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*Agjencia e Statistikave të Kosovës - Agencija za Statistike Kosova -
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Series 2: Agriculture and Environment Statistics

Greenhouse Gas Emissions in Kosovo 2014-2015



Preliminary

**Greenhouse Gas Emissions in Kosovo
2014-2015**

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Foreward

Kosovo Agency of Statistics, namely the Department of Agriculture and Environmental Statistics, realized the publication on GHG Emissions in Kosovo 2014-2015.

The purpose of this report is to provide stable statistical data for the GHG emissions from the different sectors in Kosovo.

The results presented in this publication provide a statistically significant source of the current state of the GHG emissions from sectors such as; energy, agriculture and waste.

All statistical instruments and methodology that are used for the realization of the GHG emissions in Kosovo are in accordance with EU regulations and recommendations, including: Revision 1996 IPCC Guidelines, IPCC 2006 Guidelines for National Greenhouse Gas Inventories and United Nations Framework Convention on Climate Change (UNFCCC).

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September, 2016

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Abbreviations and acronyms

EU	European Union
KAS	Kosovo Agency of Statistics
IPCC 2006	Intergovernmental Panel on Climate Change
UNFCCC	United Nations Framework Convention on Climate Change
NIR	National Inventory Report
EEA	European Environment Agency
MAFRD	Ministry of Agriculture Forestry and Rural Development
AHS	Agricultural Household Survey
MWS	Municipal Waste Survey
IWS	Industrial Waste Survey
GHG	Greenhouse Gases
MESP	Ministry of Environment and Spatial Planning

Report emissions:

Carbon dioxide (CO₂)
Methane (CH₄)
Nitrous oxide (N₂O)
Nitrogen oxides (NO_x)
Carbon monoxide (CO)

Symbols

%	Percentage
m ²	Square meter
ha	Hectares
kg	Kilogram
t	Tonnes
-	No occurrence of event
:	No data are available

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Executive summary

Human activities are contributing to climate change, primarily by releasing billions of tons of carbon dioxide (CO₂) and other heat-trapping gases, known as greenhouse gases, into the atmosphere every year.

Greenhouse gases come from a variety of human activities, including: burning fossil fuels for heat and energy, clearing forests, fertilizing crops, storing waste in landfills, raising livestock, and producing some kinds of industrial products.

According to Articles 4 and 12 of the United Nations Framework Convention on Climate Change (UNFCCC), parties are required to, on an annual basis; submit national inventories of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol annually. This report is also a submission under the Kyoto Protocol.

This publication covers data for the reference year 2014-2015 and it is written in line with the IPCC 2006 Guidelines of the Annotated outline of the National Inventory. Report cover sectors such as: Energy, Agriculture and Waste.

1 Introduction

Kosovo is not a Party to the UNFCCC or to its Kyoto Protocol. However Kosovo Government, similarly to the EU, considers climate change as a priority area, and is dedicated to make its contribution to the solution of this global challenge.

Kosovo has responsibility to respond to the requirements of the Convention and Protocol, as one of the signatories of the Energy Community Treaty. Energy Community Treaty also sets clear targets of reducing energy use while demands increase the share of renewable energies.

Based on current data, Kosovo's contribution to greenhouse gas emissions globally is almost negligible, its commitment to join the global efforts to reduce the level a greenhouse gas emission has been forthcoming.

In the context of national legislation on climate change, aspects related to these changes are included in the relevant environmental legislation, including Law on Environment, Law on Protection of Air Pollution and Law on Water.

It also approved the Climate Change Strategy 2014-2024, which is consistent with the expected policy framework of the EU climate and energy. Within the activities in the climate change sector, Kosovo has prepared the register (inventory) of greenhouse gases for 2008-2013. (Published in Pristina, November 2015).

2 General description of methodology

The methods used for calculation of the GHG emission in Kosovo are in accordance with the Revised IPCC 1996 Guidelines for National Greenhouse Gas Inventories and the IPCC 2006 Guidelines, Tier 1- Default emission factors (in accordance with the IPCC guidelines), emission factor relevant for Eastern Europe and Developing countries.

Calculations in this report are developed for three sectors; Energy, Waste and Agriculture.

Sources of relevant data published on this report are;

- Kosovo Agency of Statistics (KAS): Energy Balance 2014/15
- KAS Agriculture Census 2014
- KAS Agricultural Households Survey AHS; Livestock categories, Urea and Synthetic fertilizers used, Agricultural production.
- Expert estimates from Ministry of Agriculture, Forestry and Rural Development and Faculty of Agriculture; Manure Management systems and fractions and Area burnt in cropland areas (MAFRD).

KAS is focusing on calculation of emissions of greenhouse gases from agriculture and stationary combustion within the energy sector as recommended by the Intergovernmental Panel on Climate Change (IPCC) and air quality and air pollution statistics.

3 Trends Greenhouse Gas Emissions in Kosovo

For the first time Kosovo has developed the wide Greenhouse Gas Inventory to cover all greenhouse gases produced in Kosovo. GHG This project was supported by United Nations Development Programme and the Czech Government. Reportin period was 2008-2009.

Inventory of greenhouse gas emissions for the period 2008-2009:

Total emissions of all greenhouse gasses in 2008 reached 9.5 Mt CO₂ eq. They increased to 10.5 Mt CO₂ eq. in 2009. The most important sector for whole inventory is sector “1A Fuel combustion activities” which constitute about 80% of all anthropogenic emissions in Kosovo.

Most important source category for Kosovo is solid fuels combustion. Other so called “key categories” (those who cumulatively constitute 95% of emissions total).

Kosovo in comparison with other countries in the Europe has still relatively low emissions per capita. Compared with other countries in Europe, Kosovo has relatively low emissions per capita (5.7 ton CO₂ equivalent per capita) Energy sector produces about 82% of total national emissions of GHGs. Sector Industrial Processes and Product Use total about 250 thous. tons of CO₂ eq. which makes about 2% of whole anthropogenic emissions in Kosovo.

The main category in this sector in Kosovo is mineral and metal industry which covers approximately 90% of whole sector.

Sector of Agriculture, Forestry and Land Use covers about 13% of total GHG emissions in Kosovo.

Waste sector in Kosovo covers approximately 3% of national total of GHGs emissions. Most important sub-sector is from landfills.

Inventory of greenhouse gas emissions for the period 2008-2013:

It is estimated that Annual greenhouse gas emissions in Kosovo are about 9.5 million tons of CO₂ equivalents. The main source of GHG is the energy sector with a share of 88 % of total emissions. The second sector is agriculture with 7 %. The waste sector represents 3 % of total emissions and industrial sector and the use of products represent about 2.5 %.

Trend of total GHG emissions in Kosovo in 2013 marks a significant increase compared with 2012 (9568.4 Gg CO₂ eq in 2013 compared to 9526.7 Gg CO₂ eq in 2012). While the year with the biggest emissions from the current estimated inventory is 2009 to 10507.2 Gg CO₂ eq. should know that the amount of greenhouse gas emissions in Kosovo is heavily dependent on the amount of energy produced from coal since the coal is the source of the main greenhouse gases in our country.

4 Energy (CRF sector 1)

4.1 Methodology

Calculation of GHG emissions for energy sector is done based on national Energy Balance data on fuels in accordance with the IPCC 2006 guidelines. For mobile combustion estimation is done for CO₂, CH₄ and N₂O for road transport and railways.

Method used for calculation of GHG emissions from energy sector was Tier 1 method from IPCC guidelines 2006 for estimating GHG emissions for mobile and stationary combustion.

Source of the data on energy sector presented in this publication are from publication of Energy Balance 2014-2015.

For the detail see table bellow:

Table 1: Emissions form Solid fuels 2014

Sector	Energy (CO ₂ , CH ₄ and N ₂ O from fuel combustion by source categories – Tier 1)		
Category	Fuel combustion activities		
Energy consumption	CO ₂	CH ₄	N ₂ O
	Emissions	Emissions	Emissions
	(Gg CO ₂)	(Gg CH ₄)	(Gg N ₂ O)
Solid fuels			
Other Bituminous Coal	34,16952	0,003612	3,232436592
Lignite	56,736144	0,000842616	0,000842616
Oil Shale and Tar Sands	34,16952000	0,003612	1,30465E-06

Greenhouse Gas Emissions in Kosovo 2014-2015

Table 2: Emissions from Liquid fuels 2014

Sector	Energy (CO ₂ , CH ₄ and N ₂ O from fuel combustion by source categories – Tier 1)			CO ₂ ekv(Gg)
Category	Fuel combustion activities			
Energy consumption	CO ₂	CH ₄	N ₂ O	
	Emissions	Emissions	Emissions	
	(Gg CO ₂)	(Gg CH ₄)	(Gg N ₂ O)	
Liquid fuels				
Motor Gasoline	193,40937	0,0920997	0,00893088	198,2030198
Gas/Diesel Oil	0,828438	0,000043602	0,000043602	0,840472152

Table 3: :Emissions from Liquid fuels 2015

Sector	Energy (CO ₂ , CH ₄ and N ₂ O from fuel combustion by source categories – Tier 1)			CO ₂ ekv (Gg)
Category	Fuel combustion activities			
Energy consumption	CO ₂	CH ₄	N ₂ O	
	CO ₂ Emissions	CH ₄ Emissions	N ₂ O Emissions	
	(Gg CO ₂)	(Gg CH ₄)	(Gg N ₂ O)	
Liquid fuels				
Jet Kerosene	11,82154421	0,000496009	9,92018E-05	11,8600345
Naphtha	1598,956001	6,76198E-08	2,85964E-18	1598,956003

Greenhouse Gas Emissions in Kosovo 2014-2015

Table 4: Emission from Solid fuels 2015

Sector	Energy (CO ₂ , CH ₄ and N ₂ O from fuel combustion by source categories – Tier 1)		
Category	Fuel combustion activities		
Energy consumption	CO ₂	CH ₄	N ₂ O
	CO ₂ Emissions	CH ₄ Emissions	N ₂ O Emissions
	(Gg CO ₂)	(Gg CH ₄)	(Gg N ₂ O)
Solid fuels			
Anthracite	0,609285726	8,31222E-05	0,609285726
Other Bituminous Coal	0,029619433	3,13102E-06	0,002801998
Lignite	6559,51962	0,097418608	0,097418608
Oil Shale and Tar Sands	0,116835169	1,23504E-05	1,52533E-11

5 Agriculture (CRF 3)

5.1 Overview of agriculture statistics in Kosovo

KAS has established regular surveys on Agriculture sector (AHS) since reference year 2001. The Agriculture Census was conducted in 2014. Agriculture statistics are produced based on the legal basis on Law on Official Statistics (No. 04/L-036). All agriculture statistics are produced through the annual agriculture surveys.

The objective of the Agricultural Household Surveys is to provide data on the agricultural situation in Kosovo, namely: demography of agricultural households, land use and farm structure, livestock, crops, forestry; agricultural inputs, labour force and farm expenditure.

The Agriculture Census was conducted in 2014 in the Republic of Kosovo after more than 50 years. The census was implemented by KAS.

Agriculture Census 2014 showed that there are 130 775 agricultural holdings in Kosovo, which cultivate 413 635 ha of agricultural area and breed 261 689 cattle, 183 584 sheep and 28 430 goats. In average, an agricultural holding in Kosovo cultivates 3.2 ha of agricultural area (including common land). The agricultural holdings with cattle breed in average 3.9 cattle, agricultural holdings with sheep breed in average 64 breeding sheep, while agricultural holdings with goats breed 11.3 breeding goats.

In comparison to the EU countries, Kosovo has four (4) times smaller agricultural holdings in respect to average size of agricultural holdings by utilized agriculture area, but the average size is similar to the neighboring countries.

5.2 Methodolgy

Calculation for agriculture sector is done based on national activity data. Source of the data on agriculture sector presented in this publication are from Agriculture Census 2014 and Agriculture Household Survey 2015. GHG emissions for this sector are calculated according to the methodology IPCC 2006, the relevant emission factors were implemented according to TIER 1. In some cases the national data were not available therefore the default activity data were used. And when default activity data were not available then the expert judgements were used.

The agricultural sector by 2006 IPCC is the third sector, and it consists of three sub-sectors (category). 3. A Enteric Fermentation. These include mainly methane emissions from enteric fermentation (digestive process of animals) and emissions nitrogen oxide and methane from animal manure management. 3. B Manure management and 3.D Agriculture soils.

Also data for calculating the emissions from agriculture sector comprise data on the number of livestock by category, data management format farmyard manure, the annual amount of data's urea and fertilizer used for fertilization of agricultural production data, data for burned areas by categories of land.

Greenhouse Gas Emissions in Kosovo 2014-2015

For the detail see table bellow:

Table 5: GHG emissions from agriculture sector 2014

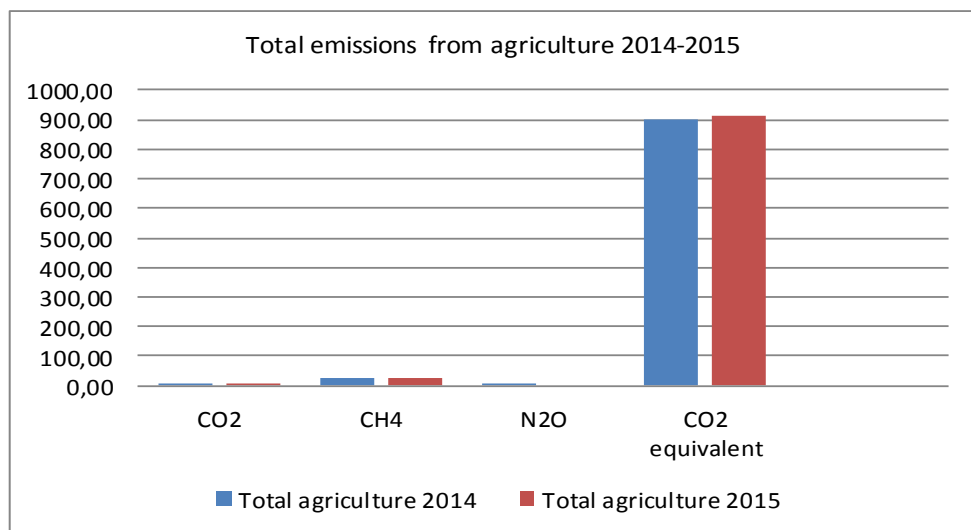
Categories according to IPCC 2006 Guidelines	CO₂	CH₄	N₂O	NO_x	CO	CO₂ equivalent
	kt					
Total agriculture	4,68	23,26	1,06	0,00	0,00	901
I.Livestock						
A.Enteric fermentation						524
Cattle						514
Dairy cattle						324
Non-dairy cattle						190
Sheep						8
Swine						0
Other livestock						3
Goats						2
Horses						0
Poultry						0
Donkeys						0
B. Manure management	2,30	0,31				148
Cattle						56
Dairy cattle						36
Non-dairy cattle						20
Sheep						0,2
Swine						1,0
Goats						0,04
Horses						0,03
Poultry						0,34
Donkeys						0,30
Indirect N₂O emissions						13
D.Agricultural soils						224
Field burning of agricultural residues			0,00	0,00	0,00	0
Urea application	4,68					5

Greenhouse Gas Emissions in Kosovo 2014-2015

Table 6: GHG emissions from agriculture sector 2015

Categories according to IPCC 2006 Guidelines	CO ₂	CH ₄	N ₂ O	NO _x	CO	CO ₂ equivalent
kt						
Total agriculture	4,37	23,46	1,09	0,18	4,48	914
I.Livestock						
A.Enteric fermentation						524
Cattle						498
Dairy cattle						323
Non-dairy cattle						175
Sheep						22
Swine						1
Other livestock						4
Goats						3
Horses						1
Poultry						0
Donkeys						0
B. Manure management	2,28	0,25				133
Cattle	2,16					54
Dairy cattle	1,43					36
Non-dairy cattle	0,72					18
Sheep	0,02					0,4
Swine	0,10					2,5
Other livestock	0,00					0,1
Goats	0,002					0,06
Horses	0,003					0,06
Poultry	0,00					0,00
Donkeys	0,00					0,00
Indirect N₂O emissions			0,04			13
D.Agricultural soils			0,83			246
Field burning of agricultural residues	0,21	0,00	0,18	4,48	7	
Urea application	4,37					4

Figure1: GHG emission from agriculture sector (mil, tons CO₂ equivalent), 2014-2015.

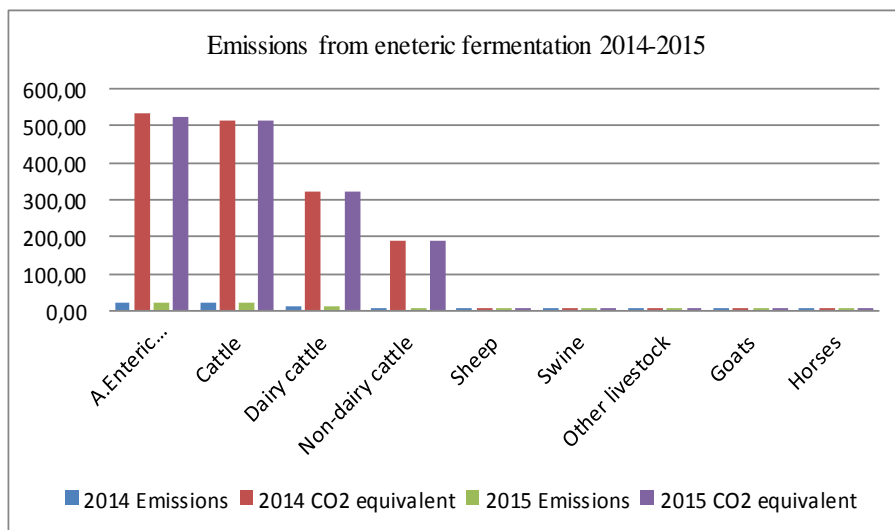


5.3 Enteric fermentation

Table 7: Emissions from enteric fermentation (mil, tons CO₂ equivalent) 2014-2015.

Categories	2014		2015	
	Emissions	CO ₂ equivalent	Emissions	CO ₂ equivalent
A.Enteric fermentation	21,37	524	20,96	524
Cattle	20,54	514	19,91	498
Dairy cattle	12,95	324	12,90	323
Non-dairy cattle	7,59	190	7,00	175
Sheep	0,31	8	0,88	22
Swine	0,01	0	0,03	1
Other livestock	0,10	3	0,14	4
Goats	0,07	2	0,10	3
Horses	0,02	0	0,04	1
Poultry	0,00	0	0,00	0
Donkeys	0,01	0	0,00	0

Figure 2: Enetric fermentation (mil, tons CO₂ equivalent), 2014-2015.

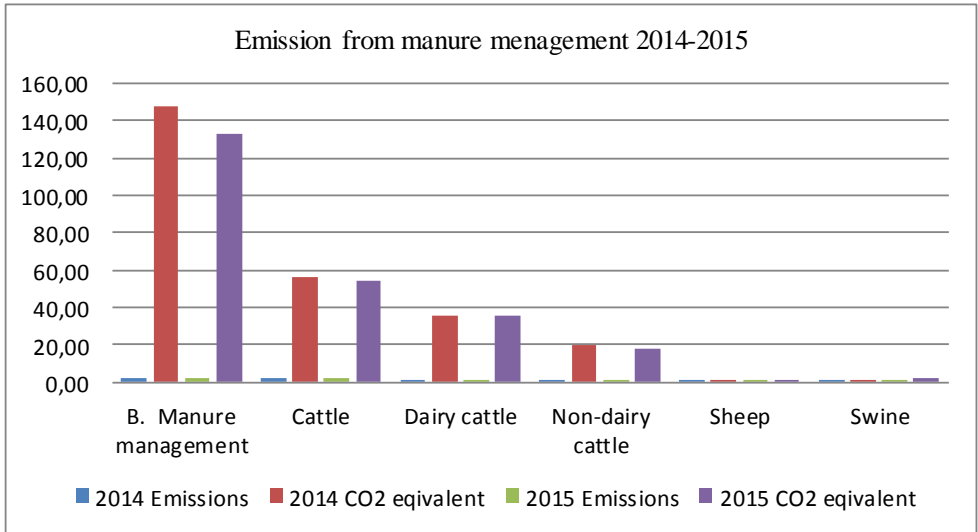


5.4 Emission from Manure management

Table 8: Emissions from manure management (mil, tons CO₂ equivalent), 2014-2015.

Categories	2014		2015	
	Emissions	CO ₂ equivalent	Emissions	CO ₂ equivalent
B. Manure management	2,30	148	2,28	133
Cattle	2,22	56	2,16	54
Dairy cattle	1,44	36	1,43	36
Non-dairy cattle	0,79	20	0,72	18
Sheep	0,01	0,2	0,02	0,4
Swine	0,04	1	0,10	2,5
Other livestock	:	:	0,00	0,1
Goats	0,002	0,04	0,002	0,06
Horses	0,001	0,03	0,003	0,06
Poultry	0,01	0,34	0,00	0,00
Donkeys	0,01	0,30	0,00	0,00

Figure 3: Emission (mil, tons CO₂ equivalent) 2014-2015.



6. Solid Waste Disposal (SWD)

6.1 Overview of waste statistics in Kosovo

The KAS has established regular surveys on the generation of municipal waste (MW survey) since reference year 2007 and on the generation and treatment of industrial waste (IW survey) since reference year 2010. Waste statistics are produced based on the legal basis on Law on Official Statistics (No. 04/L-036), Official Statistics Programme 2013-2017, Annual Plan of Official Statistics 2016, and the Law on Waste in Kosovo (No. 02/L-30).

Waste statistics actually are compiled on the basis of the following two surveys:

- Municipal Waste Survey (MWS)
- Industrial Waste Survey (IWS)

Municipal Waste Survey (MW): Data source for data on the generation of MW is the statistical survey on municipal waste which is carried out by the Kosovo Agency of Statistics (KAS) annually.

Since reference year 2007, the KAS collects data on the quantity of municipal waste collected by means of a full survey of all MW collectors (40 public and private companies). The data are collected from each economic operator via direct interviews with representatives of the companies based on the survey questionnaire. The response rate of the survey is usually close to 100%.

Industrial Waste Survey (IWS): Data on industrial waste generation were collected for the first time in 2011 for the reference year 2010. Until reference year 2012, the data were collected on the basis of NACE Rev 1.1 and cover the sectors mining and quarrying (C), manufacturing (D) and electricity (E). Since 2013, we applied NACE Rev. 2. For reference year 2014/15 the survey has been extended to the NACE sectors F (construction) and G-U (service sectors).

Classification used for producing waste statistics: NACE Rev.2 is applied since reference. year 2013, (NACE Rev. 1.1 was applied),

Waste types by LoW are converted into EWC-Stat categories using Annex III of Regulation 2150/2002/EC and LoW-List of Waste.

6.2 Methodology

KAS was introduced in the 2006 guidelines concerning GHG emissions from the waste sector. Calculation on GHG emissions for waste sector was done by using national waste statistics data. All calculation for GHG emissions from waste are based on data from Municipal Waste Survey (MWS) and Industrial Waste Survey (IWS).

Method used for calculation of the GHG emission from waste are in accordance with IPCC 2006 Guidelines.

The emissions presented from waste sector are based on data from the solid waste disposal (SWD) in Kosovo. Therefore, these results do not contain sub-sector of waste from landfills and waste incineration (do not exists municipal waste incineration plant).

For the detal see table bellow:

Table 9:Emissions from CH₄

IPCC 2006 guidelines	Methane generated			Methane emission
	MSW	Industrial	Total	
Year				Gg
2013	15	7	22	22
2014	15	7	22	22
2015	16	7	22	22

Table shows the final methan produced from diferent materials and substracts.

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Kosovo Agency of Statistics, a brief description

Kosovo Agency of Statistics is a professional institution which deals with collection, processing and publication of official statistical data. As such acts since 1948 and has passed through several historical stages, structured according to state regulation of those times. On 2 August 1999, the Agency has resumed his professional work (after nine years of interruption of all statistical series detrimental to the interest of Kosovo), as an independent institution under the Ministry of Public Administration. Since 12.12.2011 the Agency operates in the frames of the Prime Minister's Office. Office is funded by the Kosovo Consolidated Budget, but also by donors for specific projects and for technical professional support.

The mission of the Agency; to meet the needs of users with qualitative statistical data, objective, in time and space so that users have reliable base to conduct regular analysis in the interest of planning and project development at the municipal and country level. To support government institutions, scientific institutes, research academies, businesses in order to provide proper information for decision-makers and other users in Kosovo.

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