



Challenges and Solutions of Biowaste using the example of the countries in the MENA region

PD Dr.-Ing. habil. Abdallah Nassour

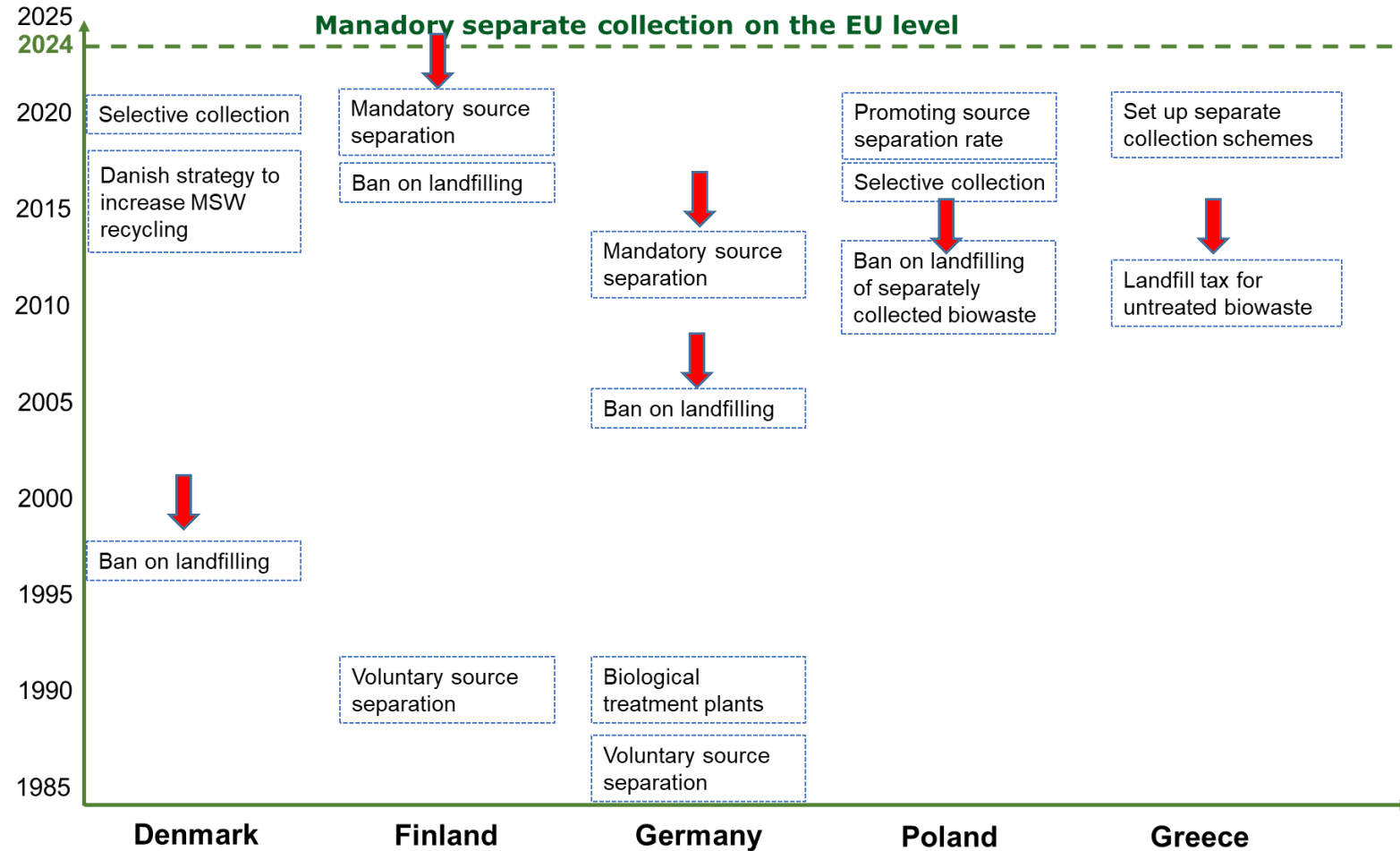


**Waste management and circular economy is
policy, responsibility and organization
more than technique**



Target of waste management is solve the problem
“not business” but costs recovery it must and is
important for sustainability

What is behind development of biowaste in Europe?



Financing and responsibility of household waste in Germany



Financing by citizen fee /
Responsibility by the municipality

Financing by Extended
Producer Responsibility /



**Residual
waste**



**Bio
waste**



**Paper and
cardboard**

**Packaging
material**

Situation of waste management in the MENA-Region

90-95 % Landfill



05-10 % Recycling



Who is responsible? and what solutions are possible?

	Challenges of waste management in the Mena-Region
Regulation and strategies	<ul style="list-style-type: none"> - No pressure for sustainable waste management from the responsible ministries - No practical strategies - Landfilling is cheap for the municipalities and responsible ministries
Financing	<ul style="list-style-type: none"> - No sustainable financing (Government pay > 80 % of the costs) - No financing system for the treatment - No EPR System in the practice - Difficulties by implementation the waste fees system in the municipalises "Municipalities pay electrify with the waste fee" - Investment in waste management is not sustainable
Know-how and Knowledge	<ul style="list-style-type: none"> - Lack of know-how and knowledge in sustainable waste management by municipalities and private sector - Waste collection is not organized and expensive - No experiences by treatment the waste "Biowaste"



Education is the Foundation of circular economy

Source: Prevent / GERMAN-MENA
University network for waste management
and circular economy

Home of waste management and circular economy

Skilled personnel for political
institutions and administration

Sustainable

- Laws and regulations
- Financing
- Long-term strategy
- Controlling and monitoring
- International cooperation

Skilled personnel for
implementation in the
municipalities

Customized

- Awareness and public relation
- Operation model
- Collection and transportation
- Recycling and treatment
- Private sector involvement

Skilled personnel for industry
of circular economy

Education - Bachelor and Master at University or Applied Science

Development of GERMAN-MENA University network for waste management and circular economy

GIZ-Project “Universities Cooperation with Jordanian Universities in - Waste to (positive) Energy“

2017 - 2020

University Sfax (Tunisia): International Professional Master program “Solid Waste Recycling and Circular Economy”

From Sep. 2023

Universities in Libya

From May 2024

GERMAN-MENA University network for waste management and circular economy

2017- 2019

GIZ-Project “Technical support for the universities of Blida and Constantine (Algeria) in master program”

01/2021 - 09/2022

GERMAN-MENA University network for waste management and circular economy “Algeria, Egypt, Jordan and Morocco”

From 2024

Cadi Ayyad University (Morocco) Bachelor and master „Waste management and circular economy”

Our partner universities



Algeria



Egypt



Morocco



Jordan



Tunisia



Our partner from public institutions and industry



Dr.-Ing. Wolfgang Pfaff-Simoneit
WPS Consult



Challenges of biowaste „composting“ management in the MENA Region

Project phases of the compost 



**Start to marketing the
compost before production**

Target is not to produce compost and business / Target to reduce the waste in the landfill

Huge capacities and compost from mixed waste / Start with available clean organic and simple available equipment's

Composting is responsibility of the municipality / Not business model / Sell of compost can not cover all the costs

Compliance with the laws of environmental ministries is almost “difficult” / Avoid “Environmental Impact Assessment” and permit in small composting projects

Composting project between Rostock and Bizerte



Hanse- und Universitätsstadt
ROSTOCK



Project phases

01-10
2017

1

Investigation and definition of the framework conditions



Manager of the green area in Bizerte "That is my project"

11/2017
12/2018

2

Site identification and feasibility study



Cooperation between municipality and consulting company with experiences in „composting plants“

01/2019
12/2021

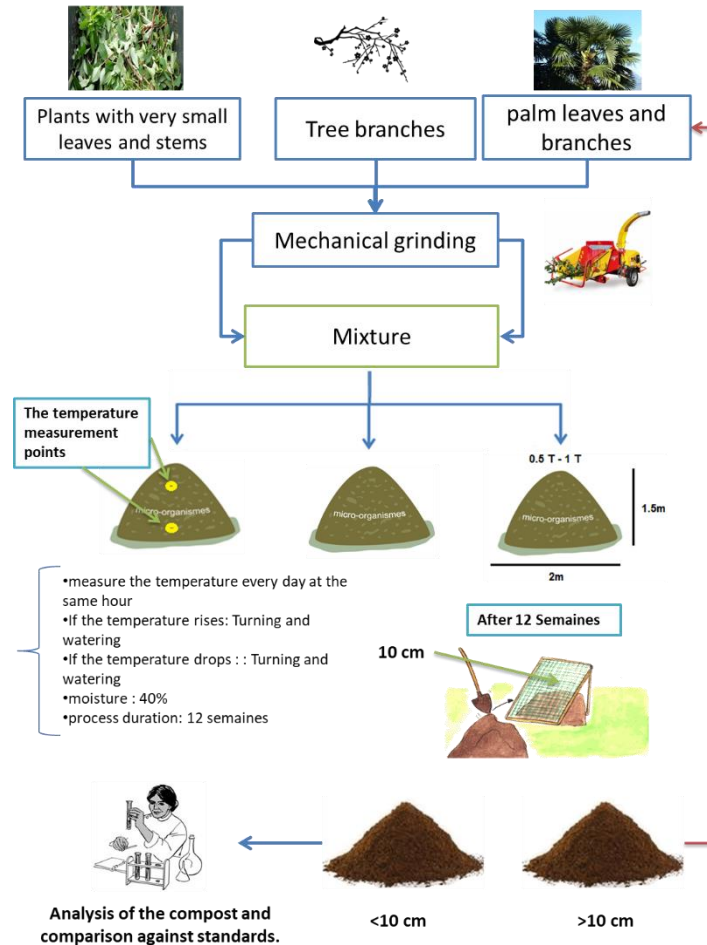
3

Build the project for 1000 t/a and operation since 2021



- **Municipality is responsible for operation**
- **Use of compost by the municipality "not sell the compost"**

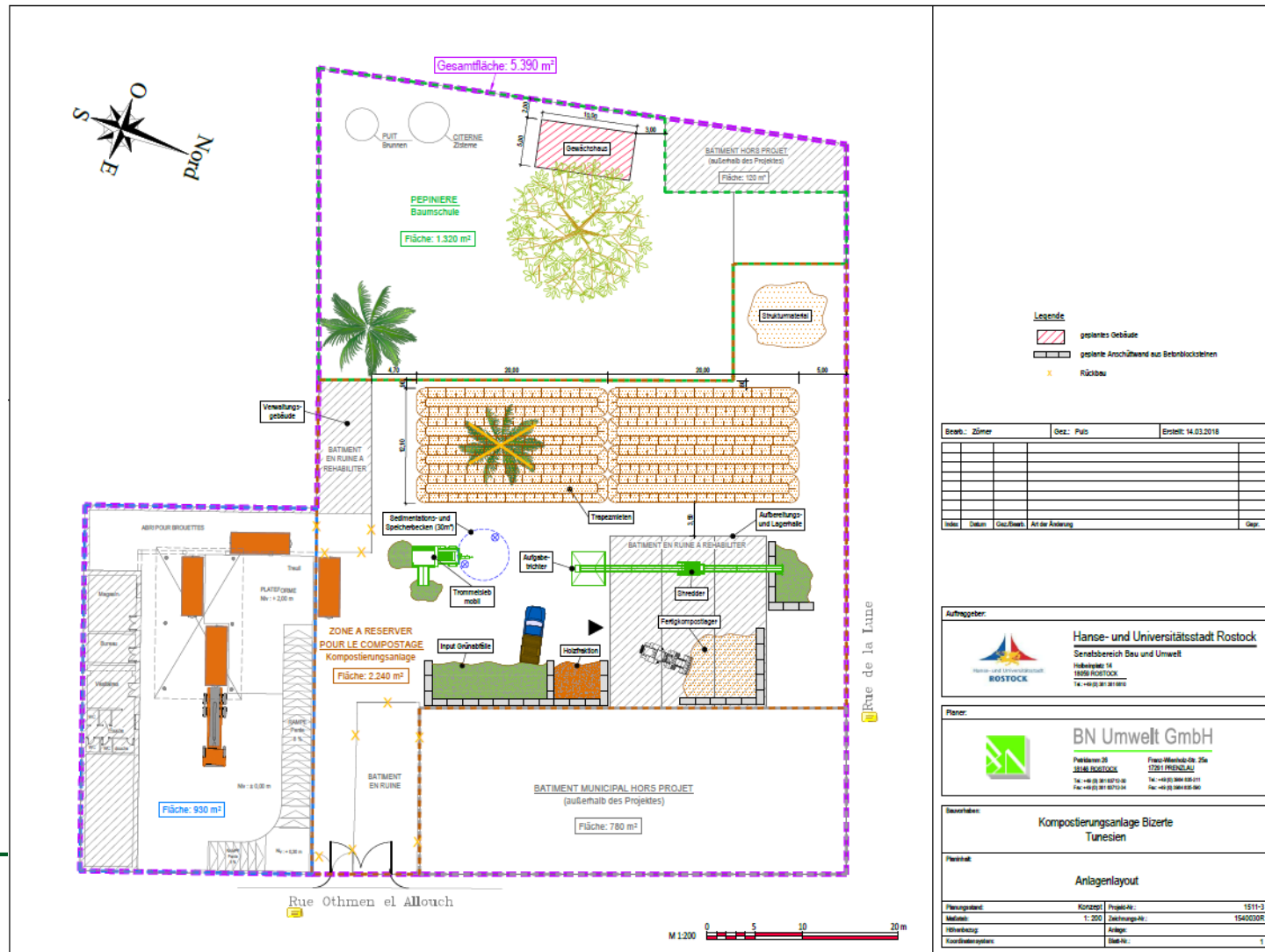
Kompostierung von organischen Abfällen in Bizerte / Tunesien



Testproject in Bizerte



Composting project between Rostock and Bizerte







Kompostierung von organischen Abfällen in Bizerte / Tunesien

<https://www.facebook.com/watch/?v=4607157742654084>

https://www.facebook.com/watch/live/?ref=watch_permalink&v=726249781840568

Now in Tunisia suggestion for the regulation
“ban of landfill for green waste”



How can this be implemented?



الجمهورية التونسية
وزارة البيئة



الوكالة الوطنية للتصرف في النفايات



المشروع النموذجي لوحدة التسميد

بسوق الجملة بصفاقس

بالشراكة مع

بلدية صفاقس



22 فيفري 2024



Pilot project with ANGED and the city of Sfax for composting

Composting plants in Irbid/Jordan We can learn a lot from this project





دعم مدينة بنزرت والبلديات المجاورة في تأسيس وكالة لإدارة النفايات الصلبة
كنموذج للجمهورية التونسية وشمال إفريقيا

**Supporting the city of Bizerte and neighboring municipalities in setting up a municipal waste
management company as a model for Tunisia and North Africa**

Universität
Rostock



الجامعة الوطنية للبلديات التونسية
FÉDÉRATION NATIONALE DES COMMUNES TUNISIENNES

V&U
VERBAND KOMMUNALER
UNTERNEHMEN e.V.



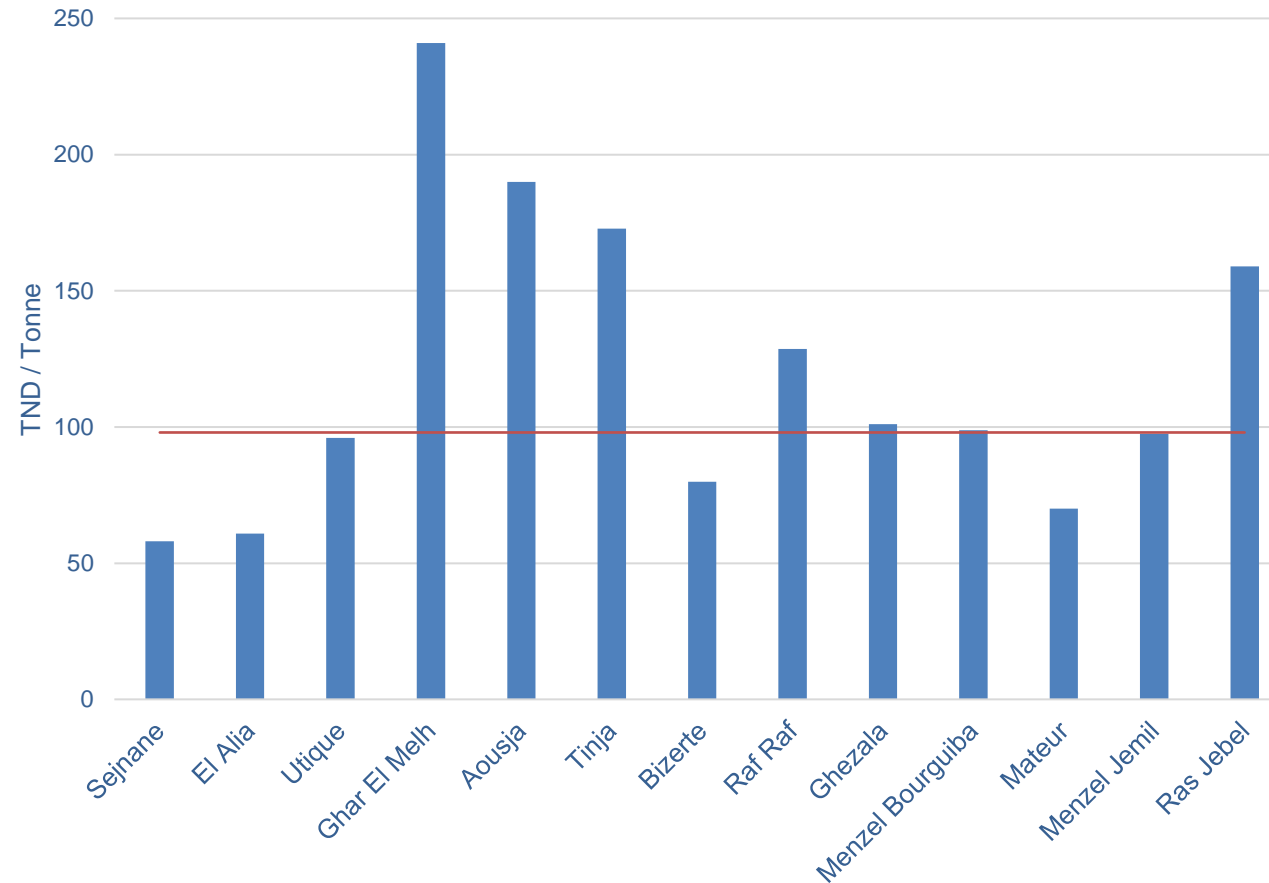
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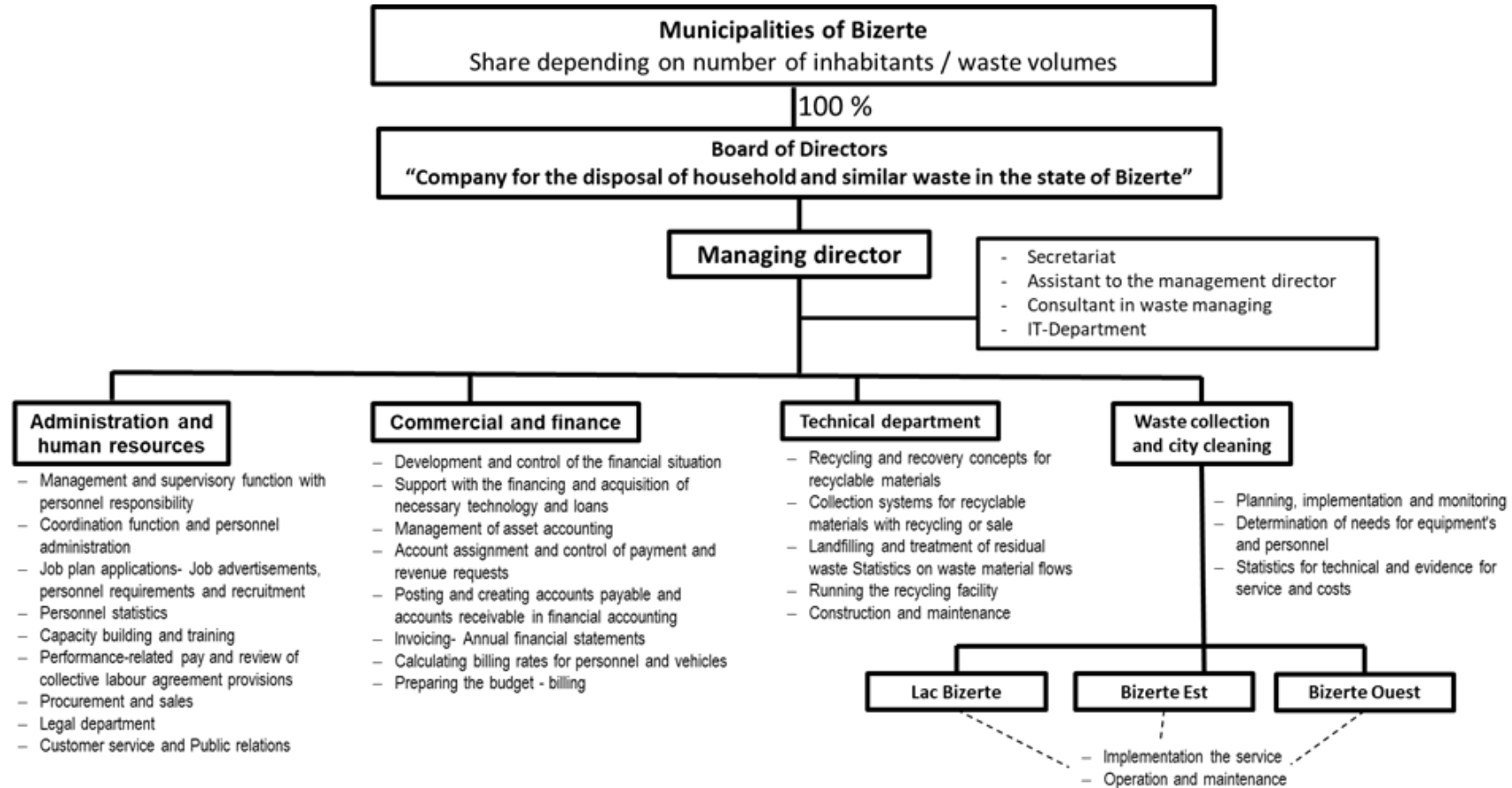
Supporting the city of Bizerte and neighboring municipalities in setting up a municipal waste management company as a model for Tunisia and North Africa

الدكتور المهندس عبدالله نصور

VERGLEICH DER BERECHNETEN KOSTEN FÜR DIE ABFALLSAMMLUNG UND -TRANSPORT PRO TONNE IN DEN GEMEINDEN DES GOUVERNEMENT BIZERTE



Organisation structure of the company





Focus and Discourse on Organic Waste: Jordan and Egypt



Focus and Discourse on Organic Waste: Jordan and Egypt

Project title	Focus and Discourse on Organic Waste: Jordan and Egypt
Funding organization	German Federal Environment Ministry's Advisory Assistance Program (AAP)
Supervisor agency	German Environment Agency (UBA)
Beneficiaries	Ministry of Environment in Jordan Waste Management Regulatory Authority in Egypt
Project partners	University of Rostock, Germany Egypt Solid Waste Management Center of Excellence University of Science and Technology in Jordan
project duration	01.10.2023-28.02.2026

Compost standard: Limits of heavy metals

Heavy metals Mg/kg _{TS}	International Standards for compost quality								
	Egypt	Tunisia	Iran	UK	Jordan	Canada	EU	Germany	
								Class A	Class B
Lead (Pb)	150	180	200	200	120	150	120	150	100
Copper (Cu)	100	300	650	200	-	400	300	100	70
Zinc (Zn)	500	600	1300	400	-	700	800	400	300
Nickel (Ni)	60	60	120	50	50	62	50	50	35
Cadmium (Cd)	3	3.0	10	1.5	3	3	1.5	1.5	1.0
Chrome (Cr)	210	-	150	100	100	210	100	100	70
Mercury (Hg)	1	2	5	-	1.5	-	1.0	1.0	0.7

Compost quality standards in Egypt, Jordan and Germany

Parameter	Unit	German standard class A	Egyptian standard	Jordanian Standard	Results from a study done in Jordan (Hemidat, 2019)
Foreign substances	%	0 (<20mm) 0.5 (<2mm) 5 (Stones >5mm)	0.5 (plastic, glass, metal) < 5 (stones>5mm)	-	-
Moisture	%	<45	35-50	≤20	33-38
Organic matter	%	15-40	>17	30-70	19-40
Total Pb	Mg/kg _{TS}	150	150	120	1.9-2.4
Total Cd	Mg/kg _{TS}	1.5	3	3	0.19-0.39
Total Cr	Mg/kg _{TS}	100	210	100	12-17
Total Hg	Mg/kg _{TS}	1	1	1.5	< 0.05
Total Cu	Mg/kg	100	100	-	11-15
Total Ni	Mg/kg	50	60	50	11-14
Total Zn	Mg/kg	400	500	-	52-68
pH	-	-	7-8	7-8	6.91-7.62

- Needs in MENA Region „Strategy for composting“,
- Waste management is an important factor for sustainability "not only business"
- Each municipality with about 50,000 inhabitants needs composting plant for clean organic material
- Huge demand for composting plants with capacities "500 to 5000 t/a"
- Compost projects should start with available clean material and equipment's
- Composting projects are responsibility of the municipality "not business"
- Start to use the compost by the municipality "not sell the compost", but later
- Needs for local production of equipment's in cooperation with companies from Europe

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