



PROPOSAL OF THE MONITORING AND EVALUATION APPROACH FOR COMMUNITY PUBLIC INFRASTRUCTURE IMPROVEMENT PROJECTS

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Abstract

Local governments in Bosnia and Herzegovina do not have clearly defined objective requirements or prescribed method for monitoring and evaluation of local public infrastructure projects. Decision making process in selection of infrastructure projects to be implemented is usually based upon an ad hoc basis or is driven by specific interest of different groups. However, effects on citizens' life quality of implemented projects are unknown, except clearly and obviously visible benefits, without any support in objective evaluation or analyses. This paper attempts to increase the awareness of necessity to introduce monitoring and evaluation principles in implementation of the infrastructure projects financed by public funds and shows that application of monitoring and evaluation principles is feasible and necessary for the implementation of such type of projects for their objective validation for achievements and results, as well as project selection, performance based decision making and project management issues. Using combination of tools, selection of quantitative and qualitative performance indicators, cross referenced by public opinion survey results, it is feasible to create an optimal monitoring and evaluation framework for monitoring of effects of implementation of any public infrastructure project. Such approach make the project implementer responsible, accountable, goal oriented and objective performance based decision maker. It also ensures maximization of results to be achieved by project implementation towards high expectations that have been earlier set up through analytical process. Such framework also assists in justification of project proposals to be implemented in initial stage to public and stakeholders, but also in evaluation of benefits and results after project completion and years to come.

Key words: *monitoring and evaluation, local public infrastructure, local public facilities, city planning*
JEL code: R530, R580, D23

Introduction

Local authorities continuously conduct various projects for improvement of local public infrastructure. In Bosnia and Herzegovina, the decision-making process of the local authorities in the selection of infrastructure projects to be implemented is usually based on an ad hoc solution and/or such process is driven by special interests of different groups. Very often, there are no objective and evidence based criteria for determination of potential benefits of project selection. In the other hand, monitoring of the project implementation is focused usually to the technical and financial aspects of such projects. This paper aims to increase awareness of the need to introduce the principles of monitoring and evaluation processes in the selection and implementation of infrastructure projects that are financed from public funds. The application of the principles of monitoring and evaluation is feasible and necessary for the implementation of such type of projects, especially for the objective evaluation of their achievements, benefits and results for community, but also for the project identification, project management and performance, where decision-making process should be evidence-based.



“The most common mistake organizations make is measuring too many variables. The next most common is measuring too few”

*Mark Graham Brown
Keeping Score (1996)*

“...But perhaps an even bigger mistake is to keeping doing the same thing, hoping for better results.”

*Ann Doucette
Making Evaluation Data Actionable (2017)*

Implementation of the local community infrastructure projects are often limited by the local budgets, so their funding assumes long term administrative and political procedures of planning and execution, but the budget amendments are equally complicated. This implies the fact that it is unrealistic to carry out projects of sufficient quality and benefits without proper planning and that ad hoc practice can sometimes cause more damage than good. Taking in consideration that capital projects in local communities affect community as a whole, implementation of such projects requires not only engineering and budget management skills, but project management, human resources management and monitoring and evaluation skills.

The management of public infrastructure improvement projects in local communities in the current practice in Bosnia and Herzegovina generally lacks the long term planning approach and setting of priorities, which is done often nontransparent and without clear vision. Essentially, it can be noticed that practice is addressing the symptoms and not the cause of problems. In this regard, local authorities should be able to implement their own monitoring and evaluation tools to identify and manage infrastructure improvement projects, what usually is not a case.

Public infrastructure improvement project description

Effective planning is required at the beginning of the project to be successful. Planning consists of a series of operations that decision makers try to conduct: identify and define the key issues and set goals, analyze relevant environmental and strategic terms, needs, opportunities and constraints, transformation objectives into operational objectives, identify alternative course of action to achieve the goals and objectives, calculate the costs and benefits of each alternative, to assess the likelihood of future events, projected trends occur, determine the potential of the non-economic gains, losses and consequences of each alternative, choose the optimal alternative or set of operations and integrate the selected course of action in a comprehensive plan.

Aiming to show possibility for change of current practice in Bosnia and Herzegovina, the imaginary infrastructure improvement project was designed in imaginary local community. The theory of change, graphically illustrated below provides a simplified depiction, which is based on the primary objectives of interest and the underlying program principals. This graphic represents the basic causal chain that characterizes the project. It builds on community outreach, awareness, existing community infrastructure, funding, human resources, collaborative opportunities and construction contracts (inputs) to improve status of infrastructure and communal services, shorter travelling time in public transportation, better hygienically conditions in community, with more visits and interest by citizens and tourists to public events at public squares (outputs). The project expects that this will lead to a creation of new jobs,



better conditions for doing business, increased tourists' interest to visit community, decreased pollution of air, water and ground and increased community wellbeing (outcomes). Impact of this project is characterized by longer-term outcomes such as increased citizens' satisfaction, economic development, environmental benefits, improved health status of citizens and development of community as a landmark.

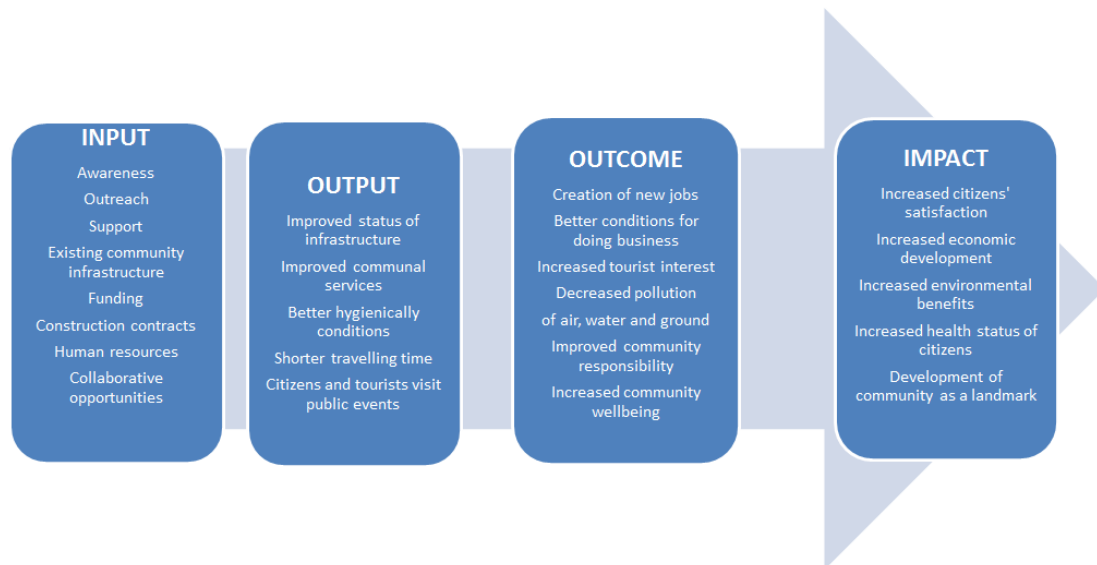


Fig. 1. Theory of Change

Source: Authors' construction

The ultimate imaginary project goal is to improve local community infrastructure. This is envisioned to be done through improvement of the traffic infrastructure, public transportation, Waste management, power supply, water supply, waste water collection and treatment system, telecommunication and public space management. As highlighted earlier, this is imaginary project for improvement of local community infrastructure. New directions of project implementation can be added or some deleted as a fit to the observed local community needs.

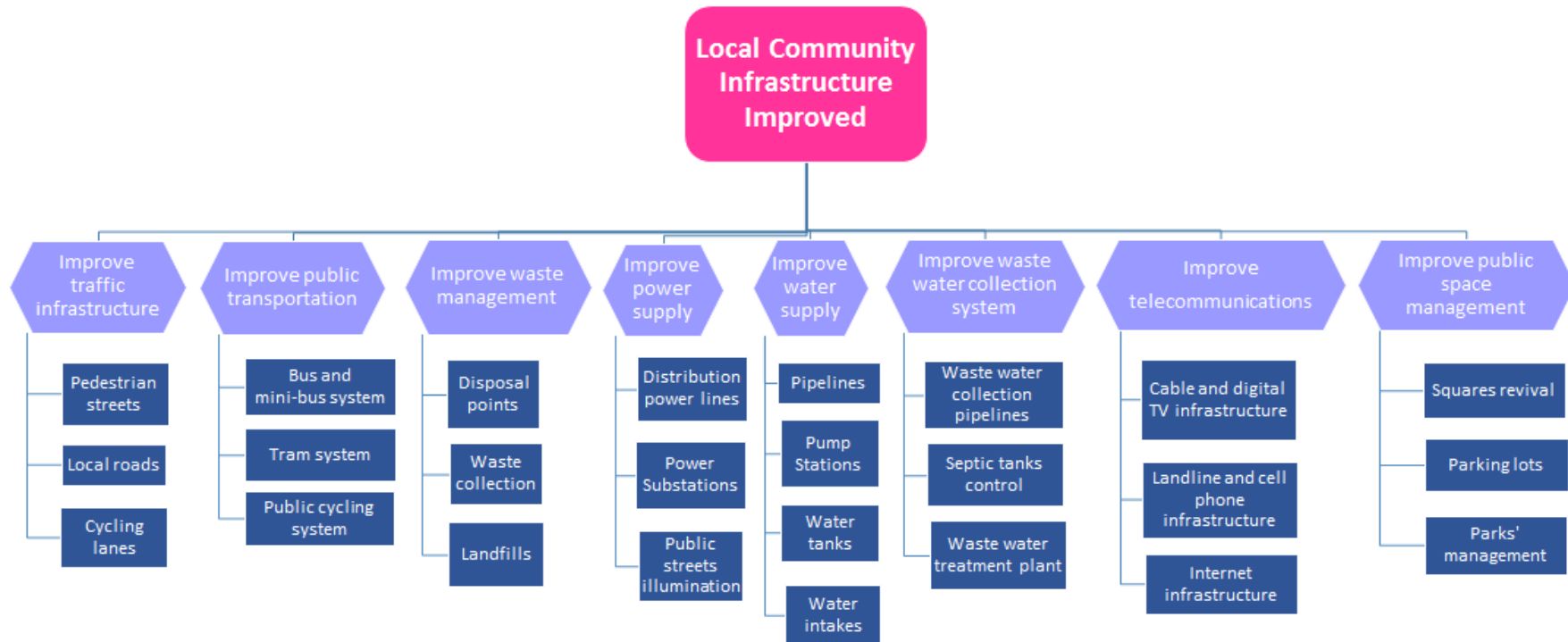


Fig. 2. Project Results' Framework

Source: Authors' construction



The structure of the project is presented on *Figure 2* through Results' Framework. Envisaged improvement of local traffic infrastructure will be implemented through the repair, modernization or total reconstruction of existing local roads and/or construction of new local roads where necessary. Pedestrian streets are supposed to be paved by stone or concrete tiles with tactile paving. Traffic infrastructure improvement will also consider rehabilitation of existing and/or construction of new cycling lanes.

The local public transportation improvement will consider improvement of existing bus, mini bus and tram lines with introducing new lines and to cover hillside parts of the community with public transportation, including purchasing new vehicles. The public cycling system will be established throughout the downtown community.

The function of waste collection system is very important for any community. This system will be improved through activities related to organization of disposal points, improvement of garbage collection and landfills management, followed by purchasing equipment and garbage collection vehicles.

Power supply system in community is supposed to be improved by rehabilitation of low and medium voltage overhead and cable lines with substitution of substations where necessary and rehabilitation and introducing of illumination of streets.

Water supply system is to be improved by repair of leaks on existing pipelines and construction of new distribution pipelines where necessary to reduce water loss, and with refurbishment, reconstruction or new construction of pumping stations, reservoirs and water intakes.

Waste water collection and treatment system improvement will consider activities on separated sewerage pipelines, and waste water treatment plant. In areas, where sewage system will not be constructed soon, regular inspection and control of septic tanks should be introduced and conducted to prevent pollution of ground water.

It is an assumption that telecommunication system in community is relatively new and in good state. Some activities will be focused to further development of the cable and digital TV infrastructure, landline, cell phone and internet infrastructure.

The additional undertaking of this project to improve public space management. That considers to make city squares more attractive for citizens and tourists by organization of different art and entertaining events. Additional attention will be paid to solve issues with limited number of vehicle parking positions in community by reorganization of existing open parking lots and construction of underground garages. Some activities will be devoted to improvement of parks in the city by installation of playgrounds for children and equipping with parks' mobiliare and outdoor work out equipment.

The logframe of the project set up the causal links, where all activities lead to outputs, and outputs to outcomes in form of matrix. The logframe shows which resources, activities and processes must be in place in order to meet objectives and goals, than what conditions must exist that project can be successful, how success will be identified and measured and what the project wants to accomplish. *Table 1* shows just an excerpt of the project logframe wishing to show logic of this causal links matrix.



Monitoring and evaluation tools

Monitoring and evaluation are two different terms but interrelated. Monitoring is internal project activity for systematic tracking key project components (inputs, activity progress etc,) which helps to assess the alignment of project implementation with original intent and design. Monitoring tracks change (performance) in relationship to outcome targets, identifies what has changed and identifies need for modification or adaptation of the project course.

Table 1

Project Logframe (excerpt)

Level of result	Narrative summary	Performance Indicators	Data sources	Assumptions
Project goal	Improved standards of living in community by infrastructure improvements	<ul style="list-style-type: none"> • Citizens' satisfaction with quality of communal services delivery • Score on capacity index for communal services delivery 	Citizens' Attitudinal Survey Capacity Index Survey findings	Budget
Purpose 1	1. Improving of local traffic infrastructure	<ul style="list-style-type: none"> • Citizens' satisfaction with local traffic infrastructure; • Score on capacity index for communal services – Dimension 1 	Citizens' Attitudinal Survey Capacity Index Survey findings	Budget
Activity 1.1 Improve pedestrian streets	Outcome/Output 1.1 Pedestrian streets are paved with stone and concrete tiles and equipped with tactile paving Input 1.1 Design and construction of pedestrian street with stone or concrete tiling including and new tactile paving	% of pedestrian streets covered by stone or concrete tiles % of pedestrian streets with tactile paving	Project records and annual reports by local community utility office	Budget
Activity 1.2 Improve local roads	Outcome/Output 1.2 Majority of local roads are paved with modern road elements and equipment Input 1.2 Design, reconstruction and construction of local roads	% of paved local roads with modern road elements and equipment	Project records and annual reports by local community utility office	Budget
Activity 1.3 Rehabilitation of existing and/or construction of new cycling lanes	Outcome/Output 1.2 Increased length of cycling lanes in the community Input 1.2 Design, rehabilitation and construction of new cycling lanes	Length of cycling lines in community	Project records and annual reports by local community utility office	Budget



Source: Authors' construction

Evaluation is episodic assessment of change associated with project implementation which often incorporates external efforts, aimed to assess inputs and activities to identify contribution to outcomes, as well as impact in terms of investment, substance and values to determine the effectiveness and efficiency of the implementation process.

Thus, monitoring and evaluation process should be designed from the very beginning of the project implementation or earlier through Monitoring and Evaluation Plan. For this particular project, it is suggested to develop Monitoring and Evaluation Plan that will apply three tools. These are Set of Performance Indicators, Community Infrastructure Capacity Index and attitudinal survey that will measure citizens' satisfaction with infrastructure developments in the community. Such approach will provide triangulation of the findings from different perspectives to the observed in light of changes made by project implementation.

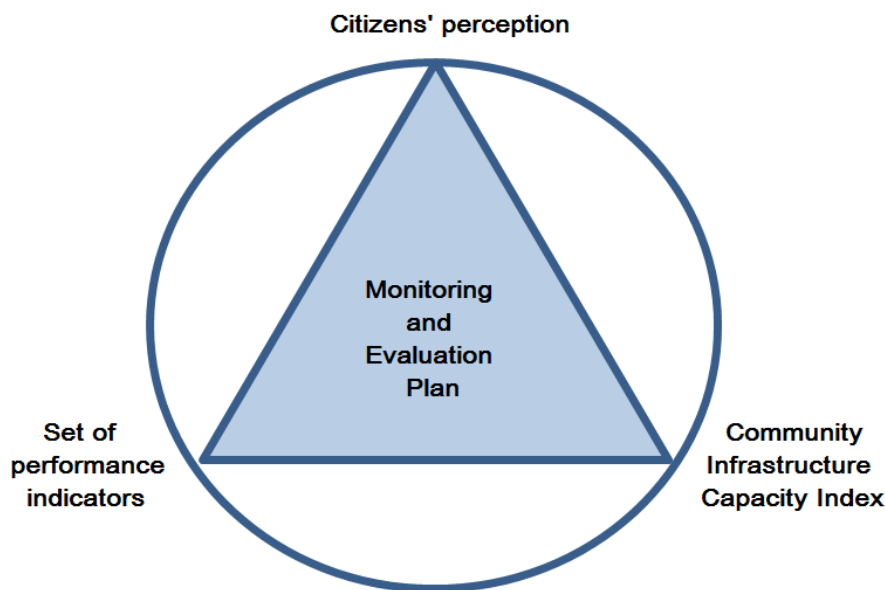


Fig. 3. Illustration of Monitoring and Evaluation Plan

Source: Authors' construction

Performance indicators are the basis for observing progress and measuring actual results compared to expected results of the project. Performance indicators are tied for the specific levels of outputs, outcomes and impacts of the project. They represent the reflection of the project outcome to be achieved. Performance indicators should be precisely defined and represent the objective measurement. They need to fulfill specific characteristics like practicality, feasibility, cost-efficiency, to be sensitive to detect change in desired outcome if it occurs and unaffected by other changes, distinct and with possibility for data disaggregation.



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Taking in consideration the type and specified results of the imaginary infrastructure improvement project to be implemented here, establishment of set of the performance indicators should not represent significant challenge. The *Table 2* shows the excerpt of the performance indicators table related to Project Goal, Purpose 1 and Activity 1.1.

Performance Indicator tables needs to define each indicator with its title, description, unit of measure, data source and collection method, reporting frequency and targets. Baseline values should be established before the project implementation starts or at the very beginning of the project. Based upon the baseline findings for each performance indicators, targets for each year of project implementation should be established in cooperation with stakeholders and representatives of citizens and community. In addition, each performance indicator should be defined in details through Performance Indicator Reference Sheet (PIRS).

The other tool to assess development and results of the project is capacity index. For this imaginary project, there was created Community Infrastructure Capacity Index. Capacity indices are tools that convert qualitative data to the numeric values. The index can be tailor made just for particular project for assessment of all activities or generally for all infrastructure aspects in observed community. The first approach is better for tracking the actual project implementation, but the second one is more favorable to assess the infrastructure needs of community and for the selection of projects to be implemented directing field of future intervention

Table 2

**PROJECT FOR IMPROVEMENT OF LOCAL COMMUNITY INFRASTRUCTURE
 PERFORMANCE INDICATOR TABLE**

Performance Indicator (# and name)	Definition of Indicator (Type of indicator)	Unit of Measure	Data Source & Collection Method	Reporting Frequency	Reporting Responsibility	Baseline 2016	Target				
							2017	2018	2019	2020	2021
Project Goal: Improved standards of living in community by infrastructure improvements											
PG 1: % of citizens' satisfied with quality of communal services delivery	This indicator measures percentage of citizens that are very satisfied and satisfied with communal serviced delivery	Percentage	Attitudinal Survey (Poll)	Annually	M&E Officer	TBD ¹	TBD	TBD	TBD	TBD	TBD
PG 2: Score on capacity index for communal services delivery	The indicator measures total score as determined by Communal Services Capacity Index Methodology	Score (Number)	Communal Services Capacity Index Survey	Annually	M&E Officer	TBD	TBD	TBD	TBD	TBD	TBD
Purpose 1: Improving local traffic infrastructure											
1.1 % of citizens satisfied with local traffic infrastructure	This indicator measures percentage of citizens that are very satisfied and satisfied with traffic infrastructure in community	Percentage	Attitudinal Survey (Poll)	Annually	M&E Officer	TBD	TBD	TBD	TBD	TBD	TBD
1.2 Score on capacity index for communal services – Dimension 1	The indicator measures total score as determined by Communal Services Capacity Index Methodology for Dimension 1 – Traffic Infrastructure	Score (Number)	Communal Services Capacity Index Survey	Annually	M&E Officer	TBD	TBD	TBD	TBD	TBD	TBD
Activity 1.1 Improve pedestrian streets											
1.1.1 % of pedestrian streets covered by stone or concrete tiles	The indicator measures percentage of length of pedestrian streets covered by stone or concrete tiles in community vs. total length of pedestrian streets in community	Percentage	Project records and annual reports by local community utility office – Data Collection	Annually	M&E Officer	TBD	TBD	TBD	TBD	TBD	TBD
1.1.2 % of pedestrian streets with tactile paving	The indicator measures percentage of length of pedestrian streets equipped with tactile paving in community vs. total length of pedestrian streets in community	Percentage	Project records and annual reports by local community utility office – Data Collection	Annually	M&E Officer	TBD	TBD	TBD	TBD	TBD	TBD

¹ TBD – To be determined



Source: Authors' construction

The Community Infrastructure Capacity Index has been developed for this imaginary project to provide a realistic and objective evaluation of the improvements in this community in infrastructure development throughout the life of the project. This index establishes and measures eight dimensions (one dimension for each project purpose), with total of twenty five elements. Each element relates to one project activity and is tied to specific outputs identified by the Project. Each element is graded on a five-point scale. Most of the grading, unless otherwise stated, follows the same scoring progression:

- zero points community is not in compliance minimal standards espoused by the project;
- one point community has reached a minimal standard;
- two points community takes over additional steps to improve above minimal standard:
- three points community takes over further steps toward improvements with a view towards longer term planning;
- four points community actively implements, adjusts, and tests steps for improvement in the desired direction;
- five points community has reached the optimal level, the impact is clearly recognized.

Scores for each element are progressive. A community must meet all the criteria assigned to points 1, 2, 3 and 4 before it can be considered for a 5 points rating. In this particular case, maximal number of points that community could earn is 125, while results would be reported in percentage of maximal available number of points.

Dimension 1- Status of the Community Traffic Infrastructure

Element 1.1 - Pedestrian Streets

- 0 points Community do not have pedestrian streets at all;
- 1 point Some community streets are declared as pedestrian for several hours a day;
- 2 points Community has designated pedestrian streets paved by asphalt pavement;
- 3 points Community has designated pedestrian streets and at least 40 percent of their length is covered by stone or concrete tiles;
- 4 points Community has designated pedestrian streets and et least 60 percent of their length is covered by stone or concrete tiles;
- 5 points Community has designated pedestrian streets and at least 80 percent of their length is covered by stone or concrete tiles.

Fig. 4. Excerpt from the Community Infrastructure Capacity Index

Source: Authors' construction



However, it would be advisable if possible to conduct annual survey on Community Infrastructure Capacity Index in community that conducts such program, but also in community that does not conduct such organized program at all. This other community can serve as “control community” for evaluation purposes and comparison. In that way, project results can be evaluated in comparison to control community and over time, what would enable application of evaluation tools like “difference in difference method” or “double difference method”.

It is suggested to set up an Evaluation Committee in the community that would grade every single element of the Index every year in observed and control communities. Evaluation Committee should have five members representing citizens, youth, representatives of governance and other stakeholders.

Third aspect of the Monitoring and Evaluation Plan is exploring citizens’ perception of the state of infrastructure in observed community. The findings from the Set of Performance Indicators and Community Infrastructure Capacity Index as objective tools should be complemented by findings from citizens’ perception on different aspects of community infrastructure. Design of the attitudinal survey (poll) should be developed as a team effort among project managers, citizens’ representatives, governance representatives, experts and NGOs, but not limited to them only. The main goal of the survey design is to analyse and identify the most efficient direction in obtaining comprehensive and reliable citizens’ perception data throughout duration of the project. In preparation phase, the population of the community should be defined and stratified sample should be determined, taking in consideration statistical significance and validity. Surveys should be conducted annually. There should be noted that poll conduct requires specific budget for its performance.

Such developed monitoring framework for the infrastructure development projects would set foundations for the project evaluation. Based upon data from the monitoring framework, evaluation could easily apply different evaluation methods to assess inputs and activities in identification of contribution to outcomes, as well as impact in terms of investment, substance and values to determine the effectiveness and efficiency of the project implementation process and satisfaction of beneficiaries. Through analyses of findings, evaluation could also identify further steps in infrastructure development in observed community and recommend focus to specific further directions in communal infrastructure development and new projects design.

Conclusions

The analyses presented in this paper highlighted advantages in application of monitoring and evaluation tools in the implementation of community infrastructure development projects. The findings can be summarized as follows:

- The application of monitoring and evaluation tools in implementation of community development infrastructure projects should be standardized practice;
- It assists in tracking the expected project results and achievements;
- It justifies the investment of public funds in transparent manner;
- It offers opportunity to change course of the project or its part during the implementation, if interim results have not been achieved;
- It brings together citizens, authorities, youth and non-governmental sector and other stakeholders in a common goal and gives the common ownership of the project and collaboration;



- Increases responsibility of the project managers and associates; and
- Provides the basis for the identification of future projects and interventions to real needs of the community.

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