CROATIA PER IN STI: ANALYSIS OF THEORY OF CHANGE AND RESULTS FRAMEWORK

# SETTING UP AN EFFECTIVE MONITORING AND EVALUATION SYSTEM

## Summary

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REPUBLIKA HRVATSKA Ministarstvo znanosti i obrazovanja

REPUBLIKA HRVATSKA Ministarstvo regionalnoga razvoja i fondova Europske unije

EUROPSKI STRUKTURNI I INVESTICIJSKI FONDOVI

Operativni program KONKURENTNOST I KOHEZIJA

Europska unija Zajedno do fondova EU

*This brief presents a summary of findings and recommendations presented in the report "Analysis of Theory of Change and Results Framework" (World Bank 2020). The report presents key findings and recommendations related to monitoring and evaluation (M&E) across STI support programs and provides guidance on applying a systematic approach in future M&E framework design and revisions. The report also contains 42 program-specific reports, each with a Theory of Change describing the potential mechanisms of impacts, a Results Framework proposing revised indicators in line with the Theory of Change, and key findings and recommendations on strengthening the M&E system of that particular program.*

# IMPROVING THE M&E SYSTEM FOR STI SUPPORT PROGRAMS

## An explicit Theory of Change can help develop a coherent program logic

A Theory of Change is a visual or narrative representation of the intervention logic. It illustrates the logical connection between inputs that are invested into the project (such as funding, human resources, and time), activities (or project interventions), and expected outputs of such activities, which together are expected to generate short-term and longer-term outcomes.

Unless required by donors or partners, STI programs in Croatia were not designed using an explicit Theory of Change. This means that the underlying logic and causal connections between the different elements of the intervention were not always clear. A Theory of Change has been developed for each program in program-specific reports based on available information and documentation. These should be taken as a starting point and should evolve over time as programs are refined.

## Each element of the intervention logic should be associated with indicators based on CART principles[1]

Programs define indicators for project reporting purposes, and most of them are set at output level. Indicator definitions are missing or incomplete in many cases. Other monitoring systems (such as S3 monitoring framework) define a different set of similar indicators which are often not harmonized with indicators at program level. The methods of collection and verification of data, targets, and deadlines for their achievement are missing for many indicators. Finally, no program defines process indicators, which would help to capture the operational performance of the programs.

## The M&E system is not merely a dry bureaucratic construct

A robust and reliable M&E framework is a precondition for understanding the effectiveness of support programs. The information resulting from M&E enables policymakers to assess the effectiveness of programs, therefore informing decisions on whether the program should be replicated in the future, adapted or discontinued.

1 CART principles are as follows: Credible – by collecting high quality data and analyzing the data accurately; Actionable – in that there is commitment to act on the data collected, Responsible – in ensuring the benefits of data collection outweigh the costs, and Transportable – so that collected data can generate knowledge for other programs.

# WHAT CAN EACH INSTITUTION DO BETTER?

### Ministry of Science and Education

- The indicators used to monitor programs should be expanded to capture all elements of the intervention logic (as specified in program-level reports).
- More information could be collected through surveys in the post-implementation period.
- Verification sources should be more clearly defined.

### Ministry of Economy, Entrepreneurship and Crafts[2]

- Follow-up surveys with beneficiaries and target groups should be conducted to complement existing reporting on outputs and outcomes.
- Indicators that are not specific to implemented project activities (such as number of enterprises supported, etc.) should be tracked internally by program managers and should not be included in reporting requirements towards beneficiaries.

### Croatian Science Foundation

- Indicators should be harmonized across different programs in order to track portfolio performance as a whole.
- Program managers could consider explicitly listing indicators and verification sources in the call document, together with objectives that they correspond to.

### Other institutions

- Programs implemented in cooperation with international partners (such as Eureka, Eurostars, B-Light, etc.) have a complex monitoring system, which should be simplified to reduce the reporting burden on beneficiaries.
- Ensure that the common indicators proposed in the Results Framework follow the same definitions and verification sources to ensure transportability and credibility of information generated, particularly when aggregating across programs that are envisaged to contribute to achievement of common indicators on a strategic level (such as S3).

2 At the time of the preparation of the report, the Ministry of Economy, Entrepreneurship and Crafts ceased to operate and the tasks within the scope of its authority were taken over in July 2020 by the newly established Ministry of Economy and Sustainable Development.

# INDICATOR-LEVEL RECOMMENDATIONS

## New indicators were added to fill the gaps revealed by explicitly developed Theory of Change

**PROGRAM GOAL**

**Increased development of new products and processes due to enhanced RDI capacity of enterprises and their increased collaboration with research organizations**

- [O1] Change in sales revenue after project completion
- [O2] Percentage of sales revenue from product innovations
- [O3] Number of product innovations introduced
- [O4] Number of process innovations introduced

**OUTCOME**

**[A] INCREASED COLLABORATION BETWEEN RESEARCH ORGANIZATIONS AND ENTERPRISES**

[A1] Number of collaborative projects contracted after project completion

[A2] Value of collaborative projects contracted after project completion

**[B] ENHANCED RDI CAPACITY OF ENTERPRISES**

[B1] Value of private investment in R&D projects after project completion

[B2] Number of IPR applications filed

[B3] Change in employment of researchers in enterprises after project completion

**New indicators** added based on Theory of Change

## Some indicators were combined to streamline the results framework and ensure comparability

| BEFORE | AFTER | |
|---|---|---|
| Increased sales revenue<br>Increased revenue from exports | Change in sales revenue after project completion | **One indicator** to replace four similar indicators defined in the call documentation and the S3 monitoring framework |
| Increase in companies' turnover compared to year of contracting<br>Increase in share of turnover from exports compared to contracting year | **Disaggregation:** Out of which: Change in revenue from sales abroad (export)<br><br>**Optional Measures:** Percentage change in sales revenue; Percentage change in revenue from sales abroad | **Disaggregation** and **optional measures** defined to capture additional details of interest |

## Process indicators were added to measure the operational performance of each program

| | |
|---|---|
| **GRANT AWARD RATE** | Number of contracts awarded/Number of proposals received |
| **PROJECT AWARD DELAYS** | Days elapsed between publishing call for proposals and awarding contracts |
| **PROJECT COMPLETION RATE** | Number of projects successfully finished/Number of contracts awarded |
| **DISBURSEMENT RATE** | Amount disbursed/Amount allocated for grants |
| **FINANCIAL CORRECTION RATE** | Amount withdrawn/Amount of grants disbursed |
| **VALUE OF FUNDS DISBURSED** | Total funds disbursed to the beneficiaries from the program |
| **NUMBER OF APPLICANTS AWARDED FUNDS** | Number of applicants who were awarded funds from the program |

## Existing indicators were revised and assigned a specification of indicator level, disaggregation, targets, deadline for achievement, verification sources and data collection process

| BEFORE | AFTER | |
|---|---|---|
| Number of new products/ services on the market supported by the project | Number of product innovations introduced | **Indicator name and definition** revised and harmonized to improve clarity and facilitate aggregation across programs |
| Not defined | Outcome/impact (depending on the program) | **Indicator level** set in line with explicit Theory of Change developed for the program |
| | By S3 thematic priority area; by industry; by market (domestic, international); by type (goods, services); by novelty (new, improved) | **Disaggregation** defined to enable more granular analysis and merging separate indicators |
| | At least one per project | **Targets** defined for all indicators to enable assessment of success of the program against expectations |
| | 5 years from project completion | **Deadline for achievement** defined for all indicators |
| | Implementation and post-implementation reports; supporting evidence | **Verification sources** defined for all indicators |
| | Target assigned during application phase; annual reporting during project implementation period; post-implementation reporting and assessment 1, 3 and 5 years after project completion | **Data collection process** defined for all indicators |

# STEP-BY-STEP GUIDE TO DEVELOPING AN M&E STRATEGY

## STEP 1 — Define the problem

Identify the 'focal problem' → Diagnose the possible factors that contribute to the problem → Identify the underlying 'root causes' of each factor

### CONSTRUCT A PROBLEM TREE

#### PROBLEM TREE

**FOCAL PROBLEM**

What is the challenge we are trying to overcome?

**Low** competitiveness of enterprises in international markets

**POTENTIAL FACTORS LEADING TO PROBLEM**

What are the factors contributing to the problem?

- Products are perceived as **lacking** in quality
- Entrepreneurs **lack** knowledge or capabilities

**ROOT CAUSES OF POTENTIAL FACTORS**

Why does this factor occur?

- Entrepreneurs **do not have funds** for capacity building
- Products **do not have** internationally recognized **quality certificates**
- Firms **do not participate** in international fairs or trade shows to present their products

## STEP 2 — Identify objectives

When the defined problems, immediate factors and root causes are "flipped," or written as overcome, then they will read as objectives.

### CONSTRUCT A SOLUTION TREE

#### OBJECTIVES

**PROGRAM OBJECTIVE**

What is the program aiming to achieve?

**Increased** competitiveness of enterprises in international markets

**OUTCOME-LEVEL OBJECTIVES**

Medium-term results from achieving output-level objectives

- **Improved** perception of quality
- **Improved** capabilities of entre-preneurs

**OUTPUT-LEVEL OBJECTIVES**

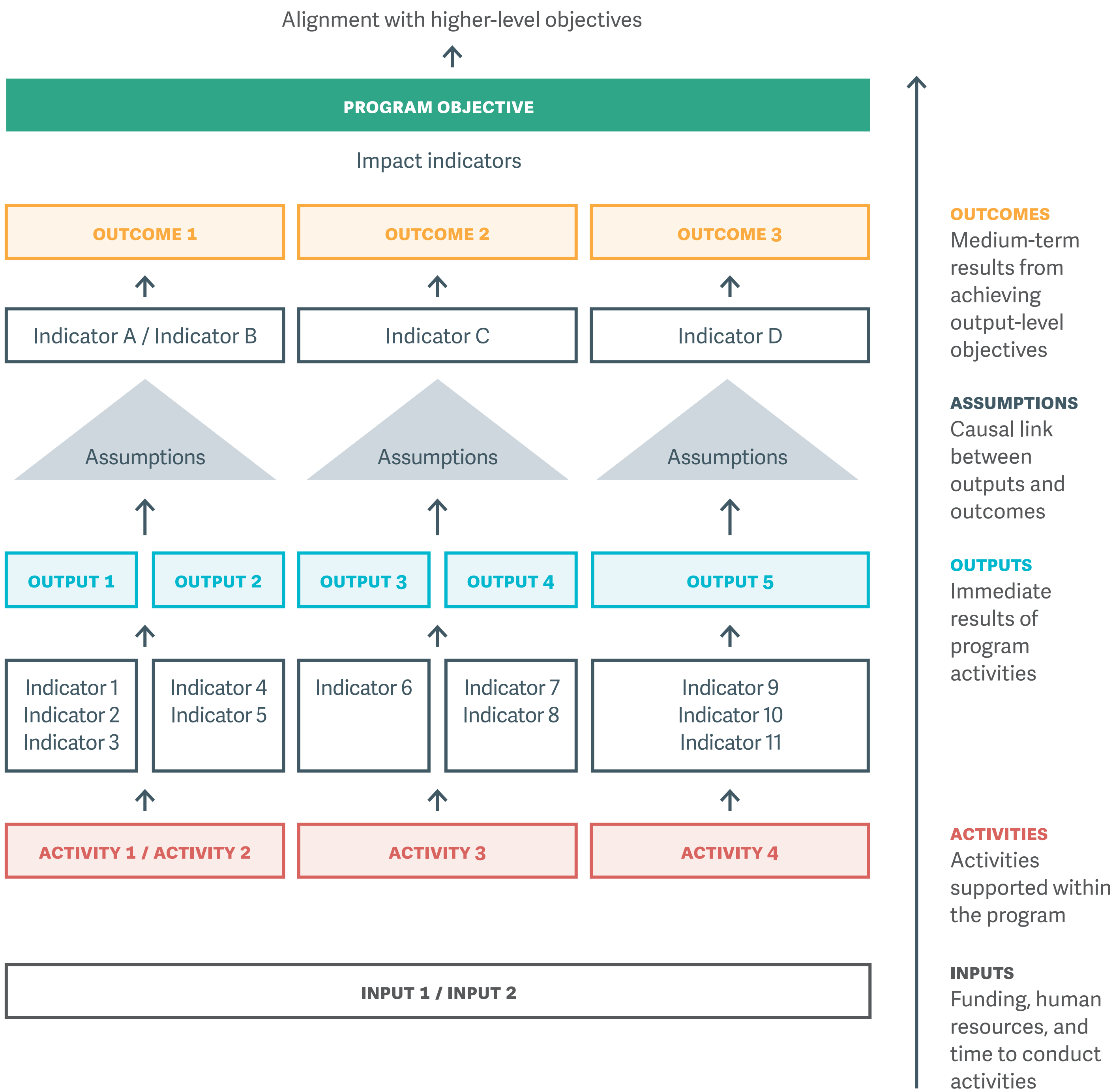
Immediate result of program activities

- Entrepreneurs **attend** training on how to enter foreign markets
- Products **are certified** with international quality standards
- Firms **participate** in international fairs or trade shows to present their products

## **STEP 3** — Develop a Theory of Change

A Theory of Change illustrates the "pathways of change," connecting the inputs that are going into the project to conduct various activities with the expected outputs, short-term and longer-term outcomes.

### CONSTRUCT A THEORY OF CHANGE DIAGRAM



## **STEP 4** — Construct a Results Framework

The Results Framework identifies indicators based on the Theory of Change for the program. For each indicator, the RF presents:

1. **a clear definition** so that interpretation and unit of measurement of the indicator is consistent,
2. **disaggregation** of the indicator that enables more granular analysis and comparisons,
3. **target** setting, with a standard approach for baseline and deadline for achievement, and
4. **methods of data collection and verification,** including frequency, process, and sources.

**SET UP THE RESULTS FRAMEWORK**

## **STEP 5** — Develop an Evaluation Plan

1. Define the types of evaluations to be conducted (process/performance, impact).
2. Develop appropriate instruments and systems for data collection (surveys, web-based dashboards).
3. Dedicate resources to evaluation.
4. If impact evaluation is envisaged, plan processes to collect data on non-beneficiaries.

**DEFINE EVALUATION PLAN**

## **STEP 6** — Implement M&E system

**Program design** → Develop the M&E strategy (Steps 1-5).

**Application stage** → Communicate the Theory of Change, Results Framework, and Evaluation Plan to applicants so they can understand the intervention logic and reporting requirements.

**Program implementation** Applicants should report on indicators, and program managers should analyze the data within and across projects and programs.

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