

TWINNING CONTRACT

BA 15 IPA SR 01 17

Support to the reform of the statistics system in Bosnia and Herzegovina



MISSION REPORT

Activity 2.D.3:

Statistical programming in R – Advanced training

Component 2: Business Statistics

Mission carried out by

Signe Hermann, Statistics Denmark

Aksel Thomsen, Statistics Denmark

27 – 30 January 2020

Version: Final

Expert contact information

Signe Hermann

Statistics Denmark

Copenhagen, Denmark

Email: she@dst.dk

Aksel Thomsen

Statistics Denmark

Copenhagen, Denmark

Email: akt@dst.dk

Table of contents

Executive Summary	Fejl! Bogmærke er ikke defineret.
1. General comments	3
2. Assessment and results	3
3. Conclusions and recommendations	4
Annex 1. Terms of Reference	5

List of Abbreviations

BHAS	Agency for Statistics of Bosnia and Herzegovina
BiH	Bosnia and Herzegovina
CBBH	Central Bank of Bosnia and Herzegovina
EC	European Commission
EU	European Union
FBiH	Federation of Bosnia and Herzegovina
FIS	Institute for Statistics of Federation of Bosnia and Herzegovina
MS	EU Member State
RSIS	Institute for Statistics of Republika Srpska
RTA	Resident Twinning Adviser
ToR	Terms of Reference

1. General comments

This mission report was prepared within the EU Twinning Project "Support to the reform of the statistics system in Bosnia and Herzegovina". It was the third mission to be devoted to training in the use of R within Component 2 of the project.

The purposes of the mission were:

- Training of methodology staff in statistical and functional programming in R.

The consultants would like to express their thanks to all officials and individuals met for the kind support and valuable information which they received during the stay in Bosnia-Herzegovina and which highly facilitated the work of the consultant.

This views and observations stated in this report are those of the consultants and do not necessarily correspond to the views of EU, BHAS, FIS, RSIS, CBBH, Statistics Denmark, INSEE, Statistics Finland and Croatian Bureau of Statistics.

2. Assessment and results

The Terms of Reference mentions the following expected output of the activity:

- Advanced training provided to methodology staff

The consultants have prepared a set of lectures (including both slides and exercises) which were presented to the participants. The material is available online at <https://akselthomsen.github.io/IR-Bosnia-III/>. The content of the lectures and the exercises have given the participants an introduction to sampling, stratification, estimation, and applications of functional programming in R.

Topics covered include:

- Stratification
- Various methods of allocation of samples (proportional, optimal)
- Sample selection
- Direct estimation (HT-estimates)
- Calibration estimates
- Intro to functional programming
- Creating functions in R
- Tidyverse programming with the dplyr, purrr and tidyr packages
- Split, apply, combine paradigm for data analysis
- Intro to applications in Big Data (more precise large data)

Due to weather conditions, we were delayed for one day, and only started Tuesday January 28. This caused us to compress the presentation of the material, particularly the Big Data part, by roughly half a day.

The consultants were impressed by the enthusiasm and eagerness to learn displayed by the participants, particularly when doing the exercises. Furthermore we experienced no technical problems.

The purpose of the course was to give a grounding in a number of techniques, and thus some of the material covered will need more study in order to be understood in depth and implemented. However, if the participants are given time to review the syllabus and read the materials listed on the webpage,

the consultants believe that the participants are in a position to acquire the further knowledge needed to implement those methods they deem to be of use in their daily work.

3. Conclusions and recommendations

- The participants should be allowed time to review the material again, and study the references for each part of the course
- We recommend the participants be allowed to sit relevant online statistical courses, e.g. the Coursera course on Combining and Analyzing Complex Data¹
- The participants should work in small groups when possible and compare notes and solutions
- The participants should try to replicate a current work-flow, e.g. sampling, in R
- In case further training is to be conducted, we recommend that the participants supply practical and concrete challenges from their everyday working life and that the training be targeted at solving the challenges supplied

¹ <https://www.coursera.org/learn/data-collection-analytics-project>

Annex 1. Terms of Reference**Terms of Reference****EU Twinning Project BA 15 IPA ST 01 17****Component 2: Business Statistics****27- 30 January 2020****Agency for Statistics of BiH****Zelenih bertki 26, Sarajevo****Activity 2.D.3: Statistical programming in R – Advanced training****1. Result for the activity**

- Knowledge gained on programming in R

2. Purpose of the activity

- Advanced training of non-IT staff to programming in R

3. Expected output of the activity

- Advanced training provided to methodological staff

4. Participants**Agency for Statistics of BiH (BHAS)**

- Edin Šabanović, Assistant Director in The Sector for Statistical Methodology, Standards, Planning, Quality and Coordination
- Jasna Isaković, Head of Department for Sample Design and Methodology
- Aida Zukanović, Senior Advisor in Department for Sample Design and Methodology

Institute for Statistics of Federation of BiH (FIS)

- Asmira Selimović, Head of Department for statistical methods and coordination
- Edina Mehidić, Associate for sampling and statistical analysis

Institute for Statistics of Republika Srpska (RSIS)

- Lazo Šegrt, Senior Statistician for Agriculture and Fishery Statistics
- Vedrana Dejanović, Statistical Sample and Analysis

MS Experts

- Signe Hermann, Statistics Denmark
- Aksel Thomsen, Statistics Denmark

Twinning Project Administration

- Katja Møller Hjelvang, RTA
- Đemka Šahinpašić, RTA Assistant