

SCENARIOS AND MORE COMPREHENSIVE FUTURE DEVELOPMENT STUDIES IN THE REGIONAL AND LOCAL PLANNING

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1. WHY SCENARIOS AND STUDIES ON FUTURE ARE IMPORTANT?

The demand for knowledge about the future is growing. This is because present generation tends to become more interested about the next generations. We want to save them from the consequences of our mistakes; more and more negative actions taken nowadays as well as the actions that are to be taken in the future. But the world is more and more complicated - **factors, upon which the development is dependent, are highly variable** and the future remains uncertain. In the spite of the progress in science, the future not only doesn't become clearer, but its uncertainty tends to develop to a higher level. It is so, because more and more regions and local territories become "open to the world", the world entangled and more complicated than before due to the developing freedom of action for various actors (not necessarily from the political scene.) .

The upcoming future should be identified and recognized on an objective basis. To accomplish that, certain prognostic methods can be applied. One of the most useful methods, especially in the case when the social and institutional behaviors play a certain, more or less crucial role, is a **scenario method**¹. Scenarios could help to reduce the uncertainty, make the future more clear, or even build a structure based on an uncertain image of the future.

Planning is generally based on the preparation of decisions and the future **actions**. Therefore, in the regional and local (e.g. district or commune) planning the **future** conditions should be considered. Also, the plan should not only account for the current, but the upcoming problems as well. Furthermore, we may say that **visualizing the future** is essential to the planning process. The importance of these predictions is proportional and becomes larger with the bigger uncertainties, the diversity of the futuristic variants, the scale and persistence of possible changes, the value of resources involved (decisive about the eventual losses in the case if improper decisions were made.) Especially significant is the **identification of the upcoming future in the strategic planning** - long term, active and flexible, relatively to the changing environment

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2. DEVELOPMENT SCENARIO – WHAT IT IS ?.

SCENARIO is an ordered and concise description of a possible or desirably predicted future of an investigated object, constructed with a logical sequence of events and processes.

Sometimes scenarios are understood as descriptions of the future conditioning of investigated objects (images, visions, situations.) In my opinion however, *the descriptions of the state (situations) could be considered as an element (“a single scene”) of a scenario only if logical descriptions of events and processes were used to determine the reality of a particular occurrence. Even if it’s done in one’s mind only.* Such scenarios could be called as “hidden” or “default.” Another suggestion is to consider concise assumptions for a description of condition (image, vision.) Such descriptions could be regarded at the most as “quasi scenarios.”

The scenario is classified as one of the methods of forecasting.

FORECAST - a judgement of a state of variables (or a single variable) relating to a studied object, referring to a certain past, formulated with support of scientific knowledge, empirically verified, uncertain, but formally accepted.

A vast majority of the forecasting methods deducts about the future with use of available data from the past. Such dependence not necessarily takes place in the case of forecasting with use of heuristic methods. Such methods are applicable in the scenario methods (and others.)

The features of forecasts determined with scenario method are:

- ◆ Complexity of certain objects belonging to scenarios and a large number of variables describing them,
- ◆ Taking into account the influence that the surrounding of the object has on its “internal” variables,
- ◆ Large number of details taken into the account,
- ◆ Many variants present, alternative vision of the future,
- ◆ Plentiful set of diagnostic and forecasting methods used,
- ◆ Qualitative, mainly expressed in words only, description of an object in a chosen period of time.

Many **types of scenarios** can be distinguished, depending on given criteria. The types essential to the subject of this work are described below.

C. Ducot and G. Lubben distinguish two pairs of scenario types, according to two criteria, which together yield in combinations, just like shown in Table 1.

SCENARIO	Explorative	Anticipative
Descriptive	<i>For the given causes – what next results (effects) could be?</i>	<i>For the given results (effects) – what could be their causes?</i>
Normative	<i>For the given measures – which specific goals could be achieved?</i>	<i>To achieve given goals – what kind of measures could be taken?</i>

Table 1. The basic types of scenarios.

Descriptive scenarios describe objectively and impartially. Described are arrangements of possible events, independently from the receiver's preferences.

Normative scenarios are formulated with a respect to preferred values. Therefore, these scenarios are sequences of events or desired images, but also they could be "terrible, still likely to occur."^[17] In such reasoning, the normative scenarios are marginal scenarios: the most and the least desired (*of threats and opportunities*) which will be discussed later on. Sometimes the normative scenarios are meant entirely by scenarios of the *desired future*. However, we consider them as a sub-type of the normative scenarios.

According to their structure, explorative (searching, discovering) and anticipative scenarios can be distinguished.

Explorative scenarios help to find out what can be the logical sequence of events leading from *the initial situation* into the future.

Anticipative scenarios result from future images of an object. They "discover" the probable sequences of events that describe the evolution leading to such an image, linking the present and the future together. The anticipative scenarios *describe the probable causes of the given hypothetical effects*. They are created by a way of writing "backwards."

Both kinds of scenarios can be constructed assuming an intervention of a controlling unit into the course of events or assuming a lack of any essential intervention. (Lack of unit's intervention should be understood as a lack of strategic operations, specific, regulating developmental tendencies, however, with a simultaneous presence of standard operations, mainly regulational. Assuming the lack of any operations would be cognitively not justified as unreal.)

In practice often descriptively explorative and normatively anticipative scenarios are used.

Basing on the degree of probability or scale of preference scenarios can be divided upon **intermediate and preferable**. Within this second group we may further distinguish **marginal** scenarios (contrast, bordering.) The intermediate scenario among the descriptive one is the *most probable* scenario. Among

normative scenarios the intermediate one is the *most desired* scenario. The remaining scenarios in both groups are peripheral scenarios.

The contrast scenarios are often: the *pessimistic and optimistic*, of **threats and opportunities**. They may be defining the range of development of an area.

It could happen that a marginal scenario is elaborated as a descriptively explorative one. We shall be able to distinguish between that one and a normative scenario and not to mislead them.

Sometimes a descriptive scenario can be built as a descriptive one while an opportunistic as an anticipative scenario. Such scenarios were elaborated, for example, for a local territory of Wicko-Łeba.

It happens that an alternative comes to our minds when we come to elaboration of scenarios and choice of their types. This can be an idea of elaboration of extreme scenarios (marginal) that define the range of possible solutions; or indirect scenarios in a form of, for example, several variants of affirmative scenarios, based on distinctly differentiated assumptions. These two scenario groups may also be treated as complementary. In such case, it is recommended to elaborate them gradually, in two steps: first the extreme, then the indirect ones. The authors think that elaborating both scenarios is a proper solution.

3. THE ROLE OF SCENARIOS IN TERRITORIAL PLANNING.

Starting with the roles that are the most general and significant ones, and at the same time making for a certain minimum, which can be fulfilled by the scenarios considering the future of a commune, district or a province, these roles can be defined as follows:

- ◆ To make the participant of the planning process (members of local governments, members of a planning team, consulting community, judgmental institutions) aware that the future is uncertain and can take different turns,
- ◆ To recognize and to make the participants of the planning process aware of what the future might be like - definition of a scope of the most likely future, recognition of “uncertainty structure” which for instance is an attempt to answer the following questions:
 - ✓ Which changes are more likely and which are less likely to occur?
 - ✓ Which events repeat themselves (as very or quite likely) in all or majority of scenarios?
 - ✓ Which elements and uncertain events are of a special significance for a territory development? What is their influence? Which of the uncertainties are based only on the time of events occurrence or a scale of event intensity, and which are qualitative in their nature including the character of alternatives. To which period of time the alternative refers? Will the solution occur independently of the action of the commune’ authority (if there can be expected any symptoms that would forecast the

solution, and of what importance is to get prepared for each possible variant) or is authority's decision required? Until what time or in what circumstances (what other events) the decision is ought to be made?

- ◆ To assess the probability of particular future variants. However, it should be taken into account, that sometimes it is more essential to eliminate variants of little likelihood from further consideration (or even these that are impossible to happen, especially in terms of the development process logistic), than pointing out the most likely ones. The distribution of probability approximation of particular future variants is of a greater significance than actual numbers.

At the end of this description of the scenarios general roles, it should be reported that “the most valuable advantage of the method of scenarios, is not only the description of a possible systems evolution, but mainly a better understanding of the system itself while decision making”

4. THE ROLE AND ADVANTAGES OF SCENARIOS VARIOUS KINDS

The affirmative scenarios and especially the marginal of maximal opportunities ones, give an opportunity to:

- ◆ prepare the instruments that would let take an advantage of oncoming opportunities
- ◆ plan the enterprise and make strategic decisions, also about the expenditures, with an awareness of possible effects and probability to obtain them,

The opportunities scenarios also inform about a possible level of financial means, which will be assigned for development (this would include costly investments, especially infrastructural ones). This would have an impact on opportunities scale and their rate.

In spatial planning, the scenarios of maximal opportunities inform about the future possible, maximal demand for the space - its scale as well as types and possibly the distribution in time of the demand rise. It is important when we consider spatial policy design (planning and defining) and others and also while making strategic decisions within strategic scenarios frames. That would make it possible to prepare the space for changes. The scenarios of opportunities also let us not to lose these opportunities, e.g. through the loss of the space intended for utilization.

The affirmative, non-marginal scenarios of “moderate opportunities” are more likely than the marginal ones, and due to this fact they are more realistic.

The affirmative scenarios that include **innovations** (new models and methods for fulfillment of requirements, leading of activities, functioning and spatial development) as scenarios of conditions or trends in spatial development, in terms of their type and stage may find their application for:

- verification of the acceptance stage for new solutions and conditions of their implementation,
- mobilization of subjects to co-operation with the territory authority via presentation of new solutions advantages,
- promotion of the territory.

Among the intermediate scenarios, the attention should be drawn to the scenarios that are qualitatively differentiated. This differentiation might result from:

- ◆ the impact of the outer process, e.g. various outer models,
- ◆ further decisions made by authority that concern realization of the infrastructure and establishment of protected areas, changes in law,
- ◆ variants of territory evolution that are differentiated in terms of quality and are depended on the hierarchy of values and local community needs, as well as the methods of their realization,
- ◆ the future choice of development options made by the authority in case of presence of various variants and a situation in which such choice has not been made so far,

Amongst other things, the main task of the negative scenarios (of threats) is to warn. They give a possibility to make advance preparations for difficult conditions and counteractions against potential threats. They also result in certain instructions that concern commune spatial and investment policy to:

- avoid these trends in spatial development that would require high threshold expenditures for a development of the “little steps” type (and the enterprises **performed** in stages),
- perform the enterprises in stages in such a way that, despite deficiency of possibilities for further continuations, there are some effects obtained,
- avoid these solutions that would threaten with tension and faulty structures,
- foresee the results of faulty structures and occurrence of spatial pathology in order to fight them at the earliest stage,
- focus all means on the possible smallest number of investment enterprises and maximally shorten the cycles

5. THE PLACE AND TYPE OF SCENARIOS IN THE PLANNING PROCESS.

The scenarios might find their application at different stages of the planning process, according to various roles they play in this process. The specification of scenario types that are recommended for implementation at particular stages of the planning process and also other elements of strategic management of the space are presented in the Table 2.

Generalizing the table contents, it can be stated that: To recognize the future, outer conditions and possible evolutionary paths of the planned territory, the adequate type of scenarios are the explorative, descriptive scenarios (i.e. “exploring and describing” the future, its possible variants. However, they do

not try to define what the situation might be like and moreover, what kind of future is desired). The scenarios should outline in objective manner the whole scope of possible future and present the probable future that cannot be chosen, but for which one can (even should!) be prepared. In particular cases, there is a possibility of application of anticipative, descriptive scenarios, to find out if the functioning hypotheses that concern the future are likely and, if they are, in which situations.

At the stage of the strategy formulation, there can be applied all of the mentioned scenarios types. Here, the possible evolutionary paths of the planned territory might be formulated as the descriptive, anticipative or also normative, explorative scenarios that are composed of explorative, descriptive scenarios. Such scenarios will be general, in which despite the evolutionary paths, the major significance will be placed at the result variables.

The stage of the result variables as well as their process, are of great importance for these scenarios that are useful at the stage at which there would be performed verification of opportunities of a desired results achievement, especially of these that were designed without the scenarios. Here, the major type of the scenarios will be the normative scenario.

6. THE GENERAL IDEA AND PROCEDURE OF BUILDING SCENARIO.

The scenario method is a multi-step generalizing procedure making management of systematic studies about the future (of a commune) possible. It does so mainly by constructing credible and concise images of the future states and situations as well as sequences of events leading to such states.

The scenario method makes up a specific combination of various methods applied individually each time a single forecast is to be prepared. However, there are some common principles that are shared between different methods. Experience supported by a detailed analysis of obtained results during experiments with the method is one of the factors deciding upon the choice of the proper method and establishment of rules.

Generally there are two **alternative approaches** which are sets of such rules and methods. One of them comprises “writing a scenario” by experts in the creation process and working with the essence of scenario’s contents, in a word-formulated form. According to H. Kahn, a creator of the “scenario writing” method, the sense of the method is to form a certain **rational model** of (imagined) future. Next, basing on such model, one should proceed with an **intuitional simulation** of the possible events. The aim of such simulation is to settle how the system’s development may proceed, step-by-step. Describing the events that are likely to occur and, next, identifying the logical and concise succession of these events can do this. It is important to create and chose such events that can be followed by other events creating alternative sequences. Creative, even discovering way of thinking, use of intuition and support of the process by various techniques of work organization and psychology, are the general characteristic

of any **heuristic method**. The described method of creating a scenario can be, for sure, classified as a heuristic.

The second approach is more **systematic**. It attempts to make use of **formal models**. It is based on a selection of a set of variables characterizing a dynamics of the investigated system, identification of a set of events (that is substantial changes of states of variables), pairing them in logical sequences and, next, defining their level of probability (usually by the experts, which makes it subjective.) The next steps are to estimate or calculate the probability of overall occurrence of the pairs of events or their whole sequences. For this purpose, various formal models are being applied. The most popular formal model is the model of “the matrix of cross-interaction.” Very important for this approach is a support of the analysis of the events occurred in the past, or at least the analysis of the present state. This approach is classified to the class of **algorithmic, formal methods**.

M. Godet, in his works, attempted to **integrate** both approaches. The method being developed in the studies discussed here also belongs to this integrative trend.

The main idea of the proposed method of building scenarios is:

- ◆ Starting with structurization of the evolving presence with use of variables and the relations between them, which allow to define the present states, as well as their future changes. To accomplish this, a structural analysis is applied,
- ◆ Making use of **the same set of variables** and relations between them for different scenario variants,
- ◆ Creation of scenarios as **variant hypotheses** to the **states of variables**, through reasoning operating with logical relations between variables and making them more detailed and improved through their multi-level, **gradual** operations.
- ◆ Making the prognostic conceptions as **objective and systematic** as possible. Simultaneously, however, **to formulate hypotheses, intuition and heuristic methods** are used. This is due to a high inaccuracy which characterizes an evolution of complex social systems,
- ◆ Including into the process of forming a scenario a **unit (subject) factor** (directly, or, in some cases, indirectly),
- ◆ Depending on a role of a scenario in a system (in our case it is a process of defining conditions (dependencies) and directions in spatial development), an individualized choice of its type, kind and character and constructing of each type of scenario using a separate method.

A methodic concept assumes application of various kinds and types of scenarios having different detailed methods of constructing. Apart from the type and kind of a scenario, the following factors depend upon their choice:

- ◆ Specification of an object (a given local spatial system), or more general: its situation,
- ◆ Various assets (financial, time, staff) utilized for elaboration of scenarios.

The **general characteristics of the method and common for all types of scenarios elements** are presented below

In the proposed method, **the first phase** of the procedure is a structural and subject analysis of a given local spatial system. Such analyses, followed by construction of a scenario (and, in general

case performed independently on works on scenarios), can be used in constructing of different types of scenarios (descriptive, normative, explorative, anticipative.)

Structural analysis comprises **choice of variables** and defining the **relations** between them. It allows understanding **mechanisms of changes** properly. The variables are these features describing the elements of a territorial system and its surrounding, which can take different forms (states) and those that are significant to the development of the system. Significant states of variables or their changes are described as events.

The next procedures in the structural analysis are:

- ◆ Systematization of variables (recognition of independent, intermediary and outcome variables) and identification of the key variables ,
- ◆ Transformation of the set of variables in order to fit in their character (e.g. measurability) into the demands for detailed methods of scenario construction.

Analysis of actors consists of:

- **Identification of the main subjects** (local and external actors) influencing developmental process of a commune,
- Determination of subjects' strengths and hypotheses of their behaviors (strategies) in an existing and predictable model – by variants: through expert's opinions or simulation with the presence of the subjects,
- Determination of the regulating rules (mechanisms of the play) between subjects, especially in defined, distinguished problematic situations, e.g. in conflict and co-operational situations.

For both analyses described above particularly useful is, gathered previously, general knowledge on local territorial systems, especially postulated for successive creation in a scientific workshop – as an expert system – informational Knowledge Base.

The structural and scientific analyses should be strictly interconnected with a diagnosis of a commune and its surrounding, within which mainly the present and the past states of variables are identified – hitherto prevailing manners of subjects' acting.

The **next phase** of scenario building is making the **assumptions**. Some of the assumptions are general, describing the character of scenarios. The substance of the remaining assumptions, however, differs and depends on a type of scenarios. For example, in explorative scenarios there will be:

- ✓ Hypotheses according to the variable, independent states,
- ✓ Assumptions connected to some dependent variables having a “broad range of variability” in so – called situations of uncertainty, which could be:
 - States of concrete, singular variables (rare, but very significant),
 - The rules in description of future states of variables.

On the contrary, assumptions in normative scenarios concern sets of goals and criteria that constitute an image of system's (commune) future and lines of events development.

The phase of **scenarios' construction** is strictly individualized. However, its common feature is that they are **multi-level**. This is taken advantage of not only because it is complex and time consuming.

The main reason is the difficulty in perception of too many and, since the beginning, too complex scenarios by the representatives of the local subjects, including the authorities. This statement is valid also for limitations connected to the future, practical application of the scenarios for management of commune's development. Furthermore, the proposed conception comprises:

- ◆ **A construction of scenarios for surroundings,**
- ◆ **Construction** of so – called **main lines** of scenario – sequences of events recorded in a general, synthetic manner, using a small number of key – variables (the most significant ones), often strongly aggregated, synthetic,
- ◆ **Opinion and verification of the main lines** basing on different criteria, e.g. for a draft of a specification or a full range of a possible development, high probability of event, etc. (this step should be followed by analysis),
- ◆ **Choice and evolvement of full scenarios** starting from a few major lines that are the most characteristic with regards to the range of problems and possible actions.

The **final phase** of the proposed method is the **analysis, comparative opinion and scenario verification** – in order to define:

- Ranges of conditions and processes of the development of the most probable ones,
- Future structures (common or alternative elements of scenarios, points of “ramifications”),
- Degree of reaching the goals through variants of developmental routes, which also means the degree of their profitability and scenario normativity.

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