



Biowaste in Macedonia

Mapping the problem and finding solutions



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Agency for Development
and Cooperation SDC

State Secretariat for
Economic Affairs SECO



Agricultural sector

01 Processing industry

Processing of fruits and vegetables

02 Fresh fruits and vegetables sector

Packaging facilities for fresh fruits and vegetables

03 Animal farms

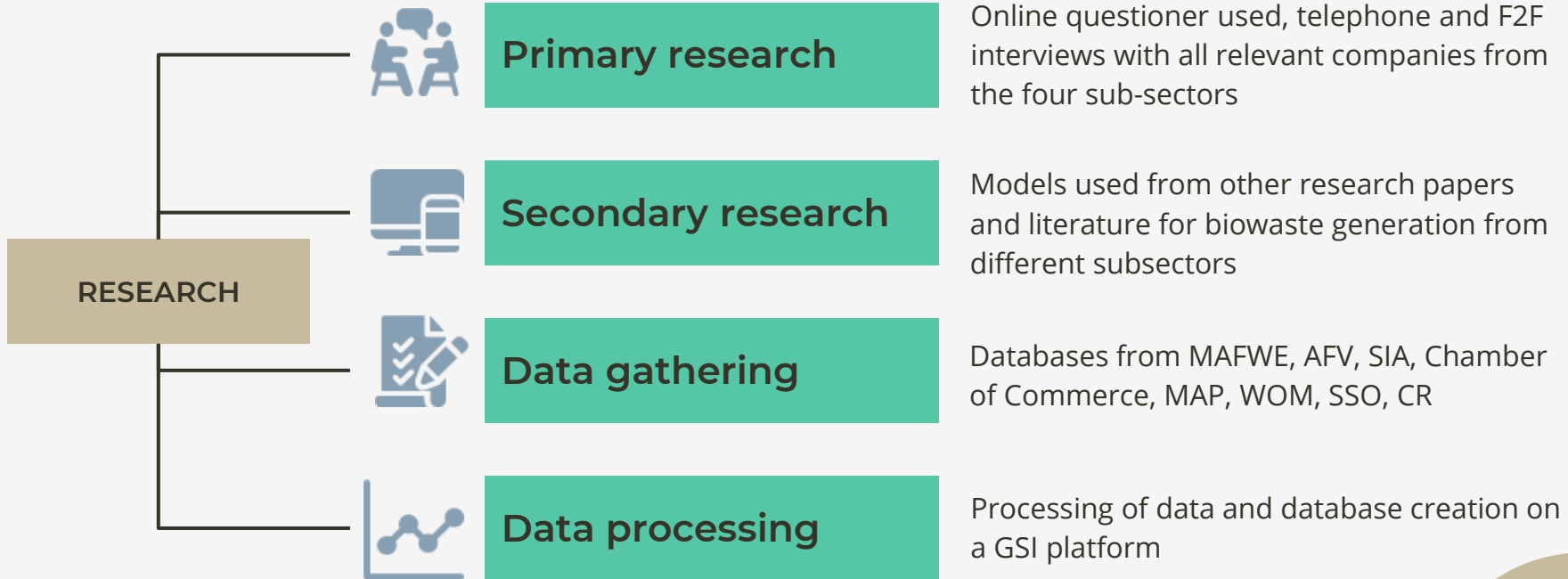
Cattle and pig farms

04 Wine industry

Wine and brandy production



Methodology





01

Results



Sample

Company size

- Micro – 36%
- Small – 43%
- Medium – 21%
- Large – 0%




Rate of response on the on-line questionnaire

Rate of response of only 14%


Telephone and F2F interviews for gathering data






Awareness of the impact of bio-waste on the environment and relevant legislature

93% From the companies believe that bio-waste does NOT have negative environmental impact



57% Of the companies create more than 100 tons of non-dangerous waste pe year

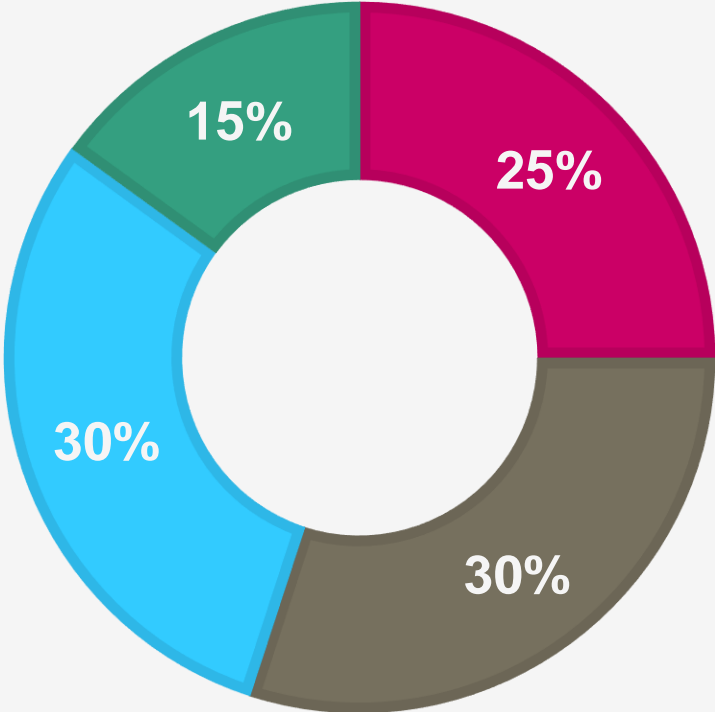
86% From the companies do NOT make a yearly plan and report to the MEPP



50% Are not aware of any legislation concerning bio-waste

Current bio-waste management


- Landfilling
- Direct land application
- Composting/biogas
- Animal feed





Income and expenses for bio-waste management

100% From the companies do NOT generate any revenue from their bio-waste



10 Eur/Ton Average expense for bio-waste management


0 - 80 Eur/Ton Variation of expenses





Plans for bio-waste management

86% Of the companies do NOT plan to invest in bio-waste management



71% Would cooperate with other companies for bio-waste management



02

Mapping of the bio-waste






Total biowaste for each sub-sector

1,900,000 tons

Over 1,900,000 tons total bio-waste generated
in animal farms (30% mapped)

41,031 tons

Bio-waste generated in the processing
industry for fruits and vegetables and wineries
(70% mapped)



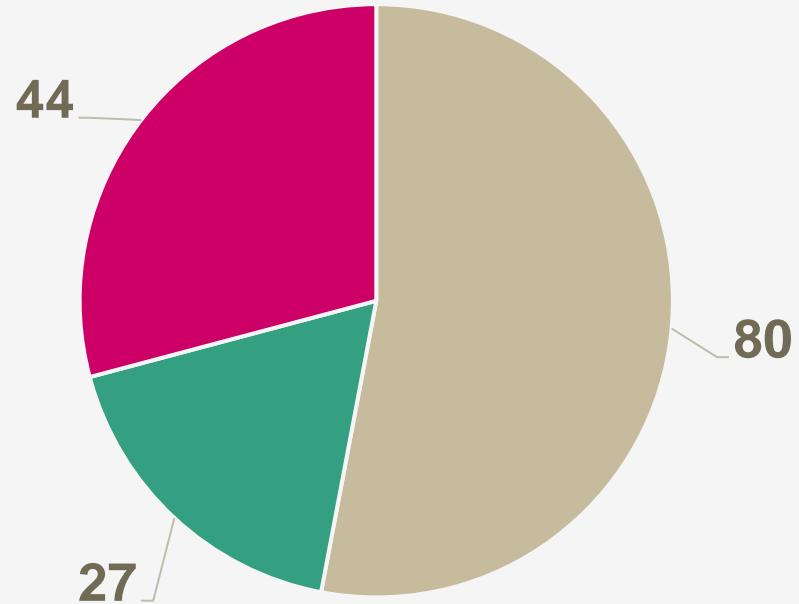


571,684 tons

Bio-waste generated from 151 mapped polluter

Total number of companies researched

151



■ Animal farms ■ Processing of fruits and vegetables ■ Wineries

Mapped bio-waste



542,992 tons

Waste in animal farms (80 companies)



10,956 tons

Processing industry (71 companies)




17,717 tons

Wine sector (44 companies)



03

Current situation



Bio-waste manage by the biogas companies



153.050 tons


Bio-waste from pig farms- 31%



39.867 tons

Bio-waste from dairy farms - 3%





Current maximum profitable distances from biogas plants



Up to 20 km for pig farms



Up to 70 km for cattle farms



Up to 50 km – for wineries



Up to 100 km – processing industry





04

Software solution

ORGANIC WASTE MANAGEMENT SYSTEM

WEBAPP ORGANICWASTE_DEV (arcgis.com)

GSI based software solution



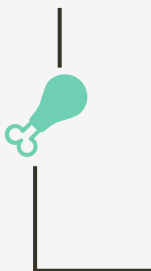
Future activities

Mapping of the other biowaste?

01

Other agricultural/food sectors

Dairy industry, meat industry, poultry, slaughterhouses ...



02

Food distribution

Fresh food markets, wholesalers, supermarkets...



03

HoReCa

Food waste



04

Communal waste

Biowaste generated



Истражување
и мапирање

Next activities



Raising awareness for the negative impact of bio-waste on the environment



Raising awareness of the current legislature dealing with bio-waste



Connecting companies with biogas companies for bio-waste management



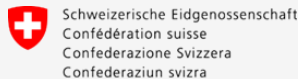
Creating of partnerships for development of circular economy business models

Thank you for your attention

Nikola Derebanov

n.derebanov@viridi.mk

+389 71 321 462



Swiss Agency for Development
and Cooperation SDC

State Secretariat for
Economic Affairs SECO

