



Training Technical Report

“Advanced Statistical Analysis using SPSS”
28-31 March, 2021



Photo credit: Dr Masnat AL Hiary (NARC-Jordan), 2021.

Strengthening Innovation and Technology Adoption towards Sustainable Agricultural Productivity in Arab Countries

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April 2021

EXECUTIVE SUMMARY

Name of the projects associated to the training course

Strengthening Innovation and Technology Adoption towards Sustainable Agricultural Productivity in Arab Countries (Case of Jordan)

Name of the training course

Advanced Statistical Analysis using SPSS.

Venue / Location of the training course

Physical classroom training through Trainer: Dr. Mohammad Khalaf

Schedule of the training course

28 – 31 March, 2021

Organization of the training course

National Agricultural Research Center NARC - Jordan

About the trainer

Eng. Mohammad KHALAF PMP, Statistical Expert (khalaf30@yahoo.com; khalaf30@gmail.com)

Purpose of the training course

The purpose of the training is to enhance capacity of the socio-economic researchers who are engaged in the component of the projects on **Strengthening Innovation and Technology Adoption towards Sustainable Agricultural Productivity in Arab Countries (Case of Jordan)**

Training course learning objectives

To provide the socio-economic team with the advanced technical skills required to deliver on the socio economics activities and outputs of the outlined project implementation and beyond. Preceisely, to provide them with up-to-date knowledge and enhanced capacity in intermediate and advanced analysis of data.

Training course specific objectives

- Developing and reinforcing participants' knowledge and understanding of statistical analysis of agricultural data.
- Empowering participants with the required skills to assess, formulate , interpretations and differentiate between reasonable and dubious conclusions.

Training course outline

The training is divided in two sections:

- Section I: theoritcal presentation—an introduction to statistical principles – guideline manual for using SPSS soft ware (4 lectures).
- Section II: practical exercises on using SPSS to analyse data and interpret the results and reporting

Training course implementation process

- This training course is designed to be interactive and participatory – discussion, and debate is encouraged.
- Sharing field-based experiences and insights with the participants.
- Training methods and activities:
 - Comprehensive approach, including theoretical lectures and using guideline SPSS manual.
 - Exercises and practical sessions in plenary to help attendees using the tool appropriately.

Specific output

Around **11** socio economic researcher-trained from NARC , (Jordan) involved in the project trained on Advanced statistical analysis using SPSS.

Specific outcomes

At the end of this short training, participants should be able to do the following:

- To realize the relationship between statistics and data
- To distinguish between types of statistics
- To distinguish between discrete and continuous variables
- To define , compute and interpret the range , variance and standard deviation and explain of these measures
- To determine the relationship between two variables
- Learn what regression means, to interpret the computations of slope and intercept

Trainer Dr Mohammad Khalaf References – E-training records

- [https:// www.statanalysis.weebly.com](https://www.statanalysis.weebly.com)

GENERAL OVERVIEW

Statistics is a crucial process behind how we make discoveries in science, make decisions based on data, and make predictions.

This course provides an application-oriented introduction to the statistical component of IBM SPSS Statistics. trainer and the trainees reviewed several statistical techniques and discussed situations in which they would use each technique, how to set up the analysis, as well as how to interpret the results. This included a broad range of techniques for exploring and summarizing data, as well as investigating and testing relationships. through the training , trainees gained an understanding of why ,how and when to use these various techniques as well as how to apply them with confidence, interpret their output, and graphically display the results.

As within the planned activities of ICARDA-of the Strengthening Innovation and Sustainable Technology Adoption Agricultural Productivity in Arab Countries (Case of Jordan) project implemented in Jordan named “Economic Feasibility Study of Dairy Processing (Sheep and Goat milk) at the Household: Case of Jordanian Badia Communities ” conducted a training course targeted socioeconomic researchers from NARC, an classroom training course on“ Advanced statistical analysis using SPSS ”. The training was implemented through Trainer: Dr. Mohammad Khalaf from 28-31 March 2021.

ICARDA is considered a valued partner for NARC to formulate economic assessment and adoption of agricultural technologies. This course offers and create a short aquick knowledge training to cover precisely the top of statistical tools SPSS program (Statistical Package for the Social Sciences) is perhaps the most widely used statistics software package that need in research to make data shine and experiments planned and executed correctly.

In a period of four days, the course provided the trainees from socioeconomic directorate with the knowledge and skills necessary to the ability to easily compile descriptive statistics, parametric and non-parametric analyses, as well as graphical depictions of results through of any data captured by the project.

PURPOSE

The purpose of the above training course was the development and enhancement of the participant’s theoretical and contextual knowledge regarding the following topics: introduction to statistical, important of data , methods of organize data , shapes of distribution and learn the measures of central tendency, percentiles, variance, correlation and regression.

This course therefore was designed to ensure that socio-economic team reach the following objectives:

- Developing and reinforcing participants’ knowledge and understanding of statistical analysis of agricultural Data.

- Empowering participants with the required skills to assess, formulate, interpretations and differentiate between reasonable and dubious conclusions.

TARGETED AUDIENCE

The target audience for this course is the staff of National Agricultural Research Center (Jordan); socioeconomic directorate team as part of the project.

ORGANIZING Training

- Dr. Boubaker Dhehibi, Social, Economic, and Policy Research Team – SEPRT – ICARDA, Tunis – Tunisia (b.dhehibi@cgiar.org).
- Dr. Masnat Al Hiary, Coordinator, Director of Socio-Economic Research Directorate, NARC, Jordan (masnath@yahoo.com).
- Eng. Omamah Al Hadidi, Coordinator assistant, Head of Socio-Economic and Adoption Research Department, NARC, Jordan (omamahfm71@yahoo.com).

COURSE STRUCTURE

Course instruction was organized through tutorial and practical sessions, which provided participants with hands-on experience using different statistical data sets and how to analyse data by using SPSS program and interpret the results, (see Annex I). The course covered the following themes:

- **Theme I:** theoretical presentation– Presentation to an introduction to statistical principles –guideline manual for using SPSS soft ware (4 lectures).
 - Importance of Data
 - Methods of organize data
 - Shapes of distribution
 - Measures of central tendency
 - Percentiles
 - Measures of variance
 - Simple linear correlation and regression
- **Theme II:** practical exercises on using SPSS to analyse data and interpret the results to the reporting
 - Evaluation of theoretical information into a process in how to enter, choose commands to produce and extract results.
 - Determination of statistical measures indicators by using the commands from spss program
 - Interpretation and discussion of output results
- **Theme III: General discussion**

The last session was focused on discussion and reflection around the following topics

- What is needed further more in using SPSS and the advanced analyse

- suggest to apply all the training information and the exercises after the training
- how to use the data and make a good models to write a good scientific papers.

COURSE IMPLEMENTATION

The course counted with the participation of Socioeconomic Directorate from NARC. The course was implemented in classroom training and attended during the entire four days by 11 participants, from whom eight were women (Annex III). The part regarding the course instruction was delivered by statistical expert from Department of statistics (Annex II). two thematic areas were covered by this training course:

- I. **Theoretical** presentations– Presentation to an introduction to statistical principles – guideline manual for using SPSS soft ware, Importance of Data, Methods of organize data, Shapes of distribution, Measures of central tendency, Percentiles, Measures of variance, Simple linear correlation and regression.
- II. **Practical** exercises on using SPSS to analyse data and interpret the results to the reporting, evaluation of theoretical information into a process in how to enter, choose commands to produce and extract results, determination of statistical measures indicators by using the commands from SPSS program, Interpretation and discussion of output results.

The training was conducted and implemented jointly by ICARDA and the Socioeconomic Directorate at NARC with the financial support from ICARDA.

GROUP ASSESSMENT

Given the main outcomes of the training are to understand the importance and enhancing knowledge and skills of the following areas: To realize the relationship between statistics and data, To distinguish between types of statistics, To distinguish between discrete and continuous variables, To define, compute and interpret the range, variance and standard deviation and explain of these measures, To determine the relationship between two variables, Learn what regression means, to interpret the computations of slope and intercept.

This training course provided an application-oriented introduction to the statistical component of IBM SPSS Statistics. trainees were review several statistical techniques and discuss situations in which they would use each technique, how to set up the analysis, as well as how to interpret the results. This includes a broad range of techniques for exploring and summarizing data, as well as investigating and testing relationships. Trainees gained an understanding of when and why to use these various techniques as well as how to apply them with confidence, interpret their output, and graphically display the results. The selected trainees were fully involved in the **“Strengthening Innovation and Technology Adoption towards Sustainable Agricultural Productivity in Arab Countries (Case of Jordan)**

Project.

Thus, the post-training assessment, based on trainees discussions and interactions, where trainees encouraged to apply this analytical platform and to carry out more advanced statistical processing to any available research data.

The Advanced Statistical Analysis Using SPSS Training Course which was held in NARC in the period 28-31/3/2021 and its objective was to improve the capacities of NARC trainers of using advanced statistical procedures in data analysis using the SPSS software. The contribution of trainers was excellent through the course. All the trainers showed positive attitudes and interactions with the subjects introduced through the course. The course, in general, accomplished its objectives despite the short time of introducing wide number of subjects. The progress of participants was measured through before and after exam. Figure 1 shows the assessment mark of participants. Also results from the exam showed a significant increase in the trainees' Familiarity with basic concepts in statistics, such as measurement levels, mean, and standard deviation, Familiarity with the windows in IBM SPSS Statistics either by experience with IBM SPSS Statistics (version 22 or later). Moreover, results showed a significant increase in the participants' understanding of the basic evaluation of the statistical principles, determination of variables and statistical measures indicators by using the commands from SPSS program.

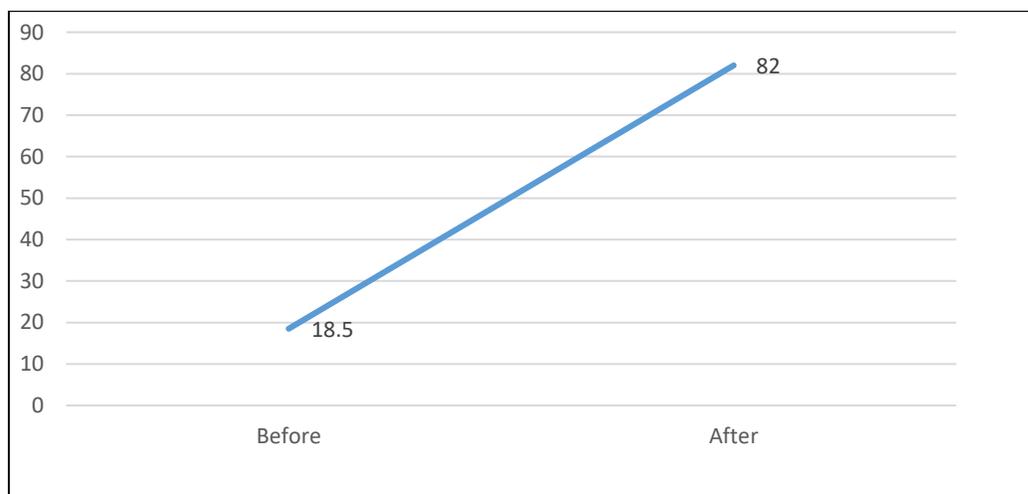


Figure 1: The average marks of participants before and after the course

Generally, results from the trainees discussion, evaluation and interactions indicates that the average trainees' understanding of all delivered topics is quite high and satisfactory.

GENERAL COURSE EVALUATION by TRAINEES

Various evaluations were carried out during the course, including a specific evaluation for each part of the course. Here we present an overview of the final evaluation. Issues considered were the topics and thematic areas of the course, the trainers and the organization, as well as general suggestions. Regarding the overall assessment of the training course, the participants qualified it as excellent (**Annex IV**).

CONCLUSION

The training course on “Advanced statistical analysis using SPSS” had positive responses from the trainees. The satisfaction of General training Course Evaluation was high scores .

Overall most participants found the course interesting and received sufficient information on the advanced statistical because the subjects delivered in the training added new knowledge and information to trainees. Trainees appreciated the interactive learning approach, especially the practical sessions activities where the lectures training subjects was applicable in practice.

There were also request from the trainees for more support from ICARDA to the economic analysis, in general, and advanced statistical training . In summary, the training is regarded as a success, however not without comments some of the main comments raised were:

- Moderately satisfied for the duration of each lecture was appropriate somehow
- Moderately satisfied for the length of the training was adequate somehow for the contents
- Level of utilization of the subject and contents of the training is very good which open doors to more advanced statistical complementary.

ACKNOWLEDGMENT

This training was undertaken as part of the "***Strengthening Innovation and Technology Adoption towards Sustainable Agricultural Productivity in Arab Countries***" project funded by the Arab Fund for Economic and Social Development (AFESD) (<http://www.arabfund.org/>) under a grant agreement with the International Center for Agricultural Research in the Dry Areas (ICARDA - <http://www.icarda.org>) within the framework of the CGIAR Research Program on Livestock (Livestock CRP) (<https://livestock.cgiar.org/>).

The views expressed are the authors' own and do not necessarily reflect ICARDA, NARC, AFESD, CGIAR or any involved research and development partners in this research program.

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Annex I: Course Program/Agenda

Training Course on “Advanced statistical analysis using SPSS”

Date: 28 – 31 March 2021

(spss 22 Version)

Venue: Physical classroom training.

Course Coordinator: Dr. Masnat Al Hiary (NARC) – masnath@yahoo.com.

Supporting Material: Eng. Mohammad KHALAF. Supervising quality in Department of Statistics and Building quality control strategies : A Guide to statistical analysis using SPSS,

Agenda

Time	Title	Trainer(Lecturer)
Sunday 28/3/2021		
9:00 –8:45	Opening session	Dr Masant Al Hiary
11:00– 9:00	Variables Samples	Eng. Mohammad Khalaf
11:30 – 11:00	Break	
2:30– 11:30	SPSS interface and features	
3:00– 2:30	Break	
Monday 29/3/2021		
11:00 –9:00	Descriptive statistics Frequencies Descriptive crosstabs Practical exercise	Eng. Mohammad Khalaf
11:30 – 11:00	Break	
2:30– 11:30	Parametric Compare means Graphs ‹Select Cases ‹Recode ‹Compute Practical exercise	
3:00– 2:30	Break	
Tuesday 30/3/2021		

9:00-11:00 –	Analysis of variance Single factor multiple factors Post Hoc tests t-test Practical exercise	Eng. Mohammad Khalaf
11:30 – 11:00	Break	
2:30– 11:30	Correlate Practical session	
3:00– 2:30	Break	
Wednesday 31/3/2021		
9:00-11:00 –	Regression analysis Multivariate analysis Chi square, correlation coefficient Practical exercise logistic regression ,Curve Estimation	Eng. Mohammad Khalaf
11:30 – 11:00	Break	
2:30– 11:30	Factor Analysis Non parametric Statistics	
3:00 – 2:30	Closing	

Annex II: About Trainer

Trainer	Name & Surname	Institution	E-mail
1	Dr. Mohammad Khalaf	Department of Statistics, Quality Management	khalaf30@yahoo.com khalaf30@gmail.com mkhalaf@dos.gov.io

	<p>Eng. Mohammad KHALAF is distinguished for his Supervising quality in Department of Statistics and Building quality control strategies and for teaching on SPSS introductory, intermediate and advanced analysis of data, reporting, questionnaire designing, building data entry access, lecturer of statistical procedures and statistical analysis</p> <p>Other statistical experiences: activities include statistical consultant for graduate research, judgment of questionnaires for graduate students, statistical analysis, reporting, questionnaire designing, research design, research methodologies.</p> <p>Contact: khalaf30@yahoo.com khalaf30@gmail.com mkhalaf@dos.gov.io</p>
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Annex III: Trainees List of Contacts

#	Name	Gender	Degree	Job title	E-mail	Mobile Phone
1	Dr. Masnat Al Hiary	F	PhD	Director of Socioeconomic Directorate	masnath@yahoo.com	0772527008
2	Thikrayat Al Qtefan	F	BSc	NA	thikrayat@yahoo.com	0798817713
3	Lana Abu Nowar	F	MSc	Head - Green Economy and Gender Research Department	laneabunowar@yahoo.com	0777852026
4	Ola Ali Al Arabiat	F	BSc	Socioeconomic researcher	ola.ali89alarabiat@yahoo.com	0798999746
5	Raghda Dradkah	F	BSc	Socioeconomic researcher	raghdadaradka@yahoo.com	0772325326
6	Alaa Ahmad Al Abdallat	F	BSc	Socioeconomic researcher	alaa.al20@yahoo.com	0795097046
7	Omamah Al Hadidi	F	BSc	Head - socioeconomic and Adoption Research Department	omamahfm71@yahoo.com	
8	Alaa Awaydah	M	BSc	Socioeconomic researcher	alaa.awaydah@hotmail.com	0790971055
9	Maysoon Al Ababneh	F	BSc	Field crop researcher	Aababneh999@yahoo.com	
10	Ahmad Mohammad Al Alwan	M	BSc	Socioeconomic researcher	ahmad_al_alwan@yahoo.com	0772400538
11	Ahmad Issa Al Ghragheer	M	BSc	Socioeconomic researcher		0799063227

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Annex VI: General Course Evaluation

Evaluation Component	Average
1) I received sufficient information on the training in advanced statistical	Excellent
2) Information sent via email were effective	Excellent
3) The duration of each lecture was appropriate	Good
4) The subjects covered during the training were useful	Excellent
5) The subjects delivered in the training added new knowledge and information to mine	Excellent
6) Presentations delivered by participants was clear and related to the workshop subject	Very Good
7) The moderators managed the sessions time efficiently	Excellent
8) The moderators encouraged participants to positively interact	Excellent
9) The answered and questions session was sufficing and queries raised answered clearly	Very Good
10) The training subject is applicable in practice	Excellent
11) The length of the training was adequate for the contents	Good
12) Level of utilization of the subject and contents of the training	Very Good
13) The training met its objectives	Very Good