Albanian Agriculture and Bioenergy, Status and Perspectives

Evan Rroço, Manjola Banja

Bioenergy and bioeconomy, status and perspectives
Israel, 2015

Country profile, 2012

- Surface 28 000 km^2
- Population ~3 million inhabitants
- GDP (nominal) - 14 billion USD

Contribution to the GDP	%
Industry	11,7
Agriculture and Fishery	19.3
Construction	11.0
Transport, Tourism and Communication	30,5
Services	13.4
Financial Transactions	14.1

Actual Land Use

- Total Surface 2.1 million ha, from wich
  - Agricultural land 24 %
  - Forestry 36 %
  - Pastures 15 %.
  - Other * 25 %

*constructions, streets, lake and rivers

Climate

- Northen and eastern part - Continental climate
- Southern and Western part – Mediterranean climate.
- Average rainfall 1400 mm y^{-1}
  - Very wet winter
  - Very dry summer

Agricultural situation

- Very small farm size (1.0 -1.5 ha)
- High fragmentation
- Land property not definitely solved
- Low investments and crediting
- Low subsidies
- High input prices

Agriculture Structure

Field Crops

Crops	Surface (000 ha)	Yield (t ha^{-1})
Cereals	143.2	4.3
Wheat	70	4.0
Maize	55	6.5
Vegetables	30	26.3
Potatoes	9.6	24.4
Beans	14.6	1.9
Industrial crops	14	2.1
Aromatic plants	8	2.2
Tobacco	0.7	2
Forage plants	204.2	267.0

Fruit trees

Categories	Total (000 trees)	Yield (kg $tree^{-1}$)
Fruit trees		
Total (000 trees)	11,909	22.8
In production	9,292	
Olives trees		
Total (000 trees)	8,994	16.9
In production	5,803	
Citrus trees		
Total (000 trees)	1,200	24,4
In production	859	
Vineyard		
Total (ha)	10,383	11.6
In production (ha)	9,625	

Source: Statistical Yearbook Ministry of Agriculture 2014

Agriculture Structure

Animal Production

Category	Number (000 units)
Cattle	499.6
Sheep/Goats	2,804
Pigs	172.4
Poultry	9493
Beehives	261

	Yield (litres head $^{-1}$)	Production (000 tons)
Milk 000 tons		
Cattle	2695.8	965
Sheep/Goats	82	168
Meat (000 tons)		
Cattle	141.1	71
Sheep/Goats	17.6	50
Pigs	101.5	18
Poultry	1.7	17
Other products		
Sheep wool (tons)	2	3,100
Honey(tons)	12	3000
Eggs (in mill)	186	835

Source: Statistical Yearbook Ministry of Agriculture 2014

Import-Export of Agricultural Products

Categories	Export vs. Import ratio
Plant products	1 : 6.1
Animal products	1 : 4.8
Processed products	1 : 8.4
Total	1 : 6.7

- Main exports – aromatic plants and fresh vegetables
- Main imports – wheat and wheat products; animal products

Source: Statistical Yearbook Ministry of Agriculture 2013

Agriculture tendences

- Slight increase of size farms
- Yield increase
- Increase of farms accessing market (from 18% three years ago – 22% actually)
- Increase of surface cultivated with more intensive crops (fruits, vegetables and aromatic plants).

Energy mix indicators, 2012

Primary energy production	2034 ktoe
Gross inland consumption	2319 ktoe
Final energy consumption	1953 ktoe
Gross electricity consumption	665 ktoe
Energy dependence	98%
Energy intensity	180 toe/USD
GHG emissions	7.3 Mt CO_2 eq

Source: Albanian Statistical Office, 2014
UNFCCC, 2014

Renewable energy indicators, 2012

Renewable energy mix	649 ktoe
Renewable energy share	31.6%
Renewable electricity	406 ktoe
Renewable heat	213 ktoe
Renewable energy in transport	29 ktoe
GHG emissions savings	6.8 Mt CO_2 eq

Source: Albanian 1st RE progress report, 2015

Renewable energy indicators, 2020

Renewable energy total	1256 ktoe
Renewable energy share	38%
Renewable energy installed capacity	2791 MW
Renewable electricity	760 ktoe
Renewable heat	391 ktoe
Renewable energy in transport	105 ktoe

Source: Albanian NREAP, (draft), 2012

Legal Framework
Agriculture - Energy

- National Strategy for Rural and Agricultural Development (2014-2020)
- Law on Renewable Energy Sources 138/2013
  Transposes partly the Directive 2009/28/EC
  (Article 17 on sustainability not fulfilled)
- First renewable energy progress report, 2015

Bioenergy in Albania – Economical framework

- Prices per kwh

	Price (Euro) kWh^{-1}	
	Albania	EU24
Oil	0.124	0.127
Electricity	0.081	0.208
Fire Wood	0.013	
Natural Gas		0.072

- No subsidies for bioenergy production
- No real market for biogas

Bioenergy opportunities

- Fire wood – main source
- Processing residues for energy
  - Olive processing residues
  - Wood processing residues
- Agriculture residues – not yet used
- Remote possibility to produce bioenergy from dedicated energetic crops.

Forest situation and use

Forest fond

	Capacity /000m^3	%
Total forests	**76,483**	**100**
State forests	49,714	65
Locally administrated forests	22,945	30
Private forests	3,824	5

Forest use

Description	Unit	Private Subjects	Rural	Estimated Illegal cuttings	Total
Timber wood	000 m^3	1.576	819	1.220	3.6
Timber for mines	000 m^3	0.531	0	0.337	0.9
Wood stick	000 m^3	0	0	0.05	0.05
Fire wood	000 mst	87.68	1,257	11.251	1,356

Memorandum for forest use

Source: Albanian Statistical Office, 2013 and 2014

Albanian Bioenergy Potentials

Agriculture residues potential

Arable crops residues for biogas production

Crop	Surface (000 ha)	Collection coefficient	Byproduct Collected (000 Mt)	Toe
Wheat	73.2	0.3	75.8	30,470
Maize	53.5	0.3	90.9	36,522
Rye	1.3	0.3	0.8	319
Barley	2.4	0.3	1.3	537
Oats	12.5	0.3	5.5	2,215
Vegetables	31.0	0.1	38.8	11,887
Potatoes	9.3	0.1	2.0	606
Beans	14.6	0.2	0.5	142
Tabacco	1.3	0.2	0.0	10
Sunflower	1.4	0.2	0.3	99
Soybean	0.3	0.2	0.0	9
Forage	208.9	0.0		
Total	**409.8**		**130.3**	**82,816**

Agriculture residues potential (cont.)

Livestock residues for biogas production

	1000 heads	Total manure production 1000 ton	Coef. Of manure collection	1000 m^3 Biogas
Cattle	498	654,372	20%	5,889
Sheep	1,809	132,057	10%	2,245
Goats	810	1620	10%	1,005
Pigs	159	116,070	30%	1,741
Equidae	97	708100	10%	9,963
Poultry	9494	103,959	30%	3,119
Slaughterhouse residues				461
Total	**151,227**			**24,423**

Agriculture residues potential (cont.)

Fruit trees residues for energy

	Residues (ton)	Collection coefficient	Total Residues (ton)	Energy	
				Giga Joule	Toe
Fruits trees	52,231	30%	15,669	188,031	4,490
Olives	64,002	20%	12,800	153,605	3,668
Citruses	5,052	20%	1,010	12,124	290
Vineyards + Pergola	28,595	30%	8,579	85,785	2,049
Total	149,880		38,059	439,545	**10,496**

Bioenergy in a typical farm

Crop	Surface	Collection coefficient	Byproduct Collected (Mt)	Toe
Wheat	0.5	0.3	0.48	0.21
Maize	0.3	0.3	5.35	0.20
Vegetables	0.2	0.1	0.16	0.08
Forage	0.2	0	0.00	
Total	1.2		5.99	0.49

	Heads	Coef. of Manure Collection	Byproduct Collected (Mt)	Biogas (m3)	Toe
Cattle	5	0.2	1.314	59	52.4

Total 53 toe

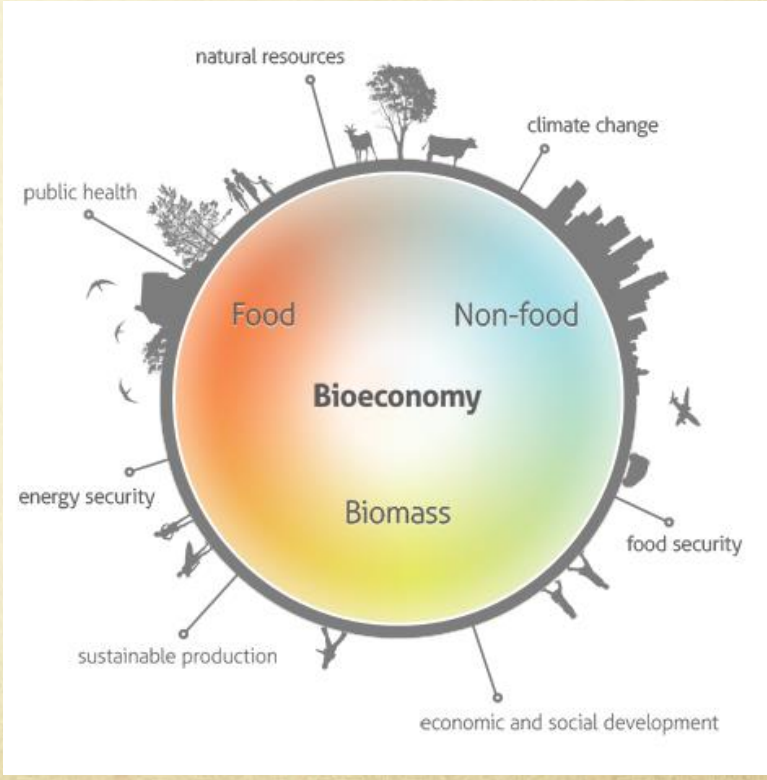
Bioeconomy

Bioeconomy encompasses the production of renewable biological resources and their conversion into food, feed, bio-based products and bioenergy via innovative and efficient technologies.

(European Forum for the Bioeconomy)

Three pillars of Bioeconomy

1. Investments in research, innovation and skills;
2. Reinforced policy interaction and stakeholder engagement;
3. Enhancement of markets and competitiveness.



Bioeconomy in Albania

- Policy integration
  - National Strategy for Development and Integration 2015 – 2020 (under preparation)
  - Coordination especially in Agriculture and Environmental issues between the two Ministries.
  - Need for an aimed politics to better coordinate all the efforts in the other sectors.
  - No legal acts approved (no strategy, no action plan, no funds allocated) for Bioeconomy.
  - Two public communications on climate change.
  - Low private stakeholders involvement

Bioeconomy in Albania

- Market and competitiveness
  - Lack on market possibilities and infrastructures (ex. for bioenergy).
  - Ongoing improvements in the legal framework on business competitiveness

Bioeconomy in Albania

- Research
  - Strategic Programme for Development of Innovation and Technology of SMEs 2011-2016
  - National Strategy for Science, Technology and Innovation 2009-2015
  - Insufficient Financing in R&D (0.01% of the state budget),
  - Still insufficient research infrastructure (despite improvements in the last 5 years)

Bioeconomy in Albania

- Research
  - Different studies on environment protection,
    - especially in the hot spots.
    - Map of the most suitable crops for each region
    - Research in improving water and fertilizers use efficiency.
  - Limited possibilities in fundamental research
  - Need for a better coordination of the human and infrastructural potential.

Thank You

Contact: evanrroco@gmail.com