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Chapter 1

Introductory Chapter: Agricultural Waste as a Source of Raw Materials

Anna Aladjadjiyan

Additional information is available at the end of the chapter

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1. Introduction

The intensive development of industrial technologies in the last century led to considerable exhaustion of natural resources. The growing human population needs more and more food and energy and creates higher and deeper pollution of the environment. Without taking measures for prevention of these harmful tendencies, the planet soon would face an ecological catastrophe. To avoid the problem, politicians and scientists from all over the world are looking for different solutions. Considerable importance has the reuse of waste and residues because it offers new resources of raw materials and decreasing of pollution. Most attractive possibilities at the moment represent the processing of waste and residues for bioenergy, and for soil additives and bio-fertilizers as well.

The reuse of waste and residues from the agricultural sector is an actual task in our time. Plant residues and animal residues (manure and bedding) contain useful elements and can be processed for production of bio-fertilizers, compost for soil re-cultivation and biofuels.

Unfortunately, six authors of the chapters included in this book represent non-European societies. Only one chapter is authored by representatives of EU countries. This fact creates the impression for less interest to the reuse of waste and residues in the EU countries. Our experience in this field shows the opposite.

2. Use of agricultural waste and residues as a source for biofuels production

In recent years, Bulgarian National Biomass Association took part in different projects, related to the reuse of agricultural waste and residues. In the frames of the project Improved Nutrient

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and Energy Management through Anaerobic Digestion (INEMAD), new flows of energy and materials within the agricultural sector (or linked to the agricultural sector) have been analyzed for creating opportunities for rethinking the relation between crop and livestock production. The possibilities for biogas production from animal manure and plant residues in partner countries have been studied [1, 2]. Composting of waste residues and using the compost for soil re-cultivation [3] have been explored as well. A comparison of nutrient content in composted solid residues from anaerobic digestion and bio-fertilizers has been performed [4]. The economic efficiency of different installations for bioenergy production and composting has been compared, too [5].

The new EU programme H2020 also gives possibilities for developing bioenergy investigations. The project B4B (Bioenergy for Business "Uptake of Solid Bioenergy in European Commercial Sectors", Horizon 2020, Coordination and Support Action [6]**)** explores the possibilities to increase the usage of bioenergy. This task should be realized through a fuel-switch from coal, oil or natural gas, used in "in-house" boilers in commercial sectors for heat purposes or in district heating, to solid biomass sources—wood pellets and chips.

The project BioRES (Sustainable Regional Supply Chains for Woody Bioenergy, Horizon 2020 [7]) aimed to increase the local production and consumption of wood biomass via the development of Biomass Logistics and Trade Centres (BLTCs). The project gave a thorough and



useful insight into all important aspects of the BLTC concept—from the wood logging process to the delivery of quality solid biofuels to the end users, through presentation of practical guidance and best practices from European technology leaders.

As a result of both projects, B4B and BioRES, the interest to wood pellet production from wood and plant residues and its use for heating in Bulgaria raised. The use of pellets for heating is expected to decrease air pollution.

3. Agricultural waste and residues as a source for BioBased products

The last project, ENABLING (Enhance New Approaches in BioBased Local Innovation Networks for Growth [8]) is related to cycle economy. It intends to respond to the need, felt by practitioners across Europe, of improving and systematizing collaboration among the different stakeholders, and in particular between the source of biomass streams, and the processing and transformation industry, or Bio-Based Industry (BBI). The main goal of the project is to support the spreading of best practices and innovation in the provision, production, and pre-processing of biomass for the BBI. In particular, ENABLING aims at creating appropriate conditions for the development of efficient biomass to Bio-Based Products and Processes (BBPs) value chains. The agricultural waste and residues are considered as important source of biomass for BBPs as well.

4. Conclusion

Development of technologies for reuse of agricultural waste and residues makes significant contribution to sustainable society by decreasing the depletion of natural resources and the pollution of the planet. Additionally, in social aspect it creates new jobs and provides cleaner living environment.

Author details

Anna Aladjadjiyan

Address all correspondence to: anna.garo@gmail.com

National Biomass Association (BGBiom), Plovdiv, Bulgaria

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