Management and Production Engineering Review
Volume 11 • Number 4 • December 2020 • pp. 25–33
DOI: 10.24425/mper.2020.136117

CLASSIFICATION OF BENEFITS BY THE CRITERION OF FACTORS OF THE LOCATION OF PRODUCTION AS A TOOL FOR MANAGEMENT OF THE SPATIAL ORGANIZATION OF THE ECONOMY

Jerzy Stadnicki[1], Andrii Terebukh[2]

[1] *Kielce University of Technology, Poland*
[2] *Lviv Polytechnic National University, Ukraine*

Corresponding author:
Jerzy Stadnicki
Kielce University of Technology
Faculty of Management and Computer Modelling
al. Tysiąclecia Państwa Polskiego 7, 25-314 Kielce, Poland
phone: +48 50 8514532
e-mail: yurijs@tu.kielce.pl

Received: 2 April 2020
Accepted: 21 July 2020

Abstract
The main purpose of the article is to try to substantiate the advisability of classification of benefits according to the criterion of factors of the location of their production and to develop a matrix for such a classification. Morphological analysis is used as the main study method. The existence of four groups and a number of subgroups of benefits is established, in the location of production of which one pair of factors dominates: from the "production of benefits" side and from the "place" side. The basics of the classification of benefits are developed, the location of production of which should take into account several pairs of factors. The result is a matrix for performing the classification of benefits by factors of the location of production, the filling of which will improve the quality and speed up decision-making on the choice of optimal places for the production of benefits. This study, in addition to being important for the theory of benefits and the theory of the spatial organization of the economy, has significant practical and social consequences, since it makes an important step in improving the justification for the location of production of benefits.

Keywords
Benefits, classification of benefits, factors of the location of production, place of production, matrix for the classification of benefits, management of the location of production.

Introduction

Benefits, which are one of the main categories of economic theory, were classified for a different purpose from the beginning of the development of economic science. Obviously, often the purpose of classification of benefits is to sort out information about benefits, creating a kind of "catalog of a library of knowledge about benefits". But a much more interesting and more pragmatic purpose of the classification of benefits is the attempts with the help of an appropriate classification to optimize the management of benefits for more efficient use.

In economic theory, there are a lot of approaches to the classification of benefits [1-29], but benefits have never been classified by factors of the location of production (FLP). At the same time, FLP of benefit we understand as the reasons to consider, substantiating (predicting) the future location of production (answering the question "where?") or explaining the previous (existing) location of production (answering the question "why here?") of benefit. Such reasons, obviously, can be not only objective, influencing the optimality criterion (for example, minimum production costs or maximum profitability), but also subjective, largely random.

Studying FLP of benefits, we should act systematically and analyze not only benefits themselves, but also the process of their production. This makes it necessary to consider the whole side of the "bene-

fit", which includes: the technology of production of benefit; resources necessary for the operation of this technology; pollution resulting from the production of benefit; the benefit that is produced.

The properties of all the constituents of the side of "benefit" should be analyzed in order to identify those that may be FLP of selected benefit. Found among the properties of technology, resources, pollution, and benefits, FLP of benefit will be factors of location from the side of "benefit".

It is advisable to begin the identification of FLP with an analysis of the properties of the technology that is planned to be used for the production of benefits. The properties of the technology, which are at what time and in what volumes the resource should be used, as well as at what time and in what volumes which pollution will be formed, are factors that should be taken into account when choosing a place for the production of benefits. This implies the need for information about the properties of resources that are used in the course of the corresponding technological process, and the properties of contaminants formed during the application of this technology.

The properties of resources are extremely diverse and each of them can be evaluated in terms of the impact on location. Pollution information from the application of the technology could be viewed in terms of production costs by taking into account the costs of environmental compliance. However, the locations may differ in the mechanisms of environmental regulation, and predetermine the need for a location-specific calculation of the corresponding costs. Therefore, the component of production costs, which would take into account the costs of compliance with environmental standards in the relevant place, is advisable to consider separately.

The properties of benefits that may be FLP are extremely diverse, in particular: transportability, physical condition, safety, specific gravity, susceptibility to spoilage, and the like. All properties of benefits should also be analyzed in order to identify the FLP.

Given the identified factors, you need to look for places that will be characterized by properties that contribute to the production of benefits with relatively low costs or with a relatively high income. These properties of places will also be FLP of selected benefit, but from the side of "place". The properties of places that may be FLP are extremely diverse, in particular: location relative to sales markets; availability; environmental quality; availability of resources; resource prices; bearing capacity of soils; geometric parameters; legal specifics; neighborhood; compliance with the destructive influences of nature and the like.

Thus, the side of "benefit" (which was produced, is produced or is planned to be produced) and the side of "place" (which was, is, or may be the place of production of benefit) are characterized by a certain set of properties, some of which are FLP of selected benefit. FLP of benefit can be divided into internal (to which the corresponding properties of the side of "benefit" belong) and external (corresponding properties of the side of "place").

Thus, we have, on the one hand, the properties of the side of "benefit", some of which should be considered as FLP of benefit. On the other hand, each property of the side "benefit" will correspond to the property of the side "place", which should also be considered as FLP of benefit. Therefore, always, answering the question "where?" or to the question "why here?" we should not show individual FLP of benefit, but their pairs: internal FLP of benefit – external FLP of benefit.

Groups and subgroups of benefits

The first divide of benefits by FLP is expediently performed by dividing benefits into those whose locations of production are determined by one dominant pair of factors (benefits of block "A"), and those whose location is caused by several pairs of factors (benefits of block "B"). The same benefits can be produced using various technologies and are characterized by specific factors of location. For example, the production of electricity is possible with the help of many technologies, to predetermine a significant difference in the factors of the location of its production. The location of the production of electricity from coal (1) is oriented to the places of extraction of this resource, since the transmission of electricity to consumers is cheaper than the transportation of the corresponding volumes of coal to produce electricity close to the market. Another condition for location of the production of electricity from coal is the availability of a sufficient amount of water necessary for cooling the aggregates. In the production of electricity from coal, an environmental factor is important, since the burning of coal generates hazardous sulfur dioxide.

The location of electricity production by solar power plants (2) is oriented to places with a high potential of solar radiation flux. Only when the solar flux exceeds a certain threshold value, it becomes a factor of the location of the solar power plant. A characteristic feature of solar energy facilities is the need for significant areas of land. And unlike coal

power, solar plants are characterized by a very low level of water consumption and therefore do not require location close to water sources.

The location of electricity production by burning natural gas (3) is oriented towards its consumers, since using pipelines for electricity production near the sales market is relatively cheaply. Electricity production near consumers avoids its losses, which are inevitable when transporting over long distances. In addition, natural gas-fired power plants are characterized by low levels of environmental pollution, it is important when production is located in densely populated areas.

Location of electricity production by hydroelectric power plants (4), for obvious reasons, is oriented to places with a high energy potential for water flow. For the efficient production of electricity by hydropower plants, two main factors are needed: guaranteed water availability all year round and landforms that facilitate the construction of hydropower plants.

The location of electricity production by nuclear power plants (5) was oriented towards consumers for the conditions of non-seismicity of the territory and the presence of significant sources of water for cooling aggregates. The consumer orientation of the location of nuclear power plants is due to the very low cost of transporting fuel for them (several wagons per year). However, over time, when placing nuclear power plants, a safety factor began to dominate, which determined their location away from large settlements.

The location of electricity production by wind power plants (6) is oriented towards places with significant wind energy potential. The use of wind energy is advisable if its speed on the Earth's surface exceeds 20 km/h. The main environmental elements that affect the performance of a wind power plant and should be taken into account when placing it, is the wind and the type of place. A plot favorable to a wind farm should be without forest and development. Its roughness (resistance), urography (type and size of landscape waves), as well as the density of the surrounding area are important.

The location of electricity production by tidal power plants (7) is oriented towards places (shores of the seas and oceans) with significant potential for water inflows. The average tide height is only 0.5 m, unless water masses move in small and narrow bays or estuaries that flow into the seas and oceans. Then the wave height can be 10-20 times higher than the normal height of the supply lift. Although the total energy of the Earth's tides is estimated at about 3 billion kW/h per year, there are only 100 places where the construction of tidal power plants can be effective, since there is a relatively high tidal wave in these places.

The location of electricity production by geothermal power plants (8) is oriented to places with significant energy potential of geothermal waters and steam-water mixtures. To generate electricity, geothermal waters and steam-water mixtures with a temperature of more than 140°C and a depth of up to 5 km are considered promising.

Thus, having in all cases an identical benefit (electricity), we fix that the factors of location for each electricity production technology will be different. This example convincingly demonstrates the need to assign identical benefits, but produced by different technologies, to different classification groups from the point of view of FLP.

Therefore, speaking about the past, present and future FLP of selected benefit, the technology of its production should be indicated, which makes it appropriate to use a template to characterize each combination of benefit-technology (BT), which takes into account "FLP (name of benefit) when using technology (name of technology)". For example, electric energy obtained by burning coal will be a different BT for classification by FLP than electric energy obtained by converting solar radiation. At the same time, BT with similar FLP form a separate class for the production of benefits (CPB). To study the classification of benefits by FLP, we first dwell on the CPB of block "A", which are divided into 4 groups, and a certain number of subgroups within these groups. Table 1 provides detailed information about CPB, where only one pair of FLP dominates.

Group 1 of CPB of block "A" is oriented when locating on places with the appropriate source of the resource. The concept of a source of resource includes not only natural resources (mineral deposits, forests, land, clean environment, etc.), but also anthropogenic resources (for example, a sugar or cement enterprise, low government requirements for impact on environment, safety, etc.). It is clear that the extreme capacity of the concept of "resource" gives rise to the potential for further division of CPB of group 1 (which includes three subgroups) into FLP not only within the group, but also subgroups. It should also be emphasized that the justification of the belonging of the detected FLP to "resources" will in most cases be, albeit an interesting, but necessary component of study in the field of spatial organization of the economy.

Table 1
CPB where one pair of FLP dominates.

CPB	Dominant FLP	
	Side of "benefit"	Side of "place"
1	1.1. Use of immobile resource	Availability of source of immobile resource
	1.2. High resource intensity	Availability of a source of resource with low nutrients
	1.3. Use of low mobile resource	Availability of a source of low mobile resource
2	2.1. Production of low mobile benefits	Sufficient demand
	2.2. Weight (volume) of the produced benefit significantly exceeds the weight (volume) of the main resource	Sufficient demand
	2.3. Slight spatial differentiation of production costs	Sufficient demand
	2.4. Need for mental affinity of workers with consumers	Sufficient demand
	2.5. Need for direct contact of workers with consumers	Sufficient demand
	2.6. Immobility of the produced benefit	Sufficient demand
3	High transportability of the benefit	Low production costs
4	Danger to the population	Remoteness from cities

Subgroup 1 of group 1 of CPB of block "A" covers CPB for which the "need for immobile resource" property is dominant. This subgroup includes CPB, where the resource is withdrawn from its source (mining, sawmilling, etc.) or use an immobile resource (for example, transport use of the lake, energy use of the river, clean environment, low government requirements for the effects of production on the environment). For CPB, subgroup 1 of group 1, the pair of FLP is "need for immobile resources" (property of the side of "benefit") – "availability of source of immobile resources" (property of the side of "place").

Subgroup 2 of group 1 of CPB of block "A" covers CPB for which the property "high resource intensity" (high costs of the corresponding resource for the production of a unit of benefit) is dominant. The level of resource intensity is characterized by an index, calculated as the ratio of the mass of raw materials to the mass of benefit. For example, the resource intensity index in production is: oil – 2.5:1; granulated sugar – 7:1; cheese – 9:1; butter – 24:1. Drying of mushrooms, fruits and vegetables is especially resource-intensive. For CPB, subgroup 2 of group 1, the pair of FLP is "high resource intensity" (property of the side of "benefit") – "availability of a source of resource with low nutrients" (property of the side of "place"). The resource orientation of the production of resource-intensive CPB is determined by the desire to save transport costs.

Subgroup 3 of group 1 of CPB of block "A" covers CPB for which the "use of low mobility" property is dominant. Production of canned goods, wine, juices, etc. focus on sources of resources, since the movement of raw materials predetermines a significant loss of quality or high costs to prevent this during transportation. For CPB, subgroup 3 of group 1, the pair of the FLP is "use of a low mobility resource" (property of the side of "benefit") – "availability of a source of low mobility resource" (property of the side of "place").

Group 2 of CPB of block "A" covers CPB, for which FLP is the proximity of the market. Market orientation can be considered on a national, regional or city level. Group 2 of CPB includes six subgroups. Subgroup 1 of group 2 of CPB of block "A" covers the CPB for which the property "low mobility of benefit" is dominant. It is difficult to transport low-mobility benefits over long distances due to the high cost of this (due to the high cost of transport or, if necessary, to pay a fee when exporting benefit), large dimensions (for example, construction of house-building plants), the possibility of loss of quality (bakery products, flour, some confectionery products, dairy products, energy of thermal power plants, etc.), safety problems (for example, sulfuric acid, explosives). For the CPB of subgroup 1 of group 2, the pair of FLP is "low mobility of benefit" (property of the side of "benefit") – "sufficient demand" (property of the side of "place").

Subgroup 2 of group 2 of CPB of block "A" covers CPB, for which the property "weight (volume) of benefit significantly exceeds the weight (volume) of the main resource" is dominant. Such a situation arises when resources are added to the main resource for the production of benefit, freely available anywhere (water and air). Therefore, heat-insulating building materials, which are produced by treating the main raw materials (usually clay) with hot air, have a pronounced consumer orientation. It is similar to the vodka industry, brewing, the production of soft drinks from concentrates, etc., of which the tangible component is water. The largest factory of Coca-Cola concentrate is located on the island of Puerto Rico,

and from there the products are sent to 1,145 enterprises in various countries, water is added to the concentrate and the legendary drink is poured into various containers for retail sale. However, it is worth paying attention to the possibility of exceptions in the subgroup 2 of group 2. Thus, Heineken beer was never produced in the USA, but was always exported from Holland, because its European character plays a key role in positioning this brand in the USA. For the CPB of subgroup 2 of group 2, the pair of FLP is "weight (volume) of the benefit significantly exceeds the weight (volume) of the main resource" (property of the side of "benefit") – "sufficient demand" (property of the side of "place").

Subgroup 3 of group 2 of CPB of block "A" covers CPB, for which the property "insignificant spatial differentiation of production costs of benefit" is dominant. The consumer orientation of this subgroup is explained by an attempt to save on costs associated with moving (benefit for consumers or consumers for benefit) in the face of the inability to save on production costs by changing the place of production. For CPB of subgroup 3 of group 2, the pair of FLP is "insignificant spatial differentiation of production costs" (property of the side of "benefit") – "sufficient demand" (property of the side of "place").

Subgroup 4 of group 2 of CPB of block "A" covers CPB, for which the property "need for cultural affinity of workers with consumers of benefit" is dominant. Enterprises that do not require proximity to the consumer for technical reasons are oriented when placed on consumers because of the need to ensure cultural affinity. Thus, enterprises that engage in retail sales by telephone or the Internet in the EU are located in Hungary and Bulgaria, where the costs of running this business will be greater than, for example, in India, but there will be no problem of a significant difference in mentality between employees and customers. For CPB of subgroup 4 of group 2, the pair of FLP is "need for cultural affinity between workers and consumers of benefit" (property of the side of "benefit") – "sufficient demand" (property of the side of "place").

Subgroup 5 of group 2 of CPB of block "A" covers CPB, for which the property "need for direct contact of employees with consumers of benefit" is dominant. Direct contact with consumers of benefit creates opportunities for quick response to the necessary improvement of existing benefits, the production of new benefits, often taking into account the individual needs of customers. It also facilitates the organization of the service. For CPB, subgroup 5 of group 2, the pair of FLP is "need for direct contact of workers with consumers of benefit" (property of the side of "benefit") – "sufficient demand" (property of the side of "place").

Subgroup 6 of group 2 of CPB of block "A" covers CPB, for which the property "immobility of benefit" is dominant (for example, the benefits offered by hotels, restaurants, etc.). For these CPB, it is important to clearly identify consumers of the benefit and assess the size of their demand. If the value of demand for a benefit within the outlined space is not less than a threshold value (the level of demand for a benefit, which makes it expedient to produce this benefit), then it is advisable to focus on selected immobile benefits when placing production. For CPB subgroup 6 of group 2, the pair of FLP is "immobility of benefit" (property of the side of "benefit") – "sufficient demand" (property of the side of "place").

Group 3 of CPB of block "A" covers CPB, for which the property "minimum cost of production of benefit" is dominant. Indicative in this regard is the software sector (of which India is a recognized world center), the provision of various accounting and consulting services (Poland maintains accounting records for firms in other European countries, in particular Germany, Great Britain and France), where the benefits are very cheap and fast via the Internet can be delivered to customers. For CPB of group 3, the pair of FLP is "high transportability of benefit" (property of the side of "benefit") – "low costs of production of benefit" (property of the side of "place").

Group 4 of CPB of block "A" covers CPB, for which the "safe distance from large settlements" property is dominant. Many production technologies of benefits are dangerous for the environment and people: it is worth recalling the nuclear accident in Chornobyl, which became the worst in nuclear energy due to the false placement of nuclear power plants – in a densely populated region, near large cities, reservoirs and rivers that fed these cities with water. For CPB group 4, a pair of FLP of benefit are "danger to the population" (property of the side of "benefit") – "remoteness from settlements" (property of the side of "place").

Define abbreviations and acronyms the first time they are used in the text, even after they have been defined in the abstract. Do not use abbreviations in the title or heads unless they are unavoidable.

Matrix for the classification of benefit

Based on the received CPB, it is possible to propose a matrix for the classification of benefits when locating production one pair of factors is dominated (Table 2).

Table 2
Matrix for the classification of BT of block "A" according to the criterion of FLP.

Dominant FLP (side of "benefit")			Dominant FLP (side of "place")					
			1. Availability of source of resource			2. Sufficient demand 2P	3. Low production costs of benefit 3P	4. Remoteness from cities 4P
			immobile 1.1.P	with low nutrients 1.2.P	low mobile 1.2.P			
1	1.1	Immobility of resource 1.1.G	1.1.G-1.1.P	–	–	–	–	–
	1.2	Resource with low nutrients 1.2.G	–	1.2.G-1.2.P	–	–	–	–
	1.3	Low mobility of resource 1.3.G	–	–	1.3.G-1.3.P	–	–	–
2	2.1	Low mobility of benefit 2.1.G	–	–	–	2.1.G-2P	–	–
	2.2	High content of free resource (water or air) 2.2.G	–	–	–	2.2.G-2P	–	–
	2.3	Insignificant spatial differentiation of production costs of benefit 2.3.G	–	–	–	2.3.G-2P	–	–
	2.4	Need for mental affinity of workers with consumers 2.4.G	–	–	–	2.4.G-2P	–	–
	2.5	Need for direct contact of workers with consumers 2.5.G	–	–	–	2.5.G-2P	–	–
	2.6	Immobility of benefit 2.6.G	–	–	–	2.6.G-2P	–	–
3	High transportability of benefit 3G		–	–	–	–	3G-3P	–
4	Danger to the population 4G		–	–	–	–	–	4G-4P

The use of indicators to describe FLP of benefits ("G" for the side of "benefit" and "P" for the side of "place") is due to the fact that each factor can relate to many different benefits. For example, an immobile resource is any mineral resource. Accordingly, each immobile resource will have its own index in group 1.1.G of FLP of the side of "benefit", for example G1.1.1 – production of sand, G1.1.2 – production of coal, G1.1.3 – production of oil. In turn, places with immobile resources will be characterized by indicators in group 1.1.P of FLP of the side of "place", for example, P1.1.1 – field of sand, P1.1.2 – field of coal, P1.1.3 – field of oil. Accordingly, basic pairs of benefits will be described, for example, as follows: G1.1.1-P1.1.1; G1.1.3-P1.1.3.

That is, the characteristic of factors of the location of BT can be carried out by coding of this type:

$$XYG - FZP,$$

where X is the number of CPB group, which takes values from 1 to 4; Y is the number of the subgroup of CPB group, which takes values from 1 to 3 for group 1 of CPB, from 1 to 6 for group 2 of CPB and 1 for group 3 and 4 of CPB; G is the number of the resource, benefit, technology, formed pollution, can take large values within each subgroup of CPB (Y); F is the number of the type of places corresponding to CPB groups and takes values from 1 to 4; Z is the number of subtype of types of places; takes values from 1 to 3 for type 1 of places and 1 for type of places 2, 3 and 4; P is the place number, which can take on large values within each type of places.

The established pairs of FLP of benefits is the basis for creating a matrix for classifying the benefits of block "B", that is, benefits whose FLP are several pairs (Table 3).

For example, a benefit for which FLP from the side of "benefit" will be two immobile resources (we assume that these are G1.1.7 and G1.1.19), a low mobile resource (G1.3.5) and immobility of benefit (G2.6.3), from the side of "place" FLP will be – the availability of sources of immobile resources (P1.1.7 and P1.1.19), the availability of a source of low mobile resource (P1.3.5) and the availability of a sufficient demand (P2.6.3).

It is obvious that each specific case of production of a benefit is characterized by a number of properties of the "benefit" side and the corresponding properties of the "place" side. Then it remains to find places with such a set, which will be considered places of possible location of the production of benefits. Both external and internal FLP can be characterized by the force of action, as well as the possibility of artificial creation, cost and duration. The strength of the FLP action is obviously different for different combinations of the side "benefit" – side "place", and is determined by their influence on the indicator, which is taken as a criterion for choosing the place of production of the benefit. Here it is worth talking about three levels of influence – deci-

sive (as is the case, for example, immobile resources or immobile benefits), important (25–75% influence on the criterion for choosing a place), usual (up to 25% influence).

FLP is worth exploring over time (as it was in the past, it is now and may be in the future), which is reflected in the matrix of the Table. 3. For this, the term PPF-study (from English past-present-future)

Table 3
Matrix for the classification of BT of block "B" by the criterion of FLP.

Pairs of FLP		BT in the temporal dimension of the past, present, future (Pa, Pr, Fu)									
		1			2			.	N		
		Pa	*Pr*	*Fu*	*Pa*	*Pr*	*Fu*	.	*Pa*	*Pr*	*Fu*
1.1.G-1.1.P	1.1.1.-1.1.1							.			
	1.1.2.-1.1.2							.			
	.	.	.	.	.	.	.	.	.	.	.
	1.1.n.-1.1.n							.			
1.2.G-1.2.P	1.2.1.-1.2.1							.			
	1.2.2.-1.2.2							.			
	.	.	.	.	.	.	.	.	.	.	.
	1.2.n.-1.2.n							.			
1.3.G-1.3.P	1.3.1.-1.3.1							.			
	1.3.2.-1.3.2							.			
	.	.	.	.	.	.	.	.	.	.	.
	1.3.n.-1.3.n							.			
2.1.G-2.P	2.1.1.-2.1							.			
	2.1.2.-2.2							.			
	.	.	.	.	.	.	.	.	.	.	.
	2.1.n.-2.n							.			
2.2.G-2.P	2.2.1.-2.1							.			
	2.2.2.-2.2							.			
	.	.	.	.	.	.	.	.	.	.	.
	2.2.n.-2.n							.			
2.3.G-2.P	2.3.1.-2.1							.			
	2.3.2.-2.2							.			
	.	.	.	.	.	.	.	.	.	.	.
	2.3.n.-2.n							.			
2.4.G-2.P	2.4.1.-2.1							.			
	2.4.2.-2.2							.			
	.	.	.	.	.	.	.	.	.	.	.
	2.4.n.-2.n							.			
2.5.G-2.P	2.5.1.-2.1							.			
	2.5.2.-2.2							.			
	.	.	.	.	.	.	.	.	.	.	.
	2.5.n.-2.n							.			
2.6.G-2.P	2.6.1.-2.1							.			
	2.6.2.-2.2							.			
	.	.	.	.	.	.	.	.	.	.	.
	2.6.n.-2.n							.			
3.G-2.P	3.1.-3.1							.			
	3.2.-3.2							.			
	.	.	.	.	.	.	.	.	.	.	.
	3.n.-3.n							.			
4.G-4.P	4.1.-4.1							.			
	4.2.-4.2							.			
	.	.	.	.	.	.	.	.	.	.	.
	4.n.-4.n							.			

can be proposed. It is clear that FLP in the PPF-study will always relate to places and technologies for the production of specific benefits. Therefore, we can talk about PPF-study of places, PPF-study of technologies and, if necessary, PPF-study of industries (in the sense of manufacturers of identical products using various technologies within a specific spatial unit, for example, region or country).

Conclusions

Problem of the location of production of benefits requires an optimal solution, since the profitability of the functioning of enterprises depends not only on the level of perfection of their technologies, but also on the correct choice of the place for production. Deciding where to produce a benefit is just as important as deciding or investing in production of that benefit. Therefore, every step towards improving the location of production is important. Classification of BT by FLP based on the proposed matrices will improve the quality and speed up decision-making on the choice of optimal places for the production of benefits, since on the basis of what benefit and with the help of which technologies it is planned to produce from the matrix it will be easy to obtain information on the factors of location of the corresponding BT.

Further research in this area is promising in the direction of identifying FLP of various BT and filling out the developed matrix for classification with specific information. At the same time, in the matrix, each BT with its factors of location can have an author's name, similar to the benefits (for example, the benefits of Giffen or the benefits of Veblen), named after scientists who discovered their specificity, which is important in terms of optimizing production decisions or use.

Also, an important area of further research can be the development of a matrix of potential places for the production of benefits, which, on the basis of interaction with matrices for the classification of BT according to the FLP criterion, would make it possible to form a list of potential production places just as quickly and efficiently and could be used to improve the management of spatial organization of economy.

References

[1] Ahrens J., Hoen H., Ohr R., *Deepening integration in an enlarged EU: A club-theoretical perspective*, European Integration, 27, 4, 417–439, 2005.

[2] Barnes P., *Capitalism 3.0: A Guide to reclaiming the commons*, San-Francisco: Berrett-Koehler Publishers, 2006.

[3] Benkler Y., *The wealth of networks: How social production transforms markets and freedom*, New Haven and London: Yale University Press, 2006.

[4] Berry C.J., *The idea of luxury. A conceptual and historical investigation*, Cambridge: Cambridge University Press 1994.

[5] Buchanan J., *An economic theory of clubs*, Economica, 32, 125, 1–14, 1965.

[6] Buchanan J., *Public benefits in theory and practice: A note on the Minasian-Samuelson discussion*, Journal of Law and Economics, 10, 193–197, 1967.

[7] Buchanan J., *Public choice: Politics without romance*, Policy, 19, 3, 13–18, 2003.

[8] Chohan U., D'Souza A., *Club theory: A contemporary economic review*, SSRN, 2020, http://dx.doi.org/10.2139/ssrn.3512557.

[9] Cornes R., Sandler T., *The theory of externalities, public benefits, and club benefits*, Cambridge: Cambridge University Press, 1996.

[10] Fisher B., Turner R., Morling P., *Defining and classifying ecosystem services for decision making*, Ecol. Econ., 68, 643–653, 2009.

[11] Green J., Laffont J., *Characterization of satisfactory mechanisms of the revelation of preferences for public benefits*, Econometrica, 45, 2, 427–438, 1977.

[12] Groot S., Wilson M., Boumans R., *A typology for the classification, description and valuation of ecosystem functions, benefits and services*, Ecol. Econ., 41, 3, 393–408, 2002.

[13] Hardin G., *The tragedy of the commons*, Science, 162, 3859, 1243–1248, 1968.

[14] Heine K., Phan M., *Trading-up mass-market goods to luxury products*, Australasian Marketing Journal, 19, 2, 108–114, 2011.

[15] Holcombe R., *Theory of the theory of public benefits*, Review of Austrian Economics, 10, 1, 1–22, 1997.

[16] Hoppe H., *Fallacies of the Public Benefits Theory and the Production of Security*, The Journal of Libertarian Studies, IX, I, 27–46, 1989.

[17] Hoy M., Robson A., *Insurance as a giffen benefit*, Economics Letters, 8, 47–51, 1981.

[18] Hummel J., *National benefits versus public benefits: Defense, disarmament and free riders*, Review of Austrian Economics, 4, 88–122, 1990.

[19] Jensen R., Miller N., *Giffen behavior and subsistence consumption*, American Economic Review, 97, 4, 1553–1577, 2008.

[20] Kapferer J., *Managing luxury brands*, Journal of Brand Management, 4, 4, 251–260, 1997.

[21] La Notte A., D'Amato D., Mäkinen H., *Ecosystem services classification: A systems ecology perspective of the cascade framework*, Ecological Indicators, 74, 392–402, 2017.

[22] Laerhoven van F., Ostrom E., *Traditions and trends in the study of commons*, International Journal of Commons, 1, 1, 3–28, 2007.

[23] Ostrom E., *Governing the commons: The evolution of institutions for collective action*, Cambridge: Cambridge University Press, 1990.

[24] Roger S., *Robert Giffen and the Giffen Paradox*, NJ: Barnes & Noble Books, 1989.

[25] Samuelson P., *Contrast between welfare conditions for joint supply and for public benefits*, The Review of Economics and Statistics, 51, 1, 26–30, 1969.

[26] Stigler G., *Notes on the History of the Giffen Paradox*, Journal of Political Economy, 55, 2, 152–156, 1947.

[27] Tullock G., *Public benefits, redistribution and rent seeking*, Northampton, Massachusetts: Edward Elgar Publishing, Inc., 2005.

[28] Vigneron F., Johnson L., *Measuring perceptions of brand luxury*, The Journal of Brand Management, 11, 6, 484–506, 2004.

[29] Wallace K., *Classification of ecosystem services: problems and solutions*, Biological Conservation, 139, 3–4, 235–246, 2007.