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THE IMPORTANCE OF INFORMATION IN SUSTAINABLE MANAGEMENT OF NATURAL RESOURCES (NATURAL CAPITAL) AT THE LOCAL LEVEL (IN THE LIGHT OF EMPIRICAL RESEARCH)

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ABSTRACT: The author has discussed the importance of information in sustainable development. She has presented sets of information indispensable for local strategies of sustainable development. She has also presented a procedure of using such information. Additionally, she has identified and explained issues regarding the use of information for managing natural resources in a sustainable manner. The author has also presented results of empirical research concerning the information practice of managing local natural resources.

KEY WORDS: sustainable development, sustainable management of natural resources, information, municipality, local development strategy

Introduction

The contemporary literature does not call into question the importance of information in the processes involved in pursuing balanced and sustainable development. Ordered sets of information, understood as knowledge, are the basis for the preparation of each strategy of balanced and sustainable development at any level of management and functioning of the society. They are also indispensable in the accomplishing, monitoring and improving such strategies¹.

The objective of this study is to verify the hypothesis expressed in the form of the following question: Are there appropriate sets of information in the municipalities under research based on which it is possible to pursue balanced and sustainable management of the local natural resources? A hypothesis thus formulated necessitates defining two essential issues. The first of them is the notion of balanced and sustainable management of natural resources. The other one is linked to identifying the sets of information that are necessary for such management.

For the purpose of verifying the research hypothesis as well as accomplishing the other tasks, the author had conducted a number of studies and empirical analyses. The empirical research was conducted for the regions of Dolny Śląsk (Lower Silesia), Ziemia Lubuska, Wielkopolska and Opole, and comprised 110 municipalities for which it was possible to obtain appropriate data focussed on managing the local natural resources. This is approximately 20% of the total number of municipalities of these regions (548 municipalities). In the empirical research, several facts were verified concerning: (1) availability of a local development strategy in the municipalities, (2) inventory of natural resources, (3) municipal information policy, (4) participation of municipal offices in the development of the local economy, (5) surveys of social expectations, and (6) active creation of local sets of information. These are manifestations of the processes involved in managing sets of information at the level of municipality and local community.

The notion of balanced and sustainable management of natural resources (natural capital)

Sustainable Development causes a lot of controversy and contentions, beginning with translation of the notion itself, through ways of understanding the essence of such an approach to management and ending with imple-

¹ This distinction can be found in the literature: (1) base and inventory information, (2) implementation information, (3) identification information, (4) improvement information, and (5) information as final knowledge (Czaja, 2007).

mentation challenges. From the theoretical perspective, of particular importance are discussions around the notion of development – balanced, sustainable, self-sustaining or integrated – as well as natural capital. Other issues willingly discussed include interrelations between different forms of economic capitals, understood as the problem of the principles of sustainable natural capital – the weak, sensitive, strong and restrictive ones². There is less interest in principles of managing natural capital and its constituents – non-renewable resources, renewable resources and services, or in a wider context, in principles of managing economic resources (dynamically speaking, capitals). Let us thus concentrate on those more seldom discussed issues. As a matter of fact, they contain some very interesting hints for the processes of managing local natural resources as well as clues for identifying information needs in this respect.

Sustainable utilisation of natural capital must be based on definite principles with varying degrees of generality. Thus, the following principles can be distinguished as one of the concepts (Czaja, Becla, 2007):

- the principle of maintaining a balance between resources and uses;
- the principle of not depleting natural resources, particularly the core natural capital;
- the principle of maintaining diversity of the components of natural capital;
- the principle of substituting natural capital with other forms of capital;
- the principle of minimising entropy sources;
- the principle of rational utilisation of natural capital resources (application of the criterion of maximising utility gained from natural capital);
- the principle of effective utilisation of elements of natural capital (surplus of benefits over costs).

The first of them is essential for the information basis of any form of the processes of managing (opening balance) and is at the same time the appropriate response to the need for monitoring rare and also limited economic resources (capitals).

The second of the above listed principles is a specific carry-over of the issue of sustainability of natural capital and at the same time a security criterion for the survival of the mankind.

The third of the principles determines the present and future potentials for the development of the human civilisation, inherent in the interactions

² The first one denotes preserving the volume of total capital (natural, anthropogenic and social) without taking account of its structure. The sensitive principle calls for preserving the whole of the capital and the appropriate structure thereof. The strong principle draws attention to the necessity of preserving each resource in the capital separately while the restrictive principle forbids causing depletion of any of the resources.

between man and the natural environment, which K. Marx referred to as the law of progressive development of productive forces.

The fourth principle, like the second one, touches upon the issue of substitution (replacement) and complementarity (reciprocity) of various forms of capitals. At the same time, it expresses the essence of the management processes as described in production function models, which consists in the necessity of combining different forms of economic resources (capitals) in order to produce goods and services satisfying human – individual and collective – needs. It also enables touching upon the issues of the availability (scarcity) and controllability of the individual forms of economic capital.

The fifth principle expresses the inevitability associated with operating in the real world of the law of entropy. Since degradation of its elements is unavoidable, then such actions should be taken that do not exceedingly aggravate this situation. This principle has some particularly interesting implications, in the aspect of information and decision-making, for the local management of natural resources that are particularly limited in volume or productive capabilities.

The last two principles enable moving directly to the issues of managing economic resources *sensu lato*. The sixth one refers to the problem of rational utilisation of natural capital resources and emphasises the criterion of maximising utility gained from such exploitation. And the seventh one indicates the trend of the (desirable) choices made, determined by the imperative of gaining surplus of benefits over costs. These last two calculation and information elements are broadly understood unlike in the traditional economic account, but rather like in the cost and benefit analysis.

The rational approach to managing is the starting point for taking up some important problems, such as (1) the issue of scarcity of economic resources; (2) the issue of their finiteness (limitation), and (3) management as a decision-making process accomplished under conditions of the unlimited character of human needs and the scarcity of resources. Here, rationality assumes the form of the well-known two-variant principle of rational management treated as a criterion of choice. Because these choices take place in definite conditions, they assume the form of searching for optimal solutions. But this generates additional challenges relating to the relations: goals-effects and goals-efforts. They can be referred to as the need for taking account of the following principles: (1) expediency, (2) praxeological effectiveness, and also: (3) aptness of the choice of means of implementation, as well as (4) viability of the selection of goals.

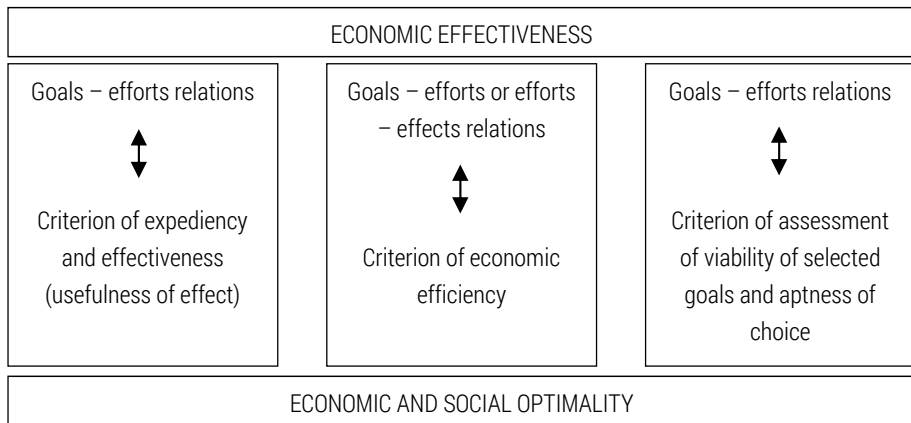


Figure 1. Criteria for assessment of effectiveness and optimality of management

Source: author's own work.

These principles are applicable in relation to each economic endeavour in which any forms of economic resources (capitals) are used. Therefore, they are also the basis for managing natural resources in the local scale³. In other words, there is no possibility of balanced and sustainable management of natural capital (natural resources) without adherence to all of the above principles.

Identification of sets of information indispensable for balanced and sustainable management of local natural resources and characteristics thereof

The second essential challenge is identification of indispensable sets of information as well as specification of the features that the information contained in them should be characterised by. Information-related basis for implementing balanced and sustainable management of natural resources is beyond dispute. There is virtually no possibility to achieve and pursue the path of such development in the local scale without appropriate sets of information and the ability to taking advantage of it (appropriate knowledge or even wisdom).

The empirical research conducted by the author made it possible to recognise and distinguish several sets of information that is extremely useful for

³ There is not enough space here to discuss these principles in detail. Please refer to relevant literature (Becla, 2012).

carrying out sustainable management of local natural resource (local natural capital). This is, most importantly:

- information originating from the natural inventory of the geographic and biological environment of the specific municipality, being a detailed characteristic of the components and elements of the local natural environment;
- statistical and empirical data on the local economy, with regard to their spatial and temporal distribution, allowing to understand the character of the managing processes being carried out, the level of their advancement, intensity and modernity as well as the temporal prospectiveness in the dynamic, globalising economy;
- information originating from various sources on the social expectations (needs), being an expression of the quality of the relationship (communications between the local community and the municipality, correctness of the municipal information policy, and also the level of civic participation and modernity of the democratic procedures);
- information on local economic resources (in the typical breakdown into five elements distinguishing human, physical/financial/structural, natural, information and cultural resources) and on the surroundings of the municipality, enabling to define the development potential of the local community and the municipality in the form of an inventory, and also to identify the barriers (inhibitors) and determinants (stimulants) of the future development, and define the viability of making it sustainable;
- documentation of the cultural heritage (of material and non-material character) of the municipality and the local community, which is becoming an increasingly featured cultural resource, a source of social capital increasing the effectiveness of the management processes and of building relationships within and between generations;
- a strategy of local development and accompanying documents containing a socially accepted vision of the future development of the municipality and the local community, being an indication for the authorities with regard to the expectations and desirable actions (or, more broadly, ventures).

Each local community and its administrative representatives (self-government authorities) seeking ways of implementing such management processes that would be characterised by structural sustainability (desirable relations between the orders) and by sustainability regarding time and resources must gather, order and update such sets, and utilise them appropriately. Their existence (possession or accessibility) is both the precondition and the baseline condition.

Empirical research⁴ conducted for 110 municipalities provided answers to some questions, such as:

- does the municipality have a strategy of local development?; the character and quality of the strategic documents were not evaluated in this question;
- has natural inventory been accomplished in the territory of the municipality?; only the fact itself was verified and not the quality and scope of the studied carried out;
- does the municipality pursue a local information policy?; additionally with this question, the objectives, scope and instruments (techniques) of the municipal information policy were checked;
- does the municipality pursue an active economic policy in the form of an own activity and/or supporting small and medium-sized enterprises as well as attracting investors from outside the area of the municipality?;
- are there any systematic surveys conducted in the municipality concerning social expectations and the inhabitants' needs?; additionally with this question, the ways used to recognise these issues were checked;
- and, are there any appropriate sets of information being actively created in the municipality, especially in the scope of natural resources in the municipality, the local economy and forms of economic activity, cultural heritage – material and non-material – or local economic resources?; no reference was made in the question to the entities responsible for the work being conducted, the scope of this work or the quality of the sets of information collected.

In the case of the first problem, the answer is unambiguous. All of the municipalities in the research had local strategies of development. In many cases, however, they did not have the form of a strategy of sustainable development.

In the case of natural inventory, the affirmative answer only concerns 30% of municipalities. There are several reasons that affect the situation, namely: (1) absence of a statutory obligation for municipal offices to carry out a natural inventory; (2) dispersion of competences concerning the ownership and management of the individual components of the natural environment; (3) the need for having appropriate knowledge and qualifications in order to carry out a natural inventory; (4) relative high costs of carrying out a natural inventory, especially with regard to geological tasks and registers of renewable resources; and also (5) the need for updating the data.

⁴ In order to increase reliability of results, the research employed an approach based on the *desk research* method, field verification, statistical and inductive processing of empirical data, interviews and deductive evaluation of information.

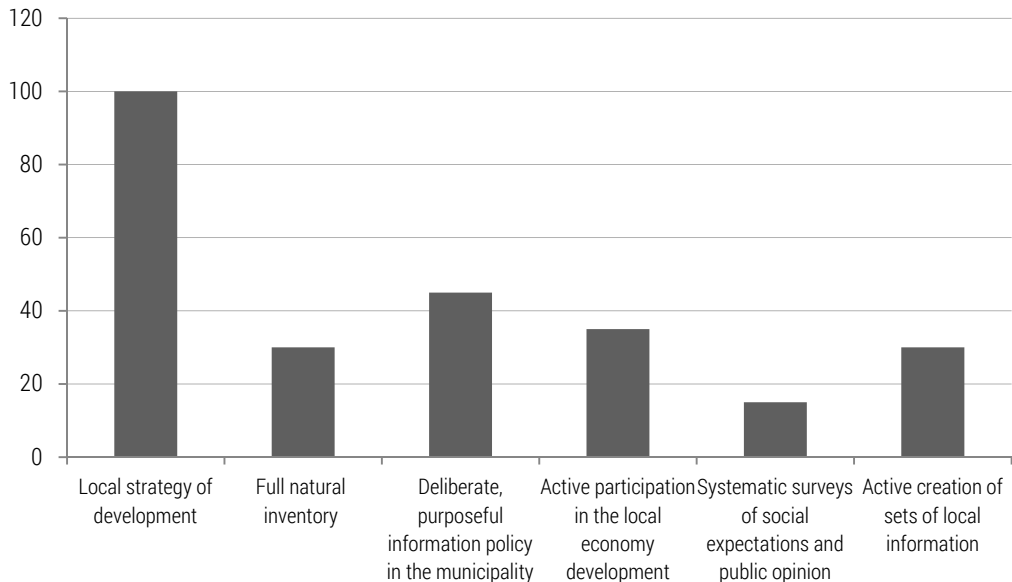


Figure 2. Answers to questions concerning selected aspects of managing local natural resources in the municipalities covered by the research [% of affirmative answers]

Source: author's own work based on the results of the research.

Among the municipalities in the research, 45% of entities pursue a defined information policy which does not only involve passing information from the authorities to the inhabitants but also acquiring information from individuals or social groups. These municipalities also endeavour to influence the information recipients' behaviours, which is an essential element of active social communication. In these municipalities, a better and better utilisation of the modern methods and tools of communications can be observed, especially concerning websites but also other carriers, appropriately prepared in terms of quality (leaflets, posters, local newspapers and bulletins, and even radio or television). In the remaining 55% of the municipalities covered in the research inconsistent information actions are performed instead of social communication. Municipal offices pass information using the available means and channels without undertaking any actions to make sure that it reaches the recipient. The assumption is that it is in the interest of the recipient, not the sender, to receive information. This is completely at variance with the principles of modern social communication as well as costly and ill-considered with regard to effectiveness. In such circumstances it is not possible to pursue sustainable management of natural resources or other forms of local economic resources.

Municipalities have great potentials for active participation in the economic life and influencing the development of the local economy. Not all municipalities take advantage of this; they frequently limit their range of activity to tasks that are required by the law and/or the easiest to accomplish. In the group of municipalities covered by the research approx. 35% extend their activity to other facultative options of supporting the local economy. These municipalities create better opportunities for future development, also for sustainable development founded primarily on their own available economic resources. The other ones, by minimising their activity, generate risks of decline of the development potential and of becoming dependent on external resources (domestic or from the EU).

The most difficult situation in the municipalities in the study concerns the problem of recognising social expectations, the inhabitants' needs or their opinions. Polish democracy has not worked out any effective mechanisms of subjecting authorities to ongoing control, and not just the control exercised at elections. The problem does not only concern people in power but also the voters, who never demand such control but content themselves with election 'promises'. Lack of insight in social expectations and needs is a frequent reason of alienation of the local authorities and lack of acceptance or even interest in their activities. Social resistance and conflicts first occur after a certain critical social border has been crossed. Each strategy of balanced and sustainable development is based on a broad social foundation, and thus the inhabitants' expectations and needs are an element thereof. The research confirms the existing information and communication shortages. Merely 15% of the municipalities in the study conduct ongoing analyses of social expectations, gather information on the inhabitants' needs and take into consideration the opinions that are submitted.

The last issue investigated was the activity of the municipalities in creating local sets of information. Approximately 30% of the municipalities concerned exhibit desirable activity in this area, and thus seek information, gather it and process, and then use it in their decision-making processes. Nearly 60% of municipalities are characterised by a passive approach. The information flowing in is gathered but not ordered or processed. It is sometimes used in decision-making processes even though it is more common to seek information directly in the course of making decisions. Opportunities for pursuing sustainable management of local resources are directly linked to the change of approach from passive to active. Such strategies cannot be accomplished without appropriate sets of information.

Conclusion

In summary, the empirical research and the theoretical analyses conducted lead to some conclusions. Firstly, a lot of information-related deficiencies can be observed in the field of managing natural resources at the local level. Secondly, sustainable management of natural resources requires access to appropriate information, which has to be created, updated and skilfully utilised. Thirdly, some procedures for utilising information should be worked out and implemented at the municipal level. The general principles of such procedures are known. They only need to be adapted to the local conditions. Fourthly, it is essential to avoid any serious threats associated with utilising information at the local level. Fifthly, municipalities should substantially improve the situation regarding collecting and utilising sets of information as well as the local information policy because the empirical research confirmed many deficiencies and shortcomings. Sixthly, it can be asserted that the objective of the study has been achieved. On the other hand, the research hypothesis has been disproved – sets of information concerning sustainable management of natural resources are not correctly used in the municipalities covered by the research.

Literature

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