.

In this case there can also be included in the category of the settlements the sea drilling platforms. Things get complicated when the caves must also be included in the category of settlements, and constitute shelters for the native hunters in the Australian desert.

The settlements of the nomad shepherds are more elaborated than the ones of the hunters, due to the easy way of transporting the building materials using the animals, and also to the use in the construction of the shelters of animal products.

The kirkizian *yourts* from the Central Asia steppes are covered by felt made of goat hair, and the tungusks from the Siberian tundra build their conic tents from reindeer skin and birch bark (F. Hudson 1976).

The Eskimos use for building their *igloos* the most available construction materials: snow and ice.

The "kraal" type of settlements specific to the Zulu population from the SE part of Africa use for building their human and animals shelters the vegetation thorn for fencing and the leaves for roofs and the clay for the walls.

In the physical regions earthquakes, land slides, collapses the buildings are made of light materials (walls of wood lined with clay and the foundation on *"wood foot"* in the Sub-Carpathian Curvature) found locally adequate technical solutions (deep foundation monolithic concrete structures in Japan) are adopted.

Temporary settlements are specific both to developed and underdeveloped countries.

In the Scandinavic Peninsula and in the mountain area of the Balcanic Peninsula, the phenomenon of transhumance makes necessary to have two or more houses. *Lapps* that breed reindeers have the winter main house in the south, on the Bothnic Bay and the summerhouse in the northern areas. The long route of their herds' migration made them build halt places in which they set up intermediate houses and shelters. The seasonal migration areas generally have 2 types of settlements:

- winter settlements from the valleys, bigger and well equipped, which form compact area of permanent habitat;
- summer settlements on the high pastures, more dispersed on the territory (I. Şandru, 1970).

Military camps for training, the refugee camps and also motels and trailer camps permanently or temporary inhabited come to complete the complex picture of forms settlement on Earth's surface.

In conclusion, as an axiomatic truth the settlements have a remarkable diversity as a result of the successive active adaptation to the physical and socio-economic environment.

Most forms of inhabiting have a permanent character and they include disperse inhabited points (stations and TV relays, astronomic observatories, military camps, farms etc.), hamlets, villages and towns.

What is a human settlement? We could answer directly adopting a less pretentious logic: a settlement with human beings, a settlement of the human beings. In the international terminology, the term of human settlement is used exclusively when referring to the human communities as biological-social groups. For other beings grouped in collectivities of different size, when referring to the built place for living the term shelter is used with specific forms according to the species which it belongs to (mole in the case of ants, den in the case of mammals). From this point of view the attribute of *"human"* does not complete, but rather accentuates, strengthens the content and the meaning of the notion of settlement.

If we accept the composed term *"human settlement"*, we could infer that on Earth might exist settlements opposite to the human ones, that is *"inhuman"* or *"not-human settlements"*, inside which events and facts take place in a total contradiction to the human spirit, human nature and human aspirations. Thus, in our opinion, only the term settlement is acceptable.

Adding the word *human* is due to the fact that both in our specialty literature and in the French one, the associated name was added very early in such a way that singular pronunciation of the term *settlement* seems to be absurd of at least phonetically disturbing (les établisements "ask for" humaines).

The Anglo-Saxon geographical school uses the term alone, specifying the major type of settlement (geography of settlements, geography of rural settlements).

With all this seemingly imprecision of the term, the settlements are constituted as territorial and social-economical undeniable realities. So, what is a settlement?

Most of the definitions found in the specialized literature only partially answer to this question, due to the multitude of forms under which the habitat manifests itself on the Globe, or they make reference just to one of the major categories of habitat (rural or urban). For the French geographer Pierre George, the notion of village is synonymous with that of rural habitat. Avoiding the term of *rural habitat*, completing it with the *grouped rural habitat* he defines the last one as "*a form of basic organization of the society, which answers to the fundamental human necessities (of the man-s.n.) and it is identified to the notion of group"* (after I. Şandru, 1970).

In our opinion, regardless of the major type to which it belongs to, the settlement represents a territorial association of some specific forms of inhabiting the land, of attendance and shelter, temporary or permanent of an adjacent or interpolated land used for the production and other purposes, and a human collectivity of variable size that is organized on the principle of social life. In conclusion, as an axiomatic truth, the settlements on Earth are presented in a remarkably diversity as a result of active successive adaptation to the physical and social-economic environment. "*Most of the inhabiting forms are those with permanent character, which also include scattered buildings and farms, hamlets, villages and towns"* (after Jacqueline Beaujeau Garnier, G. Chabot, 1971).

3. THE DISTRIBUTION OF SETTLEMENTS

3.1. The Settlements Distribution in Latitude and Altitude

The repartition of the rural settlements is influenced by natural and socio-political factors. By comparison with the town, the rural settlement is more mobile (it born and dies easily). At the same time, on a great extent of the Earth the national territories are dominated by rural settlements. In altitude the settlements are encountered up to 5000 meters. Thus, in Peru the mining settlement Chupiquina is located at 5600 m altitude while the village Tok Gialung from the Himalayan Mountains is situated on the route of the Andes' railways (Lima-Oroya in Peru- 4816 m, Rio Mulato-Potosi in Bolivia- 4774 m, Arica-La Paz – 4235 m) (I. Şandru, 1970).

A series of settlements were established at high altitude for scientific purposes. The most frequent in this category are the astronomic observatories (Mont Blanc- 4365 m; Elbrus- 4250 m; Kashmir- 4130 m). At the other end there are settlements situated under the sea level such as the villages of fishermen in the Volga delta and the town Astrahan, and also those near the dead Sea with the *Town Ierihon (*on the west bank of the Jordan River).

In latitude the settlements spread from Tierra del Fuego (*Puerto Williams* – Argentina) to the north of Greenland (the settlement *Siorapaluk*, inhabited by Eskimos).

The regions with economies organized on modern and intensive basis manage to push the limits of the settlements both in altitude and latitude deep inside the natural units, the settlements expending both vertically and horizontally (I. Şandru, 1970).

3.2. The Territorial Distribution of Settlements

The configureuration of the relief may constitute an element of attraction or rejection. The settlements keep away from the region strongly fragmented, with high values of the relief energy because this constitutes a major impediment in establishing connections with other ones. By contrast, the valley zones present various advantages; the settlements form groups in strings (*the gallery corridor settlements*) (I. Şandru, 1970).

The mountain and hilly relief scatter the settlements, due to the fragmentation of the properties. The settlements are built on sunny slopes, on ridges with easier possibilities to connect with the surrounding areas. The composition of the soil often determines the setting of the rural settlements. They avoid humid grounds of the river meadows and go up on the ridges of the terraces, on the terraces and on the interfluves. In the areas with excess of humidity the hydromechanics improvements made easier the advancing of the settlements (F. Hudson, 1976). The water supplies always constituted factors of attraction for settlements. In the impermeable rocky areas, the water is everywhere, while in the permeable rocky areas the water is situated at great depth. In the first case the hydric factor determines the scattering of settlements, and in the second case it determines the concentration of them. In Holland, before building of the polders, early settlers searched for "dry points" or they raised artificial mounds, known as *terpen* for their settlements. After the construction of the dams and the creation of the polders only a few terpens remained (F. Hudson, 1976).

In the arid regions, and also in other cases the settlements keep close to the water resources.

In the United Kingdom, the spring lines determined the emergence of strings of settlements that take advantage of the permanent access to the water supply and the proximity of the agricultural field. The political elements influenced and are still influencing the location of rural settlements. In the case of plantation agriculture the new settlements of the colonists, organized on modern principles and very distinct from the indigenous ones, have appeared. The Israel continues to set up new settlements in the occupied Arab territories. In the Danube Delta, in the territories frequently endangered by floods, the buildings are set on artificial knolls. Same practices are met in the Ganges Delta.

Regardless of their category, the settlements are in a permanent mobility. The tendency of evolution of the majority of them is towards modern forms, in concordance with the hopes of the present and future time.

Looking at the map of the spatial distribution of the settlements, they appear as points of different sizes and degrees of spatial grouping. The grouping and the scattering have different causes, due to natural (lines of springs, junctions etc.) or social-historic (swarming, colonizing) causes.

All over, the spatial placement of the settlements fluctuates between the two extreme situations that of spatial grouping and that of a high degree of dispersion (Jacqueline Beaujeau Garnier, G. Chabot, 1971).

Generally speaking, there are three models of spatial distribution of the settlements:

a) *grouped distribution;*
b) *random distribution;*
c) *uniform distribution.*

In the analysis of the spatial distribution of the settlements, *the method of the nearest vicinity*, is frequently used. This is recommended to be used when the number of the settlements used in the study is minimum 30. The mathematic formula is the following:

$$R_n = 2d\sqrt{\frac{n}{N}}$$

where:

R_n – distribution;
d - the medium distance between the neighbouring localities (km);
n - the number of localities in the analyzed area;
N - the surface of the analyzed area (km²).

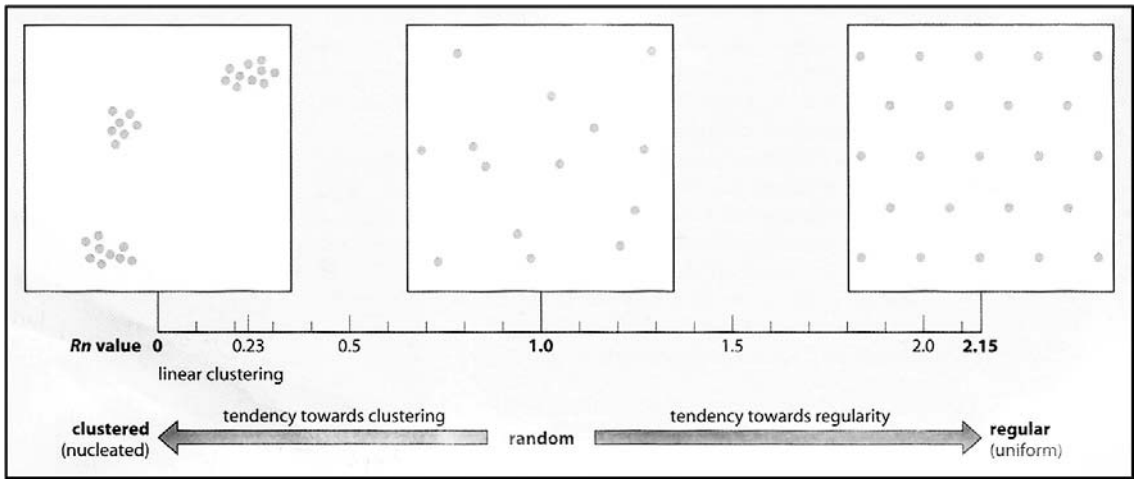


Figure 3. Models of the territorial distribution of the settlements (nearest neighbour values) *(from B. Stugren, 1982; D. Waugh, 2000).*

In the case of *grouped distribution*, the settlements gather in a limited space, forming a cluster (the dispersion value equals zero).

The random distribution concentrates in the same area settlements with grouping tendencies and those with dispersion tendencies (value 1).

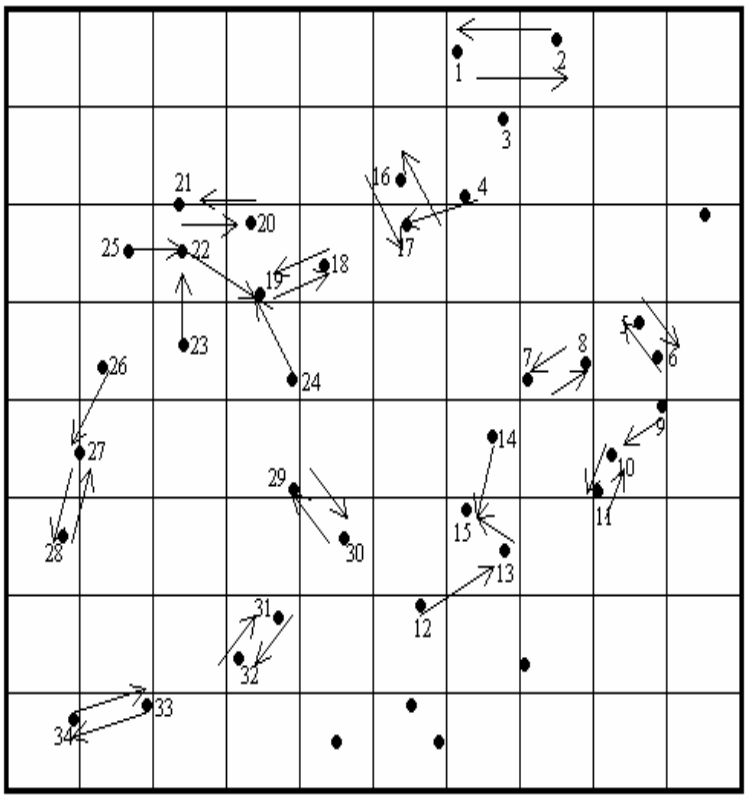
The uniform distribution represents the *"ideal"* model in the case of some *isotropic spaces* (value 2.15). In order to analyze a concrete type of distribution, 34 settlements from the west sector of Haţeg Depression (each settlement was given a number from 1 to n) have been analyzed.

The surface of the studied area is 216 km², and the sum of the medium distance between the neighbouring settlements is 68 km. In the analyzed case the distribution value is:

$$R_n = 2 \times \frac{68}{34}\sqrt{\frac{34}{216}} = 2 \times 2\sqrt{0{,}1574} = 4 \times 0{,}396 = 1{,}58$$

Using this method has some limits, like (D. Waugh, 2000):

- the surfaces must be equal in order to be compared;
- the surfaces of the areas shouldn't be very large (the largest ones exaggerate the degree of clustering and those too small exaggerate the regularity of the distribution);
- on the small scale maps it is difficult to pinpoint exactly the centre of the settlement;
- the settlements are of different sizes (population, surface etc.);
- the limits of the studied areas present a special importance (smaller spaces, relatively homogenous do not raise problems in using the formula, while when one or more neighbouring settlements are situated outside the limit of the studied area, the results are not conclusive).



Number of settlements	The nearest settlement	Distance (km)
1	2	3
2	1	3
3	4	2
4	17	2
5	6	0,5
6	5	0,5
7	8	2
8	7	2
9	10	2
10	11	0,5
11	10	0,5
12	13	4
13	15	1,5
14	15	1,5
15	17	0,5
16	16	0,5
17	19	2,5
18	18	2,5
19	21	3
20	20	3
21	19	3
22	22	3,5
23	19	4
24	22	4,5
25	27	2,5
26	28	2,5
27	27	2,5
28	30	2
29	29	2
30	32	1,5
31	31	1,5
32	34	2,5
33	33	2,5
34	34	2,5

Figure 4. The analysis of the closest vicinity (the west sector of the Haţeg Depression).

However it remains an efficient quantitative method in the comparative study of determining the "territorial order". A well known quantitative method consists in estimating the number of settlements per surface unit. For example, for our country there are 5.5 rural settlements per 100 km² and 1.1 towns per 1000 km².

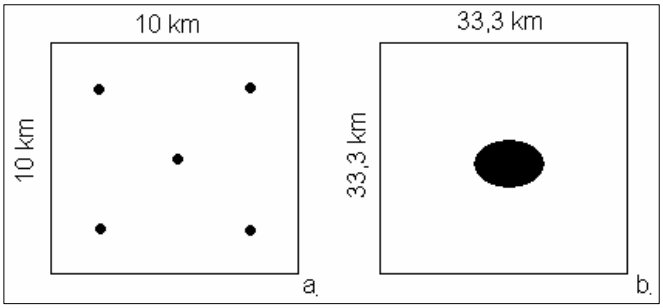


Figure 5. The density of the rural and urban settlements in Romania, per surface unit: *a. rural settlements; b. urban settlements.*

The spatial diffusion of the settlements has 4 model hypothetical situations. Case "A", linear diffusion, "B", radial diffusion, "C", diffusion in hierarchical steps and "D", a linear arborescent structure (E. Bylund, 1960, quoted P. Haggett, 1973).

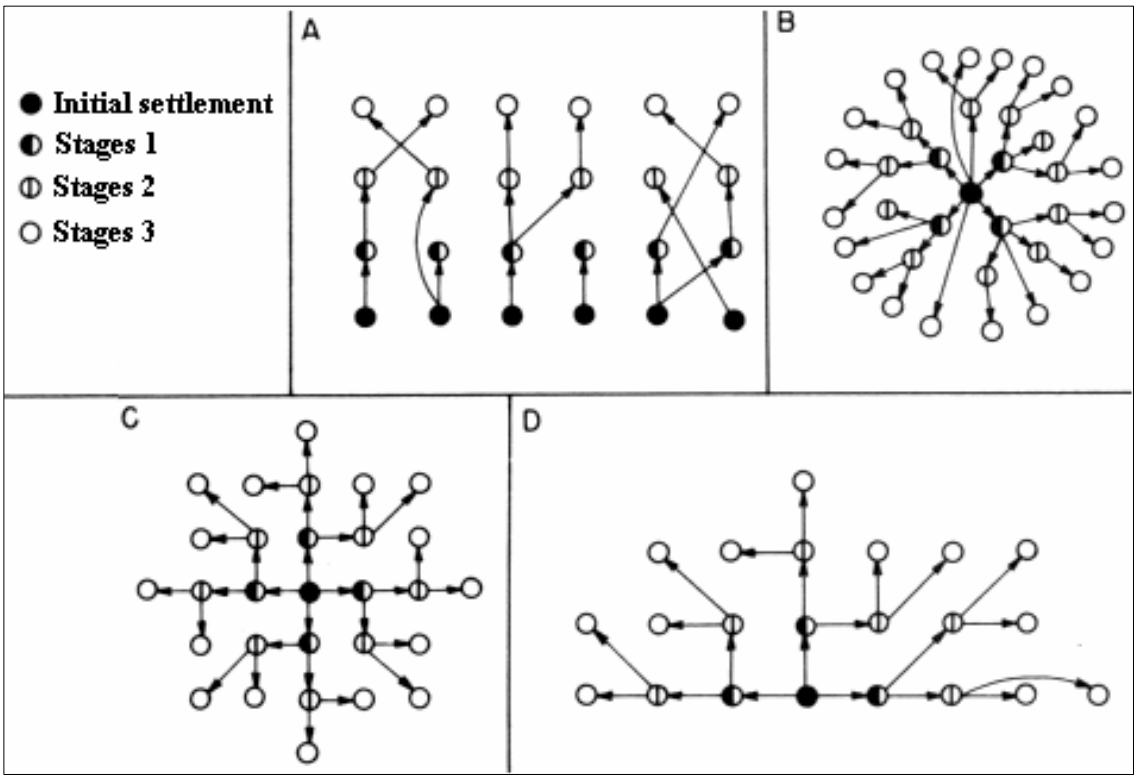


Figure 6. Diffusion models of the settlements: *(after E. Bylund, 1960, quoted by P. Hagett, 1973).*

According to the general configureuration of the land, of the historical realities, the spatial dimension and the particular situations we can highlight types of distribution close or identical to one of the model situations presented above. Isotropic spaces are suited to any model situation. The hydrographic basins constitute *"ideal patterns"* for the arborescent structure diffusion; meanwhile the coastlines *"adopt"* the model of linear distribution.

4. RURAL SETTLEMENTS (VILLAGES)

Historically the village is considered the first form of habitat of the human collectivities. Approximately 8000 years BC, at the end of the last ice age, men lived in small, nomadic groups hunting and picking, in search of food, mainly in the subtropical area of the Earth. During this period, in Neolithic, two important events took place in the life of the population:

- the taming of the animals (ship, goat, cow);
- the cultivating of cereals (wheat, rice, corn).

These important mutations in the field of the technical agriculture led to the population becoming sedentary and generated a surplus of agricultural products, process which itself constituted the main cause of the birth of permanent settlements.

These two processes (taming the animals and cultivating plants) took place approximately at the same time in territories situated at great distances (the inferior basin of the Nile, of Tiger, of Euphrates and of Indus), but which had similar natural conditions:

- permanent water in the rivers for people, animals and for the development of irrigations;
- near-by hilly areas, with pastures suitable for the growth of domestic animals;
- areas of river meadows well developed, regularly subdued to irrigations;
- fertile silts, deposited in the meadow areas, where the river overflows;
- a relatively dry climate, which maintained the natural fertility of the soil (from the climatic point of view these zones were more humid than nowadays) (D. Waugh, 2000).

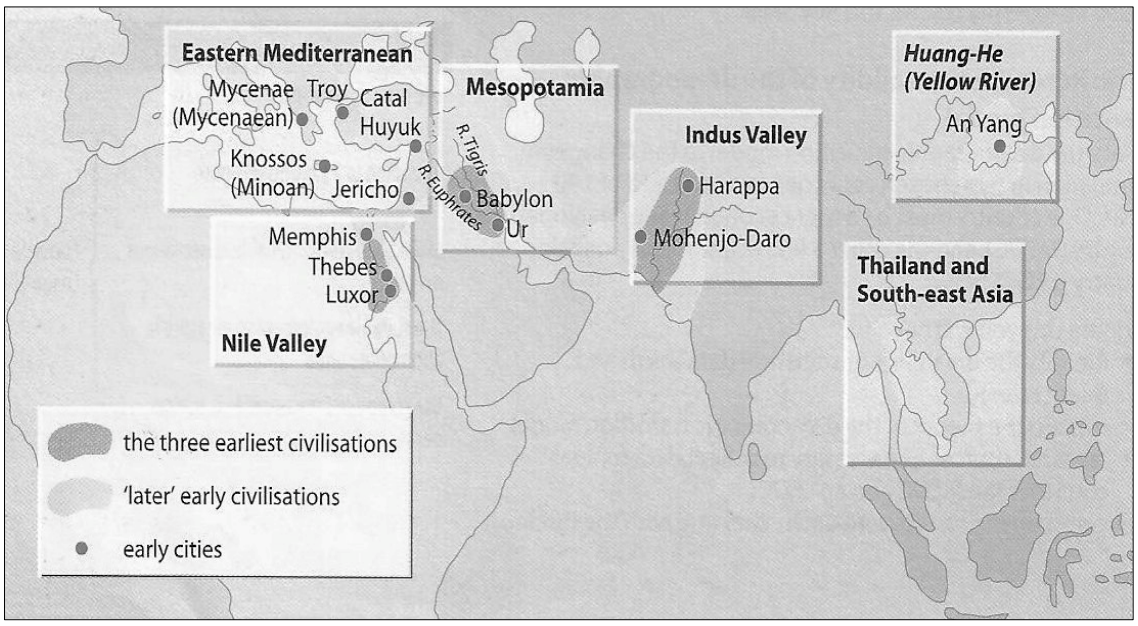


Figure 7. The earliest civilizations and towns *(after D. Waugh, pg. 388, 2000).*

Due to the rudimentary way of organizing the precincts and also to the continuous need to locate them in the proximity of the spaces with easy access to food in the early stages, the precincts migrated with the rural collectivities in search for food. This affirmation is inferred by the way the primitive populations in the equatorial area of Africa live and exploit the territory in the itinerant agriculture. That's why the traces of the early rural settlements can be reconstituted with difficulty. In our country, the traces of the oldest rural settlements are those from Habasesti-*Cucuteni culture* near Iasi (3100-2700 BC) - a fortified settlement with its agriculture land outside the fortification. In Antiquity, the village was the prevalent form of the settlement in the Danube Basin (I. Sandru, 1970). In England traces of rural settlements from the 4th millennium BC, which had meeting points for commerce and ceremonies, were found. *The daco-roman population* was mainly engaged in cultivating the land, activity that seems to have given the Romanian name for *"village"* to the rural settlements - from the Latin word *satus(um)* (ploughed land) (I. Sandru, 1970).

In the Roman colonies inhabitants were grouped in large villages called *pagi*, having in the centre the mansion of the landlord (*villa rustica*), and in simple small villages called *vici*. Traces of such settlements have been found at Ciumafaia, (Cluj County) and at Hobita, near Sarmizegetusa.

In the Middle-Age the village was composed from a mass of peasants serving the landowner, form of rural settlement which was introduced in Latin America too, where is called *fazendas* in Brazil and *estancios* in Chile and Argentina. In the present period, due to the division of the great properties due to the diminution of the central authority over the land, and also to some processes of merging real estates remarkably process of diversification of the rural settlements all over the world takes place (I. Sandru, 1970).

As it has been stated, around the world there are 2 major categories of settlements, the villages and the towns. The differences between them are of quantitative, qualitative, structural and of functional nature. Usually, the rural settlements have few inhabitants, but the number is not always and everywhere a criterion of delimitation. For instance, in our country Tusnad Bai, with a number of 1854 inhabitants (1997) is considered a town, while Babuleni, Gorj County, with over 10.000 inhabitants, belongs to the category of the large villages.

The western geographers distinguish 4 major categories of settlements: *the isolated settlement, the hamlet, the village and the town* (from I. Sandru, 1970). The distance element between *households* often plays an essential role in the determining the type of the settlement. The distance of 500-1000 m from the precincts of the villages can constitute a criterion of delimiting a new category of settlement and when the distances between households are bigger than 2 km, they are considered isolated settlements.

The names of areas with isolated settlements are determined by the frequency of certain surnames, by the grouping tendencies to a central point, to the name of the place, to the name of the rivers, etc. in the North America, the isolated settlement is called *ranch*, in Estonia *hutor*, and in Hungary *Tanya* (I. Sandru, 1970). In our country, according to the spatial placement, it has specific names (*hodaie*, in the Transylvanian Plain, *crang* in the Apuseni Mountains and *conac* in the Bumbesti Plateau).

From the point of view of the demographic and the endowment potential the hamlet made of small groups of houses is situated at the inferior limit. It is called *weiler* in German, *hamlet* in English, *hameau* in French and *aldeo* in Spanish (I. Sandru, 1970).

The demographic size of a hamlet is closely connected to the medium size of a rural settlement. For instance, in the countries in which the medium size of rural settlements is over 4.000-5.000 inhabitants, the hamlet can be considered as being the settlement with less than 500 inhabitants. In our country, where the medium *demographic potential* of a rural settlement is approximately 775 inhabitants, the hamlets regularly have a demographic potential of less than 50 inhabitants.

Due to the functions and the degree of comfort, the groups of weekend and holidays homes, have urban attributes in contrast with the nearby hamlets, which have all the qualitative and functional attributes of an *authentic rural.*

Only one German person inhabited *Steierdorf* village near Anina in 1995.

In the case of Apuseni Mountains, mainly in the superior basin of Aries river, the presence of *very small villages* (fewer than 50 inhabitants) is the general rule. *Brebu Nou*, a commune from the Semenic Mountain, Caras-Severin County, had in 1997 only 123 inhabitants, while Voluntari commune, Ilfov County had 27.000 inhabitants in the same year.

Besides the demographic component, the quality of the rural space can also be perceived through its infrastructure and ecological hypostasis. Usually in addition to fewer inhabitants, the population of the villages has a lower educational level and a weaker economical power than the city. *"The* peasants occupy the periphery of the modern economy world" (P. Knoks and J. Agnew, 1998).

Furthermore villages have weaker territorial and professional mobility. In many cases the clothes preserve the regional and local characteristics, and embody those elements of specificity, which besides the language, distinguish the nations among themselves.

The rural settlements regularly have fewer and less diversified utilities and equipments in addition to a reduced communication potential.

In the poor countries running water, electricity and telephone remain an unfulfilled desiderate, while the physical effort prevails in the working processes.

The ecological hypostasis of the rural derives from its capacity to preserve and reconstruct the natural setting, as a result of a reduced anthropic pressure, associated with the type of economic exploitation and the general level of development of production forces. The extensive cultivated fields, the absence of main means of communication, the insular presence of the small built structures and of herds of cattle, definitely reveals the presence of the rural. To this we can add the reduced density of the built space and of the population. Generally, *traditional villages* are characterized by the presence of one story buildings and the strong physical mark of the area they are located in due to the use of "natural" building materials from the surroundings. In contrast, in the villages of developed countries the quality of the inhabited space does not differ much from that of the town. In the rural settlements, around homes there are other types of buildings (shelters for animals, for agricultural technique, for fodder and food), which in the case of towns they are missing. As a way of life, the rural is definitely detached from the town. The rhythms of life and labour are subordinated to the *biological laws* that determine their cyclicity and seasonality characterized by different levels of intensity. The cyclicity and the seasonality of labour create a specific way of life that has more differences than similarities with the urban way of life. As a social structure, most of the rural population is formed by peasants. The Census Bureau in the U.S.A. divides *non-urban population* into two categories: *"rural farm"* and segments and localities in which mainly primary activities take place, while "*non-farm rural"* is represented by settlements with mostly residential and industrial functions.

According to I. Wibberley (1972), by Clout (1972) *the rural "represents those parts of the country that undoubtly show signs of an existence dominated by the use of land in present time or in the recent past".*

Miller and Lulof (1981) quoted by J. Bonnamour (1993) shows that the notion of rural is *"conventionally used, symbolizing a delimitation of geographical areas characterized by scarce population, scattered and relatively isolated from the influences of the great metropolitan centres".*

Simion Mehedinti mentions that "*the villages are groups of houses and people that obtain their means of living from a space determined by the borders of their own or collective properties of that rural community".*

Confusing situations appear when we try to delimit the hamlet from the village. There isn't criterion of delimiting the two types of settlements. Neither the number of persons nor the number of houses is precisely established.

Usually in the *hamlets* the buildings are fewer than in the villages. These hamlets have a smaller population and rarely have churches, shops, and stores. Their potential of communication is also reduced. Strict differences between hamlets and villages regarding the number of population are easily outlined when examining particular areas.

For instances, the population of a hamlet in the areas dominated by large villages can reach up to 500 inhabitants, while in those with small villages are frequently those with a population under 10 inhabitants (F. Hudson, 1976). Often, between the village and the hamlet there is an equality sign (the case of the hamlet - villages called *cranguri* in the Apuseni Mountains). The hamlet is regularly less compact than the village and has a smaller demographic potential. In most of the cases the *term village* is associated to the base activities of the primary sector. But we also meet numerous situations in which the villages have mining, industrial, touristic and residential functions.

The villages with mining functions regularly have an ugly physiognomy in contrast to the fishermen villages or those with touristic function. *It is estimated that in the world 2 out of 3 inhabitants live in villages, hamlets or dispersed settlements.*

However, the "rural" and "urban" terms are imprecise, the way they manifest at the national level being decisive in differentiating them. (V. Surd, V. Zotic, 1998). The questionnaire filled by the participants at the International Conference "Rural Space and Regional Development", 1998, Cluj-Napoca - Micești synthesizes the definition of the rural settlements *"as smaller settlements where the largest part of the population is occupied in the primary activities"* (V. Surd, V. Zotic, 1998). The historian I. S. Nistor from Cluj defines the village "*as a relatively complex socio-territorial category formed of an agglomeration of houses and dependencies (the village precinct), and of a territory where agriculture production is obtained* - called in our country the "hotar" or "moşia" or "mereaua"- the estate. " *The village as a community represents in its essence only a natural association of several families, connected among them through vicinity relations, blood relations too, its birth being a result of the need to socialize on one hand and on economic reasons on the other hand. Spontaneously*

appeared, the village represents the embryo of the society and the fundamental constructive element of the social organization. It preceded the birth of state and its social and communitarian existence preceded its juridical recognition" (after P. Negulescu, R. Boilă, Gh. Alexiano, quoted by S. I. Nistor, 2000). Natural forms, the villages are real live cells of the state organization, that have their own life and traditional personality. We need to mention that any social group born from a deep feeling of cooperation reveals the existence of an organization. Due to the fact that in this organization is reflected the entire mentality of a nation, it is the mirror of its civilization (by D.N. Codreanu, quoted S. I. Nistor, 2000).

Summarizing, the rural, can be defined as an association of physical spaces of variable extension, of population and of specific forms of inhabiting found at different stages of evolution, whose mainly economic functions are the primary ones. (V. Surd, 1993. In a concise expression the rural signifies "the opposite of urban"(J. B. Garnier, G. Chabot, 1971).

Due to economic and political reasons, the delimitation between the urban and the rural, the villages and the towns is made on the basis of appointing the affiliation or non-affiliation. The distinction between settlement and locality is an administrative one.

Localities are settlements with administrative status. Hamlets, isolated farms, etc are not localities. They are settlements, because they do no have an administrative status.

4.1. The Components of the Rural Habitat

A rural habitat is composed of three elements that are in connection and that function on systemic principles, namely: the population, the precinct, and the estate.

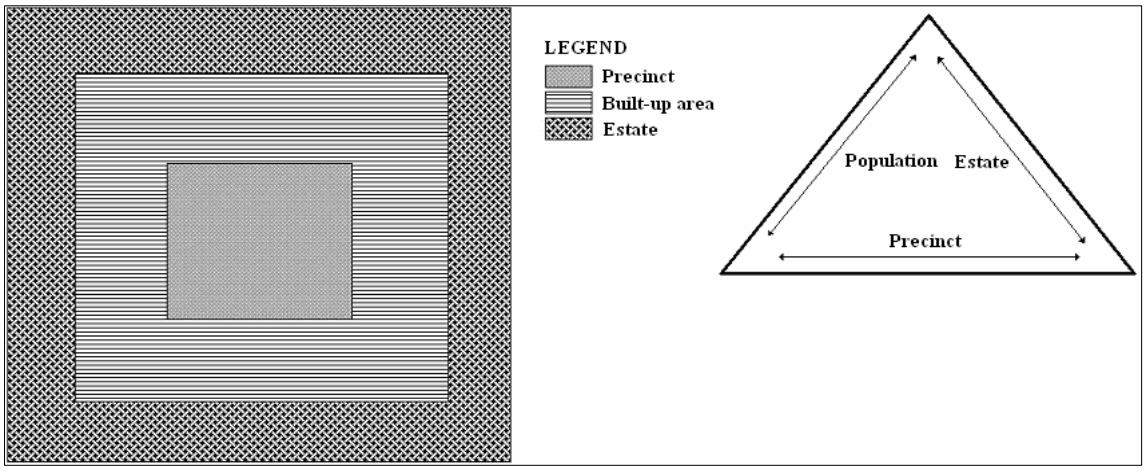


Figure 8. The graph of the components of rural settlements.

The population represents the dynamic component of the rural settlement, and through its action organizes the precinct and the pertaining territory.

The precinct represents a segment of the rural space organized in order to answer to the needs for shelter and recreation of the working force in its broadest concept meaning. In most cases the precinct also plays a secondary role in production.

The estate represents the economic support of the rural settlement. It is permanently under important functional and structural mutations dictated by the needs of the rural communities or by the major type of economy. Usually, the territory is connected to the precinct without discontinuities. However there are some deviations from the rule, sometimes the precincts are situated at long distances from the entire or part of the territory. In such cases, between the precinct and the estate, the territory of other localities is interposed (for example, the case of some rural localities from the border of Slovenia that have parts of their territory in Austria). The compact built-up area represents the land that belongs to the precinct of the settlements, approved according to the General Plans of Urbanism (P.U.G) for the extension of the precinct and for placement of other endowments of public interest (households, economic units, storing spaces, water tanks).

Outside the built area (the estate) represents the rest of the administrative territory of the locality and it is operational.

Regularly, the surface of the territory of a rural locality is direct proportional with the size of the population. However this rule suffers numerous exceptions. In the areas with fertile soils and intensive agriculture, a numerous population owns a small estate. In mountain areas, with poor soils and extensive economy a smaller population reclaims more extended agriculture and forestry hinterland. The same thing is valid for *hunters' settlements*. *The hinterland* (the estate) *of the fishermen settlements* is complemented by a variable extension aquatic property. *The size of the village* reflects its own natural, social and economic environment.

4.2. The Cognitive Model of a Rural Settlement

To emphasize the intimate relations between the components of a rural settlement, a set of variables is chosen for each component and the possible connections among them.

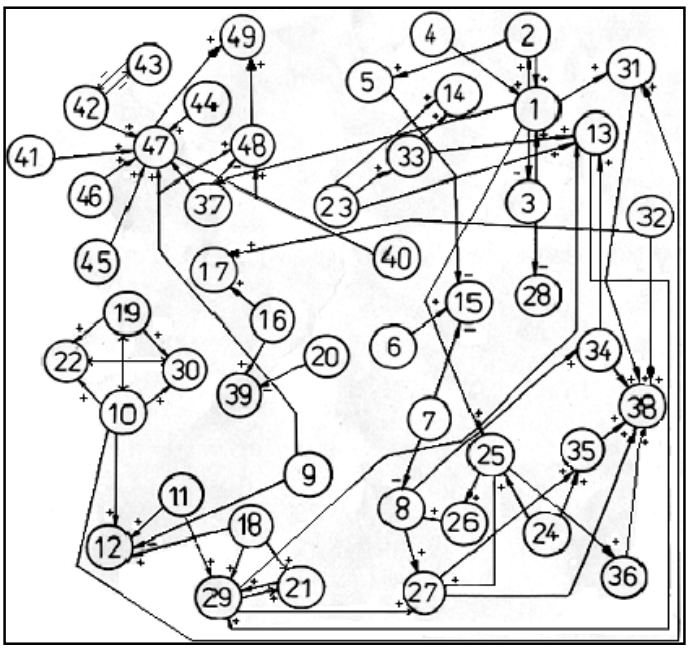


Figure 9. The cognitive model of a rural settlement: *1. Number of population; 2. Birth rate; 3. Death rate; 4. Natural increase; 5. Population between 0-14; 6. Population between 15-64; 7. Population over 64; 8. Total active population; 9. Active population in agriculture; 10. Active population in services; 11. Active population in industry; 12. Index of non-agricultural activities; 13. Commuting- inputs; 14. Commuting- outputs; 15. Dependency ratio; 16. Total surface of the locality; 17. Surface of the precinct; 18. Value of fixed funds from industry; 19. Value of fixed funds from services; 20. Surface of built and non-productive lands; 21. Efficiency of; 22. Fixed funds of industry; 23. Efficiency of fixed funds of services; 24. Communication potential; 25. Water supplies; 26. Number of households; 27. Density of buildings in the precinct; 28. Index of buildings' renewal; 29. Number of uninhabited dwellings; 30. Value of industrial production; 31. Value of the services provided; 32. Value of sold goods; 33. Utility potential; 34. Number of buses per day; 35. Number of cars; 36. Number of houses with bathrooms; 37. Housing potential; 38. Food consumption per person; 39. Living standard; 40. Size of the estate; 41. Value of fixed funds from agriculture; 42 .Climate potential; 43. Surface of agricultural land; 44. Surface of forestry; 45. Level of mechanization; 46. Level of fertilization; 47. Index of soil potential; 48. Value of vegetal production; 49. Value of animal production; 50. Capacity of biological sustainability.*

In our case the set of variables for population contains 15 indexes, for the variables inside the precinct 24 of indexes, and for the estate variables, 10 indexes, in total 49 indexes.

Depending on necessities other indexes can be studied for each variable. The "+" sign indicates relations of favourability and the "-" sign indicates relations of restrictions, of negative conditioning.

4.3. Rural Population

Approximately half of the world population lives and carries out activities in rural settlements. Usually *the size of rural settlements* is dictated by their demographic potential. Under this aspect, we meet a large scale of rural settlements; the big, medium and small term has only a role of comparative estimation. The specialized working organism of U.N.O applies *the principle of the maximum generalization* taking as a limit the value of 20.000 inhabitants for differentiating the rural from urban. *The criteria for delimiting the rural and urban in the world have* a pronounced national character.

Taken into consideration are quantitative, political, administrative, economical and territorial criteria. For instance in France, Portugal and Argentina any settlement up to 2000 inhabitants is considered rural, and in USA and Thailand the limit is of 2.500 inhabitants. In Spain and Greece the limit is of 10.000 inhabitants, in Canada, Malaysia and Scotland of 1.000, in Iceland of 300, and in Denmark of 250 inhabitants. In Panama all the settlements with a population up to 2.000 inhabitants are included in the category of rural. If they are provided with running water the number is reduced to 1500. In Israel there are included in the category of rural only the localities that perform specific activities of the primary sector, while a great number of countries from Latin America (Brazil, Bolivia, Costa Rica, Ecuador, Salvador, Honduras, Nicaragua etc.), include in the category of rural settlements those that do not have administrative points regardless of their size.

In a great number of countries the belonging to rural or urban category is decided by the government on basis of complex classification criteria (Bulgaria, England, Finland, Japan, New Zeeland, Norway, Poland, Romania, Sweden, African S.R.). Generally, in Russia, the rural settlements have a population under 12000 inhabitants (J. B. Garnier, G. Chabot, 1971, F. Hudson, 1976).
Difficulties in delimiting the two categories get bigger from a numeric point of view in situations like in the USA where there are 2 categories of rural: *farm rural* and *non-farm rural.*

In the category of rural population is also included the population that practices *non-agricultural professions* that are in the service of rural population. There can be rural people that practice non-agricultural professions in the service of regional economy or rural people that practice non-agricultural professions in the neighbouring towns (the commuters). In the powerfully developed countries rural population is not a synonym to the agricultural one. For example, the rural population of Great Britain is approx 7% of the country population, but only 3% works in agriculture. Same thing is valid for other countries like Germany or USA. In the countries where the primary sector predominates, the population exceeds the housing capacity of the villages, thus a great part of the agricultural workers are actually living in towns. In Portugal 50% of the active population works in the primary sector, out of which 40% lives in villages. In India out of 80% active population in the primary sector, only 72% live in villages, and in Brazil out of 70% only 58% live in the rural areas (J. B. Garnier, G. Chabot, 1971 – data must be cautiously interpreted, taking into account the fact that it is *"perishable"*).

Operational classifications of the *demographic potential* are generally made at regional and political administrative level, the value of the intervals and the number of classes is established according to the minimal and maximal value and also according to the frequencies of certain categories of size in the statistic line, designates the demographic potential of a limited number of rural settlements. Generally, these classifications are subordinated to certain purposes.

From a demographic point of view, the settlements present more of a heterogeneous character than homogenous one; they are similar through the structure of the population and the way of life. The rural is defined by the presence and dominance of *primary functions* (agriculture, forestry, fishing etc). In connection with these functions a specific way of life emerges, deeply rooted in the natural evolution of the processes and phenomena with a productive character. For instance, in the temperate zone, the labour has a higher intensity during the warm period of the year and slows down during the winter period. The breeding of animals requires a continuous effort, while cultivating the land offers the chance of temporary breaks. The work goes on all day and sometimes during the night too.

Usually the level of education of the rural population is inferior to that of the urban population. Compared to the urban population the rural one enjoys only a small number of services. At the same time, the rural preserves in a great extent the zonal, regional and national material and spiritual characteristics.

All these translate themselves in a specific form of behaviour. As a rule the rural population is less developed economically than the one in the cities: *"The rural population occupies the periphery of the modern economic world"* (F. Hudson, 1987). In the present period, in the developed countries the rural and the urban come closer to each other; in some of them the latter is almost dominant.

4.4. The Precinct

It often constitutes the component of the rural settlements to which most of the studies regarding the territorial planning are concentrated. The actions start from the precinct, that plays the

real role of *"a headquarter"*. Remodelling actions start with the precinct and are transmitted over time with different intensities on the territory. *The functions of the precinct* are complex, the essential ones- as we showed above – are those of shelter and recreation for the working force.

Environmentally speaking, the precinct is the most striking presence in the rural areas. It can be defined as a concentrated expression of the economy of the rural space. The precinct concentrates the houses, the animals' shelters, storage spaces and a certain number of utilities of different types and ranks. As a rule, it is organized in order to correspond to the social and economic need for which it has been created. For the rural settlements, the term precinct represents the area occupied by the houses and utilities, to which are also associated non-built spaces with different uses, inserted in the built space and adjoining gardens. The last one may be missing in the case of hunting and fishing settlements.

The shape and the dimensions of the precincts know a large range of territorial manifestation, which is a result of a sum of factors, either singular or in competition (the shape of the relief, water supplies, quality of soil, type of land property, network of roads, etc).

Taking into consideration the shape of the precinct there are two categories of rural settlements generally accepted:

- villages with regular shape of the precinct;
- villages with irregular shape of the precinct.

Villages with regular shape of the precinct present an outline of the precincts identical or similar to regular polygons. They are recently built and are part of controlled form of occupation of the territory. They are also called "geometrical villages". The cosmographic vision of the primitive populations has a great impact on the geometrical shapes of rural settlements, resulting in precincts with rectangular, square, triangular and circular shape. In most cases the precinct with precise geometrical shape betrays planned actions. The preservation of the precinct shapes is either due to previous experience, or to physical constraint.

Villages with irregular shape of the precinct are defined as those villages that present an irregular polygonal shape of the precincts. They are the most frequent. Through localization, organization and extent of the precinct, most of the time, this type of village betrays a spontaneous way of occupying the space.

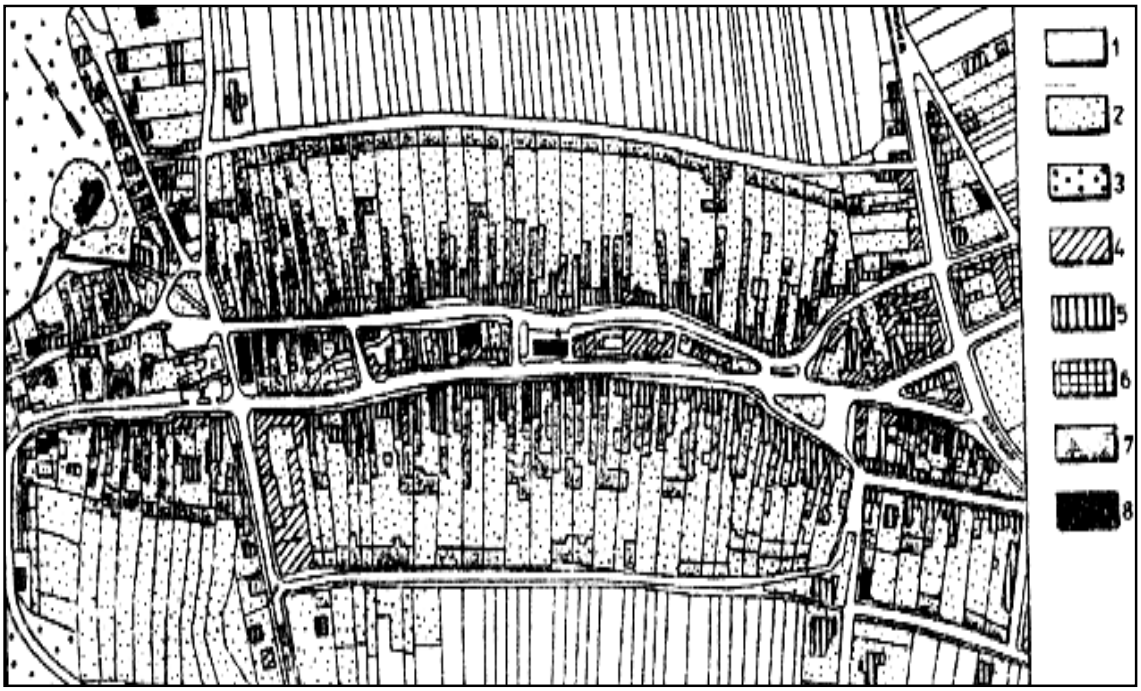


Figure 10. Village with regular shape precincts *(after Westermann Weltatlas, 1987): 1. Arable land. 2. Gardens. 3. Forest. 4. Public interest areas. 5. Buildings. 6. Green spaces. 7. Fences. 8. Public interest utilities (endowments).*

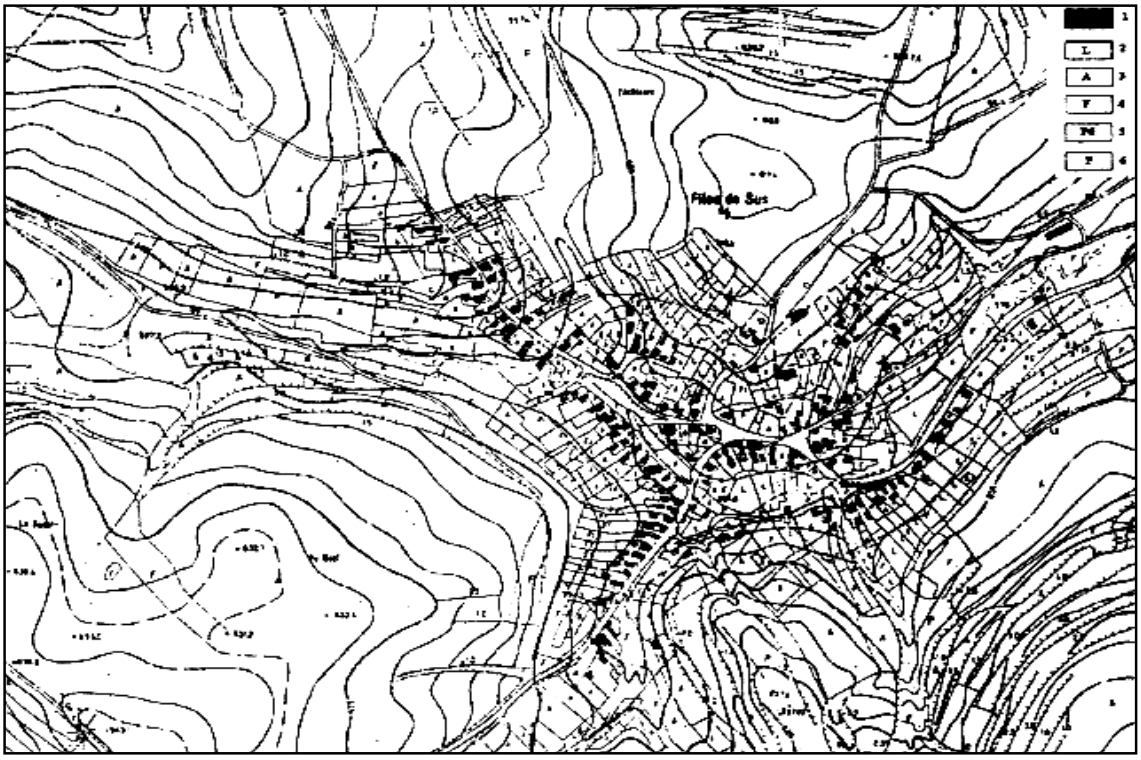


Figure 11. Village with irregular shape precinct: *1. Buildings. 2. Orchards. 3. Arable land. 4. Hay-field. 5. Forest. 6. Pasture.*

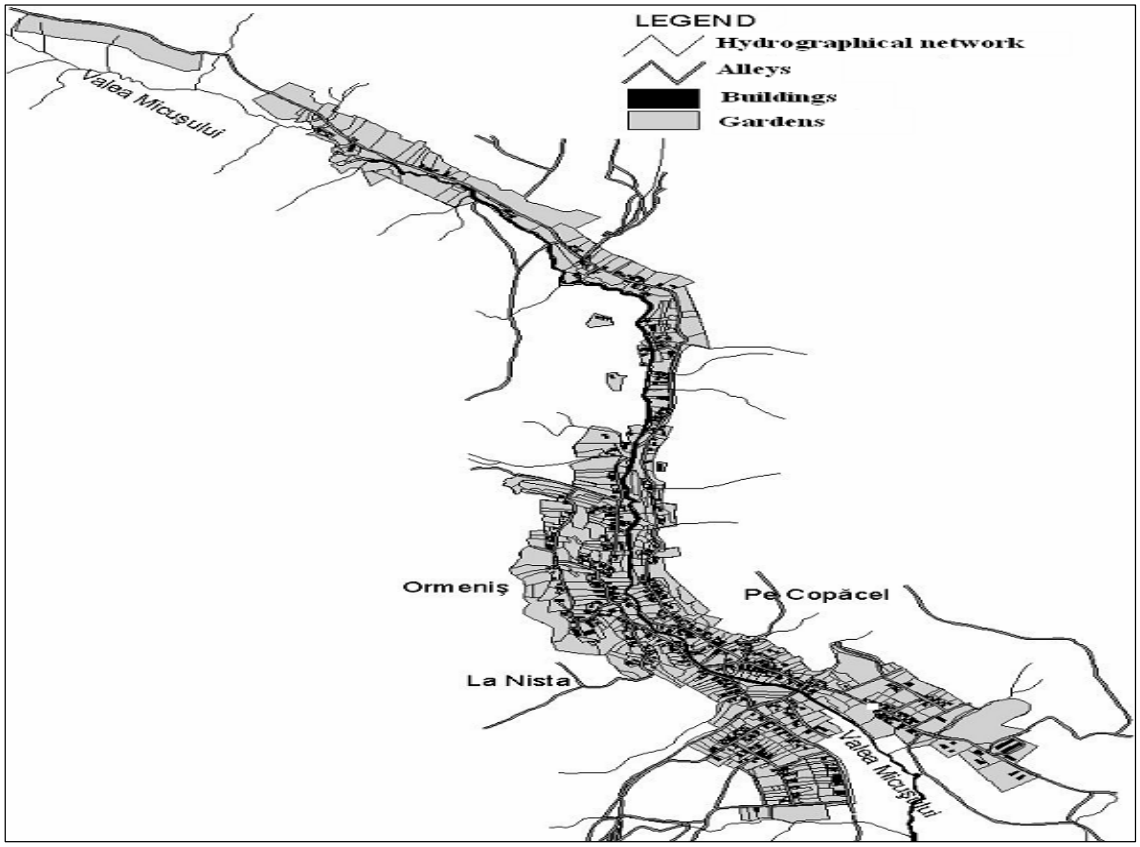


Figure 12. Villages with linear shape.

Furthermore, villages with regular shape are subdivided into:

- linear;
- square;
- circular;
- triangular.

The shape of *linear villages* is determined by the relief, hydrography, means of communication, the lining of the plots, etc. Thus, the linear village can appear at the basis of a slope, on the ridge of a hill, along a cleared forest (*Waldhufendorf*), along a road (Strassendorf), along a channel or dam, along a river, at the periphery of a plantation, along the shore or on deltaic sand bank.

The villages located along communication network, the flood dams, along the rivers, channels, bridges of the terraces, on the prolonged hills or along the shores also generally have a linear shape. *"In the Danube Delta, the river's sand banks (longitudinal ones) shelter villages with a linear shape of the precinct"* (I. Popovici, 1973).

Villages with a square form of the precinct are usually planned being a result of the colonization or regrouping processes due to large human interventions (like Hydro-energetic systems).

Villages with a circular shape of the precinct have houses grouped in shape of a circle; this way constructing has as basis defence reasons. The specialized literature frequently gives as an example, the type of village called kraal from the central-south sector of Africa, where the houses are arranged in shape of circle, sheltering in the central area the livestock during the night. In our country, such villages are found in Banat; the Germans build them in the XVIIth century.

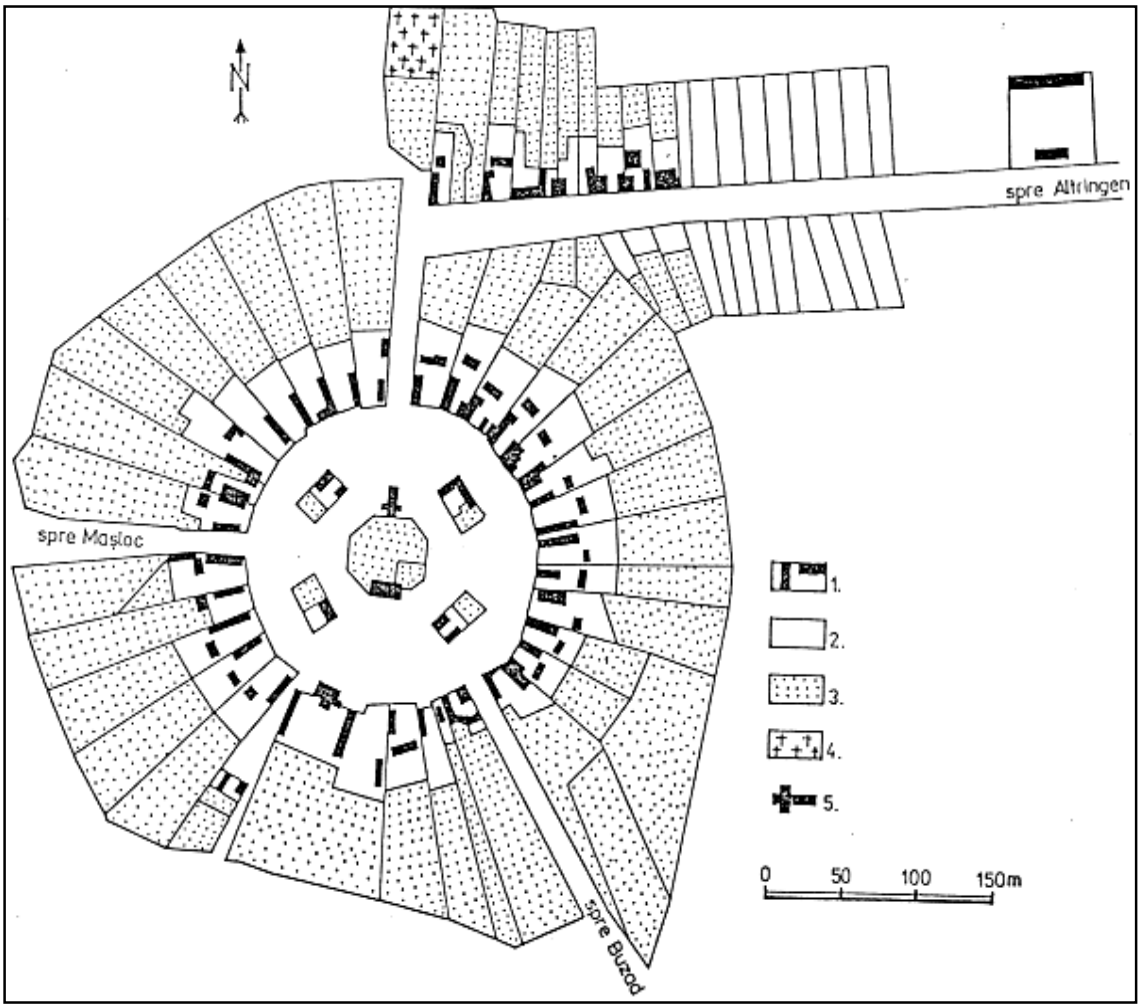


Figure 13. Village with circular shape, Charlottenburg, Timis County: *1. Buildings. 2. Yards and public places. 3. Orchards. 4. Graveyard. 5. Church (after Adriana Iuhasz, 1999).*

These villages are found in Amazonia, too; from each house there is a path towards the centre of the village, used for public reunions.

Villages with semicircular shape are found in valley sectors with well-developed meanders or in the central part of the dolines in limestone areas. The circular and the square shape of the precinct also have their origin in the cosmographic vision of the primitive nations. Thus, the *oseatiac population* of hunters and fishermen from the inferior course of Enisei river see the territorial reality on the basis of a cosmography similar to the geographical reality. This (the geographical reality) has been transformed in order to be given a vertical dimension.

For this population the centre of the Universe is the Enisei River, viewed as holly water. It springs from *"heaven"* and flows through *"the centre of the earth"* to *"hell"*. From such a vision it resulted the rectangular shape of the settlements that they build. For *the Indians* from New Mexico the earth is the centre and the most important component of the Universe. The Sun, the Moon and the stars are *"accessories"* of the Earth. Their role is to make life possible for humans on Earth. In their vision, the Earth has a square shape and the cardinal points are known.

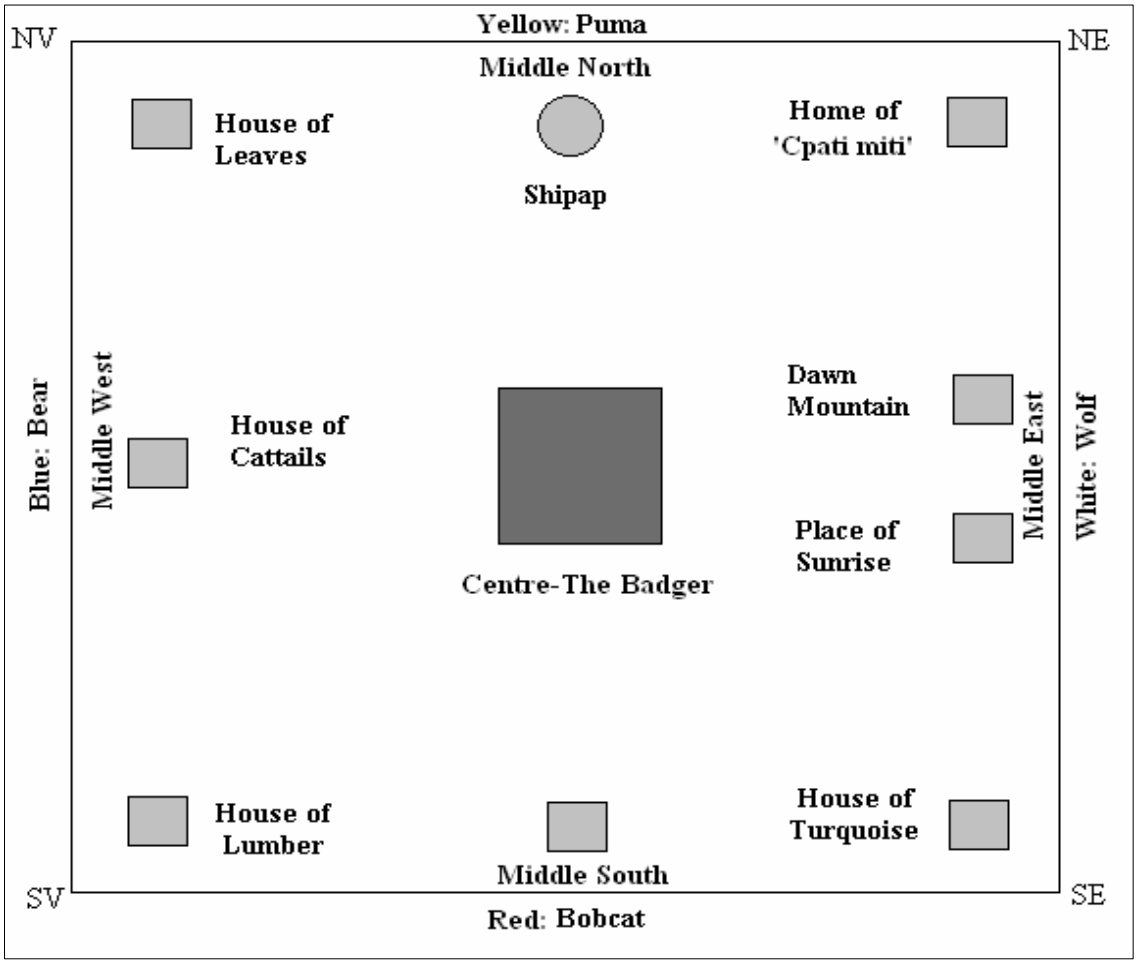


Figure 14. The image of the world in the Keresan Pueblo Indian tribe *(after I. Tuan, pg.33, 1974).*

The traditional Chinese ethnocentrism imagines the world as made of successive squares, growing towards exterior, where the square in the middle represents the centre of the empire.

The Yurok Indians from the north of California imagine the *"World"* as a circle and through its centre flows a river rich in fish, the river being also *"a mean of transport"*. At the edge of *"the World"* the immensity of the ocean in a circular shape extends.

On the well developed and rich in water supplies alluvial fans, triangular-shape settlements developed. A good example of this is represented by the settlements on the Gail valley from

Karinthaia (Austria), where the left tributaries have generated a string of alluvial cones, most of them being occupied by villages in an effort to avoid humid and partially swampy meadow sector.

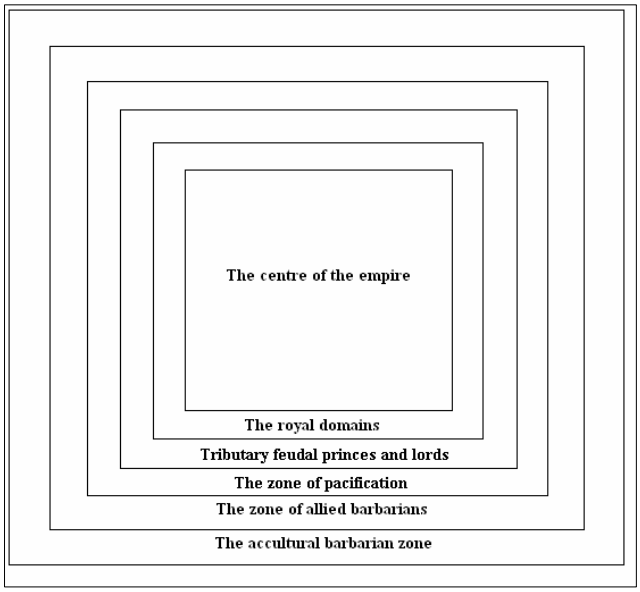


Figure 15. The Chinese traditional ethnocentrism about the world (the XVth century B.C.) *(after I.Tuan, pg.38, 1974).*

The river junctions often generate *triangular-shape* precincts, as a result the settlements have a good hydro potential, but also frequently are exposed to floods. Road intersections also generate triangular-shape precincts.

The precincts are of different types depending on the purpose they were built for. Thus, we differentiate among settlements for working, settlements as reinforcement points for carrying on some productive activities, settlements as defence points, settlements for recreation and leisure.

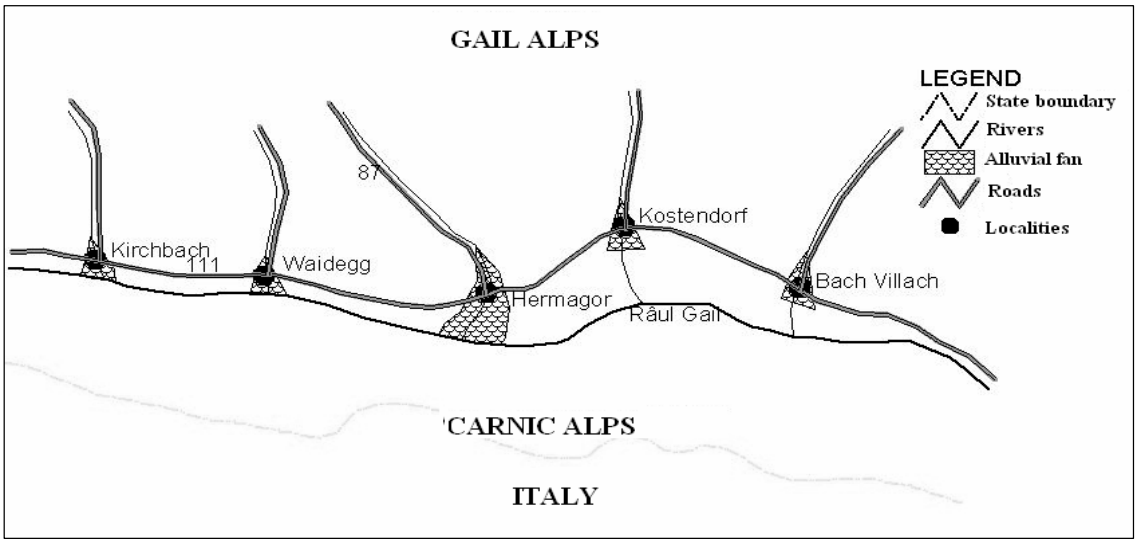


Figure 16. Village with triangular-shape precinct, developed on alluvial fans (Gail Valley Austria).

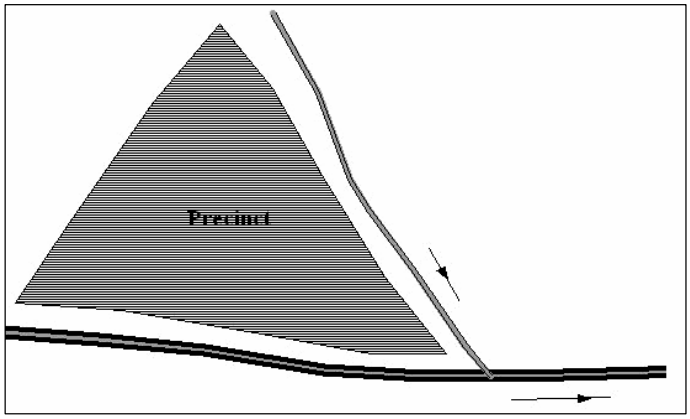


Figure 17. Village with triangular-shape precinct, at river junctions.

The settlements for working are divided into two categories: permanent settlements with permanent buildings and temporary settlements with mobile houses. The settlements are also differentiated according to the technical character of placement, the building of the precincts and according to the territorial extension.

Thus, we differentiate among settlements located in areas with favourable natural conditions and settlements that appear due to special territory planning (dams).

Rural settlements built for defence purposes are rare and tend to disappear. In such cases people searched for the most favourable natural conditions: promontories, acropolis, swampy areas. In the developing countries there are few measures and actions taken when building settlements (family, tribal) generally resulting in *dispersed settlements.*

In the regions with advanced economy the measures taken against natural disasters have a general character, which creates the *conditions for grouping the settlements* and for using some building materials that insure the security of the population. Usually, the building materials in the rural areas are supplied at the local and regional levels. Regarding this aspect, *buildings in the precinct* can be made from plant parts (wood, cane, reed, straw, leaves, tree rind, etc), from clay, stone, ice, cement and brick.

We can talk about a zoning of construction materials for precincts: vegetal products at equator, a zone of clay and stone houses in the dry tropical area (Sahara, Arabian Peninsula) and of snow and ice houses in the Polar Regions. This zoning disappears or is considerable reduced in the developed regions where besides the vegetal components (like wood) artificial ones such as lime, cement, brick, glass, and iron are used.

According to the layout of the precinct, we can identify mononuclear and multi-nuclear villages. The concentration nuclei have their genesis in the Middle Ages fortifications or in the placement of different rural utilities and also in the restrictions imposed by the existing relief.

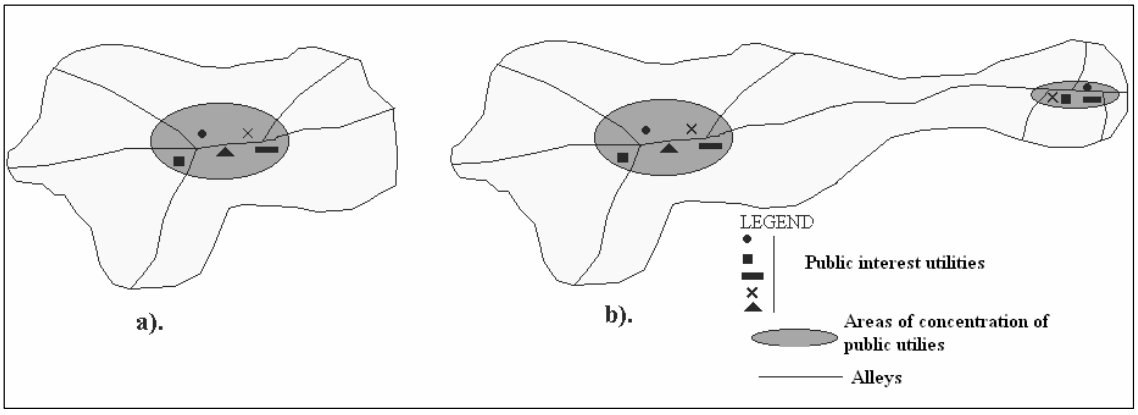


Figure 18. Precincts of (a) mononuclear and (b) multi-nuclear villages.

The structure of rural settlements. According to the concentration degree of the built components inside the precinct, we can distinguish three major categories of rural settlements:

- rural settlements with nucleated structure;
- rural settlements with spread/loose-knit structure;
- rural settlements with scattered/dispersed structure.

Due to the various forms under which the three structures manifest in the territory, it cannot be established quantitative thresholds from one type of structure to another.

Rural settlements with nucleated structure are characterized by an increased spatial concentration of buildings in the precinct. Regularly, when over 50% of the precinct is occupied by buildings we talk of a nucleated structure.

In many cases the nucleated structure is associated or is substituted by settlements with compact structure when the built area is not dissociated under territorial aspect.

The concentration is dictated by many reasons:

- to preserve agriculture land;
- to improve defence and protection
- capitalizing and exploiting some deep water resources, which may require joined efforts and similar needs for everybody;
- politics of clustering the hoses in the precinct;

- social and historical causes;
- crossroads;
- the tendency of the population to live in groups.

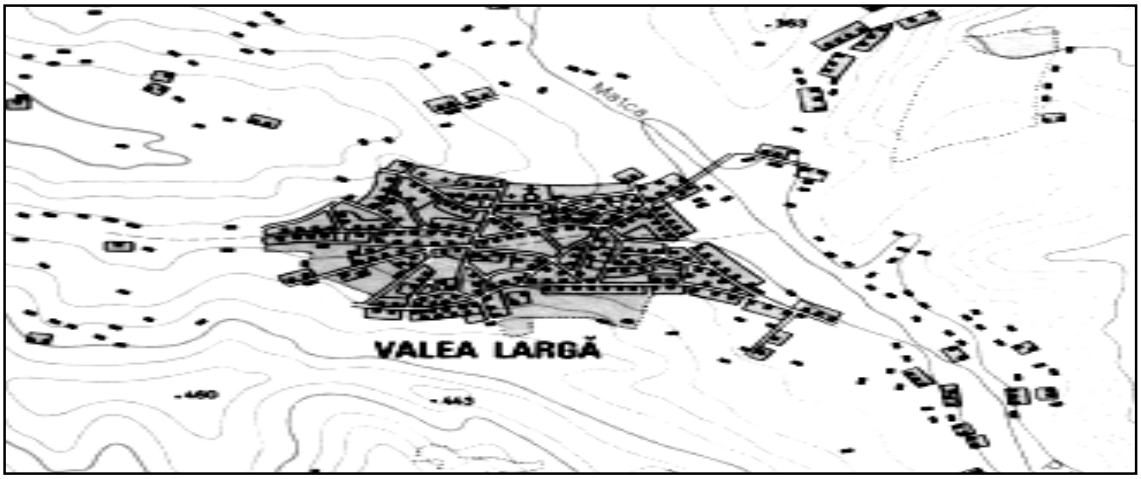


Figure 19. Rural settlements with nucleated structure *(after SR Romania Atlas, 1978).*

Rural settlements with loose-knit structure have as a common characteristic the insertion of some agricultural land among the built structures. The agricultural land represents approximately 10-20% of the surface of the precinct.

In many cases, we see an association: rural settlements with a nucleated structure, that have towards the peripheries of the precincts a loose-knit structure. They have a high frequency in our country.

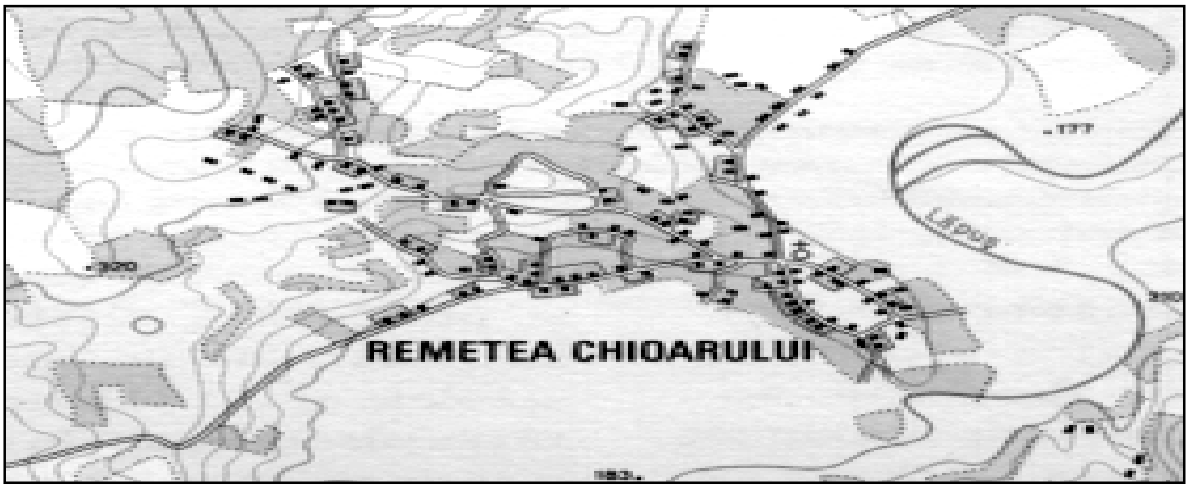


Figure 20. Rural settlements with loose-knit structure *(after the SR Romania Atlas, 1978).*

Rural settlements with loose-knit structure In this case the precinct of the village is scattered all over the territory of settlement. We see at a "multinuclear transfer" of the precinct through an apparent chaotic occupation of the entire village territory. Generally the households and especially other built spaces are situated at quite great distances from one another. We see appearing in these kinds of settlements concentration nuclei as a result of having a minimum of common interest utilities (endowments). The dispersion is generated by numerous causes, among which we mention:

- the reduced productivity of the soil;
- the demographical swarming process;
- the dividing of big properties, doubled by land reforms (distribution of land to peasants).

In the case of poor soils, especially in the mountain areas, there is a need for larger land properties in order to insure enough food growth. The difficulty of access and the long distances determine the placement of houses in certain points in order to ensure the best economic exploitation.

Demographic swarming due to the *"overpopulation"* phenomenon usually takes place through a demographic transfer in other localities, or through the establishment of new households by clearing out new lands for practicing agriculture. The most relevant examples are in Holland, the polders and the *"crânguri"*/hamlets in Apuseni Mountains.

The dividing of great properties and the land reforms resulted in most cases in the building of new houses on the assigned lands.

Settlements with loose-knit and dispersed structures have a stronger connection of the man with nature.

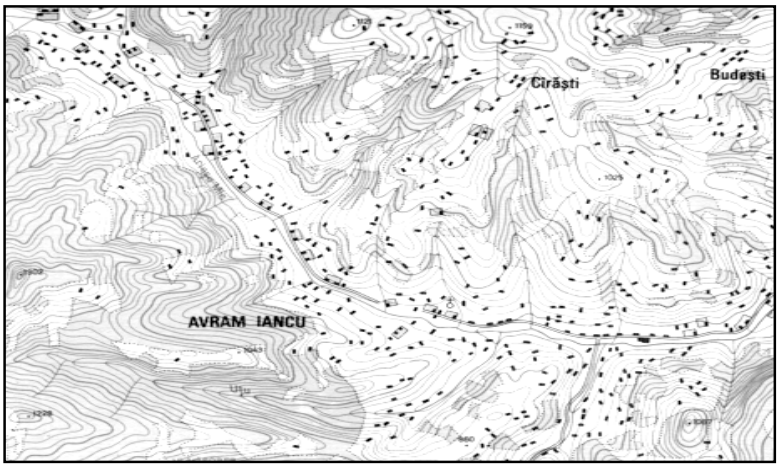


Figure 21. Rural settlement with dispersed structure *(after SR Romania Atlas, 1978).*

The Texture of the Precinct. The notion of texture in the case of rural settlements refers to the way in which the constructions and the network of narrow streets are laid out in the precinct. We can distinguish settlements with *a regular texture (geometrical) and settlements with an irregular texture*. The regular texture precincts usually have lanes with rectangular routes, along which the buildings are lined according to some geometrical norms precisely established. We have rectangular textures when the lanes go in parallel and cross each other at right angles and radial-concentric textures, when the lanes go towards a central point. Settlements with such texture have been planned. Settlements with irregular texture have a chaotic network of lanes that serve the houses, aligned on each side. The *ciflik* type of village of Turkish influence is a good example of this.

Figure 22. Rural settlement with (a) regular and (b) irregular texture *(after SR Romania Atlas, 1978).*

4.5. The Estate

As we mentioned above, it represents the economic support of the population concentrated in the precinct. It is structured according to the needs, technical possibilities for exploitation and the climatic conditions.

In the temperate climate, the territory of the rural settlement is divided in order to satisfy complex needs, due both to the cultivation of the plants and the breeding of animals. In the oceanic climate in the west and north-west parts of Europe, the territory of the rural settlements satisfies the most favourable needs: culture of juicy plants and dominance of natural pastures used for the growth of big cattle.

The climatic conditions of Central Europe are favourable for a *mixed agriculture*. Therefore the rural territory knows a more pronounced division of the functions.

The Mediterranean Europe has poorer soils, often suffering a process of erosion and lacks of valuable wood but enjoys favourable thermal conditions. Therefore most of rural settlements cultivate citrics and wine.

The territory of the Central-African rural settlements is used for practicing an itinerant agriculture. It covers a significant part of the national territory. The rural communities grouped in *temporary settlements* systematically and successively exploit the same territories. The hunters from Alaska and the Eskimos from Greenland do not have a strict delimitation of the rural territories to exploit. The vast desert territories of the Africa and Asia create territorial discontinuities of the *permanent settlements*, which are reduced to oasis. In the rest the agricultural land is exclusively used for nomadic grazing.

In what regards the surface of the territory of a rural settlement, a diversity of situations is found. For example, in our country a village has, approximately, a surface of 1600 ha. In the plains area the rural settlements have a smaller territory, while those from the mountain areas have a bigger territory. This is due to the differences in the quality of the soil.

The agricultural resources fond of the rural settlements has known various steps of evolution, from nomad community to one with common lands of the community, than to communities with common land with crop rotation (twice a year, three times a year) to feudal, capitalist and recently socialist forms in some countries of Asia and Cuba.

As we mentioned above, the village territorial structure evolved under certain social and political conditions during different historic periods, so for each type of production, a certain concept, a certain form of organization of the rural is characteristic. Thus, there are for example *the feudal type of village and the contemporary type of village.*

The feudal type of village is characterized by the existence of a group of houses clustered in a compact structure in the precinct or houses grouped in hamlets. Around the precinct the estate of the village unfolds and is divided into several zones:

- forest and lands and areas of unploughed land;
- a zone of arable land divided into parcels is used in turns and in crop rotation (soles in France, kon in Russia, gewarre in Germany) (I. Sandru, 1973).

The contemporary type of village evolved and diversified so much that many classifications do not cover all the forms under which it appears. A. Demangon (quoted I. Sandru, 1970), taking into consideration the ratio precinct-agricultural land, he distinguishes 3 types of rural settlements:

Villages a champ assolees. Here the territory of the settlement is divided into three soles which are given a different use in each year: autumn cereals, spring cereals and pasture. Usually they have a concentrated structure and a mixed agriculture profile (the cultivation of plants and breeding of animals). It is a commune type village.

Villages a champ contigus, that is, with adjacent agricultural land. This type of village was born following the cutting of forests and draining of the swamps. The landowner has the house near his working field and the villages developed in strings. The first type appeared in the XII-XVth century in the areas with excess of humidity lining the canals from Eastern Europe and the second category appeared in Sudet Mountain, Black Forest Mountain and Austria.

Villages a champ dissocies. In this case the estate of the village is isolated from the precinct, between them being sometimes a considerable distance. This type of village appeared in the troubled periods, when the inhabitants built the precinct for defence purposes, independent of the village's

estate. Another cause is the allotment at great distances. The settlement grows in surface, but becomes a scattered type (e.g. in the north of the Romanian Plane specialized in growing with wine and cereals, the Hungarian Alfold etc).

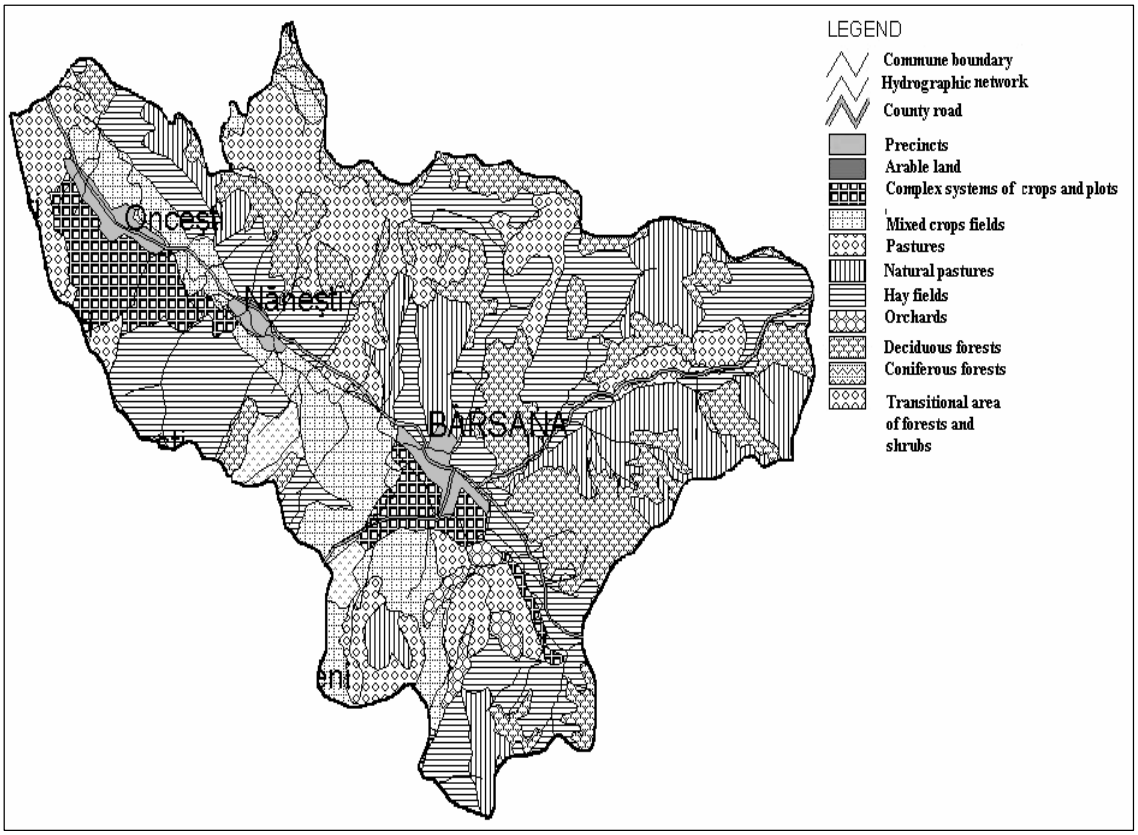


Figure 23. Organization model of the estate of a commune *(after H. Popa-Bota, 2002).*

4.5.1. The Localization of Rural Settlements

The localization of early rural settlement was determined by a complex of factors out of which we enumerate:

- water supply;
- building materials;
- arable land;
- pasture land;
- fuel supply;
- ease of communication;
- defence;
- the avoidance of natural risks (collapses, landslides, floods etc.) (D. Waugh, 2000).

The water resources have always been vital for human communities. The long distances and the lack of means of transportation of water at great distances determined the positioning of hearths in the proximity of rivers, because they provided the necessary quantities of clean water.

The existence of local materials for construction (wood, stone, clay and so on) played an important role in the localization of settlements as their transportation from long distances would have demanded great efforts.

For a long time, the wood has been the only source of energy used for food preparation, and also for heating during cold nights, even in the subtropical areas.

The easiness of contact between communities for making exchanges and for getting supplies from the adjacent territories played an essential role in the forming and development of settlements. The areas of confluence and convergence of energies constitute the best example in this sense. As a

correlation between the intrinsic and extrinsic factors of the localization of rural settlements, the forms and major type of relief, the hydrologic conditions and socio-political factors play a decisive role in the spatial positioning and the development of rural settlements. The configuration of the relief can influence positively or negatively the positioning of rural settlements.

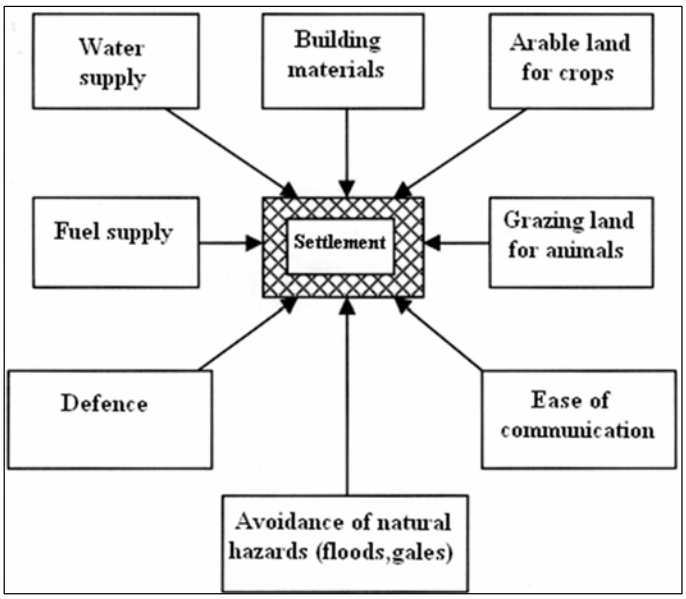


Figure 24. The determining factors in the establishment of the rural settlements (modified title) *(after D. Waugh, 2000*).

The excessive fragmentation of the relief hinders communications among settlements while flat areas do not impose major restrictions to the positioning of the hearth. High altitude constitutes a thermal and physiologic threshold in the establishing of the settlements. The cold and the decreasing level of oxygen constitute prohibiting factors in the development in altitude of settlements. The humid meadows are regularly avoided by settlements that are better established on the edge or loft of terraces or on interfluves. In many situations, during different periods, the hydrotechnical works have facilitated the populating of some areas with excess of humidity (the case of polders, in the Netherlands, of the villages in the German-Polish Plain). As an indispensable element for life, water plays everywhere a decisive role in the choosing of locating the settlements. The continuous presence of the groundwater layer, situated at shallow depths, contributes to the scattering of settlements, while the groundwater located at great depths, in areas dominated by impermeable rocks, favours the concentration of settlements in oases in arid areas, where water appears sporadically on the surface constituting a peremptory example of the concentration of settlements.

In the Netherlands, before the building of the polders, the inhabitants looked for *"dry spots"* or built artificial levels for the localization of the hearths. These artificial dry surfaces were called terpen, some of them have been maintained till today. In the Danube Delta, in the areas built on the sand banks, the houses are placed on artificial hillocks (levels), as in the Ganges Delta.

In the United Kingdom, the spring lines led to the development of a string of settlements, which enjoy a permanent access to sources of water and the proximity of agricultural land. (F. Hudson, 1976). In the case of rural settlements (but otherwise in both categories of settlements) quick changes of demographic, economic, physiological, technical and of public utility nature take place. The desire towards modernity is present in all of the rural areas.

The political factors were often decisive in the populating of a territory. For example, in the modern agricultural plantations in Latin America, Asia and Africa, the new villages set up by colonists represent a big contrast with the traditional and primitive ones of the native population.

The kibbutz type of village represents an answer to necessity of spatial control of the state of Israel.

The axiomatic truth remains valid, according to which the societies with modern economy and advanced technology are capable of *"pushing"* the limits of the permanent settlements, in altitude and latitude, deep in the spaces that are critical from the point of view of natural conditions.

The necessity for defines has always generated the search for lands with good natural protection (meanders, promontories).

The food is obtained in ideal conditions where the plots are favourable to the cultivation of plants and to the breeding of animals.

Synthesizing, the localization of a rural settlement is strongly related to the intrinsic and extrinsic qualities of the land.

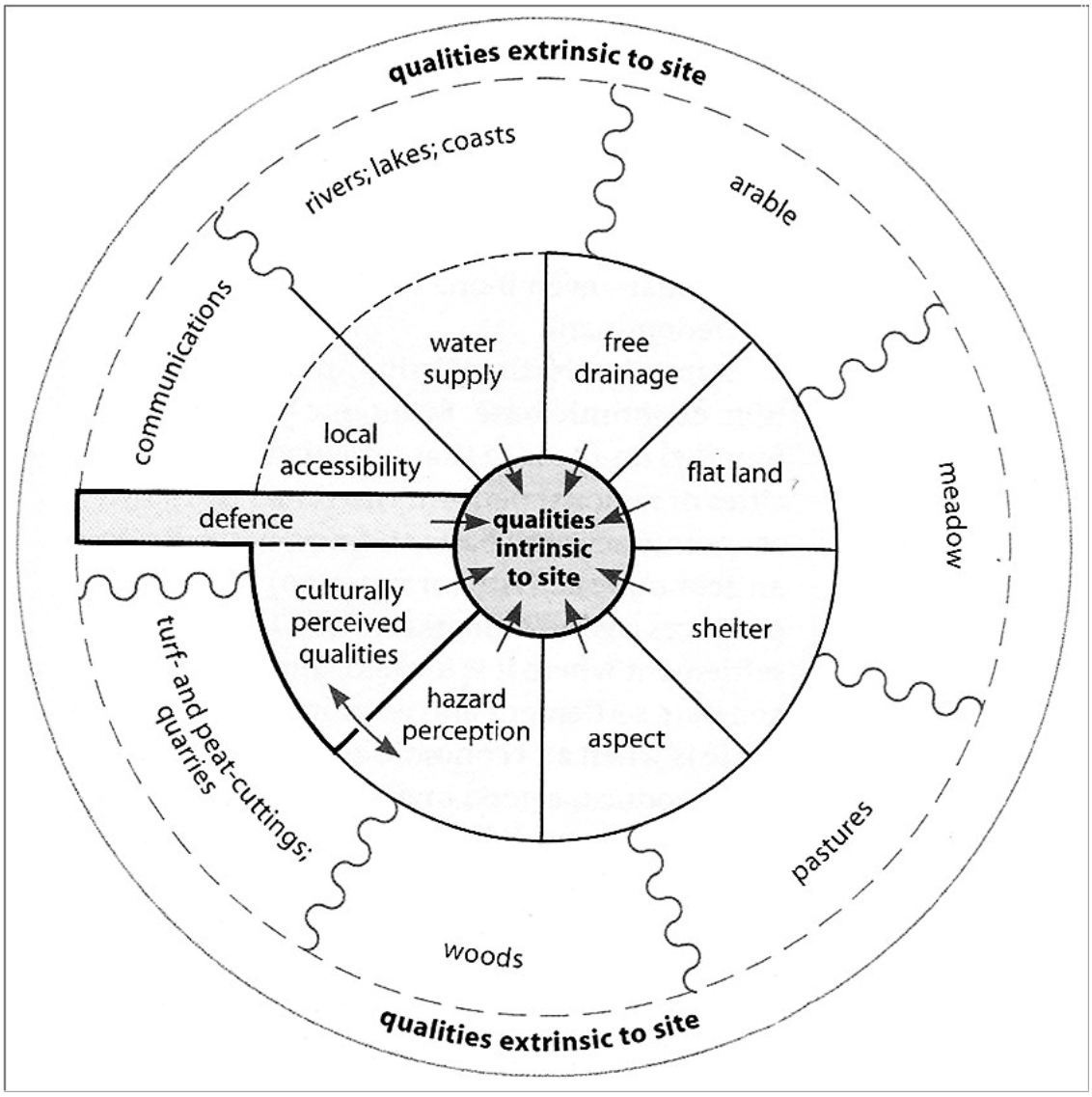


Figure 25. The intrinsic and extrinsic qualities of the localization of the hearths of rural settlements *(after D. Waugh, 2000).*

The intrinsic qualities of the land are: local accessibility, water supply, natural drainage of waters from precipitation, the fragmentation of the relief in the precinct, the sheltering from wind, the exposition of the precinct's slopes, the general physiognomy of the terrain, the perception of the cultural qualities of the population and consequently the quality of human factor.

The extrinsic qualities are: the qualities of the terrains adjacent to the precincts (hydrographic potential, communication potential, the structure of agricultural land, the afforested areas and the underground resources).

4.5.2. The Dispersion of Rural Settlements

The villages are affected by the process of dispersion, which has several causes. The first cause of dispersion consists in the limited natural resources that need to sustain a numerous population. Another cause is the property of the land and the tradition of dividing of the property among successors. In Germany, but also in other countries, each farmer, in agreement with their family, chooses the successor that will manage the farm in the future. This is done in order to forestall the excessive division of land property and also to maintain the efficiency of agricultural work. The

remaining children are usually compensated by the family that pays for their school taxes for higher education or in other forms. We find dispersion of rural settlements in the Black Forest, in the Vosges Mountains, in the Carpathians Mountains, in the Pyrenees Mountains and in Norway, where the majority of settlements have shepherding functions. The agricultural products are usually insufficient for the sustaining of a numerous population.

According to August Metzen (1895) (quoted by I. Sandru, 1970) both the nucleated rural settlements and the dispersed ones are a result of a particular agricultural practice. The individual initiatives have always generated the phenomenon of dispersion.

The extended farms in Arizona and Texas, which are surrounded by barbed wire and supplied by wind power station that extract water and produce electricity, allow the farmers to live in isolation. Social incompatibility also often generates the phenomenon of dispersion.

Long periods of political stability especially in the developed world and the improved security generate the dispersion of settlements, especially due to the improvement of the conditions of circulation and communication. The agricultural reforms in most of the countries of Latin America encourage the dispersion. A similar situation is found in our country (the scattered settlements of "hodăi" type in the Transylvanian Plain).

In the period between the two world wars, the building of the water basins in small hydrographic systems in the South of Italy generated the dispersion of settlements in close connection with water sources used for irrigation.

The facilities created by electrification, modernization of roads and water supply in the rural world, generated both the dispersion and the grouping of the population in compact centres. The isolated farms and hamlets appeared in an early stage through the *"breaking of the nucleated settlements"*, mostly due to succession laws.

Three main types of scattering are known:

- primary dispersion;
- intercalated dispersion;
- secondary dispersion.

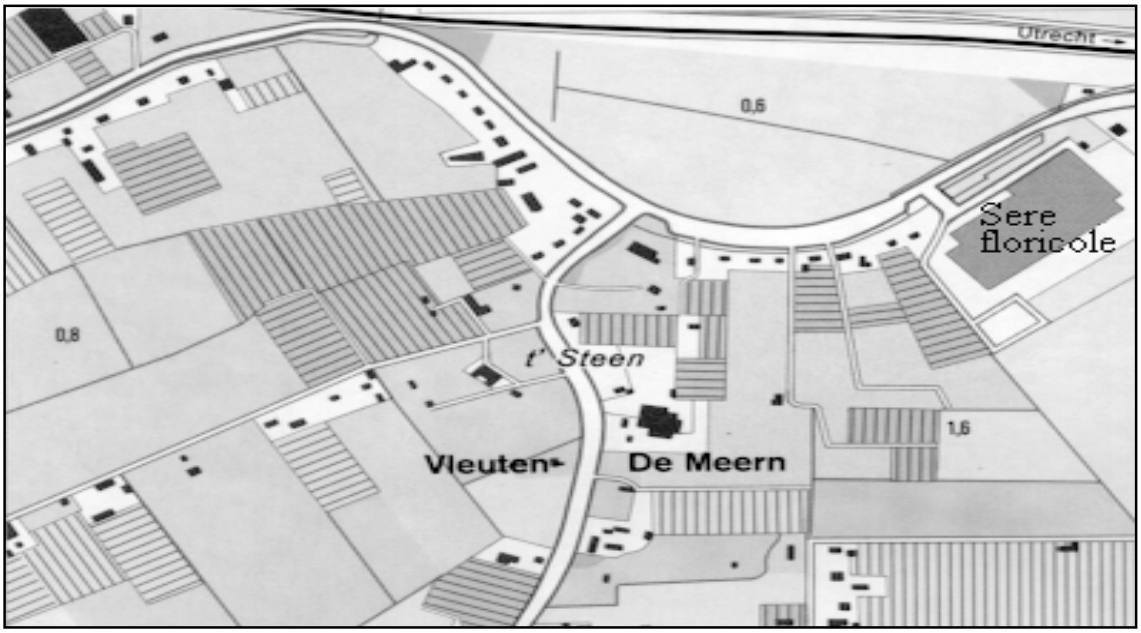


Figure 26. Dispersion in the Dutch polders *(after Seydlitz Weltatlas, 1984).*

The primary dispersion has its origins in the distribution of arable landed estate stock dispersed on the territory of the estate and also of pastures in mixture with woodlands for the breeding of animals (I. Sandru, 1970). The best example of primary dispersion represents the settlements that were established on the Dutch polders or the farms established in North America by the first waves of colonists.

The primary dispersion is characteristic to the majority of the new farms in the North American prairies, the Argentinean pampas and in the unexplored area of Australia.

Before being given to the colonists, the greatest part of the North American prairie was divided into squares, each having the surface of one square mile. The colonists were given land at arrival, with the surface of one quarter mile or its multiple. The majority of the rural settlements in North America are not real villages, but rather service centres, situated at crossroads. These usually have a school, a church, a shop, a café, a bank and a self-service.

The areas of concentration of public interest endowments benefit of a remarkable communication potential, facilitating access from all direction. These areas are constituted as nuclei of fusion of the buildings having a physiological expression that show urban characteristics.

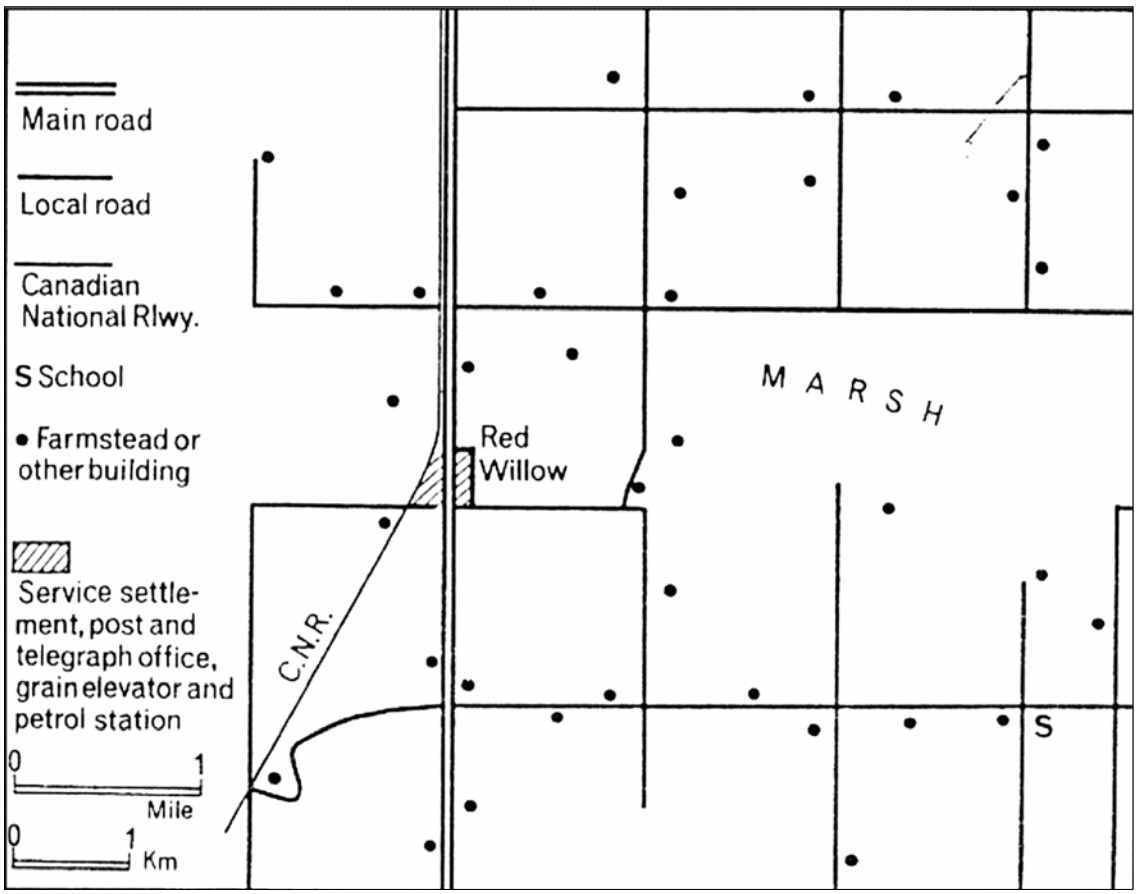


Figure 27. A model of dispersed settlement in Alberta-Canada *(after F. Hudson, 1976).*

The modern systems of water supply generated the more recent dispersion.

In North Bucovina we find big and very big villages with loose-knit structure, well organized households, modern houses, artesian wells and a vigorous demographic potential (high percentage of the youth in the population structure, despite the massive emigrations for work.).

The agricultural land is well worked and maintained everywhere, as a result of tradition and of the growing demographic pressure on the space (Tereblecea, Stăneşti, Oprişeni, Camenca a.s.o.).

The intercalated dispersion is newer and consists in the establishing of new settlements among bigger villages, on lands that have not been occupied yet.

The secondary dispersion is characterized by the overflowing of bigger settlements into small ones. For example, between the Tisza and the Danube, on the territory of Hungary, the unoccupied territories among big settlements that have agricultural function were occupied by farms named *"tanya",* while in Egypt the spreading of irrigated crops determined the population to settle down near the irrigated fields which led to the*"breaking open of some villages"* (I. Sandru, 1971).

4.5.3. The Nucleation of Settlements

As in the case of dispersion, the process of concentration has several reasons.

A first cause resides in the tendency of the population to live in groups. Often the concentration is an answer to the physical or social constraints. In the areas with fertile soils the food is obtained easier and the settlements are usually numerous. The presence of water at big depths requires increased efforts to drill, resulting in compact villages. The abundance of water in the state of Bengal (India) generated big demographic densities and consequently a more excessive clustering of settlements.

The advantages of social life, especially those with respect to education, health care, safety, public reunions, clubs, societies etc. determine the grouping of the population.

The total political control of the peasantry and the prompt acquisition of the dues by the state generated the clustering of settlements, especially in the east of China and the territory of former U.S.S.R. The kibbutz type of settlements were established by Israel in the occupied Arab territories as an answer to the urgent needs for shelter, social and production necessities of the waves of colonists, they were built in a very short period of time.

In New England the colonists built big compact villages, so as to be able to defend themselves easier against the attacks of Indians, their example was later followed by the Mormons, who settled down in the state of Utah in the 19th century.

We can say that the terms of dispersion and nucleation do not have an accurate connotation.

In reality, the result is a series of particular models, related to the local conditions of the relief, climate, fertility of soil, methods of tilling the land, density of population, ethnical customs, traditions, availability of water and methods of defence (F. Hudson, 1976).

The differentiation among villages is conditioned by a big number of factors, out of which we mention:

- the division of land lots;
- the ethnical influences;
- the historical and political conditions;
- the type of primary economy;
- the appearance and development of cities, the changing of the type of economy.

The parcelling of land influenced the diversification of villages in the late Middle Ages. Thus, as a result of the phenomenon of parcelling, at the end of the 18th century, in France, two types of areas appeared:

- areas with open agricultural fields, without fences, its English correspondence being the open field territories;
- areas with closed agricultural fields (enclosed fields).

The two methods of parcelling influenced the development of settlements in several ways. The first method with an irregular repartition of open fields determined the emergence of villages with the loose-knit precincts. The second category also named in France *"pays de bocages"* is characterized by the existence of the isolated households. It is more widespread in the central and western part of France and is characterized by the existence of cultivated parcels with regular shapes, enclosed by walls or hedges (I. Sandru, 1971).

The ethnical influences in the villages can be seen in the way different peoples organized the precincts and the boundaries of their villages. The compact villages of Western Europe indicate a German influences, the isolated houses a Celtic influence, while the villages that have round shapes are of Slavic influence. In our country the colonists' villages of the Transylvanian Saxons and Swabians, with mono-bloc households, are thoroughly different from the Romanian ones, the majority of which have loose-knit precincts.

The same influences are also evident in the organization of the farm settlements in North America. The areas of English influence are characterized by the presence of square lots of land and peripheral location of the farm's headquarters (a), while those of French influence are characterized by rectangular parcels with the headquarters situated on the main road (b).

The historical and political circumstances also significantly influenced the structures and aspects of precincts. Thus the villages of colonists in Africa and South-Eastern Asia clearly have a structure and physiognomy that reveals the traditions of the colonizing population.

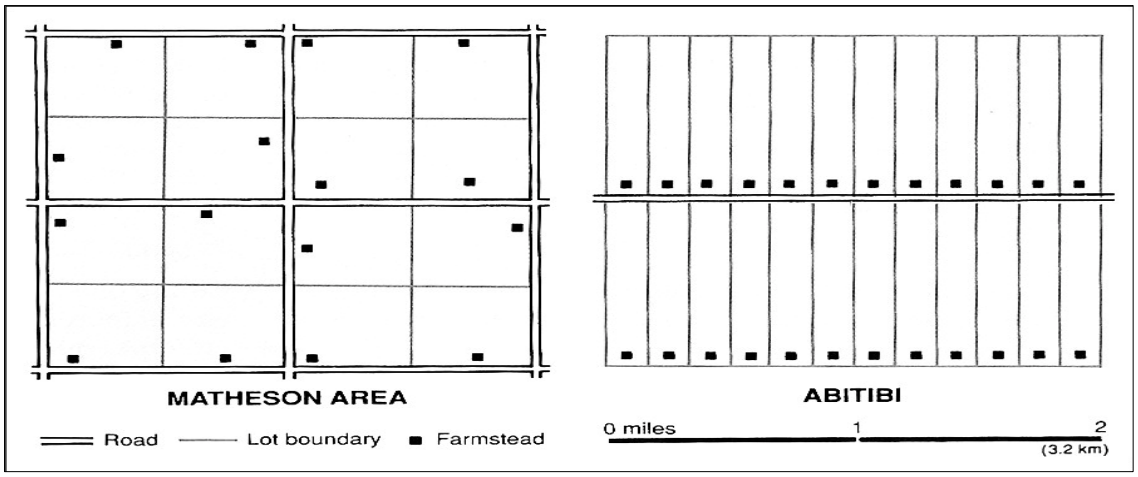


Figure 28. The ethnic and cultural influences in the localization of the farms in Canada *(title adapted, quotation from J. Fellman, A Getis, J. Getis, 1990).*

The same thing is valid for the clustered *"ciflik"* village of Turkish origin, spread in the entire Balkan Peninsula, as a result of the expansion of the Turkish Empire. The type of primary economy leaves its mark on the physiognomy of the villages, thus differentiating them. Through the organization of precincts the villages of animal breeders are different from those whose majority of the population is mostly occupied with the cultivation of the land, while the fishermen villages have distinct characteristics by comparison with other rural settlements.

The changing of the type of economy brings changes in the framework of the rural network and its structure. Thus, after 1918 (The Great Socialist Revolution in October, in Russia) the kolhoznic and sovhoznik type of rural settlements appeared and developed, which sanction the collective and state property on land. In our country, the villages suffered radical metamorphoses after the collectivization of agriculture, process that got completed by 1962. New buildings were added to the old elements of the precincts forming the real estate patrimony of the former Agricultural Production Cooperatives (A.P.C). These regularly consisted of shelters for animals, granary, barns, workshops etc. Many were destroyed in the period between December 1989 and October 1990.

A special type of villages were those for the politically deported persons, established mostly in Baragan and Dobrogea, they were a true clustering of huts, which gave those places a fame of sad memory.

The appearance and development of towns leads to important changes especially in the rural settlements neighbouring an urban settlement. Sometimes, under the influence of the continuous functional and territorial expansion of the neighbouring city, there is almost a radical change in the functional, technical and built profile of the rural settlements.

4.6. The Rural Households

The precincts of rural settlements are organized in such a way to fit the purposes they were created for: shelter, service, communication and secondary production. The basic cell of every rural settlement is the household. The rural household represents the first organized form of systematic management of the rural space (V. Surd, 1993).

The rural households present a remarkable positional, functional, demographic, aesthetic and economic diversity, strongly related to the physical environment of the precinct, the major types of relief, the climate conditions, and the distance from the town, the level of development of the society, traditions, religion, ethnical structure, the degree of economic development of the society, the level of education and the type of materials used for construction.

The physical environment of the precinct depends of households positioning, microforms of relief, water resources, the slopes angles and the particularities of the location and climate (inversions of temperature, the day of the first and the last frost, the intensity of sunlight etc.).

Functionally, the majority of the rural households exist and develop on the account of the primary activities. Those having a non-primary profile are regularly better equipped and have a higher degree of comfort.

In what concerns the demographic potential, the rural household is depicted in a pretty heterogeneous range of values, from a single person to more than ten persons, depending on the ethnicity, level of educations and traditions. In our country, between the two world wars, traditionally two families shared the same household.

The aesthetics of rural households depends on the type of materials used for construction, of the structure of the built space and of their function. The households which use local materials for construction have a physiology that blends with the surrounding. Those built from manufactured materials are more impressive and less vulnerable to the phenomena of geographical risks.

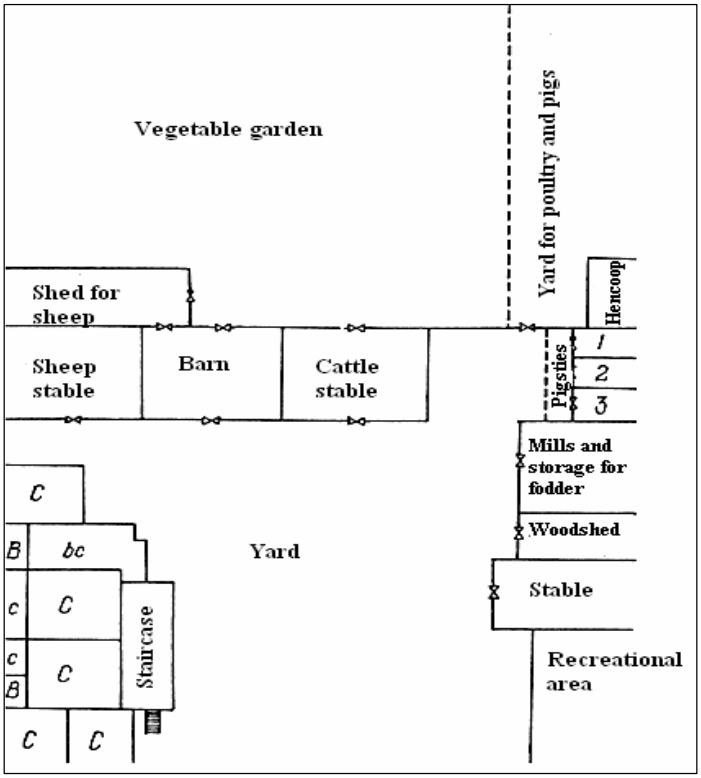


Figure 29. A rural household with dispersed components.

From the way the components of a household are connected and grouped we can distinguish between households with dispersed components and those with mono-bloc components (when components are joined together in one block (building).From the point of economy, just like in the case of other criteria, the rural households are very heterogeneous. For example, the economic potential of a farm in the U.S.A, Canada or Australia is incomparably superior of that of a rural household in our country, which disposes of 2,5 ha of agricultural land that is on average, usually divided into 15 lots.

The households in villages that neighbour towns are more complex than those of isolated rural settlements, but there are also numerous exceptions to this rule.

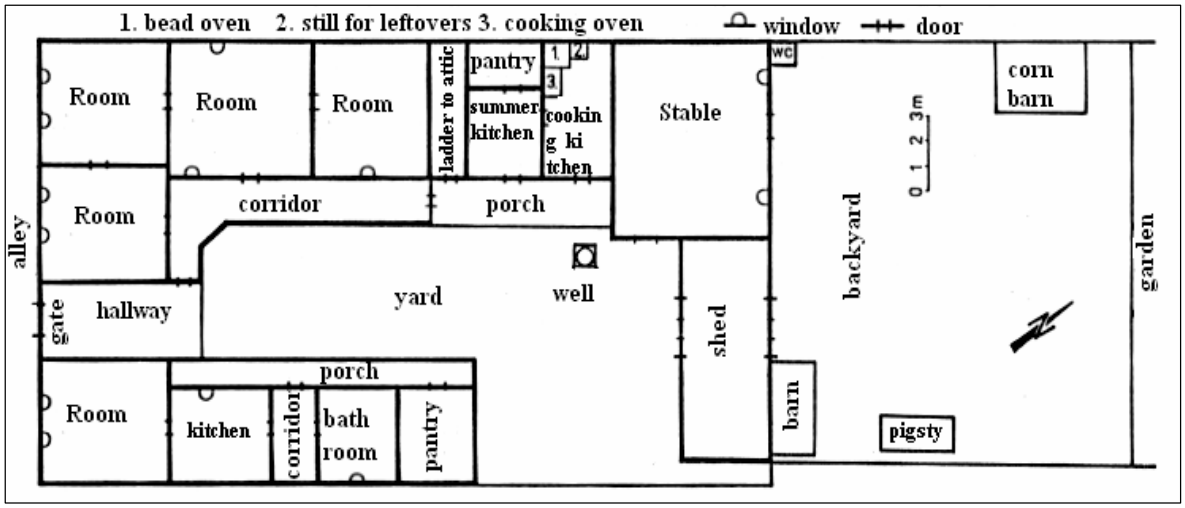


Figure 30. Rural household with single block components.

In classifying the rural households from our country, the following criteria have been taken into consideration:

- the built area;
- the demographic factor;
- the economic and public utilities;
- the agricultural and forest potential.

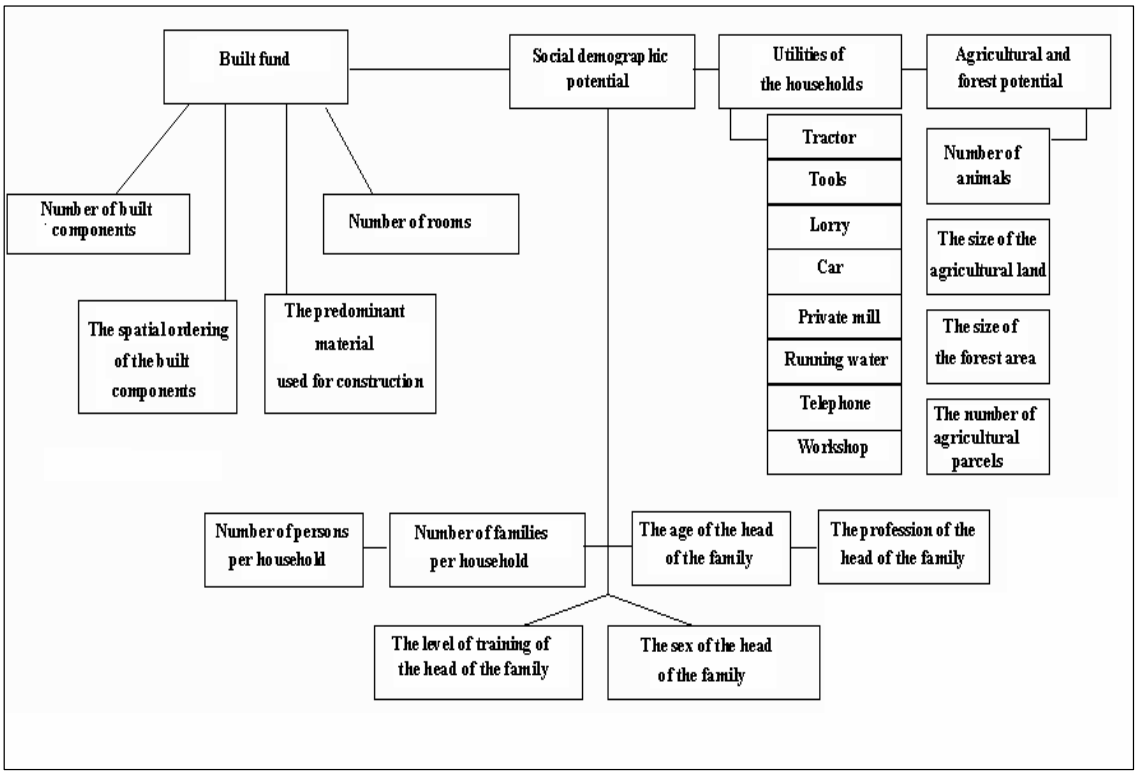


Figure 31. Criteria of classification of the rural households.

4.7. Public Interest Utilities

These are defined as a sum of buildings or special arrangements, with diverse destination, capable of satisfying the collective needs.

The number, capacity and rank of these is directly related to the number of population it serves.

The following criteria can make the base of a classification of the public interest utilities:

- the destination;
- the frequency of use;
- the rank.

According to their destination, seven big categories of endowments can be distinguished:

- for education, culture and religion purposes;
- for administrative purposes;
- for health purposes;
- for commercial purposes;
- for transportation and communication purposes;
- for special purpose.

The endowments for education, culture and cults consist of schools, houses of culture, museums, memorial houses, churches, monasteries etc.

These are situated in the administrative space of the rural, according to necessities and as a result of exceptional situations.

The endowments having administrative character usually consist of town hall and police station buildings, both situated in the communal centres.

The sanitary endowments consist of first aid points, dispensary, dentist's office, hospitals and pharmacies.

The endowments for production are very diverse, many being a result of mining or manufacturing of local raw materials.

The endowments for commercial purposes regularly have their own buildings, being divided into the same functional compartments. The improvised spaces or those adjacent to household are frequent in the small rural settlements.

The endowments for transportation and telecommunication consist of post-offices and buildings of stations or railway halts.

The endowments with the special character are those related to the agricultural use, buildings for fire brigades, banks etc.

According to frequency of use, there can be distinguished four categories of endowments:

- daily use;
- frequent use;
- periodic use;
- occasional use.

Among the endowments with daily use, the most obvious are schools and the endowments with productive character.

In the category of endowments of frequent use, the commercial and administrative ones are included.

The endowments with periodical use are religious places or buildings.

The endowments with occasional use include hospitals and rural courts, as well as police headquarters.

The endowments are organized into hierarchies, depending on the type, quality and frequency in territory, resulting ranks. Thus, we can distinguish endowments of subcommunal rank (for example, primary schools with I-IV classes); communal (mayoralties) and supracommunal (high schools, pharmacies, and restaurants). The last ones represent tendencies of urbanization. As a general rule, the bigger the rank of public interest endowments, the lesser their territorial frequency is.

Physiologically, the settlements with public interest utilities of superior rank are included in a gauge of superior quality, fortified by the existence of a high communication potential and by the pressure that the neighbouring villages exert on these categories of centres.

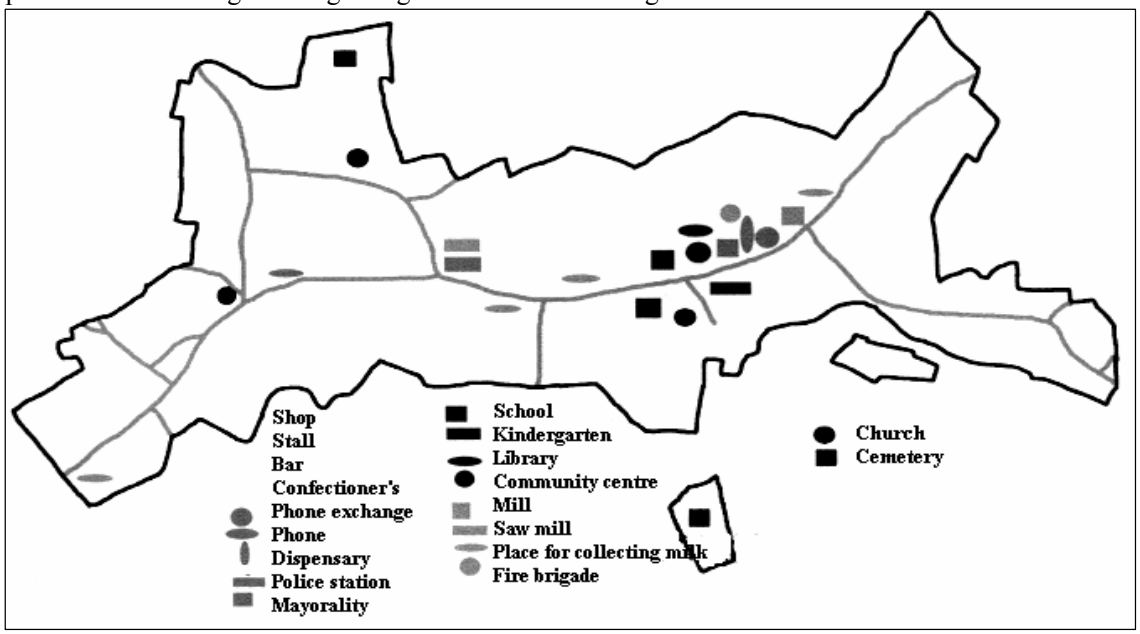


Figure 32. The spatial positioning of the public endowments in the framework of precincts of rural settlements (*after F. Lörincz, 2002).*

4.8. The Classification of Rural Settlements According To the Social, Economic and Natural Potential

The classification according tot the social, economic and natural potential represents a complex type of classification, in its realization being frequently used quantitative methods (empirical and mathematical). Such a classification takes into consideration all the factors that define and compete to the prosperity or decline of a rural settlement. Usually, the following parameters are taken into consideration.

- the demographic potential;
- the endowment potential;
- the position (communication) potential;
- the potential of the precinct's relief;
- the hydrologic potential;
- the economic potential.

The demographic potential expresses the demographic power of rural settlements both in the quantitative and qualitative aspects, regarding the age groups, sex and professional structures.

The endowment potential expresses the degree of the endowment of the rural settlement, with utilities starting with those having a productive character to those serving a large palette of needs.

The position (communication) potential shows the level of endowment of a settlement with communication networks of different types and degrees of modernization.

The potential of the precinct's relief refers to the morphologic character of this in the respect to the genetic type of the relief, the inclination and exposition of slopes in the precinct as well as the possibilities of the precinct to expand.

In most cases, the hydrologic potential of a rural settlement is estimated relatively, depending on the discharge of the river that flows through a settlement, the frequency and the depth of the groundwater, the quality of water and the extent of it meeting the needs of population.

The economic potential is usually expressed in monetary units in the global or specific respect, per inhabitant.

Other categories of potentials can also be included, with the condition to respect the same criteria for the whole ensemble of rural settlements which were included in the study.

The overall potential of a rural settlement results from the summing up of the potentials derived from the process of quantification and numeric aggregation.

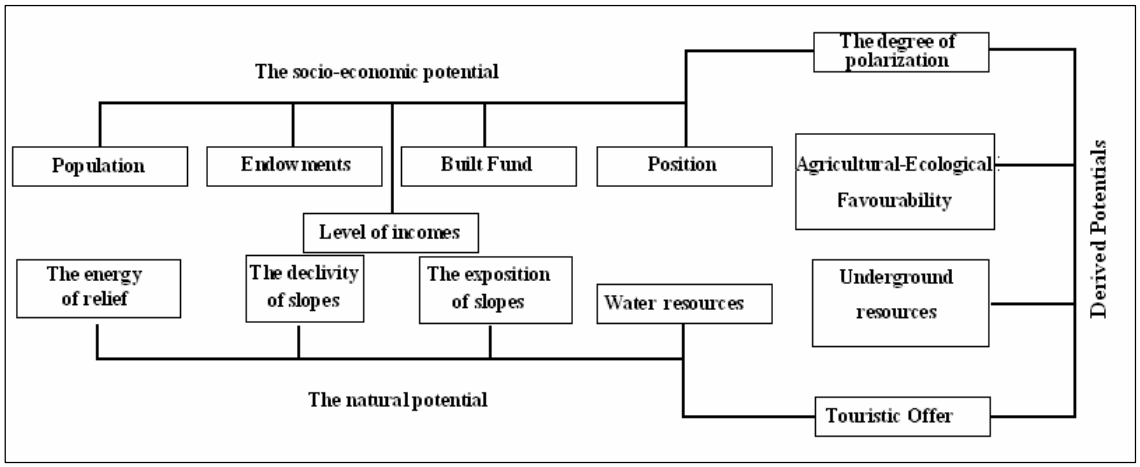


Figure 33. The defining components of the development potential of the rural settlements.

From a multidimensional perspective, the problem of differences in development and in ecology can be put in empirical terms, being possible to try some methods of quantification. The first step in this direction consists in the correct *"choosing of dimensions"*, respectively of the variables of development. The socio-economic potential derives from the demographic component, the endowment, the built fund, the position of the precinct and the level of incomes. The natural potential

includes the energy of the precinct's relief, the slopes angle of declivity, to which the hydrologic potential of settlement is added. As derived potential we mention the underground resources, the touristic offer, and the degree of polarization and agricultural – ecological favourability of the territory. So as to quantify the different categories of potential, respectively to bring these to a *"common denominator"*, the method of evaluation *("metoda bonitării"*) is used, with good results. Through this method, the biggest value is given to the variable of maximum favourability, the values decreasing gradually, depending on the classes of evaluation established during the analysis. The least favourable option is given the minimum value. By summing each subcomponent of potential results the *overall potential* of development of the rural settlements, thus expressed through a number. This potential can also be rendered as a combined form (numbers and graphics). In this respect, a number of axes of references are traced, each representing a potential category.

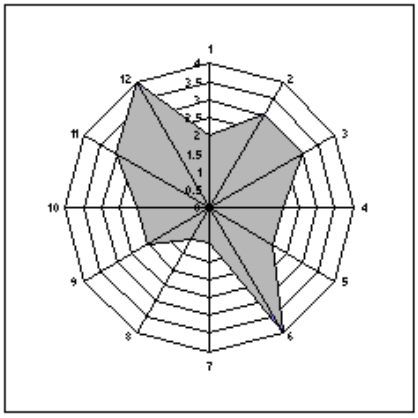


Figure 34. The graphic representation of the development potential.

On each axis the value of the specific potential is marked, as a result of the process of assessment, classification and numeric aggregation.

The method is used for the study of settlements al the level of second rank territorial administrative units (counties), but also in natural units with a big number of rural settlements. As it has already been mentioned in order to make comparisons of the level of development of the rural settlements, the same classes of assessment and the same set of indicators have to be strictly used.

4.9. Other Criteria of Classification of Rural Settlements

From those presented so far we make a classification of the rural settlements depending on the way one or another component manifests, making a more detailed study of the classification resulted from the form and structure of the precinct.

From the criteria used for the classification of the rural settlements in the world, we mention:

- the position of the precincts compared to the estate;
- the network of the rural habitat;
- the professional structure of the population;
- the geographic position of the precinct;
- the origin and age.

According to the position of the precinct on the territory of the settlement, there are villages that have their precinct in central position of the territory (for example the fruit-growing regions in south-eastern Asia) and villages with their precincts situated in the periphery, so as to economize the arable land (north-eastern Africa, the pre-desert regions, the deforested areas of Europe).

When considering the rural network there are territories with homogeneous and heterogeneous villages. The homogeneous and heterogeneous characteristics can consist in the equal or unequal spatial distribution, in approximately equal or very heterogeneous sizes etc.

So as to appreciate the density of the population in precincts, the index of dispersion is calculated (A. Demangeon).

$$I = \frac{(N - N^{'})n}{N}$$

where:

I - the index of dispersion;
N - the total number of inhabitants;
N` - the number of inhabitants in the resident village;
n - the number of non-resident villages.

By calculating the index of dispersion for our country, there can be distinguished three big categories of rural settlements:

a). Villages with a reduced index of dispersion (<2,5) are more frequent in the plains and depressions. Regarding the demographic potential, this category of settlements has an average of 1500 inhabitants and compact structure.

b). Villages with a medium index of dispersion (2,5-5) are characteristic for the hilly regions. They generally have a demographic potential under 1000 inhabitants.

c). Villages with a high index of dispersion (5-10), which characterizes the mountainous areas. The villages generally have a reduced population, under 500 inhabitants and a dispersed structure.

According to the professional structure of the working population, we distinguish villages with agricultural functions where the majority of the population is occupied in this sector (>80%) and villages with non-agricultural functions where the working population has other occupations than the agricultural ones (the mining villages, villages having touristic functions, balneal, residential etc.). So as to delimit functional agricultural categories from the non-agricultural ones, it is important to establish the percentage of the non-agricultural incomes in the relation with agricultural ones.

According to the opinions of the French geographer A. Demangeon (quoted from I. Sandru, 1970), the majority of the rural settlements are influenced in their evolution by the types of agricultural economy practiced in different stages of evolution: the stage of Nomadic culture, the stage of permanent possession inside the agricultural communities and the stage of specialized culture.

The German geographer Gabrielle Schwartz (quoted from I. Sandru, 1970), taking this into consideration, establishes six functional types of rural settlements:

- settlements of primitive fishermen;
- settlements of advanced hunters;
- settlements of Nomadic shepherds;
- settlements of semi-nomadic settlements;
- settlements with hoed crops;
- settlements for ploughed crops.

The settlements of primitive fishermen are frequent in Indonesia, in the coastal areas and in Micronesia.

The settlements of advanced hunters usually have a pair, the second dwelling being situated in the tundra, in the proximity of spaces used for hunting.

The settlements of Nomadic shepherds have a seasonal character. These receive the status of settlement only in the periods when the precincts are occupied by the animal breeding population in the seasons suitable of grazing. The Kurds in the north of Iraq and east of Turkey travel with the flocks during the summer towards the mountains, where they have established settlements. During autumn they descend to the plateaus of medium altitudes, while during winter, they go to the Tigris Plain.

Semi-nomadic settlements have the fishermen groups on the western coast of Norway and the eastern one of Canada, with fjords and the hunters for furs in the north of Canada, Alaska and north of the Siberian part of Russia.

The settlements with hoed crops are semi-permanent. An itinerary agriculture is practiced in many cases. When the cultivated land can not be changed, the settlements situated in the tropical zone become permanent.

The settlements with ploughed crops are permanent and, according to the type of economy, they are differentiated into:

- agricultural settlements with little animal breeding;
- settlements where animal breeding prevails over the few crops;
- settlements with intensive farming;
- settlements with irrigated crops;
- horticultural settlements;
- settlements specialized in plantations.

In this last category there is a blending of the criterion of agricultural profile with that of the type of crops and of the degree of intensification. The specification of the function is also done by law, when the settlements are divided into types of hierarchies from the very beginning. Thus, Russia, in the system of the kolhoznik sector, the settlements were put in hierarchies, the following categories being distinguished (after I. Sandru, 1970):

- central rural settlement;
- economic and technical service centres;
- districts' administrative agricultural centres (they are endowed with installations for the processing of the agricultural raw materials).

To the central rural settlement belong the hamlets, the kolhoznik farms which are separated territorially, as well as the seasonal used cabins in the fields. They all belong to the same kolhoz. The economic and technical service centres, also named by the French geographers *"village pilots"*, cater for a group of kolhozes (I. Sandru,1970).

In most of the cases, the districts' administrative agricultural centres develop towards urban centres. The functions of the economic and technical service centres are often accumulated either with the central rural settlement, or with the districts' administrative agricultural centres.

Approximately the same subordination was established in the sovhoznik district. The place of the central rural settlement is occupied by the central settlement of the sovhoz. The sections and farms are subordinated to this. The economic and technical service centres are missing, their role being taken by the central settlement of the sohvoz. As a result of the disintegration of the economic structures of centralized type, most of the rural settlements from the space of the former USSR are in an accentuated process of disintegration.

Taking into consideration the geographical position of the precinct there can be distinguished a large variety of settlements. Thus, H. Ahlamn in the work "Study of Settlements" New York, 1920 (quoted by Sandru, 1970) combining the topographic position of the precinct with elements of its geologic and morphologic structure distinguishes several major types of rural settlements:

- settlements of the regions with fluvial erosion;
- settlements of the mountainous regions;
- settlements of the costal regions;
- settlements of the regions with arid climate;
- settlements of the volcanic regions.

The Italian Geographer R. Almagia (1958) (quoted by I. Sandru 1970), taking into consideration the topography of settlements distinguishes in his paper "Fundamenti di Geografia Generale) Roma (1958) ten types of rural settlements:

- 'cul - de-sac' villages;
- bridge head villages;
- village at the edge of a depression or a *"dried lake"*;
- village suspended on slopes;
- village on terraces;
- village on alluvial fans with concentrations favourable for the irrigated crops;
- village on mountain ridge;
- village on hill;
- village situated on interfluves;
- village situated in mountain passes.

In a more concentrated form there can be distinguished villages on slopes, in valleys, on interfluves, on ridges, on river meadows (sand banks), on alluvial fans and in deltas.

According to their origins and age, there can be distinguished generations and families of rural settlements (I. Sandru, 1970, F. Hudson, 1976, R. Brian, 1987).

The generations of settlements appeared approximately at the same date, while in the case of the families of settlements we notice a gradual emergence and development over time.

The Romans have established fortified settlements to defend large rural territory. This type of settlement was frequent in a vast space in the basins of the Danube, the Rhine, the Black Sea and the Mediterranean Sea. Settlements of this type were also established in the Peninsular Europe, in India and in the Far East. These types of rural settlements were protected and supplied with goods by the cities and appeared a long time before the feudal order. The great migrations of nations had as a consequence the dissolution of urban life, the appearance and development of a process of involution of socio-economic level. In such a context, we see a mosaic-like evolution of settlements. In the periods of uncertainties, the rural settlements occupied small strips of the land at the edge of the pastures and wood zones. The settlements avoided open fields and plains. The fields were only occupied in peaceful periods, the settlements withdrawing with every invasion either to the

mountainous zones, or to the swampy ones, these being used as shelter zones. Starting with the 15th century the population "overflowed" into the fields due to increased safety, occupying them gradually till the 19th century. The process of populating of the rural area develops in two forms: in *"oil spots"*, which start from the existing nuclei and in areas occupied directly by villages after deforestation and drainage. The areas with small densities of population were completed by colonisations (I. Sandru, 1970).

5. THE RURAL SETTLIEMENTS ON GEORGRAPHICAL ZONES[1]

5.1. The Rural Settlements of Europe

The phenomenon of concentration of the population into settlements started as early as the Paleolithic in Europe, when these were organized in natural shelters. The European continent is also characterized by its continuity in populating the space and by the existence of old cultures which evolved into permanent settlements starting with the Antiquity. The inhabited surface was systematically enlarged by anthropic intervention both in altitude and in latitude, especially trough deforestation and hidrotechnical improvements. The settlements in this part of the world are also characterized by a pronounced diversity. With all these geographical and political differences, some common features of rural settlements exist on smaller geographical spaces.

a). The rural settlements in the northern countries. Here are included Denmark, Sweden, Norway and Finland. These are all countries with developed economy. They are characterized by reduced demographic densities, a generally reduced demographic potential and the dominance of the urban population. The geographical landscape of these countries is significantly influenced by the proximity of the sea, by the presence of numerous lake structures, of fjords, of forests, and in the case of Denmark by the dominance of the plain.

The dispersed type of settlement prevails in the fjord zone and in the northern regions populated by the Lapps. In the spaces dominated by woods and lakes the hamlets prevail, especially in Finland. In the Norwegian language the word village does not exist, even if the households are grouped and are justified to have a certain status. The farms are mostly built by wood and have several, specialized buildings (for inhabiting, for provisions, for animals, for the fishing tools). The phenomenon of grouping is manifested in the Lofoten archipelago, occupied mostly by populations of fishermen. From the functional point of view most of them have agro-forestry profiles and few also have commercial, transportation and craftsmanship functions.

In Finland the occupying of space was done from the seashore towards the interior, along the main rivers and the lakesides, the precinct being regularly located on the waves of moraines which do not present the phenomenon of swamping. At the same time the waves of moraines are used to organize the transportation network.

Starting with the 18th century, in the central afforested area big domains were established, resulting dispersed settlements through deforestation. On the seashore the rural settlements present the phenomenon of agglomeration, while from the functional point of view the fishing function is combined with the forestry one. In the central area besides the exploitation of forests and animal breeding, rural settlements with land used for crops, especially cereals (rye, spring wheat) also appear.

In Sweden and Denmark the rural settlements include the following types:

- the dispersed household;
- the village;
- the market village.

In the 18th century, both in Sweden and in Denmark, the nucleated rural settlement was dominant as a result of the existence of a strong tendency of merging of land properties. Starting with the 19th century, we assist at a process of "breaking open" of villages as the consequence of land reforms, the households occupying the lots which were given to them. The isolated households of farms are situated at some hundreds of meter distances from each-other. The villages are rare and small. They have only administrative functions.

The burg type of settlement (market-village) is common to all the states of north-western Europe and is maintained in the rural category due only to its reduced number of population. This category of villages usually concentrates commercial endowments and under this aspect serves farms and villages situated on a rather extensive area. Some of them also concentrate industry. The civil centre is organized and endowed to fulfil its main function, the commercial one.

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[1] This chapter was taken from the course of professor I. Sandru-1970, to it some information and some cartographic material was added.

In Sweden, besides the permanent forms of habitation frequently appear temporary forms of habitations, "fäbod"-s, in the form of chalets arranged outside the perimeter of the permanent settlements. As a secondary residence form, this type of household is also built in the space destined to the permanent settlements. Today, this type of households is mostly abandoned, being used by tourists and forest workers only.

The concentrated form of settlement is that of "tätort" type, which groups 200-300 inhabitants. It is situated in areas with increased accessibility, typically being a settlement of services. Usually it serves areas with dispersed population of up to 4000 inhabitants, concentrating the entire activities non-specific to the primary sector. As well as in other parts, it is the form of rural settlement which develops towards the city. The dominant materials used for construction are: wood, brick and stone. Usually the exterior walls are coloured in white in Denmark, while the frames of the windows in red. In Sweden, the exterior walls are coloured in red and the frames of the windows in white, these colour combinations lending the rural landscape a note of silence and joy.

The settlements in Lapland, from the northern extremities of Sweden, Norway and Finland, are very different. Here approximately 40000 persons live out of reindeer breeding. The Lapps established two major types of settlement: semi-permanent and permanent. The semi-permanent ones are composed of huts or beam constructions of reduced height, with polygonal form, usually occupying the depressions sheltered from the cold winds. They are populated during winter, when the reindeer, herds are brought further south to winter. During summer, when the population moves with the reindeer herds towards north, a collapsible tent with a conic form is used as shelter, named in Lapp language “goati”. The permanent settlements are mostly situated in the southern extremity of Lapland. Settlements here have a more complex profile, besides the reindeer breeding, people here also practice crafts and more frequently the cultivation of the land. On the route of “migration” of the reindeer herds, shelters were built.

b). The rural settlements from western and central Europe. They are characterized by a big variety, by the mosaic-like character as a result of the extended zones of interference, of the different forms of populating the space and with pronounced differences in the landscape (Atlantic, Central-European, Alpine, Baltic and Mediterranean). The process of populating the space started with the occupying of the spaces cleared naturally and of those on alluvial plains, with fertile soils, then started the process of occupying the space through deforestation and the reclamation of the afforested and swampy plains regions. Unlike northern Europe, here the action of occupying the space is expanding, including in the agricultural usage new and new areas, through deforestation, through draining of the swampy areas and through the establishing of new settlements of touristic interest in the mountain areas or on the costal ones.

In altitude, the rural settlements expand from the seashore or deltas situated a little above the sea level (in the areas of polders of the Netherlands below sea level) up to 2000 meters. The urban form of settlement is dominant, the process of depopulating of the rural settlements being accentuated, especially in settlements with a small number of inhabitants. The administrative form of organization of the rural is the commune. The average number of population varies between approximately 1200 inhabitants in France, to approximately 11000 in the Netherlands (3500 in Belgium, 2300 in Germany). The average surface of a commune is 3200 ha in the Netherlands and between 1000 and 1500 ha in France, Belgium and Germany. The biggest communes are found on the Dutch polders and in the regions with tree and wine growing, and cereal cultivating profile at the foot of the Alps, the Pyrenees and the Vosges. The small communes are more frequent in the mountainous regions and on the plateaus. The cost of administrative organization in small communes is not advantageous because it raises the cost of utilities. That is why in France the minimum number of population of a commune is 800 inhabitants. Depending on structure three major types of rural settlements can be distinguished:

- the nucleated village;
- the loose-knit village;
- the dispersed village.

The village with nucleated structure appears under many shapes and we find it everywhere, starting with the Bretagne Peninsula, the foot of the Vosges Mountains, the middle basin of the Rhine, Luxemburg, the Hannover-Braunschweig region, the centre of Europe and till the hilly zone in the south of Poland. The nucleated village appears and becomes dominant in the hilly zone of Austria, from Traun towards Vienna till Hungary, where it becomes dominant.

The loose-knit village is frequently found in central France, Bavaria, the Boehmian Forest and at the foot of the Beschides. The plateau region and that of the Jura Mountains from Switzerland, as well as the Salzburg-Traun sector are characterized by the dominance of the loose-knit settlements with nuclei of concentration.

The villages with a dispersed structure are the farm-types of villages. They are spread both in the low plain regions and in the mountains ones. They are present in the low areas of Aquitania, Normandy, the coastal Flemish region and till the polders of the Netherlands. They appear sporadically in the German Plain (Saxony), the superior basin of the Rhine between Strasbourg and Basel, between Nürnberg and Stuttgart as well as in the centre of Poland.

The villages in the mountainous areas are characterized by the association of the touristic function to the agricultural one.

In Tyrol the scattered households have as their economic base the cattle breeding, while those situated on the main roads, manifest tendencies to group and to transform into settlements with a touristic profile.

Through the layout of the territory, the settlements of the Alps can exploit several levels of vegetation, from the deciduous to the alpine area/"alpage"of the Alps. The precincts usually occupy the sunlit slopes, the lines of contact between the slopes and the depressions as well as the transalpine passes. The pre-alpine space is completely humanized. The nucleated type of villages occupy the coasts of the glacial lakes, the terraces of the lakes, the alluvial fans and the areas of morphologic contact between valley and slope, manifesting a tendency of scattering on the slopes. Due to their position and to the touristic endowments, some rural settlements became renowned cities (Cortina d'Ampezzo, Bolzano, St. Moritz, Davos). On the superior course of the Inn, in the Innsbruck area the rural settlements occupy the bridges of the middle terraces, in the southern sector and the well developed glacis in the northern sector. As it has already been mentioned, the majority of the rural settlements in the alpine sector have touristic functions, especially for the practicing of winter sports.

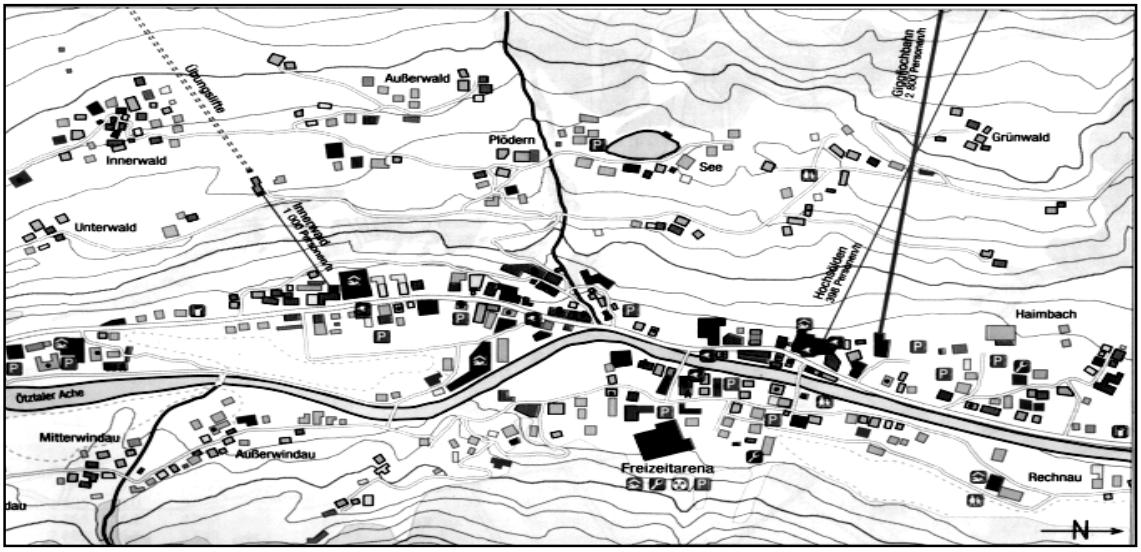


Figure 35. Rural settlement in the Alp Mountains (Tyrol) *(after EU Regiomap, 2001).*

If the relief of the valley offers enough space, the civic centre remains on the axis of circulation, while the rest of the settlement overflows on the slopes till the superior limit of the forest. The hydro-energetic power plants and the high altitude communication infrastructure, have facilitated the populating of the alpine space, the tourism relying mostly on the rural settlements. There are small villages in the poor moraine plains in the north-western Germany, that often consist of up to 10-12 households which are named Urweiler or Drubbel.

Another type of village in Germany is Haufendorfi (nucleated village), very widespread in the eastern part of the Elbe, with the extension in the loess areas in the north of Poland and Ukraine. The German colonists, who advanced toward east in the 13th and 14th centuries, took this form of village from the Slavs.

Along the drainage dams in the swampy sector between the estuaries of the Elbe and the Weser, linear villages were established, named Marschdorf or Marschhafendorf.

In the sectors situated at the forests limits appeared the Waldhufendorf village (the forest village), frequent in the Thüringen, the Bohemian Forest and the Black Forest. Another type of village found at the contact between the Slav and German influence, along the Elbe is the Rundling village (village of circular shape) with the houses grouped around a central market which used to serve as animal shelter during night. The kraal type of village of circular shape in the South of Africa has the same function, for sheltering and looking after the animals during night.

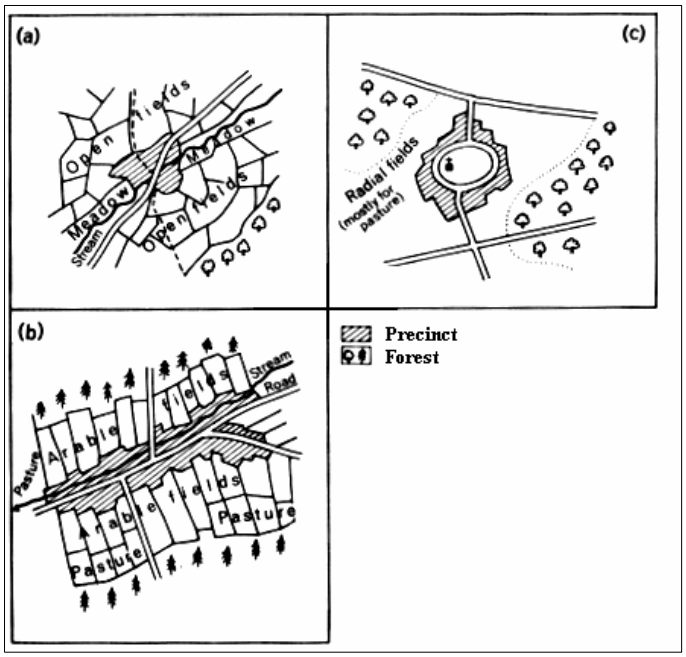


Figure 36. Traditional type of villages in Germany: *a). The Haufendorf type of village. b). The Waldhufendorf type of village. c). The Rundling type of village (after F. Hudson, 1976).*

In comparison with the Alps, the Pyrenees are less populated, the forestry and pastoral surfaces are more reduced. Contrary to the expectations, the slopes facing south (the Spanish ones) are less populated. The morphology of the mountainous relief, the piedmont character in the medium altitude sector and the consistency of the hydrographic network, dictated the way and the variety of the forms of positioning in the space of the settlements. In the superior sectors the precincts of settlements occupy the axis of the valleys. At the contact between mountain and piedmont, alluvial fans developed, which constitute the basis for the precincts for the big compact villages. At the contact between plain and piedmont, big rural settlements are developed (settlements of valley openings) with a mixed agricultural profile (the cultivation of plants and animal breeding). The interfluves are occupied by loose-knit and dispersed settlements of the farm type.

In Great Britain the dispersed type of settlement is dominant. The phenomenon of scattering is dictated by the extension of *"openfields",* as well as by the deforestation and establishing of precincts on the swampy territories. The "openfields" type of territories extended due to the abandoning of the *"closefields"* by the rural landowners who went to towns or turned towards other activities than purely agricultural ones. The scattering takes more forms. Thus, in Ireland and the Cornwall Peninsula 2-3 farms regularly associate, while in Yorkshire and south-eastern part of the country the singular farm is dominant.

In Wales, due to the Anglo- Normandic influence, the villages with enclosed properties are dominant. In the proximity of big towns appeared rural settlements which do not have agricultural territories, having only residential functions. They mark the beginning of the process of suburbanization. Scotland is characterized by a pronounced rurality, due to the existence of some very big land domains, some reaching 20.000 ha. The settlements are divided in production zones:

- zone for fishing and land cultivation;
- zone for fruit growing and animal breeding;
- zone for extensive breeding of sheep, in the conditions of a harsher climate, at altitudes over 700 m;

In many cases, the British rural settlements exist from Antiquity, over these the settlements of the Danish, Norwegian and Irish emigrants developed. Generally, the British rural settlements have a similar comfort to the urban ones, they are well maintained and dispose of green spaces which are maintained all through the year, due to the oceanic type of climate.

Figure 37. Rural settlement in the United Kingdom *(after R. Brian, 1987).*

The Mediterranean region, situated at the contact of three continents, is characterized by big contrasts in the landscape, by being inhabited from antiquity and by the overflowing of people and civilizations from north, east and south-east, which put their mark on the old type of Roman and Greek settlements.

The immigration of the Arab population from the north of Africa had its consequence in the production of new irrigated systems of crops in Spain, Sicily and the south of the Italic Peninsula, with specific forms of habitat. In this part of Europe the variety of the natural environment, with abrupt transition from the mountain units toward the coastal plains also contributed to the completing of the wide range of the forms of organizing of the rural habitat.

The swampy coastal plains were reclaimed, the arboriculture developed (olives and citric) and numerous developments for touristic purposes were created.

The main rural activities are:

- the cultivation of land with cereal and cotton;
- arboriculture (olive, lemon, orange, chestnut tree);
- shepherding.

These three main forms of activities significantly left their mark on the whole rural space. The most favourable areas for the expansion of settlements are the coastal ones with high shores, small gulfs and beaches. The settlements here also benefit from the possibilities for functional diversification (agriculture, tourism, fishing, mining). The wooden, stone and adobe constructions dominate.

The settlements have a very irregular dispersion from the point of view of geographic location and the type of settlement. The most evident groupings are found in the coastal zones where the settlements stretch as strings of beads on all types of coasts. At the foot of the Apennine Mountains continuous settlements develop having at their base nuclei of concentration, dispersing along the valleys and scattering on the slopes. In the southern sector of Italy the "hill-top villages or acropolises" are frequent, the majority being established in the 7^{th} and 8^{th} centuries through the migration of population from the valley sectors for defence purposes.

On the Dalmatian coast, because of the fragmentation of the limestone there is also a certain fragmentation in the spatial scattering of rural settlements. Some of them became specialized in the extraction of salt from seawater.

Towards the interior of Italy, the Iberian and Balkan Peninsula the rural settlements become less frequent, with the exception of the depression areas. The distribution in altitude happens in relation with the zones of natural vegetation, but especially in relation with the arboricultural zones. Thus, we distinguish the settlements in the citric areas, which spread till the average altitude of 300 m. On the island of Crete the distribution of villages overlaps with the area of cultivation of the olive and does not exceed 600-700 m in altitude.

In the area of cultivation of the grapevine, which spreads between 700-900 m in altitude, only temporary summer settlements are found.

The maximum altitude till where the permanent rural settlements spread in this region varies from 1200 m in Sicily (here the limit of arboriculture spreads till there, due tot extremely fertile volcanic soils and the great quantity of heat) till 1800 m in the Dinaric Alps. On the eastern and southern slope of Mount Olympus (2917 m) the permanent settlements go sometimes beyond the limit of 1800 m. Here the settlements are grouped in several strings. In the coastal zones the settlements with a nucleated structure spread in strings. Then follow a second string of settlements with a dispersed structure situated at the base of the alluvial fans. At the superior limit of the alluvial fans another string of villages follows, some sheltered in small depressions of contact. At higher altitudes the settlements with dispersed structure spread. On the Dalmatian coast the following way of

repartition is frequent: on the coast big nucleated villages appeared as a result of the drainage of the swampy zones. Some of them specialised in salt extraction from the sea water. After this follows the area of the loose-knit settlements, and at higher altitudes the dispersed ones with stone houses, named in Albania *"kulë"*.

If we take into consideration the functions we distinguish:

- settlements specialized in the cultivation of the land;
- pastoral settlements;
- mixed settlements.

The settlements specialized in the land cultivation overlaps the cereal zones and cotton cultivation zones. They have a reduced index of dispersion. Also included in this category are the settlements specialized in arboriculture, these having an average index of dispersion. They are spread in the plain, coastal zones and in those zones where the main streams of water flow into the sea. They are also found in the peninsulas either as strips on the valleys of Sava, Morava, Mariţa, Pad and Tibru, or in the mountains depression.

The pastoral settlements are specific to the mountainous zones, sometimes practicing the transhumance (The Pyrenees, the Rhodope, and the Dinaric Alps). In the arid limestone zones they advanced up to the coast. It is the most frequent type of settlement in the Spanish Meseta, the centre of the Apennines and the mountainous zone of the Balkan Peninsula. At the foot of the Vesuvius volcano the rural settlements specialized in the cultivation of grapevine and citric developed in circles around the volcano.

The mixed settlements spatially coexist with those specialized in land cultivation. They can have agricultural industrial or agricultural touristic profiles. The most frequent are found in the coastal areas where touristic and salt exploiting villages established. From the point of view of the size, the small villages are dominant (in the former Yugoslavia, out of 28.000 villages, 70% have under 500 inhabitants). The large villages usually occupy the areas with intensive agriculture on the valleys of Sava, Mariţa, in Andalusia, at the contact of the Apennines with the Pad Plain and on the coasts of the Adriatic and Tyrrhenian Sea. The large villages are regularly the result of the system of crops. For example the mixed cereal-arboricultural system led in Portugal to the appearance of the very big *"ferrogial"* village, widely spread in the Alentejo region in the south of the country. The precinct of the village is surrounded by the cereal crops. Then towards the periphery of the estate follows an area occupied by orchards.

Figure 38. Rural settlements at the foot of the Vesuvius volcano *(after Weltatlas, Alexander, 1982).*

In Andalusia and Aragón the orchards occupy the space adjacent to the precinct from where the isolated farms named cartiga spread. They have a population up to 10.000 inhabitants and are recognized as forms of transition towards the urban *"Stadtdorf"*. As structure we find the dispersed, nucleated and mixed type. The dispersed type regularly overlaps the pastoral areas. The extensive surfaces used for shepherding in the Castilian Plateau are characterized by the presence of a dispersed and poor network of clay houses, inhabited by a population of sheep and goat shepherds (*"dehesa"* type of settlements), these extended surfaces are divided by the Sierra de Guadarrama mountain range, where grassy lands are associated with a poor bushy vegetation, forming the maquis type of

vegetal association. The rural settlements in the south-eastern part of Spain are mostly specialized cultivating fruit and vegetable in intensive systems. The orchards and vegetable growing fields are extended till the periphery of big towns, these intensive agricultural systems being named "huerta".

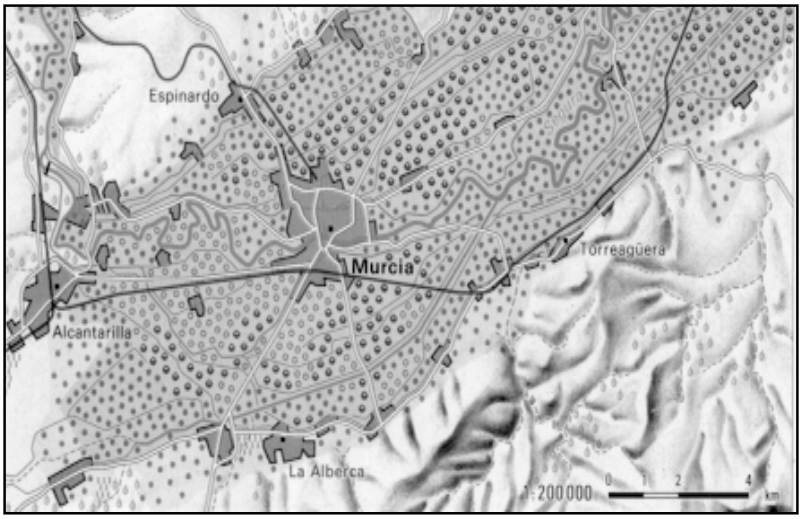


Figure 39. Rural settlements and intensive crops of *huerta* type in the surroundings of the city Murcia *(after Weltatlas, Alexander, 1982)*

In the Pyrenees and the Apennines the dispersion dominates and is completed by clusterings of the hamlet type, of grouped households, that either have a common source of water or an area sheltered from landslides or a sunny slope.

The *"haciendas"* type of villages from Andalusia is also included in the category of the dispersed settlements.

The agglomerated settlements are conditioned, first of all, by the type of economy. A complex and intensive rural economy regularly generates the phenomenon of agglomeration. Agglomeration can also be the result of customs, like in the case of the *"ciflik"* village of Turkish origin, more widespread in Turkey, Macedonia and Albania. The zones with intensive agriculture based on the irrigation in the inferior basin of the Duero, Guadalquivir, Segura basin Valencia (the area of Spanish huerta-s) and Greek Macedonia are dominated by agglomerated settlements. In some areas in Montenegro and Herzegovina the agglomeration is conditioned by the rarity of the water resources.

After the shape of the precinct, in the category of the agglomerated settlements we find the linear villages conditioned by the transportation network specific to the region of Venice, and those that have a circular precinct to the region of Timok. In the mountain areas the construction materials are usually wood and stone while in the plateaus and plains the stone and the adobe dominate.

5.2. The Rural Settlements of Russia

They have as a common feature the quick evolution towards the modern forms as a result of the mechanization of the agricultural works, the increase of endowments and the generalization of electrification of the villages.

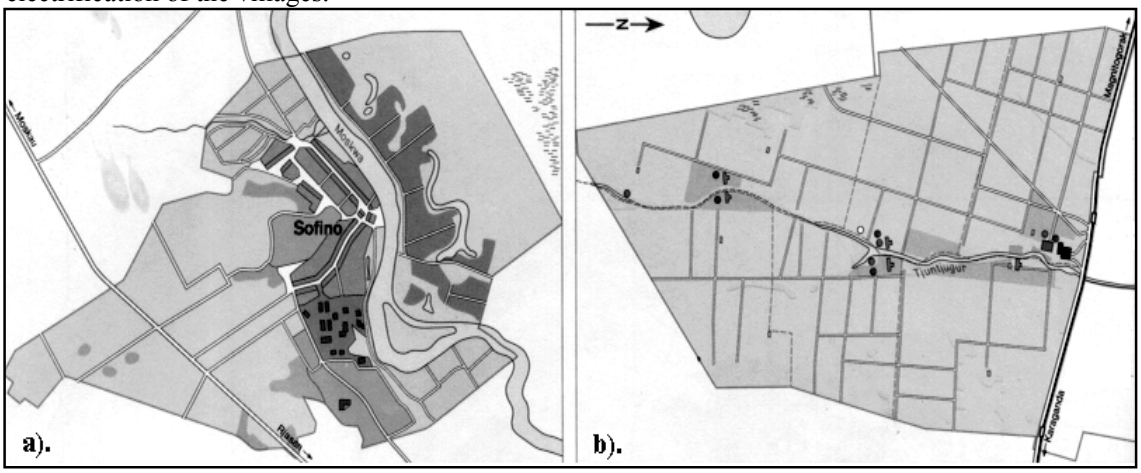


Figure 40. Rural settlements of kolhoz (a) and sovhoz type (b) *(after Seylitz Weltatlas, 1984).*

At the same time numerous new rural settlements were established by extending the cultivated areas towards north and in semiarid zones. Thus the nomandism specific to central Asia was transformed into shepherding based on transhumance. Applying the principle of maximum generalization in Russia, there can be distinguished three big zones of rural settlements, depending on the great zones of production and of the professional structure of the population.

There can be distinguished:

- rural settlements in the agricultural zone;
- rural settlements to the north of the agricultural zone;
- rural settlements to the south of agricultural zone.

a). The rural settlements of the agricultural zone overlap the area within chernozem soils and wood steppe, which stretches from the Baltic Sea to the Black Sea and continues towards east as a large corridor till West Siberia, where it becomes narrower and appears only sporadically in the Amur basin. This narrowing that becomes a sporadic presence is determined by the harsher pedogenetic and climatic conditions. Two types of villages are characteristic: the big village, which is dominant, usually with a nucleated structure and the small village that sometimes has tendencies towards scattering. In Byelorussia and the Baltic Republics farm type isolated settlements appear, named *"hutor"*. In Ukraine the big agglomerated villages typically have over 2000 inhabitants, situated at 10-15 km distances one from another. Due to this fact the shelters *("odăi")* appeared for agricultural works.

b). The rural settlements north of the agricultural zone. In this space forestry vegetation dominates, thing that determined the forming of dispersed settlements. The most favourable conditions for the appearance of settlements are found in the areas where a more diversified rural economy can develop (by exploiting of forests, hunting, animal breeding and land cultivation).

At the northern limit of the taiga the settlements become scarce because of the long period of frost. The main occupations, the reindeer breeding and hunting, require seasonal migrations in the tundra and implicitly the appearance of the double settlements (summer and winter ones). The dwellings are the *"conic tent"* and the *"yurt or felt tent"*.

The settlements of the Yakut people are generally small and are situated at long distances from one another. The traditional dwelling, the *"balagan"*, is made out of beams. It is square shaped and its roof is also made of a beam in two waters, is covered by earth. The animals are often sheltered under the same roof. There are also found hexagonal form dwellings of the *"yurt"* type, also made of beams. Under the Russian influence, nowadays the dominant constructions are of the *"izba"* type. As a result of the evolution of the Nomadic groups towards sedentary life and the numerical growing of the population of the settlements, many new settlements appeared, adapting to the harsh conditions of Siberia , they have rectangular network and with all the range of endowments specific to the rural. A considerable number of settlements were established along the Baikal-Amur railway.

c). The rural settlements south of the agricultural zone. As a result of the different agricultural profiles (irrigated and non-irrigated crops, arboriculture, animal breeding) and of the existence of a real mosaic of nations with specific traditions, the rural settlements present noteworthy differences. Two main types of rural settlements can be distinguished: those having an agglomerated structure and the scattered ones. The agglomerated ones appear on the coast of the Black Sea and the pre-Caucasian zone as wide strips which narrow in the Turkestan Plain because of the desert (Kara-Kum and Kyzyl-Kum).

The agglomerated settlements reappear in the Ashkhabad-Kerki zone, where they group around the irrigation system, advancing till the southern sector of the Aral Sea, following the course of the Amu-Darya River and the irrigation systems which are adjacent to this. In the intermountain depressions of the Tian Shan mountain range the zone of agglomerated settlements widens between Samarkand and Alma-Ata, while narrowing again at gates of Tsungaria. The Tajic villages named "kislak-s" differ very much among themselves depending on when they were established, before or during the years of the Soviet Union. The old villages are characterized by a labyrinth of narrow and winding streets, and by having no windows on the walls facing the street. In the mountains the precincts are often divided in groups of precincts, and their plan follows the relief of the site. The most widespread type of village in Uzbekistan is the *"kislak",* a traditional settlement with houses made of clay, situated along some narrow streets. In the centre of the kislak are the mosque and a pond called *"hauz"* planted on its sides trees. Near the *"hauz"* is the *"ceaihanaua"* a place preferred by men for

spending their leisure time. As a result of some natural and historical conditions some remnants of settlements surrounded by walls made of clay with isolated households remained, named *"hauli"* or *"kurgancea"*. The houses are built of clay, of unburned brick, while the exterior walls by wood carcasses filled with unburned brick or clay clods. In Turkmenia the households are grouped around a fortified spot, named kala.

In the past, in Georgia, the rural settlements were extremely varied, those from eastern Georgia are different from those in western Georgia. In eastern Georgia the villages with an agglomerated structure still remain sporadic while in western Georgia, the isolated hamlets continue to be dominant. More recently both in western Georgia, but especially in the eastern Georgia the gardens with vegetable crops extended near the court yards of the kolhozniks. The stone used as the dominant material of construction, while in western Georgia the constructions made of wood appear frequently (beams, boards, twines), with roofs made of tile, chipboard or straw. The two-story houses are frequent. Beside the agricultural function, especially in the pre-Caucasian sector, crafts are also developed (ready-made carpets, objects made of wood and metal).

The dispersed settlements have as their main function animal breeding, their population performing seasonal migrations between the semiarid and mountainous zones. As materials used for constructions in the semiarid zones dominate the clay while in the mountainous one the stone. A typical type of dwelling for the animal breeders is the *"Mongol yurt",* with a circular shape, its walls being made of felt and the supporting framework made of wood bars which can be folded. The superior part has conical shape and it's made of thin and straight poles that have their lower ends caught by iron bars, the upper ones are fixed by a ring, its opening serving for the evacuation of smoke.

In the middle of the hut is the fire place .The right side of the entrance, which occupies half of the hut, is considered to be women's sector. Here one can find cooking tools, boxes with food and wooden boxes with the family's treasure. In the left side there is the men's sector with harnesses, hunting tools and the leather pots used for keeping the "kumasului" and the sewer mild. The front part of the entrance is considered as a place of honour.

5.3. Rural Settlement from Asia

Asia is impressive due to the large number of population, to the existence of some very old cultural traditions and the large number of settlements. Highly diversified at the continental level, the rural population is dominant and is concentrated in settlements. Classification of the settlements is extremely difficult that is why is recommended a regional classification.

a). Western Asia. It includes the space that spans between the shores of: The Red Sea, The Mediterranean Sea and the Black Sea up to Iran and Afghanistan. This area is characterized by a predominantly dry climate and has extensive spaces of semi desert or desert-like climate.

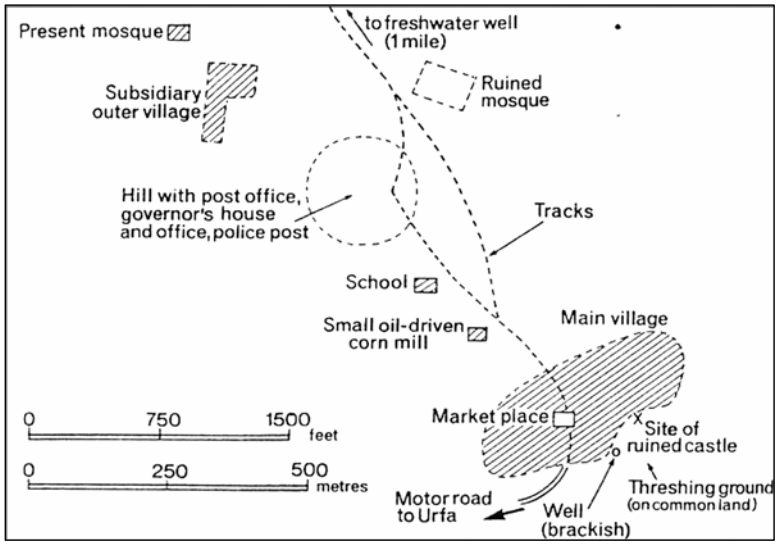


Figure 41. Village from South Turkey – Marran - Anatolia *(after, F. Hudson,1976).*

The process of exploiting the land resources demands increased efforts on one hand because of the lack of water supply and on the other hand because of the low natural fertility, except for the Mesopotamian Plain. This space is occupied almost entirely by states that have poorly developed economy. A significant part of the population is nomad. Most

frequents here are the nucleated or dispersed settlements. The nucleated village appears in the spaces with intensive agriculture. The most frequent, called the "ciflik", is found in Turkey and in the entire territory that used to be the Ottoman Empire.

It is a type of clustered village, with narrow and winding streets, with an economic profile specialized in irrigated crops and arboriculture. At the village's origin there is a nucleus made of the household of the big landowner.

The expansion of the village began at first in an unorganized way. Along the shores of The Saudit Arabia and Liban there are the nuclei of concentration dispersed on the mountain slopes. The buildings are mostly made of clay and sometimes of stone. The houses have flat or arched roofs. The workers from the big estates have built their houses in the proximity of the landowner's house. The lack of material supplies led to settlements with unequal texture. The European influence began to be noticed only after 1923, when the modern turkey village appeared. This type of agglomerated village with winding streets is found in North Iran too where is called *"kere"*, also found in Korasan area from Afghanistan, inhabited by sedentary population.

Dispersed settlements are spread usually in areas with pastoral and arboriculture traditions. The tent is used for shelter but there is also rudimentary permanent residence that is used only seasonal.

The kurd village having grouped households in alveolar nests, shelter about 30-40 households. The houses have conic shapes. They are relatively recent and belong to former nomads that today have settled. The village has a structure in levels, the roof of one household being a yard and lane for the household that is situated above it. The Beduins from the Arabic Peninsula, Syria and Iraq, as well as the Afghanistan shepherds live in tents.

In Yemen, the Djeibel population lives in dispersed settlements made of stone. The houses have two floors and towers and the first floor serves as a shelter for the animals. Throughout the state of Israel the kibbutz type of settlement has appeared, a modern rural settlement with various facilities and with a pre-planned centre of the village (dwelling areas, area for animals, the civic centre).

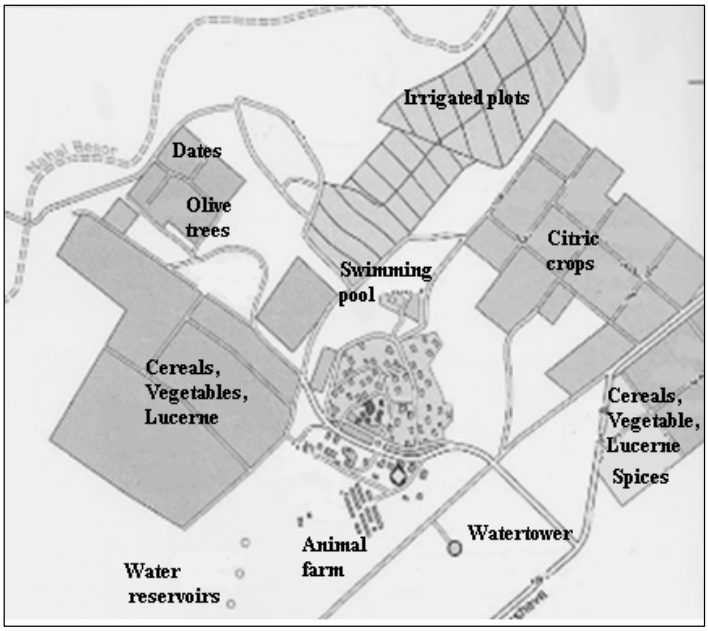


Figure 42. Rural Settlement, kibbutz type *(after Seydlitz Weltatlas, 1984).*

"Kibbutz represents the Israelian collectivist community. This is a spontaneous creation which came as a reaction of a double exigency: the human one and that of the land. The socialist ideal of people's redemption through labour was one of the driving forces of the second migration wave to Palestinian" (A. Chouraqui, 2001, p. 115).

Life in general and the economic life in particular, are organized according to the principles of group property of land and of the other means of production and of the retribution done accordingly to the needs.

The kibbutz villages are formed spontaneously, from the immigrant population, thus appearing the basic nuclei of conquering the desert. The kibbutz community takes care of all the aspects of the group's life (shelter, food, health care, work training, leisure time etc.).

"The whole kibbutz's system is voluntary, spontaneous and autonomic. The kibbutz members do not have salaries, savings, and bank accounts; for the people born in the kibbutz, individual economy represents a total mystery… Here work is done with love and for the common wealth and the community deals with everyone's needs, according to its possibilities. A deep calmness, based on

group solidarity, gives these payless people the rational certainty that they are the masters of their work and of their hands, and that they are free" (A. Chouraqui, 2001, p. 115).

The setting of the limits of a kibbutz's exploitation is established by the state's Land Registry's services. The state sustains the forming of kibbutz for the material and economic point of view, with the problems regarding the water supply and the water system being crucial (K. Zaid, manuscript, December 2001). Recently, kibbutz developed and diversified their economy through manufacture and extension of the services.

The most evolved rural settlements are those in the proximity of petrol exploitation and those from agricultural areas developed on intensive irrigation.

b). The South East Continental Asia. Here the geographic distribution and structure of the settlement have been influenced by the cultivating system, by the social aspects of property, to which was added the influence of colonial power on the distribution and the physiognomy of the settlements. In this respect, the farm-like large estates from the south of Vietnam led to a dispersion of the settlements while in the north the agglomerated villages dominate. The dispersion of settlements also appears in the area of irrigated rice parcels along the valleys of Saluen, Menam and Mekong and their deltas.

The highest dispersion appears in the regions with mixed crops (arboriculture and rice).

c). South East monsoonal and insular Asia. It is an area with a sedentary population occupied with fishing, handicraft production and crops. The excess of humidity and the type of agriculture influenced the aspect of the settlements. The houses are made of vegetal material and are usually build up on top of the pillars. The dispersed settlements are predominant, located adjacent to the crops. The traditional agriculture practiced here is an intensive one based on irrigation with two or three harvests a year. The houses on pillars appeared because of:

- the economy of land;
- as defence against some animals and insects;
- the high humidity of land.

Settlements on islands have various aspects, from the crowded settlements in the plains to the dispersed ones from Java Island, in the rice crops areas. There are different types of villages: the linear village among the rivers (Kampong) with rectangular house in pillars the linear village along the road (Filipino) and the village with terraced crops. In New Guinea we find the "palafite" villages with rectangular houses totally suspended. The connection between the houses is made by boat.

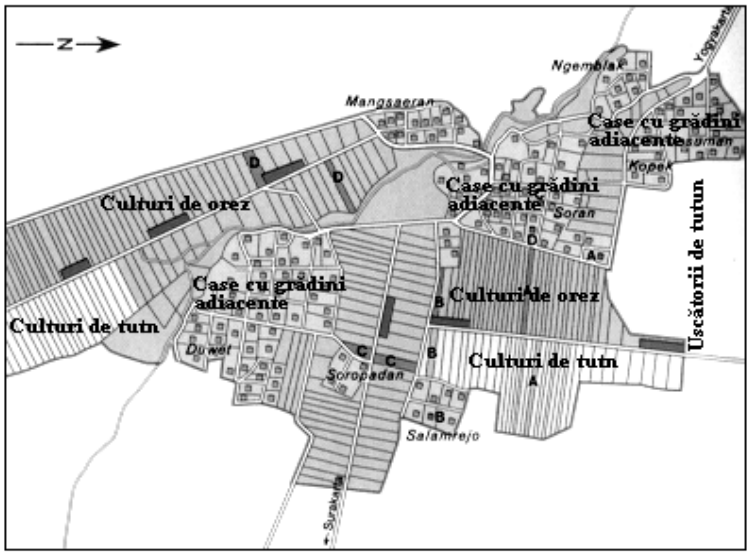


Figure 43. Rural settlement from Java Island *(after Seydlitz Weltatlas, 1984).*

The defensive instinct has led to the apparition of some villages with defence purposes difficult to attack, with precincts established in isolated places difficult to attack, like on promontories. In these situations the precincts are built far from the agricultural fields. For the same reasons, in the Solomon Islands the villages are surrounded by massive fences. In the Manila Golf an ethnic group known as the "inhabitants of the waters", organize their village in boats, called *"togoli"*.

d). The Rural Settlements in the P.R. of China and the Korean Peninsula. They are not very different one from the other, due to the traditionalism spirit of the Chinese people that preserves elements of their culture. The geographical distribution of the rural settlements was conditioned by the type of economy and by the physical restrictions.

The highest densities of rural settlements are found in the plains, in depressions, in contact areas, while the lowest are found in Tibet and Central Mongolia Hills. The agrarian reform from 1952 led to the apparition of new rural settlements. The whole rural territory of R.P. China was organized from the administrative point of view in people's communes (exceeding 75.000 communes). To a single commune belong 30-50 villages. The commune, as an administrative form has adequate facilities (schools, commercial units, sanitary units). According to the old classifications, the Chinese villages are divided into two types:

- the cijuan village;
- the sian village

The *"cijuan"* village is the most frequent and includes inhabitants related to each other. The "sian" village is composed of concentrated settlements that have both commercial and administrative functions.

The *"sian"* type villages have a very large market that forms the centre of the settlement. The Chinese rural settlements, generally speaking, are large, having hundreds of household. The scattered households have been grouped into people's cooperative of agricultural production.

In the Korean Peninsula the villages are mainly concentrated on seashores and piedmonts. These villages benefit from intense actions of systematization that brings them closer to urban centres.

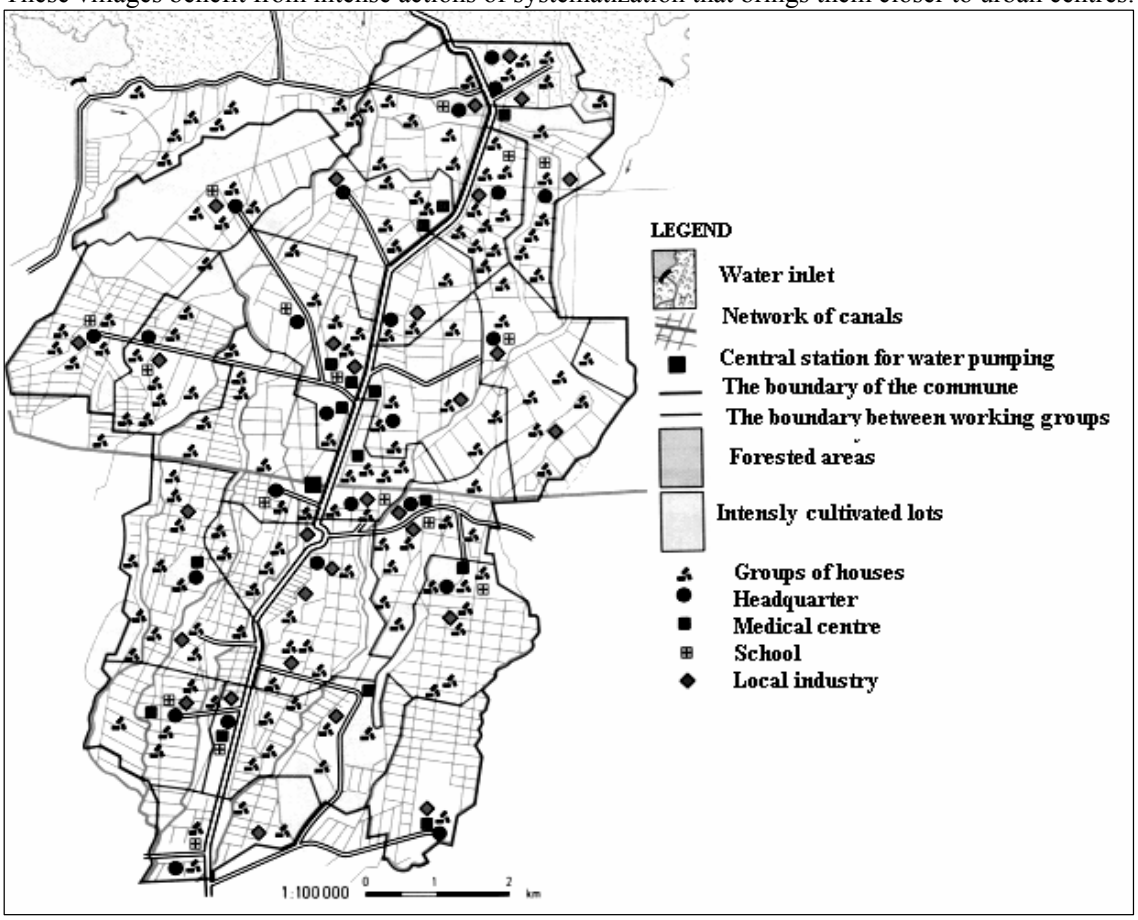


Figure 44. People's commune in R. P. China *(after Weltatlas, Alexander, 1982).*

e). Rural settlements from India. We distinguished four main types of villages:

- nucleated villages surrounded by walls (North Eastern Assam, West Rajahstan, Southern mysore);
- open villages with some dispersed hamlets, common in the Ganges Plain;
- linear villages (predominant in the Padesh Region);
- dispersed villages with isolated houses (on the west coast).

We meet villages organized on tribal principles as it is the case of villages with defensive role built on two levels of altitude (on the top level houses and on the lower level agricultural land) from the lover basis of Ganges.

Depending on the materials they were build from, there are stone, wood and clay houses in the north and in the south:

- stone houses in the hilly area;
- wood houses in the Malabar coast;
- straw houses in the Gadawari area;
- brick houses in the Mandras area.

In India many villages share the same handicraft activities (carpets), cotton fabrics, leather belts, oil pressing machines.

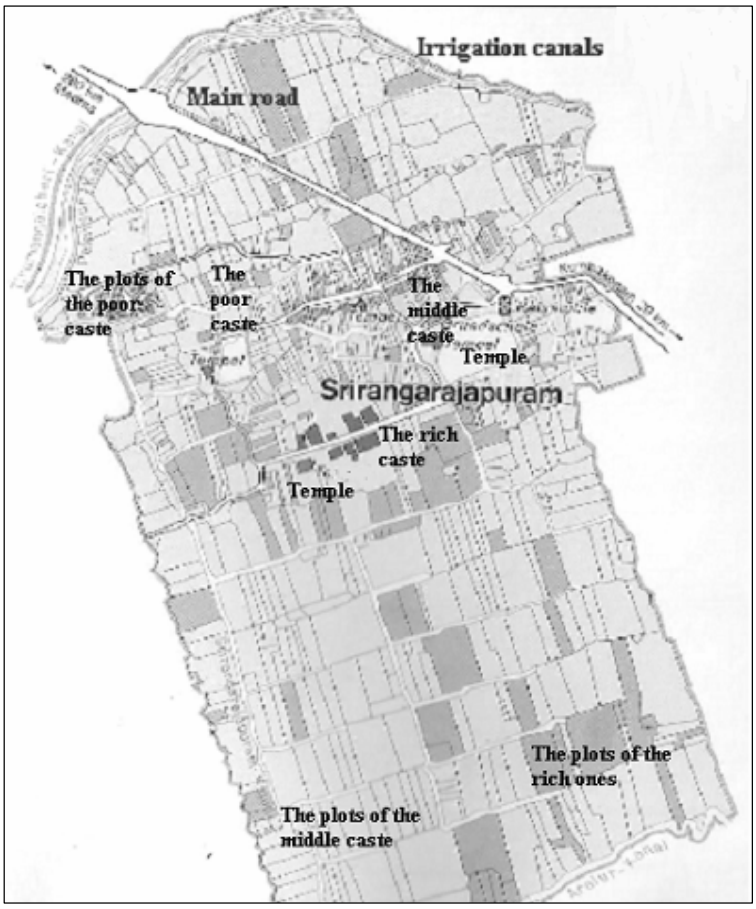


Figure 45. Rural Settlement from India *(after Seydlitz Weltatlas, 1984).*

These have an important water supply, a space for the weakly fair, a police station and a village hall. Among the buildings we distinguish the Hindu temples or the Muslim mosque and the head man's house. Usually the Indian traditional villages have the precinct divided according to wealth. The group of the rich is less numerous and concentrates almost 20% of the agricultural land of the village. The middle class has almost 70-80% of the land. The low class doesn't even have 5% of the land of the village. The last class lacks public facilities and their houses are placed at the peripheral area of the village.

We can distinguish two big categories according to size: large and small.

The large Indian village has a multinuclear aspect being composed of several small hamlets. In the central part the farmers with their families usually live, and towards the periphery, in the hamlets, live the craftsmen. In the village's structure a central market serving as gathering place is usually found.

The small Indian villages are frequent in the north-west of the country, in the Kashmir province that is specialized in cattle raising. The households are surrounded by fences or clay walls. The foundation of the houses is high, the lower part serving as a shelter for animals. This type of village is predominant in Dekan Hills too, where the modest houses and the huts have a scattered structure. Nevertheless, in the prehymalain area, villages are very small and dense.

On the eastern slope on Himalayans, dominantly in Nepal, the rural settlements scatter and are differentiated vertically. Thus, in the low area with terrace cultivation, the Hindu villages are dispersed. The higher altitudes, were settled by a population specialized in transhimalayan transport. These villages settled above the upper limit of the forest and are classified into:

- typical kumjung villages (sherpa's villages);
- commercial villages (jumbesi).

The sherpas' villages have a dispersed structure, each household being situated adjacent to their land, this being surrounded by fences and stone walls. The commercial village is, usually, situated at lower altitudes (the forest area) in the mountain passes. This kind of village has a civic centre with the necessarily utilities and an organized network of roads. At the highest altitudes, usually reaching 5.000m, the pastoral villages with simple stone constructions are situated, quite far away one from the other.

In Pakistan prevails the small villages with stone and clay houses.

f). Rural settlements in Japan. The rural landscape is characterized by fragmented estates, due to the highly fragmented relief and the small properties. Nevertheless the demographic potential is high. The surfaces that have agricultural destinations have an intensive use, the terrace cultivations appearing even on the top of the mountain. The largest part of the population is concentrated in the seashore plains and in the internal depressions that have suitable land for agriculture, thus hosting the biggest cities. In the mountain areas the rural settlements dominate. The territory o f Japan is divided into 3.511 administrative units, out of which 1.031 villages (mura), 1.924 cities (mahy) and 556 towns (shy). The rural units (mura) are formed by 30-80 so-called baruku or aza, which are made of 30-100 farmhouses. The inhabitants of buraku cooperate in the exploitation of the land by bringing several improvements (irrigation, terraces etc.). The agglomerated villages prevailed.

The dispersed settlements are scarce and we see them more often in Hokkaido forested area.

As generic types we distinguish four categories: Jori, Gashi, Shindon and Tondenhei. Jori type villages are the oldest, dating from the VII century. Are found in plains and have a regular polygonal shape. The territory of the settlement is divided into long, narrow parallel strips, belonging to 30-50 families.

The Gashi rural settlement derives from the big estates of the medieval period, and they worked the land with their servants. The main buildings were built in the centre of the estate and were surrounded by the defensive trenches. This kind of villages spread in the north of Honshu Island and in the south of Kiushu and Shikoku isles.

The Shindon settlement dates from the XVII-XIXth centuries when people were given properties in order to set up irrigations (1866). This appeared in the Meiji restoring on modern base of Japan's economic period. Equal surfaces of land were distributed to peasants coming from different areas. After two, three generations, the land owners build villages and social structures, some loosing their land. This type of villages has linear shape.

The Tondenhei settlement is from Hokkaido Island where till the XIth century the large feudal estates prevailed. In 1868 started the colonization of the island which had a poorly developed economy. By cutting down the forests there were created villages having the territory delimited like in the Jori model.

The Japanese villages are well taken care of and very well organized.

5.4. Rural Settlements from Africa

Due to the fact that the economy is less developed the villages are less diversified. Even so, we distinguish a variety of types of rural settlements, depending on the position on the continent, the social organization and on the agricultural profile.

Thus, in Magreb's area the Berber villages are organized in communities that have a nucleated structure of the precinct with the houses made of stones and leaning against the rocks. The roof of one house is the yard of the house above, exactly like Turkish villages from the north of Iraq. In the middle of the village there usually is a tower used as refuge during the invasion of the neighbouring warriors. The population of the village is made up of some large families. The Arabic-Berber population lives in large villages that developed along the roads. The main occupation of the inhabitants is the breeding of the goats and sheep. Its role in the economy of the village increases as the distances grows. Apart from breeding animals, the population is specialized in weaving carpets and manufacturing leather.

In the Shotts region we find nomad and semi-nomad's population that take the herds grazing in the pre-desert area and during the summer in the Atlas Mountain area. The *"felidj",* a tent made of cloth, is their house. These types of villages are made of 10 to 100 tents and are called "duare". In the north the villages are specialised in grapevine and arboriculture, some of them being like the farms

established by colonists. In the central area of Maroc the small villages with mixed functions are widely spread.

The Saharan region is characterized by its oases settlements, situated in the proximity of cities with commercial centres. In the surroundings of the Uargla city and in the Algerian Sahara, the permanent rural settlements have developed within 5-10 km of the downtown, taking advantage of the water supply and of the land suitable for dates growing. In the proximity of the city are also located some of the nomad settlements.

In Egypt the *"felah"* population lives in small villages dispersed on the heights around the river Nil. The houses are made of straw and clay and have only one floor and their roofs are straight. In Sudan, many tribes that breed animals have two houses: one for the winter and one for the summer. During the dry season the population moves together with their herds toward the areas with higher humidity and with better grassland. The villages are made of groups of cane huts, with conical straw roof and, placed in a circle. During the rainy season the villagers work on the plantations that are situated around the houses. This type of village is called *"nylot"* and is characteristic to the South of Sudan, the wooded areas of Congo, Zair and Tanzania.

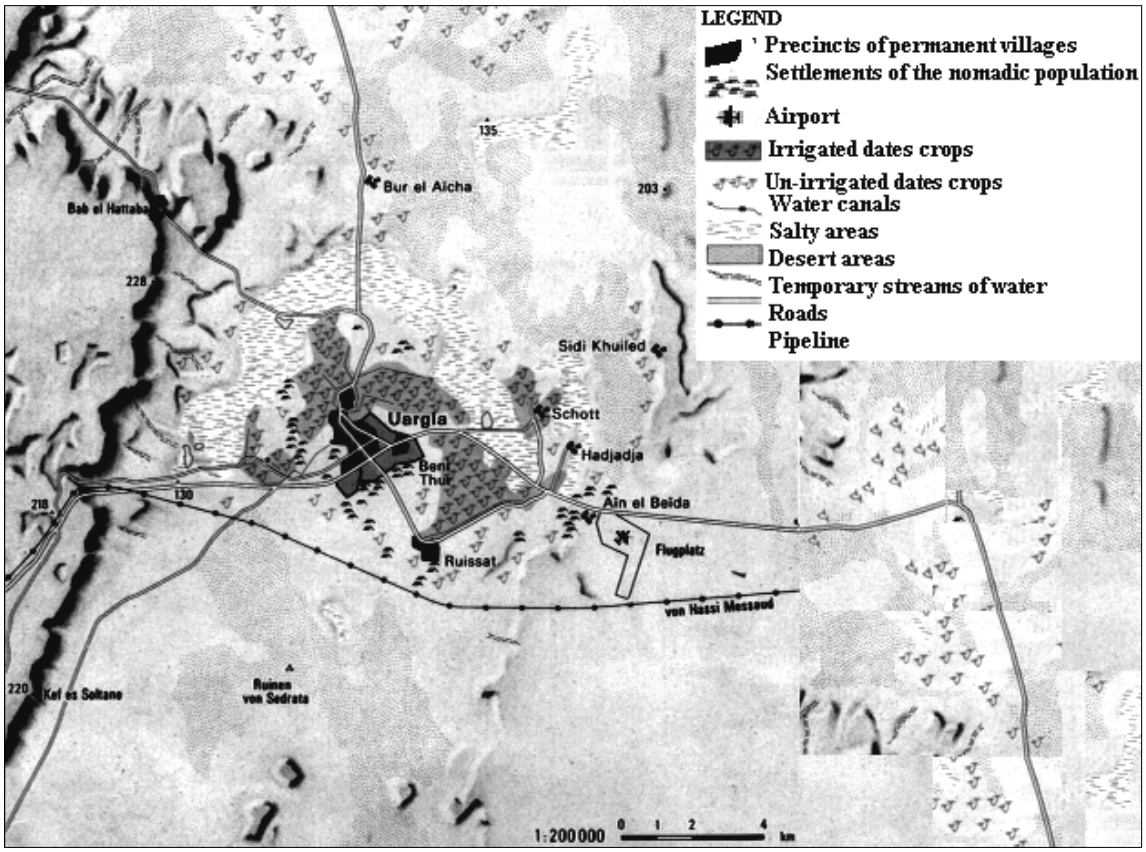


Figure 46. Clustering of settlements in Saharan Africa *(after Weltatlas, Alexander, 1982).*

The characteristic tribal life it is shown in the village's organization, fact that is well shown by the *"bamileke"* type of village from the wets Cameron where the coffee plantation prevailed. The village is usually located on a slope and is structured in social categories. At the upper part of the slope is the centre of the village made of right angle huts on pillars in which lives the head of the tribe. Down the slope there are the store huts and the servers' houses. In the lower part of the slopes there are the houses of the relatives. This way of organizing a village is a result of tribal power.

In the central Africa, in the equatorial forests the Pigmy settlements are typically located. Their occupations are picking food and hunting. Picking is done by women and hunting is done by man. There are no settlements in the real meaning of the word, they are more likely camps. When all the comestible plants around the village are eaten and the beasts killed the pigmies leave the camp and

move to a different part but never trespassing the boundaries of a certain territory. The pigmies don't have common language or written characters, each group using the neighbouring group's language that has taller individuals.

In Guinea the village has a cellular character, with several nuclei, made of groups of houses. The spaces between the houses are used for agriculture (vegetables and fruit trees).

The settlements from Congo and Zaire reach 2.000-3.000 inhabitants. This type of village is located along rivers, has a linear shape arranged in one or several parallel rows. This type of villages appeared in Tanzania too with the extension of the cotton, tea and coffee plantation. It usually has a civic centre.

Between the two world wars and after second war several mining settlements have appeared in numerous countries of Africa as a result of exploiting the ferrous and non-ferrous or, as well as of the petrol. Such types of rural mining settlements can be found in the Algerian Sahara, in Nigeria, Cameron, Shabba province from Zair (see picture 46).

In South Africa there are two types of rural settlements: the traditional and those erected by the colonists.

All the tribes that breed animals in this part of Africa (bantu, hotentots) have as traditional settlements the kraal type village.

The kraal is made of concentric circles. Toward the exterior there is high cane fence. After this follow the huts, in a circular setting and having straw roofs, then another fence and in the centre an enclosure for the animal's shelter. Another variety of the kraal type of village is the horse-shoe type of village. The houses are set in two semicircles on two rows with an interpolation. The cylindrical shape huts have the walls made of wooden frames with a layer of clay and conic roof.

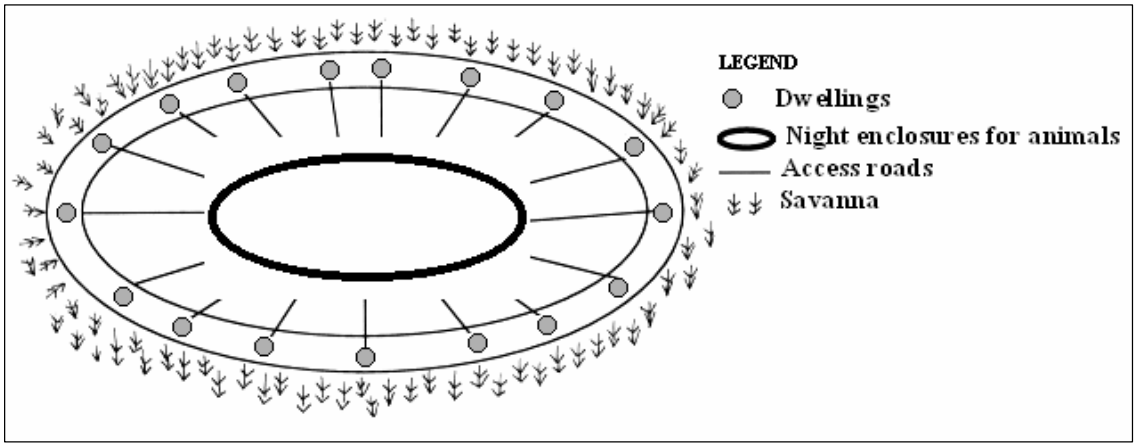


Figure 47. Kraal type village from South East Africa.

In the Lampoon's river basin is a different type of settlement with cylindrical houses, usually located near the rare springs that exist in this arid land.

In Angola the villages are set according to the area of production. Thus the clustered linear villages appeared in the north, in the area with equatorial forests, the main occupation of the inhabitants being the exploitation of wood. In the savannah area from the centre and south, the circular village prevails. In the central part, between the two extremities that form the horseshoe sitting is the water basin. In the South African Republic the Bantu population represents over 60% of the total population and lives mainly in the rural space, in reservations called *"Bantu homelands"* with kraal type villages. Some live in cities in special neighbours called *"locations"* with suburban aspect.

The settlement established by the colonists are mining villages, ranches and on plantations.

The mining settlements are formed by agglomerations of shacks organized in straight line or in a polygon. They are called "compound" and are the property of the mining society.

The settlements on the plantations are scattered along beach stripes with modern agriculture, using the natives as labour force.

The ranch settlements have developed in the lower basin of the river Orange and in its south part, areas where land cultivation is combined with extensive shepherding.

5.5. Rural Settlements from North America

On this continent we find two categories of rural settlements: those of the natives, in a continuous decline and those of the emigrant population in continuous expansion. The native population of North America is made of Indians and Eskimos.

The North American Indians have conquered most of the central part of the continent between the Arctic and the Pacific oceans. As a result of the occupation of the continent by Europeans, their habitat has strongly decreased; today they live in reservations in the Rocky Mountains area, especially in: Arizona, Colorado, and North Dakota and South Dakota states. The Indians settlements are made of tents. Hunting and fishing are their main interests.

The Eskimos occupy de north of Alaska, Canada and Labrador Peninsula and the shore line of the Greenland coast.

The typical house of these people is the igloo, a construction made of ice blocks. The ceiling is covered in seal skins that act as thermo isolators. Starting from ancient times, the main occupation is seal, walrus, whale, bear and polar fox hunting as well as fishing.

The immigrant population's settlements are usually modern settlements marked by national customs. We can distinguish thus Spanish rural settlements from Oregon and California, the Anglo-Saxon and the Scandinavian from Quebec and Louisiana area. In addition to this we mention the black people's settlements from the agricultural south east of the US and the Japanese and Chinese ones in California.

The settlements established by immigrants can be nucleated or dispersed. The compact settlements are specific both to the USA and Canada. They are the result of the colonization by identical populations from an ethnic and religious point of view (New England, New Jersey, Vermont, Oregon, Louisiana, etc) and had as a driving force the collective need for protection against the Indian tribes. Characteristic for the Quebec Province from Canada is the *"rank-type"* of rural settlements with French origin. They have linear shape following a road or a river, with households placed on rectangular parcels of land.

The typical dispersed settlement of the North American continent is *"the ranch"*. It is the result of cultivating of large parcels of land by the pioneers and of the dividing it in small squares, each one sheltering the buildings and the specific ranch facilities.

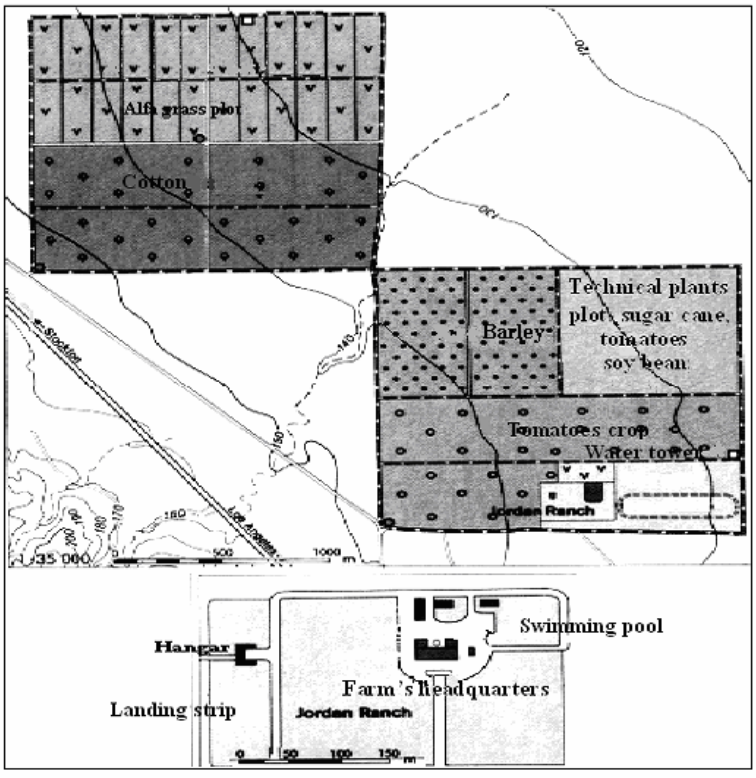


Figure 48. Ranch type settlement from California *(after Seydlitz Weltatlas, 1984).*

The ranch type settlement is the basis of the American agriculture. They have specialized depending on market demand. They can be distinguished according to size. Thus they are small ranches of 4-6 ha in the north and north east of the USA and in the east of Canada and very large ranches in the plains and mountain areas where the ranch parcels have a surface ranging from 200 to 400 ha.

In the ranches area, in the central points with good communication potential appeared services centres. The hamlet is the intermediary form between the ranch and the village. It appears in the

places favourable for products exchange and for educational services in the regions with the dispersed ranch settlements. It also appears in the forestry area of Canada as well as on the Pacific shores in form of fishing settlements.

In the case of the American rural settlements transitional types of settlements rural to urban settlements appeared in the proximity of towns where they get a mixed functional aspect (agricultural-residential) or in the mining areas where the agricultural and the mining functions mix. Many ranches from highly populated areas have rooms for rent for the urban population.

5.6. Settlements from Latin America

The colonization process of this continent, as well as the case of Anglo-Saxon America, has led to almost a complete disappearance of the native Indian's settlements. There are preserved only in Peru, Bolivia and centre of Brasil. In the Amazonian forest, the Indians of Tukako tribe live in isolated houses, called *"maloca",* that can provide shelter for 20 persons.

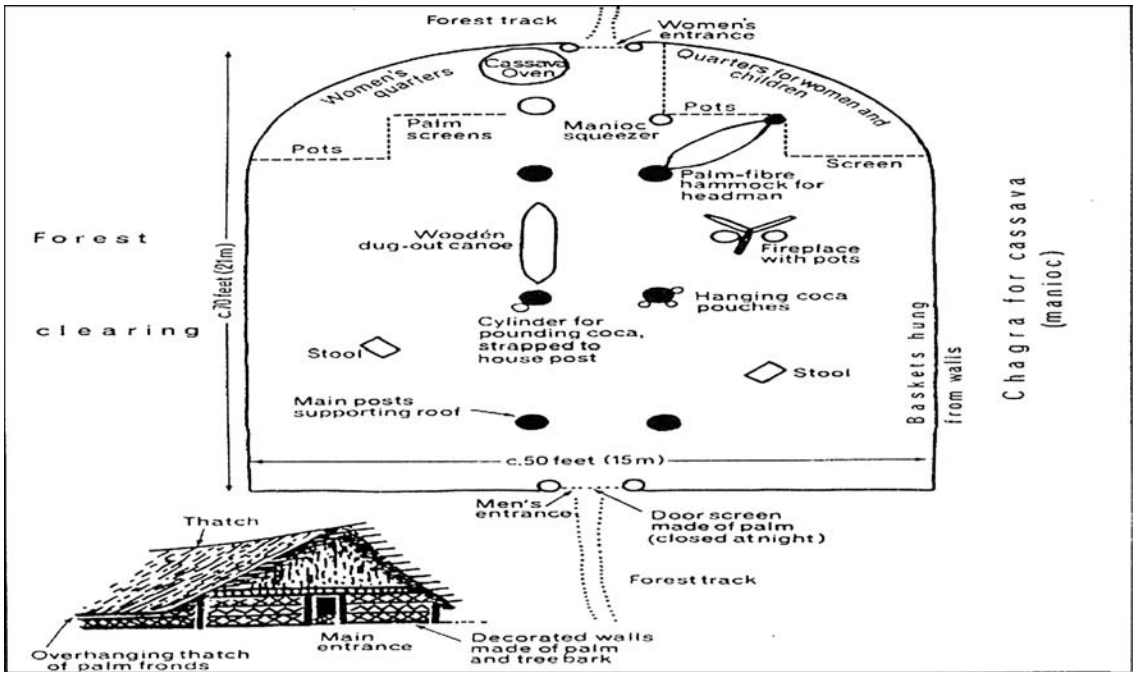


Figure 49. The plan of a maloca house from the Amazonian forest *(after F. Hudson, 1976).*

The Spanish and Portuguese colonists and the introduction of the sugarcane, coffee and cotton monocultures have influenced the development of rural settlements here. The process of populating was also influenced by the continuous expansion of animal breeding in the pampas.

The colonization has replaced the traditional forms of property with the feudal type of *"latitifundium"*. These are very big estates of thousands of hectares. The owner's household is built on these estates and the labour force used comes from the small villages situated at the peripheral zone of these estates. The farmers are called *"peoni"*. The size of the estate is reversely proportional with the intensity of the crops exploitation. Thus, the big ranches from Argentina that are specialized in cattle breeding, called *"estancios"* have surfaces between 5000- 10 000 ha and are located towards the interior of the country. Another type of ranch is *"charra"* with a surface of 50-200 ha specialized in cereal crops. Along the shoreline there are ranches specialized in milk production, called *"tambos"*. Among these types of ranches there is an unusual type of settlement that functions as a commercial centre. This kind of settlement has a high communication potential and is called "baliche". The manner in which monoculture has influenced the settlement process is well illustrated by Brazil. The sugarcane monoculture led to a strong concentration of population (including the black slaves brought from Africa) on the shores of tropical areas, thus appearing the first *"fazendas"* settlements. The

process of populating the Amazonian forest is done systematically cutting the equatorial forest and parcelling the land for *"new colonists"*. The *"control centres"* are placed along the main road's axis and is called *"agroville"*. These villages are the result of the politics of colonizing of the poor population in the scarcely populated areas of the Amazonian forest. This cleared areas have an agricultural destination and has a remarkable geometry. Each parcel has a surface of 100 ha.

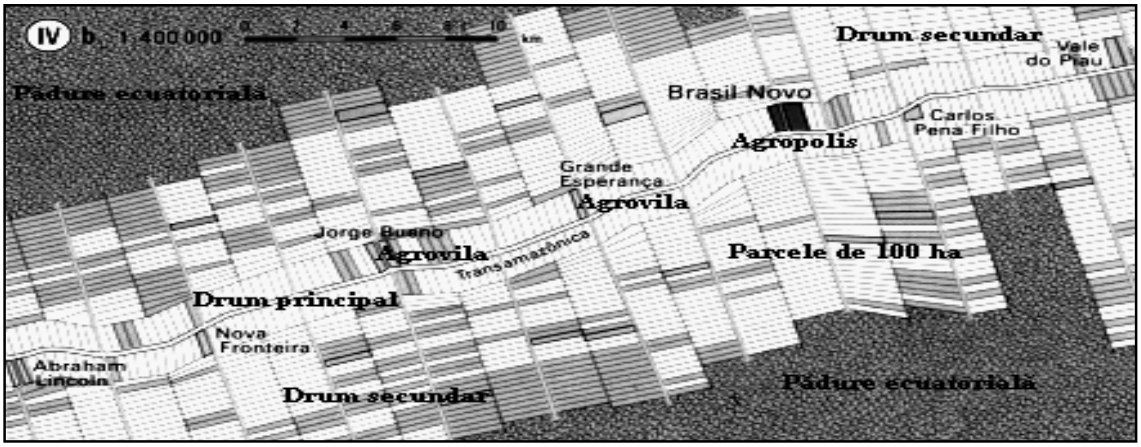


Figure 50. New rural settlements from the Amazonian forest *(after Weltatlas, Alexander, 1982).*

In New Mexico an old form of settlement is the *"pueblo"* with a layered structure. These types of settlements are made of 150-200 houses. All the construction materials are of local origin.

5.7. The Rural Settlements from Australia and New Zeeland

The rural population from Australia is scarce and the old aboriginal settlements disappeared after colonization. According to their profile we distinguish three major types of settlements:

- farm specialized in breeding of free range cattle, specific to the dry areas from the north, north-west. They are supervised during the period of selection in order to be sold;
- farms specialized in sheep breeding, in the central and western areas;
- farms specialized in wheat cultivation frequent in the Eyre Peninsula and in the south west of the continent.

The mixed ranches from the south east sector have smaller sizes. In the southern parts farms specialized in tropical crops (bananas, sugar cane, and pineapple) appear. The Australian farms use protection fences against hares around their property.

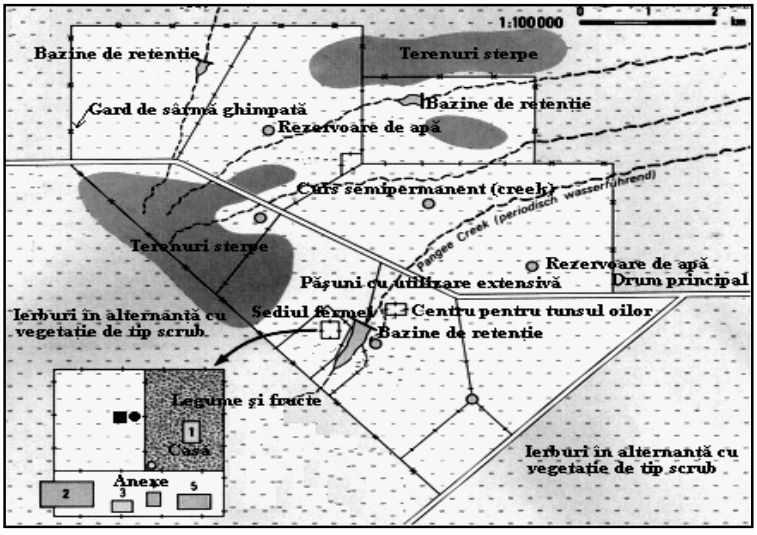


Figure 51. Farm-type settlement in Australia *(after Weltatlas, Alexander, 1982).*

The average distance between the specialized farms is approximately 150 km. The school syllabus and the lessons for students are broadcasted on radio and the sanitary assistance is provided by doctors that systematically go by plane to these farms.

A smaller, intermediary form of rural settlement is that of indigenous and immigrants that travel back and forth for work.

The New Zeeland's territory was occupied quite recently by the Europeans that have organized a process of populating according to Great Britain's interests. The indigenous population was sometimes persecuted and withdrew to the mountain areas. This Population's villages are made of groups of oval and rectangular houses. These villages have an old tradition and an educational system from the XVth century.

The organization of the present time rural settlements has occurred in four stages. The first one took place from 1853 to 1870 when the European colonists introduced the type of farm specialized in breeding of the *"runs"* sheep.

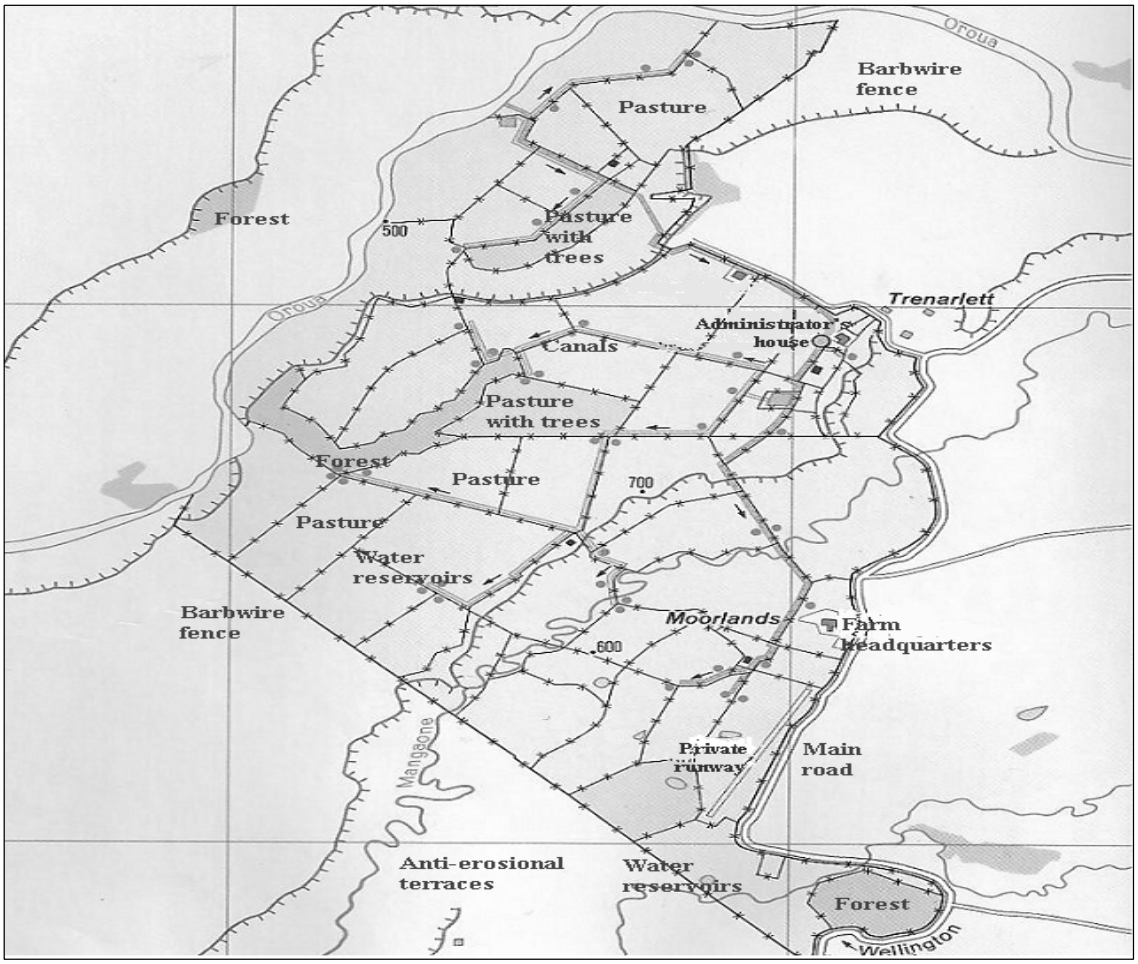


Figure 52. Farm type of settlement from New Zeeland *(after Seydlitz Weltatlas, 1984).*

The farms are displayed as strips following the directions of the slopes.

The second stage took place from 1870-1894 with mixed farms, called *"village settlements"*.

The third stage took place from 1895 till 1920, when the state makes land owners from agricultural workers, the result being the appearance of small farms.

The fourth stage, 1920-1950 is characterized by a stagnant rural with a pure agricultural profile. The number of small settlements grows and those from the proximity of the cities get a residential function.

6. URBAN SETTLEMENTS

6.1. Definition

The urban represents the opposite of rural. In comparison with the rural the urban presents the following characteristics:

- higher density of population and buildings;
- superior technical and public facilities;
- secondary and tertiary activities prevail;
- specific lifestyle;
- usually a higher demographic potential.

The transition from rural to urban is gradual and is done in certain ways and with a certain intensity as a result of the urban influence in the territory. The urban characteristics of a territory decreases with the increase of the distance between centre and periphery. This phenomenon is called *"continuum urban-rural"*.

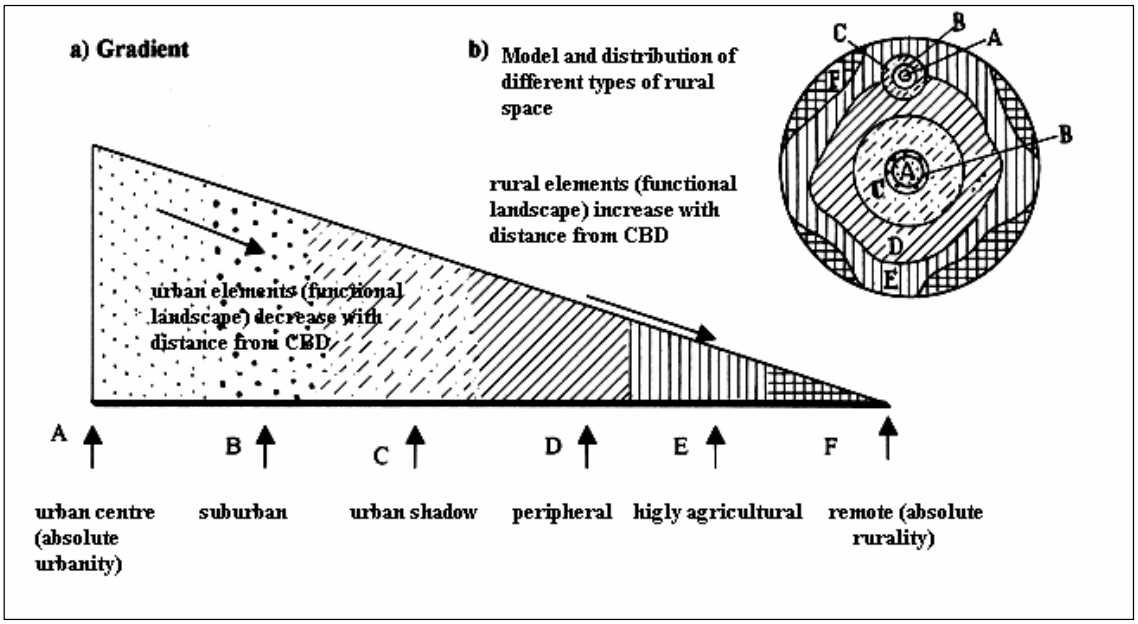


Figure 53. Continuum urban rural *(after D. Waugh, 2000).*

We can distinguish an urban centre (CBD- Central Business District) with urban characteristics that concentrates the retail commerce continued with an adjacent area with a high density of buildings (A). Towards the exterior develops a suburban space (B) with a lower density of buildings and a shadow urban area (C) used as a transit space. The periphery is a mixture of urban and rural characteristics (D) continued by an agricultural land (F) the continuum urban –rural ends with the remote rural.

Defining the urban as socio-economic and territorial phenomenon is difficult as it differs from one country to another. There are differences in understanding the meaning of word *"town"*. In the English language the words *"town"* and *"cities"* are almost synonymous, the second having a general meaning. In France, the word "ville" means the opposite of the rural, while *"city"* refers to town, socially and politically. In German the word *"stad"* converse the whole meaning range, while in Swedish the word *"staden"* indicates a class of towns containing other two: fairs *("coping")* and municipal samhallen (municipal agglomerations). In Norway the word "by" means town, while in Sweden the same word means *"village"*. In USA and Canada the urban is defined by contrast with rural (agricultural or not) (Jaquelline Beaujeau, G. Chabot, 1971).

F.R. Richtofen defines the city through the presence of industrial and commercial activities, W. Cristaler defines it by taking into consideration the importance of commerce, administration and manufacturing, and not by industry. The geographer Paul Vidal de la Blanche uses the notion *"type of*

life" to define the urban while J. Bruhnes considers that the city exists any time the majority of the population spends most of their time in the agglomeration. F.R. Rattzel defines the urban by contrasting it with the village where industrial and commercial functions prevail. He also considers that any territorial population group smaller than 2000 inhabitants loses the urban character. In Sweden, U. Ahlam and W. Olson consider the town as an agglomeration of inhabitants characterized by an occupational differentiation.

V. Mihăilescu, underlining the role of the town in the region, defines it as "a space of concentration, process, transformation, redistribution of goods and services whose influence is variable". But the town not only concentrates, processes and transforms but consumes too. "No matter the struggle to define the town, some things will remain unsaid, not taken into discussion. The gathering of taxes and fees made it necessarily to exactly establish what belongs to a town and what not (Jaquelline Beaujeau, G. Chabot, 1971).

According to the Romanian Language dictionary from 1984 *"the city is a complex form of human settlement with variable dimensions and industrial endowments, usually having administrative, industrial, commercial, political and cultural functions".*

6.2. The Birth of Cities

The factors that influence the birth and development of cities is extremely diverse. The main opinion is that the cities appeared when the productivity of agricultural labour grew, creating a surplus of products. Looking at the historic time scale the apparition of the first cities is marked by the transition from primitivism to slavery. Not by random there appear in the areas with rich soil that required a minimum of effort to exploit (Mesopotamian Plain, the middle basin of the Nile, the Huan-He and the Yang-Tze).

"Urbanization appeared independently in different regions of the glob in either stronger or weaker relation with the transitional process of agriculture" (after P. Knox and J. Agnew, 1998).
The first urban nuclei appeared around the 3000 BC in Mesopotamia along the rivers Nil, Euphrates and Tiger. Around 2500 BC the first nuclei appeared in the valley of Indus, and around 1000, in North-East of China. In Central America cities appeared in 1500 B Ch.

The colonial period was marked by the systematic birth of cities, in the early days, along shores, than more towards the interior, growing with the exploitation of land resources.

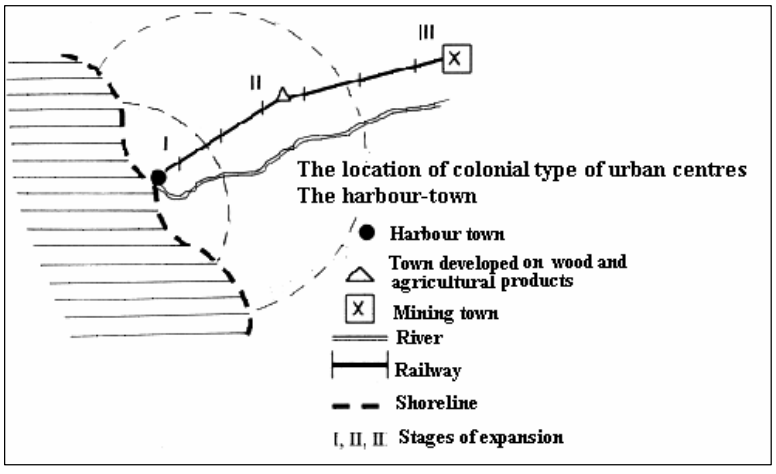


Figure 54. The location of colonial type of urban centres.

The geographical location played a crucial role in the birth and development of the cities. At the border between two regions developed on different economies, the need to exchange products appeared early on. The locations where the exchange took place became permanent, got fortified and later developed into cities (for example Buzău, Focşani a.o.).

The establishing of the axes of transportation played a significant role in the development of cities. The construction of the railway in North America and Russia lead to the emergence of operational of centres that later became cities.

The spatial localization of cities is usually due to an accessibility formula that involves distance, transportation costs and time of access. The settlement which is best located according to these factors has the most chance of becoming a city. We can determine this through an "accessibility matrix".

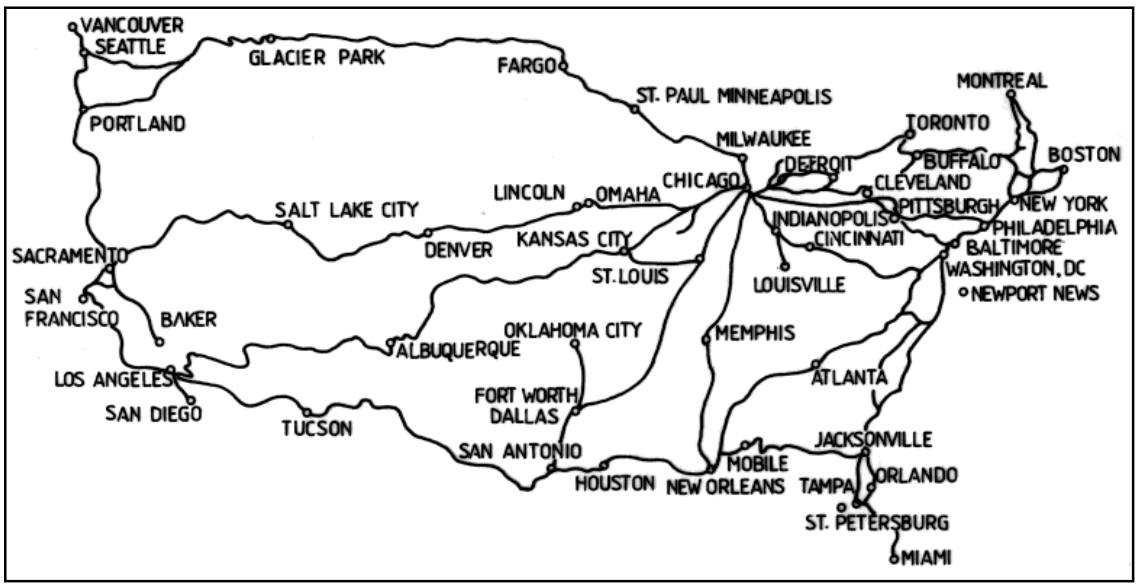
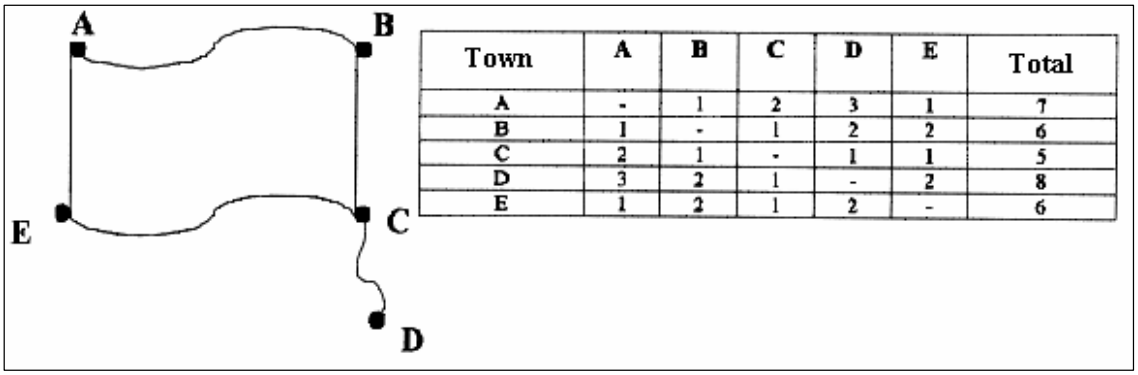


Figure 55. The major network of railways and the main cities in US *(after Amtrak National Rail Passenger System US, 2000).*



Town	A	B	C	D	E	Total
A	-	1	2	3	1	7
B	1	-	1	2	2	6
C	2	1	-	1	1	5
D	3	2	1	-	2	8
E	1	2	1	2	-	6

Figure 56. The graphs and the matrix of accessibility of 5 cities *(after Oxford Dictionary of Geography, 2000).*

We consider 5 settlements, A, B, C ,D and E, located in the following positions, some connection to the others.

The matrix resulted from the number of the back and forth connections has the following configuration. The settlement placed in C is the most accessible because it can be reached within the shortest distances from the other localities.

By analogy, the location of industry is in general, generating settlements. In this respect there are two classic models which call for our attention and these are: Weber Model and Smith Model.

Depending on these two factors on one hand, the distance between the raw materials, their spatial distribution and quality, and on the other hand, the market position, several models that converge towards the same target – the industrial location of the least expensive cost (tones/km) may take shape. For example, if the raw material is of a very good quality, than the location of the industry will be in the area in which there is a powerful market for the finished product. On the opposite, if the raw material is plentiful, cheap and heavy, than the industry, respectively the town will develop in the area where the raw material can be found.

Transportation costs represent the keystone of the Weber Model, aiming to establish the most cost effective location for industry.

In this sense, maps of the isotims and isodapanes can be outlined. The isotims are those lines that join the points with the same costs for raw materials or finished product.

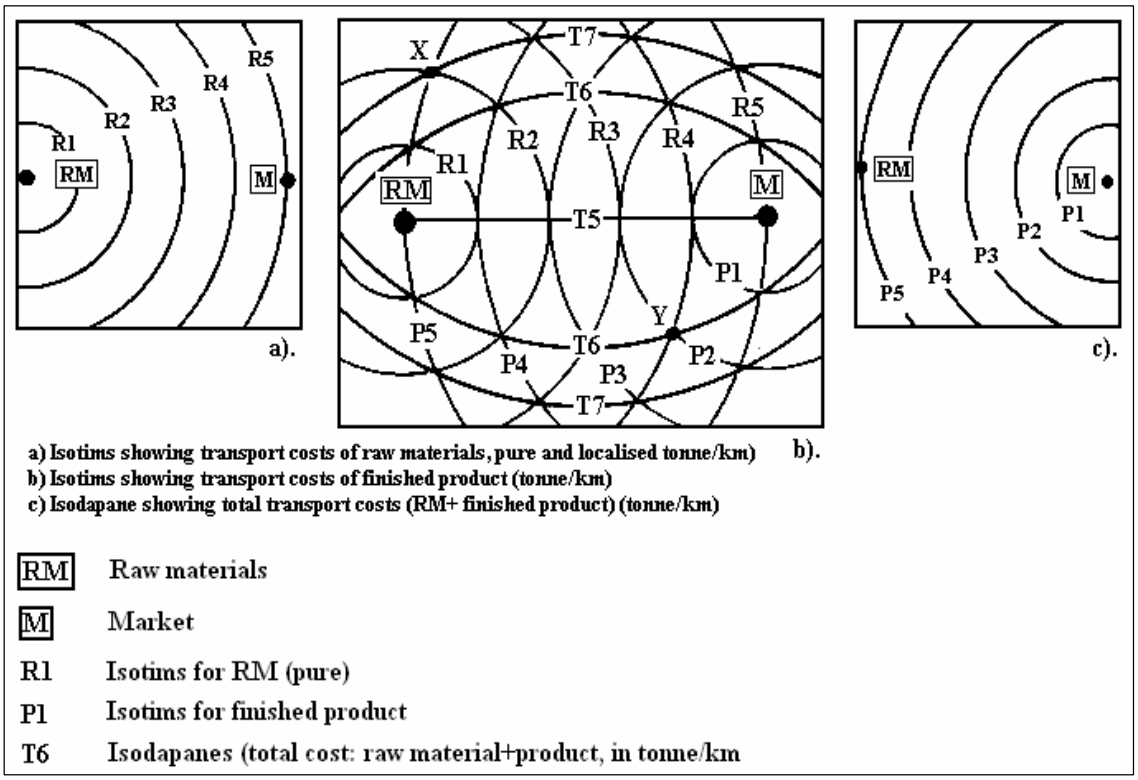


Figure 57. Weber Model *(after D. Waugh,, 2000; Oxford Dictionary of Geography 1997).*

On the axis RM-M any localization of the industry at the intersection of the raw materials transportation isotims with those of the finished products presents the least cost location. In this point, the industry location and implicitly town settlement is possible here from an economic point of view.

The Smith Model (1971) starts from the assumption that profit can be obtained wherever total income is higher than the expenses and this process can take place in an area with a variable extension where the production generates profit.

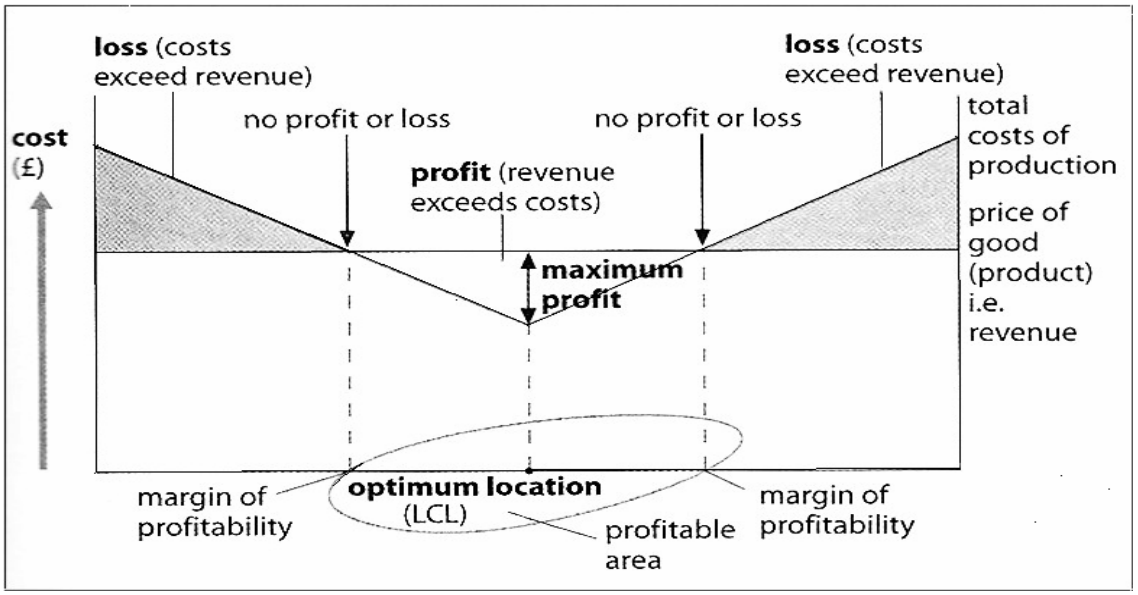


Figure 58. The Smith Model *(after I. Smith, 1971, D. Waugh, 2000; Oxford Dictionary, 1997).*

The genesis of the colonial towns is linked to the implementation of this model. Intensive exploitation of the underground resources over a long period generated mining towns almost everywhere (Ruhr, Silesia, Shabba, Petroşani).

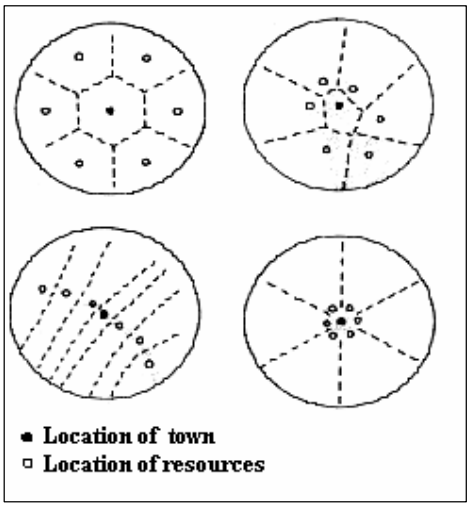


Figure 59. Hypothetical types of settlement location depending on resources *(after Haggett, 1973).*

Political - administrative measures have represented and still represent factors that generate the development of a town (Washington, Canberra, Brasilia so.).

Household wool processing centres located on the Vistula lower course needed a coordinating centre, accessible to everyone. This was selected- the city of Lodz becoming an important centre of textile industry.

Located in the South-East of Holland, Philips factories benefited from a lower cost of land at their location. In time, around the great production centres the workers' dwellings grouped together and thus a new town appeared- Eindhoven.

The end of the "boom" period for natural rubber exploitation, beginning with 1912, was accompanied by a strong demographic decline. After the roads of access in Eastern Amazonian were build, in the Belem's area of influence, many new towns appeared, especially after 1970 and most of them counting 5000 inhabitants (after S. Volbeda, Vol. Small Towns and Beyond, 1997).

In choosing the best type of habitat, Ebenezer Howard (Garden Cities of Tomorrow, 1898, Cambridge, MA: MIF Press, 1965) speaks about competing forces of attraction of the three magnets: the town, the village, the village-town, along with the "dilemma" that results from the conjugation and congruence of these "forces" in adopting the best type of living.

The advantages of planning and living in the cities are the following (after "Cities as Solution in an Urbanizing World", U. N. Centre of Human Settlements, 1995):

- great density of infrastructure components, which contributes to the allocation of smaller costs of living, telecommunication, health and education, the concentration of the population, of the production and consumption which has as a result a diminished demand of land for buildings (all the global urban population can be concentrated on a territory of 200.000km2);
- a better heat retention in the cold climate areas, because of the concentration of the buildings;
- the possibility to easily limit and control the motorized vehicles and to promote walking and riding alternatives.

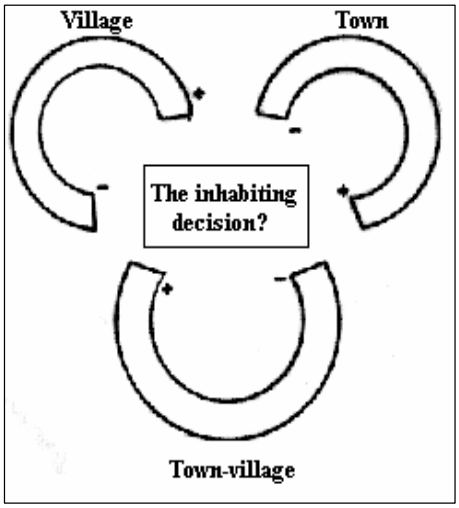


Figure 60. The three magnets and the inhabiting decision *(adapted title, after Rees E. William, 1999).*

To this we can also add the increased security that a city offers against the natural aggressive factors, a greater territorial and professional mobility and a higher life standard.

Taking into consideration the length of the urbanization process we can distinguish three main categories of factors:

- with a permanent character;
- with a pulsating character;
- with a spontaneous character.

Among the factors with a permanent character the development of services and the territorial concentration process of the production in the second sector, followed by demographic increase are the most eloquent examples.

Factors with a pulsating character. All the colonial expeditions ended with the establishment of new towns which represented the spatial economic exploitation support through the concentration and the transportation of the raw materials towards the metropolises.

Many other cities were established in this way. Thus, a rural settlement with periodical fairs became a market town. The monasteries, that attracted trade early, concentrate around them other buildings and developed into towns. Seashores with sheltered gulfs became refuges for ships and the harbour-town came into being. (Jaquelline Beaujeau Garnier, G. Chabot, 1971).

Discovering some underground resources and their intensive exploitation represented the cause of many worldwide cities foundation. Building some large factories brought about the establishment of the towns near them.

Frequently, in the genesis of towns, the spontaneous character is replaced by the systematic character. Thus, all the territorial expansions were accompanied by the establishment of towns. Political reasons commanded the establishment and development of some cities during the modern age (Canberra, Washington) as well as the pheno menon of exaggerated demographic concentration on the shore that determined the establishment of a capital city in the interior of the country (Brasilia). Some cities were created because of religious reasons (Mecca, Salt Lake City), and others to relieve demographically the great metropolitan poles. The amplification of the industrial phenomenon and its territorial extension determined the establishment of new cities (Onesti, Nowa Huta). Thus, as J. B. Garnier and G. Chabot (1971) notice "the cities are born either through the mutual agreement of their inhabitants or through their founders' aware activity".

6.3. The Energy of Urban Systems

The expansion paradigm dominated the town planning practice and evolution. According to this paradigm, economic growth is accompanied by a man's isolation from natural environment and by a certain freedom related to the physical and biological constraints.

Human activities generate wastes, anytime and anywhere and these are piled in the environment, which is considered infinite in generating resources and a "garbage dump".

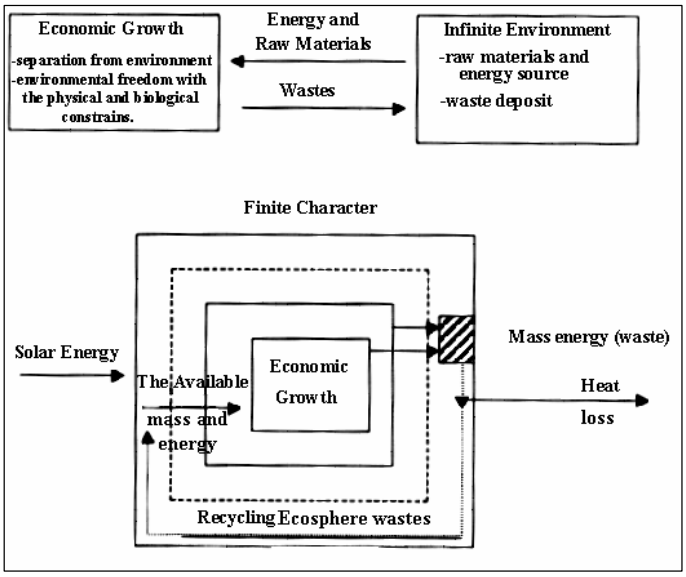


Figure 61. Expansionist economic threatening *(after William E. Rees in the vol. "The Earthscan Reader in Sustainable Cities, edited by David Satterthwithe, Earthscan Publications, Ltd., London, 1999").*

The final purpose of the organization of the geosystems is that of dissipating as efficient and complete as possible the in-puts of energy (sustaining) in order to reach the thermodynamic equilibrium. In technical and biological systems, thermodynamic equilibrium can be attained only in total isolation conditions.

The creation and development of the energy dissipating systems determined by human activity (from biological entities to socio-technological equilibrium). The thermodynamic equilibrium is attained only in conditions of total isolation. Any energy conversion is accompanied by wastes.

The energy of the environment comes from two basic sources:

- solar energy;
- the Earth's internal energy.

As part of the natural environment, systemic structures, which have an energy dissipative role, are established.

The solar energy through successive process of nuclear reactions that transform hydrogen into the helium (He) represents the main energy source at all environment levels.

The Sun, the *"big star",* evolves towards extinction over a very long time period (billions of years). The Earth energetic resource that derive from solar energy (fossils, biomass) accumulated in geological times, are about to run low in historical time. With time the available sources of power at the planetary level diminish significantly.

"If we ignore the other causes that could determine the extinction of the human specie, it is very clear that natural resources represent the factor that limits the life span of our specie. At the moment, man's existence is dependent on the usage of exomatic tools and as a result of the usage of natural resources much like he is dependent of his lungs and air in order to breath. We don't need complicated arguments to realize that a longer life requires a minimum rhythm of depletion of natural resources. Using these resources too fast, man wastes that part of solar energy which will keep reaching the Earth long time after he disappears" (N.G. Roegen, 1979).

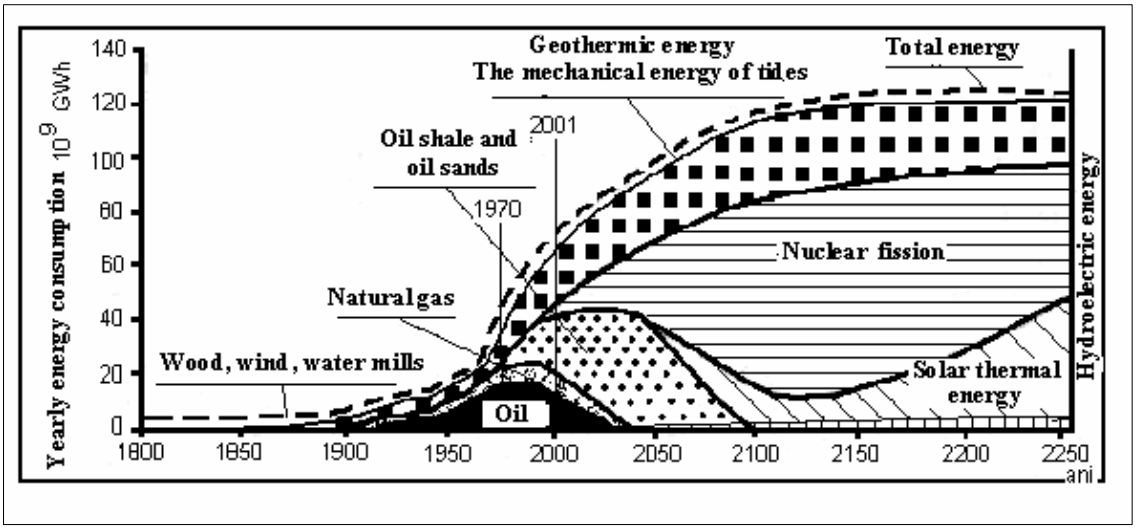


Figure 62. The Evolution of energy resources used by human systems *(after V.I. Nitu, 1975).*

The present day energy dissipative anthropic structures (including settlements) are sustained mostly by the exploitation and the usage of exhaustible fossil fuels. The consumption rhythm of the fossil fuels (coal, oil, natural gas, etc.) is higher than the natural capacity of regeneration. These were formed in geological time (of millions and millions of years) and are consumed in historical time (of hundreds and thousands of years).

Settlements, as energy dissipative systems, "assimilate" free energy in order to function (solar energy, coals, oil, natural gases, oil, wood, electricity, so). The quantity of the intercepted available energy is in direct relation with the demographic size, the function profile, the level of technical endowment and with the human behaviour. Thus, we can recognize two categories of energy dissipation systems depending on the factors listed above: with an intense dissipation and with a rational dissipation.

The intense dissipation requires the accumulation of a degraded energy higher than the real energy flow which is available in the environment. Thus, results a scarcity of energy of the system and this leads to a *"re-organization", "re-establishment"* of the geosystemic structures or to their disorganization.

After the intense (accelerated) dissipation of energy, high energetic consumptions result through processes of dissipation of the energies taken from other circuits or from disjointed systems.

In the present practice and reality, urban oversized systems resulted (going beyond *"human scale"),* with a strong technological support. They are characterized by high energy consumption in a short period time, thus, resulting a great quantity of positive entropy. The accelerated or spontaneous dissipation of the energetic potential (of the export) leads to the setting up of a specific system behaviour which is similar to that in the inorganic (technological) systems. These systems tend to

disorganize and disappear in time as they come closer to the thermodynamic equilibrium. The result is a state of chaos that generalizes.

Rational dissipations represent the adaptation of the habitat systems to the real capacity of the energetic flow available in the environment. In this way the territorial systems survive a longer period of time.

Rational dissipation means that a smaller quantity of energy than the inferior limit of tolerance of the natural systems is taken from the natural circuit. In this way an optimal dissipation process is ensured. To this we add the increased effectiveness of the energy dissipation process within the social and technological systems in the context of a limited quantity of free, accessible energy.

The quantity and the quality of the energy bearer establish the typology of the internal organization of the systems in order to supply the needs for dissipation into systems at various distances.

The energy deficit is augmented through import and the excess is accumulated in order to satisfy the dissipative needs of those systems located at various distances.

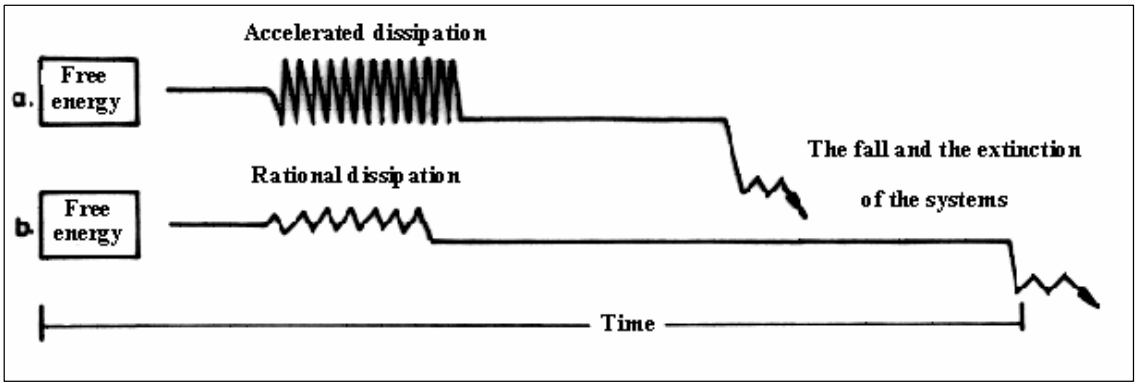


Figure 63. The life span of the habitat depending on the rhythm of the dissipation of energy*: a) systems with accelerated dissipation of energy have a short life span; b) systems with rational dissipation of energy have a longer life span.*

The great variety of the ways human civilization is organized is a consequence of the diversity of the specific ways the energy is dissipated in forms that are closer or further from the state of thermodynamic equilibrium.

The inferior critical level, where the dissipative process is reduced at maximum determines the system to enter in a state of shortage of energy. As a result of this, feedback processes usually take place which consist in the obtaining of new sources and amounts of energy. If the new energy needs are not fulfilled, the system falls under the inferior limit of energetic tolerance, which has as a consequence the breaking up into its components. In the end, these systems will disintegrate thus eliminating in the environment the energy that bound its components.

As a conclusion, the geosystemic structures and, implicitly, the habitat structures are created and exist only outside the state of thermodynamic equilibrium. The connection and cooperation between the components, part of the systemic structures, facilitates and improves the efficiency of the dissipative process of energy through the creation of new structures with different degrees of complexity from an organizational point of view.

As urban systems develop spatially and demographically, areas of support and subordination increase. This "growth" can take place within the limits of the energetic tolerance or beyond these. Going beyond the energetic tolerance limit involves the "assault" on the peripheries with a tendency to break through the buffer spaces, interposed between same rank systems or systems of different ranks *("the assault on vicinity").* In order to maintain their existence and to increase their comfort, the overgrown urban organisms resort to the import of free energy at a planetary level. The free energy affected by the dissipative process as part of the overgrown urban systems is obtained to the detriment of those geosystems located at various distances on Earth. For a longer survival, each energy dissipative geosystem creates adequate dissipative structures.

The urban system with more efficient dissipative structures (social, technical, of public utility etc.) will last no longer. They assume the advantage of a similar normal dissipation to which we can add the subordination of the spaces and structures with accelerated (intense) forms of energy dissipation.

As a conclusion, some "urban organisms" adapted and shaped as a result of the process of subordination of various areas of different sizes and that function according to the rules established by the accelerated form of energy dissipation. The inferior ones disintegrate in a shorter period of time because they are forced to sustain, with their free energy, urban organisms better adapted to the *"energetic stress"*. Once the processes of energy dissipation are finished the system reverts to the state of maximum disorder state (positive entropy). The relations of a systemic character disappear with only the individual components remaining.

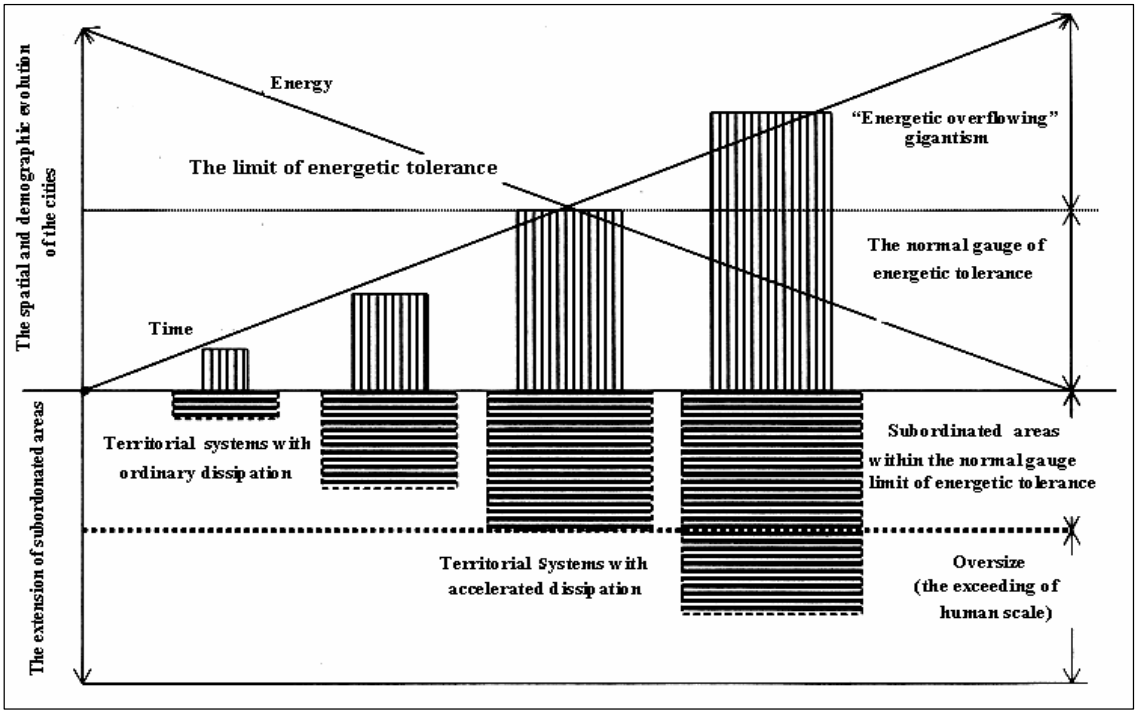


Figure 64. The graphic relation between the evolution of the urban systems and that of the supporting areas.

6.4. Components of the Urban Space

Like in the case of rural settlements, towns present two main components:

- a territorial component;
- a socio-economic component.

The territorial component, in its turn, is divided in three subcomponents that are:

- *the precinct,* that represents the outline of the areas with buildings for habitation;
- *the intraurban ("intravilan"),* that includes the built area along with storage spaces outside the depositing spaces, areas for transportation , green areas and those destined for construction;
- *build up area* includes the rest of the administrative territory of the town where are included the intensive agriculture areas, recreation areas, waste dump, power supply units etc.

The extraurban *("extravilan")* is not synonymous with territory (the estate) of the rural settlements. This one, through its extension, can only partly cope with the food requirements of the town. Thus, the town calls up for much more extended *"agricultural hinterland"*. From a practical point of view for villages and for towns the term of *"build perimeter"* is a are used representing the

delimitating area that can be occupied by buildings, storage areas, transportation etc., and which is delimitated in spatial planning.

Social-economic component is represented by the population and the places. As regards the town workplace is organically incorporated to the administrative territory of the town.

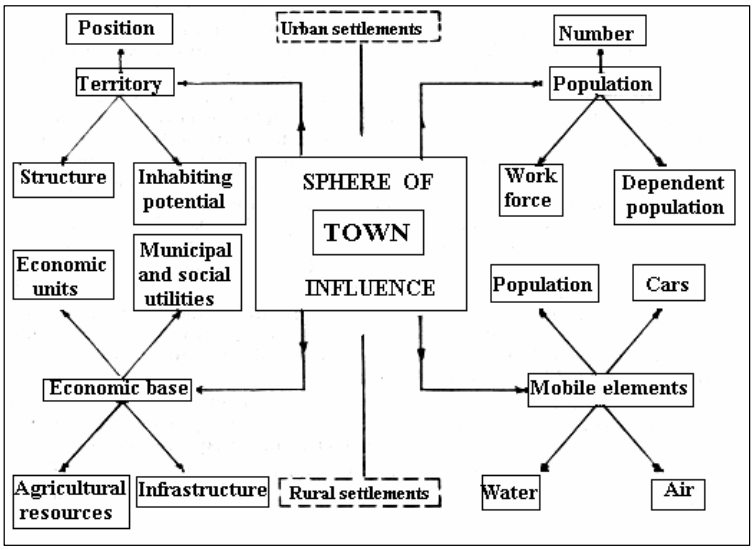


Figure 65. The inner structure of the *"Town"* System *(after I. Ianoş, 1987).*

Between the town and the surrounding area, depending on the dimension, functional profile and transportation quality, reciprocal relations are established (the reciprocity of services, of labour, of raw material, of finite products, of food etc.). Those relations determine an area with variable extension that functions on systemic principles.

Depending on the intensity and the nature of these relations, the town is surrounded by "a special supporting zone" which is called area of influence. The town appears as a concentration of buildings, substructures and population that communicates with the *"external environment"* (the area of influence) through input and output processes.

As in any thermodynamic and informational semi-opened system (the inputs are not equal with the outputs) the inputs consist of mass, energy and information.

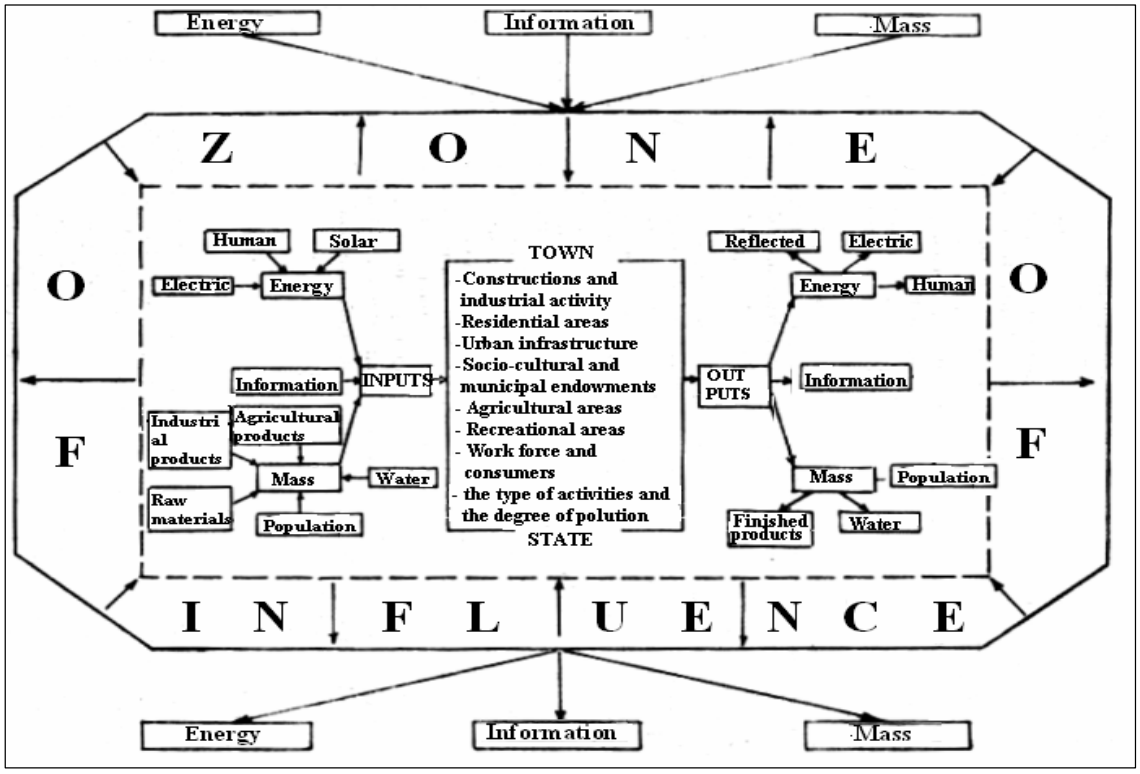


Figure 66. The Town, a semi-opened thermodynamic and informational system *(after I. Ianos, 1987).*

The input mass can be the raw material for the town industry, the agricultural and food products for the inhabitants or the persons who commute to an urban area. Most of the times mass also "comes" with information. The arrival in harbours of ships that are loaded with citrus fruits gives indirect information about the source areas. The muddy water that crosses the town "informs" us about the fact that it rained heavily upstream. Any persons who enters or goes out of a city carries information along with mass and energy.

The input energy is very diverse, the essential role being held by the solar energy, the fossil fuels and the electric one.

The outputs consist of information, mass and energy, depending on their importance. The most important is the information, due to in the capacity of the city to hold political, cultural, administrative, sanitary, business, judicial and education initiative, because of decision factor played by the town as compared to the village.

The output mass consists in the finite products in most of the cases.

The output energy is mostly a degraded form of energy that, depending on the quantity and the form of the relief, induces an artificial topoclimate.

The connection among the static components of the town system (residential areas, industrial areas, education, trade, recreation areas, etc.) is achieved with the help of the mobile components that consists mainly of the vehicles.

Depending on the input-output ratio, on mass, energy and information exchange between the town and its area of influence, the urban system can reach the state of relative equilibrium. This can be reached in two ways: through evolution and through involution.

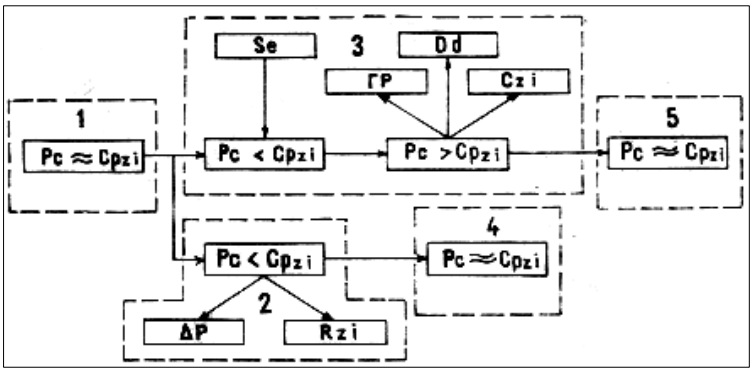


Figure 67. Urban system equilibrium *(after I. Ianos, 1987).*

In order to explain, the equilibrium state we start from the assumption of the existence of equilibrium between the town consumption potential (Pco) and the production capacity of the area of influence (Cpzi).

External stimuli (Se), like investments for example, have as a consequence the increase in production and implicitly the increase of population. The initial area of influence extends in order to cope with new "challenges". At this point the city reaches its point of equilibrium at a superior level, through evolution. On the contrary, as the functions of the town decline, especially the productive one, the population of the town diminishes too. In this case the area of influence shrinks, a new equilibrium being achieved, but at an inferior level (equilibrium through involution). The most frequent examples in this respect refer to the mining towns which almost disappear as the resources exhaust.

6.4.1. Urban Functional Areas of the Town

Each urban organism once it reaches *"maturity"* it develops specific areas for various functions (trade, residential, production etc).

6.4.1.1. The Centre Parts of the Town

In most of the cases the towns begin their development from a central nucleus. Around it the space organizes in a spontaneous or controlled manner, having different functions: industrial, commercial, residential, etc. The central nucleus of the town called by the English "city" and by Americans "downtowns", represents, in most of the cases, their central point. Here the main axes of traffic converge, here are concentrated the most important units of the retail business and the administrative institutions. In all cases, the "city" is characterized by an increase in traffic and the

prevalence of the tertiary activities. The degree of space and occupancy reaches maximum values, and has the highest price. The organization of the town centre and its physiognomy depend on the period in which the town was established. The old towns have the so-called historic city with public interest buildings, some of them of high architectural value, which are protected and preserved by the town. Beyond it is an area with buildings that shelter, in most of the cases the lower income population. A good part of commercial and public interest activities are usually concentrated in the centre of the town, too. Because of the lack of space, of agglomeration, even if it is a temporary one, the administrative institution and retail businesses often "migrate" towards those districts with more free space available and a new nucleus is created.

In the case of new towns, the centre is organized in order to answer to similar functions. The distinction consists in the differentiations in the build-up area and a more flexible organization of transportation network. Also the sordid districts close to the centre are missing.

In the case of the towns in the U.S.A., in most frequent situations, *"the downtown"* is also the location of the financial activities. That is why, the nucleus of the town is called "Central Business District". It concentrates the retail businesses, and only some industries like the printing works of the newspapers are to be found. It does not have residential areas, public interest buildings or warehouses. The theatres and the cafes so specific to the European city centres are missing. Often the buildings are standardized, of "sky-scrapers" type, even if the space allows for the town expansion.

The role of the "downtown area" in the life of the towns is different. The bigger the city the more the role of the central nucleus diminishes. This is due to the reduction in the retail trade, of the inputs towards the central areas and of the number of those who work here. Thus, in the U.S.A., the proportion of the sales in CBD was of 35,6% in San Francisco, of 26,8% in Philadelphia, of 24,8% in New York and almost of 16% in Detroit and Chicago (this values are an approximation, because the information is old, Jaqueline Beaujeau Garnier, G. Chabot, 1971). In the same country, the number of the inputs/day, on a usual working day from 7:00 am to 7:00 pm was of 665 persons at 1.000 inhabitants, in the case of the towns with a population comprised between 100.000 and 250.000 inhabitants, 201‰ in the case of the towns with a population of over 3.000.000 and of only 147‰ in New York. (after Jaqueline Beaujeau Garnier, G. Chabot, 1971). The congestion of the centre because of the concentration of traffic and people is a frequent situation.

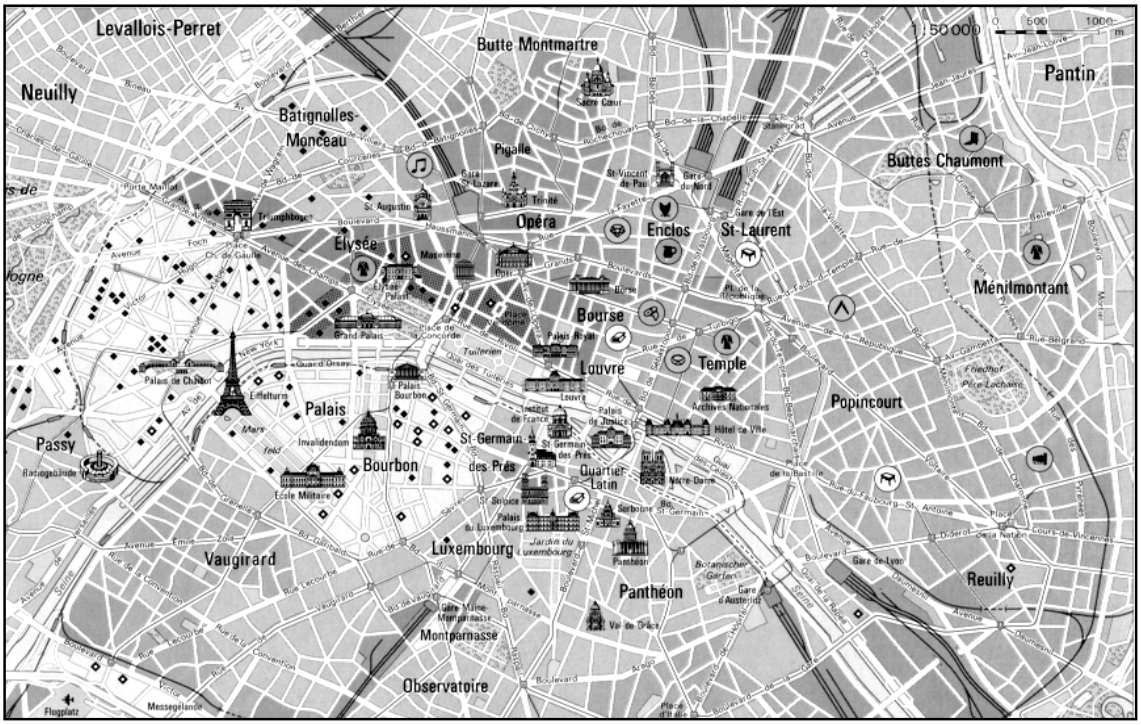


Figure 68. Paris - the city centre *(after Alexander Weltatlas, 1982).*

6.4.1.2. Residential Areas

The residential areas have as a rule, the have the biggest surfaces. In the central areas the dwelling are diffusely spread: at the second level of the stores, in unoccupied industrial buildings, close to the transportation network.

The position of the residential areas in the town as well as the configuration and the types of buildings often betrays the social structure of the population of the town. The poor ones usually dwell in the fringes of the towns because here their right over the land is not disputed. Here they hastily build from left-over materials crowded dwellings with no sewage, running water or power, thus resulting sordid districts of hovels called *"bidonviolles"* in France and *"shanty-towns"* in English. In Rio de Janeiro these are called *"favellas",* and in Lima "barriadas".

The residential areas of those with low incomes cluster, as a rule, around the services and retail business districts, or near industrial areas. They usually occupy the less favourable locations: industrial polluted areas or shady slopes. Individual types of dwellings build from cheap materials and with no vertical extension prevail. The big factories often build modest dwellings for the workers close to them, houses that can be recognized by their reduced comfort and monotony.

The districts of the higher-income population are individualized in the town configuration by the prevalence of the villa type buildings and their placement in favourable locations (lack of pollution, at great distances of the main transportation lines). Often, these sorts of districts have extended green areas.

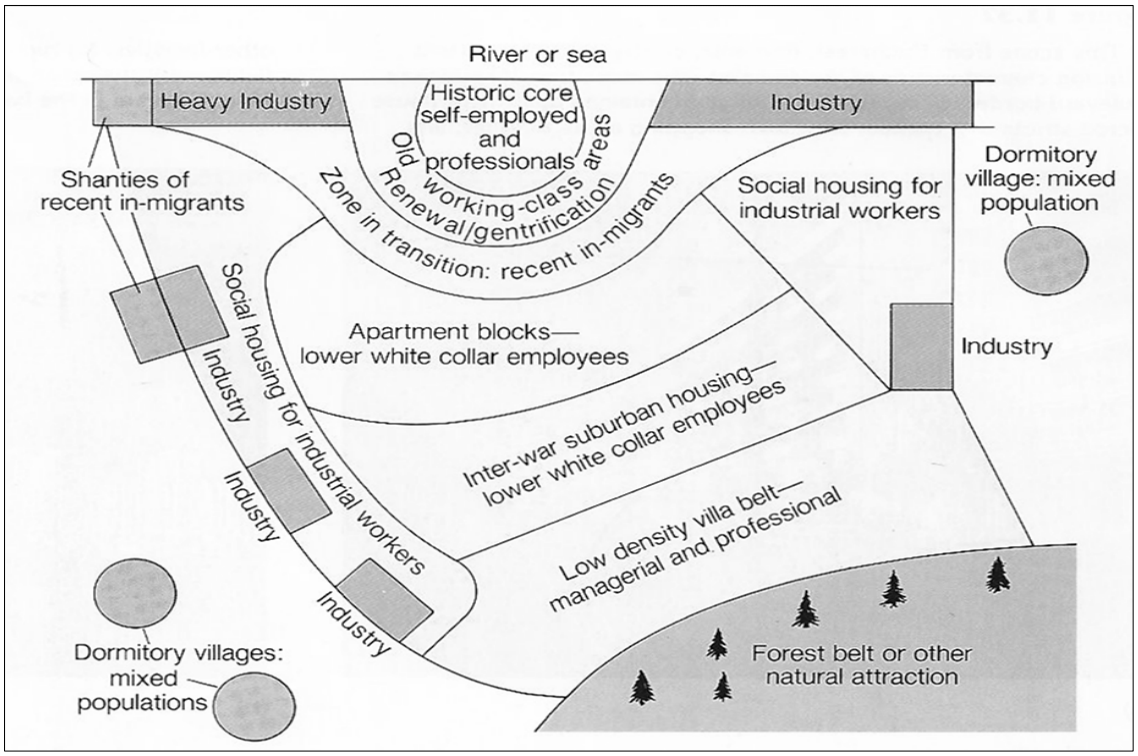


Figure 69. The residential areas of a European type of city *(from J. Fellman, A Getis, J. Getis, 1990).*

6.4.1.3. Industrial Areas

Their extension depends on the type of the town. In the case of towns with industrial functions, industrial areas are often disseminated throughout the town.

In many cases, the industry occupies special areas, being territorially separated within the town. The noxae released in the atmosphere limit the industry's diffusion process within the town. That's why for the placement of polluting industries predominant direction of the wind is taken into

consideration: that is, the location will be chosen in the opposite direction. In the case of Europe, the trade winds determined the location of the polluting industries in the East side of the towns. In the towns themselves, are usually located the less harmful industries, so-called "clean industries", as the manufacture industry, like the jewellery one, some branches of food industry which, are often situated in some workshops and small laboratories placed in interior courtyards of the buildings, being less visible.

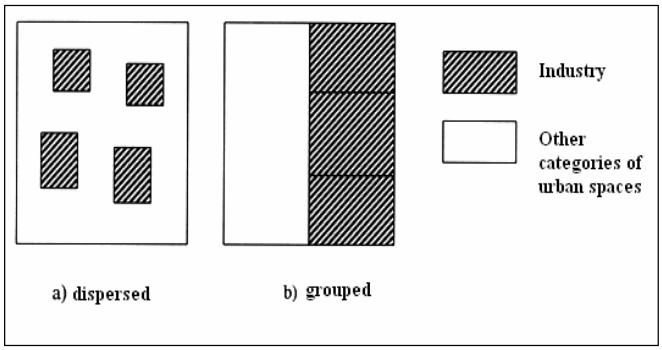


Figure 70. Industry localization within the town.

Grouped localization has the advantage of a more efficient utilization of the infrastructure that exists (railroads, electric lines, water and fuels supply, waste disposal etc.) to which a more efficient land use can be added. The advantage of an easier cooperation between industrial units with different specializations is not excluded.

Dispersed localization is more frequently seen in the case of light industry branches, which need a smaller volume of raw materials and which do not have radical consequences concerning the town aesthetics or the quality of the environment.

The parallel localization allows an easy access to the work place, as well as the establishing of an efficient buffer space. Crossing the main transportation routes requires specific signalling or the adoption of adequate technical solutions like underpasses and overpasses.

The localization in alternative strips generates difficulties within the intra-urban area by traffic jams and the existence of repulsive structures near residential areas.

Feather like localization allows an efficient access from the residential area to the work places. Depending on the *"feather role",* the two categories of location areas block one another or they make use of the law of individual advantage. In reality, we have a huge diversity of positional relations dictated mainly, by land configuration and by historic evolution of the towns.

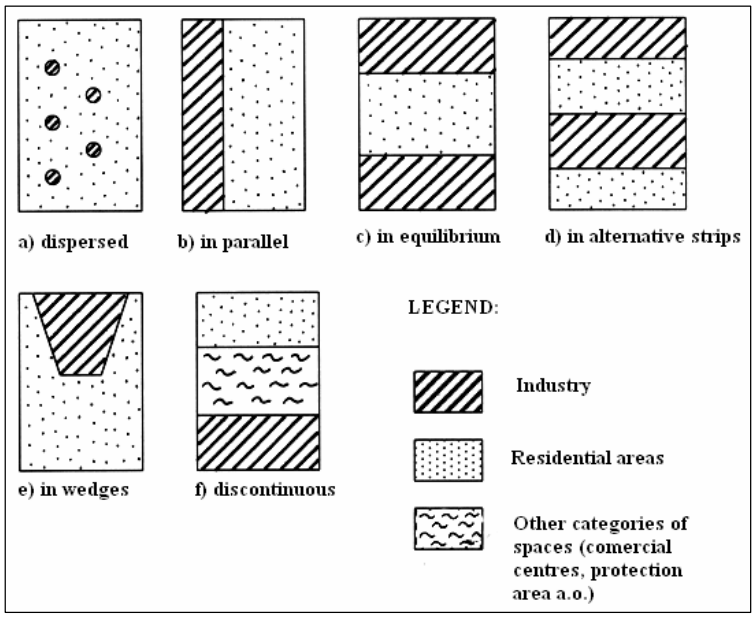


Figure 71. Types of special relations, industrial area-residential.

A new form of industrial localization is represented by the *"industrial parks"*. These are areas within the administrative territory of the towns meant to attract high-tech industries and labour force, investors being encouraged by the low prices of land acquisition and by the existence of some specific infrastructure (access, parking area, water, energy systems etc).

The plan of the industrial park on the west side of Cluj-Napoca concentrates five categories of infrastructure and services, able to ensure optimal functionality of the whole ensemble:

- infrastructure (drinking water, sewerage, electric systems, methane gas, compressed air, internet etc);
- assistance (technical, financial, work, custom);

- services for development (innovation, technology transfer, contact officials and authorities, logistics);
- general services (security in the area, postal services, medical assistance, food catering, communication, parking, transportation goods, protection of the environment, sleeping facilities, sport and leisure facilities);
- access routes (road, railway, aerial).

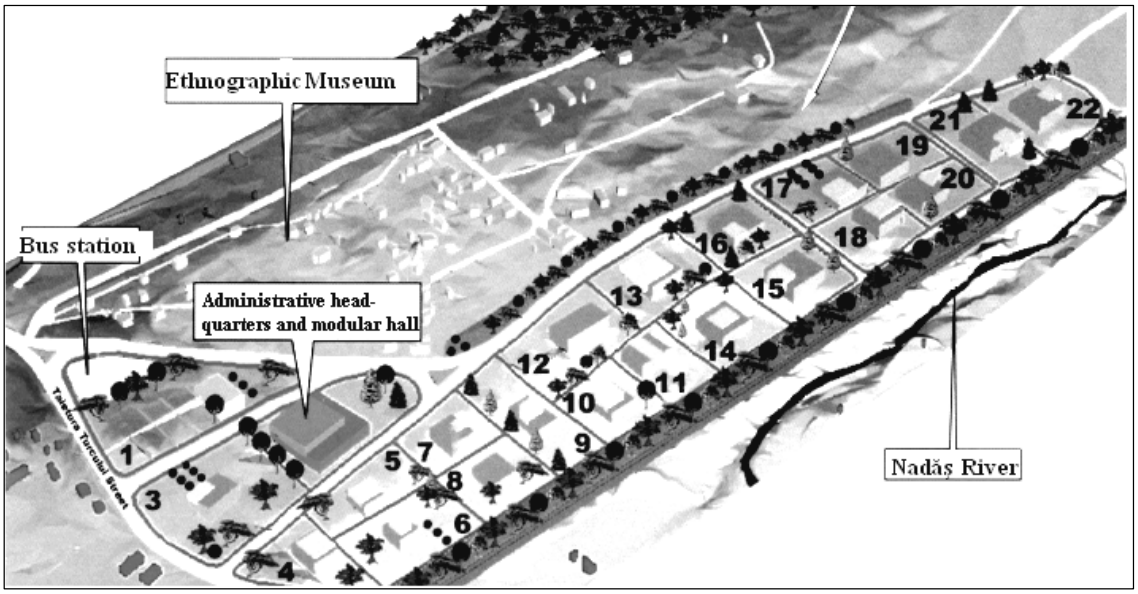


Figure 72. Localization of the industrial park in Cluj-Napoca *(project from the Cluj Council presentation folder, 2002).*

6.4.1.4. Urban Transportation and Traffic

The organization of districts in towns as well as well as their permanent growth determined the expansion of the infrastructure which has to respond to the ever-growing needs, *"condensing"* itself as a result of the transportation network development, the space and the time.

Thus, the inhabitants' daily commuting depends on the towns' surface, on the means of transportation used, the distance between their houses and their working place and the physical setting of the precinct.

The means of transportation are of two types: public and private. The more extended the town is the more public transportation is used: buses, trams, trolley-busses, special railways and undergrounds. The optimal structure of a transportation network is reached when considering systemic principles, a good complementarity among different types of means of transportation is achieved.

Subways were established as a solution to solve above ground traffic congestion. Thus, some of them date from the last century, the oldest being inaugurated in London in 1980.

In New York, this kind of transportation concentrates almost 2/3 of the number of passengers who use the public transportation. Because of the above reasons, the subway in Bucharest was implemented, thus, facilitating the transportation of passengers between the districts at periphery and the central area. A special situation is found in Venice, where the public transportation is done by water.

The towns in South-Eastern Asia are characterized by the use of *"rickshaws"* drawn by bicycles, which replaced the animal driven ones, while in Holland, the frequent utilization of the bicycles on short distances led to a diminution of the utilization of the public transportation. The investigation undertaken in Amsterdam emphasizes the role of the distances when choosing the means of transport. Thus, on a 12 km radius around the town, half of the commuters use the bicycle and 16,5% use the train, in the intermediate area from 12 km to 24 km, the trams play the main role, and over 30 km the train is the main means of transportation. The duration of transportation varies very

much. Thus, in Paris, the average time for a person is about 1 hour and 20 minutes, but it may also reach 5 hours. In the coalfield of Ruhr workers perform a daily commuting of more than 100 km (after Jaqueline Beaujeau Garnier, G. Chabot, 1971).

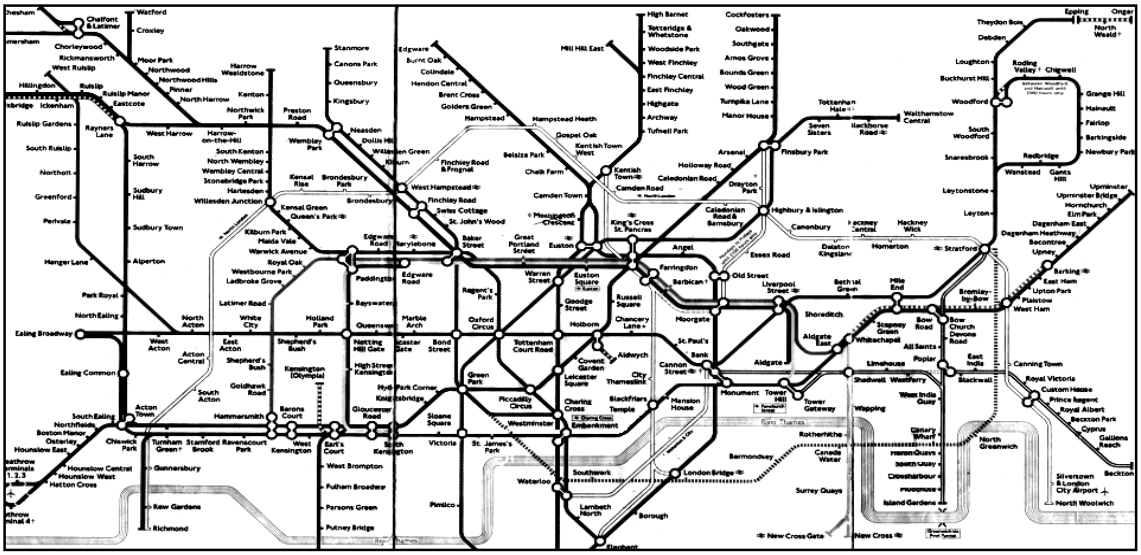


Figure 73. London subway network *(after British Tourist Authority, 1995).*

A location of the residential areas near the working place, doubled by the modernization and the diversification of the transportation means, may be the solution searched by authorities.

6.4.1.5. Supplying the Towns

The towns, some of them massive agglomerations of people need diverse food resources, raw materials, fuels etc. in order to function and develop. A part of these necessities are found in the immediate surrounding area, other at some great distances.

Any town needs electric power and heating, the problem of energy supply being the keystone of its evolution. The electric power needed for lighting and for heating, for industrial and transportation needs, is produced in power stations. Some of them are situated in the proximity of the town, usually producing also thermo energy, others at great distances in areas where fuels or hydraulic energy resources are concentrated. The transformation of the energy bearers in electricity facilitates its transportation and distribution. That is why, the town, as a consumer may be placed at considerable distances from the big power stations, sometimes even at over 1000 km. The obtaining of heat from solid fuels, especially coal, involves massive fluxes of energy, usually transported on railways. The situation is more favourable for harbours. Natural gas and oil supply is facilitated by the possibility of their transportation through pipes at great distances. Thus, as examples, we can mention the oil and gas pipes that link the Gulf and Central Area to the big cities of the Northern and North- Eastern U.S.A. as well as of those in California, the gas pipe that links Western Siberia to Western Europe and oil pipe from Baku II area to Central Europe countries.

Water supply systems are one of the defining elements of the urban.

If some interruptions or substitution are allowed in the supply with raw materials, energy or food products, the lack of water, especially the lack of drinking water or insufficient quantities of it create the most difficult problems. Water supply of the towns represents a major task to accomplish for the local authorities in each country. Sometimes, considerable efforts are made to ensure water supply. Thus, Los Angeles city, starting with 1913, is supplied with water from the Eastern slopes of Sierra Nevada Mountains, from a distance of 235 km. As a consequence of this, the neighbouring areas of the city requested their administrative inclusion in the city in order to benefit from water. It seams that the same thing happened to Brooklyn, when in 1890 as a consequence of the lack of water, the annexation to New York was requested. (after Jaqueline Beaujeau Garnier, G. Chabot, 1971).

Cluj-Napoca got its water supply for a long time from the wells in Somesul Mic river meadow upstream the town and downstream Floresti village. Once the population increased and along with industrial development, water demands also increased, the water supply was established through the building of the Gilau and Tarnita reservoirs. Iasi has used for a long time the phreatic (ground) water from the large Nemtisorul alluvial fan and Bucharest is connected to the Vidraru reservoir on Arges by an aqueduct. The daily water necessities for an inhabitant varies very much, from town to town and even within the town from downtown to the outlying districts.

Thus, in Paris, at the beginning of the 18th century were used 27 litres of water/inhabitant/day, 350 litres in 1935 and 450 litres in 1963. Nowadays are used about 650 litres an average/inhabitant/day within the town and only 250 litres in the suburban areas (after Jaqueline Beaujeau Garnier, G. Chabot, 1971).

Water necessities of the town are proportional with the number of population, the degree of the industrial development and its type, the progress of population's hygiene, as well as the climate of the territory where the town is located. Thus, in order to treat 1 tone of cotton 220m³ of water are necessary, 580m³ for hemp, 800m³ for silk, 170m³ for steal and 1300m³ for aluminium. The thermoelectric stations consume about 30 m cube water/second. A person needs for drinking, cooking, hygiene and washing are approximated at 50-60 litres per day. If the dwelling possesses a good sanitary endowment and a garden, this necessary has to be doubled (after R. Furon, 1964).

Public services in an urban agglomeration consume between 35% and 50% of the entire quantity of water, and industry between 10% and 30%. Approximately 20% from the entire water volume distributed to a town is wasted within the distribution network (after Jaqueline Beaujeau Garnier, G. Chabot, 1971).

Differences in water necessities also depend of the climate of the region where the town is located. Finland, Sweden and the Norwegian towns, besides the fact that they can dispose of huge quantities of water due to their location in the North of the continent, are at an advantage due to small values of evaporation and perspiration. The physiological needs are smaller compared to those in Mediterranean Towns which hardly cope with daily necessities, especially during the blistering days of summer. Water represents the central problem for the towns in the Persian Gulf Region. The modern desalinization machines work incessantly and the price of drinking water is often higher than that of the oil. The Israel state decreed in Galileian (Tiberiade) Lake area a strategic territory, this providing for 90% water necessities of the country. The long dispute between Israel and the neighbouring Arabian countries is rather a battle for water resources.

The water supply of the urban areas is achieved either from the ground water resources or from rivers and lakes. In the U.S.A., approximately 50% of the urban population is supplied with water from the surface resources. The dwellings are entirely supplied with water. The same thing happens in Canada and Sweden. But poor countries manifest an acute deficiency of drinking water. In Indian only approximately 10% of the town population consume adequate drinking water. The rest of the people consume the infested water of the rivers fact that causes numerous illnesses.

The insufficient quantity of water may be the result of two things: in the poor countries is a consequence of the insufficient preoccupation for it even from as far as the colonial period and of the lake of funds for these purposes, and in the development countries is a consequence of some disproportions between the available water supplies and the growth of water demand. It is estimated that the demographic increase in California will be limited as a consequence of the impossibility to satisfy the water demands. The strategic studies regarding the economic development of the U.S.A. in the next 50 years show a dependence on water resources of 90%.

6.4.1.6. Waste Disposal Management

The town is not only *"a centre of accumulation and consumption"*. The residual waters, the organic and industrial waste cause some of the most difficult evacuation, collection and transformation problems.

Thus, the residual waters, depending of the nature of their usage, are reused or sent to the common collector of the residual waters. In many instances, residual waters are used for energetic or cooling purposes. They are pumped down-streams rivers or are pumped in the underground phreatics. Others are collected and sent to the decantation and purifying stations. In some cases the gases resulted

from decomposition are collected and used as biogas. In Chinese towns, organic materials are retrieved in special arranged pits from where they are carried as fertilizer on the agricultural lands near the city. The filtered waters are discharged downstream or are used for different purposes like for irrigations.

Solid wastes are evacuated in two ways. In the case of the modern buildings, these are crushed and then, they are transported through the regular sewage system. The most frequent way of evacuation is that of the garbage containers, daily carried out to certain distance of the town to waste dumps.

Some towns use the solid wastes for energetic purposes (for heating), a very frequent practice in the German towns, around the Second World War a practice that extended to some towns from Eastern Europe where the solid waste gets mixed with coal and then used for heating (e.g. Warsaw). In the Middle East and the Far East the biodegradable solid waste is used as a fertilizer and is a means of exchange between the inhabitants of the towns and the cultivators of vegetables and cotton from around the city. If they are mixed with glass or metals their use is limited. The waste resulted from demolished buildings are just partially recycled. Often they are used as land fills in marshy areas and gulfs in order to increase the town's surface. The oceanfront boulevards of Rio de Janeiro are the result of landfills (after Jaqueline Beaujeau Garnier, G. Chabot 1971).

6.4.2. The Urban Saturation

The term *"urban saturation"* is representative for many cities and refers to a borderline situation that is the result of multiple causes and that slows or even stops the evolution of the urban areas.

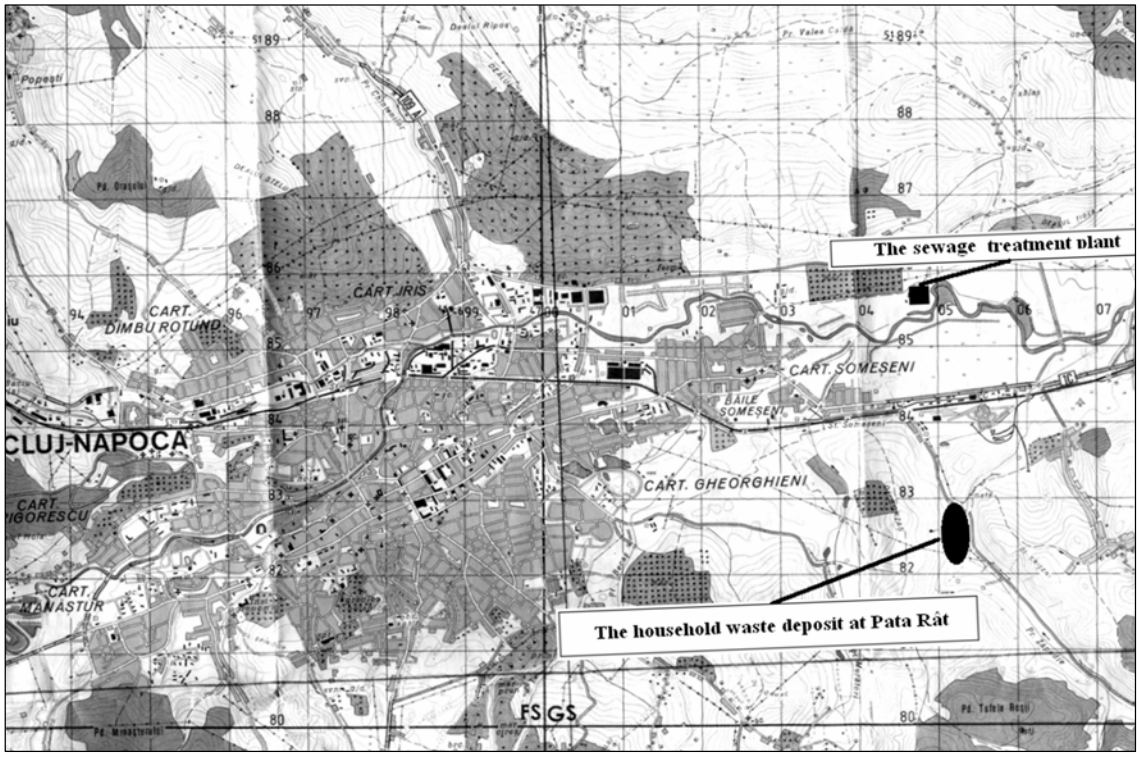


Figure 74. The location of the household waste deposit and of the sewage treatment plant of Cluj-Napoca.

Of course, these problems are different depending of the size and the resources of the city and its surrounding area. The small towns from Lorena have a stagnant evolution due to the impossibility to increase water supply (after Jaqueline Beaujeau Garnier, G. Chabot 1971).

Another aspect of the urban saturation is due to the tendency to fully occupy the urban area, the clustering of buildings, the reduced volume and space for living.

In order to build in all the available areas, two solutions are needed: demolishing and rebuilding and the expansion on new lands at the periphery. The jamming of people in a small space is very detrimental for their mental and physical health, a real threat to the *"personal territory"* (body territory); densities must be calculated based on volume of auxiliary space and not only on the available surface. As a result, the green spaces/inhabitant are being reduced. For instance, Paris has 11,4 m²/inhabitant green space while Vienna has 25 m²/inhabitant and Washington 50 m²/inhabitant (Jaqueline Beaujeau Garnier, G. Chabot 1971).

The spontaneous sprawl of the cities through the *"frog jumping"* system causes sometimes great problems concerning the functioning of the transportation and public services. Sometimes great investments are needed to solve these problems.

The term *"urban saturation"* can also be understood as a problem concerning the atmospheric pollution in the cities. There are examples of towns or cities where air pollution gets absorbed and is therefore not dangerous anymore. But, in most of the cases the towns discharge in atmosphere a lot of harmful substances like: gas, solid particles and aerosols. To all these the noises caused by cars and by industrial plants add up. The traffic agents in Japan often use an oxygen mask while on duty and the inhabitants of London are advised to use a simple mask on foggy days.

6.4.3. The Remodelling of Towns

The main problem concerning towns is related to their expansion, an unlimited and anarchic development should not occur. This is why supervision is needed; a supervision of the evolution at a national and international level otherwise because by 2025 it is estimated that 9 out of 10 people will be living urban areas. Research and projects, some of then utopic, tried to point out to the best way the towns should develop. The first preoccupations of this kind were in Great Britain and in Germany, where the evolution of towns was rapid due to the industrial development.

In 1989, Ebenezer Howard launched the idea of *"garden towns"*. According to his theory, the service sector has to be placed within the centre of an urban agglomeration. An inner ring, with residential function and then an industrial ring bordered by green spaces follow. In this way, in 1902, the first garden-town was designed in Great Britain, the town of Letchworth.

The problems concerning the lack of space at reasonable distance from the centre of the town, led to the creation of *"the Abercrombie plan"* (1943, 1944), which recommended the building of new towns behind London's green belt, where parts of the population from the central area could be relocated. The same thing happened ion the case of Moscow by the creation of the "satellite towns" which had the role to decrease the demographic concentration.

The Town and Planning Act of 1947 in England underlined the fact that the newly created towns had to be seen as self-sufficient in order to allow their inhabitants to live close to all the endowments: shops, department stores, schools, plants, churches etc.

The sketch of Great Britain's systematization, outlined by Patrick Abercrombie, provided a strategic model for the post-war development of great cities. The main idea was the reduction of densities within the central ring and the population transfer (with their work places) to the periphery (the green belt), for about one million inhabitants.

In *"the green belt"* with its green places and infrastructure designed for recreation and as barriers against the continuous expansion of London, large residential buildings can't be located. Behind those *"green belts",* an exterior ring was created for the relocation of the inhabitants of London's old and deteriorated parts of the city, as part of the urban remodelling process. The town's development had to occur in a very clear and reasonable way and this was best achieved by a step-by-step organization and by a continuous enlargement of the residential area and through a series of new towns limited in size and number, accomplishing London's decentralization and at the same time the prevalence of agriculture in most of this territory (after P. Abercrombie, 1944, F. Hudson, 1976, M. Enache, 1979). As a result, the population of Great London remained stagnant in the 50s while the surrounding area of London (within a radius of about 80 km) saw a speedy increase in population, being regarded as the area with the most rapid demographical increase in England. Practically, in the 5th decade, 1/3 of the net demographical increase of England occurred within this very area.

In Japan, the demographical and industrial growth, the few available surfaces and the many earthquakes, determined the creation of new and original forms of ordering of the urban space. The

limitations of vertical building because of the frequent earthquakes determined the research and organization of original habitat forms designed to fulfil present and future needs. One of these solutions is the creation of new urban areas: the *"technopolis",* located near cities.

The "technopolis" must assume some of the functions of the city: commercial function, university function, recreational function etc.

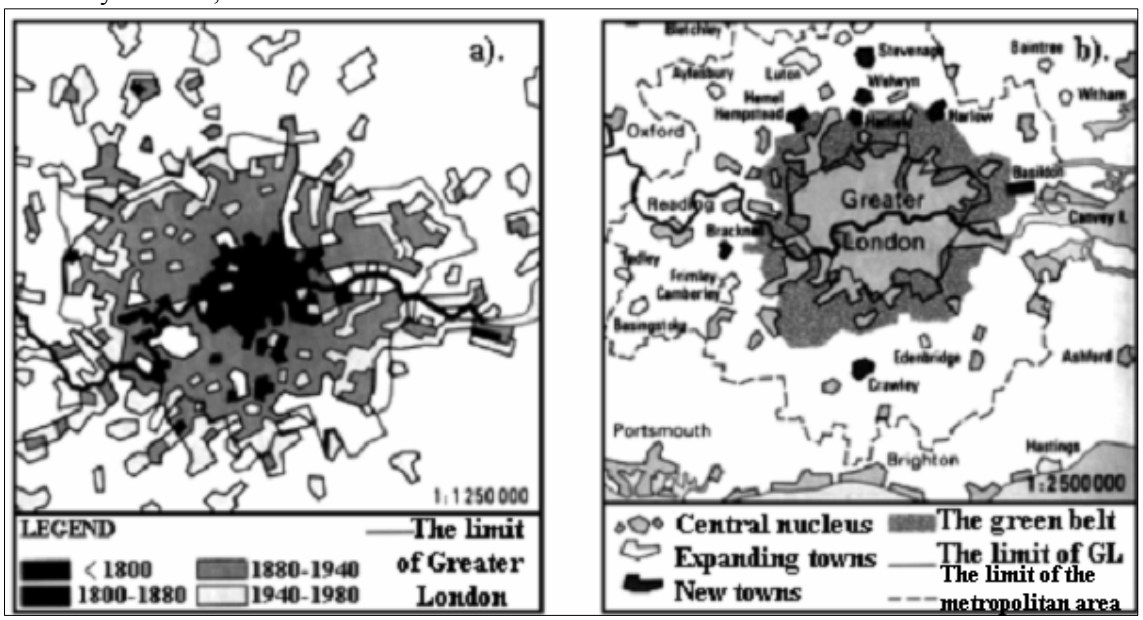


Figure 75. a). The territorial growth of the Greater London and b). The implementation of Abercrombie Plan *(draft after Weltatlas Alexander, 1982).*

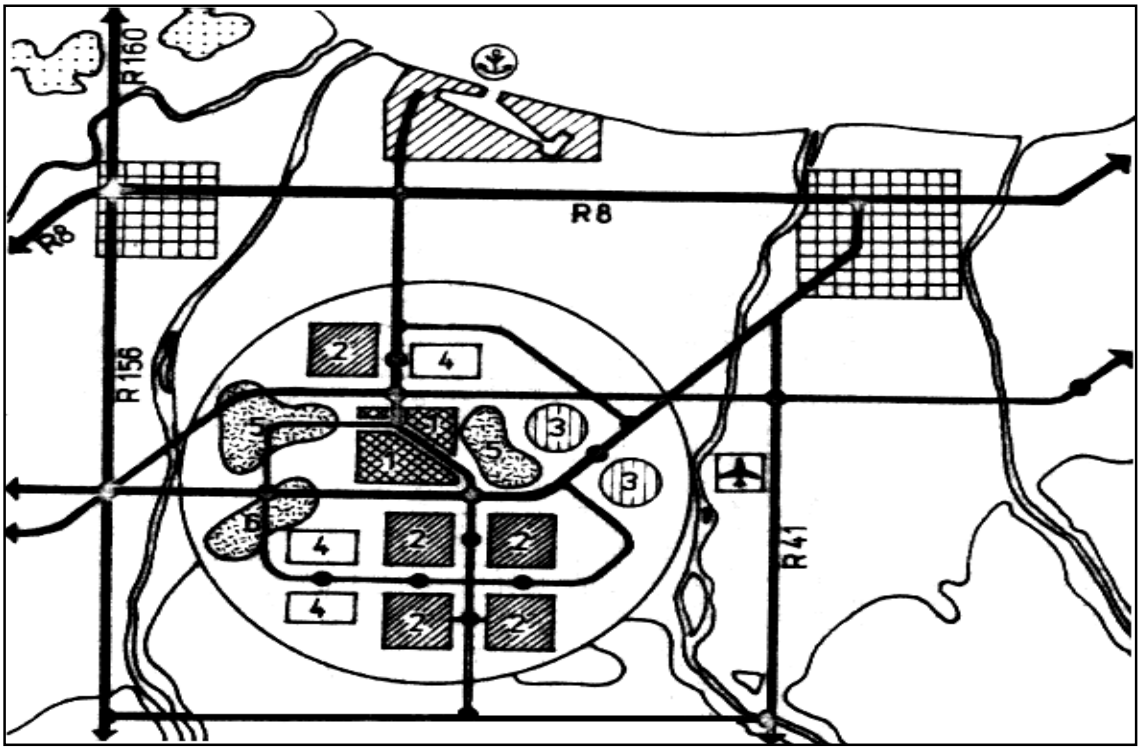


Figure 76. Tehnopolis. Japan – the model of the town of the future: *1. Tehnocentre. 2. Production zone. 3. University campus. 4. Residential area. 5. Area for leisure and sport. 6. Parking (after P. Schöller, 1984).*

This idea determined the creation of 26 such technopolis in Japan, spread all over the country. They don't develop only high-tech activities but also take care of the problems related to universities or civic centres (Knox and Agnew, 1988).

As a form of urban planning the technopolis responds to the need of space of high-tech industries which are in great expansion. The most representative complex of high-tech industry is the Santa Clara region with the Silicon Valley in California. The region was predominantly agricultural area in 1950 and had about 300.000 inhabitants. After 30 years it became the most intensive high-tech complex in the world numbering 1,25 million inhabitants. Each job in the high-tech industry generated at least two other jobs in auxiliary industries or the service sector.

The connection between university research and high-tech institutions are the basis in promoting the activities within the high-tech industry (electronics, biotechnology, spatial technologies etc.).

The high-tech system requires four collective, operational levels:

- the launching of new products regardless of domain;
- the promotion of new ideas;
- the altering and the radical change of the technology of production;
- the establishment of a new business environment and management of production.

All these processes are accompanied by a very rapid flow of information, which requires the equal participation of each employee, both in the process of decision-making and of production. This way, a pyramidal arrangement of leadership disappears and is therefore substituted by a horizontal managerial system. A translation at the basis of society occurs, from the pyramidal capitalism to the participating socialism, a sort of "levelling out" of the incomes among people, which closes the high-tech cycle through the emergence of a new type of work and social relationships. The high-tech societies are remarkable through a rapidly increasing production in all domains (dialogue with dr. Sam Topaz, Haifa University, Israel, 2002, November 8th).

6.4.4. The Urban Functions

"Function", a term borrowed from Physiology, was introduced in Geography by Fr. Ratzel in 1981. By "function of a town", in an economic-geographical context, we understand the profession that a town performs. A town concentrates a lot of activities which involve a significant part of its population but not all the activities of the town have the capacity of defining the function (e.g. the city serving production). The function is defined only by those activities which justify the existence and the development of the town, bringing the necessary resources for life.

Gabriele Schwartz (quoted by Aurelia Susan, 1970) distinguishes two categories within the functions of a town: general (external) functions (Allegemeine Fuctionen) and particular (internal) functions (Besondere Funktionen). The "general function" describes the role of the town within the region and its hierarchy as an area of influence.

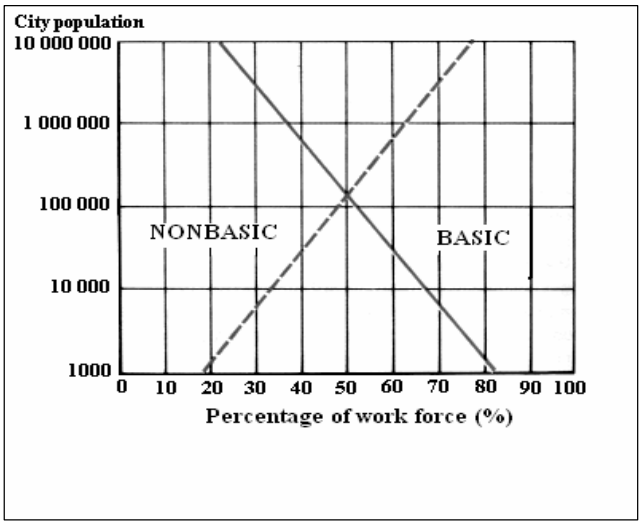


Figure 77. The proportion of the workforce engaged in basic and non-basic activities by city size *(from J. Fellman, A Getis, J. Getis, 1990).*

The activities which serve the exterior and those for internal needs form the economic base of an urban settlement.

A part of the active population provides the exterior with goods and services (the external market) and as a result, this category of population attracts the financial flow inside the town (supports the urban evolution) and forms the basic sector in the economic system of a town. The other part of the employed population produces and provides services for the

welfare of the town's population (non-basic activities- that define the internal function of a town). These activities are very important for the good functioning of towns (salesmen, bankers, employees of the educational system, health, urban transport a.o.).

There exist some ratios which can be established between the two types of population involved in basic or non-basic (service) activities. In general, towns with the same size and the same functions are characterized by the same ratio between the active basic population and active non-basic population. The population involved in non-basic activities increases more rapidly than the active population engaged in basic activities. In cities where population exceeds 1 million inhabitants, the ratio is 2:1 (non-basic – basic).

By the increasing of the population engaged in the basic activities of economy, results a multiplication of the entire functional workforce. For instance, with an increase of 10 people in the basic sector, the overall increase in workforce is of 30 persons (10 persons engaged in basic activities and 20 persons in non-basic activities) to which the dependent population is added. This process is called multiplicative effect and is associated with the economic development of a town.

6.4.4.1. The Classification of Functions

Small cities are generally monofunctional, the basic sector usually including a single type of activity (agricultural towns (farm-market towns), mining towns, lumbering towns, university towns). The majority of cities, especially the great ones, have powerful connections with the exterior, exporting more and more goods and services and thus becoming multifunctional. Nonetheless, even in cities with very diversified functions a very small part of these dominate the economic structures of the cities.

The functional specialization allows the classification of the towns in the following categories: industrial (manufacturing), commercial (retailing, wholesaling) transportation, government towns etc.

6.4.4.2. The Determination of the Urban Functions

In order to determine the predominant function(s) of a town an inventory of all the categories of activities developed in the city and the quantitative comparison of the number of people involved in these, should be taken. By excluding the workforce from the primary sector, the workforce active of the second and tertiary sectors is therefore to be analyzed. For instance, in the railway system a component of the tertiary sector, both industrial and service workers exist. If the overall approach is valid for the bigger cities, it is not so in the case of smaller towns. The existence of small specialized workshops makes the generalization difficult.

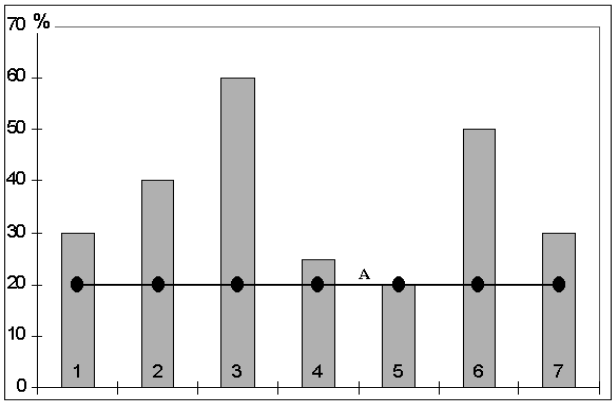


Figure 78. The Determination of the urban functions using graphics: *A. the limit between basic and non-basic population; 1,2….n, towns. (after Jaqueline Beaujeau Garnier, G. Chabot, 1971).*

The major difficulty arises when we want to distinguish between the population working for the interior and the one working for the exterior the latter one being the one that helps us determine the function of the city (after Jaqueline Beaujeau Garnier, G. Chabot, 1971). This category of population is called functional population and can be established only based on detailed monographs.

In the event of studying multiple cities, the percentage of each activity must be established and then compared among the towns. The smaller percentage should be considered the minimum for a town's needs. For those towns that have a bigger percentage of a certain activity that activity should be considered an "exterior" one. For example, let's take a number of 50 towns with a population comprised between 20.000 and 300.000 inhabitants. One of these towns has an employed population of 100.000 and only 20.000 of these work in the service sector, so a mere 20% that is the lowest

percentage among the other towns. We will assume that in all the towns 20% of the employed population in the service sector work for their town, while the rest work for the exterior.

This method must to some extent be considered arbitrary. It only allows for such a generalisation in the case of homogenous urban formations. For 147 French towns of over 20.000 inhabitants the value of 40% of the employed population in services is considered as working for the town itself while in USA is of 37,7%. In the case of France the 40 % comprise: constructions 5%, manufacturing 11%, commerce and banks 11%, freelancers 5,2%, administration 5,2% and transportation 1,9%.

The values differ depending on the size of the towns, the bigger the town, the bigger the values are. Thus, for small towns, the average is of 24% while for cities bigger than 1 million the average reaches 56.7%. Often it needs to be taken into consideration the fact that some functions may be more important than others though the number of people they employ might be smaller. For example in the case of Frankfurt on Main, 16.7% of the employed population works in commerce, banks and insurance agencies. This function is much more important for the city then the public service one that employs 21%. In some situations the dominant function can be easily established, when with the exception of the internal activities, the entire employed population is comprised in it. It is the case of mining towns, of harbours and of governmental towns (after Jaqueline Beaujeau Garnier, G. Chabot, 1971). The information has to be perceived with some reserves when considering the urban phenomenon at the global level and its national characteristics. For example with the generalized industrial collapse from 1989, the towns powerfully subsidized by the state *"stand"* on the basis on *"non-basic"* population while the regional capitals and the countries' capitals develop on the account of the *"basic"* population.

In our country due to the difficulty to get access to the statistical information the establishing of the function of a town is made by taking into consideration the professional structure of the employed population, the highest percentage indicating the predominant function. A study of the categories of functions at the national level was made by S. Negut in 1997.

6.4.4.2.1. The Commercial Function

All towns have a commercial activity for the people who live outside those towns. For some authors, the commercial function defines the town. Some of the urban settlements developed out of commercial needs (markets, harbours). Rural population used to came into the certain areas in order to exchange agricultural products for industrial products. These central places have developed in time into towns.

The primary forms of commercial towns are the local markets and the trade posts. The local market is a result of trading needs, in order to increase life standards. This type of settlement appeared in Middle Ages, when some of the services were paid with money and part of the products had to be traded. Rural population used to visit towns only on market days (walking distances up to 10 km). Most of "market" settlements developed at contact lines, whether geological, morphological but always distinctive from economical point of view. In this way, in Eastern England for instance, some market-towns developed at the contact of different geological structures (clay, sand and chalk), in the Vosgi Mountains, at the contact between sand stone and limestone, between the forested areas and the agricultural ones. Some of the markets that were located at the contact between mountains and hills got specialized in the commerce with cattle. This type of commercial function was very common in developed countries in the 19th century and the first part of the 20th century. Nevertheless, nowadays there are still some rural "market settlements", but the frequency of market days is seasonal. Rural settlements with this function are town-villages, many of them having administrative and industrial functions. In time, this type of settlements developed into towns. (Jaqueline Beaujeau Garnier, G. Chabot, 1971)

Trade posts, as a primary organizational form of exchange at great distance, appeared in the areas of contact between civilizations found at different stages of development. The commerce included usually raw products as in the case of Eskimos, for instance who traded with the population in southern areas fur for finished products such as guns, alcohol, and tobacco. Some people, transported reindeer skin by sledge for very long distances in order to obtain thread and steel sewing needles made. Some of the tropical products harvested by villagers are given to the nearest trade posts

and if the trades are frequent, towns can develop there (after Jaqueline Beaujeau Garnier, G. Chabot 1971).

The development of commerce between places situated at great distances favoured the development of the means of transportation and the transportation networks. The old transport means by animal traction determined the emergence of places for rest and exchange and if traffic was intense, different inns grouped leading to the formation of towns. Stopover points had an advantage if they were located at crossroads of important transportation routes or mountain crossings (Innsbruck was the stopover for the Brenner passing, Braşov for the Rucăr-Bran crossing, and Sibiu for the Turnu-Roşu pass).

The main routes of the caravans are still marked by some towns which were halt places (Lulan in the Tarim Depression, situated on the Silk Road, Ghardaia and Tombouctou at the periphery of Sahara, Fes located at the crossroads of caravan routes leading from Algeria towards the Atlantic Ocean) (after Jaqueline Beaujeau Garnier, G. Chabot, 1971).

The developments in transportation caused the decline of many of such towns. The emergence and development of the railway had as a result the increasing of the distance between the stopovers points to about 200 km *"working range"* (the maximum for a steam engine). Therefore, many of the halt places located on the old roads declined and new towns emerged at suitable distances. (Laroche – railway station in the middle of the distance between Paris and Dijon and transformed the village Migennes into a own with 6.000 inhabitants) (after Jaqueline Beaujeau Garnier, G. Chabot, 1971). The same situation occurred in the case of Făureni, Roşiorii de Vede, Caracal and Paşcani but Războieni, in spite of its intense traffic, is still waiting for the privilege of becoming a town. With the introduction and spreading of the electrification the intermediate stations are not of use any longer.

In North America it was the railroad system that dictated the organization of the urban network; the majority of cities from western USA and Canada were at first railway stations. Along the Transsiberian, for instance, a series of cities developed, some of which having more than one million inhabitants: Ufa, Celeabinsk, Novosibirsk etc.

The development of transportation facilitated the development of commerce, and further triggered the emergence of commercial centres (the market-towns and the big commercial cities). In the past, large scale commerce was organized in periodical markets and the commercial activity was sometimes connected to the religious events. In time, some of these small trade centres developed into great commercial centres, especially those located at crossroads. We can mention for example Leipzig with its well known market, which has been organized every year since the 13th century and Lyon that is organized four times a year ever since 1463 and the Gorki one) (after Jaqueline Beaujeau Garnier, G. Chabot, 1971).

The large commercial towns took advantage of their geographical position – Lyon, situated between the Alpine area and the Hercinic one at the confluence of Rhône and Saône, Mainz at the confluence of the Main and the Rhine rivers, Vienna at the Moravia's gate. Usually, the confluence of navigable rivers constitutes geometrical spaces, ideal for the development of towns (Khartoum, at the confluence of the White and the Blue Nile; Saint Louise at the confluence of the Mississippi and the Missouri rivers). On the other hand, there are sometimes political factors which can at any time cancel the favourable conditions of town localization. Belgrad, included for a long period of time in the Turkish Empire, couldn't take advantage of its geographical position at the confluence of the Sava and the Danube rivers (after Jaqueline Beaujeau Garnier, G. Chabot, 1971).

"Among all the commercial functions, the financial one seems to have no definite location, the most fluid type of all merchandise being the coin. In areas of modern economic development, the airports have the first call in establishing the financial function, before the establishment of a new commercial centre" (Anchorage in Alaska, Keflawik in Iceland etc) (after Jaqueline Beaujeau Garnier, G. Chabot, 1971).

Harbours have a different specificity, derived out of the volume and the variety of products and the pulse of their economies. Usually, harbours are points of convergence and development of international commerce. The activity of the harbour dictates the existence and the evolution of the town.

Istanbul, that stretches on both sides of the Bosfor, takes advantage from both the strait and the fact that it is the linkage between two continents. Such harbours are advantaged by the both longitudinal and transversal navigation Dover-Calais, Regio-Messina etc., whereas capes have

facilitated the appearance of some of the greatest harbour-cities: Singapore, Cape Town. But the development of the harbour-cities is correlated with the land hinterland that it provides for (after Jaqueline Beaujeau Garnier, G. Chabot, 1971).

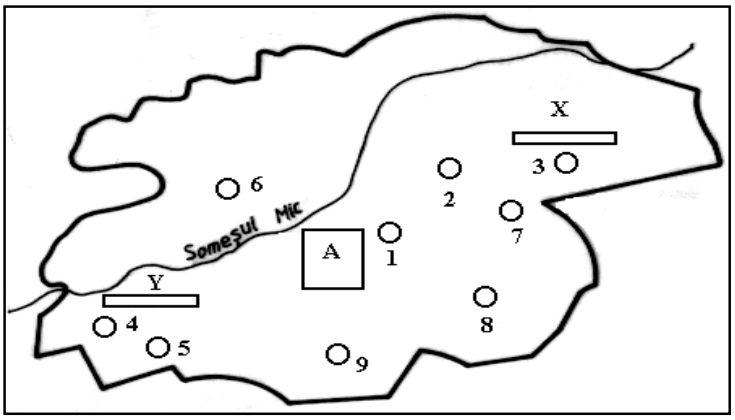


Figure 79. Cluj-Napoca – the localization of the markets and the main commercial axis: *A. The commercial centre of the city. X. The commercial axis-Mărăşti. Y. The commercial axis-Mănăştur. 1. Mihai Viteazul Market. 2. Abator Market. 3. Mărăşti Market. 4. Flora Market. 5. I. Meşter Market. 6. Grigorescu Market. 7. Mercur Market. 8. Hermes Market. 9. Zorilor Market.*

The commercial function of Cluj-Napoca developed in parallel with the tendency of this function to move towards the districts of the city. In 1960, the city had only two markets for agricultural products (Cipariu and Mihai Viteazu market). With time though, with the spatial expansion and the increase in the number of population new market areas appeared in the districts and two core areas on the eastern-western oriented axis: Mărăşti-Mănăştur.

6.4.4.2.2. The Industrial Function

If commercial towns emerged as a result of people exchanging goods, industrial towns are characterized by a deeper genetic diversity. If industry often generates the town, it is the town that contributes to the further development of the industry. Neither of both can develop without the input of external workforce. Both are more stable and in a permanent metamorphosis. Towns with industrial functions are of two major types: mining towns and manufacturing towns.

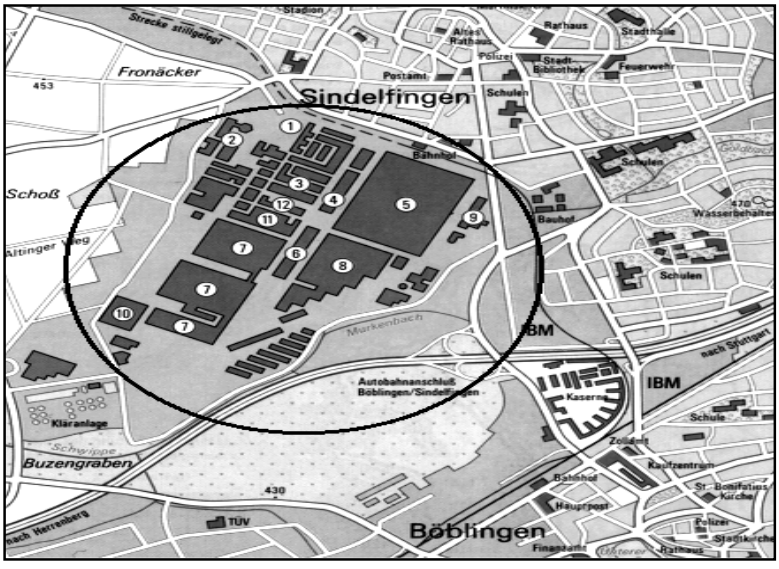


Figure 80. Localization of the Mercedes plant, in the western periphery of Stuttgart *(sketch after the Weltatlas Alexander, 1982).*

Mining towns are present everywhere as the need for raw materials *"defies"* the conditions imposed by the geographical setting. The need for iron ore lead to the emergence of towns beyond the limit of the North Pole circle, that of oil and gold towns in desert areas (Kiruna, Hassi Messaud, Port Radium). Often, the mining industry alone can be a menace for those towns in the case of the exhaustion of the ores. In most cases, this function also determines the development of the manufacturing industry, of commerce and of the town as a whole.

In most of the cases, the axiom *"industry attracts industry"* led to the diversification of the industrial activities, parallel with the development of some famous industries that fortified the fame of some cities. For instance, Stuttgart is associated with the fame of the Mercedes automobiles, as Solingen is a name that indicates and rather certificates superior quality steel and Seattle on the Pacific coast of USA is linked to the aeronautic industry, the Boeing Company.

6.4.4.2.3. The Cultural Function

To this category belong towns with mainly cultural and touristic activities.

Towns having cultural functions are:

- university towns;
- museum towns;
- festivals and congress towns.

In the past, the university function was associated to the religious one and the education was done within institutions with religious character. If pupils are recruited from nearby areas, students usually look for universities at long distances. To this category belong smaller cities but which shelter great universities: Heidelberg, Tűbingen, Göttingen in Germany, Bologna and Pisa in Italy, Cambridge and Oxford in England, Princeton in the USA, Salamanca in Spain, Uppsala and Lund in Sweden, Aarhus in Denmark, Louvain in Belgium etc. The specificity of these towns consists in the buildings designed for educational and recreational purposes, with streets being animated by the youthful population, spaces for sports, cafés and restaurants. The attraction of such spaces with tradition in education is powerful and the distances travelled to reach them are secondary to the fame gained in time.

Another category of towns with university function is that of the big cities. These cumulate the university function with other functions. *"It is only natural for the population of big cities to be able to complete their study cycles in the native town."* (after Jaqueline Beaujeau Garnier, G. Chabot 1971).

As a result of these needs, universities were opened in big cities becoming true cultural hubs. They answer to local and regional imperatives and integrate more easily the youthful population in the economical, social and spiritual life of the community. Usually, university districts are built and they become embryos of smaller neighbouring towns (Orsay near Paris, Măgurele near Bucharest). The university districts in big towns are a representation, at a reduced scale, of the university towns which they resemble in many ways.

The museum towns are those that shelter art treasures of great value and are themselves values as such through local architecture and physiognomy or location. Among the most famous examples to be mentioned are: Venice and Florence, the remodelling of which is done in accordance to the need of preserving their architectural and artistic values.

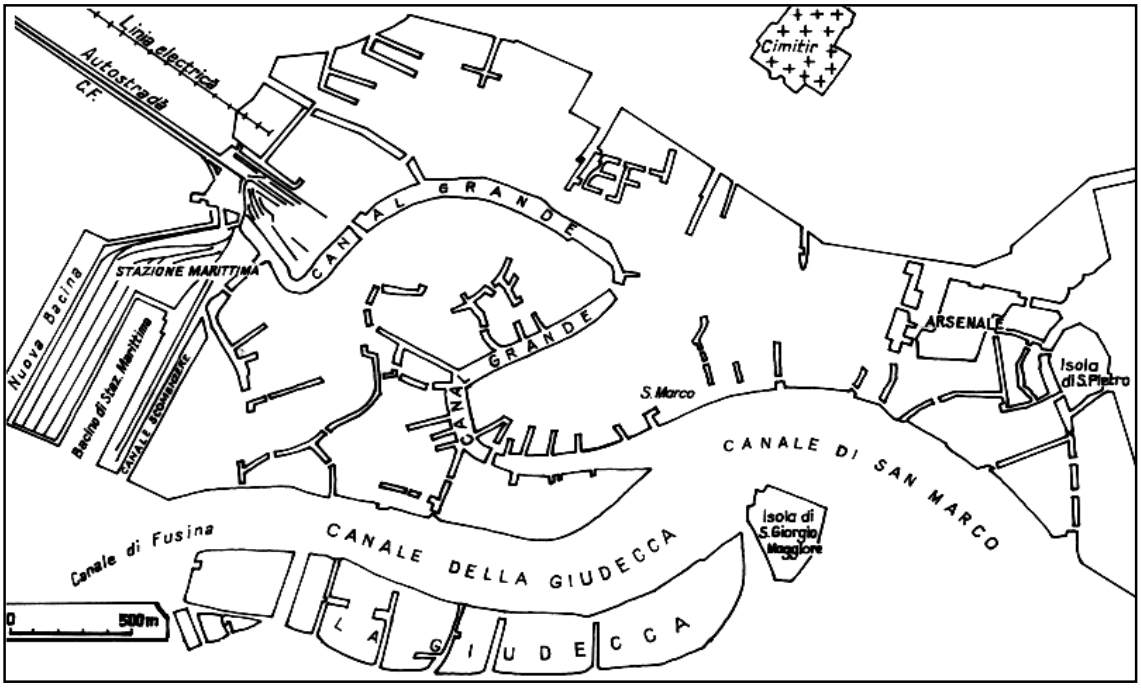


Figure 81. The ground plan of Venice *(after Der Grosse Brockhaus, 1984).*

The towns of festivals and congresses attract important masses of people, being adequately endowed for these kinds of activities. Among festival towns we mention Bayreuth, famous for the Wagnerian cult and Salzburg for the Mozart cult.

The congresses often with an international character, concentrate great groups of people and balneotherapy resorts in off-season are usually places for holding conferences. They provide the necessary comfort and have an appropriate infrastructure. This function is often cumulated with that of capital cities but some of them, middle sized, kept their fame through tradition (Cannes, Dijon, Geneva, Yalta, Evian etc.).

6.4.4.2.4. Towns with Temporary Residential Function

This category of towns includes towns such as sanatorium and baneotherapy towns/resorts and in most of the cases, the population coming to these towns for treatment or recreation outnumbers permanent residents.

Sanatorium towns developed out of the need to treat and heal chronic diseases (tuberculosis, mental illnesses). The necessity of treatment determines an urban concentration but natural local conditions favour the healing process. Often, these sorts of towns include balneotherapeutic functions as well and they developed due to the presence of some mineral springs with curative properties – usually in areas with volcanic activity or fault lines. These towns develop only if other factors contribute as well, factors like accessibility, high demographic density and high life standards, attractive natural setting.

Among famous balneotherapy resorts in Europe and in the world, worth mentioning are: Vichy in France, Karlovy-Vary in the Czech Republic, Herculane, Slănic Moldova and Călimăneşti in Romania.

6.4.4.2.5. Resort Towns

Resort towns appeared due to the development and generalization of the urban phenomenon in the developed parts of the world and the need of people to escape into natural and relatively underdeveloped settings. Therefore, these towns are specific to developed countries whereas in developing countries with predominant rural areas they tend to appear near major cities, where foreigners are more numerous.

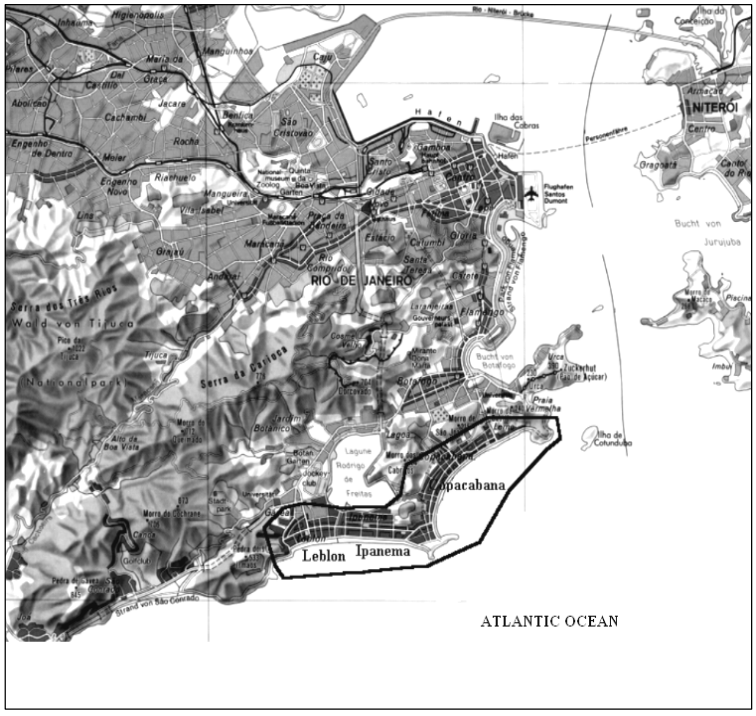


Figure 82. Rio de Janeiro with its famous beaches: Copacabana, Ipanema and Leblon *(after Seydlitz Weltatlas, 1984).*

Their classification is done according to the prevailing natural factor. Thus, there are: maritime resorts and mountain towns.

Maritime spa towns take full advantage of the morphology of the shore. In order to satisfy the need for recreation and presence of a large number of tourists, the beaches have to be large, sandy and easily accessible. A long period of insolation and the lack of winds complete the picture of favourability of the maritime spas.

Among famous spas, we mention Monaco on Côte d'Azur, the French Riviera, Biarritz on Biscay Bay, Soci and Mamaia on the coast of the Black Sea, Miami in Florida, Acapulco in Mexico, Copacabana in Rio de Janeiro etc.

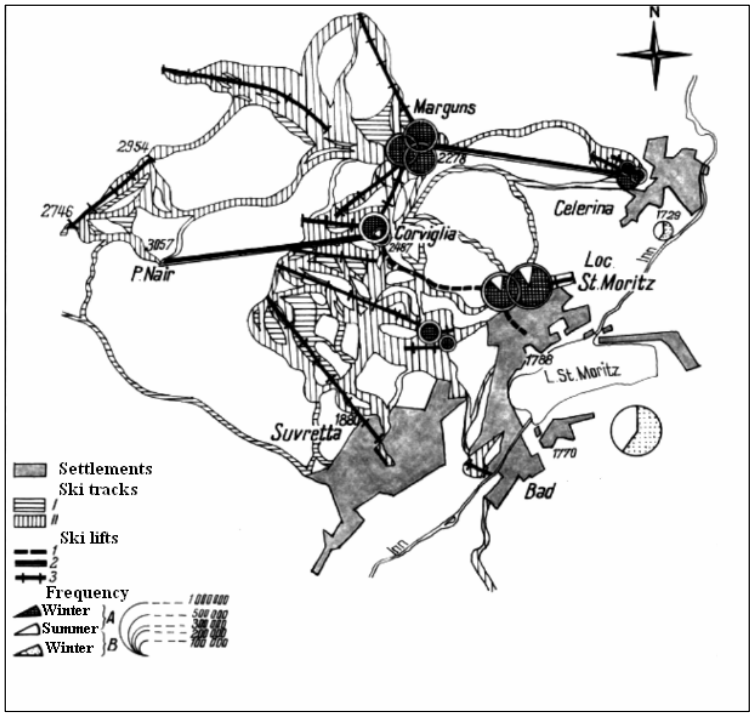


Figure 83. Mountain touristic resort of St. Moritz in Switzerland *(according to H. Boesch, 1977)* .

Mountain spa towns compared to the maritime ones, are not places favouring urban concentrations. Some forms of tourism, such as the winter tourism, contribute to the agglomeration of buildings that offer shelter and services and the organization infrastructure for winter sports. This type of towns are more common in the Alps region (Davos and Saint Moritz in Switzerland, Innsbruck in Austria, Charmonix in France, Garmisch-Partenkirchen in Germany, Zakopane in Poland and Tatranska Lomnica in Slovakia).

The main concern of these towns is related to their seasonality. To justify their existence and sustain their development, large incomes must be obtained during high-peak season so that these ensure their survival for the rest of the year. From this point of view it seems that mountain resorts are more at an advantage because their activity expands the whole year around, with a maximum activity during the winter. Through the association of the recreational function and the treatment function, a proper development is ensured and this might also trigger some non-polluting industrial branches, dispersed through house-work.

6.4.4.2.6. The Administrative and Political Function

In contradiction with the other categories of functions, the administrative and political function does not occur spontaneously. It is the result of previous planning and decision making, of disputes and challenges, of some needs of regional or central importance to the region. These functions are not only specific to cities as they manifest themselves in rural settlements as well, but on a reduced scale. In both cases, the settlements appointed to carry out these functions are those that are most developed within a specific region. Once established the administrative and political function enjoys great stability.

In the category of settlements with administrative-political function, the most representative and expressive are the capital cities. This function is one of the most favourable factors contributing to the development of major cities.

The capital-city is the synthetic territorial expression of a nation's economical, social, political, cultural, scientific and spiritual values and life. It is the main city of a country and the location is usually geometrically established, concerning strategic reasoning (Madrid, Ankara, Moscow). The geometrical centre of a country does not always correspond to the economic centre or point of convergence of an economy. Thus, there are capitals localized according to their economical centrality and in this respect, the following are to be mentioned: Paris, London, Stockholm, Cairo, Buenos Aires, Lisbon etc (after Jaqueline Beaujeau Garnier, G. Chabot, 1971).

In general, the capital-cities are the most powerful ones from a demographical point of view, sometimes concentrating large percentages of a country's population (excepting the very small

countries where the majority of the population is concentrated in the capital). For example, Budapest concentrates almost 20% of the population of Hungary, San Juan over 50% of Puerto Rico's population, Buenos Aires and Santiago de Chile over 30%, Lima 20% of the country's population, Ulan Bator 20% of Mongolia's population.

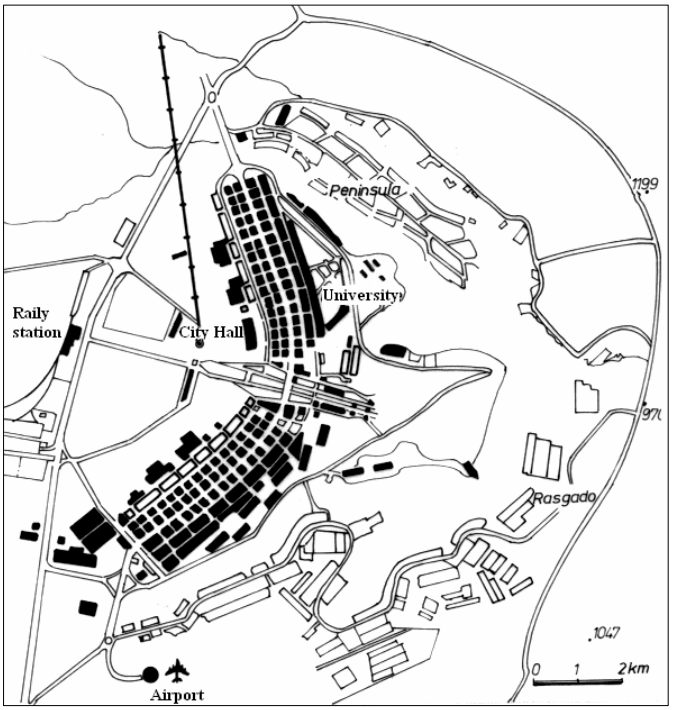


Figure 84. The ground-plan of Brasilia *(after Seydlitz Weltatlas, 1984)***.**

Capitals are not always the expressions of a country's economic or demographic power. Political and economic reasons determined other choices. In order not to damage the interests of cities entitled to aspire to the status of capitals, federal districts have been created (Canberra, Brazil, Washington DC).

The harbour town of Karachi in Pakistan, with an intense commercial activity was abandoned in favour of Islamabad, with a more central position and with a more pleasant climate. Customary, the capitals ensure the headquarters of government, of the leading power of the state. Hague, which houses Holland's government, is considered the capital of the country although the residence of the royal family is in Amsterdam.

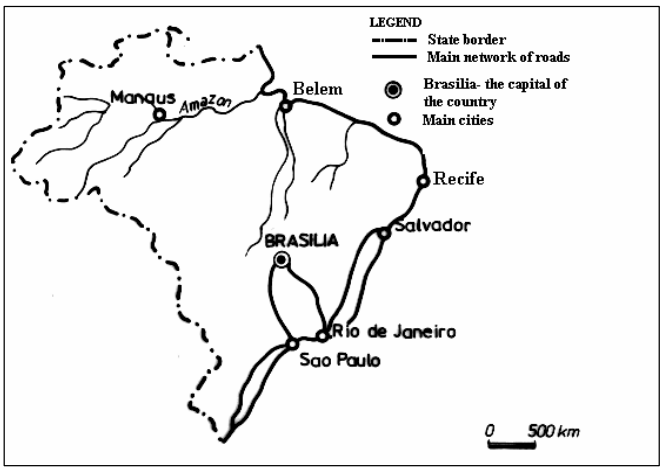


Figure 85. Spatial position of Brazil within national territory.

Once invested with those functions, the cities develop rapidly, thus, Ankara, a former rural settlement in the Anatolian Plateau, exceeded two million inhabitants, coming close to the population of Istanbul, although the latter is not hindered by the development of the capital. If once established, capitals are rather stable, at inferior levels, administrative and political reorganizations led to a "movement" of these functions to some urban settlements, with the purpose of rising them to superior economic-social levels of development.

However, the truth that the capitals are the favoured cities of nations remains valid.

The concurring factors that represent the basis of their development and also of other categories of towns that evolved into metropolitan areas in Europe, with great demographic concentrations are:

- the position (localization);
- the economic structure;
- the social structure;
- the informational, political and cultural patrimony;
- the environment in which they develop;
- the urban policy.

The position (localization):

- in a central relatively homogenous space;
- on an important communication axis;
- position as an "access gate", with multifunctional importance;
- air-traffic junction;
- a good position within the telematics network;
- the advantage of a relative territorial unfoldment due to the opening process of frontiers.

The economic structure:

- important centres of high quality tertiary activities and factory services;
- exceptional localization in relation to the headquarters of international companies;
- the presence of important international institutions;
- a good endowment (infrastructure) for the organization of international conferences;
- a strong position in research-development and innovation activities (resulting in an unprecedented increase in productivity and workforce);
- famous university centres;
- varied industrial structure, mainly focused on highly qualified workforce and with a smaller development of heavy industries that exploit natural resources.

The social structure:

- availability of good quality and low costs dwellings;
- smaller differences regarding incomes (due to an efficient policy of distribution of incomes);
- the existence of an important middle class;
- a strong social mixture within the residential districts;
- local entrepreneur tradition based on a bourgeoisie with local "patriotic spirit".

Infrastructural patrimony and cultural policy:

- an important historical patrimony;
- considerable efforts to maintain and preserve the urban patrimony;
- systemic preservation and renovation of the basic urban structures;
- qualitative urban endowments;
- cultural policy opened to international access;
- popular cultural policy regarding social integration.

The environment:

- urban prestigious sites, mainly located on water courses;
- attractive landscapes around the cities, dominated by extended green areas, mountains and hills;
- extensive green areas within the city, mainly in the residential districts;
- important efforts to monitor and reduce pollution;
- a high concentration of the traffic on roads;
- restrictive policy regarding parking lots;
- efficient public urban transportation.

Urban policy:

- adequate administrative system in order to ensure overall and autonomous urban management;
- a good urban marketing policy;
- appropriate budget for the authorities so as to sustain proactive urban policy;
- an efficient and coherent management of the urban conflicts and also of those regarding the security of the citizens.

6.4.4.3. The Functional Classification of Towns

The early capitalist towns usually concentrated various functions, stating with the cultural, administrative and commercial and later on, the industrial function, all closely connected to the surrounding areas. Many of them had religious or defence functions, today in visible decline.

Once civilization evolved and grew and advanced in complexity, cities developed new functions such as recreational, residential, transportation, mining, service or industry functions etc. Many towns multiplied their functional profile, changed it or increase its variety. For instance some towns with fishing industry functions became harbours or developed touristic functions as well. Oxford, an old and famous university town, developed recently a modern industry of automobiles.

F. Hudson distinguished nine categories of towns according to their functions:

Mining and quarries towns. These towns are very common and have a rapid development. The most famous are the towns from the coal and petroleum rich sedimentary basins.

Industrial towns. These are very diverse, according to their main industrial profile. Thus, Leverkusen and Oneşti are famous for their chemical industry, Pittsburgh, Solingen and Reşiţa for their iron and steel industry, Lille, Turcoing and Cisnădie for the textile industry and Meissen for the famous pottery.

Transport centres. Usually these towns also concentrate industries related to means of transportation. (Detroit- automobiles, Philadelphia- locomotive, Wichita- aircrafts) or these towns are junctions of transportation by road, sea or air. (Kassel, Teiuş- railway junctions; Cherbourg –harbour; Anchorage, Keflavik- airports).

Commercial towns. According to the specificity of their activity we distinguish:

- agricultural market-towns (Winnipeg, Kansas City, Slobozia);
- banking and financial centres (Frankfurt, Amsterdam);
- large commercial harbours.

Towns with administrative function. These are of two categories:

- national capitals;
- provincial capitals.

Strategic centres:

- ancient fortress towns (Edinburgh, Beijing);
- naval bases (Brest, Plymouth, Toulon);
- garrison towns (Aldershot, Cutterik).

Cultural towns. These are of three categories:

- ecclesiastic centres (Mecca, Benares, Jerusalem);
- university towns (Cambridge, Uppsala, Heidelberg);
- conference towns (Brighton, Davos).

Health and Recreational centres. These can be:

- spas (Vichy, Băile Herculane, Karlovy-Vary);
- seaside resorts (Biaritz, Miami, Cannes);
- mountain resorts (St. Moritz, Garmisch-Partenkirchen, Predeal);
- other inland resorts (Tucson-Arizona, Palm Spings- California).

Residential towns. These are of three types:

- dormitory towns (Ilkley, Harrogate and Wetherby-all serving Leeds; Hornchurch and Guillfort- serving London);
- suburban growths (Beverly Hills near Los Angeles);
- overspill towns (New Towns- London with Basildon, Crawley, Harlow).

Through PATN - National Plan of Territorial Arrangement there were determined eight major categories of towns regading their rank of development:

- metropolitan poles (> 1 million inhabitants);
- national poles (25.0000-1 million inhabitants);
- supraregional poles (50.000-250.000 inhabitants);
- regional poles;
- regional poles with specific functionality – cultural or touristic heritage;
- subregional poles;
- local poles – rank I (20.000-50.000 inhabitants);
- local poles – rank II (< 20.000 inhabitants).

We can notice a large gap between the metropolitan poles, here represented by Bucharest, the capital city of Romania, which has a population of more than 2 million inhabitants, and the national poles, proposed by the National Plan of Territorial Arrangement, which register a population of not more than 400.000 inhabitants.

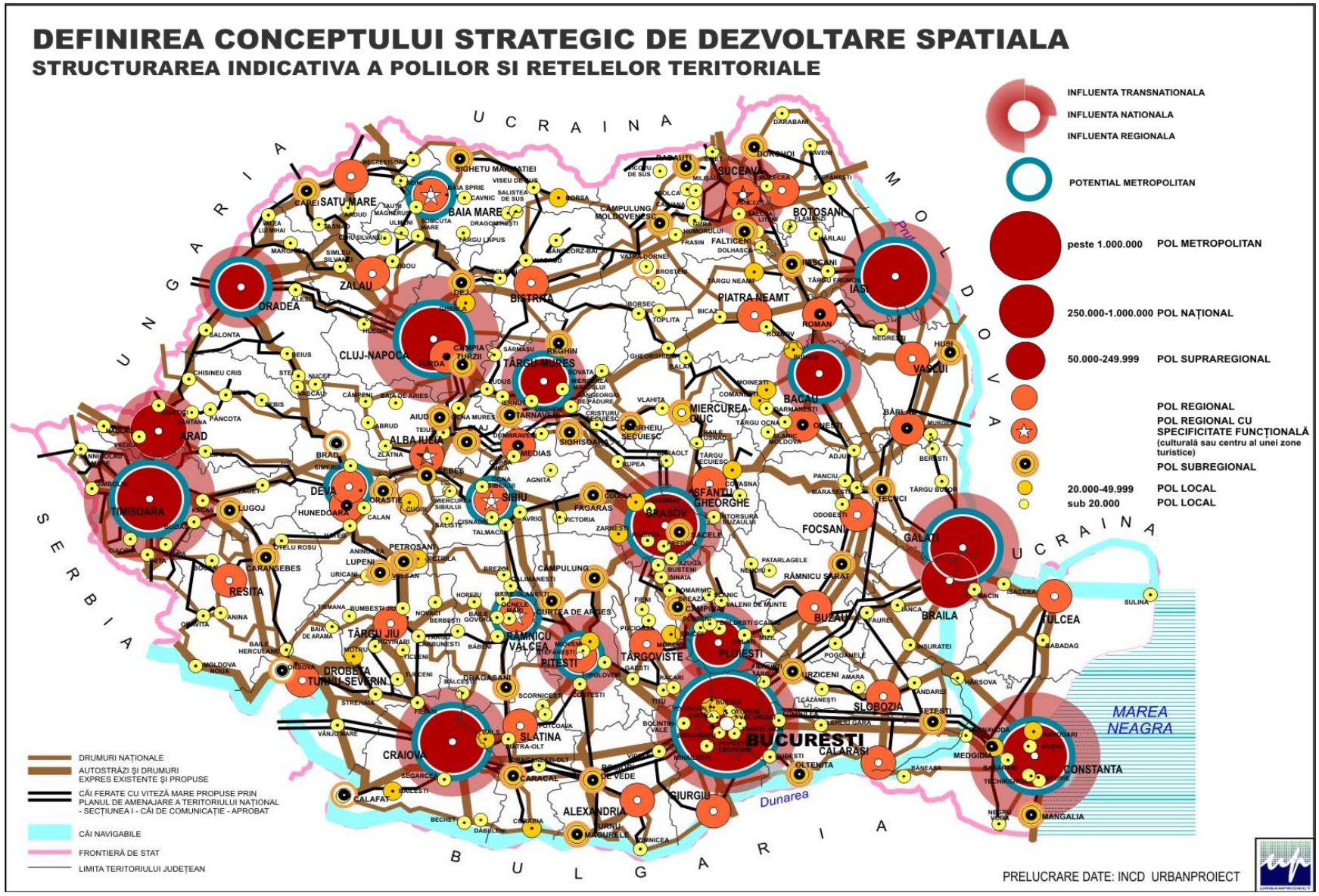


Figure 86. The structure of the poles of development and territorial networks in Romania *(after Urbanproiect, 2008).*

6.4.5. Classification of Towns by Age

J. M. Houston (1953) distinguishes three stages that characterize the evolution of towns in Europe:

- *the nuclear stage* – represented in today's cities by former confining walls (walls replaced by boulevards in some instances);
- *the formative stage*, from the XIX century, as a result of the industrial revolution and radical changes in the transportation and commercial activities; during this stage the towns expand beyond the central nucleus and along the main transportation axes;
- *the modern stage* of the XX century, characterized by the development of the suburbs due to the intensification of motor transportation.

G. Taylor (quoted by J. Hudson, 1976) identified four main development stages of towns (especially related to the towns in Canada):

- *infantile stage* when there is no obvious special separation of the commercial from the residential areas nor of richer and poorer quarters (Aklavik, Fort Smith on the Mackenzie River);
- *juvenile stage* when the shops amass in the centre of the town, big houses and villas appear at the periphery and the few factories are scattered (like Toronto in 1842);
- *maturity stage* (like Toronto in 1885) when a special regrouping of the dwellings and factories takes place (the poor people living near the now-developed commercial centres, wealthy people in the suburbs and factories are situated along the railways);
- *senility stage* marked by a downfall of development and a decline of the economic prosperity.

L. Mumford (quoted by H. Huston, 1976) classifies towns after two criteria:

- according to the level of technical equipment (which is responsible for numerous social changes);
- according to their cultural rise and fall.

Therefore, he distinguishes between the following phases in the evolution of towns:

- *eo-technic* phase when the only sources of energy were wood, water and wind energy (European towns reached this stage between X-XVIII century);
- *palaeo-technic* phase dominated by the production of steel and coal, by the development of navigation on channels and by the steam-driven machine (towns aesthetically unpleasant appeared due to the pollution resulted from the industrial processing of coal-Coketown);
- *neo-technic* phase which started in 1880 in Western Europe through the use of electric energy, rare metals, the invention of the telephone, radio and internal combustion engine (during this phase towns overgrown, the buildings grew in height – the elevator was invented in 1857, the central area or core of the town underwent decline and traffic intensified, towns increased in surface);
- *bio-technic* phase represents the development of the newest type of city where there is an increase in the use of biological rather than of physical sciences, where people's knowledge of bacteriology is largely used in medicine and sanitation; these cities represent the most adequate expression of modernity, blending together both physical and social components in a harmonious and efficient whole.

Taking into consideration the cultural progress and decline of a city (using Rome as a model of evolution, involution and rebirth) six stages in the development of towns can be outlined:

- *eopolis stage* – t he rising of village community based on agriculture, fishing and mining;
- *polis* stage characterizes small market towns with commercial and manufacturing functions dependent upon and serving a certain region;
- *metropolis stage* in which the new town dominates a number of smaller towns and villages in the surrounding area. Such settlements are occupied by a cosmopolitan population, with many specialized occupations and that have a wide territorial influence. These towns suffer drawbacks due to class conflicts, from difficulties to integrate diverse cultural influences and from high costs and from the growing power of bankers and merchants.

- *megalopolis stage* in which the town is "bloated", wealth dominates the life of the inhabitants, standardised products appear and bureaucracy intensifies;
- *tyranopolis stage* in which the vulgar display and the expense become the measurements of culture; a moral apathy and a decline in commerce dominate the life in the city;
- *nekropolis stage* – the city of the dead- describes the stage in which hunger, war and diseases strain urban services, cultural institutions decay and the whole town disintegrates like the biblical Babylon.

In 1982, Van Den Berg (quoting G. Barbina, 2000) explained the historical and territorial development of towns related to the surrounding areas and based on the evolution of the population living in the different districts of a town. He "accepts" the existence of a nucleus of the town with a high density of buildings and population and a peripheral sector that surrounds the central area. Based on the movement of the population inside the nucleus of the town and of the peripheral sectors, he distinguished four stages of evolution of the urban organism, called the "the lifecycle of a town".

In the first stage the population of the central area increases and partially, in the adjacent area as well; the complex process of urbanization takes place.

During the second phase, due to the overgrowing population in the core area, the population of the peripheral areas increases, process similar to the notion of sub-urbanization (the urbanization of the periphery).

The third stage is characterized by a demographic depression in all sectors of the town due to the urban saturation.

The fourth stage is characterised by an "urban remodelling process" due to the reallocation of the complex functions, to the requalifing of the labour force and the regaining of a superior urban status (reurbanization). At the same time, a remodelling, restructuring and adjusting of the buildings takes place by the demolishing of buildings without architectural value. We assist to the birth of some architecturally composite urban organisms (for example Bruxelles). The population of the core area and that of the peripheral sectors increases, especially within the residential areas in the outer sector.

Table 1. The phases of a town's evolution *(after G. Barbina, La geografico umana nel mondo contemporaneo, Ed. Carroci, Rome, 2000, with modifications and add-notations).*

Phases of evolution	Demographic evolution		
	Nucleus	Adjacent inner sector	Outer sector
I. Urbanization	+	+ –	–
II. Sub-urbanization	–	+	+
III. Urban saturation	–	–	–
IV. Reurbanization	+	–	+ –

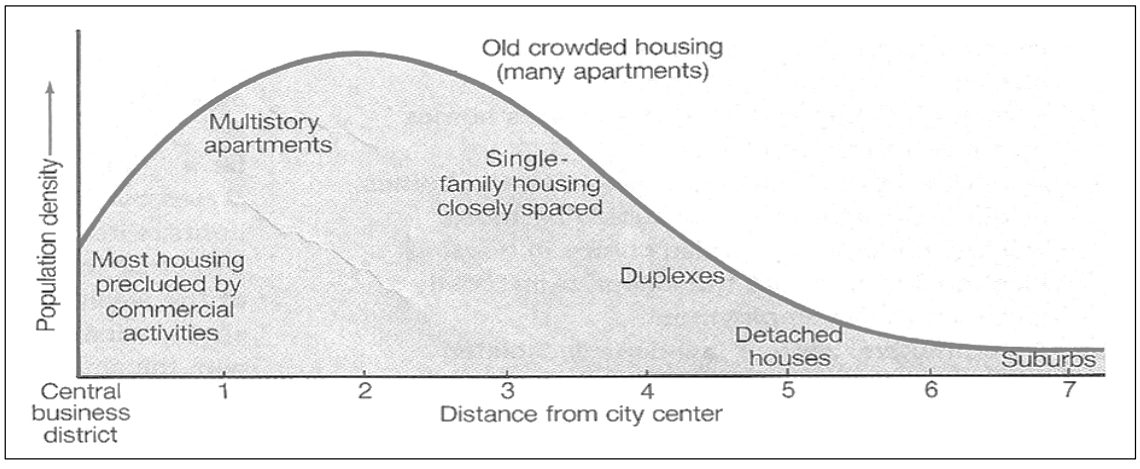


Figure 87. A theoretical density curve of the population of a town *(after J. Fellmann, A. Getis, J. Getis, 1990).*

In most big cities, the population grows in density from the centre outwards, up to almost 2 km and then decreases in the peripheral areas located approximately 6-7 km away from the town centre.

The highest population density is reached in the residential areas dominated by buildings with multiple stores, situated, as mentioned before, at distances of 1,5-2,5 km from the town centre. This rule although has numerous exceptions.

The overcrowded neighbourhoods from the periphery of big cities planned and built during the totalitarian communist regimes represent obvious exceptions of the above mentioned rule.

6.4.6. The Configuration of Towns

The configuration of towns is given by the type of the building materials used, by the density of the buildings, by the height of the structures and by the socio-political system.

The type of material used for construction is closely connected to the geological structure of the territory and the type of woodland. For instance, in Northern Europe, Russia and most of the mountain areas of the Temperate Zone, wood represents the main construction material. The coniferous wood has a reduced density and is easily processed. In earthquake threatened areas, most dwellings are made of wood, offering additional security for the inhabitants compared to the heavier buildings made of bricks, steel and concrete.

In the Subtropical Zone, stone represents the most frequent building material.

Clay, sand, unburned brick are common for most settlements in the semi-desert areas, whereas in the Tropical Zone buildings made of plants are dominant (trunks, branches, leaves).

Only religious structures are built from materials brought from great distances, materials that are resistant to compression and to corrosive agents from the hydro-atmospheric and biotic environment (marble, granite, slate). In Western Europe the power of the church during Middle Ages materialized in the creation of imposing religious edifices. The same thing happened in other parts of the world. Religious edifices all around the world are characterized by grandeur and original styles and architecture (Muslim mosques, Buddhist temples etc.) (F. Hudson, 1976).

In the XIX century, the use of brick in constructions is dominant, offering additional elegance and resistance to fire.

The end of the XIX century and the beginning of the XX century marks the threshold to the use of concrete and cement for buildings and roads. In the middle of the XIX century, a Swiss doctor accidentally discovered asphalt, paving an area in front of his house with a mixture of sand and bitumen, protecting the household from the dust spread by the passing of carriages.

The elevator was invented 1857 and therefore, the buildings started to develop in height generating a economy in land use but also a radical change in the aspect of towns. The “skyscrapers” era begins.

Blocks of flats as a collective way of living, are not a communist invention. Seoul, the capital city of South Korea, is representative in this matter. Still for almost half of the century these type of constructions have radically changed the appearance of cities, most of them in former communist countries but not only there. Villa-type buildings belonging to wealthier people and situated in areas with significant green areas, while the dwellings for the low income population lack green spaces and children playgrounds.

Another important element of the towns’ aspect is the method of building the roofs. In the Temperate Zone, for a rapid drainage of rainwater and for protection against snow, the roofs are built at an angle of 45º, while in the dry and warm zones the roofs are usually plane. The individual dwellings are made of tiles or rocks extracted locally and properly shaped (e.g. the use of slate in the south eastern part of Belgium and the northern sector of France).

The socialist type of town is dominated by the coexistence and correlative development of the industrial areas and the residential ones characterised by blocks of flats. The powerful centralisation of the decision making and the process of qualitative standardizing of residential areas have left a powerful mark on these cities.

Residential areas of blocks of flats built on vacant spaces and with reduced comfort are a characteristic of European ex-communist spaces. Urban growth has been brought under control through adequate legislation.

In the configuration and structure of some towns, "special residential areas" designated for residence and training functions have changed the physiognomy of some towns were occupying troupes were stationed (Berlin, Esztergom, Kitzingen etc.).

6.5. The Size of Towns. Towns with More Than One Million Inhabitants

From the point of view of demography, cities fall into very numerous categories. Thus, there are cities in the Scandinavian Peninsula with 300-500 inhabitants while in Romania for example the smallest town has about 1.800 inhabitants (1842 inhabitants in 1997).

There are also cities with millions of inhabitants. It is not helpful to categorize cities as small, medium or big mainly because of the variety of the urban demographic diversity and therefore, classifications are only relative.

In Romania, cities like Braşov, Cluj-Napoca, Constanţa, Iaşi and Timişoara, with more than 300.000 inhabitants are considered big cities while in the USA or Russia these cities could hardly be considered as medium sized. There are 408 urban agglomerations on the globe nowadays concentrating more than 600 million inhabitants (more than 10 % of the global population). On the first place is Tokyo (35.100.000 inhabitants) followed by Seoul (21.350.000 inhabitants), New York (21.199.865 inhabitants) and Ciudad de Mexico (20.950.000 inhabitants) (T. Brinkhoff, 12 November 2002, site http//www.citypopulation).

By continents, the biggest cities are as follows: New York for North America, Moscow (13.200.000 inhabitants) for Europe, Tokyo for Asia, Cairo (15.300.000 inhabitants) for Africa, Buenos Aires (13.300.000 inhabitants) for South America and Sydney (4.150.000 inhabitants) for Australia.

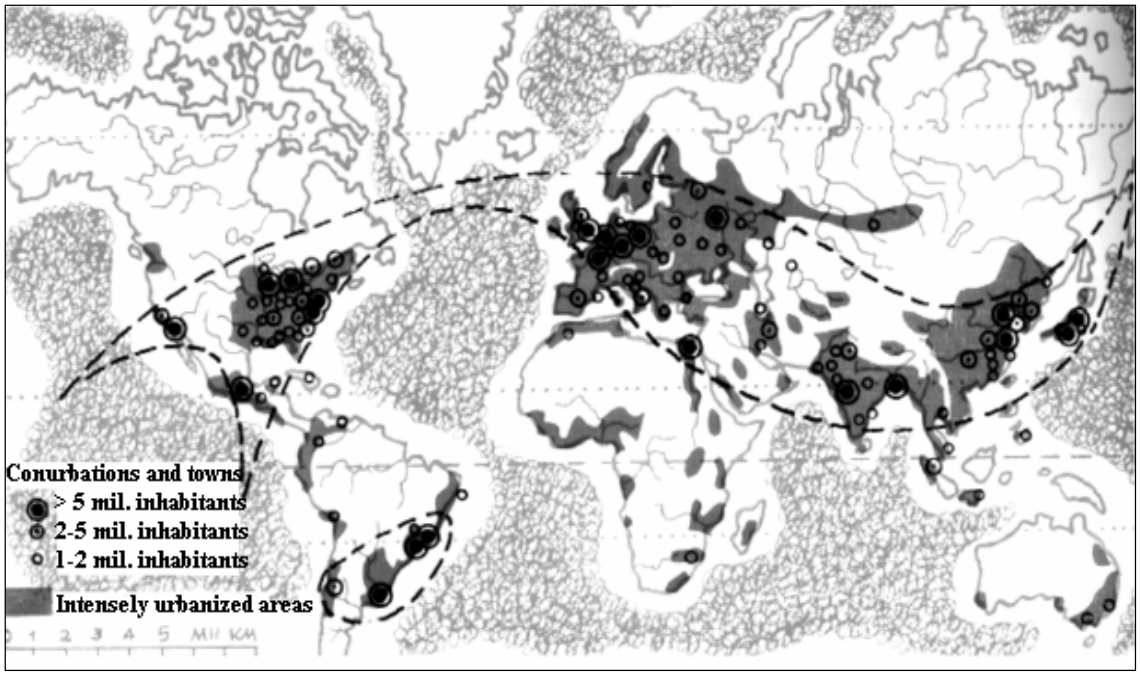


Figure 88. The grouping of towns with more than one million inhabitants on the globe *(after G. Gusti, 1974) – with some adjustments of the value categories.*

From those 408 urban agglomerations, 91 are harbour cities, developed on both sides of the Atlantic Ocean mostly during the colonial period. In the interior of the continents, the cities with millions of inhabitants are usual capital cities or important centres for processing petroleum and coal resources. In the less developed world, such cities develop very fast due to the proliferation of the poor districts in the marginal town areas.

In the cities of the developed world, the urban phenomenon is controlled but here too exists segregation based on wealth criteria in the development of residential areas.

6.6. The Ground Plan of a Town

In their spatial development, towns extend to the neighbouring areas in various ways determined by the nature of the natural setting of the precinct and by the socio-political events which marked their evolution.

We can distinguish between three major town plans:

- the radial-concentric street pattern – circular-ground plan;
- the rectilinear street pattern – grid plan;
- the linear street pattern – linear plan.

The radial-concentric street pattern consists of a nucleus to which all streets converge and a concentric arrangement of the transportation system towards the centre of the town. This sort of arrangement favours the access from the fringes of the town to the central part of it but this arrangement of the streets hinders visibility. This street pattern is characteristic for flat, undifferentiated areas.

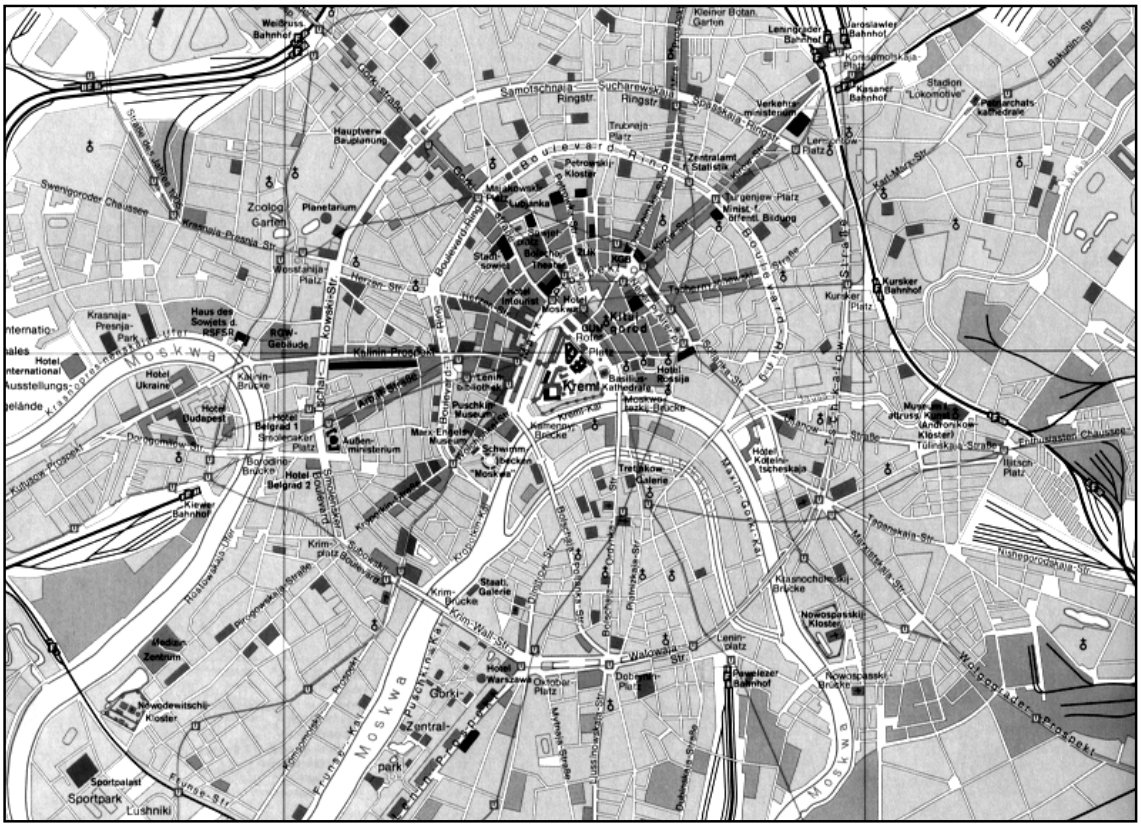


Figure 89. Radial-concentric Street Pattern of Moscow *(Weltatlas, 1985).*

The circular shaped city of Mansur, near Bagdad built in 762-766 A.D. has at centre the mosque and the royal palace, surrounded by public facilities. The whole central area was surrounded by a circular walls, the inner most one being the strongest.

The rectilinear patterned city plan is characterized by the building of streets that intersect at right angles. This shape allows for an easy division and parcelling of land. Visibility is no longer hindered in traffic but traffic suffers due to the frequent stops at the numerous intersections.

This type of arrangement was adopted by the Romans who followed cardinal signs as guidance ("carde"- way, raod and "ducumanus"- alley). The most representative example in Romania is Drobeta-Turnu Severin.

Regular geometrical forms and patterns used for the development of towns have their origin in the cosmogony of the Ancient World and were transmitted over centuries: the circle and the square used to symbolize the perfection of Paradise brought on Earth.

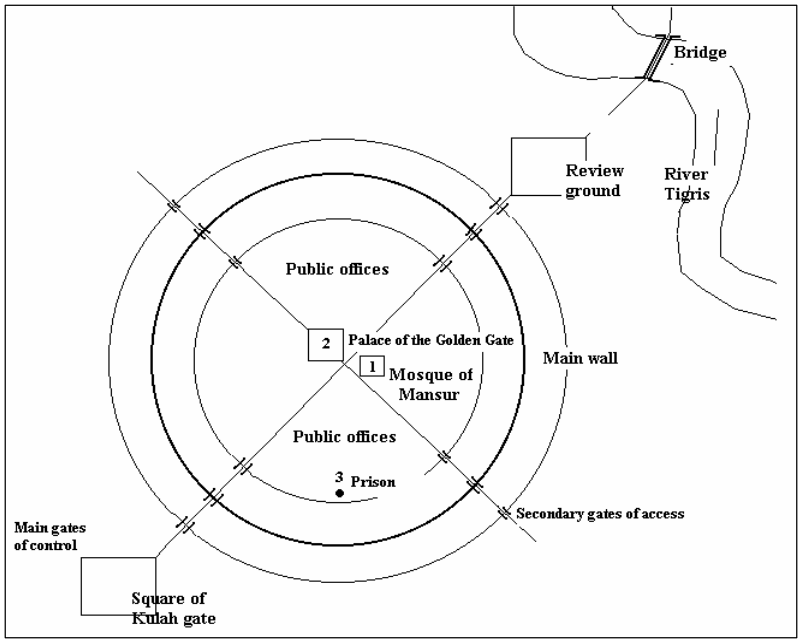


Figure 90. Plan of the round city of Mansur, western Baghdad *(after I. Tuan 1974).*

Ebenezer Howard (1850-1928) was the supporter of the circular ground plan, developing many ideas and plans for future towns. The ideal shaped town according to his conception was the garden-town. A circular shaped central town stops growing in population when it reaches about 58.000 inhabitants. Surrounding the central town, smaller urban centres develop, of about 32.000 inhabitants each.

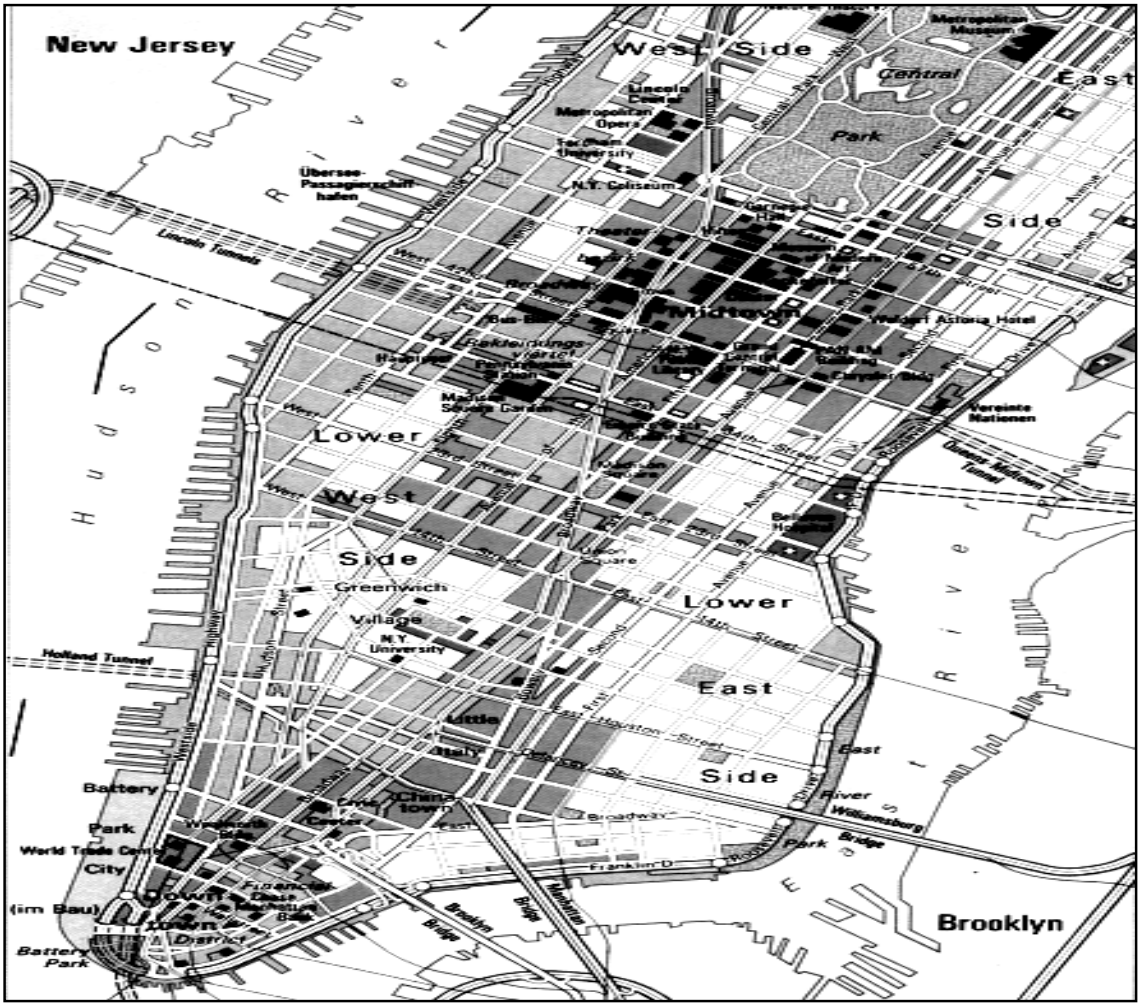


Figure 91. The grid pattern of Manhattan (New York) *(after Weltatlas Alexander, 1982).*

The smaller towns are connected together by a circular railway track and by an intercity route that runs through their central areas. The sections of circles resulted will provide for people with disabilities and elderly people and are occupied by farms or forests. This isolation of epileptics, alcoholics of blind people was considered eugenicist.

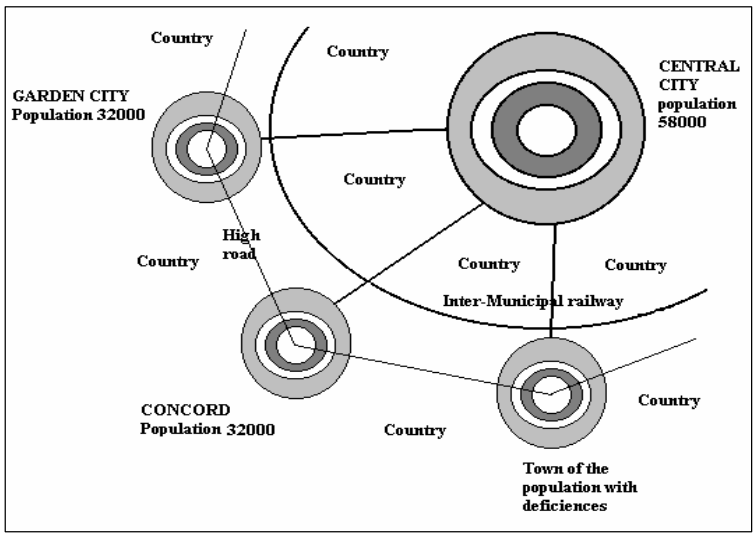


Figure 92. The model of a garden-town *(after I. Tuan, 1974) – simplified reproduction***.**

A model of concentric pattern was the basis of the decentralization process of Great London before the World War II. The so called "green-belt arrangement" or the "Unwin plan" stipulated the development of three concentric forest belts, designed for recreation and the residential functions rather than the manufacturing one.

The Unwin plan was created in four variants:

version a: envisioned open spaces with building potential;

version b: envisioned buildings located in areas opened to the exterior;

version c: preservation of the "green belt" and an unlimited space at the periphery for building;

version d: satellite settlements and plenty of development space in the open areas that remained empty.

The Unwin plan was replaced with the Abercrombie plan and the latter was adopted. The Abercrombie plan wad designed during World War II and placed the satellite settlements beyond the "green belt".

At the about same time, in Holland another plan is adopted for the development of a polder outside Amsterdam.

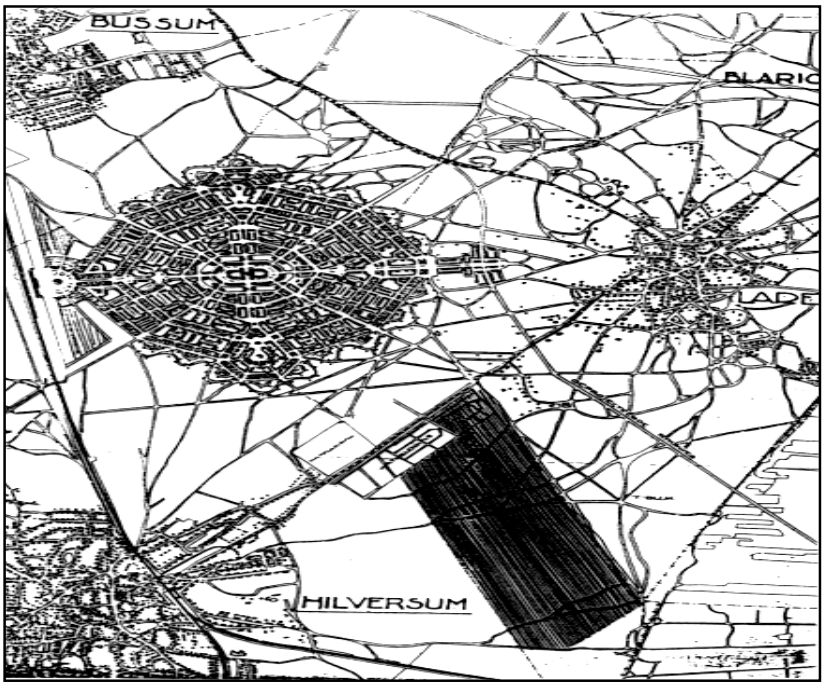


Figure 93. Garden-town pattern near *Amsterdam (after to S. R. de Miranda, 1920, quoted by I. Rooijen, 1989).*

Bucharest has developed in a radial-concentric pattern, after the victory against the Ottoman Empire in 1877, through the construction of 18 forts (1833-1900) surrounding the city. This frame was the basis for the creation of the urban development plan in 1934 under the supervision of Cincinat Sfințescu (quoted from F. Machedon, Luminița Machedon, E. Schaffhau, 1999).

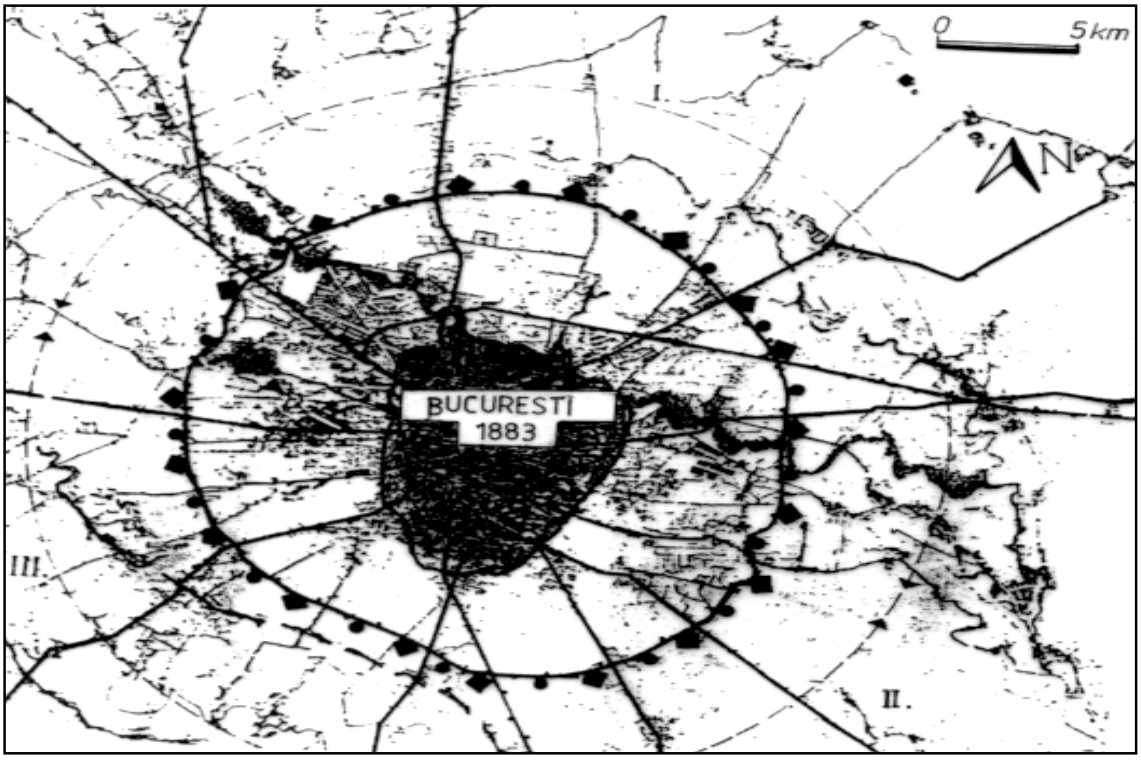


Figure 94. The plan of the forts in Bucharest after the Independence War (1877) *(F. Machedon, Luminița Machedon, E. Schaffhau, 1999).*

This type of pattern and plan creates a very artificial environment as all natural elements are eliminated, as well as the progressive increase of distances from the centre and the presence of too many crossroads that hinder traffic.

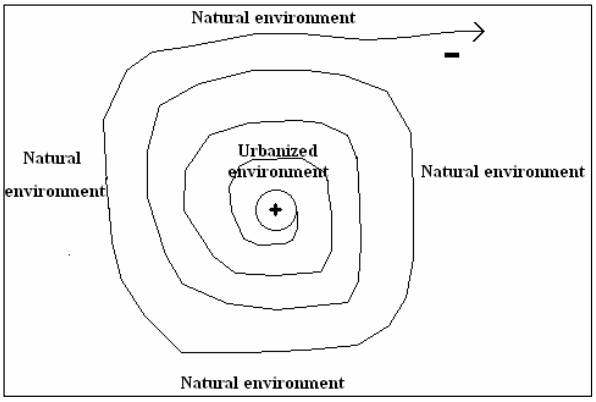


Figure 95. The radial-concentric pattern eliminates the natural components (the cyclone system).

The rectilinear pattern. Hippodamus from Millet is the creator of this type of plan, known as the grid or gridiron plan (Planning Perspectives, 1987). In his conception, this is the ideal pattern as the lots resulting from the division of the land are of equal size.

There are "open grid lots" (open squares) and "closed grids" (closed squares) the latter ones used for defence purposes.

The Chinese traditional ethnocentrism, contributed to the development of the square pattern during the Han Dynasty. (2002 B.C.- 200 A.D.).

The town was close behind walls and the space within the fortification was divided into districts. Every district was made up of 100 individual households and these households communicated with the streets through gates.

In order for the inhabitants to go outside the city, they had to go through three gates:

- the gate of the house;
- the gate of the district;
- the gate of the city.

During the night all gates were closed and well guarded. His type of plan was generated by the need of security and also by the existence of flat land.

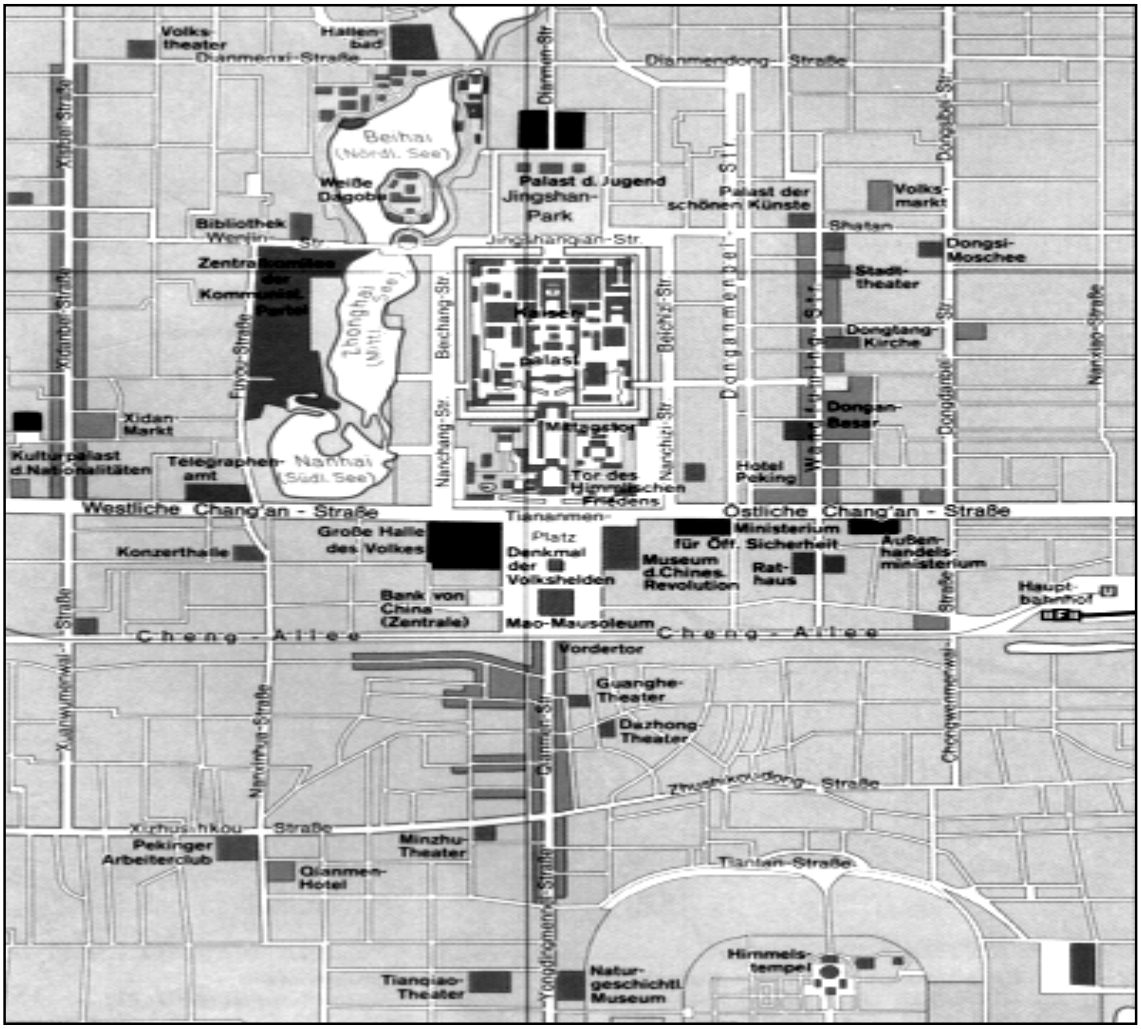


Figure 96. The grid pattern of the city of Beijing *(after Seydlitz Weltatlas, 1984).*

The town Adelaide in the north-western part of Australia is built after the rectangular pattern elaborated in 1837. In the case of New York, the grid pattern was adopted in 1811.

According to I. Marcuse's opinion (The Grid City Plan, New York City and Laissez-Faire Planning in the Nineteenth Century in "Planning perspectives", 1987, September) this type of pattern is the worst that has been adopted in big cities of the developed countries. Here are some of the objections raised to this pattern as implemented in New York City:

- rigid uniformity of the whole pattern;
- it is not hygienic (because it ignores the orientation towards the sun and shelter from winds);
- it is annoying (monotone) because of the invariable geometry;
- it is unsocial (there is only little space for public needs);
- it is inefficient, ignoring the topography of the land;
- it is uneconomic;
- it is dirty.

The reasons for the implementation of this pattern are:

- the ignorance of the urban planning commission that approved this plan;
- the strong convincing force of those in the urban planning commission.

Arguing on this topic, Lewis Mumford said: *"The resurgent capitalism of the 17th century used to consider everything individually, the block and the streets as abstract entities aimed to the*

selling and acquisition process without complying with the values and the historical importance of utilities, topographical conditions and the social needs. For the businessman, everything is reduced to the standards of monetary units for the acquisition and selling process. The urban terrain turns into merchandise, just as work does and as merchandise, the town spreads in all directions."

The linear pattern is typical for smaller towns. Natural restrictions don't always allow for the adoption of such a pattern in the case of bigger cities. On the other hand, in the case of big cities, it would only lead to the increasing of distances. Sven Dahl, from Sweden (quoted by Jaqueline Beaujeau Garnier, G. Chabot 1971) envisioned in his plan towns that stretch on both sides of an axis of transportation (1 km long and 2 km deep). Along the transportation axis are the commercial areas, administrative, industrial, educational units located. Beyond these units are the residential areas spreading for a maximum of 2 km in depth and having plenty of green spaces. This pattern is quite simple yet highly organized. The spatial orientation is different in this type of town due to the repetition of the same landmarks.

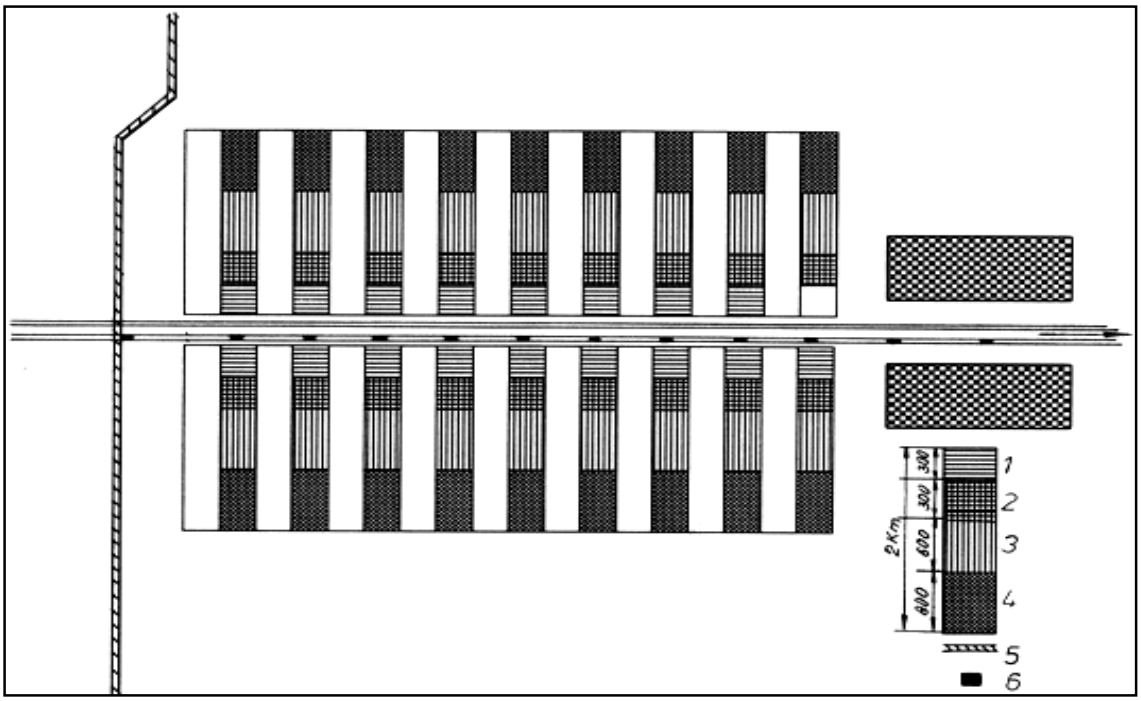


Figure 97. The linear pattern of Sven Dahl's model: *1. working areas; 2. residential areas; 3. groups of dwellings; 4. villa-types buildings; 5. railway; 6. railway station (after Jaqueline Beaujeau Garnier, G. Chabot 1971)*

Each of the residential areas (with individual houses, grouped houses or villas) houses 1700 inhabitants on average.

In Romania, linear patterns can be seen in towns like: Câmpulung Muscel, Câmpulung Moldovenesc, Petroşani, Petrila etc.

The palmate pattern was developed by R. Schmidt for the planning of the public parks in the Ruhr basin during the economic stage of the "furnace town" (1900-1930). This plan consists in a radial orientation of the streets with green areas in between them that go deep into the central areas of the town. The central area has a circular arrangement of the parks linked to each other by pedestrian and bicycle routes.

The industrial district is located at the periphery, occupying 1/3 of the town's surface. This area is surrounded by a green area.

The spatial extension of Copenhagen was done according to the palmate pattern, all the areas within the "fingers" being designed as green spaces. In this way, the access to the recreation areas is facilitated and the urban transportation system has been drawn along the middle of the "finger like" patterns.

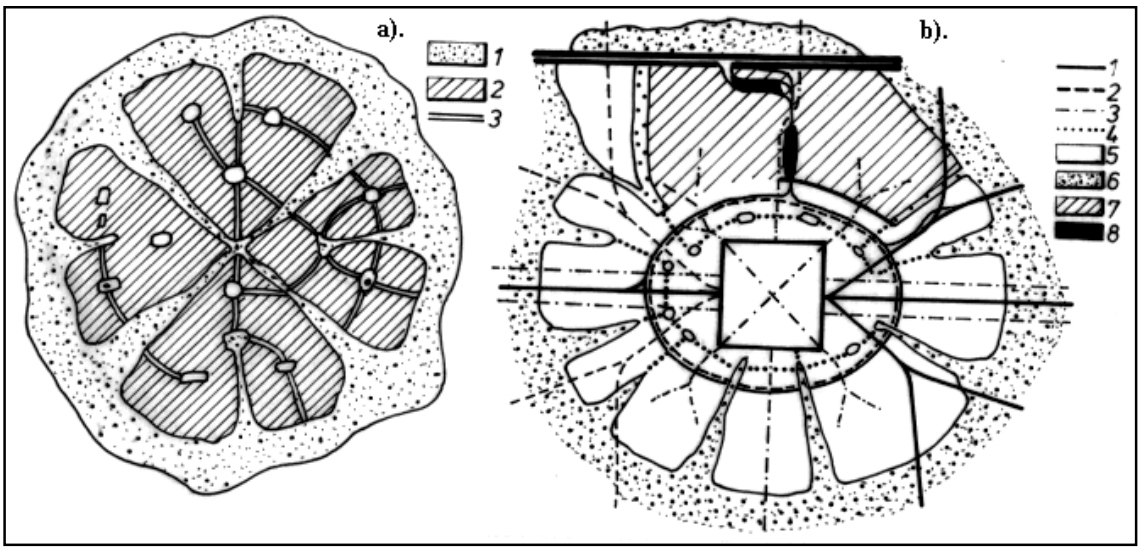


Figure 98. The radial palmate plan: *a). urban space with natural unspoiled surroundings; 1. Woodland; 2. Low density of the buildings; 3. road b). The development of the palmate patterned structure 1. Railway; 2. Access roads from motorway to centre; 3. Secondary roads; 4. Pedestrian routes; 5. High density of buildings; 6. Forest preserve; 7. Low density built-up space; 8. Motorway (according to R. Schmidt quoted by Ursula von Petz in "Robert Schmidt and the Public Park Policy in the Ruhr District, 1900-1930", in "Planning" vol. 14, nr.2, April, 1999).*

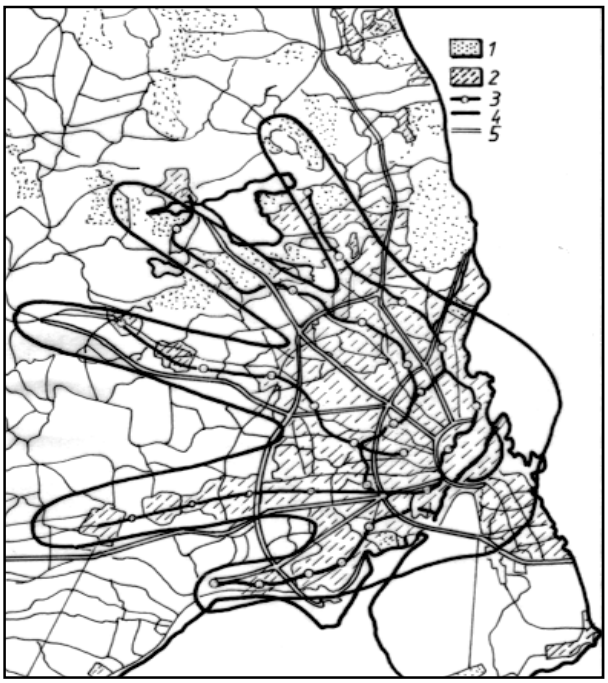


Figure 99. The spatial extension of the palmate plan of Copenhagen: *1. Woodland; 2. Built-up space; 3. Railway; 4. Limit of urban sprawl; 5. Main roads (after R. Schmidt, quoted by Ursula von Petz in "Robert Schmidt and the Public Park Policy in the Ruhr District, 1900-1930", in "Planning" vol. 14, nr.2, April, 1999).*

6.7. The Spatial Expansion of the Cities

Due to the multiplication of its functions and of the demographic pressure the towns needs to expand. There are two forms of expansion: spontaneous and planned.

6.7.1. The Spontaneous Expansion

The forms of spontaneous expansion are: agglutination, stellate expansion, multi-nuclei expansion, the absorption of neighbouring villages and the development of "bidonville" type of districts.

The agglutination is done by the systematic and unplanned addition of new constructions to the old town centre. At the gates of the old medieval towns, surrounded by walls, the dwellings of the poor were concentrated. The old walls got destroyed and the new lin of defence expanded, including the newly built buildings. This type of expansion is usually found in the case of circular-ground plan towns.

The stellate type of expansion results from the expansion of the town along the communication axis. This type of expansion developed more once the public transportation system developed.

The multi-nuclear expansion is the exact opposite of the agglutination. This type of expansion was typical for the Middle Ages where at the edge of the fortifications a new centre, usually commercial appears. Different centres were also the result of racial and social segregation. Fore example the rich always tended to build their own towns while the poor population built another one close by. It is the case of the white colonists in Africa that built their own neighbourhoods away from those of the locals. Often due to technical reasons, the railway was constructed at some distance from the town. Around the railway the necessary annexes and some house were built and in time that required the development of services (after Jaqueline Beaujeau Garnier, G. Chabot, 1971).

In their evolution the towns extend to the edge of the surrounding villages and consequently incorporate them. The rural settlements of Mănăştur and Someşeni from the west and east end of the city of Cluj-Napoca were later incorporated in it. If in the case of Someşeni district which was a latter addition to the city the rural characters are still preserved in the case of Mănăştur they disappeared by the transformation of the village in a residential district. Sometime the administrative area of the city expands by choice in order to incorporate neighbourhoods built without respect to the current laws. For example, in 2001 the intra-urban of Cluj-Napoca of 4.000 ha was „extended" with another 2000 ha, in order to incorporate the luxury homes built after 1989 on the south rim of the city, including the Făget forest that is since 1956 a natural preserve (discussions on P.U.G. in the A.U.C. meeting in Cluj-Napoca, 25.01.2003).

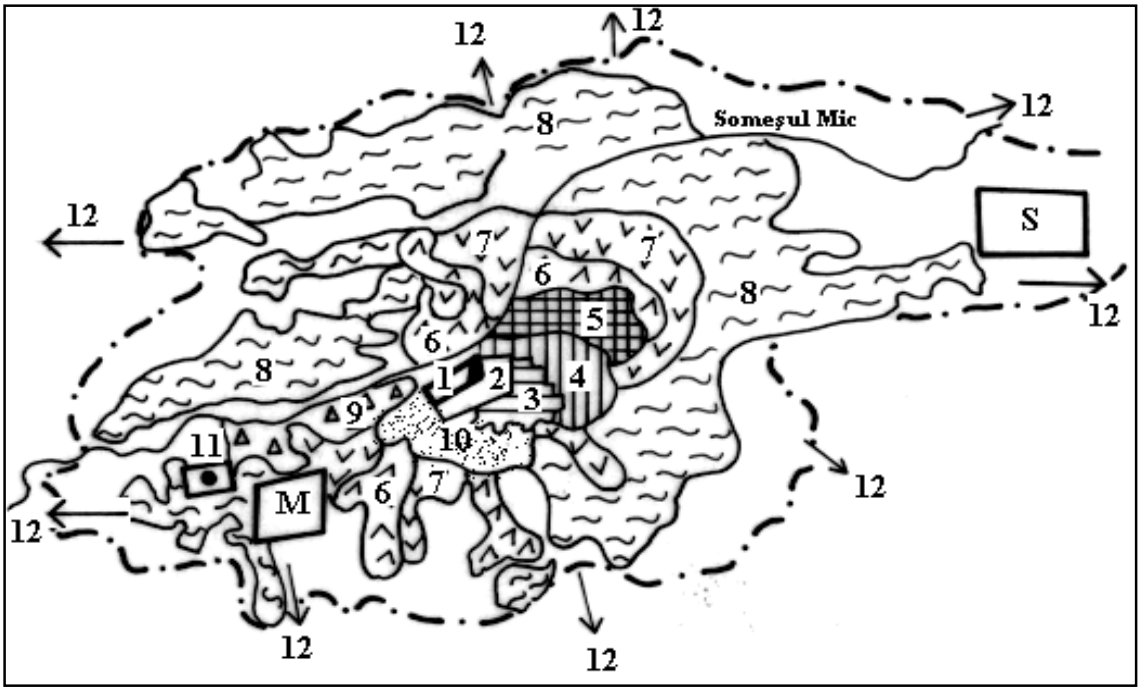


Figure 100. The territorial evolution of the city of Cluj-Napoca: *1. The fortress of Cluj (castrum) in the XII-XIIIth centuries; 2. Dwellings outside the citadel, the XII-XIIIth century; 3. The city of Cluj in intramurals, the XIV-XVth centuries; 4. The suburbs of Cluj outside the walls of the city, the XVth century; 5.The suburbs of Cluj outside the walls of the city, the XVIth century 6. Cluj, in the XVIIth century; 7. Cluj, in the XVIIIth century; 8. Cluj between 1918-1970; 9. The city's park; 10. Cluj, in the XIX- XXth century; 11. The Mănăştur village with the monastery in the XV-XVIth centuries; M- The Mănăştur village incorporated in the city of Cluj at the end of XIXth century; S- Someşeni village; 12. Directions of the expansion (the former villages of Mănăştur and Someşeni are today part of the city itself) (after Şt. Pascu and T. Morariu, 1974, with modifications).*

The "bidonville" type of neighbourhoods is an agglutination type of expansion too. The dwellings of the very poor ones are built in the continuation of the low-income districts of the city. The shelters build from cardboard, wood and metal leftovers, the lack of water and electricity networks are typical for these deplorable areas. They are some sort of "annexes" of the big cities of the developing countries and an impediment in the evolution of urbanism on modern principles.

6.7.2. The Planned Expansion

This type of territorial expansion of a city is the result of regulated development of the urban phenomenon in the territory according to some specific purposes. There's no denial that in the case of the spontaneous expansion there are/were some planned actions but only regarding the expansion of some areas of the city and not the city as a whole, as a part of the regional, national or continental system of settlements.

In today's vision the planned expansion of the city involves the study and the shaping of the urban phenomenon on the basis of systemic principles that don't treat the settlements only as networks but as interconnected systems of settlements characterized by organicity, complexity, integrity and adaptability.

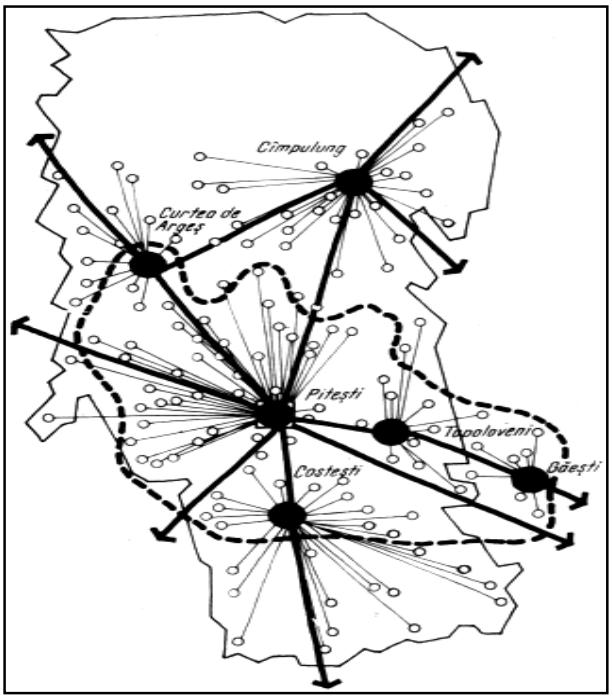


Figure 101. Systemic evolution *(after C. Lăzărescu, 1977).*

The territorial evolution of towns is closely connected with the development of the means of transportation (after W.E. Rees, from the volume *"The Earthscan Reader in Sustainable Cities"*, edited by David Sutterthwaite, Earthscan Publications Ltd., London 1999, p. 237, 238).

The traditional town grew and expanded depending on walking distance. Thus, the distances between residential areas and the daily used services were small.

The central area is walkable within the limits of the 30 minutes isochrones and the parks and green areas were accessible to everybody. The public transportation was done by carriage which was usually used for going to the railway station. Once the tram was introduced as a means of public transportation, the city develops on multiple axes following the tram routes.

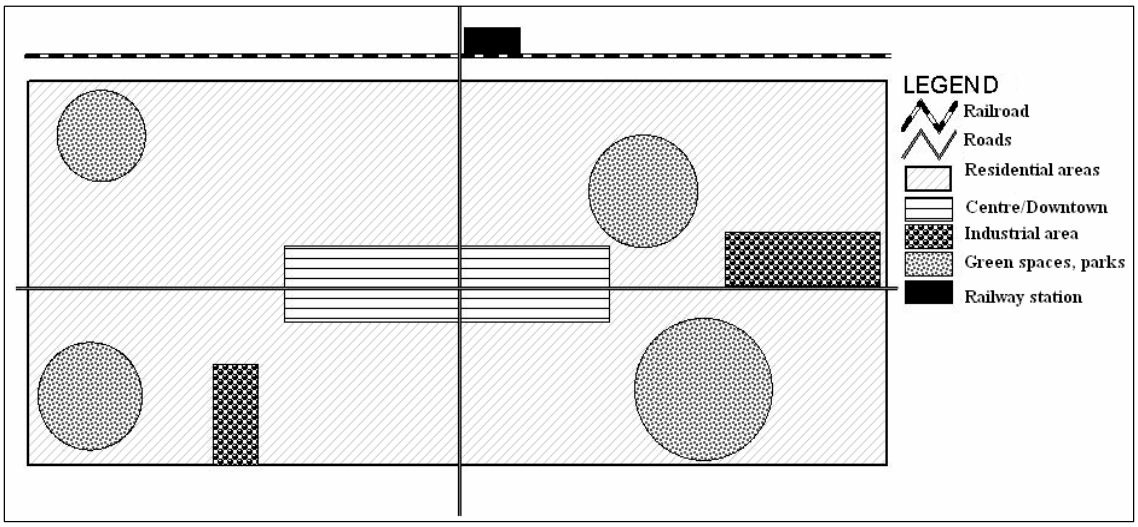


Figure 102. The traditional town (of the walking distance) *(after W.E. Rees, from the volume "The Earthscan Reader in Sustainable Cities", edited by David Sutterthwaite, Earthscan Publications Ltd., London, 1999).*

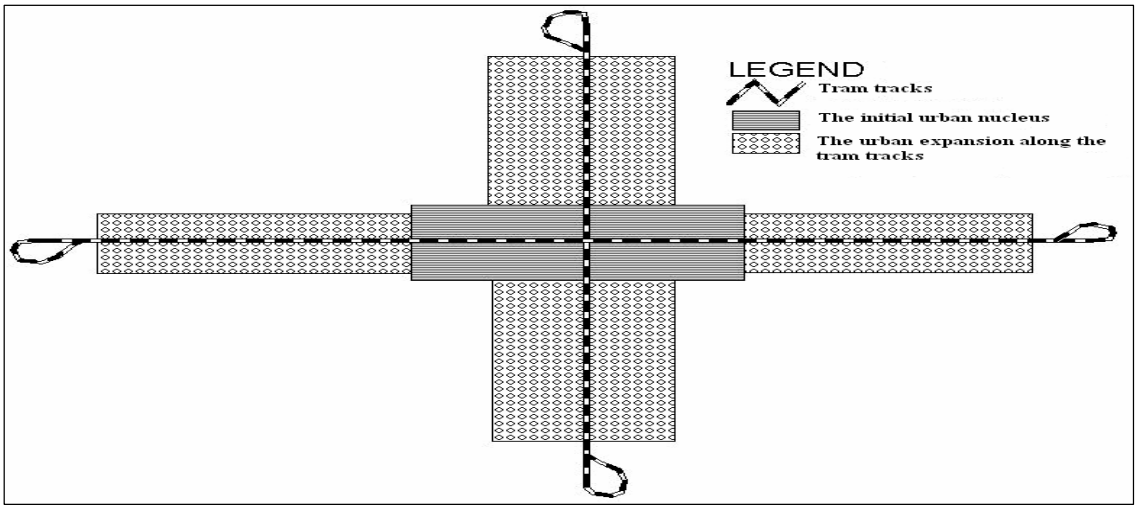


Figure 103. The evolution of the city dependent on the tram *(after W.E. Rees, from the volume "The Earthscan Reader in Sustainable Cities", edited by David Sutterthwaite, Earthscan Publications Ltd., London, 1999).*

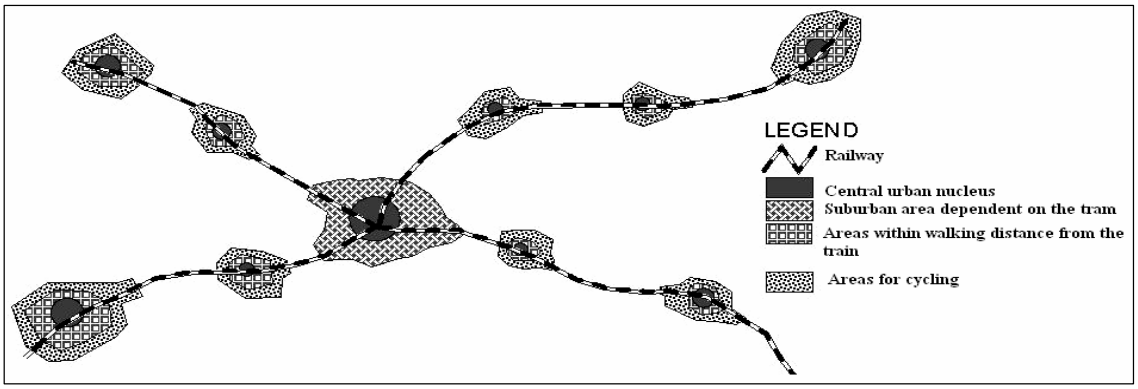


Figure 104. The evolution of the city dependent of the train *(after W.E. Rees, from the volume "The Earthscan Reader in Sustainable Cities", edited by David Sutterthwaite, Earthscan Publications Ltd., London, 1999).*

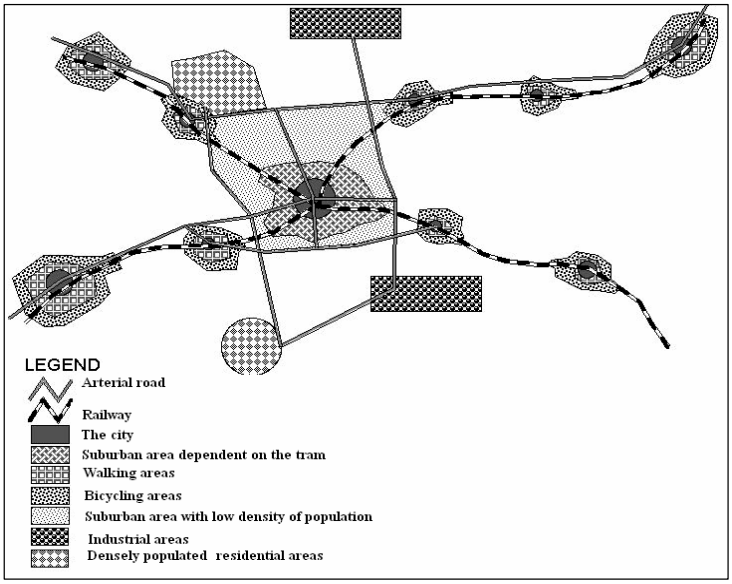


Figure 105. The evolution of the city dependent on the car *(after W.E. Rees, from the volume "The Earthscan Reader in Sustainable Cities", edited by David Sutterthwaite, Earthscan Publications Ltd., London, 1999).*

The development of transportation by train generated the growth of urban sub-centres around the railway stations. The use of cars in urban transportation led to the explosive growth of the city in a concentric form by filing up the empty places between the railway axes.

6.8. The Influence of the Town in the Region

Once established the town exerts its influence over an area of a variable size depending on the size of the town, of its rank and its functions, of its connections with the exterior. The relations that the city has with the exterior are extremely diverse having a variety of directions and intensities that together insure the existence and the prosperity of the town, in other words its area of influence or catchment area.

Theoretically, the power of the influence of the city of over the region is directly proportional with its size and indirectly proportional with the distance. The area of influence of the small towns is always a part of the area of influence of a bigger town on the basis of principles of functional subordination.

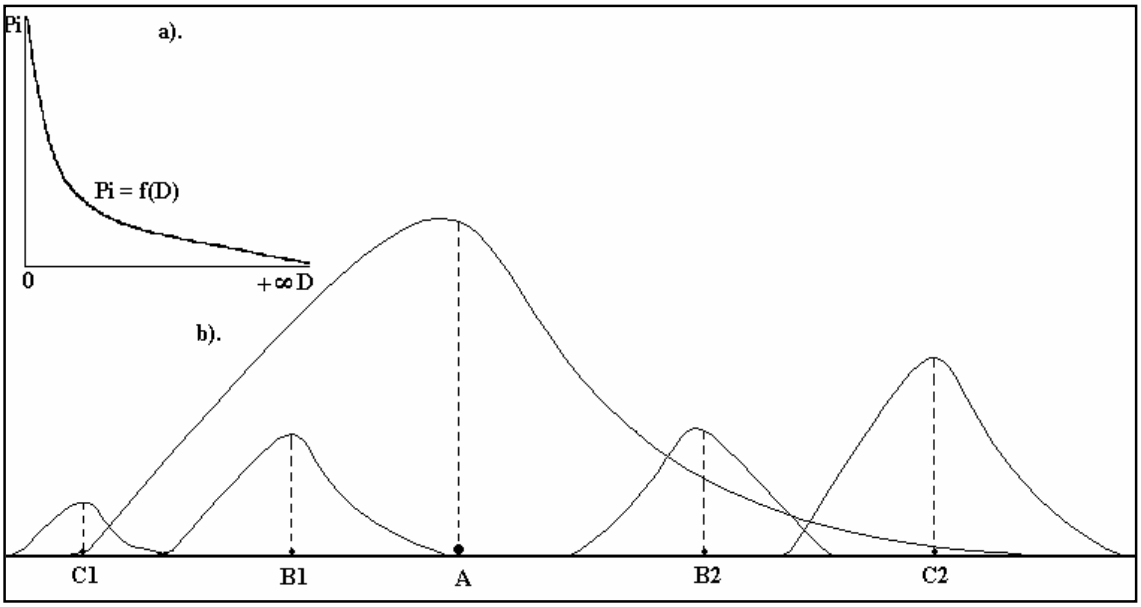


Figure 106. a). The theoretical relation between the town's power of influence and the distance and b). Hypothetical section through the areas of influence of a system of towns *(after I. Ianoş, 1987).*

I. Ianoş (1987) considers that *"the internal structure of the area of influence reveals very tight connections between all the urban and rural settlements in the area, settlements that organize in hierarchies of systems with the coordinating town situated at the superior level. This means that the area of influence is a fundamental element in individualizing the main systems of localities and is very useful in determining the most significant territorial relations".*

The ways and the forms through which the town is influenced or influences the surrounding area are multiple. Some of them have a centripetal role and other a centrifugal one.

Some of the centripetal influences are:

- commuting to work in town;
- commercial influence;
- buying food and raw materials;
- medical and educational services;
- cultural, administrative and legal services.

Commuting for work is the most expressive way of the influence of the town on the surrounding area. Due to the large concentration of industry and services in the towns, a great number of people commute daily from villages to towns. The commuting process is greatly influenced by the quality of rail and road communications of the region, by the easiness of connections and by distance. Commuting within the limit of one hour isochrone is considered reasonable. A longer commute significantly reduces the working ability of the individual and artificially lengthens the working day. The isochrones represent imaginary lines that connect places of an equal journey time to the same location. Thus, the isochrones are variables depending on speed and distance. That is why at equal

distances from the central point the isochrones are different depending on the type and the speed of the means of transportation. The central places taken a starting point can be: railway stations, bus stations or the working place.

The catchment area of a town can be delimited also by studying the place of origin for the population that migrated to the town. In this situation, only territory that surrounds the town is taken into consideration as well as the intensity of the migration phenomenon depending on the distance from the town.

The commercial influence of the town is the result of the inadequate commercial services like food and utensils in the villages. In our country in mountainous areas the majority of merchandise bought by the villagers from towns is food while in open plains areas the majority of the products are utensils, clothes and tools (I. Ianoş, 1987).

An important part of the urban sales quota is due to the inhabitants of the rural space. The bigger the town, the bigger the sales are. The commercial attraction of a small town is periodical manifesting itself during the fairs organized in these towns. By contrast the commuting population of the big cities frequently shop in them.

In conclusion, the more commuters a town has the bigger its commercial influence is. *"This influences in a decisive way the size and shape of the commercial influence area of a town. In our country the industrial towns' commercial catchment area coincides with that of the labour force. Outside this area its commercial attraction only manifests sporadically"* (after I. Ianoş, 1987).

The supply with food and raw materials is done from the surplus of these products in the rural areas. Some of the agricultural products needed are obtained on the administrative territory of the town. Usually these surfaces are specialized in the production of vegetables, fruits, flowers and of milk. This specialization of the production is due to the perishable nature of these products and the cost of transportation. If the town requires these specialized surfaces are extended outside the perimeter of the town. There can often be found greenhouses in the areas surrounding the town. The general rule is that the area of agricultural influence of the town ends where the extensive agriculture begins.

The catchment area for the raw materials is harder to establish. For example, the wool can be brought from nearby areas (like in the case of Cisnădie) or from great distances in order to be manufactured. The neighbouring villages tend to specialize in the production of raw materials for the industry of the town. For example, the villages surrounding a town that has a sugar producing factory will specialize in the growth of sugar beet.

The educational and medical services create also a sphere of influence for the town. Even if there are some medical services in the rural areas, highly qualified and highly specialized medical services are to be found in towns. The presence in the town of some renowned specialists or very good universities can make us exacerbate the extension of the area of influence, that is why in order to better establish its limits, the places of origin of the students in professional schools or middle schools are to be taken into consideration.

The power of attraction of the cultural, administrative and legal services varies in intensity depending on the rank, size and geographical position of the town.

The centrifugal influences are:

- commuting for work outside the town;
- the migration of industry;
- the political and administrative influence;
- recreational trips.

The commuting for work outside the town is less frequent and it usually involves highly qualified professionals. Depending on the quality of the communication network this type of commuting can go beyond the area the town's commuters come from.

The migration of industry towards the rural areas is a new phenomenon that appeared due to either the incapacity of the town to ensure enough labour force or in order to eliminate extended commuting. The value of land also plays a place in the migrating decision. As a result of the migration of entire factories or of some departments of them, new type of relations of cooperation between the village and the town appear. At the same time in some rural settlements units of manufacturing of the local raw materials appear, thus, the rural slowly gaining a relative independence from the town. The

catchment area of the town should be thus limited to the extension of the area where relations of cooperation and complementarity are present.

The political and administrative influence of the town over the village is due to the concentration of specialized state institutes: legal, political and administrative, that serve rural areas of various extensions depending on their profile and of the administrative and political functions. The area of distribution of newspapers in big towns constitutes a factor in delimiting the influence area of the city.

The recreational relations between the city and the surrounding area are obvious in the bigger towns and at some level in the middle-sized towns too. These types of relations led to the emergence of recreational spaces around the town that continue to expand or migrate with the growth of the town. We don't have to take into consideration only these special service places. The trips outside de town in the rural areas during the weekend can also be taken into consideration in delimiting the catchment area.

6.8.1. The Zones of Influence. Central Place Theory

Urban influence areas are formed as a result of the nature and intensity of the relations of a region with a specific town and the degree of subordination of the region to the "demands" of the town.

The international geographical literature uses different terms to describe the zone of influence of a town: *"banlieu", "suburbe", "urban fringe", "vorort", "bazin urban", "mediu urban înconjurător", "urban field", tributary area", "catchment area", "sphere/zone of influence", "city region"*. Other terms like *"arie de convergență"*- convergence area (E. Molnar, A. Maier, N. Ciangă, 1975*), "polarizing area"* (V. Surd, 2003), *"regiune polarizată"* - polarizing region (J. Boudeville, 1971), *"regiune funcțională"*- functional region (H. Carel, 1971), have a wider meaning then the zone of influence. In our country aside of the term *"zonă de influență"* – zone of influence, the terms of *"zonă periurbană"* and *"zonă preorășenească"* with a similar meaning are used too.

"The central place" is a rural or urban settlement that provides goods and services for its inhabitants and for the population of the neighbouring areas or of more distant areas. A central place can be a village that concentrates vital services for the local population or for those of the neighbouring village, or it can be a town that polarizes the villages and/or towns in a certain area. The general rule is that with the increase in the number of population increases also the number and the complexity of the functions of a settlement.

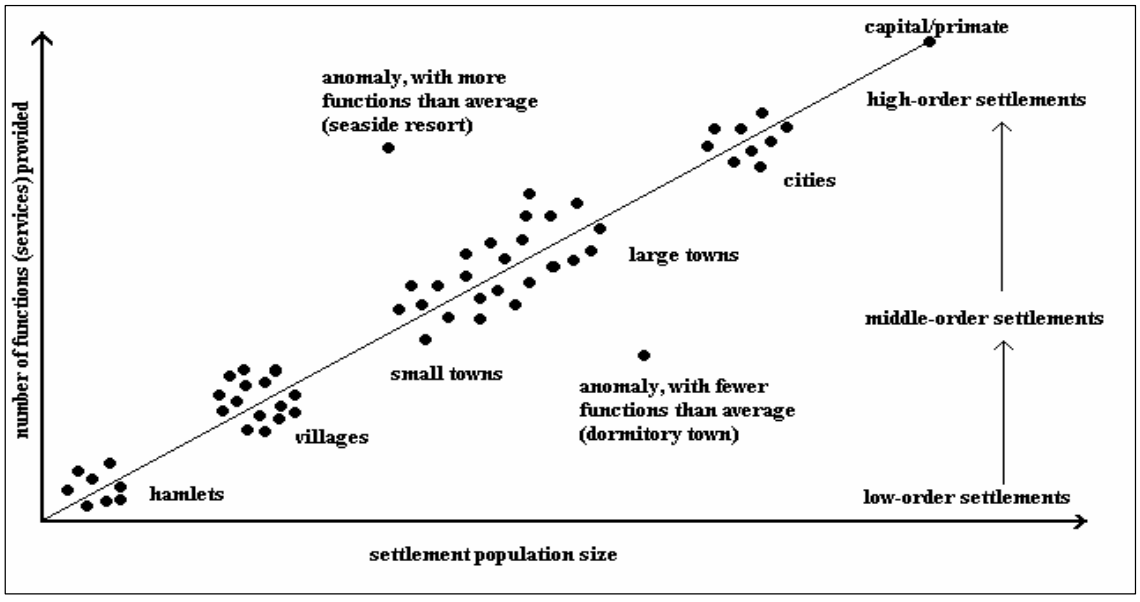


Figure 107. The relation between the size of a settlement and the number of its functions *(after D. Waugh, 2000).*

The territory under the economic, social, administrative and political influence of a settlement is called "sphere of influence or hinterland". The functions of "central places" are usually the tertiary ones- goods and services for the local population and the surrounding ones.

The spheres of influence and the interactions between the settlements modify in time as a result of the competition in size and functions. In the first stage the towns appear and develop independently. In a second stage a single powerful centre rises and subordinates areas of various sizes. Is the period that coincides historically with the development of industry. In the third stage a single national centre rises, usually the capital city, at the same time with the rise of some powerful regional centres. In the fourth stage a functionally interdependent system of settlements forms. This stage marks the complex organization of national territories and the coordination of the process of urban growth.

The range (boundary) of the service area of a settlement is considered the maximum distance from which a population uses the *"central place"* services like buying utensils, tools, like using medical, educational, legal services etc. The limit depends of the quality of goods and services, the length of the journey and the frequency of use.

The threshold of a good or service provided is established by the minimum market -number of consumers- needed to provide for in order to support the supple of a product or service. For instance, in U. K. was estimated that there are necessary a number of 300 people to justify the existence of a village shop, 500 inhabitants for a primary school, 2500 for day to day medical services and over a million for a university (F. Hudson, 1976). This threshold differs greatly from one country to another according to the degree of settlements dispersion, the demographic potential and the politics of territorial development. For example, in our country village shops are often found even in villages of less than 100 inhabitants and even in small rural settlements of less than 200 inhabitants we can find primary schools.

As it can be noticed the zone of influence of a town is the result of the overlapping and the interference of individual and mutual influences of the urban over the surrounding rural areas. In addition, it can be noticed that the sphere of influence of a function does not coincide with that of another. For example the catchment area for the labour force is much smaller than that for university students. That is why it is necessary to find the defining elements in establishing the areas of influence. Theoretically, taken into consideration the fact that the zone of influence (Zi) is made of several influence areas of its component elements (Aij), we could consider the average size of the zone of influence the intersection of the areas of influence of at least three elements:

$$Z_i = \sum_{j=1}^{n} A_{ij} (n3)$$

At the international level there are several theories concerning the central place theory, some of the best known ones are those of: Von Thünen, Weber, W. Christaller and V.J. Reilly. After the World War Two the researches in this field continued, the former methodologies and methods got perfected (Jaqueline Beaujeau Garnier, G. Chabot, H. Bobeck, E. Molnár, I. Ianoș).

The Von Thünen Model. The model has as a central idea the organization of the surrounding rural area of a town according to the perishability of the products and the distance from the town. He develops his theory in his paper "The Isolierte Staat" (1826) using as a starting point the econometric analyses of the region of Mecklenburg.

The model is based on the following limiting assumptions:

- the existence of a town located centrally within an "Isolated State" which is self sufficient and has no external influences;
- the land surrounding the market town is entirely flat and consistent in fertility;
- there are no roads. Farmers in the Isolated State transport their own goods to market using horses and carts, across land, directly to the central town;
- the selling price and the production costs are the same for all the farmers and the selling prices differ depending on the product;
- the maximization of the profit is dependent on the distance from the town;

- the profit is calculated from the selling price minus the transportation costs (the production price and the selling price is the same for all producers) these rise with the growth of distance from the town. With the growth of distance from the central market the level of intensification of agriculture diminishes.

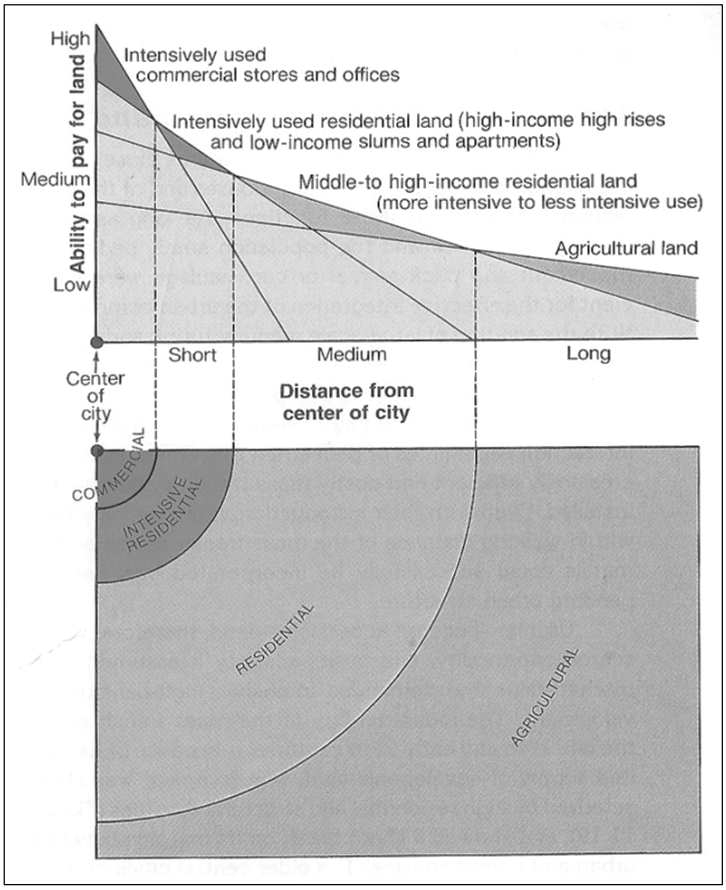


Figure 108. The location of various land uses depending on the value of the land- the Von Thünen model applied to the urban space *(after J. Fellmann, A. Getis, J. Getis, 1990).*

The model envisions four rings of agricultural activity surrounding the town. In the ring closest to the city dairying and intensive farming occur. The products obtained here- vegetables, fruit, milk and other dairy products- have the highest transportation costs because they are perishable but they also bring the highest profits. In the second ring, timber and firewood are produced because before industrialization wood was the main material used for heating and cooking and its transportation was difficult and costly. The third ring extensive field crops like cereals are cultivated because they are less perishable than fruits and easier to transport than wood. In the fourth ring ranching is located because animals can be raised far from the city because by being self-transporting (animals can walk to the market for sale or for butchering) they have low transportation costs. Beyond the fourth ring lies the unoccupied wilderness.

This model can be applied to the study of the functional sectors of a city by taking into consideration the intensity of land use, the value of land and access. Thus, the land is used intensively due to the concentration of all types of shops and offices. The second sector has an intensive residential use. Farther away the residential area of middle class is found. Much farther away from the town there are agricultural lands, most often used intensively for the cultivation of vegetables (often in greenhouses) and fruits.

The Christaller Model. This model is the creation of the German geographer Walter Christaller (1893-1969). He developed this model in 1933 using as a starting point the investigations he made in the north part of Germany. The following simplifying assumptions are the base of the model (D. Waugh, 2000):

- a flat, homogenous surface. Here the transportation is equally easy and cheap in all directions. The transport costs grow with the distance (only one type of transportation is used);
- the population is evenly distributed and has similar demands for goods and services and the same purchasing power;
- the resources are evenly distributed and there are no variations in agricultural production
- the goods and services are obtained from the nearest central place in order to avoid travelling for long distance, fact that is practiced by all the consumers;

- the high order settlements provide for goods and services for lower order settlements and for those of similar rank;
- every central place will be located as far as possible from a similar order settlements in order to avoid one to make extra profit from another;
- the multitude of central places offer the same goods and services and at the same prices in order to determine the customers that live in the areas located at mid-distance between centres to choose one or another centre;
- the rank/order of the central place is determined by the purchasing power, by the type of goods and services offered thus thresholds of the range of a central place are created. The growth of distance to the central place brings about the growth in price per product and service;
- this uniformity in the consumers behaviour allows for every central place to be surrounded by a complementary region where it has the monopoly has a sales monopoly based on travel range and price advantage.

From all this he realized that settlements would tend to form in a hexagonal lattice, this being the most efficient pattern to serve areas without any overlap. If the spheres of influence will be circles there would be places left unserved. The territorial location of settlements can be established in the centre of the hexagons, in the middle of its edges or in its corners.

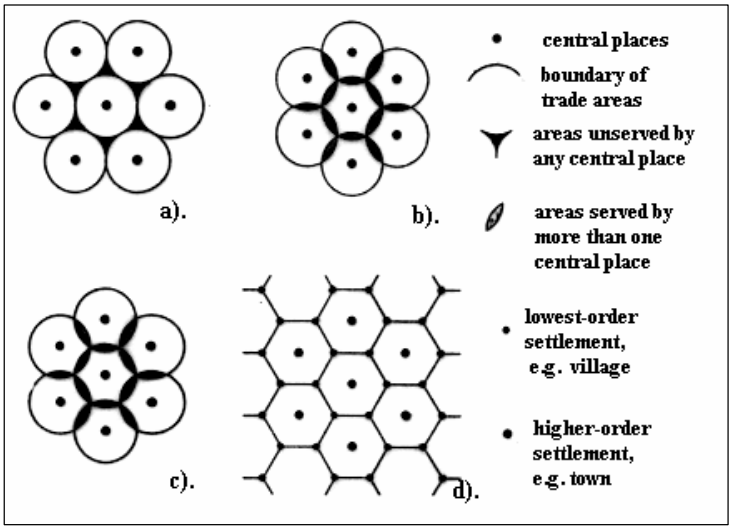


Figure 109. The spheres of influence of the settlements: *a) Touching circles; b) Overlapping circles; c) The construction of hexagonal trading areas; d) The resultant hexagonal areas (adapted after D. Waugh, 2000; Oxford Dictionary of Geography, pg. 408, 1997).*

The biggest hexagon includes all types of settlements. Inside it, the smaller hexagons represent areas of influence where goods and services are offered to a smaller number of population. A hierarchy of central places is thus created whose equilibrium must be maintained and re-established when disturbed. Settlements at the same functional level in the central place system will be of the same size and will have a similar functional profile.

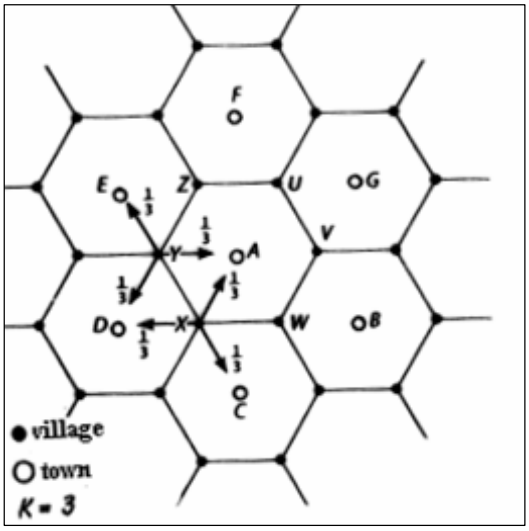


Figure 110. Christaller model. Central places when k=3:

"Under Christaller's marketing principle there is a single highest-order place and the number of places below it (after the second order) increases in a ratio- called the k-value –of 3. The sequence runs as follows: 1 highest-order centre, 2-second-order places, 6 third-order, 18 fourth-order, 54 fifth-order, and so on through the number of hierarchical levels present within the system".

One high order central place is serving three of the next lower order central places. According to the marketing principle K = 3, the market area of a higher-order place includes a third of the market area of each of the following size neighbouring lower-order places and each is located at the corner of a

hexagon around the high-order settlement. Each high-order settlement gets 1/3 of each satellite settlement, thus K = 1 + 6×1/3 = 3.

Only 1/3 of the inhabitants of the Y settlements will do their shopping in A, 1/3 in D and 1/3 in E, results that A will attract 1/3 of the customers form U, V, W, X, Y and Z (6*1/3=2), to which we add its own customers and thus, A will serve the equivalent of three central places.

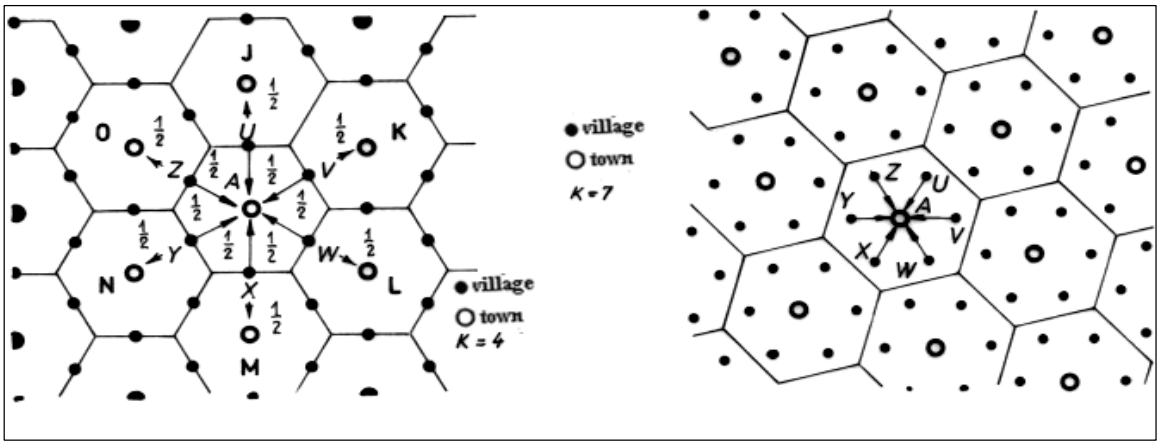
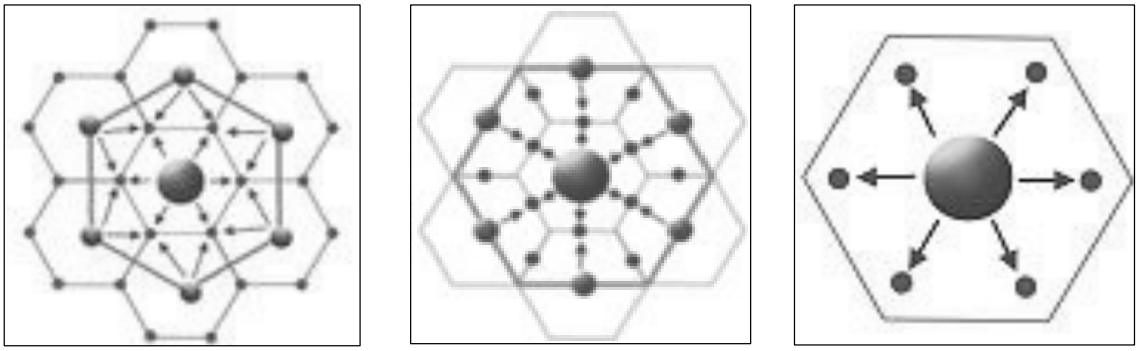


Figure 111. Christaller Model. Central Places. K=4 and K=7 *(after D. Waugh, 2000).*

When K = 4 – the transport principle- the U, V, W, X, Y, Z settlements are located in the middle of the edges of the hexagon. Thus the customers from Y will have to choose only between two markets A and N, assuming that half will chose N and half A. Similarly, the customers from X will choose between A and M. Thus, a will attract half of the customers of 6 settlements (U, V, W, X, Y, Z) (6* ½=3), to which its own customers are added (3+1). This generates a hierarchy of central places which results in the most efficient transport network (the road between two centres should be as cheap and as short as possible).

When K = 7 – the administrative principle- a larger settlement like A, completely encloses in a hexagon the market areas of the smaller settlements (U, V, W, Y, X, Z). As previously to this the customers of A are added thus resulting that A will supply for 7 central places (6+1). In order to have an efficient administration, tributary areas cannot be spilt administratively. They need to be allocated exclusively to a single higher-order place. This model can be successfully applied to the Dutch polders as the new lands obtained saved from the sea can be shaped geometrically.



K = 3 Principle | *K* = 4 Principle | *K* = 7 Principle

Figure 112. The three principles in Christaller model *(from http://en. wikipedia.org/wiki/ Central_Place_Theory).*

The limits of the Christaller model (comments, after D. Waugh, 2000):

- large flat areas are rare, often there are present relief barriers that channel transportation in certain directions, plus the use of different means of transportation triggers further changes in the coast-distance ratio;

- the wealth and the population are not evenly distributed on the territory;
- people vary their shopping trends, not always going to the nearest centre, sometimes choosing to go to a supermarket situate farther away;
- the purchasing power and the necessities of people differ;
- government intervention can dictate the location of industry and that of new towns;
- christaller envisaged each centre with a particular function whereas they have many which change over time;
- a perfect competition between businesses doesn't exist some of them obtaining considerable bigger profits;
- the model doesn't take into consideration the special modifications that appear as the result of the emergence of industry in certain areas.

In spit of these limitations, the Christaller model is an instrument for testing certain territorial realities. In addition it is useful in planning regarding the location of new tertiary functions and of building new roads.

The Reilly Model – The Gravity Model or The Interaction Model. This model has at its bases the law of gravity formulated by Newton that states that *"any two objects exert a gravitational force of attraction on each other the magnitude of which is proportional to the product of the gravitational masses of the objects and inversely proportional to the square of the distance between them"*.

In our case the "objects" are the towns and their inhabitants. The intensity of the relations between the two towns grows with the growth of the population of the towns.

The model can be used to establish the theoretical boundaries of migrations between to neighbouring territories, the number of people that resorts to the services of a central place that is in competition with another and the sphere of influence of a central place by establishing the breaking point that delimits it from the sphere of influence of another central place.

Thus in 1931, Reilly develops the law of retail gravitation that states that *"the commercial attraction between two centers on a intermediate area is directly proportional with the size of the centres and inversely proportional with the square of the distance between them"*. According to this theory the trade areas are variable in size and form and they can interfere and change with the growth of the population of towns or with the improvements in the communication potential.

The equation used to calculate the breaking point is:

$$D_b = \frac{D_{ab}}{1 + \sqrt{\frac{P_a}{P_b}}}$$

where:

D_b- breaking point;

D_{ab}- distance (or time) between two places;

P_a- the population/size of Place One;

P_b - the population/ size of Place Two.

If we take as an example the case of the two towns Cluj-Napoca (360.000inhabitants) and Turda (60.000 inhabitants) situated 30 km from each other we can establish the breaking point between them by using the equation:

$$D_b = \frac{30}{1 + \sqrt{360000/60000}} = \frac{30}{1+2.5} + \frac{30}{3.5} = 8.5km$$

Results that the breaking point is situated at 8.5 km from Turda and at 21.5 km from Cluj-Napoca, which is similar with the reality (the distance and number of inhabitants were rounded on purpose).

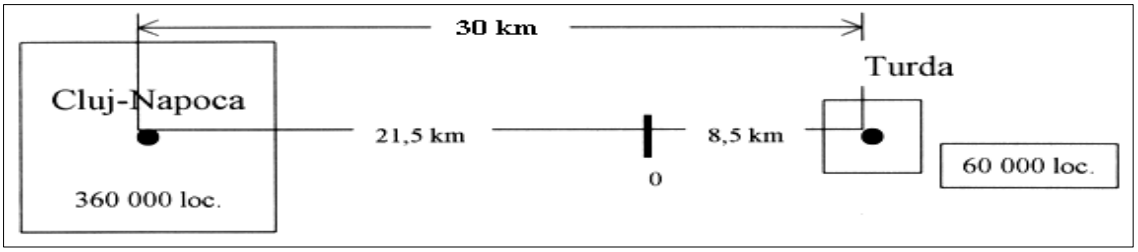


Figure 113. The breaking point in the case of Cluj-Napoca and Turda towns.

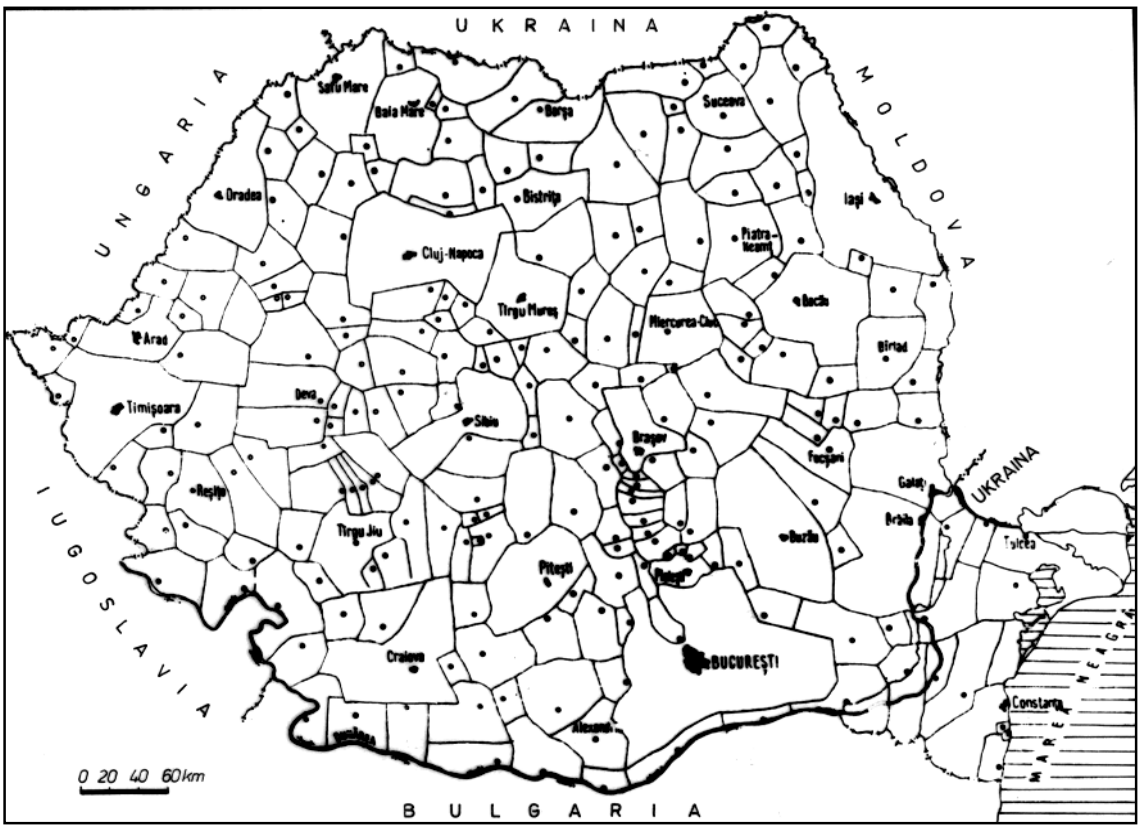


Figure 114. The theoretical areas of influence of the towns in Romania *(after I. Ianoş, 1987).*

As the models above this model two has some limitations (comments after D. Waugh, 2000). As a general rule people tend to use the nearest retail centres. Still this rule is not always valid: congested traffic determines people to look for smaller centres instead of larger ones. The smaller centres offer a good diversity of products but there are also safer and offer better services and not rarely better prices. They are more flexible when it comes to external demands.

If all the towns in Romania would be located at equal distances each of them would have an area of influence of 900km². By calculating and mapping the size of the zones of influence it can be noticed that there is a strong correlation between the size of the zone of influence and the density of the urban centres (comments after I. Ianoş, 1987). Thus we notice the presence of small sized zones of influence in Prahova county, in parts of Braşov and Dâmboviţa Counties, in Hunedoara County and in the centre of the Transylvanian Basin that is under the influence of three big urban centres: Cluj-Napoca, Sibiu and Târgu-Mureş. The biggest areas of influence have the big towns-cities that in most of cases hindered the establishing of similar centres nearby. Bucharest with its 10000km² has the biggest zone of influence.

The second biggest zones of influence of over 4.000 km² ha have the cities of Iaşi (5.200 km²), Cluj-Napoca (5.000 km²), Timişoara (4.300 km²), Buzău (4.000 km²) and Craiova (4.000 km²).

The cities of Ploieşti and Braşov, though they are big with a population of over 250.000 inhabitants, have a smaller zone of influence due to a higher density of small towns: 800 km² for Ploieşti and 1.300 km² for Braşov.

In Romanian Plain and the Eastern Carpathians the zones of influence are bigger due to the small number of town that exist here.

The small towns have the smallest theoretical zones of influence. These are quite small if they are situated in areas with a high density of urban settlements: Ocnele Mari 25 km², Plopeni 30 km², Eforie 35 km². Băile Tuşnad due to its reduced population and its only function as a resort has an area of influence of less than 30 km².

The establishing of the theoretical zones of influence help to determine these areas in reality on the basis of the place of origin of the labour force, of industrial cooperation, of food supply, of social, cultural and commercial influences. In the theoretical establishing of the borders of the areas of influence the frequency of buses and trains towards the neighbouring town was also taken into consideration.

The urban zone of influence is the result of the interference of at least three area of attraction. It has a high territorial mobility and a powerful social and economic influence. The urban zones of influence cover more than 69% of the national territory. If the periodical relations were taken into consideration than the whole national territory will be covered. A lower degree of polarization is found in the Carpathians where some depressions lack the presence of a town and thus a rural settlement place the role of a central place: Bozovici for the Almăjului Depression, Baia de Arieş for the Arieş Corridor, Gurahonț for Zarandului Depression, Broşteni for Bistrița Valley, Prundul Bârgăului for the Bârgaielor Corridor etc.

A high degree of coverage with of the zones of influence is found in the Transzlvanian basin, in the Moldavian Sub-Carpathian region (82%) and in the western part of the country (90%), where the presence of big urban centres (Timişoara, Arad, Oradea, Satu Mare) compensates for the low density of urban centres. The smallest values are found in Moldovei Plain, Bârladului Plateau, the central and southern part of Dobrogea, south-west of Oltenia, the Transylvanian Plain and the Someşelor Plateau.

At the same time we notice some quite big areas under the influence of a single town (Bucharest, Cluj-Napoca, Timişoara, Craiova, Iaşi, Galați). In order to avoid the disproportional growth of these cities it is necessary to develop rural settlements and transform them into towns.

6.8.2. The Rule of Rank and Size

This rule promotes the idea that the bigger the size of a settlement the smaller its rank is. The population of a second-order settlement will be half of that of a higher-order settlement (first order), the third-order settlement a third of the first-order population, the fourth-order a quarter etc.

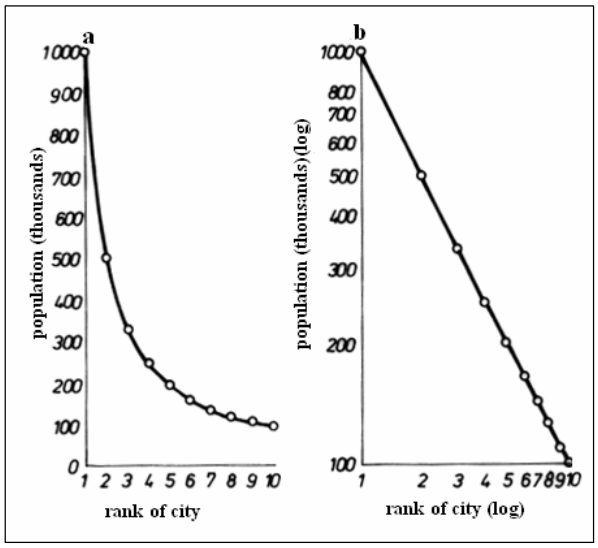


Figure 115. The relation between the rank/order and the size of a settlement: *a) normal scale; b) logarithmic scale (after D. Waugh, 2000).*

The following equation is used:

$$P_n = \frac{P_l}{n}$$

Where:

P_n - the population of the town

P_l - the population of the biggest town

n - the rank-order of the town – variable of size.

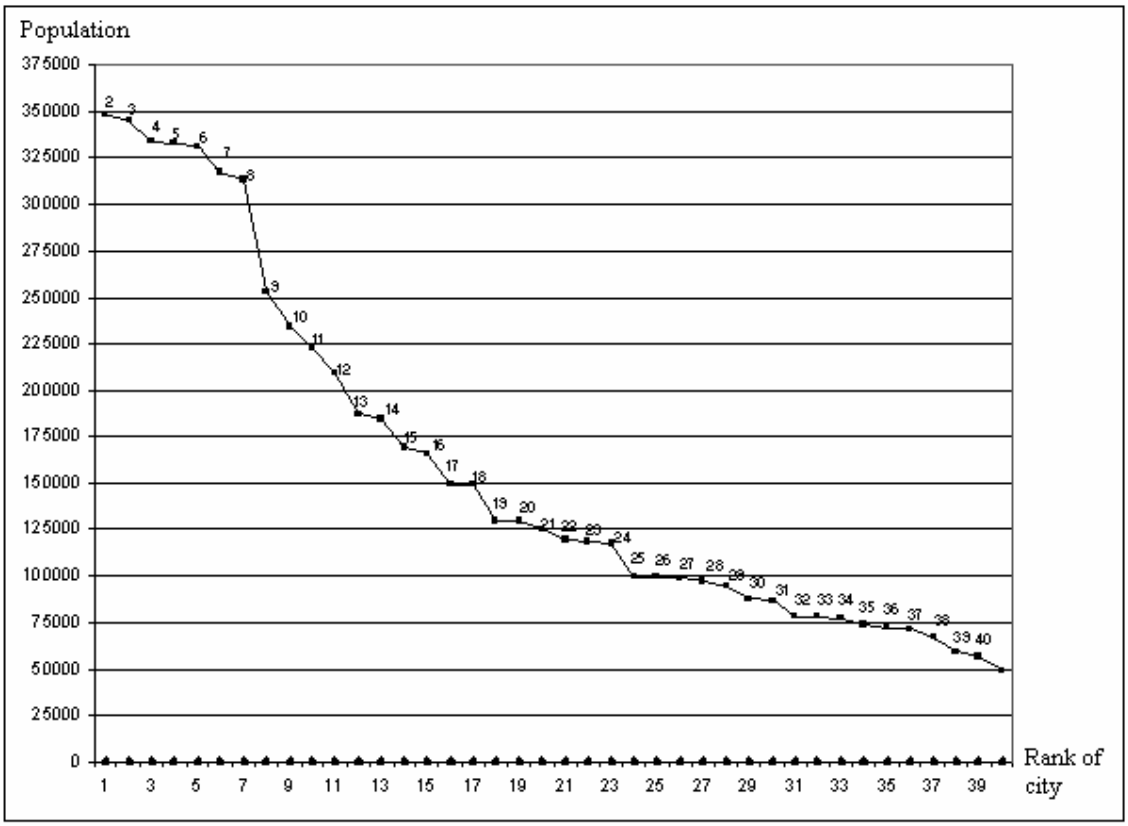


Figure 116. The ratio between rank and size of the county capitals in Romania.

For example if the first-order town has 21.00.000 inhabitants, the second-order town should be of 1.050.000 inhabitants and the third/order town of 700.000 inhabitants (2.100.000/3=700.000). Thus, according to this theory the second-order town in the national hierarchy should have a demographic potential of approximately 1 million inhabitants. In reality we notice an oversizing of the capital city in the detriment of the national demographic and economic balance.

The rhythm of the growth of the capital city should be slower than that of the provincial capitals like Constanța, Galați, Iaşi, Craiova, Braşov, Timişoara and Cluj-Napoca that need to become serious competitors of the capital.

The provincial capitals should grow to 1 million inhabitants in about 15 to 25 years while in the same the capital shouldn't go over 3 million inhabitants. In addition the provincial capitals should increase the number of their functions as a result of the administrative decentralization process needed in democratic country.

Taking into consideration this ratio there can be distinguished two types of distribution (after D. Waugh, 2000):

- *primate distribution* – it can be found in countries where the capital is the "primate city". Population wise it will be many times greater, at least three or four times bigger, than the second-order town and in addition concentrates the main urban functions (Montevideo, the capital of Uruguay is 17 times bigger than the second-order city of Colonia, while Buenos Aires, the Argentinian capital, is 10 times bigger than Cordoba);
- the binary distribution – in the case of countries or regions where we have two big cities with similar size of populations that dispute the role as a central place at the national level (Madrid and Barcelona in Spain, Quito and Guyaquil in Ecuador).

The primary distribution id more frequent for small countries, for former colonies and in general for developing countries and more recently for the countries recently formed due to the changes in frontiers (the former Soviet Union and Yugoslavian countries).

As an exception it is also met in developed countries like France and Austria where the capital don't have significant rivals yet.

Table 2. The ratio between rank and size of the county capitals in Romania.

Town	Rank	Actual population	Estimated population according to rank-size rule
Bucureşti	1	2.027.512	-
Iaşi	2	348.399	1.013.756
Constanța	3	344.876	675.837
Timişoara	4	334.098	506.878
Cluj-Napoca	5	332.792	405.502
Galați	6	331.360	337.918
Braşov	7	317.772	289.644
Craiova	8	312.891	253.439
Ploieşti	9	253.414	225.279
Brăila	10	234.648	202.751
Oradea	11	223.288	184.319
Bacău	12	209.689	168.959
Piteşti	13	187.181	155.962
Arad	14	184.619	144.822
Sibiu	15	168.949	135.167
Tg. Mureş	16	165.534	126.799
Baia Mare	17	149.496	119.265
Buzău	18	149.080	106.711
Satu Mare	19	129.886	112.639
Botoşani	20	129.285	101.375
Piatra Neamț	21	125.121	96.548
Râmnicu Vâlcea	22	119.340	92.159
Suceava	23	118.162	98.152
Drobeta Turnu Severin	24	117.882	84.479
Focşani	25	99.812	81.100
Târgovişte	26	99.486	77.981
Târgu Jiu	27	98.587	75.093
Tulcea	28	97.282	72.482
Reşița	29	94.531	69.914
Slatina	30	87.623	67.583
Bistrița	31	86.942	65.403
Vaslui	32	77.955	63.359
Călăraşi	33	77.906	61.439
Deva	34	77.061	59.632
Câmpina	35	73.586	57.928
Alba-Iulia	36	72.410	56.319
Zalău	37	70.856	59.797
Sfântu Gheorghe	38	67.142	55.585
Alexandria	39	59.007	51.987
Slobozia	40	56.925	50.687
Miercurea Ciuc	41	48.893	49.481

In the case of our country, Bucharest is approximately six times bigger then the next in line, that is Iași. Up to this point as a capital, it doesn't have a rival city, only Braşov might compete with that due to its central localization.

The binary distribution is typical for developed countries with a high degree of urbanization due to the existence of early economic competitions between regions. In some cases the rivalry

between the major cities accentuates separatist trends (Canada, Italia) and even the dividing of land (the former Czechoslovakia).

All the models presented so far are structured on ideal situations that are difficult to find in real world. Their importance consists in the fact they developed base theories for the understanding of the ordering of space.

6.9. Systems of Settlements

The system of settlements is defined as the free association of neighbouring urban or rural settlements among which strong relations of cooperation exists as a result of the fact that both the functions and the public endowments are differentially spread in the territory and have unequal dimensions and functions.

For our country there are nine levels of centres of systems that associate the same number of territorial systems.

At the lowest level is situated the subcomunal centre (Sc) which most of times polarizes one or more villages, due to the existing of its educational function and rarely of other functions. The next level is represented by the commune centre (C) and includes beside its administrative function, the medical function, the educational function (up to the 8th grade) and police centres.

The following level is made of the supracomunal centres (Spc) which usually include superior endowments in education (highschools, vocational schools), health care (hospitals, sanatoriums), commerce (restaurants) and industry, especially the food industry. It is the case of the rural settlements Rieni and Sudrigiu from Bihor County, where units of the European Drinks company (alcoholic and non-alcoholic beverage production) were established.

The systems of settlements with urban coordinating centres follow. They are split into six categories: local (L), zonal (Z), county (C), and regional(R), provincial (P), national (N).

Those with local influence are usually towns with a single function (mining or balneo-climateric /spa) that have a very small area of influence (Nucet, Sovata, Baia Sprie etc).

The centres with zonal influence comprise one or more rural systems (Huedin, Ludus, Brezoi etc).

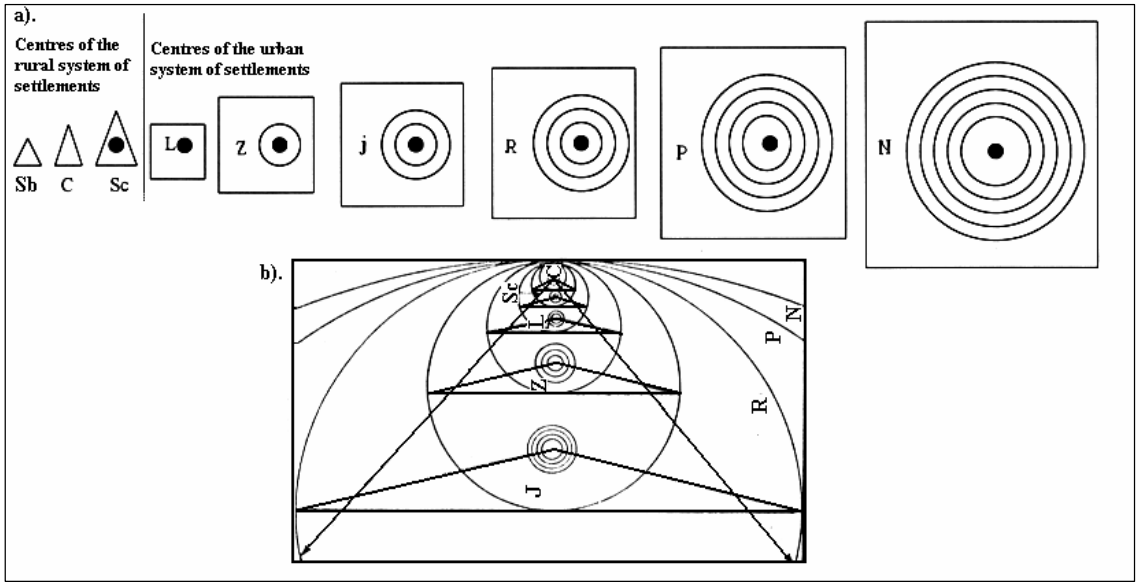


Figure 117. The hierarchy of the Systems of Settlements in Romania: *a) hierarchical relations; b) subordination relations.*

Centres that have a county as an area of influence are the towns that are the capital of some counties that resulted after the division of the national territorial that took place in 1968. These centres had been strongly sustained by industrial investments in the communist period (Zalau, Slobozia, Vaslui etc).

Regional centres are represented by towns with an area of influence that exceeds the limits of a county and have more than 175 000 inhabitants (Sibiu, Oradea, Bacau, Arad).

Provincial centres exert their influence upon large areas, about the size of the historical provinces. They include superior functions in education, culture, healthcare, information, administration and juridical system. They all have more than 300.000 inhabitants (Cluj-Napoca, Timisoara, Iasi, Galati, Brasov si Craiova).

Bucharest, our country's capital, is on top of the hierarchy of the coordinating centres, having a national area of influence.

E.Molnar, A. Maier and N. Cianga (1975) show that the power of polarization of a settlement is directly proportional with its socio-economic potential and indirectly proportional with the distance. When referring to the socio-economic potential, mainly to its polarization, the greatest importance is given to the services. The functions determine the hierarchy of the polarizing centres while the distance the area of influence of the centres.

A systematization of the centres of polarization, according to the authors cited above, is made through an integrated systemic hierarchy, which means that the superior polarizing centres include successively the functions of those inferior to them. The convergence areas are delimited by a concentric planning, the areas of the superior centres include the areas of the inferior ones.

The convergence centres are systematic types of settlements which are territorially dispersed in contrast with the convergence areas which are spatial segments or nodal regions.

The convergence centres of our country were classified according to the following criteria (after A. Molnar, A. Maier, N. Cianga, 1975):

- the number and quality of endowments;
- ratio of the employed population in services per 1000 inhabitants;
- population number (indirect indicator but synthetic of the socio-economic potential);
- present and former administrative function;
- history in relations.

After establishing the centres, the spheres of influence were delimited based on the principle of the "closest vicinity" which says that the limit between two centres of the same rank is at halfway distance between them.

According to the criteria mentioned above, seven categories of convergence centres were determined: five urban and two rural. Thus, Bucharest is considered to be the first centre of convergence, its sphere of influence covering the whole national territory.

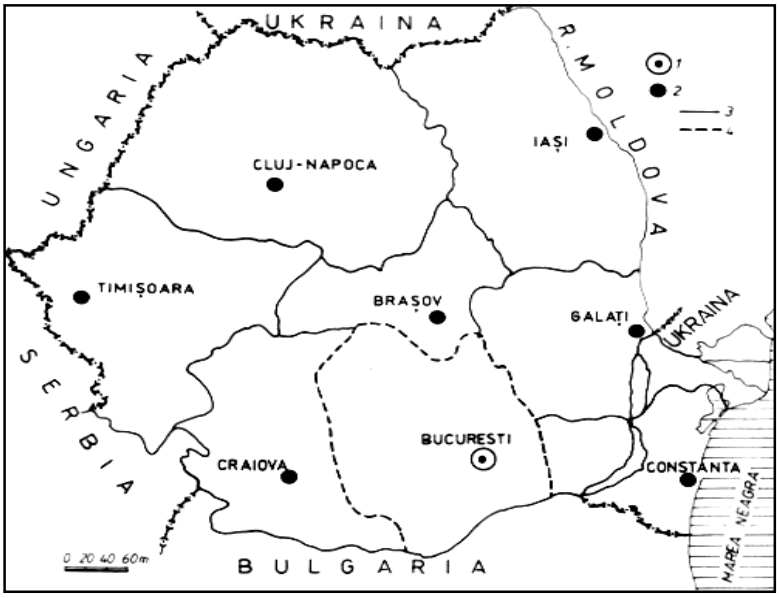


Figure 118. Provincial centres and their catchment areas: *1. the capital; 2. provincial metropolis; 3. the limit of the provincial areas of influence; 4. the limit of direct influence of the capital (after E. Molnar, A. Maier, N. Cianga, 1975).*

On the second level are the provincial centres (Cluj-Napoca, Timisoara, Iasi, Brasov, Craiova, Galati). These settlements are situated at a medium distance of 300 km from each other, each of them having a catchment area of 35.000 km². Cluj-Napoca has the largest one (50.000 km²) followed by Iasi, while Brasov and Galati have the smallest area of polarization (20.000 km²).

The third level is made up of the regional centres (Suceava, Bacau, Braila, Constanta, Ploiesti, Pitesti, Oradea, Baia-Mare, Targu Mures, Sibiu, Arad). The medium distance between them is 200 km and the medium catchment area is of 15.000 km².

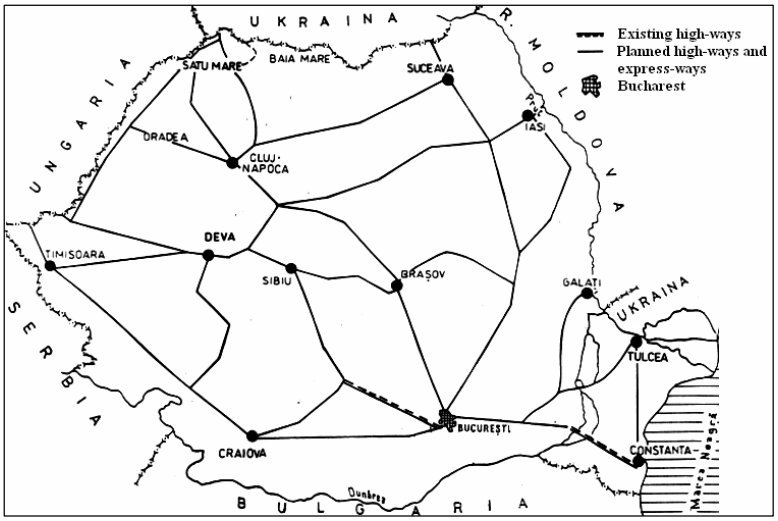


Figure 119. Main towns and roads *(after PATN 1998).*

The fourth level is formed by the county centres. The medium distance between these is about 140 km and their catchment areas of around 6.000 km².

The fifth level includes towns with some administrative function but inferior to the county centres ones. They have areas of influence smaller than the county surface. The medium distance between them is of 40 km and the catchment area is about 1.000 km².

Figure 120. Future urban centres *(after PATN 1998).*

There are three types of centres included in this category (after A. Molnar, A. Maier, N. Cianga, 1975):

- towns whose catchment areas include other urban centres (interurban influence);
- towns whose catchment areas include a big number of systems of communes and supra-communes;
- towns with very small catchment areas or even without one – these usually are spas or mining towns.

The sixth level in the hierarchy of the centres of convergence is represented by the big and very big rural settlements that have supra-commune services (hospitals, special schools, boarding schools etc). The medium distance between these, is usually smaller than 20 km and the average catchment area is of 500 km².

The seventh level is that of the communal centres. According to the present conditions of the politico-administrative division, a communal centre has an average catchment area of four villages.

As a conclusion, there is an indirect conditioning between the hierarchical rank of the centres and their territorial frequency, and also between the hierarchical level of the centres and the size of their areas of convergence. Furthermore, in the same catchment area, the polarizing power loses in intensity towards the periphery. In the agricultural areas the areas of convergence are larger than in the industrial ones (towns in industrial areas have a bigger density).

Here are some evolution trends worth mentioning (after A. Molnar, A. Maier, N. Cianga, 1975):

- all the "central places" have a continuous economical and social development and the population number grows until it reaches the limit corresponding to the rank of the centre (Bucharest 2.000.000, provincial centres 300.000-400.000 inhabitants);
- centres from the sixth level develop towards the fifth level (communal centres having an urban character will become towns).

6.10. Models of Urban Centres

"Any process, any phenomenon that cannot be modelled cannot be studied" (M. Botez, Mariana Celac, 1976).

The scientific literature distinguishes three categories of urban structure models:

- the concentric model;
- the sector model;
- the multinuclear model.

From the category of concentric models the most representatives are the Burgess model and the Alonso model.

The Hoyt model is the most representative from the category of the sector models and the Ullman-Harris model is representative for the category of the multinuclear models. To these we can add some 'synthetic' models (the Mann model) or tangential to the sector or concentric models (the model of the different value of land, the Van Der Berg model) and the axial and hispano-american models. Towns have a great variety in space due to the different physical conditions for their development and due to the socio-economic impact in different periods of time.

The model of concentric development or the Burgess model has its roots in the territorial expansion of the city of Chicago and in the territorial grouping of its population following socio-economic, racial and ethnic criteria.

The model is based on the following assumptions (F. Rees, 1987, D. Waugh, 2000):

- the city was built on a flat surface with equal advantages for expansion in all directions;
- the transport systems are accessible, fast and cheap in all directions;
- the ancient buildings are situated in the centre whereas the new buildings are situated in the periphery;
- the city is structured on a well defined socio-economical and ethnical sectors variety;
- the low income social classes established near the city centre and the place of work in order to avoid high costs housing taxes and of transportation;
- the heavy industry is spread all over the city.

The model has a perfect geometry and clearly shows the ethnic, racial and the income segregation. It is also has a biological inspiration that was taken from The Law of Substitution of Species within some Ecological Homogeneous Niches.

The result is a model defined by five concentric zones as we can see further down (after D. Waugh, 2000).

The Central Business District concentrates the main retail businesses, offices and banks forming the commercial heart of the city and the gravity centre of the main transport routes. The high value of the land in CBD results from the high level of accessibility and the intensive use of the land that actually pays for the high costs for renting. The CBD is usually expanding along the main transportation axis but at the same time its development is threatened by the growing traffic, the noise, the pollution, the shortage of parking places and of the flourishing of supermarkets outside the big city.

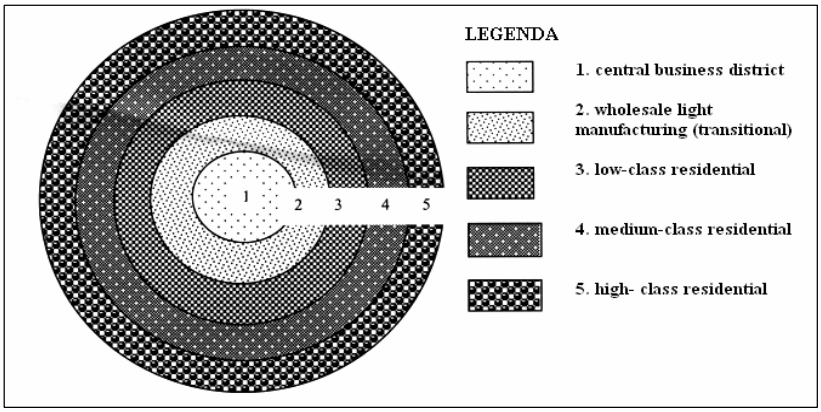


Figure 121. The concentric model *(the Burgess concentric model, D. Waugh, 2000).*

The transition zone (the second ring) has old, ruined, slum type of buildings where the low-income population lives. The light industry is also concentrated in these zones.

The third sector is made up of the dwellings of the poor class that migrated from the second sector and from the second generation of immigrants working in the nearby factories.

The fourth sector is made up of the residential buildings of the middle class (medium-class housing), some of them privately owned.

The fifth sector (exterior) is situated at the periphery and includes the residential zones of the upper class characterized by the presence of individual house of lawns and green spaces (most of them are commuters willing to pay for the ever-growing transportation costs in exchange for a good place to live).

Limitations of the model (after D. Waugh, 2000). Despite its simplicity it is inspired from the territorial situation of a single city – Chicago, and at a certain time (1920). The model has an ecological origin and starts from the assumption that the group invasion comes from the exterior, the invaders outnumbering the native population. The energy needed for maintaining the dynamics of the system is provided from the exterior throughout a continuous settlement of the waves of immigrants in the centre, fact that compels to a systematic centrifugal redistribution towards the periphery of the previous residents. The quality of houses in the residential areas grows from the centre towards the periphery. The young people (under 20 years old) and the old ones (over 60) usually prefer the central zone (CBD) whereas middle aged people and families with children prefer the periphery. The spatial segregation on ethnic criteria came with the early setting of the white colonists whose wealth grew in time and who emigrated towards the peripheries, the centre being occupied by the new population coming from the south Europe and later, by the black population that migrated from the south-east of USA.

In 1972 the METRA transport system was inaugurated. This system has a radial development from the centre towards the periphery. As the residential zones of the high-income population develop in the periphery the commuting towards the centre is made with two means of transportation: with the car to the nearest METRA station (the importance of the parking space grew) and from here with the METRA city train to the centre. The extension of the peripheries is limited towards the O'Hare international airport due to the large equipments in the area and also due to the noise of the planes.

William Alonso (1964) (after Oxford Dictionary of Geography, 1997) explains the differences in the use of land in the big cities and its different prices (the centre usually has high costs because of the expensive rents, especially for the trading places, offices etc whereas the lands in the periphery have cheaper rents and lower prices).

A higher advantage come as a result of the positioning of the parcel of land inside the city and presents a guaranteed financial success for the auctioneers. If the quantity of goods and the services variety remain the same, the price of the land will decrease as the distance from the centre increases.

In this situation the high-income population would chose to live in the areas with a low density at the periphery while the low-income population remains in the areas with a high density close to the central area of the city. The surface of land that can be bought as well as the commuting costs grow the further we go from the centre of the city. This way, the money saved from buying land at the periphery will be spent on commuting.

Every residence is a balance between the land, goods and the accessibility to the working place. The model is built upon the basic assumption that the land is being equally divided depending on its quality and there are no obligations coming from the local policies of planning.

The Hoyt sector model. It was built from the mapping of eight housing variables from 142 American cities, starting from the following assumptions (after D. Waugh, 2000):

- the wealthy population competing the high land prices, occupied the best housing places;
- the residential areas of the wealthy permit the access with the personal car or the public access and this way they were able to get away from industrial areas or those crossed by the main transport roads;
- a similar use of the land brings forth another use of the same kind, this leading to the spatial control of a function from a certain space and the rejection of other functions; it results a spatial-urban developing(the sector-feather model).

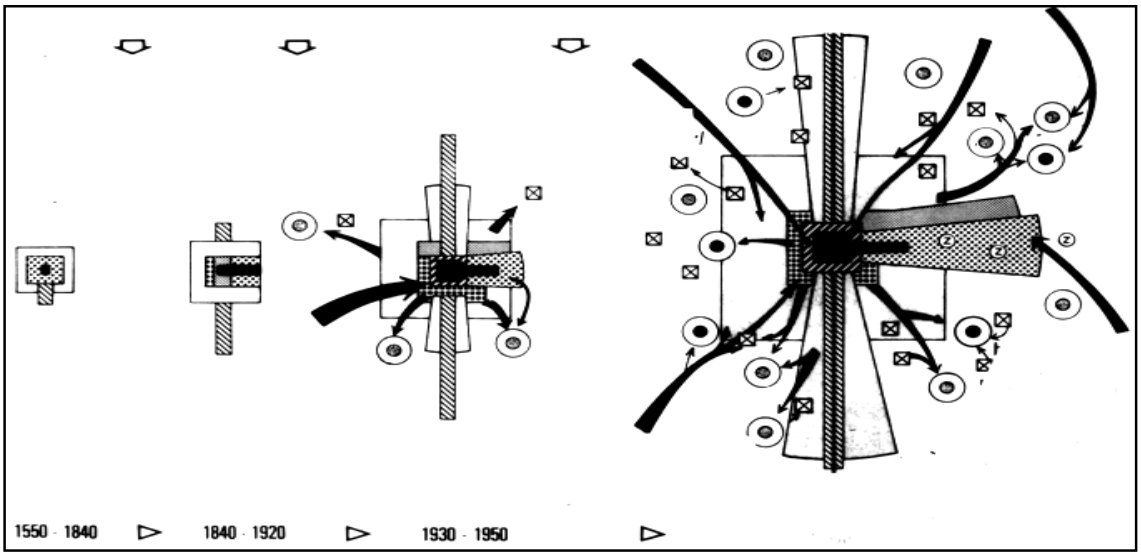


Figure 122. The evolution stages of the sector-wedge model *(after B. Hofmeister, 1982).*

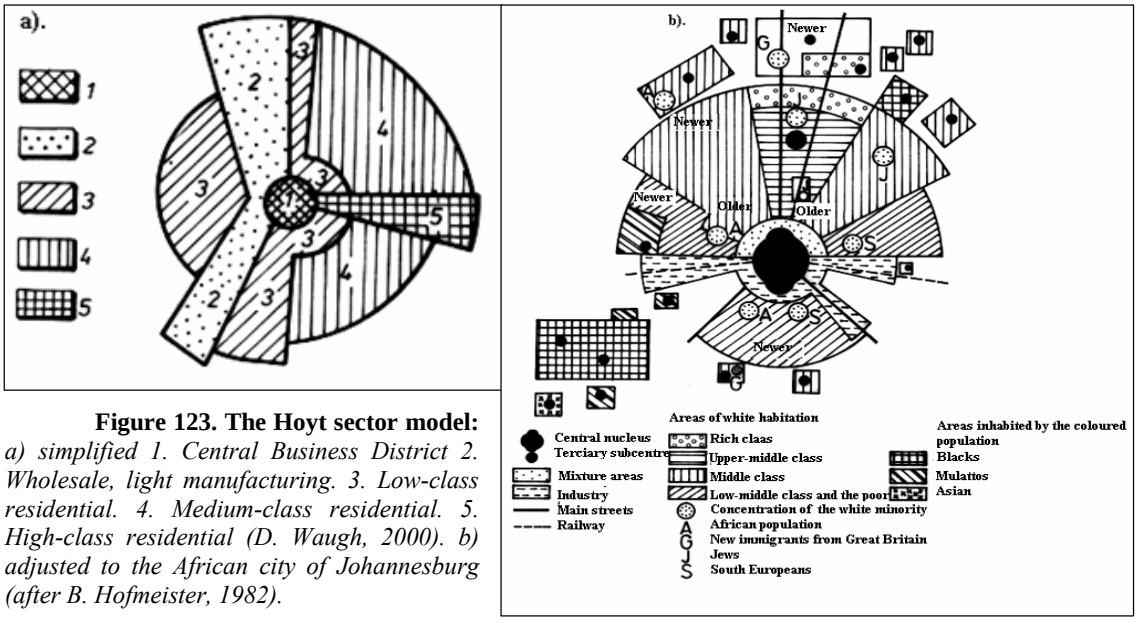


Figure 123. The Hoyt sector model: *a) simplified 1. Central Business District 2. Wholesale, light manufacturing. 3. Low-class residential. 4. Medium-class residential. 5. High-class residential (D. Waugh, 2000). b) adjusted to the African city of Johannesburg (after B. Hofmeister, 1982).*

According to the Hoyt model the high price spaces tend to develop along the main transport routes, the city expanding in wedges. Once a sector got a certain land use with a certain function, these tend to expand in the same way to the periphery. The model was inspired from the example of Calgary from Canada.

The Ullman-Harris model. It represents a more complex synthesis of the Burges and Hoyt models.

The model starts with the following assumptions:

- the modern cities do not have a more complex structure than that of the Burges and Hoyt models;
- the cities do not grow from a central nucleus (CBD) but from several independent nuclei;
- each nucleus functions as a growing centre and it may have a different function from other nuclei inside the city;
- the existing nuclei tend to grow in time until they merge and form a big urban centre (eg. Barnet and Croydon that are now part of the Greater London);
- if the city becomes too big and crowded, some of its functions can be taken by new nuclei.

The multiple nuclei development is an answer to the needs of maximum accessibility to the centre, to the differences land value and to the decentralization process of the cities.

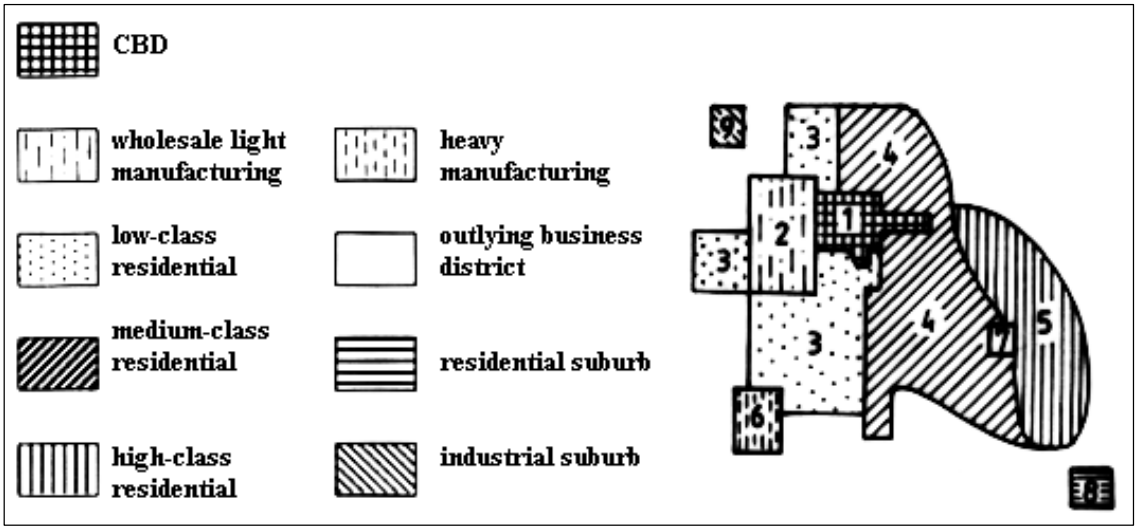


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Figure 124. The multiple-nuclei model: *1. Central Business Districc.t 2. Wholesale, light manufacturing. 3. Low-class residential. 4. Medium-class residential. 5. High-class residential. 6. Heavy manufacturing. 7. Outlying business district., 8. Residential suburb. 9. Industrial suburb (after D. Waugh, 2000).*

The Mann model (1965). Represents a synthesis between the Burgess concentric model and the Hoyt sector model that started from the realities of three industrial cities in England (Huddersfield, Nottingham and Sheffield) where the predominance of the South-West winds determined the positioning of the high class residential area in the South-East of these cities while the industry was concentrated in the opposite direction (North-East).

Conclusions from the analysis of this model are:

- the heavy industry is located along the main axis of transportation;
- the low-income residential area can also be called the elders' residential area (a classification according to the age criteria than the social criteria);
- the residential area of the high-income classes is placed at a considerable distance from the industrial polluting zones;
- the local authorities have played their role in the spatial segregation upon income.

This model was first implemented in 1975 by Robson in the towns of Belfor and Sunderland.

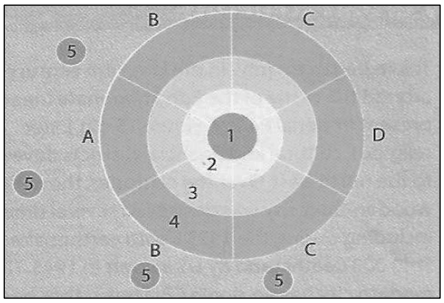

Figure 125. Mann's model: *1. City centre. 2. Transitional zone. 3. Pre-1918 housing. 4. Post-1918 residential areas, with post-1945 development mainly on the periphery. 5. Commuting-distance 'villages'. A. The middle-class sector. B. The lower-middle class sector. C. Working-class sector and main municipal housing areas. D. Industry and lowest working-class sector (after D. Waugh, 2000).*

The model of the differences in land value or the supply – demand theor. This model is an implementation of the Von Thünen model to the urban space.

The model is based upon the assumption that in a market-oriented economy the highest demand rate is there where the maximum profit can be obtained through the renting or buying of the land.

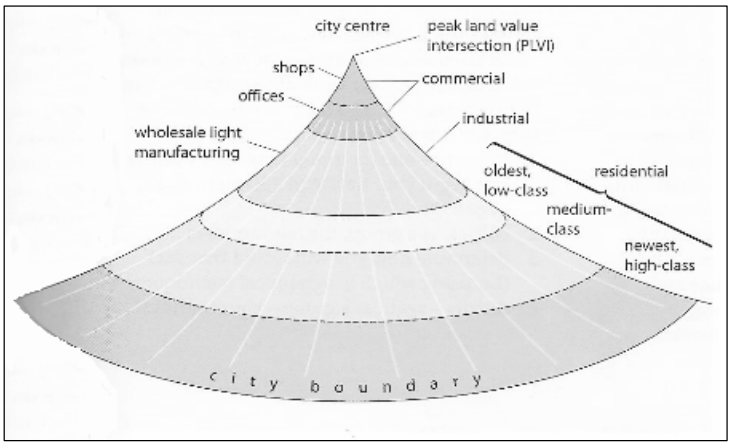

Figure 126. The model of differences in land values *(after the Oxford Dictionary of Geography, 1997).*

According to the figure 122, in most of the cities the most expensive land is in the central area (CBD) mainly because of the good accessibility. This leads to the daily high traffic of the central zones.

The concentration of the shops on a small portion of land and their excessive daily use, determines high costs for land and for renting, all these resulting in an intensive use of the space. The lands with highest values situated in the central areas (CBD), are called pick land value intersection (PLVI). At high distances from the centre of the town, the land loses its commercial value.

In the industrial areas where the land use is more extensive, rents are lower as a result of the lower demand of these lands. The residential land has to be at a big distance from the central nucleus, in places where the land is not so expensive.

This model explains the differences in the population density and in the type of constructions from the urban areas.

The population that cannot afford the daily commuting costs is forced to live close to the central nucleus where the higher land price leads to excessive division of the lots and to high density of buildings and population.

The big changes that took place in the retail commerce after 1960 through the localization of the supermarkets to the periphery of the cities, partially cancels the model's assumptions. The localization of the big industries and of the high-tech centres is done in a similar way, these being attracted to the crossroads of the main roads.

Though the spatial configuration of the cities can be very different, each of the analyzed zones has its own functional specificity. This specificity is a result of the age of the buildings, the value of the land and the accessibility.

As it has been already mentioned, CBD usually concentrates specialized shops (retail trade), offices, banks and public institutions (town hall, police etc). The age of the buildings usually grows from the periphery towards the centre, exception being CBD where the majority of the buildings were restored and modernized or new ones built.

The big cities develop several trading centres and nuclei (London, Tokyo).

The shops from CBD include a large variety, from the food shops and to cosmetics and electronics of high quality. As it was mentioned before here are concentrated most of the public interest buildings. In the American cities the centre contains the highest buildings (skyscrapers) as a consequence of the high costs of rent. The centres usually concentrate the most intensive urban traffic and the highest number of pedestrians.

More recent studies highlight the evolution of some millionaire cities in two directions: a) towards an assimilation of some segments from the B sector and the consolidation of the residential statute of higher utility (evolution from centre to exterior); b) towards an almost total isolation of the adjacent sectors.

The B zone in the old inner sector includes low class residences built usually before the 19th century and warehouses. In many cases, the B zone was modernized but still includes low price residences and small industrial units.

The C zone developed in most areas between the two World Wars and includes the middle class residences.

The D zone includes the outskirts of the city and the suburban areas with the residences of the high-income class. It is characterized by the presence of open green spaces. Here are usually found the university campuses, the high-tech and the trading centres and the new commercial units of industry.

In the case of Cluj-Napoca municipality, the fight for a leading centre is between the Uniri Square – with the St. Michael's cathedral and the statue of Matei Corvin – and the Avram Iancu Square – with the National Theatre, the Orthodox Cathedral and the imposing statue of Avram Iancu. The Unirii Square concentrates a big part of the retail commerce, whereas in the Avram Iancu there are not so many places of this kind.

The first one has rather a symbolical - trading value whereas the second has rather a cultural-sentimental value.

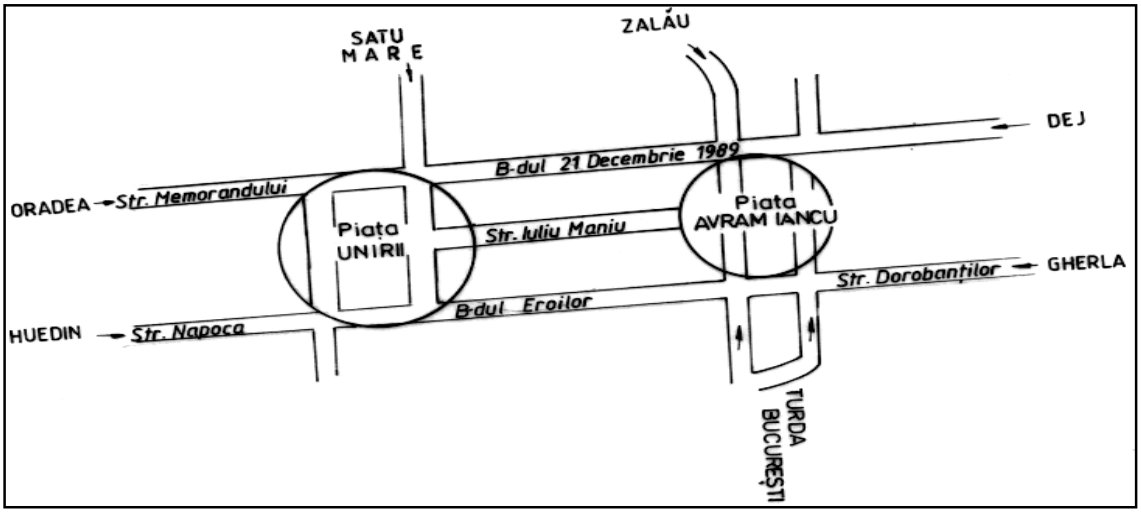

Figure 127. The centre of Cluj-Napoca and the major intersections.

The two squares are united by two main streets that are characterized by the presence of numerous commercial units, of the services and of the buildings with a residential statute.

6.11. The Urban-Rural Opposition

The opposition between the anthropic environment and the natural environment expressed itself in different ways along the time. Therefore, I. Tuan (1974) distinguishes six stages that show the spatial and the qualitative relations between the natural and the anthropic environment:

- the edenic ideal;
- the urban revolution and the cosmic ideal;
- the cosmic and the edenic ideal;
- the middle landscape ideal;
- late 19th century values;
- middle and late 20th century values.

The edenic ideal characteristic for the neolithic period was dominated by the balance between the untouched and the profane nature and by the human edifices. The garden and the village were part of the virgin nature.

The urban revolution and the cosmic ideal gave the town a central position villages and agricultural lands surrounding it.

The cosmic and edenic ideal represent the period when the nature and the town are considered of equal in importance and it corresponds to the renaissance period in Europe and to the beginning of the industrialization in England.

The middle landscape ideal interposes between the city and the virgin nature the rural landscape, *"the countryside",* threatened by both the town and the virgin nature.

The late 19th century values condemns the fate of the amorphous city and praises the edenic landscape from the countryside and the nature as a pure space and a place of rest.

The middle and late 20th century values highlight the danger eliminating the pure nature by mankind due to the uncontrolled spreading of the towns and the development of the suburbs.

The wilderness changes from something pure to an urban environment, the chaotic territorial development and the daily threats finding their edenic correspondent in building new cities at human dimensions and in the care for the nature. The ecological paradigm dominates the conception and the practical technique of changing the space. The insertion of this ecological paradigm into the nowadays urbanism system is just partial.

6.12. Urban Forms of Evolution

Globally, there are five levels that the city can reach in its spatial development. These are (after Jaqueline Beaujeau Garnier, G. Chabot, 1971):

- suburbanisation;
- conurbation;
- agglomeration;
- megalopolis;
- satellite towns.

Suburbanisation is an urbanization phenomenon of the old rural space. *"It is rather a phenomenon than a spatial determination"* (Jaqueline Beaujeau Garnier, G. Chabot, 1971).

It represents the partial migration of some urban functions towards the periphery on areas with various extensions and the subordination of the adjacent spaces of the city, to its needs. The phenomenon is favoured by the developments in transportation resulting in a migration of the suburban determined by the facilitation of the relations with the city. These relations were broadly analyzed when we define the areas of influence that are in fact suburban areas. The relations between a city and a suburban area loose gradually their intensity as the distance from the town grows.

Starting from this assumption there can be identified two categories of areas:

- inner suburban area;
- outer suburban area.

Some authors consider that there also exists a distanced suburban area.

The suburban area was delimited according to quantitative and structural criteria. Therefore, in order to define it one should consider the structure of the active population and structure of agriculture.

The inner suburban area can extend up to the rural settlements where at least 50% from the active population works in town and it also includes the agricultural spaces used mostly for cultivating vegetables and fodder, in order to provide the city with diary products.

The external suburban area includes the rural settlements that have residential functions and over the areas whose industry and trade depend upon the city. Moreover here it is concentrated a big number of the population for entertainment purposes especially in weekends.

Conurbations are made up of two or more independent neighbouring cities. During their evolution the need for cooperation for solving problems of common interest (food, water supply, power, organization of the entertainment spaces) was recognised. The terminology had been introduced by Patrick Geddes in 1912 and is comes from the Latin word con = with and urbe = town.

In order to define a conurbation two conditions need to be fulfilled (Jaqueline Beaujeau Garnier, G. Chabot, 1971).

- a first condition refers to the genesis; towns belonging to the conurbation have developed independently; the juxtaposition of towns that have separately developed as a result of the need to work together for solving some of the problems of public interest, form a conurbation (even if one of them is more important then the other);
- there has to be a certain urban density in what regards the number of towns and to the number of inhabitants; two small towns, even if they are close to one another they don't have to solve common problems and this way they cannot form a conurbation.

Within a conurbation the towns remain separated although they are included in the same ensemble. The most typical examples of conurbations are the twin cities: Minneapolis – St. Paul in the

USA; Manheim – Ludwingshafen in Germany; Reggio-Messina in Italy. The conurbations also developed in the old industrial areas, for example the Rhine conurbation being the best example (it concentrates approximately 10 millions inhabitants).

Conurbations exist also in areas that have old industrial traditions (Lille-Rubaix-Tourcoing). The conurbations can cross national borders. Thus there is the case of the Danish-Swedish conurbation formed by the Helsingor and Halsingborg towns over the Sund Strait. Here it is also planned the birth of Oresun urban ensemble by building two bridges over the Sund Strait between Copenhagen and Malmo and bweteen Helsingor and Halsingborg. A common airport will be built on the Danish island of Galthom and on the Swedish island Vem, will be built, in the middle of the strait, a recreational area for the whole ensemble.

"Conurbations are not very stable, the towns that make them up struggling to keep their individuality" (idem, 1971). The convergent spatial evolution to which is added the growing connections due to the transport means, leads to the linking of the towns. The towns *"flow towards each other"* so that they do not maintain their individuality anymore. One of these towns becomes stronger than the other one, the latest becoming a suburb of the first. Saint Paul and Minneapolis already form a single city that spreads on both sides of the Mississippi river.

In the last phase of the evolution of a conurbation the initial towns cannot be distinguished anymore. But a conurbation does not necessarily mean fusion. The towns of the Ruhr region are specialized: industrial towns, trading towns and financial towns.

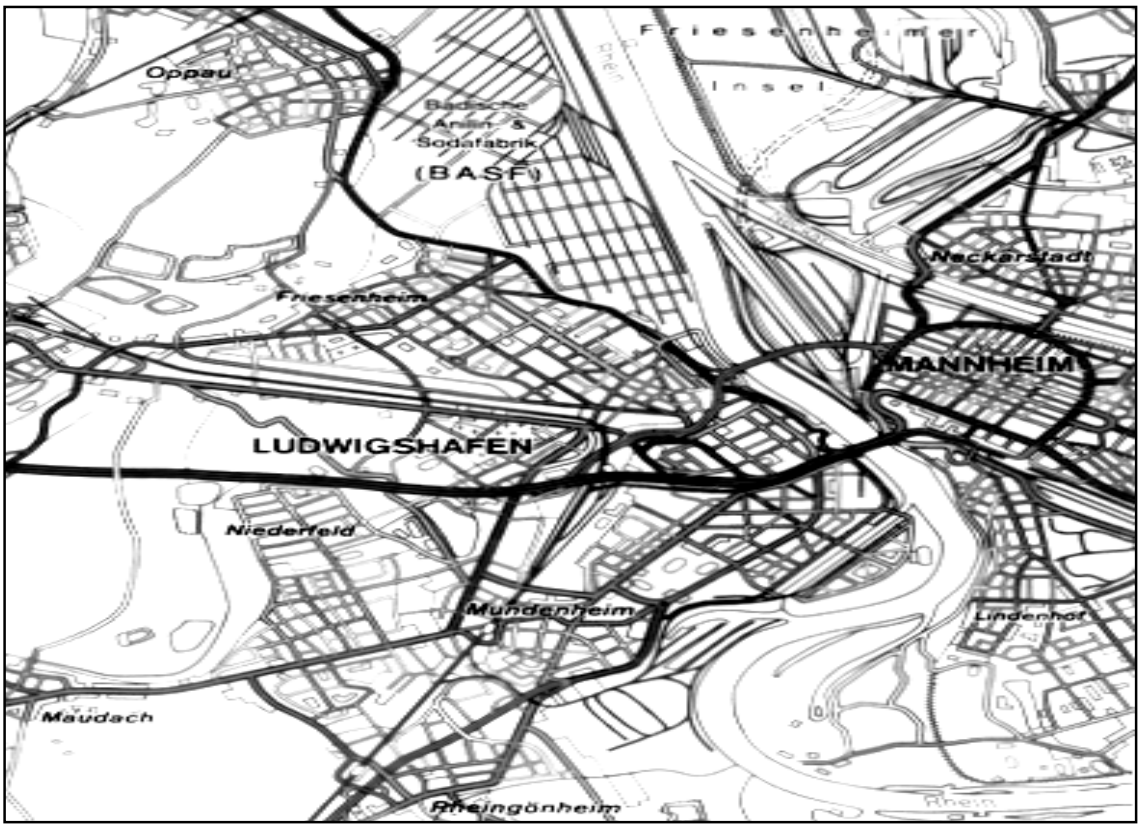

Figure 128. The Mannheim-Ludwingsafen conurbation *(after Weltatlas Alexander, 1982).*

Interurbations means an ensemble of two or more neighbouring cities which don't have all the necessary public endowments, thus being unable to function without the others. They are new cities, usually industrial centres, located next to the older city. For example, until the newly created city organizes its commerce it uses those of the old city. It is a form of transition. It is the case of the Kracovia and Nowa Huta cities. Nowa Huta appeared as an industrial town, lacking any commercial and residential spaces. In the beginning the dependency upon Kracovia was almost total. With time the new town managed to create its own commercial and residential spaces.

The agglomerations represent a process of continuous evolution of the town through the multiplying of the residential and the industrial areas of the suburban. It is a process of growth by systematically adding new urban areas to the initial town. A town means a continuation of the built areas and of those needed for the every day life of the population. There are also situations when around the towns gravitate a population that is more numerous than that of the centre town, their limits being very hard to specify. An agglomeration is a wider notion, including more than a city and more precise than that of the suburban area. There existed several opinions regarding the delimitation of the agglomeration. Some of them set the limit of the agglomerations to the external limit of the commuting migrations, thus resulting an exaggeration in setting of the limits of an agglomeration. Thus there are rural settlements where more than ½ of the active population works in the city. Another criterion would be that of setting the limits until the rural settlements whose densities cease to grow.

The Berkeley University (after Jaqueline Beaujeau Garnier, G. Chabot, 1972) added the statistical criteria in defining the metropolitan area that correspond to the agglomerations.

The metropolitan area is the agglomeration of at least 100.000 inhabitants including a town (continuous urban area) of at least 50.000 inhabitants to which are added close administrative divisions that present similar characters and especially where more than 65% of the population does not work in agriculture. If this criterion is accepted there can be situations where the population of the agglomeration is 10-20 times bigger than that of the main town.

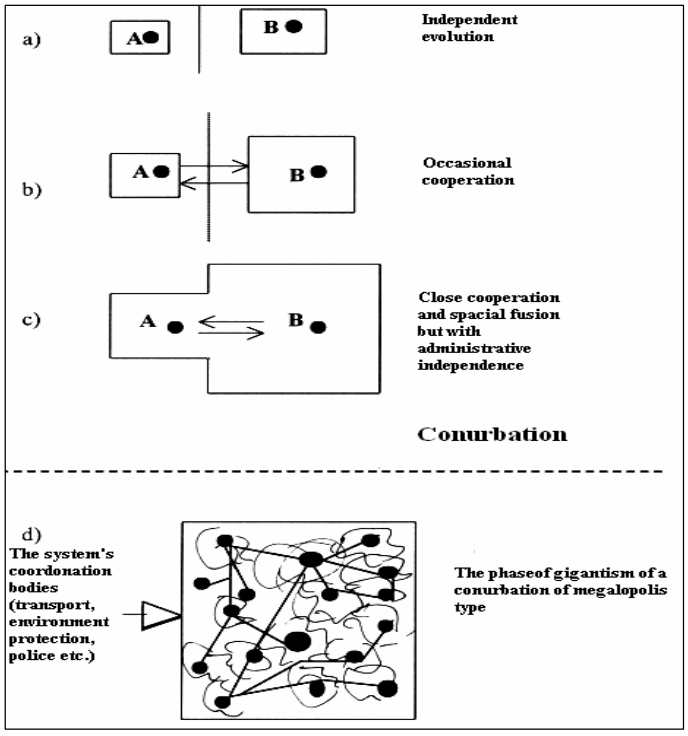

Figure 129. The transition stages from independent cities to conurbations and urban agglomerations like megalopolises.

In establishing the limits of an agglomeration we take into consideration the relations with the central nucleus resulting more zones in the agglomeration decided mainly according to the density of the population. Usually three zones can be distinguished:

- central zone;
- an inner suburban area with a rapid growth of population;
- an outer suburban area with lower demographical densities and with a moderate growing.

In the case of cities which grew and developed independently, with developed suburban areas, the densities of the latter can be equal or higher than that of the central nucleus, resulting in an expansion of the town and a development of another suburban area towards the exterior, situation that weakens the administrative limits of the town.

The bigger agglomerations include metropolises. The name comes from the ancient Greek city-states (mater = mother, polis = town). These are big cities, usually capital cities but not only these (New York, Paris, Moscow, Ciudad de Mexico, Buenos Aires, Shanghai, Calcutta etc).

There are some similarities between an agglomeration and a conurbation but there are also some differences. In order to distinguish them the genetic factor has to be taken into consideration.

At the global level conceptions for defining and establishing the limits of the agglomerations are somewhat subjective. That is why the tendency of an administrative transposition of the agglomerations is manifested.

An agglomeration might include a conurbation if its evolution has reached or passed one or more cities which developed independently until then (these were erased as a result of the

development of the agglomeration). In this case, the conurbation is only one element, a piece in the agglomeration, so that the agglomeration gets a broader meaning than the conurbation.

There can also be situations when one or more cities included in the conurbation are themselves agglomerations. Each developed as an agglomeration through their functional-territorial evolution, influencing the adjacent and interposed urban area arriving at the point when *"common problem"* need solving. Thus appears a superior conurbation, a conurbation of agglomerations, a conglomerate. But can this path of evolution of the urban phenomenon be considered when defining the megalopolis?

The megalopolis (mega = big, polis = town) represents the stage of gigantism of the conurbations, the territory being organized in an immense multi-central conurbation.

The notion was introduced by J. Gottman (1961) in order to define the urban concentration on the North-East coast of the USA (Boswash).

Figure 130. The Boswash megalopolis *(after Wealtatlas Alexander, 1982).*

From Boston to Washington (1000 km) several millionaire cities combined with some smaller ones concentrate. This conurbation knew exceptional conditions for developing: the presence of the

Appalachian Mountains with mineral and power resources, transportation routes on water towards the *"old world"* and not only with this, very good conditions for the development of ports, very resistant litology, no earthquake area etc. Here were established the first groups of European colonists and from here started the expansion towards west. The population of this megalopolis is over 40 millions inhabitants. The architectural style has specific forms (skyscrapers – as in Manhattan).

As it was mentioned before, from Boston to south of Washington the space is completely urbanized, in most of the cases the transition from a city to another being marked only by signs.

Globally, there are several zones with megalopolis tendencies. Here are some examples: the Rhine conurbation that tends to link with the great cities of Belgium and Holland; Rio de Janeiro – Sao Paolo; Kobe-Osaka; Manchester-Birmingham-Leeds etc.

In our country for certain territories with a high degree of urbanization formed from several closed cities with high densities of population, developed in specific physical, geographical and economic conditions the name of urban micro-region was given (the Petroşani basin, the Prahova valley, the Trotus valley). Inside the urban micro-region are included the interposed rural settlements.

The satellite cities are a recent modality of organizing of the new cities. Theoretically, they represent a category of towns that gravitate around a bigger city, the last functioning as a coordinating centre. These cities appear and develop as a consequence of the urban planning.

In reality there are two opposite situations regarding the way a satellite system appeared (Jaqueline Beaujeau Garnier, G. Chabout, 1971):

- when due to the powerful demographic and economic concentration decongestion is seen as a solution in order to maintain the quality of the urban life;
- when the developing of some small centres requires a coordinating centre.

V. G. Davidovici defines the satellite cities depending on three characteristics (Jaqueline Beaujeau Garnier, G. Chabout, 1971):

- the inhabitants of the satellites work in the central town;
- the central town provides a certain number of services, especially the cultural services for the satellites;
- the satellites are dormitories for the city's population.

But to all these facts are surpassed by the reality of the urban phenomenon. According to what V. G. Davidovici said, the satellites would have only the function of the dormitory-towns or most of the satellite cities also have industrial functions (satellites of production).

Being placed around a coordinating city, the satellites can be taken for the suburban area. A certain distance should be taken into consideration to avoid the confusions. Following the chaotic growth of population and industry new satellites towns were established around London, at a medium distance of 30 km from the centre.

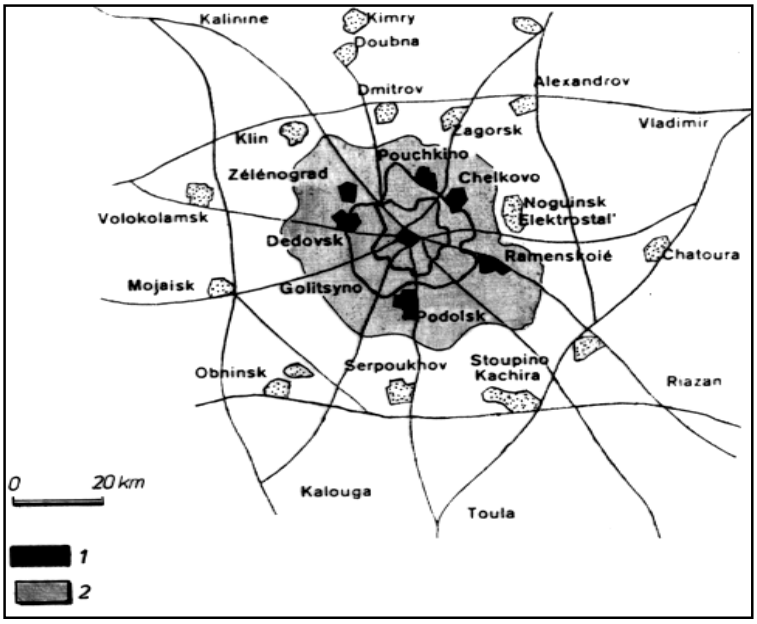

Figure 131. Moscow's satellite towns: *1. First generation satellite town; 2.Second generation satellite towns (after J. M. Bernard, 1982).*

Moscow's satellites (sputnik) were established at a medium distance of 100-200 km from the capital, and Sankt Petersburg is at a distance up to 70 km.

London's and Moscow's satellites were established as independent urban units.

In Poland, old textile centres, situated between the upper-stream sections of Wartha and Pilica rivers needed a coordinating centre. Thus a new

city, Lodz located in a central position with coordinating role and a bigger population was born.

The establishment of urban centres of satellite type proved to be a great success in the world urbanism. The development of big cities is explosive, the growth rate of urban population is superior to overall population growth. Providing for the basic needs of the populations in the big agglomerations of the world, represents the greatest challenge for governments and leaders for the beginning of the third millennium.

7. THE NATIONAL DEVELOPMENT POLITICS OF SETTLEMENTS

The National Territory Planning (N.T.P.A – 1998) defines some concepts like settlement, territorial – administrative unit, commune, the administrative territory, area of development, area of influence, metropolitan area, etc. and establishes the hierarchy of urban and rural localities of Romania according to ranks and functions. Further down we present the Annexes 1, 2, 3 from N.T.P.A. referring to urban and rural settlements.

7.1. Definitions for Most Frequently Used Terms

Locality – a permanent form of settlement of the population in the territory, forming a human life nucleus with variable structures, depending on the specific dominating form of production activities of the inhabitants, the territorial – administrative organizing characteristics, number of inhabitants, the built-up area features, the social – cultural endowment degree and the technical – public utility equipment. Depending on the dominating form of economical activities weight, character, number of inhabitants, the built-up area features, residential and population density, social-cultural endowment and technical equipment, the settlements are organized in two major groups: urban and rural settlements.

Urban settlement – a settlement where the majority of workers are occupied in non-agricultural activities. The density of population and of residences is higher and it varies in endowment and technical equipment which plays a significant social economical influence over the surrounding area.

Rural settlement (village) – a settlement where:

- the majority of the work force is concentrated in agriculture, forestry, fishing, offering a good life standard to its inhabitants, and through policies of modernization retain this rural specificity for the future;
- the majority of the work force is working in some other field than agricultural, forestry fishing industry but which are currently offering insufficient endowment to be declared a town. Through policies of modernization they will evolve towards urban level.

Basic administrative-territorial unit – the territory of a county, delimited by the law. Basic administrative-territorial units are towns and communes which include one or more localities.

Town – Basic administrative-territorial unit made up of either one or more urban localities, out of which there is at least one urban locality.

As a basic administrative-territorial unit and as socio-economical and geographical system, the town has two components:

- the territorial component – built-up area which represents the occupied or the constructions and arranged-to-be terrain (residential, socio-cultural, industrial, warehousing, production, traffic, entertainment and others) on a certain period of time, and the unincorporated area which represents the remaining administrative territory of the town;
- the demo-socio-economical component which consists of the population groups and their economical, social and politico-administrative activities taking place in the territory of the locality.

The dimension, the character and the functions of the town presents great variations, it's development depending on the territory it belongs to.

The towns with a greater number of inhabitants and a great importance in the economical, socio-political and scientific-cultural life of the country or those being prone to similar conditions of development, are declared municipalities.

The commune – a basic territorial administrative unit which includes the rural population reunited by the interests and traditions community, made up of one or more villages depending on the economical, socio-cultural, geographical and demographical conditions. The Villages where the state authorities have their headquarters are capital villages.

The administrative territory – an area delimited by the administrative-territorial organizing law for counties, municipalities, towns and communes. It is made up of the agricultural area (arable land, pastures and hay fields, vineyards and orchards), the forest surface, the infrastructure area (ways

of communications different from the statal ones, power equipment, water system supply), waters and ponds and the built-up area (constructions and arrangements) delimited by the urban plans.

Network of settlements – all the localities from a territory (national, county, functional area) whose existence and development is characterized through relations on multiple levels (politico-administrative, socio-cultural, economical and others). The network of settlements is made of urban and rural settlements.

The functional hierarchy of urban and rural settlements – the classification of the settlements on ranks of importance and territorial importance making possible an efficient population serving system from economical and social point of view, and a balanced development of settlements within the territory.

Rank – an expression of the current and close future importance of a settlement belonging to a network of settlements regarding administration, politics, sociality, economy, culture etc. in accordance with the polarized influence zone dimensions and with the level of decision concerning the allocation of the resources. This importance must find it's correspondence also in the level of modernization.

Metropolitan area – an associated built-up area, based on voluntary partnership between large urban centres (Romanian's capital and the first rank municipalities) and urban and rural settlements in surrounding area, at distances up to 20-30 km, among which cooperative relationships have developed on multiple levels.

Green belt – delimited area around the capital and first rank municipalities in order to protect the nature elements, to prevent uncontrolled extent of municipalities and to provide additional recreational areas.

Development area – delimited area in a municipality or a metropolitan area's administrative territory in which fiscal facilities are proposed in order to encourage the economical development through capital and investment attraction.

Area of influence – the territory and the settlement surrounding an urban centre and which are directly influenced by the town development and by the inter-conditional and cooperation relationships developed on economical activities, food products, social and trading endowments access, infrastructure, recreational areas.

The size of the area of influence depends on the polarizing urban function and size of the centre.

7.2. The Existent Hierarchy of the Urban Settlements, by Ranks (Annex 2):

There were established four urban settlement ranks. The 0 rank includes the country's capital.
The 1st rank consists of municipalities with provincial metropolis status.
Rank II includes other town categories with municipal title.
Rank III includes the other urban settlements.

Table 3. The existent urban settlement hierarchy, by ranks.

Rank	The administrative function	Number of localities
0	Municipium-capital of the country	1
I	Municipium –provincial capital	7
II	Municipium	74
III	Town	181
Total of urban settlements		263

7.2.1. The Hierarchy of the Urban Settlements

7.2.1.1. Favourable Geographical Localization

The international European geo-strategic placement representing development and attraction centres, localized along major transportation lines, axles of international/European importance.

7.2.1.2. Population

Under demographical aspect urban settlements on rank 0 and I must dispose of:

- important number of inhabitants – minimum of 300.000;
- high professional training.

Superior qualified work force, continuously trained, characterized by flexibility/dynamism.

Identity: identifying the specific character of the city, simultaneously with the consciousness of belonging to the same ranked city groups.

7.2.1.3. Accessibility

At international (paneuropean) level: direct access to major paneuropean communication lines (roads, railways, naval and aerial).

At national level: accessibility to the national communication lines network (motorways, roads, express, high-speed railways, sea and river navigation ways, harbours, airport).

7.2.1.4. Economic Functions

These centres must build a high level economical and technological base, very flexible (secondary sector, productive services, socio-cultural and informatics).

7.2.1.5. Endowment

Settlements assure a potential of housing some important qualitative and quantitative functions and equipment at European standards.

The international or European character of these settlements lays in the international or European dimensions and character of its functions and equipments.

7.2.1.6. The Main Endowment Features for Ranks 0 and I.

These urban settlements must house political, judicial and economical institutions of international, national or regional importance.

Parliament, government, ministries and other central authorities, supreme courts (Supreme Court, constitution court, legislative court, embassies and all others).

Headquarters of local public administration, headquarters of decentralized services in the territory of ministries and other central bodies, courts of law, prosecutor's offices, headquarters of political organizations, headquarter of unions, nongovernmental associations and organizations.

National, regional of international level (European) institutions or active international relationships domain.

Branches of international organization headquarters, national institutes of science that cooperate with similar international institutes (academy, national research centres etc.).

Important conference cities for exhibits and market fairs, huge luxury hotels, international schools, well known offices, international referee offices etc.

Foreign and international institutions with permanent headquarters: foreign companies and banks, different other socio-economical institutions, cultural and scientific, nongovernmental international organizations, other diplomatic agencies for trading and tourism etc.

Different branches of organizations, branches and agencies in foreign countries: financial banking headquarter, insurance headquarter of cultural and science organizations.

Other endowment/equipment education, science research (universities, superior education institute, national research institutes or branches of it).

Health: university hospitals and cliniques.

Culture museums, theatres, shops, puppet shows, operas, philharmonic, concert halls, different halls, libraries, publishers, typographies.

Trade, trading services for the population and economical agencies: trade and business centres, stock markets, stock exchange.

Mass-media: radio TV stations of international, national or regional rank, press agencies.

Sports, entertainment: sport facilities, stadiums, sport halls of international level, tourism and entertainment bases, parks, botanical gardens, zoos, casinos, sport and clubs.

Environment protection: agencies of environment protection and ecological services with endowment for maintaining a high quality environment (environmental education, urban hygiene, etc.).

Water supply and sewerages, water supplying network, sewerage systems and water cleaning systems.

Religions: ecumenical centres, endowing bishopric, sees, archdiocese, diocese, authorized religion centres.

Public order, state defence and national security: specific institutions connected to international organizations.

7.2.1.6.1. Zero Rank Urban Settlements

The country's capital with over 2 million inhabitants is included here.

Table 4. Zero rank urban settlements.

Number	Locality	The administrative function		Number of inhabitants at 1. 01. 1999
1.	Bucureşti	Municipium	The capital of Romania	2 021 063

7.2.1.6.2. First Rank Urban Settlements

The following urban settlements are included here: Brasov, Cluj-Napoca, Constanta, Craiova, Galati, Iasi and Timisoara. These seven cities area of influence expands over the historical provinces to which they belong, and thus, they are called provincial metropolis. These are the main factors of balance on macro-territorial level that act as a counterpart to the excessive grow tendency of the 0 rank city, the state capital.

Table 5. First rank urban centres.

Number	Locality	The administrative function	County	Number of inhabitants at 1.01.1998
1.	Braşov	Municipium – county capital	Braşov	315.842
2.	Cluj-Napoca	Municipium – county capital	Cluj	333.607
3.	Constanţa	Municipium – county capital	Constanţa	343.986
4.	Craiova	Municipium – county capital	Dolj	314.437
5.	Galaţi	Municipium – county capital	Galaţi	332.154
6.	Iaşi	Municipium – county capital	Iaşi	349.544
7.	Timişoara	Municipium – county capital	Timiş	326.958

7.2.1.6.3. The Elements and the Endowment Level of the Second Rank Urban Centres

This category of urban centres can be divided into two: municipia and municipia that are county capitals.

7.2.1.6.3.1. Municipia That Are County Capitals

These cities play an important part in the distribution of goods and services. These towns have between 50.000 and 300.000 inhabitants while the number of population in their area of influence is of 200.000 to 500.000 inhabitants. The service radius is about 60 to 80 km. The access to the communication axes: direct access to at least two major transportation axes (main railway, national roads, airports, ports or/and river ports).

Economic functions: industrial means of production, services for production, social, cultural and informative needs, having the county as the area of influence.

The quality of the public utilities/endowments: political, juridical, administrative institutions for the county:

The headquarters for public administration, for ministers in the territory and for non-governmental institutions, for parties, for the unions and for NGOs.

Court-rooms, court-houses, prosecutor's office and other legal institutions

Education and scientific research: institutes of higher education or their subsidiaries, colleges, institutes of research or their national subsidiaries.

Health and social services: university hospital, general hospital, speciality hospitals, county's rescue/ambulance centre, special assistance centres (chronic diseases, handicap, psychiatry) recovery centres, orphanages etc.

Culture: community centres, theatres, concert halls, exposition and conference rooms, clubs, museums, libraries, publishing houses, printing houses etc.

Commerce: commercial services for the populations and for the commercial agents: commercial centre, house of commerce, business centres, stock exchange, showrooms, infrastructure for organizing important fairs etc.

Tourism: three star hotels with at least 200 rooms.

Mass-media: the county's mass-media (radio and television channels), newspapers and magazines.

Finance, banks and insurance: braches and subsidiaries of banks and insurance agencies.

Leisure and sport: areas for leisure and sport, zoos, sport's arenas, stadiums, and other infrastructure for practicing sports (pools, skating rings, sport fields etc.)

Environment protection: agencies for environment protection and equipments for monitoring the environment.

Drinking water and sewage networks: water networks, collecting systems, filtering stations etc.

Religion: churches, temples, episcopates etc.

Transport and communications: rail stations, bus stations, public transportation, post office etc.

Public order and security: the necessary institutions of this kind for the county.

7.2.1.6.3.2. Other Municipia

These categories of towns have between 25.000 and 70.000 inhabitants while the number of the population of their catchment area is between 30.000 to 100.000 inhabitants. The average surface is of a 20 km radius around the city, these towns have direct access to the railway network, national road, county road and easy access towards settlements from the area of influence.

Economic functions: production capacities for the secondary and tertiary sectors and some for agriculture.

Public utilities/endowments:

- public administration, political parties, unions;
- headquarters of the local public administration, of court-house, of parties, of unions etc.

Education and research:

- secondary school, high-school, colleges etc.;
- subsidiaries of the research institutes.

Health and social care: general hospital, rescue/ambulance stations, kindergarten, retirement houses, nurseries, crèches etc.

Culture: community centres, cinema, public libraries, museums, exposition halls, clubs etc.

Commerce and commercial services:

- diversified commercial units, supermarkets, specialized shops, markets;
- units for diversified or/and flexible commercial services.

Tourism: three stars hotel with a minimum of 50 rooms.

Finances, banks and insurance agencies: braches and subsidiaries of banks and insurance agencies.

Leisure and sport: stadium, sport fields, gymnasiums for competitions at the local or county level, public gardens and other green spaces designed for spending the spare time.

Environment protection: services with equipments used for environment protection, monitoring pollutants and urban hygiene/sanitation.

Drinking water and sewage networks: water networks, collecting systems, filtering stations etc.

Religion: parishes, archpriestship.

Transportation and communication: railway station, bus station, post office, telephone exchange.

Public order and security: police stations.

This category of second rank urban settlements includes a large variety of towns from county capitals to other types of municipalities. Demographically these towns are varied: for example Brad in Hunedoara county has 18.244 inhabitants while Ploieşti in Prahova county has 253.068 inhabitants. Same variety can be found in what regards their size, their functions and the size of their area of influence.

Table 6. Second rank urban settlements.

No.	Locality	The administrative function	County	Number of inhabitants at 1.01.1998
1.	Aiud	Municipium	Alba	29.172
2.	Alba Iulia	Municipium – county capital	Alba	72.405
3.	Alexandria	Municipium – county capital	Teleorman	59.308
4.	Arad	Municipium – county capital	Arad	185.272
5.	Bacău	Municipium – county capital	Bacău	210.042
6.	Baia Mare	Municipium – county capital	Maramureş	149.735
7.	Bârlad	Municipium	Vaslui	78.758
8.	Bistriţa	Municipium – county capital	Bistriţa-Năsăud	87.169
9.	Blaj	Municipium	Alba	21.934
10.	Botoşani	Municipium – county capital	Botoşani	128.888
11.	Brad	Municipium	Hunedoara	18.244
12.	Brăila	Municipium – county capital	Brăila	234.201
13.	Buzău	Municipium – county capital	Buzău	149.025
14.	Calafat	Municipium	Dolj	21.394
15.	Caracal	Municipium	Olt	39.263
16.	Caransebeş	Municipium	Caraş-Severin	31.289
17.	Carei	Municipium	Satu Mare	25.517
18.	Călăraşi	Municipium – county capital	Călăraşi	77.819
19.	Câmpina	Municipium	Prahova	40.755
20.	Câmpulung	Municipium	Argeş	44.289
21.	C. Moldovenesc	Municipium	Suceava	21.672
22.	C. de Argeş	Municipium	Argeş	35.135
23.	Dej	Municipium	Cluj	41.191
24.	Deva	Municipium – county capital	Hunedoara	77.259
25.	Dorohoi	Municipium	Botoşani	35.482
26.	Drăgăşani	Municipium	Vâlcea	22.625
27.	D. T. Severin	Municipium – county capital	Mehedinţi	118.734
28.	Făgăraş	Municipium	Braşov	44.792
29.	Fălticeni	Municipium	Suceava	33.993
30.	Feteşti	Municipium	Ialomiţa	36.546
31.	Focşani	Municipium – county capital	Vrancea	99.527

32.	Giurgiu	Municipium – county capital	Giurgiu	73.260
33.	Hunedoara	Municipium	Hunedoara	80.196
34.	Huşi	Municipium	Vaslui	33.483
35.	Lugoj	Municipium	Timiş	48.974
36.	Mangalia	Municipium	Constanţa	44.083
37.	Medgidia	Municipium	Constanţa	47.078
38.	Mediaş	Municipium	Sibiu	62.851
39.	Miercurea Ciuc	Municipium – county capital	Harghita	47.073
40.	O. Secuiesc	Municipium	Harghita	39.768
41.	Oltenița	Municipium	Călăraşi	31.695
42.	Oneşti	Municipium	Bacău	60.497
43.	Oradea	Municipium – county capital	Bihor	223.190
44.	Oraştie	Municipium	Hunedoara	24.604
45.	Paşcani	Municipium	Iaşi	45.809
46.	Petroşani	Municipium	Hunedoara	52.195
47.	Piatra Neamț	Municipium – county capital	Neamț	125.050
48.	Piteşti	Municipium – county capital	Argeş	187.558
49.	Ploieşti	Municipium – county capital	Prahova	253.068
50.	Rădăuți	Municipium	Suceava	32.165
51.	Râmnicu Sărat	Municipium – county capital	Buzău	42.040
52.	R. Vâlcea	Municipium – county capital	Vâlcea	119.581
53.	Reghin	Municipium	Mureş	39.199
54.	Reşița	Municipium – county capital	Caraş-Severin	94.320
55.	Roman	Municipium	Neamț	82.110
56.	Roşiori de Vede	Municipium	Teleorman	36.893
57.	Satu Mare	Municipium – county capital	Satu Mare	130.573
58.	Sf. Gheorghe	Municipium – county capital	Covasna	67.108
59.	Sibiu	Municipium – county capital	Sibiu	170.038
60.	S. Marmației	Municipium	Maramureş	44.537
61.	Sighişoara	Municipium	Mureş	36.269
62.	Slatina	Municipium – county capital	Olt	87.608
63.	Slobozia	Municipium – county capital	Ialomița	56.913
64.	Suceava	Municipium – county capital	Suceava	118.670
65.	Târgovişte	Municipium – county capital	Dâmbovița	99.137
66.	Târgu Jiu	Municipium – county capital	Gorj	98.897
67.	Târgu Mureş	Municipium – county capital	Mureş	165.835
68.	Tecuci	Municipium	Galați	46.485
69.	Tulcea	Municipium – county capital	Tulcea	96.813
70.	T. Măgurele	Municipium	Teleorman	35.879
71.	Turda	Municipium	Cluj	61.227
72.	Urziceni	Municipium	Ialomița	19.179
73.	Vaslui	Municipium – county capital	Vaslui	79.658
74.	Zalău	Municipium – county capital	Sălaj	71.580

7.2.1.6.4. Third Rank Urban Settlements

The settlements comprised in this category have a population comprised between 5000 and 30000 inhabitants and a catchment area that comprises another 5000-40000 inhabitants. The service radius is about 10 to 20 km. This category includes 181 towns.

Communication: these towns have direct access to a national road or county road, to a urban centre of superior rank and easy access towards settlements from the area of influence.

Economic functions: production capacities for the secondary sector (manufacturing and construction), tertiary sector (social and commercial services) and primary sector (mining, agriculture, fishing, logging).

Public utilities/endowments:

- public administration, city-hall, court house, prosecutor's office, notary;
- headquarters of various associations.

Education and research: pre-school education, primary, secondary school, high-school.

Health and social care: general hospital, ambulance stations, maternity, pharmacy, retirement houses, nurseries, crèches etc.

Culture: community centres, cinema, public libraries, museums, exposition halls, clubs etc.

Commerce and commercial services: department stores, specialized stores, food market.

Tourism: two stars hotel with a minimum of 50 rooms.

Finances, banks and insurance agencies: braches and subsidiaries of banks and insurance agencies.

Leisure and sport: small stadium, sport fields, gymnasiums for competitions at the local public gardens and other green spaces designed for spending the spare time.

Environment protection: services with equipments used for environment protection.

Drinking water and sewage networks: water networks, collecting systems, filtering stations etc.

Religion: churches.

Transportation and communication: bus station, post office, telephone exchange, sometimes a railway station.

Public order and security: police stations.

Table 7. Third rank urban settlements.

No.	Locality	The administrative function	County	Number of inhabitants at 1.01.1998
1.	Abrud	Town	Alba	7.011
2.	Adjud	Town	Vrancea	20.825
3	Agnita	Town	Sibiu	12.258
4.	Aleşd	Town	Bihor	10.893
5.	Anina	Town	Caraş-Severin	10.863
6.	Aninoasa	Town	Hunedoara	6.212
7.	Avrig	Town	Sibiu	16.177
8.	Azuga	Town	Prahova	6.224
9.	Babadag	Town	Tulcea	10.853
10.	Baia de Aramă	Town	Mehedinți	5.772
11.	Baia de Arieş	Town	Alba	4.905
12.	Baia Sprie	Town	Maramureş	15.836
13	Balş	Town	Olt	23.266
14.	Baraolt	Town	Covasna	10.514
15.	Basarabi	Town	Constanța	11.063
16.	Băicoi	Town	Prahova	20.251
17.	Băile Govora	Town	Vâlcea	3.180
18.	Băile Herculane	Town	Caraş-Severin	6.147

19.	Băile Olăneşti	Town	Vâlcea	4.836
20.	Băile Tuşnad	Town	Harghita	1.820
21.	Băileşti	Town	Dolj	22.237
22.	Bălan	Town	Harghita	9.604
23.	Beclean	Town	Bistrița-Năsăud	11.985
24.	Beiuş	Town	Bihor	12.275
25.	Bereşti	Town	Galați	3.873
26.	Bicaz	Town	Neamț	8.898
27.	Bocşa	Town	Caraş-Severin	19.171
28.	Boldeşti-Scăieni	Town	Prahova	11.531
29.	Bolitin-Vale	Town	Giurgiu	11.552
30.	Borsec	Town	Harghita	3.114
31.	Borşa	Town	Maramureş	27.311
32.	Breaza	Town	Prahova	19.000
33.	Brezoi	Town	Vâlcea	7.650
34.	Budeşti	Town	Călăraşi	9.649
35.	Buftea	Town	Ilfov	19.807
36.	Buhuşi	Town	Bacău	21.872
37.	Bumbeşti-Jiu	Town	Gorj	11.925
38.	Buşteni	Town	Prahova	11.843
39.	Buziaş	Town	Timiş	8.158
40.	Cavnic	Town	Maramureş	5.543
41.	Călan	Town	Hunedoara	14.725
42.	Călimăneşti-Căciulata	Town	Vâlcea	9.084
43.	Câmpeni	Town	Alba	8.537
44.	Câmpia Turzii	Town	Cluj	29.948
45.	Cehu Silvaniei	Town	Sălaj	8.599
46.	Cernavodă	Town	Constanța	20.762
47.	Chişineu-Criş	Town	Arad	8.798
48.	Cisnădie	Town	Sibiu	17.144
49.	Codlea	Town	Braşov	24.668
50.	Comarnic	Town	Prahova	13.573
51	Comăneşti	Town	Bacău	25.960
52.	Copşa Mică	Town	Sibiu	5.110
53.	Corabia	Town	Olt	22.140
54.	Costeşti	Town	Argeş	12.340
55.	Covasna	Town	Covasna	12.362
56.	Cristuru Secuiesc	Town	Harghita	11.274
57.	Cugir	Town	Alba	30.599

58.	Curtici	Town	Arad	9.682
59.	Dărăbani	Town	Botoşani	11.970
60.	Dărmăneşti	Town	Bacău	14.198
61.	Deta	Town	Timiş	7.111
62.	Drăgăneşti-Olt	Town	Olt	13.222
63.	Dumbrăveni	Town	Sibiu	8.872
64.	Eforie	Town	Constanța	9.426
65.	Făget	Town	Timiş	7.520
66.	Făureni	Town	Brăila	4.593
67.	Fieni	Town	Dâmbovița	8.202
68.	Filiaşi	Town	Dolj	20.254
69.	Fundulea	Town	Călăraşi	6.220
70.	Găeşti	Town	Dâmbovița	16.887
71.	Gheorgheni	Town	Harghita	21.550
72.	Gherla	Town	Cluj	24.276
73.	Gura Humorului	Town	Suceava	16.839
74.	Hațeg	Town	Hunedoara	12.604
75.	Hârlău	Town	Iaşi	12.223
76.	Hârşova	Town	Constanța	11.160
77.	Horezu	Town	Vâlcea	7.412
78.	Huedin	Town	Cluj	10.114
79.	Ianca	Town	Brăila	12.826
80.	Iernut	Town	Mureş	9.842
81.	Ineu	Town	Arad	10.332
82.	Isaccea	Town	Tulcea	5.627
83.	Însurăței	Town	Brăila	7.478
84.	Întorsura Buzăului	Town	Covasna	9.042
85.	Jibou	Town	Sălaj	12.262
86	Jimbolia	Town	Timiş	10.615
87.	Lehliu Gară	Town	Călăraşi	6.666
88.	Lipova	Town	Arad	11.614
89.	Luduş	Town	Mureş	18.691
90.	Lupeni	Town	Hunedoara	31.869
91.	Măcin	Town	Tulcea	11.972
92.	Mărăşeşti	Town	Vrancea	13.125
93.	Marghita	Town	Bihor	18.699
94.	Mihăileşti	Town	Giurgiu	7.184
95.	Mioveni	Town	Argeş	35.563
96.	Mizil	Town	Prahova	17.199
97.	Moineşti	Town	Bacău	25.665

98.	Moldova Nouă	Town	Caraş-Severin	15.416
99.	Moreni	Town	Dâmbovița	23.418
100.	Motru	Town	Gorj	26.435
101.	Nădlac	Town	Arad	8.403
102.	Năsăud	Town	Bistrița-Năsăud	11.454
103.	Năvodari	Town	Constanța	34.670
104.	Negreşti	Town	Vaslui	10.285
105.	Negreşti-Oaş	Town	Satu Mare	16.347
106.	Negru Vodă	Town	Constanța	5.632
107.	Nehoiu	Town	Buzău	12.693
108.	Novaci	Town	Gorj	6.326
109.	Nucet	Town	Bihor	2.928
110.	Ocna Mureş	Town	Alba	15.798
111.	Ocna Sibiului	Town	Sibiu	4.240
112.	Ocnele Mari	Town	Vâlcea	3.601
113.	Odobeşti	Town	Vrancea	7.968
114.	Oravița	Town	Caraş-Severin	15.351
115.	Orşova	Town	Mehedinți	15.487
116.	Oțelu Roşu	Town	Caraş-Severin	13.188
117.	Ovidiu	Town	Constanța	13.279
118.	Panciu	Town	Vrancea	9.841
119.	Pâncota	Town	Arad	7.407
120.	Petrila	Town	Hunedoara	29.076
121.	Piatra Olt	Town	Olt	6.590
122.	Plopeni	Town	Prahova	10.272
123.	Pogoanele	Town	Buzău	7.621
124.	Predeal	Town	Braşov	6.825
125.	Pucioasa	Town	Dâmbovița	16.624
126.	Râşnov	Town	Braşov	16.487
127.	Rovinari	Town	Gorj	13.065
128.	Rupea	Town	Braşov	6.192
129.	Salonta	Town	Bihor	20.227
130.	Săcele	Town	Braşov	29.876
131.	Săveni	Town	Botoşani	8.665
132.	Sângeorz Băi	Town	Bistrița-Năsăud	10.648
133.	Sânnicolau Mare	Town	Timiş	12.933
134.	Scorniceşti	Town	Olt	13.714
135.	Sebeş	Town	Alba	29.806
136.	Sebiş	Town	Arad	6.936
137.	Segarcea	Town	Dolj	8.716

138.	Seini	Town	Maramureş	9.428
139.	Simeria	Town	Hunedoara	14.548
140.	Sinaia	Town	Prahova	14.939
141.	Şimleu Silvaniei	Town	Sălaj	17.045
142.	Siret	Town	Suceava	10.130
143.	Slănic	Town	Prahova	7.311
144.	Slănic Moldova	Town	Bacău	5.385
145.	Solca	Town	Suceava	4.684
146.	Sovata	Town	Mureş	12.112
147.	Strehaia	Town	Mehedinți	12.495
148.	Sulina	Town	Tulcea	5.209
149.	Ştei	Town	Bihor	9.530
150.	Tălmaciu	Town	Sibiu	9.140
151.	Tăşnad	Town	Satu Mare	10.128
152.	Târgu Bujor	Town	Galați	8.052
153.	Târgu Cărbuneşti	Town	Gorj	9.324
154.	Târgu Frumos	Town	Iaşi	13.902
155.	Târgu Lăpuş	Town	Maramureş	14.107
156.	Târgu Neamț	Town	Neamț	22.598
157.	Târgu Ocna	Town	Bacău	14.161
158.	Târgu Secuiesc	Town	Covasna	22.646
159.	Târnăveni	Town	Mureş	29.996
160.	Techirghiol	Town	Constanța	7.321
161.	Teiuş	Town	Alba	7.331
162.	Titu	Town	Dâmbovița	10.827
163.	Toplovița	Town	Harghita	16.774
164.	Topoloveni	Town	Argeş	10.272
165.	Țăndăeni	Town	Ialomița	14.549
166.	Țicleni	Town	Gorj	5.147
167.	Uricani	Town	Hunedoara	12.494
168.	Urlați	Town	Prahova	12.081
169.	Valea lui Mihai	Town	Bihor	10.683
170.	Vaşcău	Town	Bihor	3.106
171.	Vatra Dornei	Town	Suceava	17.937
172.	Vălenii de Munte	Town	Prahova	13.905
173.	Vânju Mare	Town	Mehedinți	7.193
174.	Victoria	Town	Braşov	10.918
175.	Videle	Town	Teleorman	12.571
176.	Vişeu de Sus	Town	Maramureş	18.553
177.	Vlăhița	Town	Harghita	7.432

178.	Vulcan	Town	Hunedoara	34.222
179.	Zărneşti	Town	Braşov	26.563
180.	Zimnicea	Town	Teleorman	16.825
181.	Zlatna	Town	Alba	9.336

7.2.1.7. Areas lacking urban settlements

At the national level 17 of these types of areas were identified, most of them being located outside the Carpathian rim. These areas urgently need a series of actions in order to increase the quality of the endowments (public facilities) and the diversity of functions in order to limit the migration of the populations from these areas.

Table 8. Areas of 25-30km lacking urban settlements that urgently require the establishing of some inter-communal service settlements.

Zone	County	Approximate surface (ha)	Number ofinhabitants at 1.01.1997	Number of communes	Number of villages
Zone 1	Constanţa	147.156	25.319	8	31
	Tulcea	181.397	40.221	14	52
	Total zone 1	**328.553**	**65.540**	**22**	**83**
Zone 2	Constanţa	157.150	35.966	11	51
	Total zone 2	**157.150**	**35.966**	**11**	**51**
Zone 3	Brăila	36.115	13.826	4	15
	Călăraşi	30.834	11.893	2	6
	Ialomiţa	80.898	31.304	10	26
	Total zone 3	**147.847**	**57.023**	**16**	**47**
Zone 4	Argeş	84.586	44.592	13	52
	Olt	57.019	33.305	10	27
	Teleorman	82.339	46.339	14	50
	Total zone 4	**223.944**	**124.236**	**37**	**129**
Zone 5	Dolj	177.423	104.363	21	52
	Total zone 5	**177.423**	**104.363**	**21**	**52**
Zone 6	Dolj	33.764	12.436	4	41
	Gorj	65.823	41.488	11	74
	Vâlcea	184.012	120.905	35	279
	Total zone 6	**283.599**	**174.829**	**50**	**394**
Zone 7	Dolj	102.778	40.057	17	72
	Mehedinţi	79.882	39.368	11	31
	Total zone 7	**182.660**	**79.425**	**28**	**103**
Zone 8	Arad	152.554	30.579	12	83
	Timiş	53.713	7.192	6	28
	Total zone 8	**206.267**	**37.771**	**18**	**111**
Zone 9	Arad	29.019	8.560	3	19
	Bihor	75.393	34.731	10	60
	Total zone 9	**104.412**	**43.291**	**13**	**79**
Zone 10	Sălaj	141.983	32.544	13	70
	Total zone 10	**141.983**	**32.544**	**13**	**70**
Zone 11	Mamamureş	41.417	24.466	5	33
	Sălaj	48.481	14.673	7	52
	Total zone 11	**89.898**	**39.139**	**12**	**85**
Zone 12	Bistriţa-Năsăud	82.187	31.849	11	67
	Cluj	44.716	19.436	8	42
	Mureş	68.322	40.922	14	104
	Total zone 12	**195.225**	**92.207**	**33**	**213**

Zone 13	Botoşani	118.290	71.093	17	89
	Iaşi	59.072	29.270	7	39
	Total zone 13	**177.362**	**100.363**	**24**	**128**
Zone 14	Iaşi	49.789	32.174	9	31
	Vaslui	46.054	24.415	8	41
	Total zone 14	**95.843**	**56.589**	**17**	**72**
Zone 15	Bacău	134.037	66.728	20	176
	Iaşi	43.213	35.076	8	60
	Neamț	22.398	12.595	4	28
	Vaslui	222.906	99.253	27	198
	Total zone 15	**422.554**	**213.652**	**59**	**462**
Zone 16	Buzău	159.832	98.670	29	241
	Vrancea	228.597	75.703	22	149
	Total zone 16	**388.429**	**174.373**	**51**	**390**
Zone 17	Brăila	59.288	15.812	7	27
	Buzău	13.203	4.687	2	6
	Galați	94.792	72.897	13	26
	Vrancea	33.965	14.193	4	17
	Total zone 17	**201.248**	**107.589**	**26**	**76**

7.3. The Ranks of Rural settlements

The P.A.T.N. distinguishes between two types and two ranks of settlements.

7.3.1. The Hierarchy of the Rural Settlements

Rural settlements are divided in two ranks: commune centres and villages part of a commune or a town. These villages are very different from a locational, demographical and economic potential point of view.

Table 9. The ranks of rural settlements.

Number	Rank	Administrative function
1.	IV	Villages that are commune centres
2.	V	Villages part of a commune or a town

7.3.1.1. The Elements and the Endowment Level of the Fourth Rank Rural Settlements

The fourth rank settlements are the villages that are commune centres. This service village has to have some minimum endowments like: mayoralty, kindergarten, primary and secondary schools, dispensary, pharmacy, post office, telephone, police station, community centre with a library, department store, sport field, parish, cemetery, bus station or small railway station, veterinary practice, fire station, waste storage area.

7.3.1.2. The Elements and the Endowment Level of the Fifth Rank Rural Settlements

The fifth rank settlements are the villages that are part of a commune or a town. The number and the quality of the endowments and commercial services depend on the number of the inhabitants and the functions of the settlements. The minimum public facilities in the villages of over 200 inhabitants are: primary school, first aid point, shop for food and tools. All these facilities are necessary even for villages under 200 inhabitants in the case of isolated villages that are more than 3-5km apart from the nearest villages with that can provide these minimum services.

7.3.2. The Requirements to Be Met In Order For a New Commune to Be Established

In order for a new administrative centre to be established some quantitative and qualitative thresholds need to be met while at the same time the settlement's previous administrative history needs

to be examined. Fore example the commune to be needs to have at least 1500 inhabitants and a history as a former commune centre. These together with the potential deriving from its geographical position and the future viably of the proposed administrative structures need to be taken into consideration. Not at least, an excessive local patriotism and political agenda need to be discouraged.

Table 10. Criteria for the establishment of a new commune.

1.	The minimum number of population needed: 1500 inhabitants
2.	Economic potential in order to ensure a stable budget for the commune
3.	There need to be roads (dust roads) or railway connections between the commune and its pertaining villages
4.	Previous commune status
5.	The distance between the service village(commune centre) and the rest of the villages needs to be reduced from over 10km to less than 5km
6.	Proper buildings for public facilities and institutions: ▪ mayoralty; ▪ primary and secondary schools; ▪ human dispensary, pharmacy; ▪ police station; ▪ small railway station or bus station. After the establishment of the new commune the necessary public utilities need to be established in the new service village, according to annex no. IV, chapter 2.

The mentioned requirements mentioned at chapter 4 have to be met by the remaining commune after the separation from the new commune.

7.3.3. Critical Rural Areas

In each county there are areas that have being going through an intense demographic depletion during the last 40 years. At the national level there are 681 communes in this situation (25.4% of the total number of communes) that concentrate approximately 20% of the total rural population. These communes tend to regress so their keeping afloat implies a concentrated action (economic, ecologic, social, educational etc.) In the current economic and social-political context this is hard to accomplish. A certain category of villages from these communes are permanently on the slope of regression due to their excessive population depletion.

Table 11. Communes that registered an intense population depletion during the period between 1966 and 1997 that are in need of interventions in order to revitalize them.

No.	County	Communes that registered population depletion							
		Decrease of 30,1-50 %				Decrease of over 50 %			
		Number of communes	% of the.total number of communes	% of the total surface	% of the total population	Number of communes	% of the.total number of communes	% of the total surface	% of the total population
1.	Alba	24	36,4	27,5	27,4	9	13,8	9,3	5,9
2.	Arad	20	29,9	44,5	22,3	5	7,5	7,0	2,8
3.	Argeş	20	21,5	20,6	17,0	3	3,2	14,1	3,0
4.	Bacău	14	17,7	13,1	10,7	2	2,5	2,0	1,0
5.	Bihor	23	26,7	21,6	21,1	4	1,2	1,5	0,7
6.	Bistriţa-Năsăud	4	7,5	5,0	4,9	3	5,7	2,9	2,2
7.	Botoşani	34	50,0	45,8	40,5	1	1,6	1,0	1,2
8.	Braşov	12	27,9	2,9	18,1	2	4,7	2,6	1,6
9.	Brăila	17	43,6	39,2	35,3	2	5,1	3,0	2,1
10.	Buzău	29	35,8	29,5	25,5	4	4,9	2,0	1,2
11.	Caraş-Severin	22	31,9	27,4	25,4	7	10,1	5,1	4,7
12.	Călăraşi	16	33,3	32,2	27,1	4	8,3	6,2	3,9
13.	Cluj	29	39,2	37,7	31,6	18	24,3	22,7	18,8
14.	Constanţa	11	21,2	19,8	14,4	3	5,8	5,1	1,7
15.	Covasna	2	6,1	2,0	3,1	-	-	-	-

16.	Dâmbovița	1	1,3	1,6	0,5	-	-	-	-
17.	Dolj	36	38,3	33,1	27,5	4	4,3	3,9	2,1
18.	Galați	16	28,6	24,2	15,2	-	-	-	-
19.	Giurgiu	13	28,3	25,5	18,8	3	6,5	6,2	3,7
20.	Gorj	2	3,2	1,6	1,6	-	-	-	-
21.	Harghita	6	12,2	12,1	7,1	1	2,0	1,1	0,7
22.	Hunedoara	18	32,1	21,8	28,3	11	19,6	11,9	8,7
23.	Ialomița	22	44,9	36,1	35,0	3	6,4	6,8	8,0
24.	Iași	10	11,8	9,7	6,8	1	1,2	0,5	0,3
25.	Ilfov	3	7,9	9,1	3,0	-	-	-	-
26.	Maramureș	5	8,1	4,1	2,9	-	-	-	-
27.	Mehedinți	25	42,4	35,3	33,1	6	10,2	8,8	6,6
28.	Mureș	27	30,0	20,3	19,5	8	8,9	5,5	4,0
29.	Neamț	10	14,3	9,4	8,3	-	-	-	-
30.	Olt	16	17,0	17,1	12,6	1	1,1	0,8	0,4
31.	Prahova	3	3,5	2,6	1,0	1	1,2	0,6	0,2
32.	Satu Mare	24	42,9	68,0	31,0	-	-	-	-
33.	Sălaj	26	47,3	48,3	40,9	5	9,1	9,5	4,7
34.	Sibiu	15	28,3	25,5	25,8	8	15,1	11,1	7,4
35.	Suceava	1	1,1	0,5	0,5	-	-	-	-
36.	Teleorman	36	43,4	40,8	38,8	4	4,8	3,7	2,2
37.	Timiș	26	34,7	34,8	28,1	4	5,3	3,6	0,8
38.	Tulcea	14	32,6	44,4	24,2	3	7,0	5,6	2,5
39.	Vaslui	31	43,7	39,9	35,6	1	1,4	0,9	0,7
40.	Vâlcea	10	13,0	12,1	7,9	-	-	-	-
41.	Vrancea	8	13,6	11,2	9,5	-	-	-	-
TOTAL		**681**	**25,4**	**23,7**	**17,5**	**128**	**4,8**	**4,3**	**1,8**

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