

TAKING
COOPERATION
FORWARD

📍 GOTOMEETING CITYCIRCLE 8th PSM / 5th October 2021

💬 **Pilot - BIO-ECONOMY IN VARAŽDIN**

👤 CE1515/ CITYCIRCLE/DAN/Nikolina Žigmund

2. PROJECT IMPLEMENTATION

2.3. SEPARATION, COLLECTION AND TREATMENT OF WASTE

Pilot implementation

- ✓ Monthly separate waste collection system in City Open market
- ✓ Monitoring and monthly reporting of separately collected waste quantities
- ✓ Production of quality digestate in the biogas plant in Family farm Vrček
- ✓ Closing the loop by using the produced digestate as a fertilizer on the hazelnut farm owned by the City Open market



2. PROJECT IMPLEMENTATION

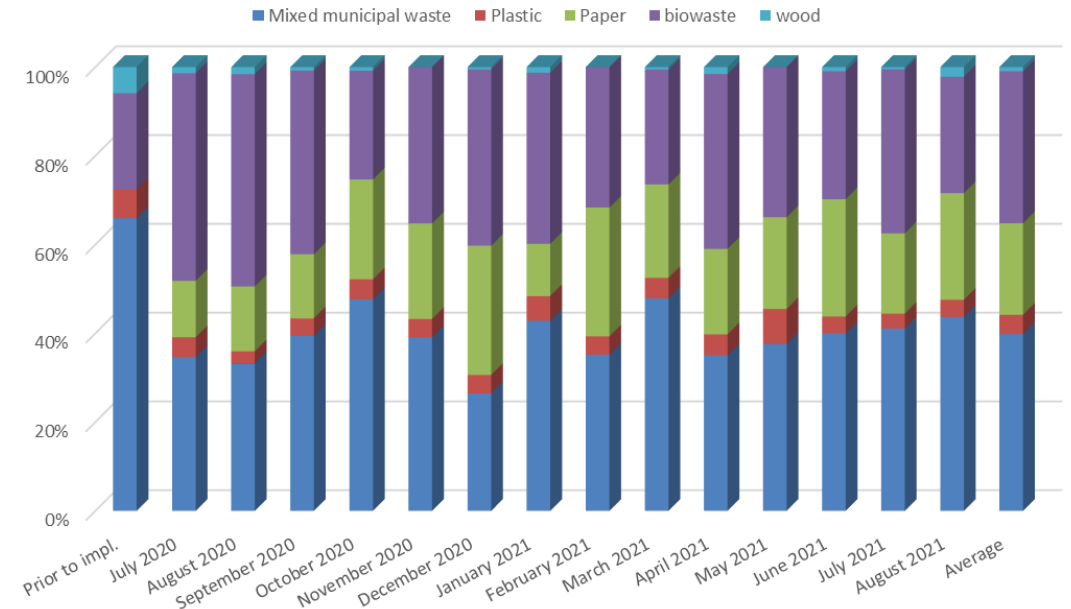
2.3. SEPARATION, COLLECTION AND TREATMENT OF WASTE

MONITORING RESULTS

COMPARISON OF DATA ON WASTE QUANTITIES PRIOR AND DURING THE IMPLEMENTATION OF THE PILOT PROJECT

	Prior to implementation of pilot project	During the implementation of the pilot project (7/2020-8/2021)
Mixed municipal waste	65,9%	38,9%
Bio-waste	21,7%	35,5%

- ✓ Reduction of mixed municipal waste quantity up to 30 % in average;
- ✓ Increase of separately collected biowaste quantities by 15% on average;
- ✓ The efficiency of separate waste collection is declining in the second year
- ✓ Additional measures will be taken for further improvement of separate collection.



EXPERIENCE GAINED AND LESSONS LEARNT

- ✓ Not all market users endorsed separate collection
- ✓ It is necessary to find a way to improve the waste separation system
- ✓ Additional education and constant encouragement of the importance of waste separation are needed
- ✓ Educate market users about problems due to biowaste disposal on landfills
- ✓ Introducing positive/negative incentives for waste separation



2. PROJECT IMPLEMENTATION

2.4. SOIL AND DIGESTATE SAMPLING AND ANALYSIS AND APPLICATION OF DIGESTATE ON FARMLAND



Soil Analyses	Parameters							
	pH KCl	pH H ₂ O	Humus (%)	P ₂ O ₅ (mg/100g)	K ₂ O (mg/100g)	CaCO ₃ (%)	Hy (mmol/100g)	N (%)
Sample 1	4,2	5,5	2,64	9,2	15,8	-	7,53	0,14
Sample 2	4,1	5,3	3,75	17,1	11,4	-	9,45	0,16

Application on only ½ of the plantation for comparison

Recommendation from Croatian Agency for Agriculture and Food:

1. Autumn 2020 addition of 10 tones of digestate and 1000 kg of calcification
2. Spring 2021 addition of 5 tones of digestate and 500 kg of calcification
3. Autumn 2021 addition of 10 tones of digestate and 500 kg of calcification
4. Autumn 2022 addition of 10 tones of digestate and 1000 kg of calcification



2. PROJECT IMPLEMENTATION

2.5. HAZELNUT HARVESTING

Milestones/outputs: Successful harvest of hazelnuts



Fertilised tree

Unfertilised tree

Fertilisation boundary

Haselnuts

- Clearly visible effect
- 80 % of harvest on fertilised portion of plantation



OUTCOMES ACHIEVED



- Hazelnut plantation is rather young (in the 6th year) therefore harvest is still minimal
- The differences are small, however clearly visible and measurable
- On fertilised portion trees are greener and have over double more harvest



EXPERIENCE GAINED AND LESSONS LEARNT

- ✓ The circular economy was clearly demonstrated
- ✓ The use of organic waste for energy/fertilizer in hazelnut farming is a viable option
- ✓ The difference between fertilized and unfertilized plantation is small however visible - it is necessary to follow the fertilization recommendation plan for several years in order to achieve full potential of harvest
- ✓ In all steps of the project, stakeholder's cooperation was of outmost importance and had crucial effect on successful implementation



THANK YOU FOR YOUR ATTENTION



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