



**MASARYK UNIVERSITY  
FACULTY OF ECONOMICS AND ADMINISTRATION**

# **Environmental protection expenditure: Ex–post evaluation**

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Working paper WP KVE 08/2013

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### **Abstract**

The paper presents the methodology for monitoring and evaluating the efficiency of current environmental protection expenditures of municipalities developed within the project of Ministry of Environment of the Czech Republic. The methodology has been approved as the voluntary environmental tool for municipal officials. A proposal of methodological procedure for evaluating municipal environmental protection expenditure is based on multi-criteria weighed assessment. It gives municipalities the instrument for assessment of expenditure efficiency and includes all three pillars of sustainable development – economical, ecological and environmental. In the paper are investigate outputs which results from the evaluation of environmental protection expenditures in the city of Brno that is the second largest city in the Czech Republic and represents the territory where live approximately 380 000 citizens. The results show real state of expenditure efficiency in the city Brno and point out the possibility of improving the current situation. The methodology is assessing tool based on available data usable for other states and their municipalities for evaluation of effectiveness of public spending at the local level.

### **Key words:**

methodology; efficiency; municipality; environmental protection expenditure.

**JEL classification :** D61, H59, H76

## CONTENT

1. Introduction	.....	5
2. Methodology	.....	7
2.1 Procedure for assessing the efficiency	.....	9
3. Case study	.....	16
4. Conclusion	.....	20
5. Bibliography	.....	21

## 1. Introduction

Defining and measuring the efficiency, or in other words a process of using resources and their transformation into outputs and outcomes, seems to be one of the biggest issues of contemporary economic theory. Already in 1957 Farrell asked the question how to measure efficiency and pointed out its importance for economic policy makers: „it is important to know how far a given industry can be expected to increase its output by simply increasing its efficiency, without absorbing further resources”(Farrell, 1957). Throughout several decades’ efficiency evaluation and its technology are greatly improved and advanced. However it still remains conceptual challenge in relation to public expenditures. This issue is also complicated by the fact that outcomes of public sector are often off-market, lacking relevant data and thus making it cannot be quantified, as stated by collective of authors at the European Commission (Mandl et al., 2008).

Efficiency of public expenditure on environmental protection at the local level needs to be seen from several points of view. The first point is the perception in terms of both theoretical and practical. Theoretical part includes some particular levels. The first level is to deal with understanding and discussion on the effectiveness as general term, i.e. how the concept of efficiency could be understand, what to include in this concept and which factors can influence the effectiveness and to what extent, including the concept of efficiency in relation to the environment (as the impacts of human activities affects environment, and how to effectively protect the environment). The concept of efficiency in general term and then in relation to the ecological efficiency is discussed by various authors (e.g. Wätzold, 2000; Hannon, 2001; Jollands, 2006). Jollands (2006) deals mainly with efficiency generally in relation to ecological economics, refers to the history of the concept of efficiency, including the problem of perception, both generally and especially in relation to the environment, stresses the relationship of efficiency and managerial decision-making and planning. Hannon points out factor in the valuation of the environment and its relationship to effectiveness. Wätzold (2000) is emphasized on the influence of environmental uncertainty concerning to the efficiency.

The second level from the perspective of theoretical perception includes the concept of public spending as a whole. Similarly taken what can the public expenditure understand (what is the role of the public sector), the factors that affect them, and also to what extent. Separate component consists of the management of public expenditure respectively and their effective using. Another part of public spending represents public spending on the local level. In theory it is mainly defined the mission of the different levels of public authorities (governments) and their role and impact on the size, scope and effectiveness of public spending. Afonso and Fernandez (2005), dedicated to the issue of assessment and the efficiency of local public expenditure and suggest two possible approaches (including on environmental issues) that have been investigated previously by various authors:

Following De Borger and Kerstens (2000) it is possible to identify two groups in local efficiency literature. On the one hand, there are studies that evaluate efficiency in a global way, covering all or at least several services provided by local governments. See, for instance: Eeckaut et al. (1993), De Borger et al. (1994), De Borger and Kerstens (1996), Athanassopoulos and Triantis (1998), Worthington and Dollery (2000), Prieto and Zofio (2001), Balaguer Coll et al. (2002), Loikkanen and Susiluoto (2005), Afonso and Fernandes (2005, 2008), among others.

On the other hand, there are studies that evaluate a particular local service, as it is the case, for instance, of solid waste collection (Burgat and Jeanrenaud, 2008), fire protection (Bouckaert, 1992), local police units (Davis and Hayes, 1993) and general administration (Kalseth and Rattsø, 1995).

An interesting contribution to the effectiveness of public spending on the local level has Ring (2002), the German author who examined the relationship functions of the public sector's environmental and fiscal equivalence at the local level. Autonomic parts in terms of the perception of a theoretical evaluation and measurement represent various methods in relation to effectiveness of public expenditure. Also the work in the above-mentioned authors has been discussing theoretical models and methods to measure effectiveness. The best known method for measuring the efficiency is probably the method "Data Envelopment Analysis (DEA), see for example the work of authors: De Borger and Kerstens (1996), Prieto and Zofio (2001), De Sousa et al. (2005), Loikkanen and Susiluoto (2005) or Gonzales et al. (2011).

Practical level of exploring the effectiveness of public spending on the environment at the local level is based on the theoretical concept of effectiveness, the evaluation and measurement. Practical implementation lies in the applicability of theoretically established methods (e.g., the above-mentioned method DEA) and its reliability in relation to the measurement of efficiency. In other words, the extent of which selected method actually measures the real public spending and reflects the actual efficiency of local public expenditure. To accomplish this, a number of empirical studies (see, e.g., such as already mentioned studies above) was made and their authors conducted research that e.g. states in their paper Afonso and Fernandez (2008, 2005).

In the praxis, implementation of public expenditure management also lies in the applicability of the manuals and practice that originated in international organizations. A number of tools have been created for the public expenditure management.

These procedures and methodological guides represent the concept of "proper" management of public expenditure. For all the manuals can evoke Allen and Tommasi (2001) handbook. With the development of sustainable society is much more promoted efficiency and effectiveness in the field of environment and also directly at the level of environmental public expenditure now. A number of international institutions are aware of this. Therefore, some handbooks and guides of the management of economic instruments have been created to manage the environment and especially environmental

protection costs and expenditures – the experience of the OECD methodology (Barde, 1994; Burns and Yoo, 2002; Mickwitz, 2003; OECD, 1997, 2003 and Peszko, 2003), which is primarily focused on the economic tools of environmental protection (specifically on public expenditure in this area), as well as the recommendations of the United Nations Organization and World Bank procedures (EIG, 2010).

In addition to the theoretical and practical level it is necessary to distinguish between positive and normative perception of efficiency, i.e. the aspects describing not only the current state of public expenditure in relation to the environment - respectively static state of "effectiveness" of public spending, i.e. whether or not expenditure is spent effectively - but also the normative approach, which should just somehow static state to evaluate and propose the "effective" approach to improving the current state of both the theoretical level, i.e. through the creation of new evaluation, methods and tools, and also practical recommendations as officials manuals for practice, which the public policy implemented.

In this connection it should be pointed simplicity and complexity of this issue. In theory it is possible to define and describe a number of factors that determine the effectiveness of public spending on the environment at the local level. In practice, however, it is not possible to include all these aspects to the real implementation. The main objective of this paper is to introduce an approach that especially in terms of practical normative approach suggests how to improve and streamline public spending on the environment at the local level in the Czech Republic.

The main goal of this paper is to bring out key aspects of the new methodology for the assessment of the current municipal EPE efficiency invented by authors of this paper (Soukopová et al., 2010). It also argues results and experience from the evaluation in the city of Brno, the second largest city in the Czech Republic.

## **2. Methodology**

Environmental protection expenditures (EPE) is defined, by definition, EPEA (Environmental Protection Expenditures Account) as spending on all activities aimed at prevention and protection of environment. One of the key criteria is that environmental protection is the primary objective of these activities. Activities, which positively affect the environment, but their primary aim is not to protect the environment, are not included to the EPE. This aspect was reflected in the methodology.

EPE is possible divide by: funding sources, types of expenditure or area of environmental protection.

According to the sources of funding, there are several classifications. According to EU statistics, EPE are divided by sector (Eurostat, 2001) on the public sector, the corporate sector and environmental specialist manufacturers and producers of environmental services for private and public sector. By type of expenditure, the expenditure share of capital (investment) expenditure includes all expenditure on tangible fixed assets (TFA)

which were acquired by buying, its own activities, free acquisition, etc. Current (non-investment) expenditure include labour expenditures, payments for material and energy consumption, repairs and maintenance, etc., and payments for services whose main purpose is the prevention, reduction, modification or destruction of pollutants and pollution.

The methodology was designed for the evaluation of *current public* expenditure only.

From the point of environmental protection (technically) is for dividing of EPE most frequently used classification of CEPA 2000 (Classification of Environmental Protection Activities) prepared by the Statistical Office of the European Communities (Eurostat, 2001). According to the environmental expenditures are divided to the following areas of environmental protection (EP):

- 1st - Protection of ambient air and climate,
- 2nd - Wastewater management,
- 3rd - Waste management,
- 4th - Protection and remediation of soil, groundwater and surface water
- 5th - Noise and vibration abatement
- 6th - Protection of biodiversity and landscapes
- 7th - Protection against radiation,
- 8th - Research and development
- 9th - Other environmental protection activities.

The methodology was designed for each area of environmental protection separately apart from area of research and development because municipalities have no expenditures in this area.

The evaluation of effectiveness and efficiency of public spending should support decision-making in the political process. It provides information on to what extent the environmental and other objectives of an implemented municipal environmental policy have been achieved, and with what economic, environmental and social impacts on all important subjects were concerned. The results should include, among other things, possibility for comparison of public spending in relation to other municipalities.

Methodology for evaluating of municipal EPE efficiency (the Methodology) is built on the criteria which indicate the scope and philosophy of this material, which are:

1. *Using the concept of environmental protection, including economic and social aspects* – the methodology is based primarily on three basic “pillars” of sustainable development: environmental, economic and social. Each pillar is considered alone, the overall rating is a summary of these three pillars.
2. *Use of existing methodologies and analysis* – before the creation of the methodology have been carried out investigations and analysis of existing methodologies, procedures, methods and criteria for assessment of environmental expenditures. If possible, was taken over Good Practices and



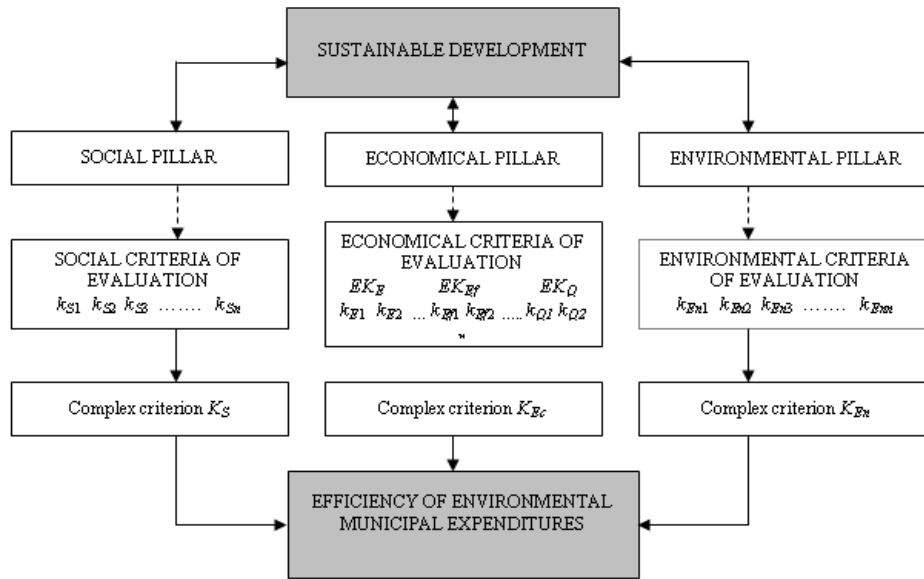
satisfactory evaluation indicators that have been adapted to the conditions of Czech regions.

3. *The availability of data* – the authors attempt to define such indicators for the evaluation would be possible to use data that is accessible for regional authorities.
4. *Multi-criteria evaluation using weights* – the effectiveness is evaluated according to criteria of economic, social and environmental criteria and the feasibility of using scheduling weights determining the importance of individual expenditures and environmental protection. Weights were determined expertly.
5. *Simplicity and complexity of output* – the methodology was based on the criteria proposed as an index (the resulting index is a combination of partial evaluation indices, which are defined for each of the pillars of sustainable environmental protection). The operational goal was to facilitate the interpretation, publication and communication of the evaluation results
6. *Quality of Legislation* – using of this methodology is strictly limited with legislation of the country which want this methodology put into praxis. It is assumed that policy makers and other stakeholders have opportunity to influence environmental policy of the country, exchange ideas and implement best practises of the assessment

### 2.1 *Procedure for assessing the efficiency*

The methodology evaluates current municipal EPE in the concept of 3E (effectiveness, efficiency, effectiveness). The suggested assessment process is divided into two main levels - basic assessment and general assessment. The basic assessment is based on municipal environmental management evaluation and principle of appropriate budget planning. The general assessment is used for each EPE and proceeds in three (parallel) parts of assessment that correspond to the three pillars of sustainable development: environmental, economic and social (see figure I).

**Fig. I. Scheme of current municipal EPE efficiency evaluation**

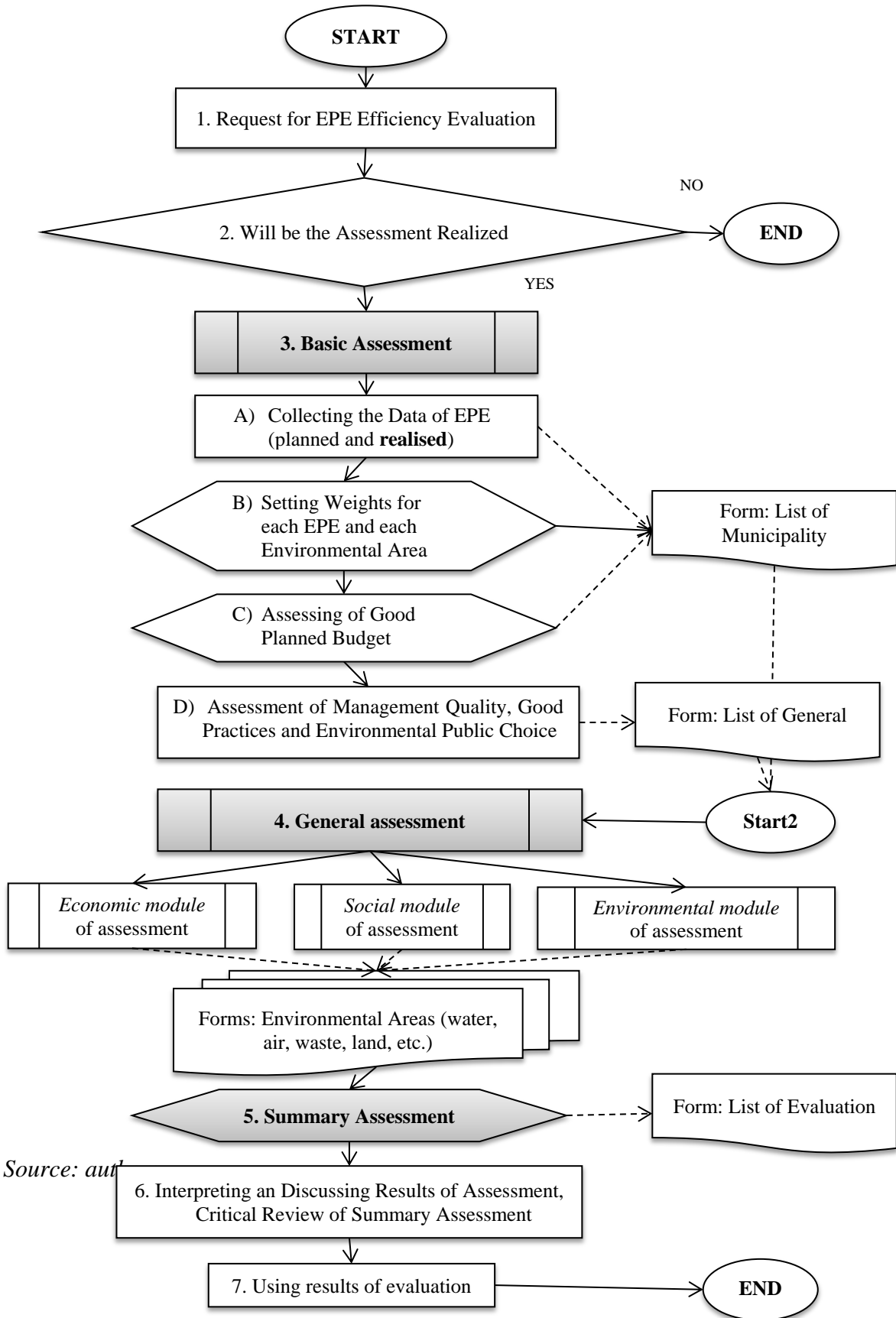


*Source: Soukopová, Bakoš (2010)*

The methodology is based on obvious, clear and easy assessment which is aimed to mayors and the other municipal policy-makers and experts, as well as the general public. Basic principle of the methodology is structured and easy-to-survey tables, which is necessary to complete step by step. The methodology uses both qualitative and quantitative methods of the assessment. The qualitative methods include filling the simple questionnaire for each realised EPE. The quantitative methods incorporate multi-criteria analysis techniques.

Figure II clearly shows simplified schema of procedure for assessing the effectiveness.

**Fig. II. Scheme of methodology**



Following it is presented the design of the methodology which is only way to evaluate the effectiveness and expenditures.

According to the simplicity of evaluation, it was appropriate to use an existing recording apparatus of the expenditure items that are required to apply the regions. For the purpose of the methodology was used sectorial budget classification. Expenditure of selected particular items of budget is divided by classification methodology CEPA 2000 in the following areas of EP (see above) are used for evaluation of good planned budget. In the following table are shown particular areas of EP and their associated activity budget classification used in the methodology.

**Table I. Individual EPE and their associated activity budget classification and areas of EP.**

Area of EP	Item (EPE no.)	Activity
Water management	2321	Collection and treatment of wastewater, sludge
	2322	Prevention of water pollution
	2329	Collection and treatment of wastewater, others
	2333	Modification of small watercourses
Protection of ambient air and climate	2115	Programs insulation and energy savings
	3711	Removal of particulate emissions
	3712	Removal of gaseous emissions
	3713	Changes in heating technology
	3714	Measures to reduce greenhouse gas emissions
	3715	Changes in manufacturing technology to eliminate emissions
	3716	Monitoring of air pollution
3719	Other activities to protect air	
Waste management	2122	Collection and recycling
	3721	Collection and transport of hazardous waste
	3722	Collection and transport of municipal waste
	3723	Collection and transport of other waste
	3724	Use and disposal of hazardous waste
	3725	Use and disposal of municipal waste
	3726	Use and disposal of other waste
	3727	Prevention of waste
	3728	Monitoring of waste
	3729	Other waste
Protection and remediation of soil and ground water	2341	Protection against cellular
	3731	Protection against soil and ground water pollution
	3732	Decontamination of soil and ground water purification
	3733	Monitoring of soil and ground water
	3734	Prevention and remediation of soil salinity
3739	Other soil and ground water protection	
Protection of biodiversity and	1037	Societal functions of forests
	2334	Revitalization of rivers systems

landscapes	3741	Protection of species and habitats
	3742	Protected parts of nature
	3743	Reclamation of land due to mining and quarrying activities
	3744	Erosion, avalanche and fire protection
	3745	Taking care of appearance of municipality and public greenery
	3749	Other activities to protect nature and landscapes
Protection and reduction against physical factors	3751	Construction and application of noise equipment
	3752+3771	Measures against radon
	3772	Radioactive waste
	3753+3773	Monitoring to ensure level of physical factors
	3759+3779	Other activities to reduce level of physical factors
Administration in EP	3761	Central government in environmental protection
	3762	Other government activities in environmental protection
	3769	Other administration in ecology
Research in Environment <sup>1</sup>	3780	Research in environment
Other activities in ecology	3791	International cooperation in environment protection
	3792	Environmental education and awareness
	3793	Environmental programs in transport
	3799	Environmental affairs and programs

Source: authors according to MF (2002)

As is shown in figure II, basic assessment is primarily used to set the weights of each EPE and environmental area. The second function of basic assessment is the evaluation of good planned budget and quality of municipal environmental management.

Setting of weights of EPE is following:

$$w_{iO} = \frac{C_{iO}}{\sum_{i=1}^n C_{iO}} \quad (1)$$

where

$w_{iO}$  is the weight of the  $i$ -th EPE in the  $O$ -area of EP ( $i = 1, \dots, n$   $O = 1, \dots, 7$ ),

$C_{iO}$  is the  $i$ -th EPE in the  $O$ -the area of EP,

$n$  is the number of implemented EPE of the municipality.

Thus it is guaranteed balance of evaluation and relevance and importance of EPE and areas of EP. The result is knowledge of the distribution volume of funds that were

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<sup>1</sup> This category is used only by regions. In the table it is used for the reason that the methodology is applicable for all stakeholders of the public administration - municipalities and regions.

allocated to specific activities within the areas. Information can be used for own needs of the municipality/city, is for informational purposes, serve as input to the next step computational algorithm. The second function of basic assessment is evaluation of good planned budget. Here is analysed the difference between budgeted and realized EPE. Results then enter the general assessment.

The methodology includes closed and open questions.

The form – Municipality contains only open questions. It provides basic general information about the municipality/city, i.e.: name of a local authority type, population, land size and the current environmental expenditures budget under the above mentioned sections of the analysed activity budget classification, which are specified in table I and as planned and realized expenses.

The other forms – General and 9 areas of EP contain only closed questions. The General form contains information about the relationship of the municipality to protect the environment from the perspective of environmental management tools, good practices and municipal bodies. This section includes questions relating to the tools of environmental management, good practice support the elected bodies of the municipality/city. Forms of the areas of environmental protection is divided by area of water, air, waste, soil, biodiversity, reduction of FF and management, based on the Ministry of Environment of the Czech Republic breakdown listed in Table I. These forms include questions to assess the effectiveness of economic, social and environmental pillars. Evaluation of economic and social pillar is for all areas of environmental protection consistent. Different issues are environmental aspects of the assessment. The economic and social pillars of the sets of questions are still further divided into themed areas, which are the economic pillars - legitimacy (legality), effectiveness. Economy and efficiency and social pillars - the legitimacy and transparency in spending, the extent in which environmental protection policy creates space for the participation of stakeholders, improving the quality of life, improvement of working conditions and others.

Because the evaluation makes the municipal officials, which are responsible for many tasks and do not have much time to fulfil complicated forms, the methodology has to be easy as much as possible. Thus, they have to set the answers, which are assessed from 0 to 3 points:

- 3 – fully satisfactory
- 2 – rather satisfactory
- 1 – rather unsatisfactory
- 0 – unsatisfactory.

The methodology describes the rules for assigning points much more detail.

For each area and each pillar have been worded questions that have connection with the pillar and the area of EP. These sets of questions for each area and each pillar can reach up to 100 points. These points are weighted.

From the perspective of environmental protection, including social and economic aspect were the weights subsequently determined expertly:

- economic pillar – weight 0.35,
- social pillar – weight 0.25,
- environmental pillar – weight 0,30 and
- good planned budget – weight 0.10.

$$EC_{iO} = Ec_{iO}w_{Ec} + S_{iO}w_S + En_{iO}w_{En} + GPB_{iO}w_{GPB} \quad (2)$$

where

$EC_{iO}$  is the point evaluation of i-th EPE in the O-the area of EP (0-100 points),

$Ec_{iO}$  is the point evaluation of economic pillar (0-100 points),

$S_{iO}$  is the point evaluation of social pillar (0-100 points),

$En_{iO}$  is the point evaluation of environmental pillar (0-100 points),

$w_{Ec}$  is the weight of economic pillar,

$w_S$  is the weight of social pillar,

$w_{En}$  is the weight of environmental pillar,

$w_{GPB}$  is the weight of good planned budget, where  $1 = w_{Ec} + w_S + w_{En} + w_{GPB}$

$EC_{iO}$  shows the efficiency of on individual EPE. Based on communication with local authorities is presented as percentage of 100% efficiency.

Subsequently, the actual number of points achieved for each section divided by the peak pillar for the assessment of expenditures and applies a weighted score for the pillar. The results of evaluating the effectiveness of the particular individual pillars in relation to paragraphs provide information about which sub - activities are evaluated in terms of angle of view (economic, social, environmental) within a given area most efficiently, or how much % is expenditure to which this section or effective compared to other sections. Weights for individual pillars were established on the basis of an expert determination, but the methodology allows you to set weights for each pillar of the priorities of the municipality. Alternatively, it is based on evaluation by the sum of all areas and the priorities of the municipality.

Overall rating is a sum of the weighted sum of the all three pillars of sustainable development and feasibility planning:

$$E_{iO} = EC_{iO}w_{iO} \quad (3)$$

where

$E_{iO}$  is the efficiency of i-th EPE in the O-the area of EP

$w_{iO}$  is the weight of the  $i$ -th EPE in the  $O$ -area of EP ( $i = 1, \dots, n$   $O = 1, \dots, 7$ ), see above (1)

and

$$E_O = \sum_{O=1}^7 EC_{iO} w_{iO} \quad (4)$$

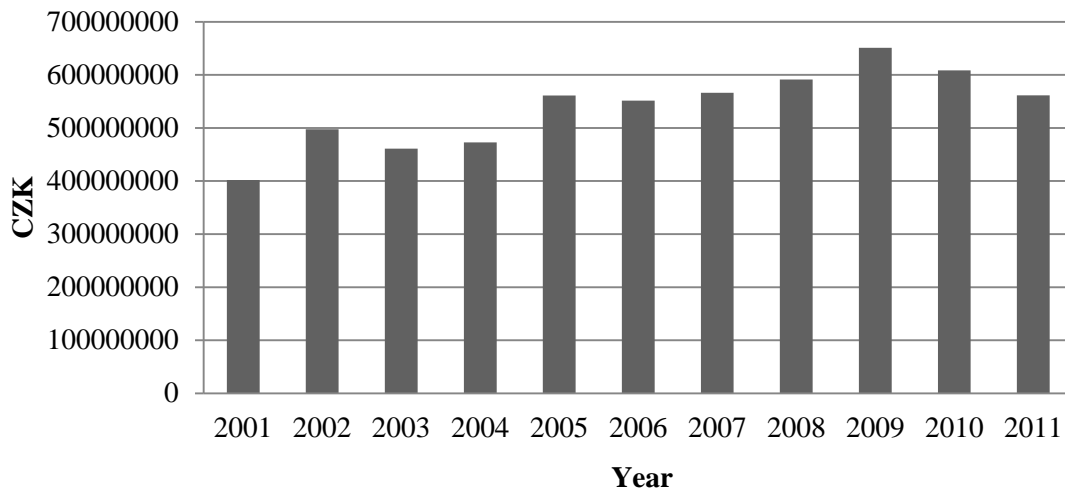
where

$E_O$  is the efficiency of  $O$ -the area of EP

### 3. Case study

The case study concerns the results of efficiency evaluation of the city of Brno, the second largest city in the Czech Republic. Brno has a population almost 380,000 people and it's area is 23 020 ha. Total environmental protection expenditures of Brno are from 2005 more than half a billion CZK yearly, see figure III.

**Fig. III. Aggregate environmental protection expenditure of city of Brno**



*Source: authors*

In the tables II and III and figure IV are presented results of evaluation in the city of Brno.



**Table IV. Summarized Report Table with point result of pillars and overall rating of efficiency of each EPE and areas of EP - year 2010, city of Brno**

Area of EP	EPE	w	GBP	Ec	S	En	EC
Water management	2321	<b>0.095</b>	61	100	100	100	98.00%
	2322	0.000					
	2329	0.000					
	3331	<b>0.522</b>	87	34	0	25	25.00%
	2333	<b>0.383</b>	96	100	90	100	97.00%
	$\Sigma = O_1$	<b>0.016</b>	1	1	1	1	<b>59.39%</b>
Protection fo ambient air and climate	2115	0.000					
	3711	0.000					
	3712	0.000					
	3713	0.000					
	3714	0.000					
	3715	0.000					
	3716	<b>1.000</b>	96	63	68	77	69.53%
	3719	0.000					
$\Sigma = O_2$	<b>0.004</b>					<b>69.53%</b>	
Waste management	2122	0.000					
	3721	0.000					
	3722	<b>0.427</b>	100	88	97	100	94.00%
	3723	0.000					
	3724	0.000					
	3725	<b>0.559</b>	100	50	80	100	74.00%
	3726	0.000					
	3727	<b>0.001</b>	0	44	80	100	66.00%
	3728	0.000					
	3729	<b>0.014</b>	67	31	0	100	41.00%
$\Sigma = O_3$	<b>0.643</b>	64	42	55	64	<b>82.04%</b>	
Protection and remediation of soil and ground water	2342	0.000					
	3731	0.000					
	3732	0.000					
	3733	<b>0.785</b>	100	13	0	25	17.00%
	3734	0.000					
	3739	<b>0.215</b>	0	13	0	25	11.00%
$\Sigma = O_4$	<b>0.002</b>	0	0	0	0	<b>15.71%</b>	
Protection of biodiversity and landscapes	1037	0.000	67	13	0	25	15.00%
	2334	0.000					
	3741	<b>0.198</b>	100	81	57	81	75.00%
	3742	<b>0.003</b>	100	13	0	25	17.00%
	3743	0.000					
	3744	<b>0.001</b>	0	78	68	88	73.00%

	3745	<b>0.796</b>	100	81	78	100	86.00%
	3749	<b>0.002</b>	100	47	73	96	70.00%
	$\Sigma = O_5$	<b>0.332</b>	33	27	24	32	<b>83.35%</b>
Protection and reduction against PF	$\Sigma = O_6$	0.000					
Administration in EP	$\Sigma = O_{71}$	0.000					
Other activities in ecology	3791	0.000					
	3792	<b>1.000</b>	100	13	0	25	17.00%
	3793	0.000					
	3799	0.000	0	0	0	25	
	$\Sigma = O_8$	<b>0.004</b>	0	0	0	0	<b>17.00%</b>

Source: authors in collaboration with Local Authority of city of Brno

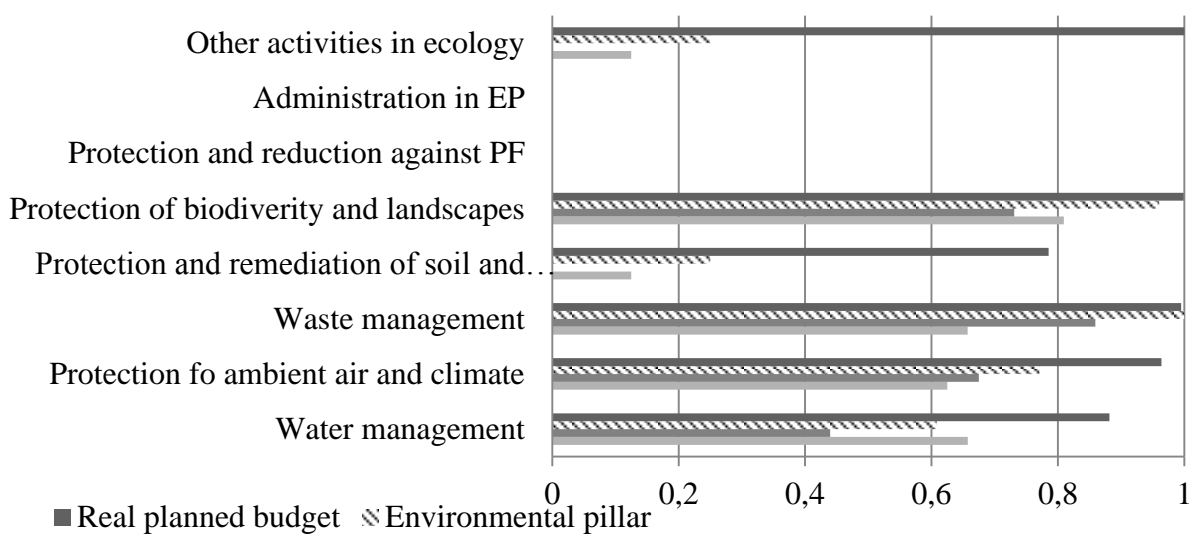
This table does not take into account the value of each EPE, therefore methodology contains a statement and commentary of evaluation of all EPE and each pillars, see table III and figure IV.

**Table III. Evaluation of EPE of city of Kuřim in 2010**

Evaluated EPE	Performance
Economic pillar	70.46%
Social pillar	80.45%
Ecological pillar	97.54%
Real planned budget	99.40%
Efficiency of environmental protection expenditures	86.96%

Source: authors

**Fig. IV. Graph of efficiency of each area of EP and each pillar**



Source: authors

The results show that least effective is again the economic pillar, especially in the area of protection and remediation of soil and ground water but also other areas.

Municipal officers of city of Brno can examine each EPE in these areas and the weight of these EPE. After a more detailed probation, it was found that a large effect on the low assessment has expenditures in the area of waste management, especially in the area of “collection and transport” and “use and disposal of municipal waste” (item 3721 and 3725). These expenditures are the inefficient in medium-term (period of 5 years – from 2007 to 2011), which was also confirmed by other studies of the cost-effectiveness in relation to waste management services (see example Soukopová and Malý, 2013 or Soukopová and Struk, 2011).

Evaluation of the effectiveness in city of Brno is influenced with expenditures in area “Protection of biodiversity and landscapes”, where the largest part has expenditure on taking care of appearance of municipality and public greenery, and this are less cost-effective in comparison with other towns in South Moravia Region.

From the tables II and III and from figure IV it is obvious that the methodology invented by authors and approved by the Ministry of Environment of the Czech Republic as voluntary environmental tool provides for municipal officers the wide variety of information that are not incorporated in other best known methodologies (Barde, 1994; Burns and Yoo, 2002; Mickwitz, 2003; OECD, 1997, 2003 and Peszko, 2003 and EIG, 2010).

Municipal officers can obtain from the results of evaluation contained in the list of evaluation the following information:

- Efficiency of each EPE and each area of EP;
- Assesment of each pillars of sustainable development and real planned budget;
- Basis for planning, decision making, negotiation, monitoring and possibly also the case for defense activities carried out and the associated allocation of funds;
- Possibility of monitoring the effectiveness in real-time – municipal officers can follow up effect and cost-effectiveness of EPE in real time;
- Optimize resources to the objectives and needs;
- Reduce the likelihood of incorrect or inefficient allocation of resources.

It is necessary to add that the decision-making about EPE depend not only on professional examination and monitoring but also on political decision. The best methodology does not fix this problem, but could contribute to general awareness about possible tools how to enhance current situation. In the methodology is included “real planned budget” which means that municipality officers have possibility to adjust the priorities of the municipality in the environmental areas and then check the fulfilling of

them. Furthermore the authors are aware that implementation of this methodology can be complicated in relation to people who are responsible for allocation of resources, but hope that implementation is possible as shows the case study in city of Brno.

#### **4. Conclusion**

The use of indicators for evaluating various areas / activities at the local level is not in the local government of the CR current phenomenon. Most municipalities still does not work systematically with indicators of local environment, including economic and social aspects. Statistical indicators are used only in isolation and piecemeal. The design of methodology was created in response to the absence of a simple methodology for the needs of local authorities.

The methodology was created also because for the evaluation of expenditure on environmental protection is not at the national level and globally unified conceptual tool that would allow evaluation of current expenditure. For the evaluation of economic instruments exist but the OECD methodology (1997, 2002), which is partly based on our proposed methodology as well. The concept, however, the OECD methodology is based on a different philosophy than linking environmental, economic and social pillars of environmental protection. For the construction of a single evaluation criterion is based on criteria of environmental efficiency, and developed administrative expenditures and economic efficiency. OECD methodology also emphasizes and draws attention to the institutional environment before an assessment of economic instruments. In addition to these methodologies OECD methodology is also based on "good practice" methodology Jílková et al. (2004), Sauer et al. (2012), and "good practices" (OECD, 2003) for the management of public expenditure on environmental protection. These approaches draw attention to the concept of efficiency both generally in relation to public expenditure, and specifically to public expenditure on environmental protection. These approaches also point to problems arising in the evaluation of public expenditure. By development of this methodology was taken into consideration to these approaches.

All these methods are based on qualitative and quantitative analysis of available statistical data on public expenditure. In view of their monitoring and evaluation, it is necessary to point out their interpretation and applicability. It often happens that these data and the implications of them are wrongly explained. Incommensurability of data occurs for example when compared to data from the Czech Statistical Office and the Ministry of Finance.

The result is information on the evaluation of economic efficiency, social efficiency, environmental effectiveness and feasibility of planning for individual spending areas as well as protection of the total expenditure on environmental protection. This makes it possible to get an overview of whether allocated resources gain in relation to the level of total expenditure in all areas and activities of environmental protection, the desired results in terms of principles of environmental protection of the municipality / town. All

four values are graphically displayed for all the different areas of environmental protection.

In addition to efficiency funding individual conservation areas is denominated comprehensive economic, social, environmental effectiveness and feasibility planning and the overall effectiveness of total expenditure on environmental protection.

The information obtained can be used for further planning, decision making and management, based on that evaluation findings. This provide a basis of argument, built on the knowledge of reality, to monitor the trend of expenditures in the areas of environmental protection, under which it will be possible to carry out a retrospective evaluation and comparison of data if the evaluation is carried out regularly (outcomes assessment will help to increase knowledge and awareness of individual officials of expenditure directed to areas of environmental protection), the transparency of spending decisions made that are especially important towards the elected authorities of the town. (especially graphical outputs can help members of these bodies easily and quickly understand the policy and strategy of the town in the field of environmental protection). It can also be used to provide information and possible feedback with the public (the public is aware of the financial flows to environmental protection, including whether these resources are effective with respect to efforts to control and manage the municipality / town sustainably), which will ensure transparency of the representatives of the municipality in the area of environmental protection, to compare with another municipality / town of which it is possible to obtain feedback and compare.

The methodology could be inspiration for other states and their municipalities to provide evaluation of effectiveness of public spending at the local level.

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