

TWINNING CONTRACT

BA 17 IPA ST 01 20



Further Support to the Reform of Statistics System in Bosnia and Herzegovina



MISSION REPORT

Activity 2E2: Analysis of the Pilot Agricultural Census Results

Component 2 - Agriculture Statistics

Mission carried out by

Irena Oresnik

16 – 18 January 2023

Version: Final

Expert contact information

Irena Oresnik
Ljubljana, Slovenia
irena.oresnik@gmail.com

Table of contents

1. General comments	4
2. Assessment and results	4
Background	4
Analysis of the coverage of the frame	5
AC frame.....	8
Threshold	9
Identification of non-significant and non-existing items which are not relevant for BiH, since the item does not exist or is not significant.	10
Further analysis of the Pilot agriculture census	11
Working groups	11
The timing of the second pilot AC and the full AC.....	11
Second pilot agriculture census	11
CAPI application.....	12
3. Conclusions and recommendations	12
Annex 1. Terms of Reference for the current mission.....	13
Annex 2. Persons met	15

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 "Further Support to the Reform of the Statistics System in Bosnia and Herzegovina". It was the part II of the fifth mission to be devoted to Agriculture Statistics, Component 2, of the project.

The purposes of the mission were:

- Review of the frame, details of its design and some information on data collection
- Data editing on the basic level, focusing especially on the detection of the (significantly) outlying values
- Estimation and analysis of key agricultural units
- Deciding on the practical procedure for the next steps for the agricultural census.
- Analysis of the results of the Pilot agricultural census 2022 (introductory questionnaire)
- Analysis of the status of households used in the Pilot agricultural census 2022
- Analysis of new households recorded during the Pilot agricultural census 2022
- Analysis of the thresholds used during the Pilot agricultural census 2022

The consultant would like to express her thanks to all officials and individuals from Bosnia and Herzegovina met for the kind support and valuable information, and which highly facilitated the work of the consultant.

These views and observations, stated in this report are those of the consultant and do not necessarily correspond to the views of EU, BHAS, FIS, RSIS, CBBH, Statistics Denmark, Statistics Finland, Statistics Sweden or The Italian National Institute of Statistics.

2. Assessment and results

Background

The participants presented the state of the art concerning the implementation of the Pilot agriculture census. The pilot agriculture census was carried out in October 2022. The objectives of the pilot were the following:

- To test the coverage of the frame
- To test the questionnaire and related methodology
- To test the Computer-Assisted Personal Interview (CAPI) application used for the collection of the data

A pilot was implemented on the sample. The enumeration areas were selected among the rural and urban enumeration areas. The sample was divided into two subsamples:

- one subsample was used to test the coverage by implementing door to door, visiting all the buildings in the enumeration areas. In that case, only a short questionnaire was filled

in, where the short questionnaire is the screening questionnaire for the identification of households with agriculture activity above the predefined threshold.

- in the other subsample, the enumerators only visited the households on the list, where the list for rural enumeration areas (EA) only included households from the Population and Housing Census (PHC) 2013, while the lists for urban EAs included only households from PHC 2013 with agriculture activity amended with the units with agriculture activity obtained from the administrative farm register kept by the Ministry of agriculture.

All entities implemented the pilot, however, in the FBIH some of the EAs were not surveyed, since they could not find enough surveyors.

All data were collected by face-to-face interviews using the CAPI application. RSIS used the IST application, while in District Brčko and FBIH, the CS PRO platform was used.

Analysis of the coverage of the frame

During the mission, several topics were discussed in line with the TOR, where the main objective was to derive conclusions concerning the frame to be used in the future AC. The analysis performed by statistical offices is still at an early stage, therefore the majority of the time was spent defining additional analysis to be implemented to be able to derive relevant conclusions on the future AC frame.

RSIS already performed the analysis concerning missing households and agricultural holdings as identified by the first subsample (a short questionnaire). The identified potential missing households were around 70, but after several analyses, only 4 households with agriculture activity remained as really missing. Even the last four are questionable in the sense that the land they have reported is very likely only owned, but not used. That is concluded on the bases that the identified units have an area of permanent grassland, which is disproportionate to the livestock they breed.

The analysis performed by RSIS were the following:

1. The identified new households were matched with other households in the frame. The personal identification number (PIN) was used for matching. In this way, the households which were identified as new were partly found in other EAs, usually in the neighbouring EAs. Such units were deleted from the list of new households.
2. Within the new households, the households with agriculture activity above the threshold were identified and units were re-contacted to see if they are real farms.
3. The identified households with agriculture activity were matched with the administrative farm register. All matched units were deleted from the list of new households with agriculture activity.
4. The remaining households with agriculture activity were analysed in detail and the disproportion between the area of permanent grassland and livestock number was identified (see above).

In the Brčko District the administrative farm register is not available (exists, but is not provided, even though requested and promised several times). Some new farms were identified, but could not be verified if the farm exists in the administrative register. The number of new farms is low.

FBIH has already done most of the analysis of the missing households, however, all analysis, as performed by RSIS, should be done for the newly identified households. For now, 194 households with agriculture activity above the threshold were identified. In addition to the implementation of the analysis, as done by RSIS; in cases where the number of “new” households is significant in a specific EA, the enumerator is to be contacted and the criteria used by enumerators for “new” households are to be verified. The error can be in the PHC database or it happened by the misunderstanding of the pilot census methodology by the surveyor. It must be verified that the enumerator understands the rules. The biggest danger is that the households were listed as new, even though they existed before, but the heads of the households are new. All details should be presented in the pilot census report.

The final number of “new” households with agriculture activity is needed for concluding.

All three entities (including Brčko District) must add the new response status concerning new households with agriculture activity above the threshold (the household did not exist in PHC 2013, but according to the pilot census survey exists and has agriculture activity above the threshold). The new response status is suggested to be 9 (in the questionnaire the response status for new farms does not exist).

None of the entities has yet analysed agricultural holdings, which appeared as agricultural holdings above the threshold in the pilot census, but did not have agriculture activity according to the Population Census 2013 (PHC 2013). The number of them is relatively high (about 10%) for all households in the sample. Some calculations in that respect were done during the previous mission carried out by Rudi Seljak.

Concerning the agricultural holdings mentioned in the previous paragraph (found in the pilot census, but not existing in PHC 2013), the following analysis should be implemented by all 3 entities:

1. Identify the remaining outliers in the short questionnaire (at least) and correct them.
2. Verify that the households are correctly classified according to threshold criteria. Verify the used formulas. For the second part of the sample where the short and long questionnaire was applied, verify that the detailed data of the long questionnaire confirm the short questionnaire calculation of the threshold.
3. Calculate the number of Livestock units (LSU) of each household with agriculture activity above the threshold, based on the information from the short questionnaire. Use only the totals (021, 023, 025, 027, 029) and apply EU coefficients.
4. Calculate the area of permanent grassland for the units which answered just a short questionnaire (deduce all relevant listed land use categories in the short questionnaire from Utilized agriculture area (UAA)) 011-(012+016+017+018+019)
5. Calculate new indicator: number of LSU per 1 hectare of permanent grassland.

6. Identify all units where the LSU per hectare is less than 0,2 LSU per hectare of permanent grassland and verify the data by calling back the farmers. Correct the data where it is identified that the grassland is only possessed and not used or it is used only partly. Correct the response status.
7. Recalculate the threshold indicator with the new data.
8. Match the pilot census data and pilot census frame and identify the household, which did not have agriculture activity in the PHC 2013, but has agriculture activity above the threshold in the pilot AC.
9. Match the identified households with agriculture above the threshold with the administrative farm register. Delete from the new farms all farms which were matched (if they exist in the administrative register, they will be on the list and cannot be considered new).
10. Mark the remaining units as new agricultural holdings with new response status 10. (The households with status 11 are the households with agriculture activity above the threshold, they existed in PHC2013 but they were not households with agriculture activity. The households with status 11 could not be found in any of the administrative sources).

Along with the analysis, also the response statuses are to be corrected. The above-mentioned analysis should result in the corrected data (where the error is identified) and in to correct response status. The analysis will particularly have an impact on the two statuses (status 6 (duplicate) and status related to threshold 035= 1 (yes)).

The data are to be adjusted for nonresponse, where the response statuses which represent the non-response are 2 and 3, and 7 In the case of status 2 and 3 it is not clear what is nonresponse and what is over coverage so the 0,5 coefficient is to be applied.

The results of the extrapolated data should present the under-coverage and over-coverage in terms of the number of farms and in terms of land and livestock by categories as used in the short questionnaire.

The over-coverage is all the households that are below the threshold (035 is 2 (no)) and the ones with response status 4 (no more farming), 5 (house demolished), and 6 (duplicate).

Under coverage are the ones belonging to statuses 9 and 10.

The over-coverage and under-coverage are to be presented by all listed statuses (4,5,6) as well as in an aggregate way (for 4,5 and 6 together).

In addition, the under-coverage is to be presented also by items related to the sale of the products (034 selling or not) and concerning different possible thresholds (details see below under item “threshold”).

AC frame

The data on potential under coverage are significant in the decision-making concerning the frame to be used in the AC. The detailed data are not yet available. Three options are to be considered in the future AC. The choice is to be done based on different aspects when the under-coverage is the important one, but cannot be considered in isolation from other aspects, such as needed field staff, needed equipment, and differences in training and monitoring demands.

Below are the three options under consideration.

Option 1: Door-to-door implementation by visiting all buildings with the help of updated maps. For sure, if correctly implemented, the method under option 1 would solve the problem of under-coverage, at least theoretically. However, using option1 would involve hiring approximately double the number of fieldwork staff (in comparison to the use of a list of agricultural holdings only), as well, the updated maps are needed, and rather complicated methodology is involved. That would not require only a considerably bigger budget and equipment needed, but would also require additional preparatory time. The methodology of identifications of households and agricultural holdings would be as used in the PHC or very similar.

The first results of the analysis show that this is not needed for RSIS and Brčko District, while for FBIH the final word cannot be said. If the decision would be taken to use option 1 then this would be somehow justified only if the operation would be done in common with the next PHC (to avoid the duplication of activities with PHC). If that methodology is to be used, the AC can be implemented at the earliest in 2025.

Using option1, would not necessarily contribute to more reliable census results than option 2 or 3. The complicated methodology related to the identification of the agricultural holdings would result in a diverted focus and exceeding the number of field staff, which would be difficult to hire, train and monitor. (the least recommended option)

Option 2: Use of a list of households in rural areas and a list of agricultural holdings in urban areas, both amended with administrative farm register

This solution can be considered a door-to-door method, as well. This is a good solution for improvement of coverage if the analysis would show that considerable under coverage exists in the existing list of agricultural holdings, However, also in this case the exceeding number of field staff is needed, which, as already said, is difficult to hire, sufficiently train and monitor. (Recommended only, if option 3 would not reach acceptable coverage)

Under option 2 the frame would be generated in the following way:

1. Take the list of households from PHC 2013.

2. Match the list with the administrative farm register and with the cattle register. For them, the identification data of all persons by the households are needed to improve the share of the matched units. Currently, the entities have available only the identification data of the persons for the households with agriculture activity.
3. Add unmatched units to the list within the settlements.

Option 3: Use of list of agricultural holdings amended with administrative farm register and use of the household list in the EAs where the PHC list of agricultural holdings is incomplete.

The BiHBC statisticians identified some of the deficiencies of the current PHC 2013 frame, which could be improved to a big extent. The cases were identified, where the enumerator in the PHC 2013 did not ask at all about the agricultural activity of the household or did not ask all the households in the EA.

On one hand, the use of administrative data in combination with the PHC list will ensure that important agricultural holdings are covered. Further improvements are possible by using the list of all households in the EAs, where the questions on agriculture were not asked during PHC2013.

Under option 3 the frame would be generated in the following way:

4. Take the list of households with agriculture activity from PHC 2013.
5. Match the list with the administrative farm register and with the cattle register. For them, the identification data of all persons by the households are needed to improve the share of the matched units. Currently, the entities have available only the identification data of the persons for the households with agriculture activity.
6. Identify the rural settlements where the number of agricultural holdings in the settlement is lower in the PHC 2013 list than in the administrative register.
7. For the above-identified settlements, use the complete list of households instead of agricultural holdings from 2013.
8. Add unmatched units (from point 5) to the list within the settlements.
9. Use the local knowledge of advisory service to identify additional settlements where the use of the list of all households would be needed and use the complete list of households also in these cases.

Threshold

The training on threshold calculation was implemented in the spring of 2022. Additional activities in that respect were suggested, but not implemented. One of the prepared versions of the threshold was used in the pilot. The coverage concerning UAA and livestock units is about 99 %.

Some additional simulations were tested during the mission, to make the criteria used in the threshold more equal. For livestock, the LSU was used instead of independent criteria in terms

of the number of livestock. In the case of land, as well the scenarios were tested, where bigger importance was given to arable land and permanent crops, while the permanent grasslands are supposed to enter the threshold through the livestock. The coverage was calculated on national and entities level. The tests provided good coverage in all key items and the tested criteria are covering complex cases. The number of units above the threshold remained like the previous simulations (about 80% of farms cover 98 % of UAA and above 98 % of LSU). Further simulations are necessary and the most appropriate one should be identified. The threshold is usually one of the key items of interest to the stakeholders. It is recommended to establish working groups for AC, where the key different professionals who can contribute to the preparation of AC are to be included. The working groups already established, but not active, can be activated.

The stakeholders should get different scenarios, which should include the criteria and estimated coverage of livestock and land. The final threshold is to be agreed upon together with the stakeholders.

The current threshold is low, with good coverage, and provides the space to set it higher. The higher threshold might also have an impact on the potential under coverage. It is suggested that the under coverage of the frame is evaluated also from the point of the threshold used. The suggested under-coverage estimates are to be prepared also in respect to different possible thresholds.

Identification of non-significant and non-existing items which are not relevant for BiH, since the item does not exist or is not significant.

During the mission, the integrated farm statistics (IFS) variables were reviewed in terms of their significance on the level of entities. Some variables are not relevant for BiH, and some are not relevant for one of the entities. The variables were discussed in terms of their importance and in term of their inclusion in the questionnaire. As well. it was identified for which items the administrative data can be potentially used. BA will need to provide Eurostat with the filled-in templates; one on non-significant and non-existing items and one on the use of administrative data. Several variables were identified for which more information is needed. The pilot census data will be one source of information. The existence of certain phenomena in BiH is to be discussed also with experts outside statistics, in case of doubts. The working groups, suggested above, can be a place for these discussions as well. On that bases, the templates are to be filled in and the content of the questionnaire is to be finalized.

There are certain phenomena, which are directly linked to the CAPI and cannot be implemented in BiH, however, the data on national policy measures can be collected or better added to the farms on the bases of the administrative data (matching is necessary.)

Further analysis of the Pilot agriculture census

The pilot census was not yet analysed, apart from partly analysis of coverage. The pilot is to be analysed also from another aspect, where with the help of different controls and queries the main problems are to be identified, the source of the problem identified, and the actions for improvements agreed upon. The results should be the pilot census report with the list of activities to be implemented, all to improve the instruments and methodology.

Working groups

Internal working groups are to be defined back-to-back with the preparation of the action plan. AC is a big operation and close cooperation with other units is essential (IT, legal, financial, data dissemination, GIS,).

As well the working groups with external members are to be defined.

The timing of the second pilot AC and the full AC

BiH declared that the full AC will be implemented in the autumn 2023. However, considering the lack of legislation, lack of a defined budget, lack of final decision on the frame for AC, and technical preparations being well behind the schedule, the implementation of AC in 2023 is not realistic. It is proposed to implement a second pilot AC in the autumn 2023 and the full AC in autumn 2024, where the implementation of AC in 2024 is possible only if activities continue with an accelerated tempo and if the frame for the census will be the amended list of agricultural holding from PHC 2013. The use of a door-to-door approach, especially by visiting all buildings, would postpone the AC for a minimum of one more year. The use of a household list would extremely increase the work related to recruitment, training, and monitoring of the fieldwork staff (approximately double the number of staff would be needed).

Second pilot agriculture census

The second pilot agriculture census is suggested in autumn 2023. The revised questionnaire and related CAPI application will be tested. It was suggested that the sample will include up to 500 farms on the level of BiH. The sample is not to be selected randomly. The farms should be close to Banja Luka, Sarajevo and Brčko and farms of different types and sizes are to be included. The preparation of the CAPI application must start and need to be tested in the office first or on some farms close to the office. It has to be done by agriculture statisticians involved in the AC. An additional pre-test in the field is suggested. The pre-test in the field should include 50 farms. The surveyors should be selected randomly, trained, and followed in the field. The followers are expected to be the agricultural statistics team. They are supposed to follow the interview in silence and register the observations. This should serve for final improvements in the questionnaire, CAPI application, and training.

CAPI application

Two different applications were used, using two different platforms (IST and CSPRO). That causes some problems in the generation of the unique database (see a report by Rudi Seljak). All data were collected by laptops, even the CSPRO could be also used on tablets. It would be preferable to use the same CAPI application. CS PRO has some very useful characteristics; it runs on laptops and tablets and the coordinates of the farms can be automatically registered. Possible use on tablets makes the work of enumerators easier; it is difficult to carry a heavy laptop. Automatic registration of geographical coordinates enables registration of the location of the farm headquarters, which can be very useful in the case of BA, where the address system is missing in many rural areas. As well the location can be used for matching. The registration of the location is also very useful in monitoring the work of enumerators.

3. Conclusions and recommendations

- **Final recommendations for frame/sample design and data collection strategy reviewed;**
To be able to derive conclusions on the most appropriate strategy concerning the frame to be used, the analysis listed in the report should be implemented.
- **Frame indicators estimated**
The relevant indicators on the coverage of the frame can only be calculated after the analysis recommended.
- **Final recommendations for the status of households to be used for the full scope AC 2023**
The conclusions can be drawn after the suggested analysis is implemented.
- **Final recommendations for thresholds to be used for the full-scope AC 2023**
Additional simulations are to be implemented and discussed with the key stakeholders.

Annex 1. Terms of Reference for the current mission

Terms of Reference

EU Twinning Project BA 17 IPA ST 01 20

Component 2 - Agriculture Statistics

Period: 16 - 19 January 2023

Venue: Republika Srpska Institute of Statistics, Vladike Platona bb, Banja Luka, Bosnia-Herzegovina.

Activity 2E2: Analysis of the results of the pilot agriculture census

1. Mandatory result

The component on Agricultural Statistics has three main objectives:

- 2.1 Master Plan for Agriculture statistics for the period 2020-2030 developed and adopted (with clearly defined objectives, timetable of implementation for the implementation of the objectives, and precisely defined responsibilities of all stakeholders.)
- 2.2. Cooperation among all stakeholders improved
- 2.3. Protocol(s) on cooperation and exchange of data among all stakeholders adopted

Indicator / Relevant Milestones / Internal deadlines:

- Master Plan for Agriculture statistics in BiH available on the web
- Identification of stakeholders at the national and entity level
- Responsibilities of each stakeholders clarified
- Overview of currently available data both administrative and from surveys
- Development of roadmap for implementation
- Development of initial budget for agricultural census
- Definition of SRPG ~Statistical Register of Agricultural Holdings
- Development of high-level cooperation agreements / Memorandums of Understanding
- Protocols describing specific exchange of data

2. Purpose of the activity

- Review of the frame, details of its design and some information on data collection
- Data editing on the basic level, focusing especially on the detection of the (significantly) outlying values
- Estimation and analysis of key agricultural units
- Deciding on the practical procedure for the next steps for agricultural census.
- Analysis of the results of the Pilot agricultural census 2022 (introductory questionnaire)
- Analysis of the status of households used in the Pilot agricultural census 2022
- Analysis of new households recorded during the Pilot agricultural census 2022
- Analysis of the thresholds used during the Pilot agricultural census 2022

3. Expected output of the activity

- Final recommendations for frame/sample design and data collection strategy reviewed
- Frame indicators estimated
- Final recommendations for the status of households to be used for the full scope AC 2023
- Final recommendations for thresholds to be used for the full scope AC 2023

Annex 2. Persons met

BHAS:

Jasna Isaković, Head of Department for Sample Design and Methodology
Ljubiša Eškić, Senior Advisor for Structural Statistics in Agriculture
Fahrudin Subotić, Senior Advisor for Production of Statistics in Agriculture and Fishery
Lidija Lukić, Senior Officer for Agriculture statistics
Neno Svjetlanović, IT officer - Department for applications and management of databases

RSIS:

Biljana Đukić, Head of Production Statistics Department
Lazo Šegrt, Head of Department for Statistics of Agriculture, Forestry and Environmental Protection
Nada Šobot, Senior Officer for Agriculture Statistics
Danijela Savanović, Senior Officer for Agriculture Statistics
Branislav Gojković, Senior Officer for Agriculture Statistics
Pero Kazanović, System programmer
Vedrana Dejanović, Senior expert for statistical sample and analysis

FIS:

Elmina Ramić-Lukač, Senior Officer for Agriculture Statistics
Amel Sikirić, Senior Officer for Databases

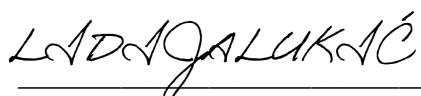
RTA Team:

Niels Madsen

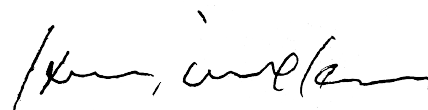
Signatures

For the approval of the contents of this report, representatives from BHAS, FIS and RSIS as well as MS experts and the RTA sign here:

Date:



Component leader, BHAS



Component leader, FIS



Component leader, RSIS



RTA

MS Expert