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REGIONAL PLANNING AND PROJECTS LOCATION
(Dictionary)

P R E F A C E

Regional planning, i.e. elaboration of plans and programmes for the sub-national regions of a country, is increasingly developing through the African continent. About thirty African countries have already created central agencies which deal exclusively with the regional plans and physical planning.

Meanwhile, the UNIDO Seminar on industrial location and regional development (August 1968, Minsk, Belorussian S.S.R.) in its report pointed out that 'a major difficulty confronting planners and administrators concerned with regional development and industrial location was the lack of a standardized terminology for working purposes' (ID/WG.9/20, p. 20). It was recommended that some actions should be undertaken in order to eliminate this difficulty.

This dictionary which has been prepared within the UN Economic Commission for Africa, may be regarded as a step forward in filling the gap in the regional planning manuals. The main ends of the dictionary are as follows:

- (1) To bring into conformity, as near as possible, the existing terms, to eliminate unnecessary divergences and to standardize the definitions.
- (2) To enrich the international terminology in that field by some unique but practically useful terms applied in some countries, especially in African nations.
- (3) To acquaint the African planners with modern terminology in domain of regional planning and, where possible, to give them commonly used techniques of planning in that field.

In such a controversial atmosphere of definitions, as it is relevant to economic sciences, a conventional guideline to confirm various notions had to be found. Thus, the order of preferences has been taken as follows: Firstly, all the definitions already adopted by any UN body and proved to be correct and commonly acceptable have the priority. Secondly, the viewpoint of a country was taken where a given phenomenon got the most evident development and practical solution. The third place in order of priorities was given to the viewpoints of the known scientists.

The notions of the dictionary are arranged in alphabetical order. There are some conventional symbols to be noted:

- *CIRCUMCONNECTION - a neologism which is already in use in one or more countries and is to be introduced into international glossary.
- (DISTRESSED REGION) - a notion which is used by some scholars but not recommended for international use; the recommended one is hereby noticed (see:).

(q.v.) or (see:) - it marks the notion which may be found separately, on its alphabetical place.

The dictionary includes a bibliography comprising about 160 titles which have been attached to the respective articles. As a rule, all the references include the publications in English and French only, but some theoretical studies are given also in other languages.

The dictionary should be regarded as a subject to further corrections and improvements.

 ** A **
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ABSOLUTE DATA basic data of the statistics, including regional statistics, collected by direct measurements (censuses, samples, questionnaires) and represented by subject and its quantity in respective units (for a country: space, say 500,000 square km, population 2 millions of inhabitants, maize production, for a certain year, 100,000 tons, etc.). The absolute data are used to calculate relative data (q.v.), which reflect the relation between two indicators (for example, for the same country, density of population will be 4 persons per square km, maize production 50 kg per capita, etc.).

ACCESSIBILITY in regional planning, means availability of transport connection between central and peripheral places. Often is understood as access to the central (district, provincial, national, international) market, though this term includes all kinds of relations depending on transport (e.g., tourist movements). It is classified: (a) By type of transport (with a remark, if seasonal differences occur); (b) by the rank of central place. Quantitative indicators: cost of accessibility (transport cost per ton of general goods delivered from the subordinated to the central place, or vice versa); index of accessibility (percentage of the region's population living within accessible/walkable distance from the pick-up points or service centres).

Bibl: Forbes, J., Mapping accessibility; Scottish Geographical Magazine, 1964, Vol. 80, pp. 12-21.

ADJUSTED EXPENDITURE a sort of shadow prices used in some countries for locational planning. The main aim is to make comparable two different types of expenditures: capital and current. If there are given for a project, two alternative standorts, different in expenditures as it is shown below:

	Capital expenditure:	Current expenditure:	Annual shipment:
Standort A	500 unit	100 unit	200 unit
Standort B	400 unit	120 unit	200 unit

so, there is an evident difficulty in selection of the more economical place of location; since the standort A gives savings in current expenditure, while its rival is more attractive in terms of capital investment. If it is known that capital expenditure is to be refunded in 10 years, the comparison can be done in adjusted expenditure, which is:

$$\frac{\text{Capital expenditure}}{\text{Refund time}} + \text{Current expenditure.}$$

Thus, for both projects, the adjusted expenditure are:

$$A = \frac{500}{10} + 100 = 150; \quad B = \frac{400}{10} + 120 = 160.$$

With the same sales (200 units), the project A gives more profit (200-150 = 50 unit) than the project B (200-160 = 40 unit), and is more preferable.

The exercise has been facilitated by availability of approved "normatives of depreciation" for each industry (per cent of capital investment to be refunded each year), or "refund periods" (the total period during which the capital investment has to be refunded). Evidently, both indicators are reciprocative, e.g. the normative of depreciation, say, 10 per cent (1/10) means 10 years of the refund period.

ADMINISTRATIVE REGION territorial part of the governmental machinery (province, department, district, etc.) created for supervisory and legal purposes for respective area. It possesses an administrative staff which repeats, usually, the structure of the central apparatus, though in miniature. In most countries, among the duties assigned to the regional administration there is also its responsibility for regional development, with various degree of sovereignty in that field. This task is often hampered by the fact that administrative sub-divisions are in contradiction with economic regions' (q.v.) network. Meanwhile, bearing in mind that governmental activities are implemented mostly through the administrative machinery (budgeting, crediting, statistical, health, education, etc.), it is obvious that despite its faults, the administrative region could be used as a planning region (q.v.), until proper planning unit emerge. See also: region, regionalization of territory.

Bibl: Administrative Aspects of Planning in Development Countries.
UN Meeting of Experts on Administrative Aspects of National Development Planning, Paris, 8-19 June 1964.

ADVANCED REGION is that which has its economic and social indicators above the country average (the main indicator could be the income per capita). This term defines only the level of regional development, and not the tempo of growth. Another remark: the classification of regions by level of development is relative to the country's average. An advanced region for the country "A" may be regarded as an under-developed region from the country "B" viewpoint.

AGGLOMERATION

(1) Process of merging of several settlements into one single urbanized area. It grows up in two ways: either it develops through expansion of a central city which swallows the neighbouring suburbs, or it grows up through amalgamation of two or more settlements of approximately equal size and economic importance. In the latter case agglomeration is called conurbation (q.v.). The term agglomeration underlines mainly the territorial expansion of the settlements. The economic and social aspects of this process are covered by the term urbanization (q.v.).

(2) The tendency to locate industrial enterprises as near to each other as possible. The main economic reason for such a territorial concentration is the full utilization of the agglomeration effect (q.v.).

(3) Sometimes, the big cities with population of 1 million and more are called agglomerations. See: metropolis.

AGGLOMERATION EFFECT the term was introduced by one of the classics of the location theory, Alfred Weber, in order to identify the third important factor (besides those like transport costs and labour) determining the location preference. Generally, the agglomeration effect means all the advantages provided by the territorial concentration of economic activities, especially industrial enterprises. These advantages are:

(1) external economies (inter-linkage with specialized enterprises within the area, relying on the common infrastructural facilities, etc.);

(2) use of industrial estates;

(3) lessening of transport costs in input-output relations among the enterprises, securing a better continuity of the productive process, savings in storage facilities;

(4) better possibility for economies of scale operations;

(5) better marketing possibilities within the agglomerated partners;

(6) better supply by qualified manpower.

As for social life, agglomeration provides better servicing in the field of education, health, culture, etc.. Besides, the average salary and family income in agglomeration are usually higher, and employment opportunity and variety better, than elsewhere, what makes it more attractive for population. If measured for a single enterprise, the agglomeration effect is the benefit gained by location of the former in the agglomeration in comparison with the variant of its location outside the latter.

Agglomeration effect is not a permanent factor, and has its limits, what may be seen in over-crowded and over-concentrated places (see: over-concentration).

Bibl: A. Weber - Über den Standort der Industrien, Tübingen 1909.

AGRICULTURAL ZONE is an area marked by some sort of homogeneity of both the physical-geographical features (soil, climate, water resources etc.) and economic conditions (accessibility to markets, labour know-how, etc.) which make this area proper for specific crops, husbandry, hunting, natural fruits gathering, and generally - for a specific type of agriculture. The agricultural zoning should be done, firstly, from the viewpoint of natural resources, and then, bearing in mind economic

situation; thus, within a physical geographic zone some sub-zones, according to economic productivity and profitability, may be identified.

AGRICULTURE MAPPING embraces a number of methods and maps necessary for regional planning. An auxiliary role is played by natural conditions map (soil, height, rainfall, insolation). Special economic maps may be classified as follows: (a) agriculture production maps-crops and livestock shown by using of dot method (each dot represents a certain amount of yield, or a certain number of cattle); (b) agriculture production units map - location, size and specialization of co-operatives, state ranches and other units, shown by symbols; (c) agriculture services map - agriculture and veterinary camps, tse-tse control stations, research stations, tractorization and mechanization centres, etc., shown by symbols; (d) agriculture marketing map - marketing centres, depots, feeder roads; (e) agriculture income map - total agriculture income and income per capita shown by economic or planning regions; for this purpose, a combination of diagrammatic and choropleth maps may be recommended. See also: cartographic methods, maps for regional planning.

AGRO-ALLIED INDUSTRIES entire complex of activities that service and supply agriculture and that process agriculture products of the farms, and therefore are connected directly with the agricultural production. They are divided into two big groups:

Agro-processing industries - those which use the agriculture product as their raw material, and

Agro-servicing industries - those which secure the normal productive process in agriculture, like tractor mechanization camps, fertilizer distribution, providing with packing material, repairs, etc..

AGRO-INDUSTRIAL CENTRE settlement concentrating on both agro-allied and agro-processing industries and serving as a focal point of an attached agricultural area; very often, it carries also administrative functions for the area.

AGRO-INDUSTRIAL COMPLEX an object of location consisting of: (a) producers of agricultural raw materials, and (b) industrial enterprise(s) processing those materials. Both elements are located in the same area where processing unit plays the role of central object (q.v.). Processing capacity usually coincides with crop growing (or cattle growing) capacity of the attached area. The close territorial and technological connections create possibility for manoeuvring by manpower and other capacities according to fluctuation in the intensity of work in both elements (very often the periods of intensity in crop growing and in processing do not coincide seasonally). Relations between growing and processing enterprises usually are arranged by special agreements (in crediting, marketing, transportation, etc.). In some cases both elements work under the same supervision.

Bibl: Bredo, W., Rural industrialization for agricultural development; Stanford Research Institute, Menlo Park, Cal., 1959.

AGRO-PROCESSING INDUSTRIES are those which get their raw materials directly from agriculture and are performing the primary manufacturing of them. By standard classification, these industries may belong to various branches, but food industries are overwhelming (fruit canning, sugar plant, oil plant, etc.); among others: tobacco industry (tobacco barn), textile industry (cotton ginney), leather industry (tanning), and so on. Due to the specific reasons, the agro-processing enterprises tend to locate within the growing areas of the respective agriculture raw materials. The produce of agro-processing has usually better transportation characteristic, thus the secondary processing may be located far from the zone of primary sources, in urban centres. Development of agro-processing industries is regarded as one of the radical measures to make rural areas more profitable for the peasants and to stop "rural exodus" hereby.

Bibl: Moses, M., The Impact of Industrial Processing on Puerto-Rico's Agricultural Economy: Economic Development Administration, San Juan, 1959.

AGRO-SERVICING INDUSTRIES (institutions) are those which secure the normal productive process in agriculture. They may be represented by:

- (a) productive auxiliary enterprises (tractorization unit, fertilizer mixers and distributors, energy supply, packing manufacture, storage facilities, etc.);
- (e) scientific and educational centres (meteorologic stations, training centres, agriculture demonstration camps, radio-forum, etc.);
- (c) prophylactic services (tse-tse control, veterinary camps);
- (d) credit and marketing institutions.

AIR POLLUTION see: environmental pollution.

ALTERNATIVE PROJECTS two (or more) projects aiming to a similar goal but differing in means and ways to reach it. E.g., transport link between the points A and B may be done by various means of transport (road, rail, waterway) and by different itineraries. Evidently, each competing project brings different side-effects and has an economic characteristic of its own, what is being considered while selecting the best variant. As a rule, the implementation of one of the alternative projects excludes that of the rest.

ALTERNATIVE STANDORTS the problem of location of a given project never deals with a vast area and thousand of geographical points. Due to the specific locational determinants of the project, the location planners usually select, in a preliminary analysis, a limited number of the most probable places of location, which are regarded afterwards as alternative standorts and are to be analyzed more carefully in order to select one of them more suitable. While comparing the alternative standorts, their locational characteristics which are identical may be neglected, thus facilitating the process of selection. If, for example, two standorts A and B have the characteristics as follows:

Locational Characteristics	Standort A	Standort B
1) Manpower resources, workers	250	200
2) Railway connection	available	available
3) Harbour facilities	available	available
4) Installed capacity, MW	1.7	2.5
5) Energy costs, US\$ per 100 kWh	0.20	0.22
6) Construction site, ha	150	150

so, such characteristics as those given under Nos. 2, 3, and 6 are the same and may not be taken into consideration (see: Standort, locational characteristics).

AMENAGEMENT DU TERRITOIRE a term used in the French-speaking countries and almost analogical to that of physical planning (q.v.). The difference is that aménagement is usually applied not all spatial entities, but only to those which possess two outstanding features: "masse" and "internal coherence". The "masse" is understood as a sufficient size of region (population, economic basis, territorial structure) which can afford a more or less independent economic development. "Internal coherence", on the other hand, means availability of nucleus, network of settlements and routes, economic integrity of a sufficient level. The main goal of the aménagement is to distribute by space and time all the actions in respective region in order to promote and accelerate its economic and social development. The final document may be called physical plan and programme of priorities for a region.

Bibl: Bugnicourt, J., Amenagement du territoire et planification educationnelle; Dakar, 1967.

AREA in the regional terminology there are many specific definitions applied to various spatial units, like region, economic region, economic area, administrative region, zone, etc. (see: classification of spatial units). If any geographical space has no specifications, the term "area" may be of use.

AUTARCHY an ideal of self-sufficiency, a country attempting to be as independent as possible of import from other countries; a costly policy for those who try it and an unrealistic one for most. It should not be identified with the policy of import substitution since the latter tries to develop and produce such commodities which are at least of the same profitability as those imported. The term autarchy sometimes is used also for a regional policy which tries to achieve self-sufficiency for the regions within a country. See also: complexity.

AUXILIARY INDUSTRIES (enterprises) - all the industries and economic infrastructure of any region (industrial centre, etc.) which serve its industries of specialization (exporting industries). The output of the former is the input of the latter. Their production is not

consumed directly either by local population or by the external markets. While planning expansion of the specialized industries, a proper development of auxiliary enterprises should be provided.

AVERAGE REGION a rarely used term to define the region, the economic and social regional indicators (q.v.) of which are close to the country's average figures. See also: classification of regions.

AXIS OF INTEGRATION a transport route connecting different regions or countries and serving as main channel for trade exchange of commodities among the regions (countries) concerned. Some authors call the space adjacent to the axis of integration "development corridor".

Bibl: Industrialization, economic co-operation and transport hypothesis of work in the region of the Great African Lakes,
UNECA Document E/CN.14/AS/IV/7, 25 January 1966.

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BACKWARD EFFECT a side-effect which arises after implementation of a project and directed towards existing enterprises, and local population; it may be positive and negative. For example, construction of an iron and steel works creates better opportunities for some local enterprises (extension of market) and labour, but overloads local water supply system and deteriorates environment.

(BACKWARD LINKS) those directed towards the given enterprise; see: centripetal links.

BACKWARD REGION is characterized by an economic growth rate (during some period, say, five years or about) which is below the national average tempo of development for the same period. If it concerns an advanced, well developed region, there might be no worries for the planners, since it may happen due to a deliberated regional policy to accelerate growth of the less developed regions. See: classification of regions, regional development policy.

BALANCE OF ENERGY an important document necessary for both regional analysis and regional planning. It demonstrates the regional requirements of energy, the sources, import, export and consumption (by sector). A primitive scheme looks as it is shown on the following page:

REGION "N". BALANCE OF ENERGY
for the basic^(a) and end^(b) years of the plan period

Kind of energy Sources	Coal		Petrol		Gas		Electri- city		Others		Total	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
I. Energy produc- tion - local												
II. Import from other regions												
Region "K"												
Region "L"												
Region "M"												
From abroad												
III. Export to other regions												
Region "K"												
Region "L"												
Region "M"												
Abroad												
IV. Regional con- sumption (I + II - III)												
Agriculture												
Mining												
Energy												
Manufacturing												
Tertiary sectors												
Population												

A more sophisticated balance points out the so-called interchangeable fuels, takes into account the secondary kinds of energy (electricity on the coal, petrol, etc. basis; natural gas, manufactured gas) and includes some economic indicators (prices of various fuels, specific consumption) which are necessary for a thorough analysis. The fuel and power are shown either in respective units or in comparable units (tons of coal equivalent) only the latter is valid for the column "Total".

BALANCE OF MANPOWER RESOURCES, of a region - an important part of any regional development plan. It is being done for both basic and end years of the plan period. A dummy table for the existing distribution of the manpower may be as it is shown below:

Region "K". Balance of manpower resources.
 The basic year of plan period.

	Category "A" (Unskilled)		Category "B" (Skilled)		Category "C" (Technicians and engi- neers)		Total	
	male	female	male	female	male	female	male	female
I. Resources avail- able								
II. Distribution								
a) By social state								
-Independent owners								
-Members of their families								
-Employees								
-Subsistence								
-Others								
b) By sectors and branches								
-Agriculture								
-Industry								
-Tertiary sector								
-Unemployed								

The sub-division by sector and branch can be more detailed.

The prospective balance may be done in two different ways. For a region where the manpower resources are superfluous, the main task is how to employ the people. Therefore the first part of the balance consist of calculations of the future resources (by source: natural-growth; spontaneous in-migration minus out-migration; resettlement: reclassification, e.g., the structural changes in the distribution by categories, the graduates of various schools and training courses to be taken into account). The second part of the balance foresees the fields of employment required to meet the demand of the labour market. For a region lacking labour (for example, for a pioneer region), the first part of the balance will consist of the requirements of the developing economy, while the second part will represent the sources where to recruit the manpower from.

BALANCE OF MINERAL RESOURCES a very important locational characteristic (q.v.) for a region. It consists of the inventories (quantity and quality of various minerals) specified by: (a) total resources, (b) discovered resources, (c) probable resources, (d) exploitable resources.

BALANCE OF WATER RESOURCES of a region is an inevitable prerequisite for future development planning, and this statement is valid not only

for the regions with scarce water resources. The balance of water resources admittedly includes only those which can be used by existing and proposed water withdrawals, thus it deals mainly with the existing or planned water supply systems. The overall balance is called hydrological balance (q.v.).

The source part of the water balance includes:

- (a) reticulated water (the technical data of any water system have the indicators on the quality and quantity of water - cubic metres per day or per second);
- (b) artesian sources (if not combined with the reticulated water supply systems), or boreholes;
- (c) dams;
- (d) wells;
- (e) perennial streams.

If the total output of water is influenced by seasonal fluctuation, the source have to be calculated for each season separately.

The consumption part counts all the existing consumers (including future ones, if the balance is being done for the end year of the plan period).

In order to estimate output of water from various sources, a sample study is to be carried out; the average data found in such a way may be extrapolated on all analogical sources.

For a more thorough economic analysis, the approximate costs per cubic meter of fresh water by source have to be estimated.

Bibl: Major deficiencies in hydrologic data in Africa. Document jointly prepared by the secretariats of the Economic Commission for Africa and World Meteorological Organization, June 1966, Geneva.

BASIC DATA in any planning exercise are those for the year preceeding the planning period.

(BASIC AND NONBASIC INDUSTRIES) see: city-forming and city-serving industries.

Bibl: Alexander, J.W., The Basic - Nonbasic Concept of Urban Economic Function; Economic Geography, 1954, Vol. 30(3), pp. 246-261.

BASIN a geographical term applied to any region with a homogeneous geological, geomorphological structure, but mostly used to define a large area of mineral deposits (coal basin) or the catchment area of a river or river system.

BASIN FORM of settlement is characterized by concentration of urban settlements within a vast, but distinctively limited area (mineral deposit basin, for example), and when the hierarchy of settlements is not diversified. The suburban zones of towns are overlapping. The transport network usually is well developed.

BLIGHTED ZONE (of a city) the part of city which, due to the lack of investments for a long period, becomes obsolete, built up by old houses (slums) with deteriorated infrastructural facilities; as a rule, it is connected with a low income of inhabitants struck by permanent unemployment.

BLOCKING a method of micro-location (see) when two or several enterprises are designed and built on a common site. This method brings about not only saving of space, but stipulated some more economic benefit (see: block of enterprises).

BLOCK OF ENTERPRISES two or more industrial enterprises built on a common site and united by common auxiliary facilities (water and power supply, railway station, etc.). There are: (a) a block of heterogeneous enterprises (united only by common place of location and general services), (b) a block of homogeneous enterprises (the common technological processes may be united, like welding in a group of engineering plants), (c) a block of converging (inter-related) industries, better known as combine (see). As experience shows, the micro-location (see) of enterprises in blocked form saves up to 20 per cent in capital and up to 10 per cent in current investments. The blocks may arise: either by implementation of a general multi-unit project, or by gradual micro-location of several enterprises based on a common industrial estate (q.v.).

BLUE-PRINTS the document of the last stage of project identification composed of the working designs ready for immediate implementation if provided by finance, labour, equipment and management. The blue-prints are a further development of the standard design of a project, and differ from the latter by following features: the project passed the stages of evaluation, selection and has been adopted; all the necessary modifications recommended during discussion have been added; the place of micro-location (q.v.) approved and local peculiarities of the area taken into account and mirrored in the design; if it is a rule, an expert appraisal (q.v.) has been organized and positive conclusion received. All these measures have to be accomplished before preparation of the final blue-prints, since the latter cost sometimes many-fold more than the standard designs.

BRANCH a secondary specialized sub-division of the major sectors of the national economy. For example, the primary sector consists of agriculture, forestry, fishing, etc.; the secondary sector consists of various industries (engineering, textile, pulp and paper, etc.); the tertiary sector may be divided into such branches like transport, banking, health, education, etc.. See: classification of branches.

BUILDING FACILITY a very important factor of location which means the availability, in a given region (centre), a free (or going to be free soon) capacity of building (construction) enterprise: in-so-far the building process in modern economy became very complicated and mechanized, and the building industry transformed itself in an independent branch of modern economic development, the selection of the place of location for a new project is now highly dependent on the building facility. The capacity of building contractors of a region (centre) presented in the costs of building and assembling works they can do in a year is a very convenient locational characteristic (q.v.) to measure the building facility.

BUSINESS ZONE the part of a city occupied by managements of firms or/and by administrative buildings. It is usually located in the centre (kernel) of city and often amalgamated with commercial zone (q.v.).

 * C *

CAPACITY OF LOCATION of a given standort (centre, region, etc.) is its ability to absorb a new project without heavy extra expenditures (those are permitted to be less than 10 per cent of the project's standard capital costs). This ability is based on the fact that each functioning centre (region) has unused capacities in the infrastructural facilities, unemployed reserves of manpower, free sites for construction, etc.. The capacity of location very often is limited by one or several critical locational characteristics (q.v.). If, for example, it is stated that the location capacity of the city "N" is 1.0 cubic meter of fresh water per second, it means that one may locate there one project (or many projects) with a total water requirement not exceeding the prescribed amount; the other characteristics are not limiting so strictly. A limited or exhausted capacity of location does not mean that the place cannot accept some new enterprises since the former may be raised by expansion of infrastructure and/or resettlement of new labour force. As a matter of fact, the bigger the centre, the higher the capacity of location - to the point when over-concentration (q.v.) hampers further expansion of the centre.

The capacity of location should not be mixed with the development potential (q.v.); the latter includes all the prerequisites for development existing in a standort, no matter what kind and amount of necessary investments will be required.

CAPACITY OF TRANSHIPMENT of a nodal point (transport junction) is its ability (speed) to perform the loading-unloading operation and is measured in amount of goods (railway cars) manufactured per day. Very often it is not the transport route itself which limits the commodity of flow but the capacity of transshipment of certain points (railway junctions, harbours), so that the relatively modest investments into station or port facilities bring about a significant increase of efficiency the whole transport route along.

CARTOGRAPHIC ANALYSIS is a necessary and inevitable stage of both the regional and locational analyses (q.v.), as well as the regional and locational planning (q.v.). The latter, due to their very nature to deal with spatial phenomena, cannot be carried out successfully without maps. Moreover, the maps demonstrating the natural and economic conditions of an area carry a lot of special information (although presented in a specific "cartographic language") which is extremely fruitful for analysis. It may be mentioned:

- (a) Quantitative analysis. The map gives a precise and immediate impression on distances, spaces, and sizes of the phenomena (if, of course, the size is properly scaled by symbols).

- (b) Qualitative analysis. The soil map, rainfall map and any other natural condition map - all of them depict the differences among various regions, often up to making unnecessary the use of regional statistics. The modern methods of mapping do permit to have even economic and social maps ready for qualitative analysis (density of population, agricultural zoning, etc.).
- (c) Comparative analysis. This may be done in two ways; either one compares different maps for the same area and derives the conclusion on the spatial reasons of distribution of a phenomenon (e.g., inter-dependence between relief and density of population); or one analyzes the maps of two regions with the same natural conditions but differing in the level of economic development. The quality of analysis depends on the quality of maps (their up-dating, consistency, reliability, scale), as well as the experience of the planner.

CARTOGRAPHIC METHODS for regional planning and industrial location represent a very useful instrument due to several reasons. First of all, the spatial planning and mapping are inseparable. None of the methods of data collection - files, catalogues, textual descriptions, etc. - can substitute the impression given by a well prepared map. Moreover some special methods permit the transformation of the ordinary map as a means of observation into a device for calculation and decision-making.

Cartographic techniques provide a simple and relatively undemanding tool for regional planning analysis which is readily applicable to conditions prevailing in developing countries, especially when some more sophisticated methods (economic modelling, input-output analysis etc.) have not yet necessary prerequisites to be applied. In this dictionary, some simplest cartographic methods are defined and explained under separate terms; see: elimination method; economic regionalization; equal-cost-distance map; cartographic analysis; maps for regional planning.

The statistical data must be presented in a uniform, clear and logical manner and should be:

- geographical, i.e. related to a given area, city, village, etc.;
- contemporaneous, i.e. collected for a given year or period common for the whole mapped area; for example, the Republic of Zambia has had two censuses of population: non-Africans in 1961, Africans in 1963, and this fact makes it impossible to prepare a general population map based on these census data;
- homogeneous, i.e. collected in the same form or units; for example, it would be inconsistent to present different power plants on the same energy map some according to their capacity (in MW), and others according to their production (in kWh);

- changing from one geographical place to another; if, for example, a phenomenon is of the same value all over the country (say, rainfall), it is practically useless to map it on the national map, since there will be no difference between regions. For the same reason, all national data (gross national product, income per capita, etc.), if not broken down by regions, are not worthwhile for mapping. They may be used as bases for the selection of cartographic scales. The map symbols can be divided into two groups: (1) those marking the areas with the indicator above the country's average figure, (2) those with the indicator being less than the country's average.

While applying cartographic methods, the planner has:

- to choose the proper mode (or modes) for mapping a given object;
- to choose the proper scale in order to prevent visual distortion;
- to eliminate secondary phenomena so as to prevent overcrowding of the map;
- to choose the proper class of territorial division of the country (provinces, or districts, or other cells) suitable for the object to be mapped and to the problem under investigation.

Cartographic methods do not intend to replace other methods of planning. The maps are very useful and sometimes indispensable, for planning, but it would be erroneous to expect that they could answer all the questions for planners. Cartographic methods must be applied together with other methods.

Secondly, the application of cartographic methods, although being simple, requires some special training for the people involved. First of all, one should know how to read the maps, in order to acquaint oneself with the special "cartographic language", and in order to make maximum use of all the possibilities and advantages of these methods.

Bibl: (1) Economic Commission for Africa, Cartographic Methods for Planning; Doc. E/CN.14/CP.15, 1968.

(2) Getis, A., The determination of the location of retail activities with the use of a map transformation; Economic Geography, 1963, Vol. 39, pp. 1-22.

CENTRALIZATION the process of bringing together of several enterprises (services) and putting them under a single management, with a various degree of sovereignty of the component units. This process is likely to be very useful in such sectors like transport, electricity supply etc., since it provides, without heavy extra investments, a more reliable work of the system, creates better opportunities for planning and supervision, often raises the capacity of location (q.v.) of a given standort.

CENTRAL OBJECT OF LOCATION an object located in a single place but with a zone of influence covering a vast area, and the links between the object and its customers are provided by transport means. The area to be served by the central object depends on the capacity of the latter (the bigger the capacity, the bigger the area) and on the density of the customers (the higher the density, the smaller the area). Transport facilities may also influence both the size of area and its configuration. All the agro-processing plants, as well as agro-servicing enterprises, are typical central objects.

CENTRAL PLACE a term introduced by Christaller to define focal point of a certain area, which concentrates the industries and services to provide by them the whole attached area (see: nodal region, nucleus). The theory and method of central places foresees the techniques how to serve territory by minimum number of central places (the primary regions look, in that case, like hexagons). Christaller's ideas on the central places gave an impact to shift regional research from homogeneous regions towards nodal (functional) regions.

Bibl: Getis, A. and Getis, J., Christaller's central place theory; Journal of Geography (USA), 1966, Vol.65, No.5, pp. 220-226.

CENTRE in the location and regional science, the centre is usually understood as a locally well defined, compact region, all the elements of which are within walkable distance to each other. The village, town, city are typical centres. A more complicated character have such centres like agglomerations, metropolises (q.v.). Sometimes there may be agro-industrial centre, recreation centre, scientific centre. On the maps, especially on the small-scale maps, the centres are shown by conditional symbols (dots, circles).

CENTRIFUGAL LINKS all the flow of goods and services from the given enterprise. In calculations, they are known as output items.

CENTRIPETAL LINKS all the flow of goods and services to the given enterprise. In calculations, they are known as input items.

"**CETERIS PARIBUS**" - "others are equal" (lat.); the mode of comparative analysis when the equal characteristics of two or more objects being analyzed are neglected so that only differences are to be compared (see: alternative standorts).

CHOROPLEITH MAP if a planner desires to observe the change of any economic phenomenon from one area (province, district, municipality) to another, he may shade or colour these areas in such a way that the intensity of occurrence of the phenomenon is shown by a corresponding intensity of shading on the map. Usually, relative data are coded by means of this method: population density, per capita income, capital/output ratios and others. Choropleth maps are never used for absolute data.

The question arises as to which of a country's sub-divisions is best suited to choropleth mapping. Statistical data are usually available by administrative divisions - provinces, districts, townships, etc..

That is why the simplest way to make a choropleth map is to code the phenomenon according to existing administrative divisions. If other divisions are taken, special work for data collection should be undertaken.

CIRCUIT ROUTE a transport route (railway, road, pipeline, electric line) constructed around a centre and connecting all radial routes going out of the latter. It improves the manoeuvring abilities of the transport knot and permit the transit flows to avoid the overloaded centre.

CIRCUMCONNECTION the building of a circuit route (q.v.). The necessity to perform circumconnection of the transport routes arises usually in metropolises.

CITY (TOWN) a well defined economically, territorially and statistically settlement where non-agricultural activities are dominant. Historically, the cities have emerged centuries ago when trade, handicraft commenced to separate from the agriculture. The science, arts, education have settled in the cities, thus increasing the leading role of the latter in the economic and social progress of mankind. The modern cities are virtual centres of industry, trade, science and, as a rule, places of concentration of the governmental and administrative power. This increasing role of cities is mirrored in the process of urbanization (q.v.). Having got a general common feature - predominance of non-agricultural occupations - the cities differ from each other in size, industrial specialization, historical background, their position in administrative hierarchy, pattern of settlement and lay-out (see: Classification of cities) -- In regional development, the cities play the role of regional nuclei; in location, they are the most probable standorts for new industrial (and analogical) enterprises, and the most decisive factor which attracts the latter to cities, is the agglomeration effect (see). See also: master-plan, urban economics, town planning.

- Bibl:** (1) Ullman, E.L., A theory of location of cities; American Journal of Sociology, 1941, Vol. 46, pp. 853-864.
- (2) Tunnard, Ch., The City of Man; New York, 1953.
- (3) Alexandersson, G., The Industrial Structure of American Cities; Lincoln (Nebraska), 1956.
- (4) George, P., Precis de la Geographie Urbaine, Paris, 1961.

CITY-FORMING INDUSTRIES a term used by city and town planners to mark the industries of specialization, the produces of which exceed the local market and are exported to other regions or foreign markets. Educational, scientific, recreational facilities of a city are also regarded as city-forming sectors if they work on national (regional) scale. Not to be mixed with city-serving industries (q.v.) which secure the normal life of the population and functioning of the economy of the city itself. For planning, this distinguishing is of a certain importance, because for each type and size of city there exist a known

proportion between the city-forming and city-serving employment (in average, for developed countries, the share is ten to seven).

CITY-SERVING INDUSTRIES (SECTORS) are those which stipulate the normal functioning of the city's economic and social life and the production of which is consumed locally (economic and social infrastructure, perishable food, repairs, etc.). In economic sense, the city-serving industries may have a character of auxiliary enterprises (those which secure the functioning of the city-forming sectors) or servicing enterprises (those serving the population of the city directly).

CITY TRAFFIC a very specified branch of transport activities and services devoted exclusively to intra-urban movements of people and goods. In developed countries, the necessity for creation an urban transport arises usually when the settlement passes the 20,000 mark of population, though configuration of city and some other conditions may cause exceptions. In developing countries, this necessity, as well as possibility, may arise later, but as for industrial centres, their requirements hardly differ from those of their counterparts in developed nations. Alongside the growth of the city population, the needs in transport services increase by an accelerated growth rate, which creates some quite difficult problems in big agglomerations (congestions, deceleration of the average commercial speed, lack of parking place). The types of transport means are represented by buses, trams, trolleys, and taxis, which are supplemented, in big cities (metropolises), by underground, city railways, sky-ways (mono-rails). Such a diversification of the city transport compels to co-ordinate the operation and development of the whole traffic. The increasing role of the private cars creates a new problem to be solved by city planners. It should be added, that two more problems have to be solved while planning the city traffic: first, its dovetailing with suburban traffic, second, its alignment with the inter-urban traffic (creation of terminals, organizing of the helicopter flights connecting the kernel of city with outlying aerodromes).

CLASSIFICATION OF BRANCHES of the national economy is a conventional subdivision of various economic and social activities aggregated in accordance with various criteria. The more general approach is to divide the national economy into three major sectors: primary (embracing the branches directly based on exploitation of natural resources, like agriculture, mining, forestry); secondary (the rest of productive industries manufacturing the produce of the primary sector); tertiary (all the branches of economic and social infrastructure). In the regional and locational planning, there exist two special classifications of branches.

Locational classification is based on critical locational determinants (q.v.) of the industries or plants. Thus, there are:

A. Input-intensive industries

- (1) Energy-intensive (with sub-division by type of energy).
- (2) Material-intensive (with sub-division by type of raw material mostly consumed).

(3) Water-intensive.

(4) Labour-intensive.

B. Market-oriented industries

(1) Consumer-orientated.

(2) Agglomeration-orientated.

The terms "intensiveness" and "orientation" distinguish the following peculiarity: the former stresses the main input item, but the industry is not obligatorily tied to the area where that item is in abundance, it may be transported to the place of location, if other factors compel to locate the industry far from the source area; the latter shows that the location in the area of orientation is obligatory. A textile enterprise (labour-intensive) may be located in the place lacking labour resources, which can be resettled from other area; but nobody will build the bakery in a desert and organize around it consumer market.

Regional classification shows the place and role of various industries in the regional (and national) economy.

- (1) Industries (branches) of specialization - those exporting their produces to other regions or to foreign markets (evidently, a portion of produce may be consumed locally).
- (2) Auxiliary industries - those which supply other regional industries (mainly those of specialization) by their produces or services.
- (3) Servicing industries (branches) - those supplying the regional population directly.

The difference among those types of industries is well reflected in the regional inter-branch (input-output) balance.

One distinguishes also: propulsive industry (usually a new branch, not obligatorily the biggest one, but bringing about a remarkable change in the economic structure and tempo of development for the region), region-forming industry (which, by its development and territorial allocation, determines the configuration of the region), supplementing industry (which, in co-operation of another regional industry, helps to solve a certain regional problem), converging industry (connected with another by input-output relations). More detailed definitions of all the terms listed may be found in this dictionary under respective notions.

CLASSIFICATION OF CITIES for practical and academic purposes, the planners and scientists have elaborated several classifications, and the most important of them are as follows:

Classification by size takes such a very precisely defined criterion like population. Approximately, the cities may be divided in the following classes:

- (1) Up to 20,000 inhabitants - small towns
- (2) 20,000 - 50,000 - medium size towns
- (3) 50,000 - 100,000 - big towns
- (4) 100,000 - 500,000 - cities
- (5) 500,000 - 1,000,000 - big cities
- (6) more than 1,000,000 - metropolises

Depending on the conditions of a given country, the classes can be altered.

Genetic classifications may vary from country to country, but their feature is the stressing of the historic origin of a city (that developed on the basis of an old medieval town; from a commercial village; on a transport junction; new town etc.).

Hierarchical classification is based on the interdependence (economic, administrative) of the cities. One uses such classes: the city of the first order (usually, a capital); that of the second order, etc..

Functional classification stresses the role of a given city in the national (regional) economy. The biggest class is represented by industrial cities (industrial centres, industrial knots - q.v.), with their sub-division by industry of specialization (engineering centre, coal centre, textile centre, etc.). Agro-industrial centres (q.v.) make a second class. A special class embraces the biggest multipurpose cities displaying a very high diversification of functions. One distinguishes also: scientific centres, recreation/tourist centres, transport knots, etc..

CLASSIFICATION OF PROJECTS for the regional planning purposes consists of their distribution bearing in mind their importance (often mirrored in size of the investment, but not obligatorily), priority, supervision and source of financing. It is a very useful procedure, first of all, for harmonization of the national and regional plans and budgets. A principal scheme of such classification is shown below:

Class of project	Body to define priority of realization 1/	Body responsible for location	Body responsible for implementation	Financing sources 2/
Local (importance limited by needs of small rural or urban community)	Local administration (regional administration to be informed)	Local administration (regional administration to be consulted)		Local budget, self-help programme
Regional (that of regional importance)	Regional administration (local administration to be informed)	Regional administration (national administration to be consulted, local - to be informed)	Regional Administration (national administration to be informed)	Regional budget

Class of project	Body to define priority of realization <u>1/</u>	Body responsible for location	Body responsible for implementation	Financing source <u>2/</u>
Multi-regional (affecting several regions)	National administration and regional administrations concerned		Regional administrations concerned	Regional budgets of the regions concerned
National (that of national importance)	National administration (regional administrations concerned to be informed)		National administration	National budget
Multi-national, localized <u>3/</u>	Multi-national committee appointed for the purpose (national governments concerned to be consulted)		National administration of the country of location (multi-national committee to be consulted)	National budget of the country of location, assistance of other countries not excluded
Multi-national, extended <u>4/</u>	Multi-national committee appointed for the purpose (National governments to be consulted)			National budgets of the countries concerned

- Notes:
- 1/ Among the projects of the same class.
 - 2/ Foreign aid not mentioned.
 - 3/ The project is located in one country, other countries are regarded as suppliers of raw materials and/or consumer of production.
 - 4/ Project is stretched over the territories of several countries (for example, a big basin development project).

This scheme should not be accepted dogmatically, because the variety of projects and circumstances can request some exceptions in administrative and financial approaches. Several axiomatic rules have to be stressed:

- (1) Whatever class of project is under consideration, its place of location should be approved by superior body, in consistence with the general scheme of location (q.v.); the inferior body must be informed.
- (2) For national financing bodies the common rule should be: who gives money, takes also responsibility (or part of responsibility) for the project implementation and follow-up procedures.
- (3) The level of responsibility of foreign investors is a subject of special agreement.

The proper classification of all the projects creates a useful framework also for budgetary planning. See also: regional budget.

CLASSIFICATION OF REGIONS in the regional science and planning one can meet an avalanche of definitions and attributes applied to various types of regions. To put all that in order, a series of classifications is hereby suggested, each of which is based upon various practically important criteria. Thus, the regions may be classified:

(a) by their territorial structure

- nodal region has a very well defined economic nucleus, kernel, dominating the whole territory of the area;

- homogeneous region, the territory of which is not diversified; it corresponds to the initial stages of the regional development.

(b) by level of development

- advanced region has the economic and social indicators which are above the national averages.

- average region has the social and economic indicators near to the national averages (say, if measured in income per capita, from 10 per cent above and to 10 per cent below the country average);

- underdeveloped region has, corollarily, these indicators for below the national averages.

(c) by the growth rate of development

- prospering region demonstrates during, at least, the last five years, an accelerated economic growth, as compared with the growth of the national economy;

- backward region shows the growth rate below of the country's average;

- stagnating region does not grow at all or even has a negative growth rate.

It should be noted that the level of economic development does not always coincide with the tempo of current development. For example, if the government pursues the regional policy of equalization the underdeveloped regions may and certainly do experience a faster growth than the advanced regions, and vice versa.

(d) by peculiarities of economic development

- pioneer region exposes new remarkable opportunity for development (discovery of rich mineral deposits, arable soils, water resources; improvement of accessibility, etc.) and begins to attract large new investment;

- depressed region has had an economic growth in the past but, due to some internal or external reasons falls into stagnation.

(e) by specialization

one may easily classify the regions according to their economic specialization (e.g., "coal" region, "textile" region, "fishing" region, etc.; if combined specialization: "petro-chemical" region, etc.).

The above-presented classification covers all the general characteristics of regional development. Nevertheless, it should not be understood as a "Procrustian bed", since, in some specific exercises, one needs special classification (for example, by density of population, by transport accessibility, by level of complexity, and so like). But, in any case, the research worker or planner has to justify the selected criteria, practical significance of classification, and should be warned not to extend the definitions useful for a certain field of research towards other spheres where they bring nothing but misunderstanding.

This article concerns the economic regions; see also region.

CLASSIFICATION OF SPATIAL UNITS is a most controversial sphere of regional science: region, area, zone, belt, stripe, place, site may be enough to be mentioned, and which are applied by different people in different ways; there exist even more adjective characteristics (developed, underdeveloped, marginal, central, etc.). The necessity to standardize those terms is therefore outmost valuable. Below, one can find a recommended application of various terms.

Area is rather descriptive than operative term and may be applied to any geographical space in the meaning that, firstly, it is less than the whole country, secondly, it is connected with the phenomenon under investigation. In statistics, area means the space measured in quantitative terms (square km, square miles). See also: economic area.

Zone should be applied always to those areas which have some sort of homogeneity; whatever point within a given zone one takes, this point displays the same locational characteristic (forest zone, agricultural zone, blighted zone, etc.). If the "area" may be identified visually, by primitive observations, the "zone" is a result of some precise investigations. See also: zonal delimitation.

Region is a more complex term to define areas possessing a certain level of integrity. It is foreseen, besides, that a country possesses a network of regions covering the whole territory of the country. See: region, classification of regions.

Place is meant usually a limited geographic area and has only descriptive application. As for the place of location, it should be replaced by a more precise term standort (q.v.).

Site is more convenient to be applied for the area where an actual construction of an industrial or analogical project is going to occur. See also: micro-location.

The rest of spatial terms may be used in descriptive analysis just stressing the configuration or geographical location of the phenomena.

COMBINE term used in the USSR to mark an industrial complex (q.v.), the components of which are inter-connected by very close technological links, located within a compact area on a common site, and united under a common supervision. The same term is applied also to the aggregate of servicing enterprises (laundry, barber shop, shoe repairs, photography, sometimes bakery and production of non-alcoholic beverages for local consumption) located usually in small centres and called "combines of public utilities". The latter is not in a full conformity with the term "combining" since units activities which are heterogeneous in the field of production process and have only a common consumer.

COMBINING process of diversification of production within a single enterprise, when each new production unit is technologically connected with the existing ones. This process may occur in two ways: either by development of new production units within the same enterprise, or by uniting several specialized enterprises into a single one. The combining is well known in such industries like steel making (pig iron-steel-fabricated steel-coke), textile industry (yarn-brown Holland-bleached fabrics), and others.

COMMERCIAL PROFITABILITY in location is an approach to find the optimal place of location for a new enterprise when the benefits to be gained by this enterprise are the leading criteria. The side-effects on the region, neighbouring industries and national economy are neglected. The opposite approach is called national profitability (q.v.).

COMMERCIAL ZONE a part of a city where the trading enterprises are concentrated; often this zone is combined with the business zone, especially in small cities and towns. The development of the commercial zone is an important division of the master-plan.

COMMODITY FLOW geographical pattern of exchange of goods among the various regions and centres; it is characterized by: (a) place of origin, (b) place of destination, (c) kind of goods, (d) amount of goods, (e) type of carrier, (f) itinerary of transportation (the last one is important for mapping and analysis of the overall commodity flow of a country). Specific characteristics may be required such as (g) type of goods (bulky, liquid, packed, etc.), (d) seasonal intensiveness of delivering. The analysis of current and prospective commodity flow helps both to determine more precisely specialization of the regions and to elaborate appropriate pattern of transport development. Commodity flow should be well planned since neglecting it may annihilate the efficiency of location. - On the maps, the commodity flow is shown by arrows and epures.

Bibl: (1) Isard, W., Regional commodity balances and interregional commodity flow; American Economic Review, 1953, No.2, pp. 167-180.

(2) Ghosh, A., Efficiency of Location and Interregional Flows; Amsterdam, 1965.

COMMUNITY the smallest administrative unit whatever official name it has. Its main features are: administrative boundary, local authority, administrative indivisibleness (may consist of several localities).

COMMUNITY DEVELOPMENT the term has come into international usage to connote the processes by which the efforts of the people themselves are united with those of governmental authorities to improve the economic, social and cultural conditions of communities, to integrate these communities into the life of the nation, and to enable them to contribute fully to national progress. This complex of processes is, therefore, made up of two essential elements: the participation by the people themselves in efforts to improve their level of living, with as much reliance as possible on their own initiative; and the provision of technical and other services in ways which encourage initiative, self-help and mutual help and make these more effective. It is expressed in programme designed to achieve a wide variety of specific improvement.

- Bibl: (1) United Nations, Official Records of the Economic and Social Council, Twenty-fourth Session, Annexes, Agenda item 4 (document E/2931, annex III).
- (2) United Nations, Local Participation in Development Planning. A preliminary study of the relationship of community development to national planning. New York, 1967, ST/SOA/77, Sales No. E.68.IV.2...

COMMUTER a person whose places of housing and of work are disconnected as to necessitate to travel daily (or weekly) to and from the work. Commuters are those who create and take part in shuttle-traffic (q.v.).

COMPLEX aggregate of enterprises, highly inter-dependent on mutual input-output links and united, selectively, by: (a) co-operation in manufacturing of final product; (b) common raw material/energy source; (c) mutual exchange of intermediate products; (d) wastes/by-products utilization; (e) combination of linkages mentioned. The lack of any element constituting the complex deteriorates the economies of combination considerably, if does not make the whole production process impossible. The capacities of the elements are compatible, to a certain degree. Due to some technological and economic reasons, the enterprises forming the complex tend to be located as near to each other as possible. Location and development of industries in a form of complex brings about many economic advantages (see: industrial complex, agro-industrial complex). The elements of a complex are usually planned, designed and implemented through a common multi-staged project.

Classification of complexes: (a) Consequent (e.g., iron ore extraction - ore concentration - pig iron, - steel, - fabricated steel production - engineering); (b) Divergent (a power plant plus several energy-consuming enterprises based on it); (c) Convergent (assembling plant collecting parts and aggregates from several enterprises); (d) Extended (a complex with a waste or by-product utilization); (e) Mutual (coal mine supplying fuel for a power plant and receiving current from it). A complex functioning under a common management is called combine.

(COMPLEX DEVELOPMENT) see: comprehensive development.

COMPLEXITY the level of self-sufficiency of a region (centre) when the efficiency of the regional economy finds itself within tolerable limits (that distinguishes the state of complexity from that of autarchy). The complexity of the regional economy is attained by: more close co-operation between the regional industries; combining of industries; full utilization of the regional natural resources, which are economical; full employment of the local labour resources; appropriate development of the economic and social infrastructure; modernizing and improvement of the territorial structure of the region. The complexity is measured by relation of locally produced and consumed output to total local output, or by fraction where nominator is total output in region minus export, and denominator is total output in region. Due to the natural, economic, historical and other differences existing among the regions, the comparison of the levels of complexity of various regions has only a limited practical value; but such a comparative analysis applied to the same region, say, in the beginning and in the end of the planning period, may give a supplementary indicator to evaluate the region's development. Theoretically, the latter can be accepted as a proper one if the raising of complexity is accompanied by the productivity increase.

COMPREHENSIVE DEVELOPMENT of a region (centre) takes place when:

- (1) the contribution of the region to the external markets, channelled through its external industries, increases;
- (2) all the converging industries develop proportionately;
- (3) the share of local natural resources in regional input increases;
- (4) the full employment of manpower is secured;
- (5) the purchasing power of population increases;
- (6) the economic effectiveness of the regional production is being increased or, at least, preserved at the same level.

The comprehensive development is one of the strategical goals of regional planning. In countries where private business plays a significant role, the planners have to apply special measures (economic incentives) in order to attract the former to follow adopted plan of comprehensive development. In the centrally planned economies the main task is to co-ordinate activities of various governmental and public bodies operating within a given region.

COMPREHENSIVE EVALUATION OF NATURAL RESOURCES is a paramount stage of general evaluation of natural possibilities for the economic development of a given territory. It presupposes the preliminary investigation and inventory of natural resources on the basis of integrated and specialized studies by the representative of natural viewer. The received data should

permit to evaluate the economy and the effectiveness of the utilization of one or another kind of natural resources considering them not isolated but in common with other economic possibilities which nature opens on the given territory (usually the comprehensive evaluation of natural resources is made on national scale). This evaluation has to answer two main questions: (i) Does the drawing in the exploitation (or the expansion of the exploitation already carried on) of one or another kind of natural resources correspond to the main national economic tasks at present period of the development? (ii) Can such drawing into exploitation (or the expansion of it) be economically effective?

It is to be noted that during a comprehensive evaluation of economic importance of one or another kind of natural resources the principle of economic effectiveness of the exploitation has not the absolute meaning, especially in countries seeking for economic independence. In some cases this principle may be deliberately avoided for the purpose of quicker achievement of a temporary but necessary economic effect. Still for the sound decision what natural resources in the given concrete conditions can give the maximum economic and social benefit from their exploitation, one should carry a comprehensive evaluation of the whole complex of natural resources.

- Bibl: (1) Gornung, M.B. - Natural Resources and Economic Development in Africa, - in "Developing countries of the World", 21st International Geographical Congress, India, 1968.
- (2) Units A. - The Impact of Natural Resources Development on the Formation of Economic Regions, - in "Regionalisation et Developpement", Paris, 1968.

COMPREHENSIVE UTILIZATION OF NATURAL RESOURCES is a simultaneous economic utilization of the aggregate of different resources (e.g. mining - energy-water complexes for the creation of metallurgical or chemical industrial combines, or the eventual creation of agro-industrial complexes etc.).

CONCENTRATION (in location and regional development) a pattern of location of new enterprises when those are set up in few more advantageous places, already well developed, while the rest of the country remains neglected; in a broader sense - the process of increasing of economic activities and population within a limited area, usually in cities, in mineral basins etc.. It is due to two main processes: growth of dimensions of the enterprises already existing in the area, and creating of new enterprises. From the economic point of view, that is the agglomeration effect (q.v.) which causes such a tendency. Generally speaking, concentration is a progressive process, since it raises the total labour productivity. But, if not controlled, it may bring about some disadvantages affecting the agglomeration itself as well as the whole country (see: polarization, over-concentration).

CONSERVATION OF NATURE AND NATURAL RESOURCES is defined as an important part of the rational use of the earth's resources to achieve the highest

quality of living for mankind. It does not aim to preserve only wild nature, but pays proper attention to all three distinct but interrelated aspects of the conservation of man's natural environment:

- (i) - conservation of land and water resources - through rational utilization and prevention from environmental pollution (q.v.) for future settlement and use, as well as conservation of non-renewable resources (ores, coal, oil, etc.) through improved consumption and rational exploitation;
- (ii) - production conservation of the renewable resources to support the material needs of the human population in present and in the foreseeable future;
- (iii) - conservation of territories with wholly or partially unmodified natural environment for scientific and aesthetic purposes.

Bibl: (1) Conservation and Rational Use of the Environment, New York, UNACAST, 1967 (STD/8/5).

(2) The African Convention on the Conservation of Nature and Natural Resources, OAU, 1968.

(3) Huxley, I., The Conservation of Wild Life and Natural Habitats in Central and East Africa, Paris, UNESCO, 1961.

CONSUMER-ORIENTATED INDUSTRIES (SERVICES) are those which produce goods (usually, perishable and non-transportable) and render services directly for the broad masses of population, need a permanent contact with the local consumers' market and therefore tend to be located in heavily populated areas (cities, towns, big villages). In the scarcely populated areas, those services try to establish some sort of mobile units in order to get as closely to the consumers (clients) as possible.

CONURBATION a type of agglomeration (q.v.) created by merging of several neighbouring settlements of nearly equal size and economic importance into an integrated metropolitan region. The conurbation possesses all the characteristics relevant to the agglomeration and, in addition, two others which are important for planning: (1) availability of several local kernels (business districts, transport junctions, etc.) - those of the former merged cities; (2) preservation of several transport networks, though inter-connected, but with a level of independence. This independence of traffic is more obvious and prolonged if the transport means of the merged cities had technical incompatibilities (different gauge of tram railways, for example).

CONVERGING INDUSTRIES two industries connected by direct productive ties, and the output of the first is the input of the second; sometimes, reciprocal exchange of production may be observed. The primary side-effect of development of any industry in the region necessitates development of all converging industries. This side-effect may not occur if the import of relevant commodities from other regions is more economical than increase of a local converging industry.

CO-OPERATIVE LINKS between two enterprises exist when the quantity, quality and time of delivery of intermediate goods from one enterprise to another are confirmed by special agreement. In such a linkage, the goods pass the intermediate market dealers by.

(CORE REGION) a term used to define, by some authors, the growth centre (q.v.), by others - the nodal region (q.v.) or metropolitan region (q.v.).

COST OF TRANSFER term used by some economists and being defined as including all the expenses spent on the commodity movements, i.e. transportation costs plus the costs overcoming other obstacles, such as tariff walls.

COST OF WORKING PLACE an amount of investment to be spent in order to employ a worker. This amount differ highly from industry to industry, is influenced by economies of scale, but, for a planning period, is a sort of stable indicators. When the problem of employment arises, the planning by such an indicator has some advantages.

*"COUNTER-FLOW" a mode of location when the selection of place is justified by availability of empties on transport, and new enterprise has to fill these empties by its production. Thus, if there exists a permanent commodity flow from the city "A" to the city "B", and none reciprocally, a plant may be located in city "B", production of which (relying partly on the market in city "A") may be transported using empty cars. The transport costs in empty direction are usually considerably less than those in loaded direction.

CRITERIA OF OPTIMIZATION in the locational planning are listed below in order of their complexity:

- (1) Minimum of transport costs
- (2) Minimum of total costs
- (3) Minimum of capital investments
- (4) Minimum of adjusted expenditures (aggregate of the capital and current expenditures)
- (5) Minimum of time spent for implementation of project.

All the methods of optimization pursue, of course, the maximum of benefit. The latter may be measured in two ways: commercial profitability (from the viewpoint of a single enterprise) and national (regional) profitability which counts all the side effects, economic and social, affecting the whole national (regional) economy.

In the regional planning, one may find the criteria of optimization as follows:

- (1) Accelerated growth rate
- (2) Maximum employment
- (3) Minimum of I.C.O.R. (Increment capital/output ratio) or maximum of return (the indicator reciprocate to I.C.O.R.).

Two alternative projects (standorts) cannot be compared unless they have been measured by the same criterion of optimization.

Bibl: Galenson, W., and H. Loibenstein: "Investment Criteria, Productivity and Economic Development", in: Quarterly Journal of Economics, August 1955.

CRITICAL LOCATIONAL CHARACTERISTICS those of the locational characteristics (q.v.) of a region which limit, to a remarkable degree, the location of certain industries in it. For a region exposing the shortage of water the latter will be a critical characteristic, prohibiting the water-intensive enterprises to "enter" this region. The adequate knowledge of critical locational characteristics by region and centre prevents the mislocation of new projects; see: method of elimination.

CRITICAL LOCATIONAL DETERMINANTS those of the locational determinants (q.v.) of a project which determine its place of location decisively; the rest of determinants, for such or other reasons, may be neglected, while selecting the probable places of location. Usually, the critical locational determinants play a leading role in the structure of costs, or, if not, are required in large quantities. Thus, for an iron and steel works, the critical locational determinants are the requirements of iron ore, coal (coke), and water. This does not mean that the planner can forget other material requirements (ferro alloys, flux, electricity, oxygen, etc.), but for the locational planning they are the indicators of the second sort. The critical locational determinants give a yardstick to classify the enterprises by their locational preferences (see: classification of branches).

The peculiarities of the regional environment may change the value of some critical determinants. For example, in a region with a rich water resources everywhere, the water requirements for an admittedly water-intensive project lose their critical character.

CRITICAL PATH METHOD (CPM) a method of analysis of the various works or other time-consuming operations which have to be performed to complete a project from start to finish with a view to establish the total minimum time needed for the project. The method starts with arrow diagramming, which incorporates all elements of a project. Operations, methods, and resources (time, money, manpower, equipment, and material) plus imposed conditions (design, delivery, approval, budget, completion date, decisions, and so on) are molded into a co-ordinated plan and model. Each activity is represented as an arrow ("action"), and each task is represented as a rectangle ("event"). The arrows interconnect the events in their consequence. The critical path links activities in such a way that the total "float" of free-time is zero; delays in any of these activities delays the completion of the project by the same amount. - In regional and locational planning, the method is valuable for planning and implementation of a complex multi-unit project.

Bibl: Cosinuke, W., The critical path Method. In: PERT, a new management planning and control technique, American Management Association, New York, 1962.

CYCLICAL SENSITIVITY (in regional development). In the economies subjected to cyclical fluctuation of the overall activities, it seems to be important to take into account the different reaction of various industries to probable falls and downs in the future. The economic regions, due to their differences in the structure of industries, have behaviour pattern, during the crises, depressions and booms, of their own which they impose upon the collection of national characteristic they happen to contain. For the same reason, a regional enterprise cannot rely upon national forecast in planning for the future. It must be more concerned with the economic outlook in this very region which it serves than with anticipated changes in economic climate elsewhere. The regional planners in the cyclically affected economies do regard the diversification of the regional economy as a main remedy against fluctuations, since a diversified economy is likely more stable. - In the centrally planned economies, where cyclical fluctuations do not occur, the attention should be given, while planning, to those industries which are closely connected with the international market, because they may be affected by the cyclical variations in other countries.

- Bibl: (1) Borts, George H., Regional Aspects of Cyclical Fluctuation. Proceedings of the Business and Economic Statistics Section, American Statistical Association, 117th Annual Meeting.
- (2) Miernyk, William H., Forecasting Short-term Regional Economic Activity. Regional Sciences Association, Papers & Proceedings, Vol. 5/1957.

 ** D **

DAILY FLUCTUATION a naturally caused change in overall activities which differ remarkably in the day and night periods. The proper calculations on these type of fluctuation is very important for regional and especially for city and town planning. It brings about, first of all, a strong difference between the day-time and night-time consumption of energy, water, heat, transport and communication services, as well as many other services. Secondly, it causes two extreme peaks in transport use, one coinciding with the beginning of the working day, other relevant to the end of that (with two less remarkable peaks in lunch time and in the evening "entertainment" travelling). The daily fluctuation compels to create relatively high peak capacities (in energy, water supply, transport services) which appears not to be used during the night-time and between the peaks. Introduction of the night shifts, transfer of some energy-intensive (and not labour-intensive) processes from the day-time to the night hours and some other measures are applied in order to align the day and night consumption; many countries introduce a reduced price for utilities during the night-time.

DECONCENTRATION a pattern of location when the enterprises (and people) are moved from over-concentrated and overcrowded areas (large agglomerations) towards other areas, usually less developed. This process concerns exclusively already existing enterprises, not the new projects, and takes place, so far, mainly in the developed countries (the shifts of plants from Paris, London, Glasgow, Moscow), but sometimes may be noticed in developing world (Ethiopia). The process, although being necessary, seems to be very costly - needless to say, the desirable goals are being achieved only partially, - so, the planners in developing countries have to pay primary attention to the reasons which necessitate it and to avoid, while planning, the over-concentration of economic activities in a certain place, no matter how profitable it seems in a short-term approach. - When the removed enterprises are settled in the suburbs of a large city, it calls deglomeration (see).

Bibl: Laufenburger, H., La déconcentration des grandes villes et le développement économique régional; Actual, 1958, 34: 3, pp. 414-425.

DEGLOMERATION when the capacity of location (q.v.) of a large agglomeration seems to be exhausted, but the development of respective industries is likely to be profitable, the planners may drop their attention to the city suburban places and attach to them new investments. The suburban industry develops in form of subsidiaries of the urban enterprises (the latter even may be moved from the city to the vicinity, if necessary - see: deconcentration). Such process is known as deglomeration, and display a bulk of advantages (short communications with the central city, opportunity for co-operation, manpower exchange, etc.) but is dangerous for the suburban environment, shortens the recreation zone and hardly facilitates the situation on the transport knot, rather in the contrary. This pattern of location, therefore, has to be applied with caution. The physical

planning, for example, never should be carried out separately for the city and its suburban zone.

DEPRECIATION the part of price of production devoted to replacing worn-out or obsolescent capital stocks. In time all capital investments wear out (physical obsolescence) or becomes out-of-date so that their replacement appears to be economically desirable (moral obsolescence). In regional planning, the regional statistics on depreciation is important because it shows the amount of capital investment (both public and private) assigned for restauration of exhausted capital stocks and not for the new projects.

DEPRESSED REGION (AREA) is defined usually as a region relatively developed, even once prospering, but undergone suddenly, due to some reasons, the state of stagnation or even retard. The depression may be caused by natural grounds (exhaustion of mineral deposits, big disaster), economic reasons (cyclical down of basic regional industries), political events (break of foreign trade, change in the boundaries severely affecting some regions, etc.). The term firstly introduced in England to mark the parts of country with exceptionally high level of unemployment during the "Great Depression" of 1929-1935. The cure of regional depression may be done only relying upon governmental measures and national sources. Syn: distressed region.

(DEVELOPED REGION) term used by some regionalists to define the region, the economic and social indicators of which are generally higher than the national averages. See: advanced region, classification of regions.

DEVELOPMENT OPPORTUNITIES favourable prerequisites for development of an area indirectly created by implementation of a project. Thus, the construction of a road between the points "A" and "B" may and do create good opportunities for development in an intermediate point "C" situated on the proposed road. The term differs from that of development potential (q.v.) which defines the favourable development prerequisites inherent in this very area, depending on its own resources.

DEVELOPMENT POTENTIAL an aggregate of the natural, economic and human resources of an area which can be exploited economically to provide the stable and continuous growth of that area. Estimation of the regional development includes an economic evaluation of its components (how big are the coal deposits - what might be the specific investment in that coal basin). Development potential is estimated usually in connection with the elaboration of long-term programmes and plans. The term differs from that of capacity of location (q.v.) which means the possibility of an area to accept new projects without incurring heavy investment into infrastructure or labour recruitment.

DIAGRAMMATIC MAP a type of map used for regional planning, especially when an analyst desires to investigate the structural and historical nature of phenomena within their regional context. In this method, each division of the country (province, district, municipality or whatever division is chosen) has its own diagramme. This method is suitable for the demonstration of two or more features simultaneously, or for showing the different aspects of a phenomenon. For example, one column of diagramme may correspond to the total yield of a crop in a given province, and an adjacent

column to yield per hectare. Or, one column may correspond to the base year of the plan period, the second column to the end year. See: cartographic methods.

DISPERSION (DISPERSIVE LOCATION) a pattern of location when the centres (regions) which have been already developed are deliberately prevented from new investments, and the latter are distributed, more or less evenly, among the undeveloped centres (regions). Usually, that method brings about a dangerous fall in the efficiency of investment, and is not recommended for general applications. Nevertheless, for some types of activities, the dispersive location is inevitable (primary schools, feeder roads, and alike). The opposite pattern of location is called concentration (q.v.).

DISTANCE means, in the location exercises, the space to be passed while moving people or delivering goods (services) from one point to another. It is measured:

- (a) in length (crow-line, or through existing transport routes);
- (b) in economic values (cost per ton of general goods per kilometer, mile);
- (c) in time spent for the movement.

If the distance between two regions is to be measured, one takes the distance connecting the nuclei of respective regions.

(DISTRESSED REGION) a region suddenly struck by economic depression or stagnation. See: depressed region.

DIVERSIFICATION process of complicating of the sectoral structure of a region as a result of appearance and development of new industries within the latter. Diversification raises elasticity of total economic growth, employment opportunities, and creates prerequisites for complexity and comprehensive development (q.v.) of the region.

DORMITORY SETTLEMENT a suburban place almost without any local employment opportunity, so that all local manpower resources are occupied in the central city (see also: commuter, shuttle traffic).

DOT METHOD a widely used in the mapping, especially that for regional planning, method of presentation of the spatial phenomena. This method gives simultaneously the impression of both area expansion of the phenomenon and quantitative characteristic since each dot represents some definite quantity. For example, each dot may represent 500 ha of crops (agricultural map), or 500 persons of population (population map), etc.. It is obvious that the areas where the phenomenon occurs more dense will be reflected on the map by the increased density of points.

See also: cartographic methods.

Bibl: Mackay, J.R., Dotting the dot map: an analysis of dot size, number and visual tone density; Surveying and Mapping, 1949, Vol. 9(I), pp. 3-10.

 * E *

ECONOMIC AREA is referred to the territory which cannot be marked as an economic region (lack of some features relevant to the latter), but still has some kind of territorial economic integrity or similarity in economic and social goals to be attained. Often, economic area may have a separate development plan. For example, the Republic of Zambia, having already plans for each of eight provinces, prepares a special plan for economic area covering the Kafue dam project.

Unlike economic regions, economic areas do not cover the whole territory of a country.

ECONOMIC EFFICIENCY criterion used in the USSR and some other socialist countries for both selection of projects and their optimal location. In general, it looks like:

$$\frac{\text{Planned output} - \text{adjusted expenditure}}{\text{Adjusted expenditure}}$$

(Adjusted expenditure - q.v. - is an aggregate of the operational and capital costs, the latter divided by the period of refund).

Both the current and capital costs of the project include a standard share of the expenditure for social purposes. For each industry and type of project, there exist so called standard coefficient of efficiency based on the evaluation of many projects and past experience, so that a mere comparison of the project with standard normatives can give for its approval or refusal.

ECONOMIC GEOGRAPHY a science studying the distribution of economic activities of the people over the territory. The general approach of the science is an integrated one, supposing that natural environment, people, their social behaviour and relations, their economic activity are mutually interconnected and stipulated. The main morphological object of research is the economic region (q.v.). Economic geography dissipates into several specialized disciplines such as geography of population, economic geographies of various countries, industries, etc.. - Scholarship in the economic geography gives most advantages for the regional planners and location experts.

- Bibl: (1) Saushkin, Y.G., Economic Geography of the USSR, Oslo, 1959.
 (2) Alexander, J.W., Economic Geography; Englewood Cliffs, 1963.

ECONOMIC GRAVITY ZONE if the centre "B" has more than a half of its input and output links with a bigger centre "A", that means that the former finds itself in the economic gravity zone of the latter. If a third centre "C" belongs to the economic gravity zone of the centre "B", and the latter belongs to that of the centre "A", one can conclude that the centre

"C" belongs as well to the zone of the centre "A". Objectively, the zone of economic gravity tends to coincide with the equal-cost zone, but not always it is a fact.

ECONOMIC MODELLING the method of interpretation of the actual economic processes in a form of graphs (qualitative model) or mathematical equations (quantitative model), both used in economic planning as methods of optimization. In regional planning, economic modelling is widely used for planning of industrial and agro-industrial complexes, industrial centres and knots, industrial estates, as well as for elaboration of the long-term programmes of the regional development.

- Bibl: (1) Mash, V.A., Principles and models for the location of industry, UNIDO document ID/Conf.1/G.38 presented to the International Symposium on Industrial Development, Athens, 1966.
- (2) Isard, W., Regional Programming Models and the Case Study of a Refinery-Petrochemical-Synthetic Fiber Industrial Complex for Puerto Rico, unpublished Ph.D. dissertation, M.I.T., Cambridge, Mass., 1956.

"ECONOMIC" PROFITABILITY is not a fully scientific term since the profitability is always measured in economic units. Nonetheless, one may apply it aiming to stress that a given calculation of profitability of a project neglects completely non-economic side-effects (social, political ones, etc.).

ECONOMIC REGION in brief, a space-production complex constituting a well defined economic unit of a country. It possesses the following characteristics:

- (1) in economic aspect - specialization, i.e., it produces some commodities for external markets (for other economic regions of this country, for export), and a proper level of economic integrity, or complexity, i.e. inter-dependence of the elements within the region. This inter-dependence is not limited by input-output links among the enterprises and industries of productive sectors only; it means also that relevant links exist between productive sectors and infrastructure, between production, population and spatial structure of region (settlement and transport network, for example), and the whole economy of the region uses properly its natural conditions and resources. That are these general inter-linkage which give the economic region a sort of economic unity, and that fact hardly can be omitted while development planning.
- (2) in territorial aspect - availability of the so-called centre of economic activity and gravity, nucleus, influence of which spreads over the whole region. In that respect, the so-called homogenous region, not polarized in its spatial structure, can be regarded not more as preliminary stage of becoming a virtual economic region, if proper territorial re-organization will be provided.
- (3) in managerial aspect - an economic region must have some kind of local (regional) authorities responsible for development planning and,

consequently, for plan implementation, and overall management - needless to say, supported by whatever small autonomous financial power. These authorities may be appointed by the government (that takes place when, for example, economic regions coincide with administrative subdivisions), or created locally due to the irresistible demands of regional economic and social needs (for example, the Union of cities of the Ruhr basin, West Germany). Evidently, the dimensions and the structure of the economic region should be within manageableness.

The process of consolidation of economic regions is a long-term and rather contradictory, and so is, as well as difficult, their identification. The more indicators and criteria are used, the more precise is delimitation of the regions - and elaboration of their development targets, respectively. Bearing in mind those difficulties, and the fact that several parts of the country have not yet reached the stage of being an economic unit (that take place not only in developing countries), a simplified approach for regionalization can be recommended; the regional planning can be done using existing administrative regions (q.v.) or, on a more sophisticated basis, using specially delimited planning regions (q.v.), if the administrative territorial structure does not meet the development planning requirements.

Bibl: (1) Lösch, A., The nature of economic regions; The Southern Economic Journal, 1938, Vol. 5, pp. 71-78.

(2) Grigg, D., Regions, Models and Classes; in Chorley, R.J. and Haggett, P., Models in Geography, London, 1967, Ch. 12.

(3) Lonsdale, R.E., The Soviet Concept of the Territorial-Production Complex; American Slavic Review, 1965, Vol. 24, pp. 466-478.

ECONOMIC REGIONALIZATION process of dividing the country into viable integrated territorial economic entities for purpose of economic development and planning in spatial aspect. See: economic region, regional planning.

Bibl: (1) Alampiyev, P.M., The objective basis of economic regionalization and its long range prospects; Soviet Geography, 1961, II, 64-74.

(2) Lipets Y.G., Economic Regionalization as a Method of Coordinating the Economic Development of Africa. UNIDO document ID/Conf.1/G.39 presented to the International Symposium on Industrial Development, Athens, 1966.

ECONOMIC STRUCTURE (of a region). For a thorough development planning, the analysis of regional economic structure is necessary. It is to be carried out in two ways: sectoral and locational. Sectoral analysis does not differ from that of the national economy; the economy of a region is classified by major sector (primary, secondary, tertiary), then by sub-sector (agriculture, forestry, fishing, etc.; mining, manufacturing construction, etc.; transport, communication, education, etc.); then if

necessary, by branches (crop, livestock, etc.; food processing, engineering, etc.). Indicators to be taken: number of employees, output, value added, capital stocks, investments. The comparison of the regional economic structures with the national one is very useful for development programming. Locational analysis of the regional economic structure divides all industries into specific groups: industries of specialization (exporting industries); auxiliary (intermediate) industries; servicing industries and other branches of economic and social activities. Investigation of the regional economic structure is an important part of locational and regional analysis (see also: classification of branches).

Bibl: Conway, Freda: "The Industrial Structure of Towns", in: Manchester School of Economic and Social Studies, Nov. 2, 1953, pp. 154-164.

ECONOMIC ZONE an area marked with the same economic locational characteristic (see), for example, zone of economic gravity, equal-cost-distance zone, zones of the high, medium, low incomes per capita, etc..

ECONOMIES OF SCALE the gains by way of reduced costs of production per unit of output arising from increasing the size of an enterprise. In suitable circumstances, larger-scale production leads to important economies in the use of land, labour, capital, research, etc.. The permanent growth of the average size of a plant is a progressive tendency of the modern economy. Meanwhile, the law of large-scale production is not so absolute as it seems to be from the theoretical view-point. In location and regional planning, for example, sometimes two small-scale enterprises located in different places may occur more desirable than one large-scale (gaining of time of construction, more employment, etc.). On the other hand, the increasing of the size of an enterprise may be limited by such factors like manageableness, capacity of the market.

- Bibl:
- (1) Florence, P. Sargent: Investment, Location and Size of Plant, Cambridge University Press, 1948. Important book.
 - (2) Revue Internationale du Travail: "La grandeur des établissements industriels", vol. LXXIII, no. 6, June 1956, p. 702. Important for size-of-plant studies.
 - (3) Moore, F.T.: "Economies of Scale - Some Statistical Evidence", in: Quarterly Journal of Economics, May, 1959.
 - (4) Guthrie, J.A., Economies of Scale and Regional Development; Papers and Proceedings of the Regional Science Association, 1955, I, J1-J10.

ELIMINATION METHOD a cartographic method used in locational planning on the preliminary stages of analysis when it is desired to find the rational place of location of a given project. It is used for the elimination of areas which are for various reasons not suitable for the given project. The exercise is carried on in relation to the locational determinants and locational characteristics (see).

Suppose it is desired to locate a nitrogen fertilizer plant (on the

natural gas basis), the locational determinants of which are as follows:

Locational determinants of a nitrogen fertilizer plant

Manpower: (persons)	skilled	98
	unskilled	85
	total	183
Production	ammonia	150,000 tons a year
	nitric acid	280,000 tons a year
	ammonium nitrate	345,000 tons a year
Gas requirements	240,000,000 cubic meters a year	
Energy	344,000,000 kWh a year	
Water	113,850,000 cubic meters a year (or 0.4 cubic metres per second)	

On a map of the territory, using the given locational parameters, all areas lacking sufficient water resources (0.4 cubic meters per second) are first of all eliminated and distinguished by any convenient mode of shading (see: non-quantitative areal distribution). Then areas without the required amount of natural gas and those which cannot be reached by gas pipeline are further excluded. And finally areas where sufficient energy reserves are not available are also eliminated.

By progressive elimination, the size of the territory necessary for subsequent analysis is considerably reduced. After all unsuitable areas have been eliminated, the most ideal place of location within the rest of the territory then becomes a subject for direct calculation.

The proper selection of the critical locational determinants of a project and a good knowledge of the locational characteristics of a country's economic regions are two major prerequisites for using the method of elimination. Its results can facilitate subsequent stages of research considerably.

EMERGENCY REGION an area severely struck by natural disaster (earth-quake, flood, fire) so that immediate measures are necessary to provide relief, organized usually by national government or even by international resources.

EMPLOYMENT a very important locational characteristic (q.v.) for any region or centre, and in its negative form (unemployment) may be regarded as a factor of location for labour-intensive projects.

ENCLOSING RESOURCE supposingly, a region has several types of analogical resources differing in their costs, and the cheapest of them are limited. By any expansion of consumption, the most expensive resource has to be exploited. This "enclosing" resource should be taken as locational

characteristic, and not the cheapest one, while calculating the future development and consumption. Even if the new project will be based on the latter, some existing consumers will be compelled to shift towards the former.

ENERGY RESOURCE a factor of location important for any kind of economic activity, especially for energy-intensive projects. It aggregates all the possible (exploitable) resources of energy of a region and is taken into account while elaborating long-term programme of economic development.

ENERGY FACILITIES a factor of location relative to that of energy resource but indicating already existing energy and power capacity in a form of infrastructure. This factor is important for location of projects with a modest requirement on energy.

ENERGY-INTENSIVENESS a locational determinant of industry (project) which indicates exact requirement of energy per unit of production (in rare cases, per worker). Energy-intensive industries (production of aluminium, phosphorous, refined copper, some kinds of synthetic fiber) tend to locate themselves in the regions where energy resources are adequate.

ENTERPRISE the smallest object of location - any production unit, as well as social institution, with its own management and independent account (plant, works, power station, port, aerodrome, hospital, etc.). The enterprises may compose larger objects of location, like combine, industrial complex, agro-industrial complex, etc..

ENVIRONMENT a term used to define the aggregate of natural, and human made conditions for the life of people. The natural conditions significant for that are: climate (humidity, rainfall, insolation, seasonal fluctuation), height (influencing the content of oxygen), water resources, endemic diseases. Human made factors are: pollution of water, air and soil, specific and professional diseases, etc.. These two types of factors may act in a combined form, like "smog", a very unhealthy mixture of natural fog and smoke from the chimneys. Environment is thus a very important factor of location and is to be specially studied among other factors.

Bibl: United Nations, Problems of the human environment; Report of the Secretary-General, 26 May 1969, No. E/4667.

ENVIRONMENTAL POLLUTION contamination of air, water, soil and other elements of human environment by sewage, organic and inorganic chemicals and other deleterious substances mainly connected with the human activity. Environmental pollution often may affect the food chain transferring the chemical, radioactive and biological contamination (e.g. pesticide residues) to drinking water and food. Pollution as a social danger seems to be essentially a consequence of modern industrial technology, rapid transport development, modern housing etc.. Pollution usually interfere with man's health and his economic, social and even mental well-being. The problem of pollution control is an important part of economic and several development planning and has to determine the level of pollution which permits optimal economic and social development without hazards to health in its broad

sense. There can be little doubt that pollution is increasing with the development and it presents now a special danger in developing countries where the scientific and technological means of pollution control are less known and less taken into consideration in comparison with industrially developed countries forced to strengthen the pollution control often having reached a dangerous level of environmental pollution. The substance providing pollution are mainly chemicals such as synthetic detergents, solvents, fuels or alloys, some pesticides etc., which may reach air, surface and underground water, soil. Surveys involving the measurements of the concentrations of individual pollutants are needed everywhere. Plans must be made so that new power stations, industrial plants and domestic sources of pollution do not surpass the limits dangerous for the health.

- Bibl: (1) Environmental Pollution and its Control, Report by the World Health Organization, UN document E/4457/Add.1, 1968.
- (2) International co-operation to study the pollution of water by detergents; The OECD Observer, 1964, Vol. 12, pp. 38-39.

EPURE a special cartographic symbol for coding dynamic phenomena (migration, transportation, etc.). On the transport map, for example, epures are those stripes which follow the transport routes and show the direction of traffic, the quantity, and, if necessary, the structure of commodity flow. They may show also the capacity of transport routes and its utilization. The direction of traffic on the map, for a better understanding, should be related to the type of driving in a given country. Thus, in right-hand driving countries, the stripes on the right side of the road should indicate "forward" flow, on the left - "backward" flow.

EQUAL-COST-DISTANCE MAP a map with isograms drawn concentrically around a point and showing the zones with the same (within a zone) transport costs for goods to be delivered to that point (e.g., 1 dollar per ton, 2 dollars per ton, etc.).

EQUALIZATION a type of the regional development policy (q.v.) which pursues elimination of differences and disparities among the economic region. It foresees: (1) equalization of living standards of population; (2) elimination of substantial differences in levels of economic development. The process is performed by raising of the backward region up to the level of advanced ones. Opposite to equalization is the process of polarization (q.v.).

EXPERT APPRAISAL a procedure used in some countries in order to have the last professional evaluation of the selected project (or several alternative projects) before preparation of blue-prints. The decision-making body appoints a team of experts, known masters in the fields concerned, supplies it by project documentation and assigns it to produce the last appraisal. The experts may request additional information from the authors of the project. In order to avoid subjective factors, the expert appraisal may be done secretly (neither expert, nor author of project know each other). The project passed this procedure with positive mark is handed over to the blue-prints preparation.

EXPLOITABLE RESOURCES those which can be used economically by current economic and technical conditions.

(EXPORTING INDUSTRIES) in regional analysis, those which deliver their produces mainly to the consumers (markets) outside of the region. See: specialization.

EXTERNAL ECONOMIES a fall in the cost of any of the materials and services which (the fall) is not a merit of the enterprise itself but obtained from outside sources. External economies arise also when a firm is freed from necessity to create expensive, if isolated, auxiliary services (power, transport, etc.) and relies upon external infrastructure where economies of scale are fully utilized.

Bibl: Scitovsky, T., Two Concepts of External Economies; Journal of Political Economy, April, 1954.

EXTRAPOLATION extension of judgement about the known portion of the event (phenomenon) towards that part which is not known. For example, extension of the growth rate of the past to the future. In regional planning, a rule is to be followed: the smaller the area, the more cautiously the method of extrapolation is to be applied.

* F *

FACTORS OF INTEGRATION are worth investigating when a multi-national project is under consideration. These are: geographical (neighbourhood of the areas affected by the project), transport accessibility, economic factors (distribution of economic activities and benefits), political factors necessary for any economic co-operation.

FACTOR OF LOCATION as defined by the father of the location theory, Alfred Weber, is "a kind of clearly distinct advantage, which arises in economic activity when this activity occurs in a given place or generally in a given kind of place". A. Weber, who dealt almost exclusively with the problem of location of a single enterprise, recommended to apply three major factors influencing the costs of production, namely, transport costs (which, in Weber's Theory, establish the basic framework determining general location), labour costs and agglomeration. In the course of development of modern economy, its complication, more and more factors of location were introduced in the theory and practice, and some scholars count them now near two dozens. A series of their classifications exist, as well as various interpretations on how to apply them. The appearance and development of mathematical machines and methods broadened the sphere of planners in applying such factors which were not imaginable not only in the time of Weber, in the beginning of this century, but even two decades ago. - Below, a principal classification of locational factors may be observed. This classification, unlike the various existing ones, is based on the criterion of complexity. The "primary" factor (left column) are those which are simple to calculate and to take into account while planning (it does not mean that application of primary factors is completely free from certain difficulties). The "secondary" factors bear some kind of complexity, since they are, as a rule, the result of transformation of primary (naturally given) factors. The right column - "tertiary" factors - contains highly aggregated conditions of location, each of them needs, before being applied, several quantitative and qualitative characteristics, so that their identification alone creates some theoretical and practical difficulties.

Primary factors

1) Population (quantity, density, distribution by territory, sex, age; vital statistics)

2) Territory (area, its physical diversification)

3) Natural conditions (climate, humidity, altitude, geological and seismic characteristics)

Secondary factors

1) Labour (quantity, quality, employment)

2) Transport (network, efficiency, accessibility, costs)

3) Building facilities (capacity and efficiency of building enterprises)

Tertiary factors

1) Environment (physical conditions for human life and work)

2) Market (capacity, location, diversification, taxation)

3) Social security (emergency zones)

Primary factors

4) Natural resources: minerals (location, quantity, quality, specificities of exploitation and delivery)

5) Natural resources: Energy (kinds, quantity, quality, costs)

6) Natural resources: Water (quantity, quality, possibility for comprehensive utilization, seasonal fluctuation)

7) Natural resources: others (soils, forests, animals, etc.)

Secondary factors

4) Raw materials (quantity, quality, delivery, costs)

5) Energy facilities (capacity and efficiency of existing infrastructure in that field)

6) Water supply facilities (capacity and efficiency of existing infrastructure in water supply and sewerage)

Tertiary factors

4) Technological factors (territorial incompatibility)

5) Agglomeration effect

As it may be seen, the primary factors are significant for elaboration of the general direction of economic development and may be also used for a rough, preliminary identification of the standort (place of location). The secondary factors are more taken into account while planning of location of the new projects. The last column represents mainly the factors necessary for micro-location.

The planner never must take the factors in isolation, but to have in mind their inter-dependence. On the other hand, various industries are related towards various factors in a different way; for example, for a labour-intensive project the factors such as "labour", "environment" will play a decisive role, while for an energy-consuming enterprise that is "energy" which will have priority. The quantitative characteristic of the factor of location is called locational characteristic (see). The relationship of various projects towards locational factors is shown in their locational determinants (see).

Bibl: Criteria for location of industrial plants (changes and problems). Document presented to the International Symposium on Industrial Development, Athens, 29 November - 20 December 1967, ID/CONF.1/B.3.

FEASIBILITY STUDY: an important preliminary economic research work for locational and regional planning. Respectively, its goals might be either investigation of the probable standorts (places of location) for given project or the analysis of the development potential for a given region. The regional feasibility study may be conducted also in favour of one or several industries to be located there. Usually, the feasibility study is performed by an appointed team of experts and the work accomplished takes a form of special document presented to the planning body.

FEEDER ROAD a non-transit transport route connecting remote place (usually in rural area) with the central market or with the main route.

FLUCTUATION OF LABOUR say, 25 per cent means that during a reported year a quarter of the employees left the factory and the same portion of new workers came. The higher the fluctuation of labour, the more difficulties are to be met in the factory, especially in the field of vocational training and experience of the workers. The fluctuation of labour is one of social indicators of economic development, and its increase signals that something is wrong in the organization of the work (inadequate salary, absence of proper dwellings/schools, bad transport conditions for commuters, etc.).

FOCAL POINT a point (centre, enterprise) experiencing centripetal forces in regional development. See: nucleus, growth centre.

FOLLOW-UP the process of controlling implementation of the plans and projects. In regional planning a supplementary feature of this process is to observe the side-effects of the projects being implemented on the surrounding area and to master the relevant measures.

FOOTLOOSE INDUSTRY a branch of industry which has no evident connections with the region's natural and economic potentials and resources; or that one which has had those connections but lost them in the course of time (exhaustion of the deposits, replacement of crops under cultivation, etc.).

(FRONTIER REGION) a geographic area within a country which is characterized by sparse population and unexploited natural resources of a remarkable potential. See: pioneer region.

"FULL CAPACITY" a mode of location when the selection of place for the project is justified by availability (in that chosen place) of unused capacity in some industries or infrastructure. Thus, if a city has generation capacity of 50 MW, and consumes during the peak hours only 40 MW, an enterprise may be located here, if its electricity requirements lay below 10 MW.

"FULL EMPLOYMENT" a mode of location when the selection of place for the project is justified by availability (in that chosen place) of unemployed labour. An example: a city with overwhelming engineering industry, or other heavy industries employing mainly male labour force, may accept a textile plant in order to provide jobs for female labour.

(FUNCTIONAL ECONOMIC AREA) term used by some regionalists to define economic region (q.v.).

FUNCTIONAL TYPOLOGY in modern regional science, one can easily confirm the overall trend from morphological, genetical and horological typologies and classifications towards functional ones. The latter are based on such criteria like the role of the investigated elements in the framework of the national (regional) economy, specialization of elements, their place in the national (regional) hierarchy, etc.. The

functional typology suits more than any other to the comprehensive regional development planning since it stresses the inter-relationship among the elements.

FUNCTIONAL ZONING OF TERRITORY in the town planning, the architects and planners use to divide the area of a city (town) into specific zones: governmental, business, commercial, industrial, housing, recreational, etc.. Such a division helps in planning, in supervision, in organizing of transport network, and permits to preserve normal environment according to the sanitary and hygienic regulations.

* G *

GENERAL SCHEME OF LOCATION is the main document (programme) of location policy describing the strategy, principles, and pattern of future location of productive forces over the country's territory for a long-term period (10-15-20 years). General scheme of location is a component part of national strategy for economic and social development. The basic prerequisites for elaboration of General Scheme are:

- (a) Overall strategy of economic and social development for the relevant period.
- (b) Analysis of current pattern of location and regional development, as well as of tendencies observed in the past.
- (c) Feasibility studies related to both sectoral and regional aspects of development (a study for each economic sector or industry, a study for each economic region).
- (d) Population growth projection, for country and by region.
- (e) Criteria of optimization and rationalization of location and regional development.

General Scheme has to determine:

- (a) Main principles and goals of location policy for relevant period.
- (b) Location of economic sectors and industries.
- (c) Development of regions.
- (d) Distribution of population (manpower), development of the settlement network.
- (e) Territorial development of economic and social infrastructure.
- (f) Perspective flows of main commodities - within the country and in export-import operations.

The General Scheme of location must foresee several alternative variants in its main directions. The ideas and targets expressed in General Scheme have to be taken into account while elaborating short-term plans and programmes within the whole long-term period.

GEOLOGICAL SURVEY is a basic research work in the regional analysis (q.v.); the ends of which are:

- (a) investigation of the geological structure of the area;
- (b) exploration and evaluation of its mineral wealth;
- (c) estimation of the tectonic and seismic peculiarities of the area and other conditions necessary for engineering and construction.

The results of the survey are presented in a form of descriptions and geological map.

"GHOST TOWN" defines a township which had prosperity but later was abandoned and almost completely disactivated due to the disappearance of development stimuli. It happens usually with the mining towns after their deposits have been exhausted, but may be experienced by other types of towns.

GREEN BELT, GREEN ZONE is an area covered by natural or artificially planted forests, fully or partially surrounding a big city. It serves not only as a recreation zone but also as "lungs" of the city, supplying the population by fresh waves of oxygen. In physical planning, it is commonly accepted that, in average, a city must have not less than 10 square metres of green area (parks, forests, play grounds) per inhabitant.

GROWTH CENTRE is not obligatorily a geometrical centre of a region but such a point where the investments, being accumulated, give the most effective influence on the whole region. It is represented usually by a most favourable settlement, well situated on the crossroads, supplied by at least a minimum of the necessary natural resources (space, water, ubiquitous building materials, etc.), manpower and, as a rule, an already existing embryonic infrastructure. Selection of a growth centre is a prerequisite for location policy of selective dispersion (q.v.). See also: resettlement centre.

Bibl: Tosi, Dario. An Overall View of the Policy for the Creation of a Local Development Pole; SUDENE, Recife, 1966.

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HARMONIZATION OF NATIONAL PLANS is an international action aiming to dovetail the development plans of several countries (in timing, mutual exchange by certain products, custom regulation, etc.). A special attention should be given to the planning and implementation of the multi-national projects and other joint ventures.

HARMONIZATION OF REGIONAL DEVELOPMENT is a necessary component of any planning work. It pursues two main goals: to provide a proper development for each region in accordance with its potential and general development policy, and, on the other hand, to incorporate regional plans or programmes into national plan.

HEIGHT above sea level is an important locational characteristic for a region, especially for transport and agriculture (some plants have their "height" limit), and for identification of catchment areas. The height is shown on hypsometric map or combined with an outline map.

HIERARCHY OF CITIES it is an objective fact that the cities of a given country (region), as well as all the settlements, find themselves in a sort of inter-dependency. Regional science distinguishes several orders of cities. In a relatively small country, it is usually the biggest city (often the capital) which dominates, both economically and administratively, the whole network of settlements; it is a city of the first order. It is followed by some regional centres, each of them being a master of respective areas - the cities of the second order; and so on. The bigger the city, the more diversified is its industry, services, the bigger is its market. In regional planning, it is an important goal to arrange proper inter-dependency of cities, taking into account their geographic situation, existing industries, size of city and attached area, economies of scale, accessibility, perspectives of development.

HIERARCHY OF REGIONS from both the economic and managerial points of view, it is suitable to have several (depending on the size of country and its population) grades of regional subdivisions (like province - district - community, speaking in administrative terms). The national plan may have as its objects in regional planning so-called regions of the first order, while the regional plans or programmes may detailize their goals by smaller regions, etc.. For practical purpose, each country has to elaborate its normatives for the primary economic regions (q.v.), the smallest territorial units below which regional planning seems to be useless.

HINTERLAND (1) Zone served by port or railway station. (2) Zone of economic gravity of any central object of location (q.v.) or centre (q.v.); that of urban places is called, by some authors, urban field (q.v.).

HOMOGENEOUS REGION one of extreme two types of regions classified by their territorial structure (see: nodal region). The component parts of the homogeneous region are not diversified, and first of all, there is no economic centre, or nucleus (see), the economic and social indicators do not vary remarkably from one point to another. This type of region is relevant to agriculture and forest areas. Generally, the homogeneity is proper for the primary stage of regional development, in the course of time all the homogeneous regions transform themselves into nodal regions. As a matter of fact, there are no strictly homogeneous regions, since even in the underdeveloped rural areas one can find small focal points (marketing centres, for example) which may be regarded as embryos of future nuclei.

HYDROLOGICAL BALANCE of a given area is a calculation of all theoretically possible water resources. In its simplest form, the equation of hydrological balance reads: $P - E = Q$ (when P is precipitation, E is the evapotranspiration - evaporation plus transpiration by plants - and Q is surface flow). For a more exact calculation, the fluctuation in penetration of surface waters into the ground have to be observed. The basis for calculation is represented always by precipitation data, which, due to the relatively intensive coverage of territory by meteorological stations, are available and their data are most reliable. Meanwhile, despite the recognized key role the evaporation plays in the hydrological cycle, most countries are not adequately covered by evaporation measurements. Stream flow records are the most important of all hydrologic data, since they represent an integration of other factors. Furthermore, the flow of streams is an indicator of climatic changes, because the run-off is the residual of rainfall after demands for evapotranspiration are satisfied. The completed general hydrological balance is a basis for a long-term programming of water utilization for any purposes. See also: balance of water resources.

HYPOMETRIC MAP a map which indicates the height of land above sea level, mainly using contours - isogramms connecting points with the same height. The latter are usually taken in rounded intervals (100, 200, 300, etc. metres). The relief - height and diversification of territory - plays a vital role in the distribution of population, in determining of catchment areas, in transport construction, thus, the hypometric map is extremely important for regional planning. The contours may be drawn on the outline map (q.v.).

HYPERURBANIZATION term used sometimes to define process of uncontrolled urbanization when giant agglomerations and megalopolises arise. See: agglomeration, over-concentration, urbanization.

 ** I **

IDENTIFICATION OF PROJECTS all the scientific, design, and financial exercises preliminary to the stage of the concrete implementation of the projects. It consists of three stages:

- (1) Evaluation of projects - process of definition of the type, size and number of new projects appropriate to the national (regional) economy in accordance with adopted plan or development programme.
- (2) Selection of the better projects (on basis of their evaluation). This phase includes preliminary territorial allocation of the selected projects.
- (3) Preparation of blue prints (see) for the selected projects. The third phase is always the last one in the consequence. The phases one and two may, due to some conditions, be inversed or amalgamated.

Bibl: Edin, Osman, and Morris J. Solomon: Project Preparation and Analysis, U.S. Bureau of the Census, Washington, D.C., January, 1962.

INCOME in regional planning is an important locational characteristic of a region, as well as a goal of the regional development, if one has to increase the income during a certain period. Due to the controversial nature of the income calculations, it may be recommended to take the so-called "purchasing power" which accumulates all the wages and salaries and net profits gained by individuals and communities of a region during a year. The total income of a region may serve as a good indicator of the size of the regional market, while the income per capita shows the standard of living and, to a certain extent, the diversification of the regional market. It is worth specifying the income by source (that gained in agriculture, industry, services, etc.) since it gives a more reliable picture for comparisons in both the spatial and temporal surveys. Whatever principles of income calculation is in use, they should be the same for all objects under comparison.

- Bibl: (1) Leven, Charles L.: "Regional Income and Product Accounts", in: W. Hechwald (ed.): Design of Regional Accounts, The Johns Hopkins Press, Baltimore, Md., 1961.
- (2) Prandecka, B.K., Les problèmes de l'optimalisation du revenue national dans le système spatial; Les problèmes spatiaux dans la planification en perspective, Warszawa, 1968.

INDUSTRIAL CENTRE any territorial concentration of industrial activities (usually a city or a town) where agglomeration effect takes place. The extent and efficiency of that effect depends on the size of the industrial centre, as well as on the level of complexity, i.e. on the intensity of mutual relations among the enterprises of the centre. A particular

category of industrial centres specialized almost exclusively on the processing of agricultural raw material from the adjacent area are called agro-industrial centres.

INDUSTRIAL COMPLEX an ensemble of technologically and economically inter-connected industrial units located in a given territory. It may be of different scale of size depending on the type, number, and size of its component industrial units. Although industrial complexes may form the core of the development of an economic region or an industrial centre, the notion of industrial complexes is different from that of territorial concepts of the latter. The concept of an economic region or industrial centre remains territorial - or spatial - in character, it shares therefore the unique locational characteristics of the particular area to which it refers. The notion of an industrial complex is based on the techno-economic specificities which establish the interconnections between the converging industries included in it.

The advantages of creation of industrial complexes are:

- (1) substantial economies of investment expenditure (as a rule, the investment for the whole complex is less than the sum of investment for each enterprise planned and located in isolation);
- (2) most efficient production results since they make it possible to secure the advantages of specialization, economies of large-scale operation and organization of common managerial and infrastructural facilities;
- (3) possibility of maximum exploitation of the natural and raw material resources of the area concerned;
- (4) opportunities for technological research and experimentation and for the overall modernization of economy.

As for classification, the industrial complexes may be those of extracting industries, energy, building materials, metallurgy, machine-building, chemical industries, light and food industries, or have a mixed character (petroleum extraction plus petrochemical industry, iron and steel works plus engineering, etc.). The complexes based on the processing of agricultural raw material are known as agro-industrial complexes (q.v.).

- Bibl:**
- (1) Chardonnet, J., Les Grands Types de Complexes Industriels, Paris, 1953.
 - (2) Isard, Walter, & Thomas Vietorisz: "Industrial Complex Analysis and Regional Development", in: Papers & Proceedings, Reg. Sc. Ass., Vol. 1, 1956.
 - (3) Isard, Walter & E.W. Schooler: "Industrial Complex Analysis: Agglomeration Economics and Regional Development", in: Journal of Regional Science, Vol. 1, No.2, Spring 1959.
 - (4) United Nations, Inter-regional Seminar on the Role of Industrial Complexes in Economic Development, Tashkent, 1964.

- (5) Berns, L.S., Complexes Industriels Planifiés aux Etat-Unis, Luxembourg, 1966.

INDUSTRIAL ESTATE organization and objects (usually those of infrastructure) set up for the purpose of developing an area and providing it, often with factory buildings, for sale or lease to prospective industrial occupants. The enterprises based on the same industrial estate may either have the character of an industrial complex, or may have no inter-connections. The creation of industrial estates brings about significant savings in the infrastructural expenses (external economies) and make prosper even small-scale enterprises.

- Bibl: (1) United Nations, The Physical Planning of Industrial Estates, Department for Economic and Social Affairs.
- (2) United Nations, Establishment of Industrial Estates in Under-developed Countries, 60,11.B.Y., New York, 1961.

INDUSTRIAL KNOT a new form of industrial centre (see) developed in the countries with centrally planned economies where the cyclical fluctuations do not occur. It is characterized by a high level of inter-dependence among the industries and is created and supervised (planned) in accordance with the integrated general plan.

INDUSTRIAL LOCATION EXPERT a title of expert recruited by UN to work in the field of industrial location. University degree in economics or economic geography is necessary.

INFRASTRUCTURE general term defining all the man-made elements of a territory which secure normal functioning of production. The infrastructure can be divided into two branches:

(a) Economic Infrastructure -

- (1) transport;
- (2) water supply and sewerage system;
- (3) energy supply system;
- (4) trade and banking.

(b) Social Infrastructure -

- (1) education and training;
- (2) health service;
- (3) culture and recreation services;
- (4) housing;
- (5) social security.

All these services are regarded as essential for the creation of a modern economy, although they do not participate in the process of production directly. In the regional and locational planning, the development of infrastructure plays a vital role, since it determines the possibilities of the general development of regions. Infrastructure, its facilities and capacities, are the main yardstick to measure the capacity of location (q.v.).

***INSTITUTION** a term to define any enterprise of non-productive character (bank, school, hospital, etc.), relevant mostly for social infrastructure, as well as for administrative organizations.

INPUT-OUTPUT ANALYSIS the quantitative analysis of inter-industry relations. All transactions that involve the sale (delivery) of products or services within a economy during a given period are arranged in a square indicating simultaneously the sectors making ("outputs"), and the sectors receiving ("inputs") delivery. Knowing the standard specific requirements of an industry on the input of others (per unit of production or service), one can calculate input-output balance for the future year. This method allows the use of modern computers in planning exercises.

INPUT-OUTPUT BALANCE of a region (centre) is an analytical model of the overall commodity flow within the region (inter-industry relations) and outside (inter-regional relations). The input items are specified not only by sector, but also by region of origin, while the output items crossing the limit of region are also specified by region of destination. It is a good, though complicated, device for analysis and verification of the commodity flow in the intra- and inter-regional aspects. The balance can be elaborated also for the future years.

Input-output balance may be prepared in an inter-regional form, where all the country's regions have their lines and columns in the matrix. Such a balance usually is prepared in a very simplified manner, sometimes even for a single product - or for all products but aggregated in tonnage; the latter balance is necessary for the planning of transport development.

Bibl: (1) Leontief, Wassily:

- (a) Input-output Economics, Oxford University Press, 1966.
"Multiregional Input-output Analysis", in Tibor Barna (ed).
- (b) Structural Interdependence and Economic Development, MacMillan, London, 1963.
- (2) Isard, W., Interregional and Regional Input-output Analysis: a Model of a Space Economy; Review of Economics and Statistics, 1951, 33(4), pp. 318-328.
- (3) Miernyck, William H.: The Elements of Input-output Analysis, Random House, Inc., 501 Madison Ave., New York, 1965.
- (4) Moses, Leon: "Interregional Input-output Analysis", in: American Economic Review, December 1956, pp. 803-832.
- (5) Fedorenko, N., and Kossov, V., Utilization of inter-sectoral balances in the drawing up of economic development programmes. The paper presented to the International Symposium on Industrial Development, UNIDO document No. ID/Conf.1/G.15.

***INTERMEDIATE TECHNOLOGY** a term defining the introduction, by some developing countries, the technology which is, for the time being, below the world standards, but having in view its future modernization. The action may have various reasons (necessity to introduce obsolete, but labour-intensive

projects in order to arrest increasing unemployment; lack of sources or/and smallness of market for full-scale projects; availability of obsolete, but cheap equipment offered by foreign investors, etc.). But, whatever reason might be, the action is understood as a temporary measure, and the adopted projects have to be modernized as soon as possible. In order to guard those uneconomical projects from outside competition, the governments apply two measures: either they introduce protective taxes, or they locate intermediate technology projects in remote areas, the poor accessibility of which makes imported goods less competitive (due to raising transport costs).

INTERPOLATION calculation of intermediate data when the extreme or adjacent data are known. This method is used in both the graphs (while drawing the curve) and maps (while drawing the isogram). The closer the gap between extreme data, the more precise the result of interpolation.

INTER-REGIONAL LINKS - the exchange by goods and services among various regions. Although they are nothing but the aggregate of links among concrete enterprises located in different regions, as such they are a subject for special research in the interest of transport, improvement of the commodity flow, etc..

ISOGRAM a line on the map connecting points with the same quantitative characteristic (density of population, height above sea level - called contour, rainfall, etc.).

ISOVALENTE a line on the map (isogram) connecting the points with uniform economic indicator. Thus, all the points situated around a centre in the distance where the transport cost of a ton to and from the centre is equal to one dollar are connected with the same isovalente. Several isovalentes basing on that centre - say, for the marks "one dollar", "two dollars", "three dollars", etc. - compose so-called "equal-cost distance map" (q.v.).

** J **

(JUNCTION) the point of inter-crossing of the transport routes; see nodal point.

** K **

KERNEL historical (in most cases, also geographical) nucleus of a city.

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LAND RECLAMATION is the process of making wholly or partially submerged foreshores, swamps, moors and lakes into habitable or otherwise usable land. The recovery of areas spoilt by mining, abandoned quarries etc. also is included in this notion.

LAND USE a broad term meaning all kinds of utilization of the land as a territory, distribution of the territory among various users, identification of the functional zones, etc.. The practice involves also such questions like price of land, land reclamation, property on the land and some others. It is a very important exercise in locational and regional planning.

Bibl: Alonso, W., Location and Land Use. Cambridge (Mass.), Harvard University Press, 1964.

(LESS DEVELOPED REGION) see: undeveloped region.

LINEAR OBJECT (OF LOCATION) is an object which has only one dimension - the distance (length). Since the activities which require the construction of a linear object lie usually on the extreme points of the latter (producing enterprise - its market), the real stretching of the object (transport route) permits more alternatives.

LINK any material connection or relation of one enterprise to another, most often it is the delivery of produce or raw material. For the enterprise delivering the goods they are "output items", for that receiving them they are "input items". About indirect linkage, see: supplementing industries.

LOCALITY a settlement, or an isolated part of a settlement, which is not given an administrative authority; so-called un-authorized settlement may be also counted as locality. A settlement with an administrative authority is called community.

LOCAL MARKET INDUSTRIES are those of a region (centre) the produce of which is consumed within regional boundaries; they are of two types: auxiliary (to serve the industrial and other economic requirements of the region) and servicing (to serve the population of the region; see also classification of branches). The rest of industries is called industries of specialization.

LOCAL OBJECT (OF LOCATION) an object of location the zone of influence of which lies, as a rule, within walkable distance (schools, dispensaries, cinemas, bars, shops, laundries etc.). As these objects are mostly population-oriented, they are located in settlements. Their micro-location is more subject of convenience for customers. The size of the local objects is determined by number of customers living within the zone of influence.

LOCATION in regional science and practice, it is the finding of geographical place where the object (plant, institution), will be built and operated. Since there are always more than one proper place, location means also selection of the best one of them - best means in accordance with approved criteria. There are several methods which permit to solve the particular problem of location in an optimal way. See also: regional science, micro-location.

Bibl: L8sch, A., The Economics of Location; New Haven, 1954.

LOCATIONAL ANALYSIS a scientific research (survey) of the territory in order to find out the most appropriate geographical place for building and further operating a project. It consists of identification of locational characteristics (q.v.) of various probable alternative places of location, or standorts, and of their comparison.

Bibl: Haggett, P., Locational Analysis in Human Geography; London, 1965.

LOCATIONAL CHARACTERISTICS locational factors in a given region expressed in quantitative terms. It is not sufficient to know that this region has "much" or "limited", say, water resources, but it is vital to know exactly how much cubic metres per second (per day, per year) may be extracted for the project being located; what are the costs of a cubic metre of water supplied; what are the seasonal differences, etc.. A set of locational characteristics (water, energy, manpower, raw materials, transport facilities, etc.) is extremely necessary for locational exercises. Those of them which, for any reason, limit location of new enterprises, are called critical locational characteristics.

Generally the process of selection of the best place for a given project, is the process of identification of the locational characteristics of various places with the locational determinants (q.v.) of the project under investigation.

LOCATIONAL DETERMINANTS of a project are those from its techno-economic data which determine selection of the most rational place of its location, or, in other words, its relations (requirements) to the locational factors expressed quantitatively. It is not sufficient to know, that a project depends strongly on such a factor like "water resources", but it is vital to know, for exact calculations, how many cubic metres of fresh water it consumes per second (per day). Petroleum refinery and iron and steel works of similar size (in terms of payroll) are both big water consumers. Meanwhile, the determinant of the former may be $2\text{m}^3/\text{sec.}$, while that of the latter $5\text{m}^3/\text{sec.}$, and this difference may influence their location. The quality of elements required is also a necessary attribute of locational determinants. A brick works and a bakery may require the same quality of water, say, 0.2 cubic metre per second. But for production of bricks any water may be used while the bakery requires only chemically and biologically clean water.

The techno-economic data of a project which are indifferent to the place of location cannot be labelled as locational determinants, (for example, technical specificities of buildings, interior transport, structure of shops, pattern of management, etc.).

(LOCATIONAL FACTORS) see: factors of location.

LOCATIONAL PLANNING a section of sectoral and regional planning which deals exclusively with the future standorts (places of location) of all the projects included in the national or regional plan. The basic documents for locational planning are: list of the projects approved for implementation, feasibility studies for major projects, alternative recommendations of locational analysis, locational determinants (q.v.) of the projects. The decision makers for big projects are usually sectoral ministries (see: classification of projects). The decisions have to be taken according to the approved location policy and regional development policy.

- Bibl:
- (1) United Nations, Location of Industrial Plants, New York, 1964 and 1965.
 - (2) Sampedro, José Luis. Principios Practicos de la Localization Industrial, Aguilar, Madrid, 1957.
 - (3) Bloom, C.C., State and Local Tax Differentials and the Location of Manufacturing, Towa City, 1956.
 - (4) Alonso W., The Location of Industry in Developing Countries, UNIDO document ID/WG.9/17.

LOCATION POLICY Location policy is the aggregate of goals, media, and methods to be used in order to accelerate/to help in achievement of the planned (desired) general ends of development - by means of territorial distribution (redistribution) of resources. General goal of the location policy is to achieve the most rational distribution of resources (productive forces) over a country's territory; in that aspect, it has close connection with the regional development policy, the main goal of which is to provide rational (balanced) growth of the country's regions. The partial goals, adjusted to the general economic policy, may be: minimum of expenditure spent; minimum of imported goods (foreign currency) consumed; maximal use of the local raw materials; maximal employment; specific concern towards several regions, etc.. The media at the disposal of location policy are: territorial distribution of the infrastructural facilities; economic incentives; restrictive measures, etc.. The methods of location policy embrace both the patterns of location (concentration, deconcentration, dispersion, selective dispersion, nificative dispersion, decentralization) and modes of location ("counter-flow", "full employment", "full capacity use", "complex development", etc.). Location policy is formulated in the form of "principles of location". It has to be a more or less stable, within a given planning (development) period, but must give some room for manoeuvring. This flexibility of policy is to be provided by: (a) elaboration of various criteria of optimal (rational) location; (b) devising of the order of priorities (by industry, by region); (c) combination of the pattern of location to be approved. After a certain period, just with the changes in the general development strategy, the location policy should be revised. - It implements itself in the planning (programming) of location, for which the location policy has to provide long-term and short-term goals, criteria of optimization (rationalization), list of priorities, pattern of location approved. - Location policy is not

and never has been an independent activity but one subordinated to the general policy of economic and social development. What may be labelled as "independent" concerns only the scientific fundament, methods of analysis, calculations, and implementations, which have some specificities and thus predetermine separation of location policy as a special discipline with specially trained people to carry it on. The words and deeds of location policy cannot be in contradiction with those of general development policy; therefore the decision-makers in the field of location are the same as in the overall development strategy. But, on the other hand, the materialization of the general strategy cannot be properly achieved without a wisdomful location policy. If, for example, the "import substitution" is one of the general national targets, that is location policy which can carefully identify the areas possessing necessary local sources and to show the best places for location of "substituting" enterprises. In such a way, whatever national goal is proclaimed, it has its response in the policy of location.

Specificities of location policy are as follows:

- (1) Location policy is distinguished by a higher level of concretization of the plans and projects, since any decision on standort of location needs, besides common economic calculations, a proper solution of technical, technological, geological, managerial and other problems depending upon the peculiarities of the chosen geographical place for new project. It is due to the fact that location is closely connected with the micro-location, i.e. with the siting of a project on a unique place of ground where it will be built and function for a long period.
- (2) The bulk of advantages, as well as disadvantages, produced by implementation of the location policy, are often implicit. Often the policy-makers and planners may foresee only primary side-effects, but as for those which appear to be secondary and even tertiary, it is usually difficult to forecast; the more comprehensive is the location policy, the more side-effects of a project located can be foreseen and taken into account while planning.
- (3) The errors in location policy have one outstanding feature: once implemented, they are almost irreversible. Control figures (targets) of sectoral plans, fiscal policy, pattern of management may be altered swiftly but a plant that has been already built cannot be dismantled without incurring heavy losses.

Location policy is performed by specially appointed people within planning ministry or within the location units in the sectoral ministries. Regional planning units may have officers responsible for location activities in the region.

Bibl: Industrial location policies and policy measures in developing countries. The paper presented by the Executive Director of the UNIDO for International Symposium on Industrial Development, Athens, 29 November - 20 December 1967, ID/CONF.1/27.

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MANAGEMENT as a factor of location and regional development, increases its significance gradually and steadily, especially in the centrally planned economies. The size of an enterprise or of an industrial complex, the diversification of the regional economy are often limited not by the resources necessary for them, but by their manageableness - or by the lack of proper management. This factor has not yet been well studied, as far as it concerns the regional development, but its problems arise everywhere when practical implementation of the regional projects is under question.

MAPS FOR REGIONAL PLANNING Regional planning, due to its very nature to deal with spatial phenomena, cannot be carried out successfully without maps. Moreover, the maps, properly prepared and carefully studies, seem to be a highly useful instrument for regional planning exercises and decision making. Besides, the maps demonstrating all the economic and social objects of a given country, region, or area, can and should be regarded as a very convenient mode to collect statistical information. That is why all central regional planning units and regional development agencies must have at their disposal a set of maps - both ordinary and specially prepared for analytical and planning exercises. A principal catalogue of maps necessary for those institutions is shown below:

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| A. Basic maps | - | 1. Outline map* |
| | | 2. Population map* |
| | | 3. Settlements map |
| B. Natural conditions maps | - | 4. Soil map |
| | | 5. Hypsometric map |
| | | 6. Precipitation map |
| | | 7. Insolation map |
| | | 8. Endemic diseases maps (tse-tse, etc.) |
| | | 9. Vegetation map |
| | | 10. Game reserves and national parks map |
| C. Agriculture and fishery maps | - | 11. Crop maps |
| | | 12. Livestock maps |
| | | 13. Production units map (co-operatives, state ranches, agricultural schemes, etc.) |
| | | 14. Agriculture services map (camps, tractorization centres, fertilizer distribution, etc.) |
| | | 15. Agriculture marketing map |
| | | 16. Fishery map |

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|-------------------------------------|---|---------------------------------|
| D. Industry maps | - | 17. Mining map |
| | | 18. Manufacturing map |
| | | 19. Construction map |
| E. Transport and communication maps | - | 20. Railways map |
| | | 21. Road map |
| | | 22. Water ways map |
| | | 23. Air transport map |
| | | 24. Communication map |
| F. Economic infrastructure map | - | 25. Energy map |
| | | 26. Electric power map |
| | | 27. Water supply map |
| | | 28. Trade and banking map |
| G. Social infrastructure map | - | 29. Education facilities map |
| | | 30. Health services map |
| | | 31. Administrative services map |
| | | 32. Cultural amenities map |
| H. Special maps | - | 33. Equal-cost-distance map |
| | | 34. Income distribution map |
| | | 35. Project map |

-The complex of maps is necessary and useful for any regional planning exercise. Preparation of these maps on transparent paper or film is recommended. It permits to combine several maps (transparent overlays) in any desired combination relevant for the procedure to be accomplished. Some examples may prove this method.

If one needs to select the places for new marketing points (say, for crops), the following attributes are necessary: crop growing areas; rural population distribution; transport networks; location of existing markets. The respective maps may be selected, combined together and put on the tracing table with a light from beneath; or a photocopy of this combination may be made, so that the subsequent work could be done on this photocopy.

Respectively, in order to find new areas for crops some maps of the class B (Natural conditions maps) may be combined with the maps Nos. 1 and 2. In such a way, for any practical problem one can select relevant maps and combine them. The advantage is that each transparent overlay can serve many times for various combinations.

Evidently, the scale of maps should be uniform. The most useful scales are 1:500,000 and 1:250,000.

The transparent overlays are to be kept in special map cabinets (for example, in those of the firm OZALID, Essex, England). This way of storing them facilitates both their storage and utilization.

Some of the maps for regional planning may be used also for location

planning, especially if the method of elimination (q.v.) is used. See also: cartographic analysis, cartographic methods.

MARKET is one of the locational factors which play a significant role for any object of location (the market is understood here in a broad sense as a sphere of consumption even of those items which have no "marketing" problems in commercial terminology). Five main problems are to be studied while evaluating the marketing opportunities: (1) size of market; (2) continuity of demand; (3) distance to the market and transportation; (4) technology of marketing (packing problem); and (5) organization of marketing. Each of these problems affects, in its own way, the decision-making on the place of location, on the size of enterprise, on the management, etc.. A special research has to be made in the field of competition, including foreign competition, especially for the import-substituting projects.

- Bibl: (1) Dunn, E., The Market Potential Concept and the Analysis of Location; Papers and Proceedings, Regional Science Association, 2, 1956, pp. 183-194.
- (2) Greenhut, M.L., Size of Markets versus Transport Costs in Industrial Location Surveys and Theory; Journal of Industrial Economics, 1960, 8, pp. 172-184.

MASTER PLAN a plan of the development of a settlement, usually that of a city, although nowadays this term is also applied to all varieties of physical plans. Its main concern is that of territorial structure, extension, functional zoning of the urban area (the most comprehensive plans include also suburban zone), general architecture of city. But, as such, the master plan cannot be reliable without a proper investigation of the future economic development of the city.

MATERIAL-INTENSIVE INDUSTRIES those which require bulky raw materials in big amounts, like cement works, sugar plants, petroleum refineries, iron and steel works, etc.. They tend to locate themselves as near to the material supply base as possible, or in the places with a good and cheap transport connections - on the railways, in harbours.

MEGALOPOLIS a vast urbanized area characterized by (a) availability of several urban communities of various hierarchical significance and located in close neighbourhood as to (b) suburban zones of urban centres are overlapping each other and (c) agriculture areas and their significance are next to zero. Samples: Northeastern seaboard of the USA, Ruhr-basin in West Germany, Donbass area in Ukraine. Many scientists predict the development of the megalopolises as a normal picture of the future world.

METROPOLIS a definitely localized economic region embracing a big city (or several merged cities) and its close suburbs. It is characterized by heavy urbanizing of territory and high level of territorial concentration of population (with a density more than a thousand people per square km) industry and infrastructure. Admittedly, in order to be called a metropolis, the region has to pass the mark of one million inhabitants, though some features proper to this type of regions may appear even earlier. The latter may be summarized as follows:

- (1) The highest level of diversification in industry and infrastructure.
- (2) Service sector becomes a component of the regional specialization, especially such services like education, research and culture.
- (3) Internal market and general consumption capacity expand up to the level when the whole branches of industries turn to meet local demand.
- (4) The area of routine food supply (milk, poultry, vegetables) exceeds the limits of the suburban zone.
- (5) Gradually, along sides the agglomeration growth, the cost of land increases - centrifugally from the kernel - what influences all the branches of activities and diminishes the capacity of location.
- (6) Congestions in city traffic cannot be eliminated by ordinary means, and new types of transport must be introduced - such as underground, highway, skyway, etc..
- (7) Rising difficulties in the traffic, especially in the kernel of agglomeration, compell to make circumconnection - to construct the ring road or railway for transit traffic.
- (8) In external traffic, besides an unusual quantitative increasing of commodity flow, the latter's structure changes so that inflow exceeds outflow in three-five times. It happens due to two main reasons: first, increase of internal consumption, second, predominant development of manufacturing industries requiring more and more raw materials, energy (especially bulky fuel). Thus, agglomeration becomes a "generator of empty cars" what creates supplementary difficulties in transport activities. And both - industry and population - require a tremendous quantity of fresh water (up to 30-50 cubic metres per second), which is, in the neighbourhood of a metropolis, neither fresh nor available in proper quantity. Needless to say that the seamy side of the water supply is another problem - that of sewerage system.
- (9) Usually, metropolises are sufficiently supplied by labour, especially by skilled workers and engineers. But expanding industries need more and more labour force, not to be forgotten, young and semiskilled workers too. Meanwhile, the labour supply is deteriorated. On the one hand, the natural growth of labour age population, in metropolises, is less than in small towns and countryside - due to the reasons, not to be discussed here. On the other hand, the inflow of new labour from outside is sometimes limited since existing concentration of population simply does not permit to absorb it (in some countries, this inflow is also limited by administrative measures in order to avoid over-concentration). Thus, metropolis begins to absorb the labour force from vicinity, and shuttle-traffic (q.v.) becomes an indissoluble feature of metropolis. In some big metropolises, up to hundreds of thousand people participate in shuttle traffic.

Historically, metropolises began to emerge at the turn of the XIX and XX centuries, firstly on the basis of national capital cities. Later, the most prosperous industrial centres formed the basis for their growth.

This growing up occurred in two ways: metropolis either develops itself through expansion of a single city which "swallows" and subordinates the neighbouring settlement (London, Paris, Moscow, Cairo), or it grows up through amalgamation of several neighbouring cities of approximately equal size and significance (Wuppertal in West Germany, merged by two former independent cities of Barmen and Elberfeld; triple city Khartoum-Omdürman - Khartoum North, Sudan). Nowadays, one counts about 220 urbanized areas over the world which can be called metropolises.

From the very beginning, the fate of metropolises became a "talk of the town" in both the scientific and practical circles, and the dominant appeal was to stop, by all measures, the spontaneous growth of big cities. This worry was, and still is, justified by overwhelming negative effects caused by their growth. (Transport congestions, water and air pollution, unbearable cost of land, social disturbances, etc. - see "over-concentration".) Theoretically, there is no reason why a city of over a million of inhabitants - if properly planned and built up - should be undesirable, uneconomical, and unattractive. Moreover, this city possesses the highest agglomeration effect (q.v.) for industry. But in so far the objective laws of its growth are not yet well identified, and if even some of them have been discovered, their implementation is still hampered by political and social conditions - the preventive policy remains to be the best in mastering that problem (see: decentralization, "rural exodus", urbanization).

Metropolis should not be mixed with another type of urbanized region - megalopolis (q.v.).

- Bibl:
- (1) Bollens, J.C. and Schmandt, H.J., The metropolis: its people, politics and economic life, New York, 1965.
 - (2) Vigman, F.K., Crisis of the Cities. Public Affairs Press, Wash. 1955.
 - (3) Karpov L., Gochman V., Peculiarities of Modern Urbanization and Industrialization of Production. UNIDO Document ID/WG.9/B.16.
 - (4) Rough M.F., Définition des agglomérations, Urbanisme, 1958, 27, No.60.

METROPOLITAN REGION a planning region created to serve the development needs of a city. In the first instance, it is presented by a city within its administrative boundaries. With the progress of city growth, it penetrates into the adjacent areas either by spreading itself, or by subordinating the nearest settlement. Thus, the planning authorities faced the necessity to organize a new type of regions covering the whole urbanized area. In the USA, so-called "Standard Metropolitan Area" has been created, mainly for statistical purposes. In Japan city regions have been organized. Metropolitan region differs from metropolis by the following features: first, metropolis has, or may have, no administrative delimitation (once it has got it, it may be called a metropolitan region); second, metropolis does not have, or may not have, an unified authority to manage it, when a metropolitan region must have it, no matter of

sovereignty level; third, a metropolitan region may be created for a city which, due to its size, has not yet reached the stage of metropolis.

- Bibl:
- (1) Ginsburg, N.S., The regional concept and planning regions. In: Regional Planning, UN, Department of Economic and Social Affairs, New York, 1959, pp. 31-45.
 - (2) Harris, Britton: "Projecting Industrial Growth of Metropolitan Regions", in: Papers and Proceedings of the Regional Science Association, Vol.2, 1956, pp. 239-249.
 - (3) Hirsch, W.Z., Inter-industry Relations of a Metropolitan Area; Review of Economics and Statistics, 1959, 41, pp. 360-369.

MICRO-LOCATION process of identification of an exact place (building site) for a given project (syn: siting), the final stage of locational exercises. The process differs from that of location. For determining the standort, the general place of location (say, "the city of Mombasa"), it will be enough to investigate general economic and social conditions of the latter and to compare it with alternative standorts. Once the standort "city at Mombasa" has been chosen as the most preferable, one should find the area within the city most proper to the project (say, the northern suburb at Mombasa, in such a distance from the port, from the railway station", etc.). In micro-location, one needs to scrutinize the geological and engineering conditions of the selected area, its accessibility for the labour force, to determine sanitary-protective zone (if necessary), to study the prospective inter-linkage between the new project and other enterprises in the area (see: industrial estate, blocking of enterprises), etc..

The final stage of the process is preparation of blue-prints. If the process of general location (locational planning) is an exclusive domain of the planners and location experts, the micro-location needs a co-operation between planners, engineers and building engineers, as well as the municipality officials. The lack of proper site for micro-location in that standort can even alter the previously made decision on standort identification.

- Bibl: V.P. Chernyshev, L.M. Eingorn. Micro-location of industrial enterprises and planning of towns. UNIDO Document ID/WG.9/B.8., 1968.

MIGRATION movements of people over territory, a very important phenomenon and (in statistics) social indicator of economic development. There are some kinds of it:

- A. Anisotropic migrations (when the people change their residence).
 1. Inter-regional (in-migration and out-migration within a country);
 2. rural-urban migration;
 3. international (immigration and emigration).

B. Pendulum migrations (when the people do not change their residence).

1. Working seasonal, weekly and daily migrations (see: shuttle-traffic);
2. sporadic migrations (for shopping, recreation, etc.).

The people taking part in migration are called migrants. Those compelled to go by political reasons are called also refugees.

- Bibl:
- (1) Conjoncture économique et démographique. Hommes et Migrations. Documents 1967, 18, No. 677, pp. 2-7.
 - (2) Todaro, M.P., A Model of Labour Migration and Urban Unemployment in Less Developed Countries; American Economic Review, 1969, March, Vol. 59, No.1, pp. 138-148.

MODELS the graphic or mathematic presentations of actual or planned economic processes, are widely used in regional planning (scheme of an industrial or agro-industrial complex, commodity flow, input-output tables and balances, etc.). Some authors call the maps as models, but it is not quite correct. See: economic modelling.

- Bibl:
- (1) Chorley, R.J. and Haggett, P. (Eds.), Models in Geography, London, 1967.
 - (2) Beguin, H., Modeles géographiques pour l'espace rural africain; Brussels, 1964.
 - (3) Tinbergen, J., Sur un modèle de la dispersion géographique de l'activité économique; Revue d'économie politique, 1964, 74(I), pp. 30-44.

MODES OF LOCATION sometimes a given standort selected for the project has no explicit favourable locational characteristics, still the project is located there, and the decision is not wrong. That means that the planners exploit inter-action of some factors partially of external origin (empties on the transport, improper utilization of the power capacity during the night time, etc.). See: "counter-flow", "full capacity", "full employment", supplementing industries.

MUNICIPALITY a name given to the urban communities.

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NATIONAL PROFITABILITY approach to optimize the pattern of location taking into account all the economic and social benefits to be gained by the whole national economy. See also: Commercial profitability.

NATIONAL QUESTION as a factor of regional planning should be understood like that: if there are, within a country, some regions populated by national minorities or national groups whatsoever, the central planners must be very careful and cautious, in order to provide proper (equal) development for such regions. Economic equality in development is a basis for political stability in countries with heterogeneous national structure.

NATIONAL AND SOCIAL SECURITY as a factor of location has to be observed when, for some reasons, the neglect of it may cause damages and losses. For example, it is prohibited to create permanent buildings and settlements in the valley below the erected dam, since, once the dam occasionally breaks (accident, tremor), the flood may annihilate them. One observes also that housing is not to be built near dangerous factories (pollution, probable explosion), kindergartens to be located near railways, etc.. In the same way, special regulations exist for construction in a seismic area.

NATURAL CONDITIONS embrace such locational characteristics which effect the life and economic activity indirectly, like climate, precipitation, relief, altitude, endemic diseases, seasonal fluctuations in the nature, etc..

NATURAL RESOURCES embrace such natural phenomena which can be exploited by people in any way: mineral deposits, rivers and hydroenergy, geotermic energy, soil, vegetation, animal wildlife, fishing potential, etc.. Their exploration, calculation and economic evaluation is an important component of the regional analysis.

Bibl: Fordham, P., Natural Resources and Economic Development; in: The Geography of African Affairs, Harmondsworth, 1965, Ch. 4.

NODAL REGION is a region exposing a well defined territorial-economic kernel, nucleus (q.v.), which expand its influence upon the whole area of the region. The nucleus is presented usually by the biggest regional city backed by growing agglomeration of suburban and satellite towns. The rest of the region is called periphery. The opposite territorial structure is proper for a homogeneous region (q.v.). Admittedly, the development of homogeneous regions into nodal regions is a progressive tendency of modern regional development, because it follows such advantageous tendencies like concentration of production and complex (comprehensive) development. But the speed of this transformation may vary depending on the economic specialization of the region. For example, the regions specialized on agriculture or forestry tend to preserve their territorial homogeneity. The comprehensive development of the nodal region assumed that the peripheral part of it becomes an organically dovetailed component of the

nucleus, with a proper distribution of labour between them; if the periphery is let to stagnate and serves only as a source for supplementary income for the nucleus (so called polarization, q.v.), it will bring, in due time, to the contradictions and discrepancies in the whole regional economy.

NON-QUANTITATIVE AREAL DISTRIBUTION a method of mapping suitable for the presentation of the localization of so-called "spatial phenomena" - areas under crop, dispersed mineral deposits, briefly, any area with specific characteristic distinguishing it from the rest of the territory. The areas where a given phenomenon is observed are shaded or coloured on the map or just delimited by any conventional boundary. The map shows the approximate distribution of the phenomenon without taking into account the density or intensiveness of its spatial distribution. This method is very convenient for the coding of spatial phenomena when the latter's intensiveness does not play a significant role - for a planner it is important only to know, where these phenomena occur (for example, tse-tse areas, national parks and game reserves, etc.).

Often, non-quantitative areal distribution method is applied for the demarcation of areas where some kind of development is possible. This method may be used also in a negative way, marking the areas where a given phenomenon does not exist or where its location is impossible for any reason. See: elimination method.

NUCLEUS in a nodal region (q.v.), it is the main centre of economic gravity which spreads its influence over the rest part of the region-periphery.

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OBJECT OF LOCATION any physical project which is or may be under consideration in locational and regional planning. It may consist of a single enterprise or of a set of interconnected units. According to their size, configuration and territorial requests they are: central, linear, and spatial objects of location. Each object of location is characterized by: purpose, size (generally, in four dimensions - capital investment, current expenditure, output, employment), period of construction, and locational determinants (q.v.).

Some financial measures used as economic incentives in regional development (e.g., tax redistribution) and often called "projects" are not regarded as objects of location.

OBJECTS OF REGIONAL PLANNING any territorial unit which is under consideration of regional planning and need to answer the question "What to locate in it". These are the objects of regional planning: economic region, planning region, economic area, economic zone, industrial centre, etc.. In administrative sense: province, district, municipality, etc..

OPTIMAL location means that the chosen variant of prospective location produces the best results in accordance with a given criterion of optimization (national profitability, commercial profitability, transport costs, etc.). Since the process of location is extremely multi-factorial, with contradictory and complicated relations among the variables, the optimal decision is very difficult, in some cases, to obtain; the planner selects then the best pattern of the available variants (see: rational location).

OUTLINE MAP a basic map for any cartographic exercise. It normally portrays all permanent planimetric objects (sea and lake shore, rivers and navigable canals) as well as national and provincial (district) boundaries. Some permanent social and economic objects, like major settlements, principal transport routes, may also be shown on this map. The mathematical elements (grid system of meridians and parallels) for outline map are necessary. Each agency dealing with spatial planning must have a sufficient stock of outline maps.

OVER-CONCENTRATION a stage of the territorial concentration (q.v.) of economic activities when, generally speaking, the advantages derived from the agglomeration effect (q.v.) are less than the losses caused by some negative sides of concentration. The latter are as follows:

- (1) Overloading of transport facilities, especially in the kernels (centres) of agglomeration, as well as in the nodal points (harbours, railway stations).
- (2) Water pollution which complicates the problem of water supply

generally and deteriorates - coupled with air pollution - the life conditions for the pollution. The pollution of soils in the urban and suburban zones is also to be mentioned. As a secondary effect, it causes the decline in the health of population.

(3) Shortage of free space, increasing price of land, which complicate the problem of housing and industrial construction.

(4) The share of non-productive investment (infrastructure) is permanently increasing; that is the first reason to lessen the capacity of location of the standort.

The essential reason of the over-concentration is an uncontrolled growth of big agglomerations, where this phenomenon usually occurs. It does not mean, however, that some negative features cannot be noticed in smaller communities.

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PATTERNS OF LOCATION are the methods of territorial distribution of new enterprises (investment, incentives) in order to stipulate the chosen location policy. They are classified as follows:

- (1) Concentration. New enterprises are located in few more advantageous and already developed centres aiming to gain all the benefits of agglomeration effect; the rest of country is usually neglected.
- (2) Dispersion. Pattern of location opposite to concentration. The developed centres are deliberately prevented from new investments, the latter distributed, almost equally, among the underdeveloped centres.
- (3) Dagglomeration. New enterprises are located in satellite towns of big industrial centres.
- (4) Deconcentration. Enterprises (and people) are moved from over-crowded, over-concentrated cities towards other areas, usually underdeveloped.
- (5) Selective dispersion. Investments are distributed in the underdeveloped areas, but in a concentrated form, i.e., being tied to several most advantageous centres (growth centres) which, in their turn, are distributed more or less equally in order to serve more population.
- (6) Nidificative dispersion. Investments are located in few new centres which are not (and cannot be) connected with each other and usually have no attached areas. This pattern is used in almost inaccessible areas. (northern territories of the USSR and Canada, mine towns in deserts, mountains, etc.) to exploit some rich mineral deposits.

PATTERNS OF SETTLEMENT in rural area is an import objective of research before any physical planning is to be started. There are: nucleated settlements (villages), closely spaced groups of houses (clustered), scattered settlements, non-permanent settlements of nomadic population, etc.. Each pattern affects the planning and location of transport, services, production schemes.

PENETRATION ROUTE the transport route which secures accessibility of a region to the national market, or that of the country (and its remote regions) to the world market.

PERIPHERY is a part of nodal region which surrounds the centre, nucleus, and is economically connected with the latter.

PHYSICAL PLANNING is an aggregate of research, planning and design works to tie up the proposed projects with concrete area; laying out of the objects to be built within an area. It tries to achieve the coherence of new objects (plants, houses, roads, parks, etc.) with already existing

elements, as well as with relief and other important features of the nature. There are: physical planning for a project (see: micro-location), town planning, village planning.

PIONEER REGION is an area where new development opportunities have been just discovered (for example, new mineral deposits) and caused the inflow of capital investments and labour force. These regions need a special approach in the planning and management.

(PLACE OF LOCATION) geographical address of any existing enterprise or planned object of location. See: Standort.

PLANNING REGION a territorial sub-division of the country by which the regionalization of national plan is carried out and the regional plans (programmes) are elaborated. Planning region may differ from administrative sub-division (see: classification of regions, region).

Bibl: Friedmann, J.R.P., The concept of a planning region; Land Economics, 1956, 32, pp. 1-13.

POLARIZATION policy of regional development which leads to raising of differences among the regions so that the more advanced regions grow faster than backward regions. Usually, this process is expressed in concentration of economic activities in few prosperous regions or cities, as well as in increasing disparity between urban and rural areas. It hampers the full employment of all the natural and human resources of a country. The opposite process is called equalization (q.v.).

Bibl: Beguin, H., Aspects Géographiques de la Polarisation; Tiers-Monde, 1963, 4, 16, pp. 559-608.

(POLARIZED REGION) see: nodal region.

POLLUTION see: environmental pollution.

POPULATION from the viewpoint of location and regional development, the population is the principal subject of regional planning. Though population and phenomena associated with it (labour, manpower) are regarded as locational factors, it should be stressed that these factors cannot be formally compared and aligned with such like, for example, water resources or any other. That are people, their needs and aspirations, what determines, primarily, the market for consumer goods industries and demand for economic and social services, secondarily, the quantity and quality of labour market. As object of regional planning and location population figures when a settlement (resettlement) scheme is under consideration, or when a problem arises to recruit manpower for big projects in pioneer regions. But the same remark is valid for these cases: population needs a special attention and cannot be treated in the same way as, say, location of new enterprises.

Fortunately, this phenomenon has found the best reflection in the routine statistics. Most of the countries possess quite full, up-dated and reliable data on population (including its distribution by sex, age,

into rural and urban parts, state of education and health). Many countries have also sufficient information on the territorial distribution of population. For practical purpose, the mapping of population is done in different ways for its rural and urban portions. The former usually is shown by dot method, when a dot represents a certain rounded number of people (100, 250, 500), the latter is shown by circles, their radii proportional to the size of urban settlements (needless to say that those circles are situated on the places of cities and towns). Prepared in such way, the population map can be productively used for several planning exercises (see: cartographic methods).

Bibl: Harbison, Frederick: "The Development of Human Resources in the Newly Developing Countries", in: J.D. Brown & F. Harbison: High-talent Manpower for Science and Industry, Princeton University Press, 1957, pp. 61-90.

PRECIPITATION MAP a map which indicates annual rainfall over territory. The isograms are drawn in rounded intervals (100, 200, 300, etc. mm), and the interval zones are coloured or shaded in accordance with the legend. Precipitation map is a necessary requisite for regional and locational planning, especially for development of agriculture, and should be available in any regional planning body. - If a certain country's annual rainfalls differ from year to year, three maps should be used: that for a "dry" year, for a "wet" year and an average for several consequent years.

PRIMARY ECONOMIC REGION a smallest cell in the regional structure of a country, below which the regional planning is practically superfluous and useless. This type of region must be big enough (in the sense of population, territory, availability of natural resources and existing economic potential, including infrastructure) to bear a relatively independent development, and limited as to preserve a certain homogeneity in its economic and natural conditions. A city or town is a typical primary economic region. In rural areas, identification of the primary regions is a subject to special research.

PRINCIPLES OF LOCATION a summary of the location policy (q.v.) adopted for the period of a long-term plan.

PROJECT if not specified, an enterprise (institution) which is under design, evaluation, implementation, etc., but has not yet been built and put into operation.

PROJECT MAP a final stage of cartographic exercises in the regional plan. Briefly speaking, the map depicts the location of economic activities as they could be seen at the end of the planning period. The emphasis is given to new projects to be implemented or started by construction during the plan period.

PROPULSIVE INDUSTRY a new industry in the region, which is not obligatorily the largest one, but which changes, or is going to change, the economy and social life of a region considerably.

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RADIUS OF PROFITABLE MARKETING. The transport costs swallow a certain part of gross profit measured at the gate of the producing factory, and, the longer the distance of marketing, the more transport costs. At a certain point, the latter may annihilate the profit completely. Thus, for each enterprise, there exists a theoretical radius of profitable marketing, delimiting the zone where the marketing is economical. This radius depends on: a) type of produce, b) size of enterprise (the bigger the enterprise, the longer the radius), c) pattern of delivery (dispersed, concentrated), d) type of transport and efficiency of the transport network.

RAINFALL a very important locational characteristic, especially for agriculture, forestry and transport. Annual distribution of rainfall over a given territory is demonstrated on the precipitation map (q.v.).

RATIONAL location (regional development) means that the chosen pattern of prospective location takes into account a set of criteria of optimization, satisfying each of them, though not optimally. If not specified, what criteria have been considered, the word "rational" anticipates that the planned pattern of location meets both economic and social requirements on national scale (multi-national, as far as it concerns multi-national projects).

RECREATION ZONE an area devoted exclusively for purpose of recreation of the urban population; all other uses of it are almost fully prohibited. One distinguishes: a) evening recreation zones (public parks and playgrounds within the city, or in its nearest suburbs); and b) weekend recreation zones spread concentrically around the agglomeration. See also: green belt, green zone.

REFUND PERIOD of investment is a time during which the profit of an operating project covers the capital expenditure spent on its construction and putting into stream. It is a convenient yardstick to compare alternative projects. See also: adjusted expenditure, economic efficiency.

REGION

(1) Commonly used without specifying, the region means a part of territory less than the whole country. Presumably, a network of similarly identified regions should cover the country's territory. Syn: sub-national region. One distinguishes purposefully:

- **Economic region** - an objectively consolidated territorial part of a country; is characterized, in the first instance, by specialization (on national or inter-regional scale) and by relevant level of economic integrity or complexity.

- **Administrative region** - a territorial sub-division of state

machinery, provided by elected or appointed staff responsible for all the governmental affairs through the region's territory; it may not, and usually does not coincide territorially with economic region.

- Planning region - a territorial unit of the country deliberately created for regional planning; it may coincide either with economic or with administrative regions, as well as have independent delimitation.

Usually there are different ranks of regions, the big region of the first division may consist of several smaller regions (see: hierarchy of regions). Process of identification of the regions is called regionalization.

In some other aspects, the regions may be classified as nodal (syn: polarized), homogeneous; advanced (syn: developed), average, under-developed (syn: less developed); prospering, backward, stagnating; pioneer (syn: frontier, new opportunity region), depressed (syn: distressed) region, etc.. See: classification of regions.

Bibl: Isard, W., Regional Science; the concept of the region and regional structure; Papers and Proceedings of the Regional Science Association, 1956, 2, pp. 13-26.

(2) In physical geography, the term region is applied in various ways, depending on the subject of research, but stressing always some sort of homogeneity of the physical features within a region.

(3) In the United Nations terminology, a huge part of the world (usually embracing a continent) homogeneous in its history and level of economic and social development - like Africa, Latin America, East Asia and the Far East, etc.. This term brings about some misunderstanding since in the same UN terminology the notions "regional development" and "regional planning" concern the areas within national boundaries.

REGIONAL AGGREGATION OF NATIONAL PROJECTS the first stage of regional planning proper to the initial stage of the planning in territorial aspect. The list of the projects is distributed by their geographical allocation, so that each region gets its "share" of new constructions. Although the aggregate of projects has no full complexity, this document may serve as a basis for analysis of regional development during the planning period and, to a certain extent, gives to regional authorities fundamental indicators for management of local economy.

REGIONAL ANALYSIS a set of research exercises pursuing to answer the main question of regional planning: what are the most prospective directions of economic and social development of a region. It is carried out in several stages:

- (1) What are development resources of this region; natural resources and their economic evaluation; population and manpower resources; existing economic environment.

(2) What role the region does play and is to play in the national economy.

(3) What is its capacity of location and how it could be raised.

(4) What kind of hindrances and impediments are which hamper the development of the region.

The regional analysis may be done for one region; for several or all the country's regions; in the interest of a short-term planning, long-term planning and programming.

The following consequence of analysis may be recommended:

A. Introduction. Name of the region, its geographical situation, space, population; historical and political background; the main goal of and the reason for the regional analysis.

B. Natural resources and environment. (a) Natural conditions: relief (with special concern to economic development, e.g. to transport or settlement schemes); climate and its agro-economic evaluation. (b) Natural resources: water (for: agriculture, industry, population; seasonal fluctuations); forests; fishing potential; mineral deposits; energy sources. (c) Natural environment: special remarks on the living and working conditions, including medical-sanitary characteristics. (d) Economic evaluation of natural resources (in comparison with the national or foreign standards).

C. Human resources. Population; demographic statistics (vital statistics, migrations, urban and rural population, sex and age distribution); density and intra-regional distribution of population, types of settlements and resettlements facilities; manpower characteristics, educational and training facilities.

D. Economic resources. Existing: (a) agriculture, (b) mining, (c) energy and water supply, (d) manufacturing, (e) tertiary sectors; (f) economic and social infrastructure. The analysis is to be done in dynamic development during preceding years, and in comparison with the national averages.

E. Territorial structure. (a) Nucleus and nodes; network of cities and towns. (b) Transport network. (c) Extra- and intra-regional movements (commodity flows and migrations). (d) Growth poles. (e) Sub-regions.

F. Conclusions. Existing stage of development; development potentials; prospective ways of development; impediments; recommendations.

G. Annexes. (a) Tables of routine regional statistics; (b) Locational characteristics; (c) Social indicators of regional development; (d) Maps; (e) Calculations related to the recommendations.

What distinguishes the regional analysis from the locational analysis (see) is that the latter aims to answer the question "where to locate" (an enterprise, a set of enterprises or any other object of location) while the former concentrates itself on the task "how to develop this very region".

- Bibl: (1) Isard, Walter: Methods of Regional Analysis: An Introduction to Regional Science, M.I.T. Press, Cambridge, Mass. & John Wiley, New York, 1960. Basic standard annual which should be frequently consulted by African planners.
- (2) Klemme, R.T., Regional Analysis as a Business Tool; Papers and Proceedings, Regional Science Association, 1959, 5, pp. 71-77.
- (3) Lombardini, S., Les Analyses Economiques pour la Préparation d'un Plan Régional; Revue d'Economie Politique, 1964, 74(I), pp. 45-64.

REGIONAL BUDGET an estimate of regional revenue and expenditure for the ensuing fiscal year, a component part of the national budget, but put completely or partially under sovereignty of the regional administration. The revenue of budget may consist of taxes collected by local authorities; some countries practice so-called vertical tax distribution, which foresees that each kind of taxation is attached to a certain level of regional administration. For example, tax on agricultural produce may be collected by rural communities; tax on goods and services - by urban municipalities; petrol tax - by provincial governments, and so on. The rest of taxes is left to feed the national (central) budget (tobacco tax, import duty, etc.). It may be fixed that a portion of locally collected taxes should be spent on special purposes; for example, the petrol tax may be handed over to provinces on a condition that a certain part of it will go to the road improvements. The second part of revenue of the regional budget comes by redistribution of national sources. This action is necessary since the poor regions cannot rely upon their own revenue only, if the government wants them to be developed faster. The expenditure of the regional budget must cover operational expenses and secure the implementation of project of the regional significance (see: classification of projects).

REGIONAL DEVELOPMENT POLICY is an aggregate of goals, means and methods applied by central government in order to provide rational, harmonized and comprehensive development of the country's regions. It is subordinated to the overall national policy of economic and social development. The words and deeds of the regional development policy cannot be in contradiction with those of general development strategy, as well as they cannot neglect objective natural, economic and social conditions of various regions. There are two extreme directions in that policy: polarization (concentration of investments in few prosperous areas - big cities and ports - while the rest of the country remains neglected) and equalization (dispersion of investments, almost evenly, among all regions, priority to be given to underdeveloped ones). The former seems to be more profitable, since it uses on a full scale the advantages of agglomeration. The latter is more preferable in the sense of social development, and even brings about economic benefit, if measured in a long-term approach. None of those alternative directions is pursued in a clean form, the real policy takes

usually an intermediate position (see: patterns of location, selective dispersal). Regional development policy is materialized into regional planning (q.v.).

- Bibl:
- (1) Borts, G.H., The Equalization of Returns and Regional Economic Growth; American Economic Review, 1960, 50(3), pp. 319-347.
 - (2) Coutsoumaris, G., Regional Activity Relocation Problems in a Developing Economy; Papers of the Regional Science Association, European Congress, 1964, 12, pp. 79-86.
 - (3) Tinbergen, J., Regional Planning: some Principles; Netherlands Economic Institute, Division of Balanced International Growth, Publications, 1960, 21/60.
 - (4) Mihailovic, K., Certaines questions fondamentales du developpement regional; Les problèmes spatiaux dans la planification en perspective, Warszawa, 1968.

REGIONAL DIFFERENCE IN PRODUCTIVITY is a very important indicator for locational planning and a subject for analysis of reasons caused such difference. These reasons may be of two types: practically unavoidable and those which can be altered. The first group of reasons lay in natural conditions (climate, soils, important for the agriculture, geological peculiarities, important for mining, water resources, affecting many of the industries). The second group embraces all the economic and social conditions influencing the productivity of labour (infrastructure, skill, economies of scale, etc.) and can be improved by special measures foreseen in the regional plans.

REGIONAL DIFFERENCE IN WAGES AND SALARIES may arise historically (usually the emuneration is bigger in cities than in rural areas, in more industrialized regions than in agricultural regions), or is the result of a deliberate government policy when the emuneration is raised in regions which should attract more people, or when it is done in order to compensate inconveniences of environment or lack of infrastructural facilities.

REGIONAL INDICATORS are those which demonstrate the comparative level of economic and social development of the regions. They may be:

A. Economic

- (1) Share of region in the country's output - by sector.
- (2) Structure of regional economy.
- (3) Per capita production of consumer goods industries and agriculture.
- (4) Rate of economic growth, in the past and planned.

B. Social

- (1) Share of region in the country's population.
- (2) Structure of manpower distribution and share of unemployed.
- (3) Per capita income.

- (4) Structure of consumption.
- (5) Per capita (or other relative data) servicing by social institutions (health, education, culture, social security, etc.).

REGIONALIZATION OF PLAN breaking down of national plan targets (gross domestic product, investments, etc.) by economic regions or by provinces or other sub-divisions taken as planning regions. The sum of regional figures received does not, however, represent regional plan, since the latter foresees a sort of comprehensive dovetailing of different sectorial targets within a region. The regionalization of national plan is a very good instrument to follow up the implementation of targets in territorial aspect; besides, it has a big moral impact on the regional population, since each region is aware of what is proposed to be built in the area and which share of the national wealth will be devoted to it.

REGIONALIZATION OF TERRITORY process of dividing of the territory (of a country) into economic regions (q.v.). This process includes: delimitation of the regional boundaries; determining of the centres of economic gravity for each region; determining of specialization of each region. The network of economic regions serves as a base for all subsequent locational exercises. Since economic regions are developing units, it is necessary to revise from time to time the network of the country's regions (usually every five years).

The process of regionalization is multi-staged; the macro-regions (the regions of the first order) have to be divided in smaller units - regions of the second order, and so forth. In practice, it is easier to identify the smallest economic units - primary economic regions (q.v.) and then to combine of them the regions of superior level.

Bibl: Kayser, B.; Les divisions de l'espace géographique dans les pays sous-développés; Annales Géographiques, 1966, 75, 412, pp. 686-697.

REGIONAL OPTIMUM is attained when the decision on location of a project takes into account only the interests of that region. For example, the best place to locate a hospital in the region "K" is the city "X". But, from the national viewpoint, it would be better to locate it in the city "Y" of that region, bearing in mind that the hospital will also serve population of the adjacent areas of the neighbouring region "L".

REGIONAL PLANNER a title introduced by UNIDO for the experts who deal with the problems of the regional development planning. University degree in economics or economic geography, as well as practical experience in planning, are necessary.

REGIONAL PLANNING

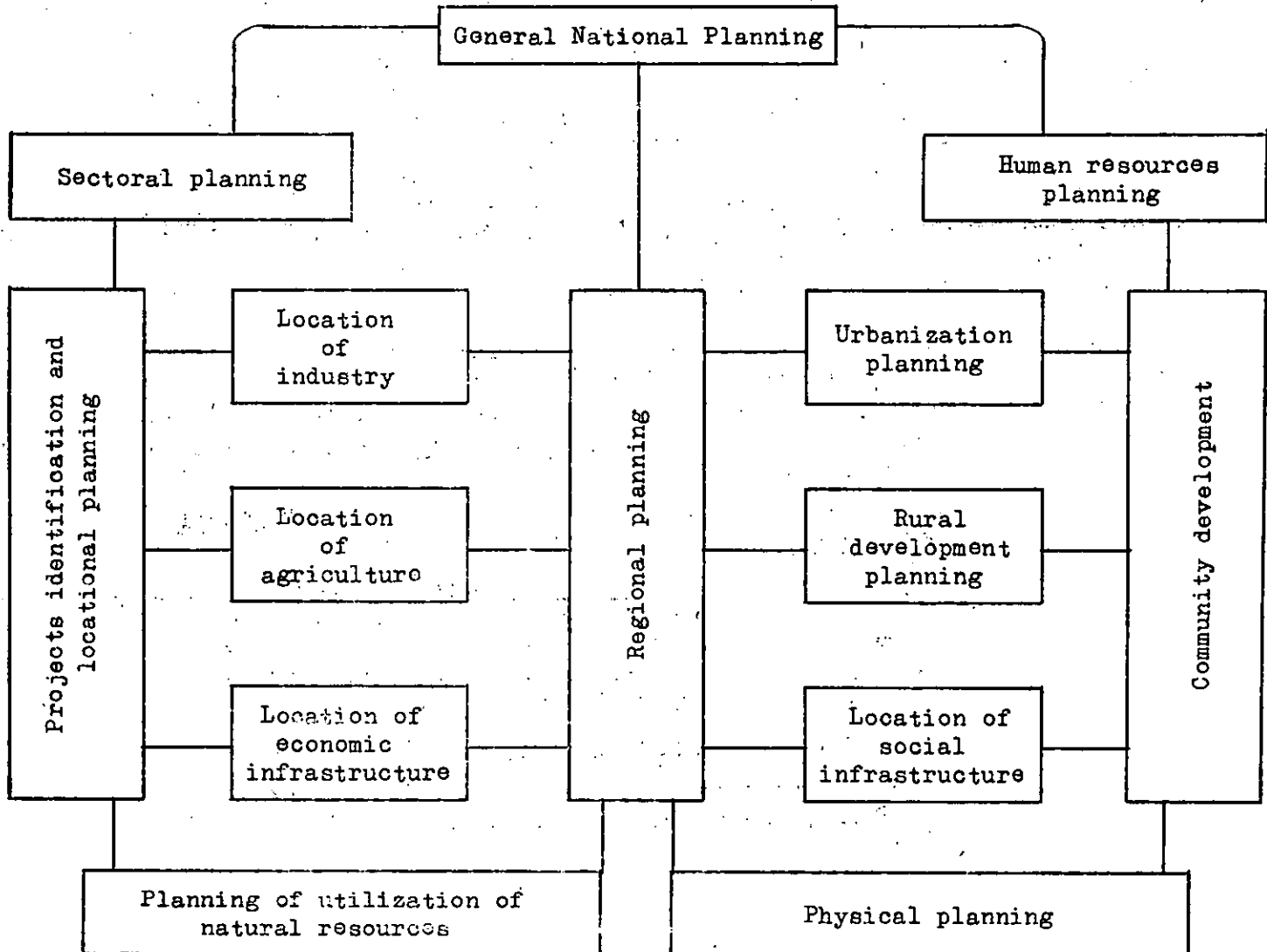
Definition and origin. In a broad sense, regional planning embraces all the policies and measures regarding comprehensive development of the country's economic regions (or other territorial units taken for planning). In a particular sense, it means elaboration of the development plans

(programmes) for each region and incorporation of these plans into national plan. Having started as a secondary domain within the sectoral planning, the regional planning crystalized itself gradually in an independent part of the general economic planning, firstly in the U.S.S.R. (1920, the first state plan of electrification of Russia), and then was accepted in other countries. Recently, it has increasingly developed in almost all developing nations, the plans of which include, as a rule, regional programmes. The maturity of regional planning is mirrored in creation of special units within planning ministries and on the regional level, in separation of special research teams and works.

Goals and problems. The major goals of the regional planning may be listed as follows:

- (1) to elaborate the regional development policy (q.v.) which has to be in accordance with the overall development strategy; needless to emphasize that the regional planning cannot be in contradictions with the overall national goals;
- (2) to identify spatial units as subjects of regional development and planning (to regionalize the country); in the initial stage, these units may be represented by existing administrative sub-divisions; a more sophisticated approach is to use integrated economic regions; as an intermediate measure, the specially created planning regions may be used;
- (3) to investigate, by means of regional analysis (q.v.), the development potentials, requirements, locational characteristics for each planning region, and to accumulate these data in a form usable for planning procedures;
- (4) to elaborate long-term programmes of development of each region, which must be in accordance with the general scheme of location of the whole country; these long-term programmes (schemes) serve as basic documents for regional plans;
- (5) to elaborate short-term regional plans or programmes as component parts of the national plan for the same period, and which should be dovetailed with each other.

Regional planning within general planning system. The distribution of work and responsibility among various bodies concerned, in various degrees, with the regional planning and location, is of a big importance for good and resultative plans, as well as for their implementation. The relations of the regional (and locational) planning with other types of planning is shown in the following table:



Stages of the regional planning. The regional planning starts usually with the aggregation of the projects and measures of the national plan by their territorial belonging (by region). These regional aggregates of national projects bear no inter-connections among their elements, but they can give for the regional authorities some guidance as to how to develop the local economy. The next stage is the elaboration of regional programmes. These documents represent already the results of an independent research (regional analysis) and display some general lines for regional development, though its recommendations are not or cannot yet be properly financed. Regional plans are the most comprehensive and sophisticated documents where programme of actions is

properly timed, financially and managerially secured and incorporated into national plan. Elaboration of the plan does not diminish the role of programmes, both documents can exist parallelly, one for concrete action, other for determining of the long-term goals.

Organization of regional planning. As the experiences indicate, the most useful manner is to keep the central regional planning body within the Ministry of Economic Planning in a state of an independent department. This department consists of the following sections:

- (a) Regional development policy; (b) regional section (having groups or persons responsible for each region); (c) sectoral section; (d) harmonization of regional development. Respective sections work in constant co-operation with location sections in the sectoral ministries, with planning bodies in regions, with department responsible for harmonization of national plan and budget. On regional level, a miniature replica of central apparatus is created. See also: classification of projects.

- Bibl:
- (1) United Nations, Regional Planning, ST/SOA/SER.C/12 and 13, New York, 1959. Sales No. 59.IV.7.
 - (2) Abrams, Charles: "Regional Planning Legislation in Under-developed Areas", in: Land Economics, Madison, Wisconsin, No. 2, 1959.
 - (3) Isard, Walter and John H. Cumberland (eds.); Regional Economic Planning, OECD, 1961.
 - (4) Boudeville, J.R.: Problems of Regional Economic Planning, Aldine Publishing Co., 64 East Van Buren St., Chicago. Co-ordination of regional economic planning with a long-term National Plan, tools for regional economic studies, regional operational models.
 - (5) Tinbergen, J., Regional Planning; Rotterdam, 1964.
 - (6) Friedmann, J.R.p., and Alonso. W. (eds.), Regional Development and Planning: A Reader; Cambridge (mass.), 1964.

REGIONAL SCIENCE In modern economics and social science, the term "regional science" is used for distinguishing a number of scientific disciplines interconnected by a common feature - all of them have, as a subject, the spatial (geographical) distribution of human activities, economic and social. It is a relatively young science emerged as a necessity to meet the growing demand of economic and social development. The main tasks of this science is to find out the useful ways to distribute the human activity (works, transport routes, social institutions, etc.) over the territory gaining more benefit, and to elaborate the most economical ways for development of the country's various regions. The first task is associated usually with the problems of location, while the second one - with the problems of regional development.

The most elementary problem of location is to take an "enterprise" (its project) and to find the best place for it in accordance with some selected criteria. If, for example, the criterion used is the maximum of profit (a mostly applied criterion of location) the project will tend to be placed in a standort where the total costs of production (including centripetal and centrifugal transportation) seem to be minimal. If, on the other hand, the planner is bored by the problem of unemployment in certain areas, the project (especially that labour-intensive) may be shifted towards one of those areas. So-called "material-intensive" enterprises tend to function near their raw material base, while "energy-intensive" ones are located usually in the neighbourhood of a big power plant. The modern methods of locational analysis and calculations permit to find the optimum place for any single enterprise. And were the goal limited by this procedure, the location never would become an important and controversial part of economics. But it is not the fact.

The first disappointment appears when one realizes that the optimum place of location for a couple of enterprises lies often not in those found in isolated calculations for each enterprise, but somewhere else. The various factors of location inter-acting in a very complicated way, often implicitly, make the picture more complex. And, in a long-term development programmes, the planners have to deal with an avalanche of enterprises and institutions to be set within the country. The relationships (links) of new enterprises with those already existing; with labour forces to be influenced; with raw materials and other natural resources; with the area to be occupied and influenced by them; with economic and social infrastructure necessary for them - all these links are so complicated, directly and indirectly interdependent, that a necessity arises to create theoretical basis and practical instruments for solution of the problems of location.

The definition of the regional science is still a subject for arguments. Due to its controversial nature, it would be worth just listing the problems which it has to solve. These problems are put in the table below in a form of questions.

Regional Science,
Principal problems

1. WHERE to locate an enterprise?	HOW to organise the outer links of an enterprise? (To find out its supply and marketing zone)	WHAT enterprise to locate in this very area?
2. WHERE to locate set of enterprises?	HOW to organize the commodity flows among all enterprises?	WHAT set of enterprises (industries) are to be developed in this region?
3. WHERE to locate a complex of enterprises?	HOW to regionalize the country?	HOW to harmonize the development within this region?
4. WHERE to locate the whole branch of industry (agriculture, etc.)?		HOW to harmonize the development of all the country's regions?
5. WHAT criteria for optimum location should be taken?	HOW to harmonize the sectoral and regional development over the country?	WHAT measures and means should be assumed to promote regional development?

The problems listed certainly are over-generalized. So, the term "enterprise" should be understood as any object of location - a plant project, state ranch, new road, school, etc.. In the same way, the term "region" may mean also "village", "district" or any other defined geographical area. Presumably, the problem of harmonization of a region's economy includes such goals like structural changes, manpower equilibrium, resettlement, improvement of infrastructure - bearing in mind that all of them could be covered by a common term "harmonization". As a rule, the complexity of the problems increases from top to bottom and from left to right.

All the problems listed in column "A" belong to the branch of location (they answer mostly the question WHERE to locate a given object), while the problems under "C" form the second major branch - regional development (answering mostly the questions WHAT to locate in this very region, or HOW to develop the region). The problems under "B" may be counted as a link between those two major disciplines. From managerial viewpoint, the problems "A" (1 to 4) are solved within sectoral bodies (Ministries responsible for certain sectors), the problems "C" (1 to 4) are a domain of the regional development organizations (regional planning units within planning ministries, as well as in the local administration). The problems listed in the line "5" highly depend on the general strategy of development and the decisions on them can be made on the national (governmental) level only. But formally separated and distributed among

various administrations, all the problems listed are of the same spatial nature and hardly can be isolated from each other in practice.

All countries which adhere development planning have to answer - and do answer - those questions. But different approaches cause slight varieties in the terminology. Thus, in the U.S.S.R. and some other socialist countries the general science embracing all spatial problems is called "location of productive forces". In the U.S.A. and England the scholars used both terms, "location" and "regional development" separately, though without any barrier between them, and only recently introduced an united notion "regional science". In German terminology, one can find "Standortverteilung" (distribution by place of location) and "Raumforschung und Raumordnung" (research and organization of a territory), which might be interpreted like "location" and "regional development" respectively. The Spanish word "ubicación" (location) covers all the spatial problems, but the term "desarrollo regional" (regional development) is also in use. It is more difficult in French, where the scientists use such terms like "localisation", "implantation", "repartition géographique", all equal to the English word "location", and "development regional" and "aménagement de territoire" as counterparts to "regional development". Without any attempt to interfere into national vocabularies, the table lists only the problems which obviously have the same nature, and, consequently, have to be solved by similar means based on a common theoretical background.

Regional science emerged on the edges of several fundamental sciences. The contributions laid by the latter towards the former may be classified as in the Table on the following page.

The conclusion to be drawn out of the table is that the level of development of regional and location planning depends, in various proportions, upon the level of the overall scientific progress in a given country.

Having been created on an independent scientific discipline, regional science, in course of development, elaborated its own theory of location (q.v.), method of research (see: locational analysis, regional analysis) and interferes into practice through location policy and locational planning, as well as through regional development policy and regional planning. See also: factors of location.

Regional Science. Contributions to it
from other sciences

Fundamental group of sciences	Sciences and disciplines	Contributing in the field of:		
		Analysis	Methods	Decision making
Philosophy and Natural Sciences	Philosophy	+	+	+
	Physical Geography	+		+
	Geology	+		
	Meteorology	+		
Economic Sciences	Political Economy	+	+	+
	Economics	+	+	
	Economic Geography	+	+	
	Econometrics		+	
Social Sciences	Sociology	+		+
	Demography	+		
	Medical Geography	+		
	Ethnography	+		
	Organization and Management		+	
Mathematics and Technical Sciences	Statistics	+	+	
	Cybernetics		+	
	Technologies of Production	+		+
	Cartography	+	+	

- Bibl: (1) Hoover, E.M., The Location of Economic Activity, New York, McGraw Hill, 1948.
- (2) United Nations, Location of Industries, New York, 1959.
- (3) Isard, Walter & Thomas Reiner: "Regional Science and Planning", in: Papers and Proceedings, Regional Science Association, Vol. 8, 1962.

- (4) Aménagement Régional et Démocratie Economique, Economie et Humanisme, supplement annuel, 1960.
- (5) Bos, H.C., Spatial Dispersion of Economic Activity, Rotterdam, 1964.
- (6) Boudeville, J.R., Les Espaces Economiques, Presses Universitaires de France, Paris, 1961.
- (7) "Développement Régional", Revue d'Economie Politique, January/February 1964.
- (8) Isard, W. and Reiner, T.A., Regional Science: retrospect and prospect; Papers and Proceedings of the Regional Science Association, 1966, 16, pp. 1-16.
- (9) Nekrasov, N., Problems of Distribution of Industry in the U.S.S.R., UNIDO paper ID/WG.9/17.
- (10) Michalopoulos, C., Inter-industry Relations, External Economies and Regional Economic Development. UNIDO paper ID/WG.9/7.
- (11) Alayev, E., Planned Location of Industries and Regional Development in the East-African Sub-region. UNIDO paper ID/WG.9/B.1.
- (12) Jack, S., Industrial Location and Regional Development in Africa, UNIDO paper ID/WG.9/B.2.

REGIONAL STATISTICS basic statistical data by region (area, population, economic activity, social institutions), as well as derived relative data characterizing regional development (density of population, income per capita, etc.).

- Bibl:
- (1) Jouandet-Bernadat, R., Les comptabilités économiques régionales; Revue d'Economie Politique, 1964, 74(I), pp. 136-168.
 - (2) Peare, C.W.D. and Thomas, H., Regional Economic Statistics; Journal, Royal Stat. Society, London, Series A (General), Vol. 131, part 3 (1968).
 - (3) Kuklinski, R., International Research on Regional Development and Implication for Regional Statistics, UN European Seminar on Regional Statistics, 1969, Doc. No. CES/SEM.4/10.
 - (4) Opallo, M., Basic Economic and Statistical Indexes for Regional Studies. UN European Seminar on Regional Statistics, 1969, Doc. No. CES/SEM.4/3.

RELATIVE DATA measure of relation between two statistical data, usually a quotient after division of two related figures. For example, dividing figure of population by space one receives the density of population. For practical purpose, the dividend is taken multiple to 10, 100, 1,000, etc., so as to receive the relative data in per cent or per mille. Or the relative data are related to a certain indicative figure like country's average (static presentation), or basic year of the plan period (dynamic presentation).

RESERVED ZONE any piece of land prohibited for use for economic and other purposes (may serve as recreation zone) and devoted to the future expansion of construction. Usually it is municipality or other governmental body which has property on reserved zones.

RESETTLEMENT CENTRE a place selected for resettlement of scattered or nomadic population, usually a village located in the most favourable conditions, in the centre of area to be affected by resettlement scheme.

RESIDENTIAL ZONE within a city is that devoted for housing and situated, as a rule, in the areas with better environmental conditions.

RURAL AREAS all the country's areas where agricultural production (and such sectors like forestry, fishery) is dominating.

"RURAL EXODUS" a figurative term widely used now a days to define overall migration of rural population towards the cities. It is caused by: (a) faster natural growth of rural population, in comparison with that of urban places; (b) low income in rural areas, especially in developing countries; (c) industrialization, which settles down in the urban areas first; (d) attraction of urban life, which gives more opportunity for income and social development. The role of each ground varies from country to country. This rural-urban migration involves firstly young people, usually more dynamic in their aspiration for better life. See also: urbanization.

RURAL POPULATION is the portion of total population of a country (region) residing in rural areas. The share between rural and urban population, especially in its historical dynamic, is an important indicator of regional development.

* S *

SANITARY PROTECTIVE ZONE a belt of empty space around the enterprise with dangerous environmental pollutions, separating it from residential zone. The width of the protective zone is shown in the locational determinants of the project.

SATELLITE TOWN an independent urban community located in the vicinity of a big (or a bigger) city and connected with the latter by economic and social relationship. The central (metropolitan) city serves as the nearest central market, provides employment for surplus labour of the satellite town, and dominates it in many other aspects. The metropolitan industries often create their subsidiary firms in satellite towns (see: deglomeration).

SEASONAL FLUCTUATION a naturally caused change of vital natural conditions (precipitation, temperature, humidity, insolation) during an annual cycle, with their peaks and lows from summer to winter, from wet to dry season, etc.. These fluctuations affect considerably activity of economy and social life, especially agricultural production, consumption of energy (in areas with temperate climate), transport intensiveness, migration of people, etc.. In regional planning, the peculiarities of the seasonal fluctuation in a given area have to be thoroughly investigated and taken into account.

SECTORAL PLANNING is a component part of general integrated planning dealing with the development of sectors (industries, branches). Through the location of sectoral projects, this kind of planning is closely connected with the second major part - regional planning (q.v.). It is carried out usually by sectoral ministries and harmonized in the ministry of planning into common national plan.

SELECTION OF PROJECTS is a process by which, from several offered alternative projects, the most appropriate for the development purpose is to be chosen, in accordance with the criteria taken for this process.

SELECTIVE DISPERSION a pattern of location when the investments are distributed in the underdeveloped areas, but in a concentrated form, i.e., being tied to several most advantageous centres (see: growth centre, resettlement centre). These centres are selected in various parts of the region in order to serve as many people as possible. This pattern of location is widely used in developing countries.

SERVICING INDUSTRIES all the industries of any region (centre) which serve the population of the latter. Their produces go directly to the population, or via some social institutions (hospitals, schools, etc.), and do not cross the boundary of the region (as for centre, suburban zone may be supplied by the city's servicing industries).

SETTLEMENT is a place of permanent living of population, like city, town, village, hamlet, etc..

SETTLEMENT SCHEME a project which aims to find a place with good environmental conditions, to create housing and infrastructural facilities on that place, and to resettle the people in this area. This resettlement may be caused by various reasons: creation of a permanent settlement near a big project, resettlement of people from emergency areas or from areas with bad environment, necessity to settle down nomadic population, and so like. The settlement scheme involves the activity of all sections of planning: regional planning (to incorporate the scheme into regional plan and budget), physical planning (to investigate the place and to prepare the designs and timetable), community development (mobilization of people to accept the move and to perform it in order).

SHUTTLE-TRAFFIC daily (in rare cases, weekly) migrations of labour force from home to the place of work and back using public transport (or the special transport provided by the employing firm); persons participating in the shuttle-traffic are called commuters (q.v.); pedestrians and cyclists are not regarded as commuters; it is still a subject for argument whether to include into shuttle-traffic the private car drivers. Statistically, the shuttle-traffic is relevant to the people living in one community (municipality) and working in another; as a matter of fact, this phenomenon is observed in big agglomerations which have to recruit the missing labour force from the suburban zone (the number of employees coming daily for working purposes to such metropolises like Paris, London, Moscow, Tokyo, exceeds several hundred of thousands). From the medical viewpoint, the time spent on shuttle-traffic by each person should not exceed 45 minutes in one way. Usually, especially in big agglomeration, this time is more. The shuttle-traffic condition is a subject of consideration when the place of micro-location (q.v.) of the project is to be selected.

Bibl: Journeys to Work. Planning, London, Vol. 34 - No. 504 (November 1968).

SIDE-EFFECTS in location and regional planning are all the consequences of the project implementation which are not foreseen and specified in the standard project of that kind. They may be: backward effects (stretching their influence over the previously existed enterprises, e.g., building a new factory in the port adds more work for harbour), forward effects (which create positive or negative conditions for future enterprises, e.g., construction of a road creates development opportunity alongside it, though subtracting simultaneously portion of land from agricultural use). One mentions also primary, secondary etc. side-effects, using these attributes to precise the order of inter-connections between the project and various corollaries of it.

(SITING) process of identification of an exact place (building site) for a given project, see: micro-location.

SMALL-SCALE INDUSTRY is that presented by tiny enterprises which have the following quantitative limits (per enterprise): (a) capital expenditure not more than US\$ 50,000; (b) current annual expenditure not more than 100,000; (c) number of employees not more than 100; (d) period of construction not more than one year. These figures like the whole definition of the small-scale enterprise are subject to argument, and they really vary from country to country, as well as from industry to industry, but generally the aforesaid indicators give the magnitude of the activity. From the viewpoint of the regional development and location, the small-scale industry has a specific meaning and importance, since it helps to develop the areas relying upon scarce resources and to locate the industrial projects in the settlements with a limited capacity of location. Sometimes, due to peculiar reasons, it would be worth dividing a big project (combine, industrial complex) into smaller unit and locating them in separate places. Another problem arising in respect of small-scale enterprises is that they are usually outside of the governmental sight and control, so that special measures have to be taken in order to supervise the location and functioning of those enterprises to make them consistent with the general scheme of location, national and regional plans. That are the regional planning authorities who must look at the affairs in order to assist and to control the development.

- Bibl:
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 - (2) Singer, Hans W.: Problems of Small-scale Industry, paper submitted at the International Economic Association Regional Conference on Economic Development South of the Sahara, Addis Ababa, July 17-29, 1961.
 - (3) Alexander, P.C.: The Definition of Small-scale Industry, United Nations, Economic Commission for Africa, Seminar on Industrial Estates, Addis Ababa, December 1964.
 - (4) Staley, Eugene and Richard Morse, Modern Small Industry for Developing Countries, McGraw-Hill, New York, 1965.

SMOG a neologism in English, now accepted internationally, defining the mixture of smoke and natural fog, a very dangerous pollution of air which occurs in highly industrialized area with a bad natural air drainage (London, Midland in England, Los Angeles in the U.S.A.).

SOCIAL INDICATORS OF REGIONAL DEVELOPMENT (SIRD) the events occurring in social life of a region and their quantitative presentation (statistics) which indirectly reflect the side-effects of location and regional planning (migration, natural growth of population, disease statistics, etc.). For example, exodus of people from a region may indicate lack of employment opportunities; increase of cases of stomach diseases may indicate enormous pollution of water. Constant observation and investigation of SIRD is an important measure in the regional development planning.

SOIL POLLUTION see: environmental pollution.

SPACE In real life, the economy is not only a combination of industries, sectors and their relations to labour, time and other important factors, but also occupies a certain territory (two-dimensional) which affects decisively almost all quantities of economy through commodity flow, transportation and transport costs, peculiarities of various areas, etc.. Thus, in economic philosophy, the space is understood as a territorial factor inherent in actual stretching of economic and social life over a given area, no matter how big it is.

SPACE ECONOMY a term used by many authors to define the part of the economic science dealing with all factors influencing economy and derived from territorial allocation of economic activity. Since the space economy has not paid due attention to social factors, it has been replaced by a more broad science - regional science (q.v.).

Bibl: Isard, W., Location and Space Economy; New York, 1956.

SPATIAL OBJECT (OF LOCATION) is an object which occupies a vast territory (afforestation scheme, irrigation scheme, agriculture scheme, national parks and game reserves, etc.). Usually, location of a spatial object excludes the occupied land from other kind of utilization. Thus, the land use is one of the main problems in location of spatial objects.

SPECIALIZATION of a region (centre) - regional contributions to the national economy expressed through activities of the external (exporting) industries of that region. The indicators of regional specialization are: (a) share of the regional output in the total output of a given industry in the country; (b) share of the regional export of a given commodity in the overall inter-regional exchange by that commodity; (c) share of exporting industry (by output, by capital stocks, by employees) of the region in the whole regional economy. Effectiveness of the specialization is expressed in the fact that the production of the commodities, on which the region is specialized, is more economical than in other regions.

SPECIFIC INVESTMENT a relative indicator showing amount of investment per unit of output (per ton of coal, per kWh of electricity, etc.). Sometimes, instead of comparison of all specifications of the alternative projects, one compares only specific investment related to each of them and select the best one.

SPECIFIC MATERIAL CONSUMPTION amount of produce (raw material, energy, and other inputs) of an industry necessary to manufacture one unit of the final produce in the industry under analysis. It may be direct, indirect and total. Thus, to produce a ton of pig iron one needs 20 kg of coal directly and about 450 kg of coal indirectly (via coke), the total specific consumption of coal per ton of pig iron will be 470 kg. These data are subject to change due to the technical progress. But, for a certain period, they remain stable and are used for elaboration of the prospective input-output balances (q.v.).

STANDARD PROJECT Among various enterprises of any branches of industry, as well as among social institutions, there are such kinds which are built in many replicas, like sugar plants, meat canning factory, school, cinema, railway station, garage, etc.. For these enterprises one prepares so-called standard projects (blue-prints) which reflect usually the last word in technology, rely, in construction on pre-fabricated building details, etc.. Preparation of standard projects saves resources for this stage of work, since they are considerably cheaper than unique projects. The application of standard projects does not free regional planners from special research necessary for adjustment of the projects to a particular place of location (see: micro-location).

***STANDORT** means a geographical address of any existing or planned object of location. In administrative terminology, it may be: province, district, city, town, village or any other geographically determined place. In the terminology of regional planning, it may be: economic or planning region, economic area, zone, centre, etc..

In locational exercises, the alternative standorts should be of the same order, i.e. city has to be compared with another city, region with region, etc..

Originally, the term was firstly used by von Thünen (for Agriculture) and afterwards developed by A. Weber (for Industry) with the meaning "place of location". The necessity to introduce this neologism in other languages is caused by the fact that the latter have no counterpart and use two or three words for that notion; the acception of this German word will be harmless since it is already well known everywhere and used in practice, though with reference to the classical theory of location.

SUBURBAN ZONE the zone surrounding the city or town (industrial centre) and serving the latter in four aspects: (1) supplying daily foodstuffs like milk, poultry, vegetables, etc.; (2) providing the recreation facility for urban population; (3) compensating the lack of manpower in the urban centre by adding labour forces which continue to live in the suburban zone but have job in the city; (4) to a certain extent, the suburban zone may be regarded as a reserve territory for the expansion of city. It is extremely important, while elaborating the master-plan (q.v.) for a city to foresee an appropriate development of its suburban zone.

SUPPLEMENTING INDUSTRIES two or more industries in the region connected with each other indirectly. This indirect relations may be expressed through selective utilization of manpower (for example, engineering industry employs the male labour, while textile industry employs the female labour), through selective utilization of energy sources (for example, one enterprise consumes the electricity during the day time, another during the night time - like water-pump station), etc.. Development of supplementary industries helps to raise the level of utilization of the natural, economic, and human resources thus increasing the productivity of labour.

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TECHNICAL-ECONOMIC FOUNDATION of a variant of location is a set of documents (text, tables and calculations, maps, locational determinants of the project and locational characteristics of the standort) which support the recommendation on this very place of location and defends this variant against alternative ones.

TECHNICAL PROGRESS as a factor of location and regional development should be understood in such a way: each project under implementation is to function for a long period; that means that all possible to forecasting changes in technology and equipment should be taken in mind. It is useless to build a project based on a wittingly obsolete technology (a special case for developing countries is under the term intermediate technology, q.v.). Usually, the so-called standard projects (q.v.) are based upon the "latest word" in technology.

Bibl: Vilensky, M.A., Technical Progress and Efficiency of Distribution of Productive Forces, Inter-regional seminar on Industrial Location and Regional Planning, UNIDO Document ID/WG.9/B.17, 1968.

TECHNOLOGICAL FACTORS of location are those technological peculiarities of a project, of a produce, or of a technology, which influence the pattern of location. For example, a nitrogen fertilizer plant can use, as a basic raw material, coal, petroleum, natural gas, etc., and each pattern of technology will play a decisive role in selection of the place of location. Is the produce liquid or bulk, does it permit long-distance transportation or not - these questions are taken into account while planning. It is improper to locate radio or television transmitter near an engineering plant using technology of electrical welding (due to occurrence of radio disturbances). The technological factors which are important for location have to be specified in the locational determinants of the project.

TERMINAL a centralized (usually one for city) and combined station of a big city (metropolis) playing the role of gate for all the in-coming and out-going passengers and their luggage; sometimes it provides services for transit passengers too. It consists of: central railway station, bus station (the latter connect the terminal with the out-laying railway stations, harbours and airports), and manifold services (tickets, banking, tourist, recreation, shopping, custom, etc.) dislocated in a specially built building. The terminal has also transport connections with urban and suburban traffic. Creation of terminals in some metropolises have proved their advantages for both passengers and transport organizations.

TERRITORIAL DIVISION OF LABOUR is a philosophical understanding of the basic concept in the regional science. Division of labour between the branches of economic activities, as well as between the people engaged in them, is

a well known historical progressive process which rises continuously the productivity of labour. Territorial division of labour means that each area is specialized in production of a certain goods, so that exchange by goods among various areas becomes necessary. The effectiveness of such division of labour is expressed in the fact that the production of the goods, on which the area is specialized, is more economical than in other regions, because of various factors affecting the production - climate, natural resources, geographical situation, experience of the people, etc.. Although the diversification of the production within a region is now developing rapidly, it does not annihilate dependence of many industries on the geographical factors of location.

Bibl: Nikolajev S.A., Territorial Division of Labour and Distribution of Productive Forces. Interregional Seminar on Industrial Location and Regional Development, UNIDO Doc. No. ID/WG.9/9, 1968.

TERRITORIAL PLANNING a term combining all types of planning in spatial aspect - locational planning, regional planning, physical planning, amenagement of territory, and their derivatives like town planning etc.. On the other hand, sectoral planning deals only with elements inherent in the development of sectors, industries, branches as such.

TERRITORIAL STRUCTURE (of a region). The static elements of the territorial structure of a region are: (a) boundary of the region; (b) nucleus; (c) nodes; (d) network(s); (e) intra-regional subdivisions (economic regions of a lower degree). These elements are to be identified by the first stage of the regional analysis. Next stage has to identify (using some dynamic indicators, like commodity flow, migration, etc.) the functional zones (hierarchy of the nucleus and nodes, gravity zones, reserved territories, etc.). The thorough investigation of the territorial structure can produce several positive decisions on the location policy to be applied to this region.

THEORY OF LOCATION assembles all main spheres of research and scientific foundations of the problems connected with the location of enterprises and regional development. Generally, it is divided into two main directions:

(1) Discovery of virtual laws and rules which determine the geographical allocation of human activity. A group of scholars tried to apply some physical laws to the economic and social life of society (for example, extrapolation of the Newton's formula of gravity on the relations between the cities, application of the Bernulli formula of gas flow to the transport flow of goods, etc.). But these attempts gave nothing but comparisons of a pure academic interest. More success was given by a second group of scientists who concentrated their attention on discovery of the factors of location (q.v.) as real indicators of the objective relationship between the human activity and geographical places.

(2) The second major field of exploration is the elaboration of practical recommendations, methods, using which one can perform the locational and regional planning in a more sophisticated way. One of the goals in that field, elaboration of criteria of location (q.v.) may be mentioned. The other one is development of the methods of location.

Location and regional development are such exercises which are affected by, and connected with both the natural (technical) and economic elements of human environment. As for the natural and technical factors, they are not influenced so highly by the social and economic structure of the society. Another state can be observed, if the economic and social factors are in sight. The type of society (capitalist, socialist), the varieties of property have a big impact on the decision-making, because of different approaches to such instruments like criteria (national or commercial profitability), management, location and regional development policies, etc.. That explains why, for example, the practices which seemed to be effective in one country fail in another one, if applied dogmatically.

That is why the regional planners and location experts of any country have to study carefully the available theoretical manuals and to select only those theories and methods which may work successfully under peculiar economic and social conditions of the country.

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 - (2) Isard, Walter: Location and Space Economy: A General Theory Relating to Industrial Location, Market Areas, Land Use, Trade and Urban Structure, M.I.T. Press, Cambridge, Mass., 1956. See No. 282.
 - (3) Moses, Loan: "Location and the Theory of Production", in: Quarterly Journal of Economics, Vol. 72, No. 2, May 1958.
 - (4) UNIDO, Draft report of the Seminar on Industrial Location and Regional Development, ID/WG.9/20, August 1968.
 - (5) Zajda, Z.; Les problèmes de l'intégration de la théorie macro-économique de croissance économique et de la théorie régionale; Les problèmes spatiaux dans la planification en perspective, Warszawa, 1968.

TIME is a special factor of location and regional development which is not inherent in the specificities of the natural, economic and social conditions by region, but connected directly with the general development strategy and availability of national resources. Meanwhile, it may affect the decision on location. If, for example, the country cannot afford a big integrated project (cannot freeze a bulk of investment in the period of construction), it may desintegrate the project and construct it gradually, by units, putting them into operation and gaining some return of investment, which can be used for construction of a next unit. Evidently, this decision can affect the selection of standorts for separate units. The time-factor works in favour of big agglomerations, if the time is limited, and in favour of remote areas, if it is not.

TOWN PLANNING a special kind of physical planning which deals with urban settlements. The main tasks of it are: to elaborate the master plan (q.v.) of a town (city) and to control the fulfilment of that plan.

Bibl: United Nations, Planning of Metropolitan Areas and New Towns;
New York, 1967, Sales No. 67.IV.5.

TRADE ESTATE a common infrastructural facilities built for sale or lease to the commercial enterprises in analogy with the industrial estate.

TRANSPORT as a factor of location plays an extraordinary role, since it affects all the elements to be located, though in a different way. On the other hand, transport is the "oldest" factor in the history of the regional science and is studied quite well. For the industries, the produce of which requires big transport costs, this factor is sometimes the most decisive. But this factor has to be checked in combination with other factors, because the increase of transport costs may be accompanied by a bigger decrease of other costs, if the chosen place of location has more advantages of other origin.

Bibl: (1) Fulton, M. and Hoch, L.C., Transportation Factors Affecting Location Decisions; Economic Geography, Vol. 35, 1959, pp. 51-59.

(2) Owen, W., A Transport Strategy for Development. Inter-regional Seminar on Industrial Location and Regional Development, UNIDO Document ID/WG.9/15, August 1968.

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UBIQUITE a source of development which is not limited to a certain place but distributed almost evenly over the territory. The extreme example is the air; up to a certain extent, such elements like soil, water (rainfall), wood, fishing potentials may be called ubiquites in some countries.

(UNIFORM REGION) a term used sometimes for a region without any diversification of territorial structure; see: homogeneous region.

URBAN ECONOMICS a special economic (and social) discipline studying the problems and peculiarities of the economic and social life of urban centres (towns, cities, metropolises), while the town planning (q.v.) is concentrated on the physical planning, structure and architecture of cities. The importance of that discipline increased considerably in recent years due to the fast developing and controversial process of urbanization.

Bibl: Thompson, W.R., A Preface to Urban Economics, Baltimore, 1965.

(URBAN FIELD) hinterland (q.v.) of urban places, zone of their economic influence.

URBANIZATION

Definition and subject. Urbanization is movement (migration) of people from small communities concerned chiefly or solely with agriculture to other communities, generally larger, whose activities are primarily centred in industrial, trade, administrative, cultural or allied interests, i.e. to the urban settlement. Statistically, urbanization is mirrored, firstly, in increasing the share of urban population in the total population of a country, accompanied, secondly, by concentration of urban population in larger cities. The role of migration in this process is to be emphasized since the natural growth of population in urban areas is generally lower than in the rural areas (some big cities with an inverted population age structure in favour of the olders have even negative natural growth, the crude rate of deaths exceeding that of births), and therefore cannot play a decisive role in the urbanization process, nor explain it.

Background forces. The main objective reasons for the process are:

- (1) Modernization of economy, especially industrialization, leads to striking growth of role of non-agricultural sectors, which are concentrated almost exclusively in urban areas, thus making the latter attractive for new labour forces;
- (2) Modernization of agriculture, on the other hand, results in raising of labour productivity, forces out superfluous manpower from that sector, consequently, from the rural areas;

(3) Both aforementioned processes are likely to be in equilibrium, theoretically. But in the real life the third factor, social one, perverts the picture. Usually, living standard in urban areas is higher than in rural areas, that gives a strong social impact for the people to run into the cities. Most rural migrants expect to find in the city not only a job, better housing and physical amenities, but also a richer social and human experience and access to national and universal culture (see: "Rural Exodus"). Notwithstanding greater social satisfaction and possibility of labour organization which urban life affords improve the status of city workers and make them less subservient to the will of employers than are workers in farm villages, who are subject to constant supervision. The real fact is that more people are coming into cities than can be absorbed by the existing industrial and other forms of employment. In many areas of the world, this problem is rapidly assuming the proportions of a full-fledged crisis.

Problem caused by urbanization. Although there were earlier eras, as, for example, in Greece during the age of Pericles and during the latter Roman Empire, when the movement of people to the cities presented serious social problems, the phenomenon has become especially important since the onset of the industrial revolution. The main problems caused by modern urbanization are: unemployment, dwelling shortage, and over-concentration. The fact that most countries cannot afford conformity between employment opportunity in the cities and inflow of labour leads to increase of the unemployment in urban areas.

The spontaneous process of urbanization causes, consequently, the lowering of the personal income of urban people - of course, that are the immigrants who suffer mostly - and the first corollary of it is deterioration in housing. By 1965 the developing countries of Asia, Africa and Latin America required up to 24 million dwellings annually to house the increase in population, to remedy existing shortages, mainly in urban areas, over a period of thirty years, and to offset continuing obsolescence. This is equivalent to about 10 dwellings annually per 1,000 inhabitants. The magnitude of these requirements may be gauged from the fact that with few exceptions, the highly developed countries today build no more than 6 or 7 dwellings annually per 1,000 people. Slums, decay, blighted areas and unauthorized bidonvilles mark the process of urbanization, if the latter is out of control.

The last child of the controlled urban growth is the negative side of over-concentration: rise of the cost of land, transport congestions, air and water pollution and overall deterioration of urban environment. Needless to say that the scope of events leads to growth of criminality and other manifestations of social instability.

Significance of urbanization. Urbanization is not a fact to deny or regret. Cities have always been carriers of social, economic and cultural progress and their importance in this role continues to grow in all parts of the world as countries enter the path of national and industrial development. Through the whole history of mankind, urbanization has depended largely on the extent to which the division of labour is progressing and industrial products are divorced from agriculture. Thus, generally,

urbanization is inevitable, permanent, and progressive, and if it is well planned and followed up, the picture will not all be black as described above. Although the statistics on mere urban population growth is hardly a definite indicator of the progress, nonetheless, if supported simultaneously by:

- the growth of gross domestic product predominantly through the contribution of industrial sectors;
- the increase of output per employee;
- the increase in savings;
- the stability or improvement of employment, -

that means that the process of urbanization goes properly and the national government is the master of situation.

Peculiarities of urbanization in developing countries. The major difference between the processes of urbanization in developed countries and that in developing countries is that, in the latter, it progresses relatively on a higher speed, if compared with the earlier stages of urbanization in the former. Thus, the national resources are not sufficient to meet this challenge of population movements. The fact is aggravated by several features relevant to the developing countries. Firstly, they do not possess such a developed system of urban settlements, with well progressed territorial and economic hierarchy of cities, that exists in the developed countries. For the latter, that system regulates, to a known degree, the pattern of movements. The village people migrate firstly to the nearest country town, while the latter loses its population which moves to the larger cities - and so on, up to the national capital. Thus, that system plays a role of decelerator. In developing countries, especially in those with a single big city, that is the national capital which takes over all the burdens of urbanization. Secondly, the lack of employment opportunity in the cities compels the migrant to take any job - in handicraft production, retail trading, street paddling, and domestic services in urban areas. That means that the shift of population from villages to cities is not simultaneously the shift of labour from sectors of low productivity to those of high productivity, but a re-distribution of labour between the sectors of, at least, the same productivity. Thirdly, when the big cities absorb the immigrants coming directly from the remote villages, that means that their manpower resources grow mainly at the expense of unskilled workers.

Planning of urbanization. Since the process of urbanization is caused by, and connected with, the processes occurring in the whole economy, the leading rule for planning is to keep this process in path with the general economic and social development. The main directions are:

- (a) to improve the existing urban areas (employment, housing, infrastructure, etc.) in order to exploit the advantages of urbanization on full scale;
- (b) to control the very process (development of the settlement network, local and regional growth centres, raising of

attractiveness in the rural areas, use of labour-intensive and intermediate technology in the rural areas, etc.) in order to prevent undesirable consequences of the process.

The wrongest view is that which is based on the desire to stop the urbanization.

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- (1) Thompson, J.G., Urbanization; Its Effects on Government and Society. New York, 1927.
 - (2) Baker, O.E., Rural-urban Migration and the National Welfare, in: "Association of American Geographers", Annuals, Vol. XIII (1933), pp. 59-126.
 - (3) Encyclopaedia of the Social Sciences, the McMillan Company, 1957, New York, Vol. 15.
 - (4) Report of the ad hoc group of experts on Housing and Urban Development, UN Sales No. 63.IV.1.
 - (5) Introduction to the problems of urbanization in Tropical Africa, UNECA document SEM/URB/AP/1, 7 March 1962.
 - (6) Population Development and Urbanization, UNECA, Doc. No. E/CN.14/HOU/41, 1969.
 - (7) Breese, G.W., Urbanization in newly developing countries; Englewood Cliffs, N.J., 1966.

URBANIZED AREA in the practice of some countries is defined as an area consisting of central city, plus its contiguous suburbs, plus such satellite cities as may be connected physically with the central city through its suburbs. Quantitative yardsticks are: the area occupied by buildings exceeds 50 per cent of the area being investigated, that occupied by roads and other transport premises exceeds 5 per cent of the area, the share of population engaged in agriculture is less than 2 per cent of total population. Urbanized areas requires special approach in development and physical planning and are often a subject for special study and projecting.

URBANIZING the physical expansion of the urban settlement over the territory. Formerly insignificant, the process of urbanizing has got a proper attention in the recent decades when the process of urbanization, among other inherited problems, brought about the new insight into problem of land use in urban places. It is known that the biggest urban communities of the world have expanded their areas up to several hundreds square kilometres, and urbanized areas spread over thousands of square kilometres.

URBAN POPULATION the part of the total population (of a country, of a region) living in urban settlements (cities, towns), while the rest living in rural areas is called rural population (rural plus urban equal total population). Official statistics shows only that population as urban one which lives in legally authorized urban settlements (according to the rules of this country). But, for more adequate planning, the population of unauthorized localities with urban character

should be included into urban population. Urban population is mainly non-agricultural one, though not equal to it, since, on the one hand, a given portion of urban people is engaged in agriculture (especially in small towns), on the other hand, a given portion of rural population gains its main income from non-agricultural activities. The statistics on the urban population growth is the main indicator of the process of urbanization, which takes an extremely important place in regional and overall planning.

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VARIANT METHOD should be widely introduced into regional planning and location. It means that the decision-making body is offered several (at least two) variants of regional plan, one of them based on minimum resources, another on the maximum possible resources, or each of them based on different technologies. In such cases, the body has a field for manoeuvring within the framework of the national plan and resources which support it.

VEGETATION MAP a map which indicates the areal distribution of various phytocenoses (forests, grassland, savannah, etc.) and is used while planning of agriculture, forestry, etc.. This map can show also some endemic diseases or disasters important for development (tse-tse fly, locust infestation). The method of non-qualitative areal distribution (q.v.) is used for mapping. Sometimes only selected phytocenoses are shown (for example, forest map).

VERTICAL LINKS those existing among the institutions, one of which is subordinated to another (central planning commission - provincial planning commission - district planner, or central firm - subsidiary).

VERTICAL TAX DISTRIBUTION a practice when the all taxes to be collected in the country are in various ways attached to various administrative levels in order to provide revenue for local budgets. See: regional budget.

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WALKABLE DISTANCE (1) is a distance which may be passed by pedestrian for everyday purposes (work, shopping, etc.) spending not more than half an hour and without using public (special) transport. Many countries include cyclist in the category of "pedestrian" and everywhere the private car and motor cycle drivers are not counted. The walkable distance is important while deciding on micro-location of the so-called local objects (shops, repair-shops, cinemas, municipalities, etc.). A special approach is applied when the walkable distance is to be defined for the pupils, especially for those of primary school. Some countries introduced the limit of 4 km for the younger school children (if more, a school bus should be provided). (2) The term walkable distance is rather controversial, since its definition and measurement differ widely in various countries. The above-mentioned definition is valid for developed countries or for urbanized areas of developing countries. As for remote rural areas, the planners (in Africa, for example) have a definition as follows: it is a distance which a village person may pass to reach the central place for special purposes (market, hospital, shop, etc.), to solve the problem, and to come back within a day's time; the use of animal transport and bicycle is admitted. This distance varies from 8 to 16 km (5-10 miles) and has to be taken into account while defining growth centres, service centres, feeder roads, and primary economic regions (q.v.) generally.

WATER-INTENSIVE INDUSTRIES those which consume big amount of water per unit of production and tend to locate themselves near big streams or other rich water resources.

WATER POLLUTION see: environmental pollution.

WATER RESOURCES a factor of location which is important for almost all objects and especially for those water-intensive. Utilization of water resources needs special and sometimes very costly equipment, so one has to distinguish two separate factors: natural water resources (which are important for a long-term programming) and water supply facilities (infrastructure) which determines the capacity of location of a given place.

WATER SUPPLY FACILITIES a factor of location (q.v.) which includes all the infrastructural facilities of a standort, dealing with extraction, preparation, cleaning of water for human and industrial use, as well as with sewerage of water.

WATER UTILIZATION a branch of economy, the "produce" of which is water for human and economic use. In modern economy, it has grown up to a complicated and technically diversified industry, although, traditionally, is always included into infrastructure.

Bibl: Bower, B.T., The economics of industrial water utilization; in: Water Research, Washington, 1966, pp. 143-173.

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ZONAL DELIMITATION the process of identification of zones according to a chosen criterion (locational characteristic). If a complicated phenomenon is to be demonstrated on the map, the sub-zones may be indicated; thus, while delimiting the agricultural zone (criterion: more than 50 per cent of population are engaged in agriculture), one can delimit sub-zones according to a supplementary criterion (income per capita).

ZONATION, ZONING a pattern of dislocation and configuration of zones over a vast territory (country, continent). For example, in physical geography, usually observed horizontal dislocation of the climatic zones may be transferred into a vertical zonation on the slope of a mountain. In economic geography, one can observe the concentric zonation of the suburban agriculture around a big market (city).

ZONE a spatial unit (area) which possesses, within its limits, a sort of homogeneity measured by a single or complex locational characteristic, or by a certain intensity of it. Thus, physical-geographical zones may be: forest zone, savannah zone, seismic zone, etc.. Economic and social zoning may deal with the density of population, economic gravity, income per capita, etc.. The availability of economic integrity of various places within the zonal limits is not necessary.