

JUSTIFICATION OF THE PROJECT PROPOSAL FOR PROCESSING THE ORGANIC COMPONENT OF SOLID HOUSEHOLD WASTES INTO COMPOST



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BRIEFLY ABOUT POLTAVA REGION



The territory – 28748 км²;
The population is – 1419 thousand.
Of which rural – 542,2 thousand persons;
urban – 873,8 thousand persons.

Rural
38,4%



Urban
61,6%

Distribution of population of Poltava region according to the place of residence

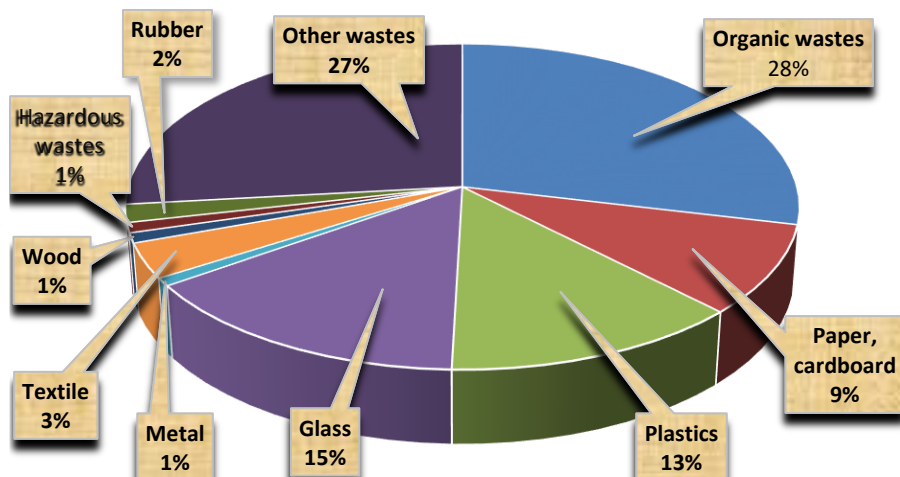




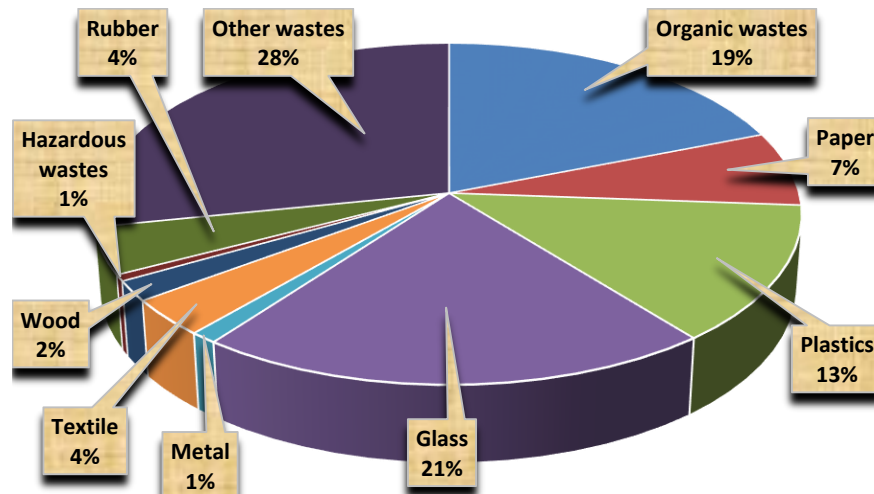
RESOURCE POTENTIAL OF DOMESTIC SOLID WASTES



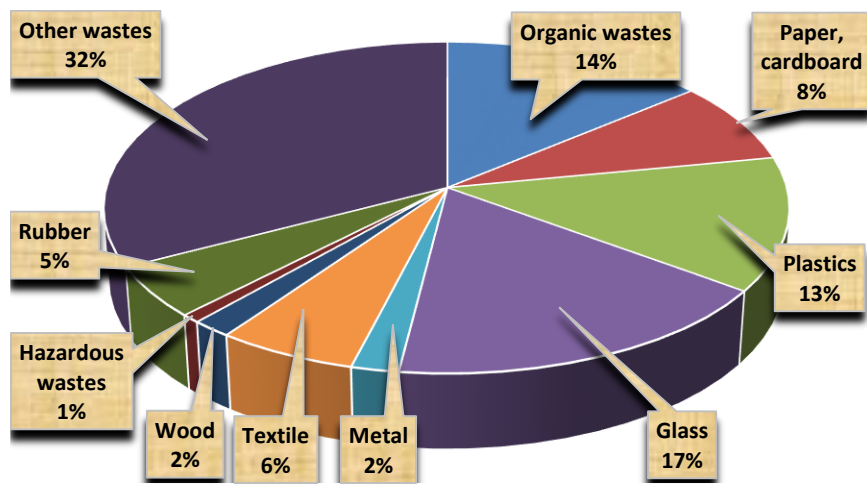
Cities with population ≤ 5000 people
high-rise housing



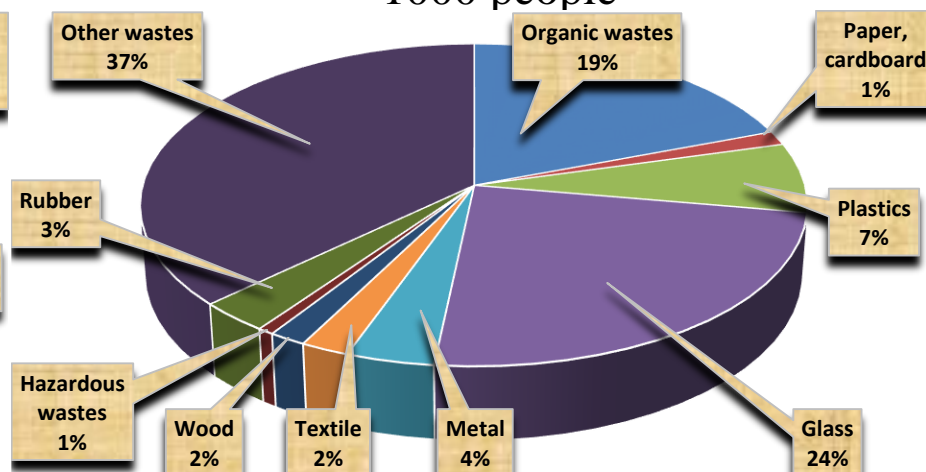
Cities with population ≥ 5000 people
high-rise housing



Major population centers with population
1000-5000 people



Small settlements with population less than
1000 people



VOLUME OF RESOURCE COMPONENTS IN POLTAVA REGION, m/year



Rubber;
60812

Other wastes ;
645118

Organic
wastes;
604301

Hazardous
wastes;
15173

Paper,
cardboard;
145630

Wood;
25902

Textile; 77470

Metal; 42129

Glass; 409253

Plastics;
238241





MAIN METHODS OF DOMESTIC SOLID WASTES MANAGEMENT



Burning



Composting



Pyrolysis



Collecting and stowing



Sorting

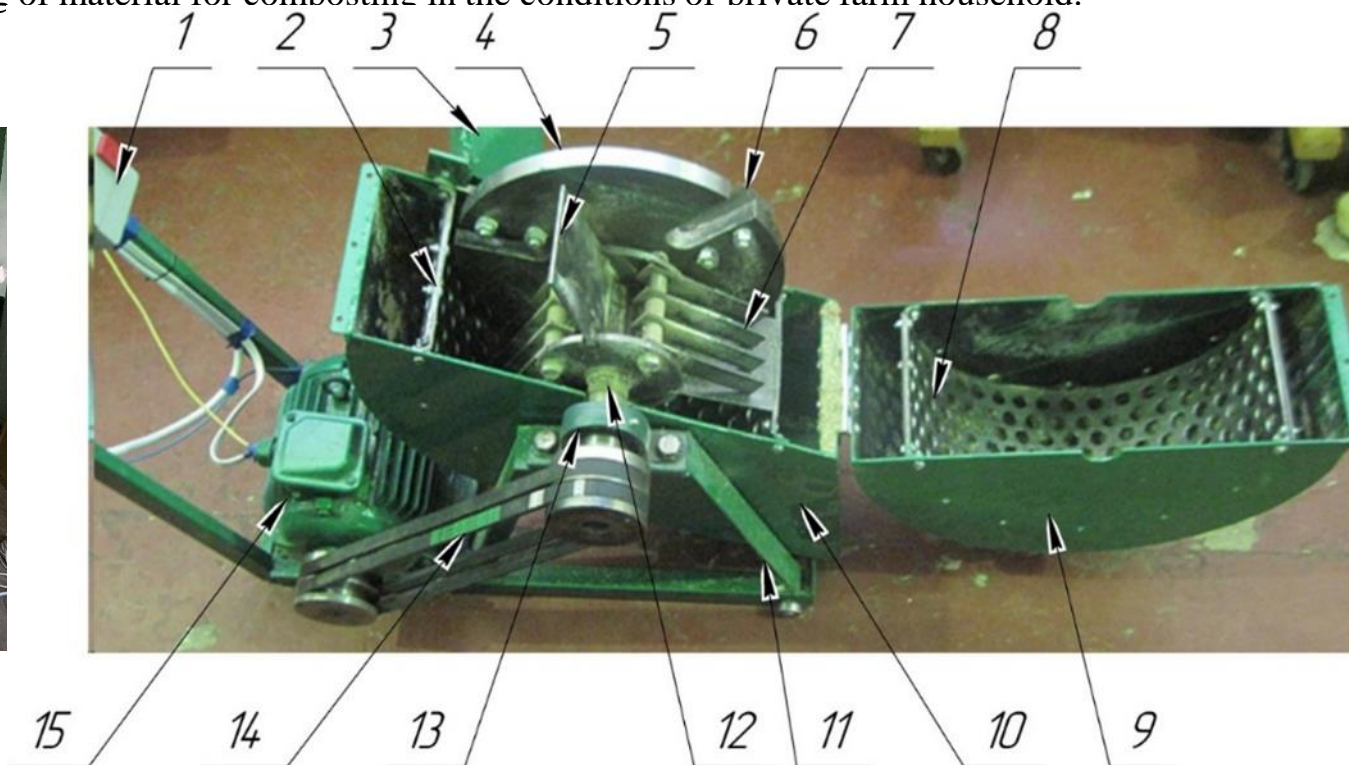




SMALL-SIZED DOMESTIC CHOPPER FOR COMPOST PREPARATION



The authors developed and patented the construction of small-sized domestic chopper for compost preparation. It is designed for chopping the organic component of domestic solid wastes into the given fraction. It performs chopping, mixing, screening and clamping of material for composting in the conditions of private farm household.



1-control panel; 2-fixing strip for screen; 3-charging hopper; 4-disc for fixing the blades; 5-fan blades; 6-cutting blade; 7-grinding hammers; 8-screen; 9-upper housing; 10-lower housing; 11-frame; 12-working shaft; 13-support bearing; 14 - V-belt transmission; 15-electric motor



THE PROPOSED TECHNOLOGY OF PROCESSING THE ORGANIC COMPONENT OF DOMESTIC SOLID WASTES INTO COMPOST

1. Sorting of domestic solid wastes in order to select the organic component.
2. Sequential loading of the components of organic part of domestic solid wastes to the machine.
3. The content of food waste should be not less than 25-30% of the total weight of material prepared for composting
4. Chopping to the fraction, where particle size does not exceed 50 mm.
5. The content of particles up to 50 mm should be about 90% of the total volume.
6. Clamping layer by layer.
7. The chopped material in the storage piles should be moistened to 50-60% of moisture content by weight.



ECONOMIC CALCULATIONS OF WASTE USE AS SECONDARY MATERIAL RESOURCES

1. Compost produced per year – 73 t / year
2. The value of one-time costs: raw materials, auxiliary materials, inventory, and developed chopper – 2835 euros
3. The value of variable costs: electricity, water, wages, depreciation costs – 4379 euros
4. Cost of 1 kg of compost – 0,093 euros
5. The market cost of 1 kilogram of compost – 0,128 euros
6. The obtained profit – 2145 euros
7. The payback period of the project is 9 months





CONCLUSIONS



1. Waste use as secondary resources requires constant search for new technologies, and subsequently their application. Ukraine and Poltava region in particular has significant opportunities for processing waste into secondary raw materials.
2. As the advantages of applying modern technologies of waste processing into compost in private farm households should be considered the following: decrease in the cost of cultivated products, substantial material saving, use of new technologies in agriculture, cost saving, increase in productivity, increase in product quality, organizational effectiveness.
3. In addition to economic benefits, technologies of waste reprocessing have an environmental function, as the amount of garbage that is thrown into landfills is reduced, and they are disposed of at the production site.
4. The use of waste as secondary material resources is a strategy that is directed on the economy development, increase in the efficiency of enterprise, decrease in the impact of private farm households on the environment.

THANK YOU FOR YOUR ATTENTION!



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