

Co-funded by the
Erasmus+ Programme
of the European Union



Design and Implement Waste Bank Digital App with Design Thinking approach

study case of Serang District, Indonesia

Prepared by : Permata Nur M.R., Ph.D (Universitas Prasetiya Mulya)



Co-funded by the
Erasmus+ Programme
of the European Union





Objectives

- Give an overview about the process of creating mobile/web application.
- Provide examples of how design thinking is applied in the field of software engineering



About Project



Local Government (Serang)



- This project is intended to assist waste management in the Serang area of Indonesia.
- This project collaborates with the *local government, communities, and local partners* in implementing our solutions.
-
- The output of this project is an digital app to help people in collecting waste around their residence

BACKGROUND

6 Fakta Pembuangan Sampah di Kantor Lurah Cilowong Serang, Tolak Buangan dari Tangsel

Kamis, 28 Oktober 2021 13:12
Reporter : Nurul Diva Kautsar

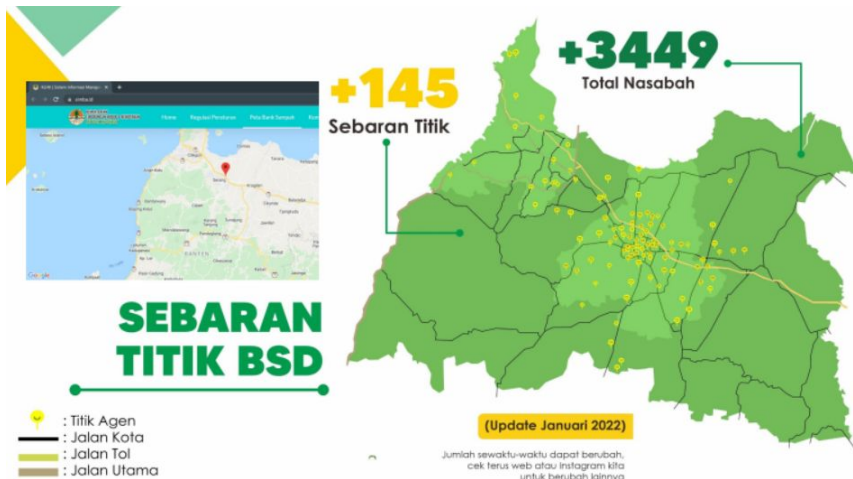


source: Indonesian Newspaper KOMPAS

- Waste management in the Serang area has not been implemented properly, especially in involving the community
 - Only few people (out of 650,000 people) aware and contribute to zero waste
 - the amount of waste is getting increased.
- Transportation carried out by the local government (600m³/day) and the private sector (150m³/day) is only able to reach 750m³/day out of a total of 1,625 m³/day.
- The government strongly supports all solutions that able to reduce waste from the house family (0.0025 m³/day per person).

Empathize

Conduct an analysis about waste management in Serang district.



Pemerintah Kota Serang

Co-funded by the Erasmus+ Programme of the European Union



People / Home

TPS
(temporary Landfill)



TPA
(Landfill)





DEFINE

- Family member consider no value for waste
- A few awareness about waste management → no effort to sort, collect, & reuse
- Waste management by local partners is in the traditional way → not effective in reducing the amount of existing waste on a large scale. Ex: record manually the contribution in collecting waste, benefit record, etc





IDEATE

Design and implement an application that is able to increase awareness and contribution in waste management for reducing amount of waste

Community
Awareness

Management
Solution

Appreciation
& Benefit

[Software Requirement and Specification](#)



Community Awareness

- Education & Campaign :
 - Waste definition
 - Importance of waste
 - How to contribute zero waste
 - Triggering in waste become something valued

Management Solution

- Inorganic waste collection
- Organic waste management
- Easy contribute zero waste through application

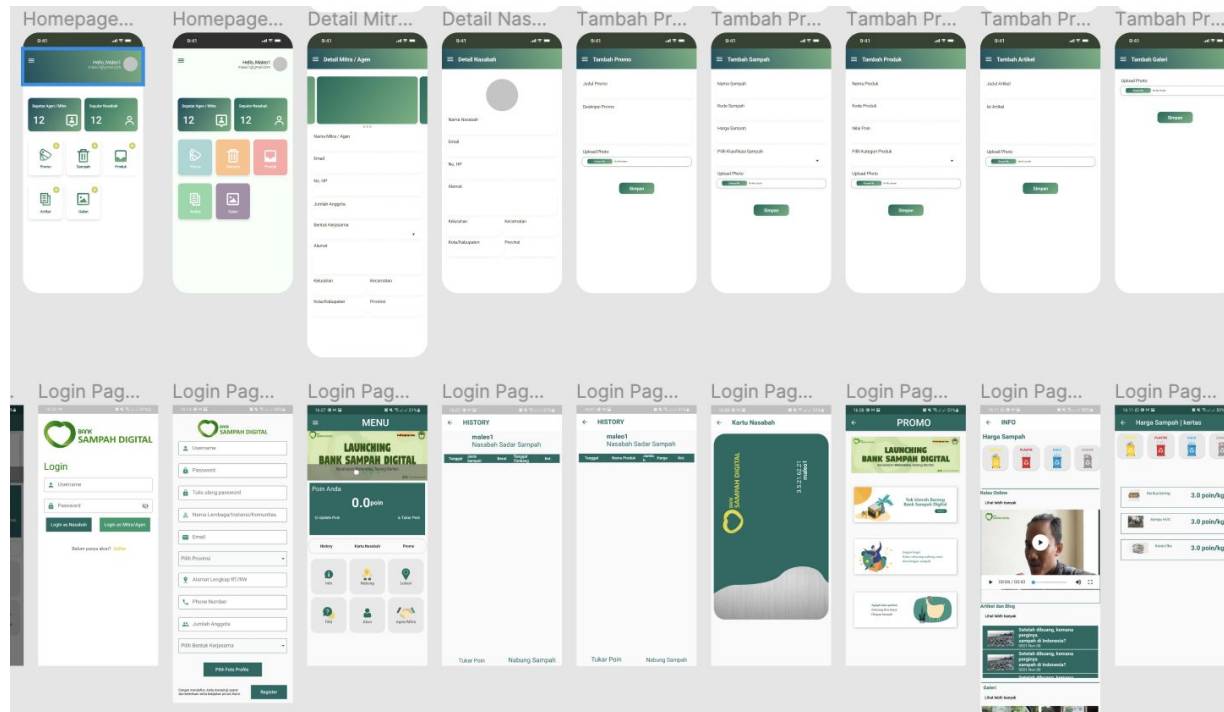
Appreciation & Benefit

- Exchange waste with daily necessities
- Easy access in rewards

PROTOTYPE

application design in Figma

Co-funded by the
Erasmus+ Programme
of the European Union

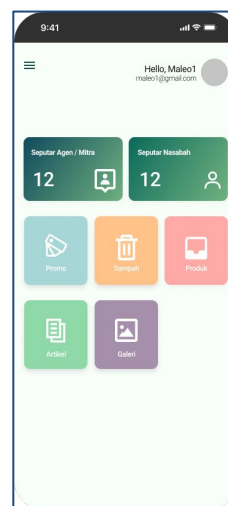
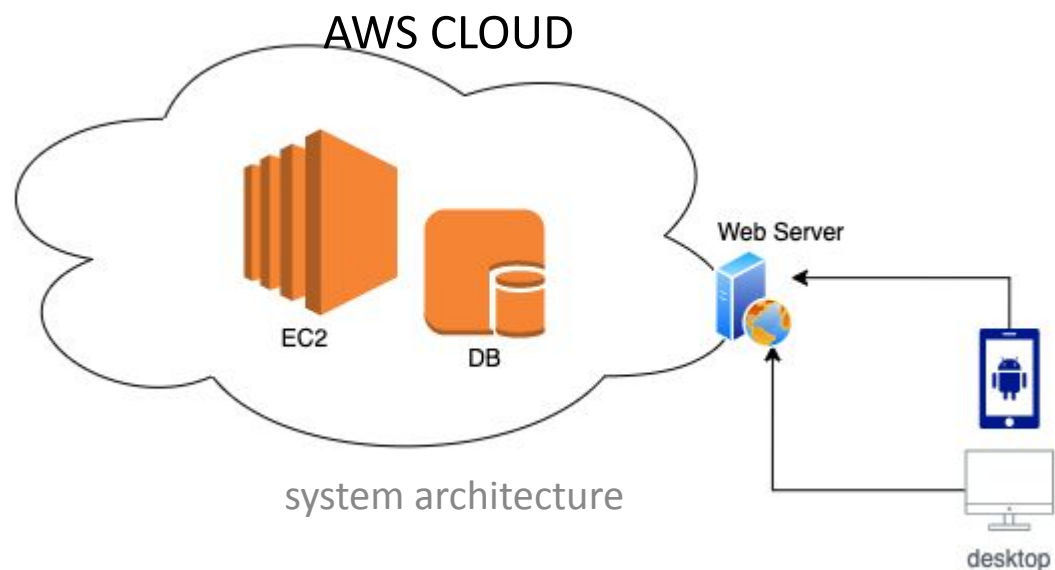


[Figma Link](#)



IMPLEMENTATION

Co-funded by the
Erasmus+ Programme
of the European Union



Bank Sampah Digital

STEMPreneur Center Produktivitas

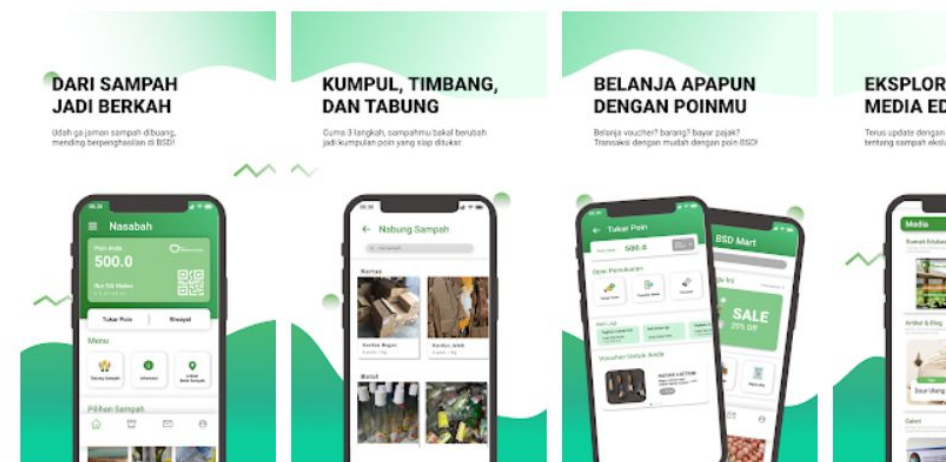
★★★★★ 19

3+

Aplikasi ini tersedia untuk semua perangkat Anda

Tambahkan ke Wishlist

Instal





USER ACQUISITION



Total Pengguna
1393 orang

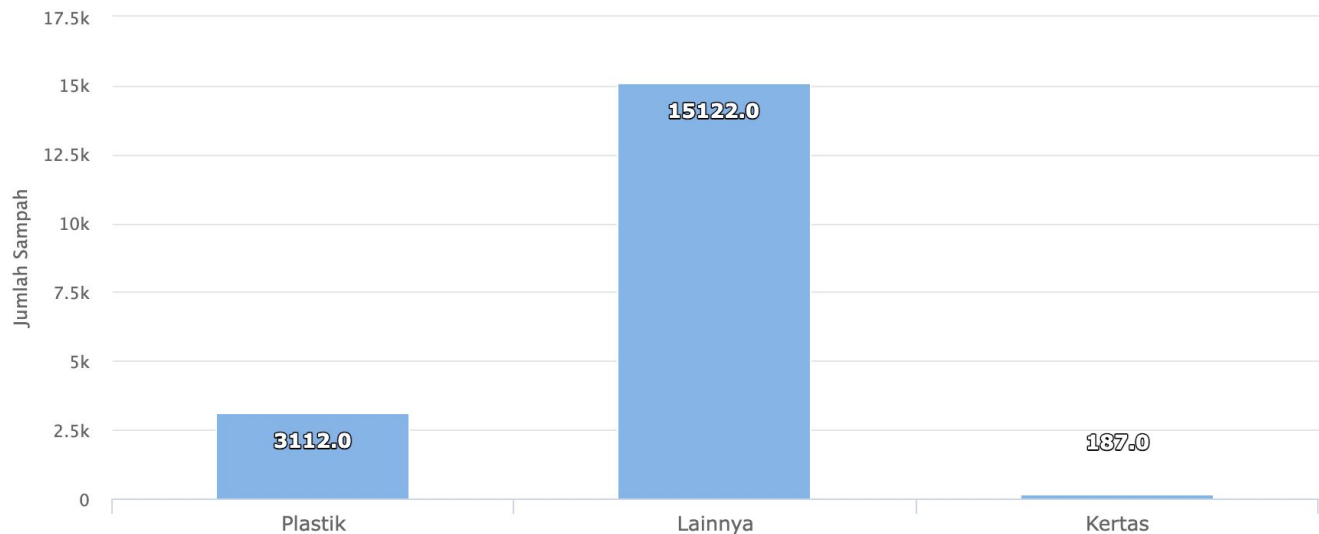


Total Lokasi BSD
124 titik



Jenis Sampah
26 jenis

Tabungan Sampah Bar Chart



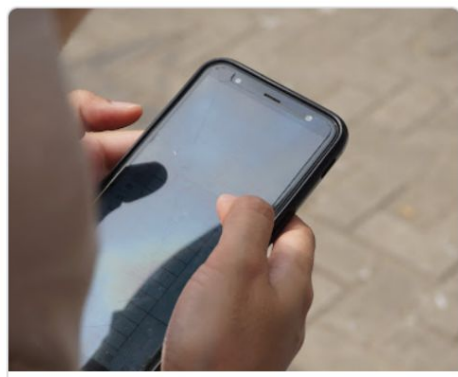
#Users : 1393 person

#Location : 124 spots

#Waste : 26 variants

TESTING

Co-funded by the
Erasmus+ Programme
of the European Union





FEEDBACK

- UI/UX Improvement (User Journey)
- Integrated Payment gateway system:
 - able to pay tax with waste
 - poin rewards
- Improvement for organic waste solution:
 - Komposter
 - Biopori
 - Eco-enzyme



Co-funded by the
Erasmus+ Programme
of the European Union



Thank you

permata.nmr@prasetiyamulya.ac.id



Co-funded by the
Erasmus+ Programme
of the European Union



Understanding Food Waste Twitter Conversations

BY : Stevanus Wisnu Wijaya



Co-funded by the
Erasmus+ Programme
of the European Union



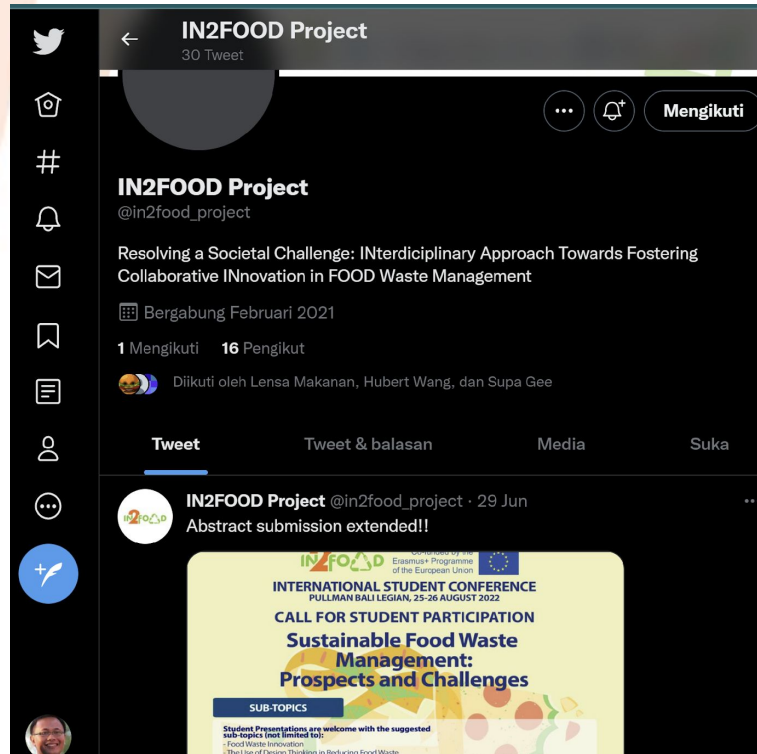


agenda

- Understanding Twitter Conversations
- Mining Twitter Conversations using TAGS.
- Analysing Twitter Conversations using NodeXL
- Discussions

Twitter Conversations

Co-funded by the
Erasmus+ Programme
of the European Union



- Display name: IN2FOOD project
- User name: @in2food_project
- Tweet:
- @reply replky
- Retweet forwarding message

Step

Co-funded by the
Erasmus+ Programme
of the European Union



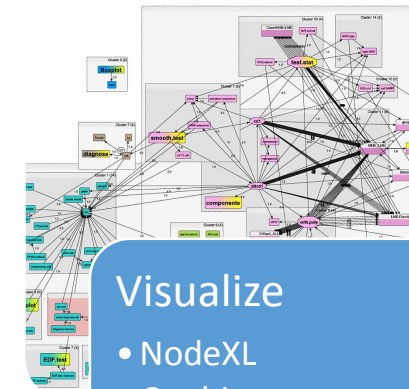
Download

- Using TAGS
- Using NodeXL
- Using other's software such as Pajek, Gephi, Phyton



Analyse

- NodeXL
- Pajek
- Gephi
- Phyton



Visualize

- NodeXL
- Gephi
- Phyton

Co-funded by the
Erasmus+ Programme
of the European Union



Let's use TAGS

<https://tags.hawksey.info/>





Food Waste





https://docs.google.com/spreadsheets/d/1W1XfwUOcwLN_Rok_iOqbHqL4o-d4_TNEdMWwyMxqg1pw/edit#gid=8743918

Surat tugas memberik... x Search results - Googl... x Food Waste - Google... x Template PPT IN2FOOD... x New Tab

docs.google.com/spreadsheets/d/1W1XfwUOcwLN_Rok_iOqbHqL4o-d4_TNEdMWwyMxqg1pw/edit#gid=8743918

Laporan Kerja Riset... Collecting Twitter d... (439) Perhitungan A...

Food Waste ☆ 📄 🌐

File Edit View Insert Format Data Tools Extensions Help TAGS Last edit was made seconds ago by Stevan

100% £ % .0 .00 123 Roboto 10 B I A

C4 fx =IMAGE(getGABeacon("UA-48225260-1",B9),3)

| | A | B | C |
|----|--|------------|--|
| 1 | TAGS v6.1.9.1 | | |
| 2 | Created by mhawksey. Read more about this at: | | |
| 3 | http://tags.hawksey.info | | |
| 4 | With this spreadsheet you can: | | |
| 5 | - automatically pull results from a Twitter Search into a Google Spreadsheet | | |
| 6 | Instructions: | | |
| 7 | 1. If you've never run TAGS > Setup Twitter Access do so now (this should only need to be done once for all your TAGS sheets) | | |
| 8 | | | |
| 9 | 2. Enter term | Food waste | <- you can use search operators like AND OR as well as from: and to: eg #JobsNow AND from:BarackObama (without quotes) |
| 10 | | | |
| 11 | Note: Make a one off collection with TAGS > Run now! or set a trigger to collect every hour TAGS > Update archive every hour. To change the frequency open Tools > Script Editor then Triggers > Current script's triggers... and adjust | | |
| 12 | Advanced Settings: | | |
| 13 | Period | default | |

+ Readme/Settings Archive Summary NODEXL FORMATTED

32°C Berawan 16:05 20/08/2022



What you need to do?

- Converting the TAGS Data format to NodeXL Format
- Importing the data to NodeXL

Using NODEXL

NodeXLGraph1 - Excel

Table Tools Prasetiya Mulya PM

File Home Insert Draw Page Layout Formulas Data Review View Help NodeXL Pro Table Design Tell me what you want to do Share

Import Export Prepare Data Show Graph Summary Automate Type: Undirected Fruchterma... Layout: Fruchterma... Color Opacity Visibility Autofill Columns Vertex Shape Vertex Size Edge Width Graph Metrics Subgraph Images Dynamic Filters Groups Import Export Use Current for New Reset All Show/Hide Help

Visual Properties Labels Other Columns

Vertex 1 Vertex 2 Color Width Style Opacity Visibility Label Label Text Label Font Size Add Your Own Columns Here

Vertex 1 Name
Enter the name of the edge's first vertex.

Edges Vertices Groups Group Vertices Overall Metrics

Ready Accessibility: Investigate

31°C Kabut 9:18 21/08/2022

Download from
<https://www.smrfoundation.org/nodexl/>
Install it. It is a windows based application.

Import data from Twitter

The screenshot displays the NodeXL Pro software interface within an Excel window. The 'Import' menu is open, listing various data sources. The option 'From Twitter Search Network...' is highlighted. A tooltip for this option reads: 'Import from Twitter Search Network. Optionally clear the NodeXL workbook, then get the network of people whose tweets contain a specified word.'

The interface includes a ribbon with tabs for 'NodeXL Pro' and 'Table Design'. The 'NodeXL Pro' ribbon contains sections for 'Visual Properties' (Color, Opacity, Vertex Shape, Vertex Size, Visibility, Edge Width), 'Analysis' (Graph Metrics, Subgraph Images, Dynamic Filters, Groups), and 'Options' (Import, Export, Use Current for New, Reset All). The 'Table Design' ribbon includes 'Show/Hide' and 'Help' options.

On the right side, a 'DOCUMENTATION' pane is visible, showing a yellow callout box with the text: 'NodeXL Pro frequently. H recent chang' followed by a bulleted list: 'Fixed User (DI network)', 'Added "Time" Twitter', and 'Added Weight "Relatio Edges w GEXF'. Below this, a brown box mentions 'New step-by network anal Pro:' with a sub-bullet 'Social i'.

The Windows taskbar at the bottom shows the system tray with a temperature of 31°C, the time 9:23, and the date 21/08/2022.

Add your keywords: Food Waste

Import from Twitter Search Network

This might take a long time: [Twitter rate limiting](#)

Search for tweets that match this query:
Food Waste

[How to use advanced search operators](#)

What to import

- Basic network
Show who was replied to or mentioned in recent tweets
[More about this option](#)
- Basic network plus friends (very slow!)
Add some of the users' friends
[More about this option](#)

Your Twitter account

- I have a Twitter account, but I have not yet authorized NodeXL to use my account to import Twitter networks. Take me to Twitter's authorization Web page.
- I have a Twitter account, and I have authorized NodeXL to use my account to import Twitter networks.

Limit to 2,000 tweets

- Limit friends and followers to 2,000 per user
- Expand URLs in tweets (slower)
- Extended analysis: perform a second pass on the collected Tweets to ensure that all Retweets are collected and all RetweetedIDs are correct. (Slow!)

OK Cancel

Document ...

NodeXL Pro

NodeXL Pro frequently. H
[recent chang](#)

- Fixed b
User (Di
network
- Added
"Time"
Twitter
- Added
Weight'
"Relatio
Edges w
GEXF

New step-by-
network anal
Pro:

- Social i

Twitter Data

NodeXLGraph1 - Excel

File Home Insert Draw Page Layout Formulas Data Review View Help NodeXL Pro Table Design Tell me what you want to do

A3 trishahileyuk

| | A | B | C | D | E | F | G | H | I | J | N | O | |
|----|----------------|-------------------|-------------------|-------|-------|---------|------------|--------|------------|---------------|--------------|---------------|--|
| 1 | | | Visual Properties | | | | | Labels | | | | Other Columns | |
| 2 | Vertex 1 | Vertex 2 | Color | Width | Style | Opacity | Visibility | Label | Label Text | Label Font Si | Add Your Own | Relationship | |
| 3 | trishahileyuk | trishahileyuk | | | | | | | | | | Tweet | |
| 4 | vsansc | Vertex 1 Name | | | | | | | | | | MentionsInRe | |
| 5 | vsansc | Enter the name of | | | | | | | | | | MentionsInRe | |
| 6 | vsansc | the edge's first | | | | | | | | | | Retweet | |
| 7 | miu_n | vertex. | | | | | | | | | | Tweet | |
| 8 | thomasdwyb | lakotaman1 | | | | | | | | | | Replies to | |
| 9 | iaimaimch | thavisin | | | | | | | | | | Retweet | |
| 10 | megraeb | acshilton | | | | | | | | | | Replies to | |
| 11 | crowsplay1 | crowsplay1 | | | | | | | | | | Tweet | |
| 12 | crowsplay1 | crowsplay1 | | | | | | | | | | Tweet | |
| 13 | crowsplay1 | crowsplay1 | | | | | | | | | | Tweet | |
| 14 | jerseygirlk8 | crowsplay1 | | | | | | | | | | Retweet | |
| 15 | mickcarroll6 | zombywoof4 | | | | | | | | | | Retweet | |
| 16 | mickcarroll6 | jacob_rees_mogg | | | | | | | | | | Replies to | |
| 17 | charlielfarley | charlielfarley | | | | | | | | | | Tweet | |
| 18 | sadiefoster | sadiefoster | | | | | | | | | | Tweet | |
| 19 | mattshupepr | sadiefoster | | | | | | | | | | Retweet | |
| 20 | gopit2255 | thavisin | | | | | | | | | | Retweet | |
| 21 | electrorecycl | electrorecycle | | | | | | | | | | Tweet | |
| 22 | compassion_ | compassion_heal | | | | | | | | | | Tweet | |
| 23 | compassion_ | compassion_heal | | | | | | | | | | Retweet | |
| 24 | perishablene | perishablenews | | | | | | | | | | Tweet | |
| 25 | finstudent | acshilton | | | | | | | | | | Replies to | |
| 26 | william30621 | chineseemb_uga | | | | | | | | | | Mentions | |
| 27 | william30621 | opmuganda | | | | | | | | | | Mentions | |
| 28 | william30621 | opmuganda | | | | | | | | | | Mentions | |

Document ...

Show Graph

NODEXL Pro

NodeXL Pro i frequently. H recent chang

- Fixed b User (Di network
- Added "Time" Twitter
- Added Weight' "Relatio Edges w GEXF

New step-by-network anal Pro:

- Social i

Edges Vertices Groups Group Vertices Overall Metrics

Ready Accessibility: Investigate

31°C Kabut 9:29 21/08/2022

STEP 1: Calculating Graph Metrics

Co-funded by the
Erasmus+ Programme
of the European Union



NodeXLGraph1_summerschool - Excel

File Home Insert Draw Page Layout Formulas Data Review View Help NodeXL Pro Table Design Tell me what you want to do

Refresh Graph Type: Directed Color Vertex Shape Summary Layout: Fruchterma... Autofill Columns Visibility Edge Width Dynamic Filters Groups Use Current for New Import Export Show/Hide Help

| Visual Properties | Labels |
|--|--------|
| Vertex Color Shape Size Opacity File Visibility Label Co | |
| trishahileyuk Solid Squa 1,5 https://pbs.twimg.com/profile_image | |
| vsansome Disk 1,5 https://pbs.twimg.com/profile_image | |
| scobie Solid Squa 1,5 https://pbs.twimg.com/profile_image | |
| sholamos1 Solid Squa 1,5 https://pbs.twimg.com/profile_image | |
| _truthseekerg Solid Squa 1,5 https://pbs.twimg.com/profile_image | |
| miu_mill Solid Squa 1,5 https://pbs.twimg.com/profile_image | |
| thomasdwybo Disk 1,5 https://pbs.twimg.com/profile_image | |
| lakotaman1 Solid Squa 1,5 https://pbs.twimg.com/profile_image | |
| iaimaimch Disk 1,5 https://pbs.twimg.com/profile_image | |
| thavisin Solid Squa 1,5 https://pbs.twimg.com/profile_image | |
| megraeb Disk 1,5 https://pbs.twimg.com/profile_image | |
| acshilton Solid Squa 1,5 https://pbs.twimg.com/profile_image | |
| crowsplay1 Solid Squa 1,5 https://pbs.twimg.com/profile_image | |
| jerseygirll8 Disk 1,5 https://pbs.twimg.com/profile_image | |
| mickcarroll6 Disk 1,5 https://pbs.twimg.com/profile_image | |
| zombywoof4 Solid Squa 1,5 https://pbs.twimg.com/profile_image | |
| jacob_rees_mogg Solid Squa 1,5 https://pbs.twimg.com/profile_image | |
| charlielfarley Solid Squa 1,5 https://pbs.twimg.com/profile_image | |
| sadiefoster Solid Squa 1,5 https://pbs.twimg.com/profile_image | |
| mattshupepr Disk 1,5 https://pbs.twimg.com/profile_image | |
| gopit2255 Disk 1,5 https://pbs.twimg.com/profile_image | |
| electrorecycle Solid Squa 1,5 https://pbs.twimg.com/profile_image | |

Graph Metrics

Calculate selected graph metrics and insert the results into the workbook.

Zoom: 100 Autoscale

Count: 53

31°C Kabut 9:58 21/08/2022

Graph Metrics

Metrics to calculate and insert into the workbook:

- Overall graph metrics
- Vertex degree (undirected graphs only)
- Vertex in-degree (directed graphs only)
- Vertex out-degree (directed graphs only)
- Vertex betweenness and closeness centralities
- Vertex eigenvector centrality
- Vertex PageRank
- Vertex clustering coefficient
- Vertex reciprocated vertex pair ratio (directed graphs only)
- Edge reciprocation (directed graphs only)
- Group metrics
- Words and word pairs
- Top items
- Twitter search network top items

Select All Deselect All Options...

Overall graph metrics

The following overall metrics get inserted into the Overall Metrics worksheet

| Graph Type | Directed or undirected. |
|--------------|--|
| Vertices | The number of vertices in the graph. |
| Unique Edges | The number of edges that do not have duplicates. |
| Edges With | The number of edges that have duplicates. |

About duplicate edges Calculate Metrics Cancel



Graph Metrics

- To examine the network of conversations
- In degree: the most popular users
- Out degree: the most active users

| Graph Metric | Value |
|---|-------------|
| Graph Type | Directed |
| Vertices | 2773 |
| Unique Edges | 2775 |
| Edges With Duplicates | 174 |
| Total Edges | 2949 |
| Self-Loops | 522 |
| Reciprocated Vertex Pair Ratio | 0,012820513 |
| Reciprocated Edge Ratio | 0,025316456 |
| Connected Components | 867 |
| Single-Vertex Connected Components | 326 |
| Maximum Vertices in a Connected Component | 185 |
| Maximum Edges in a Connected Component | 275 |
| Maximum Geodesic Distance (Diameter) | 8 |
| Average Geodesic Distance | 2,274058 |
| Graph Density | 0,000308323 |
| Modularity | 0,863456 |
| NodeXL Version | 1.0.1.504 |

B1 fx

A B C D E F G H

Document Actions

| | | |
|----|--------------|----------|
| 1 | | |
| 2 | Vertex | Subgraph |
| 3 | trishahileyu | |
| 4 | vsansome | |
| 5 | scobie | |
| 6 | sholamos1 | |
| 7 | _truthseeker | |
| 8 | miu_mill | |
| 9 | thomasdwy | |
| 10 | lakotaman1 | |
| 11 | iaimaimch | |
| 12 | thavisin | |
| 13 | megraeb | |
| 14 | acsilton | |
| 15 | crowsplay1 | |
| 16 | jerseygirlk8 | |
| 17 | mickcarroll | |
| 18 | zombywool | |
| 19 | jacob_rees | |
| 20 | charlielfar | |
| 21 | sadiefoster | |

Visual Properties

Autofill Columns

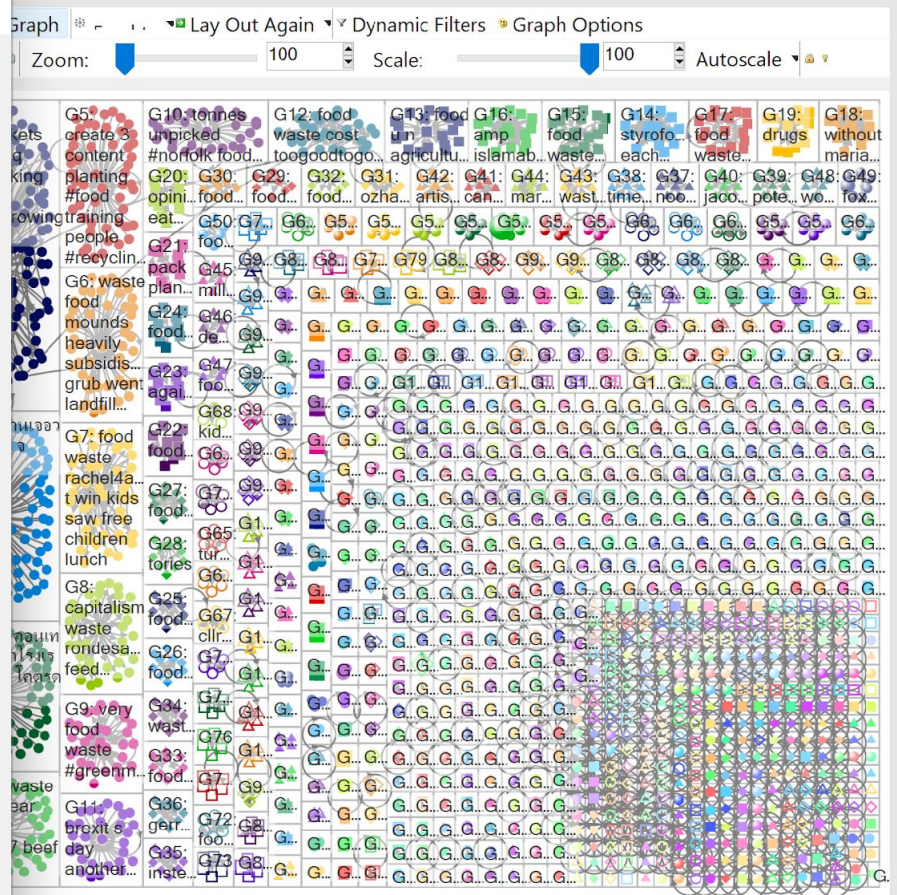
Edges Vertices Groups

| Property | Value | Options |
|--|---|---------|
| When Autofill is clicked, fill in these worksheet columns... | ...using the values in these source columns, if the columns exist | |
| Vertex Color | | • |
| Vertex Shape | In-Degree | • |
| Vertex Size | Followers | • |
| Vertex Opacity | | • |
| Vertex Visibility | Degree | • |
| Vertex Label | | • |
| Fill Color | | • |
| Vertex Label Position | | • |
| Vertex Tooltip | | • |
| Vertex Layout Order | Followers | • |
| Vertex X | | • |
| Vertex Y | | • |
| Vertex Polar R | | • |
| Vertex Polar Angle | | • |

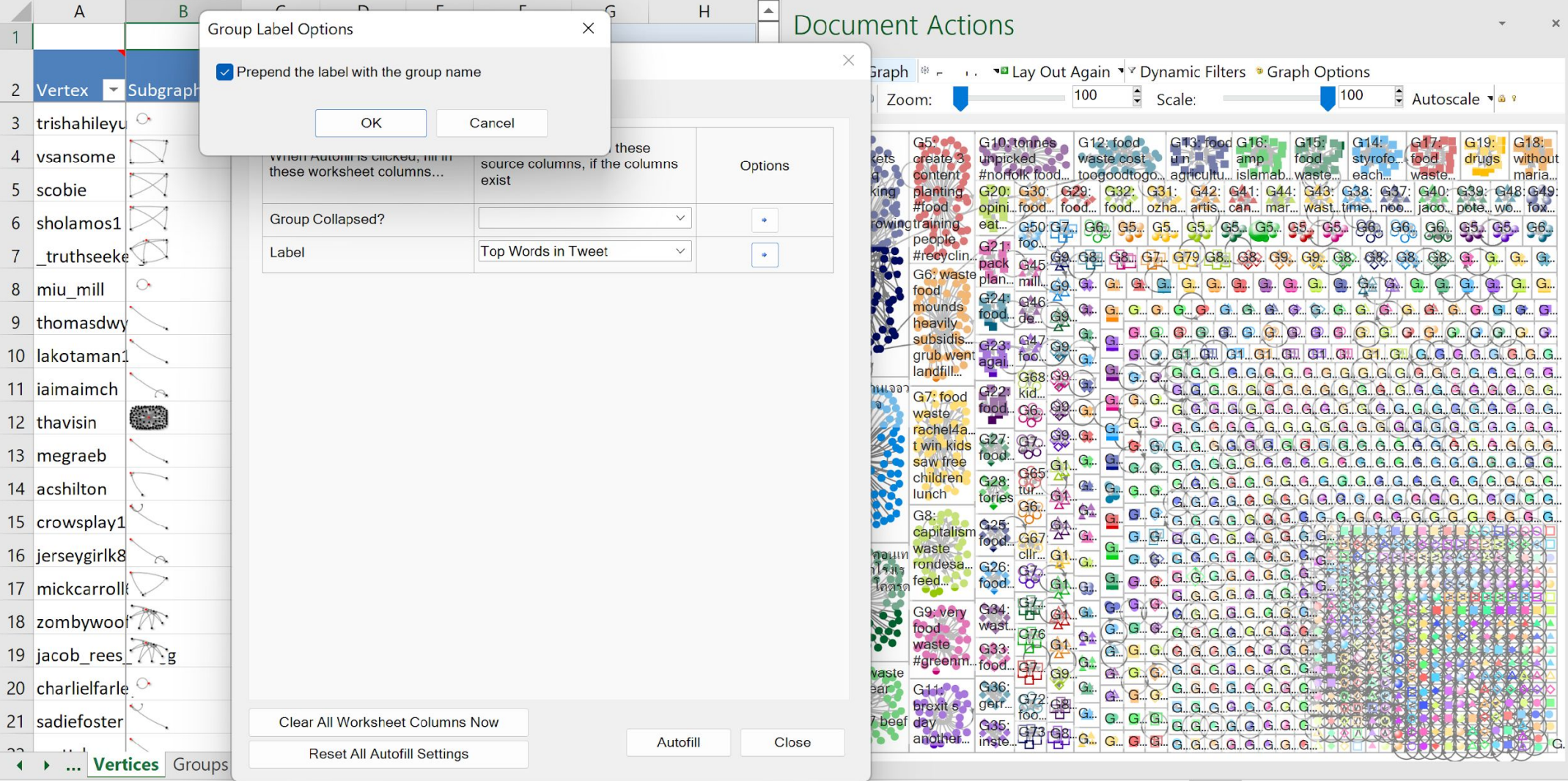
Clear All Worksheet Columns Now

Reset All Autofill Settings

Autofill Close



B1 fx



Group Label Options

Prepend the label with the group name

OK Cancel

| When Autofill is clicked, fill in these worksheet columns... | source columns, if the columns exist | Options |
|--|--------------------------------------|---------|
| Group Collapsed? | | • |
| Label | Top Words in Tweet | • |

Clear All Worksheet Columns Now

Reset All Autofill Settings

Autofill Close



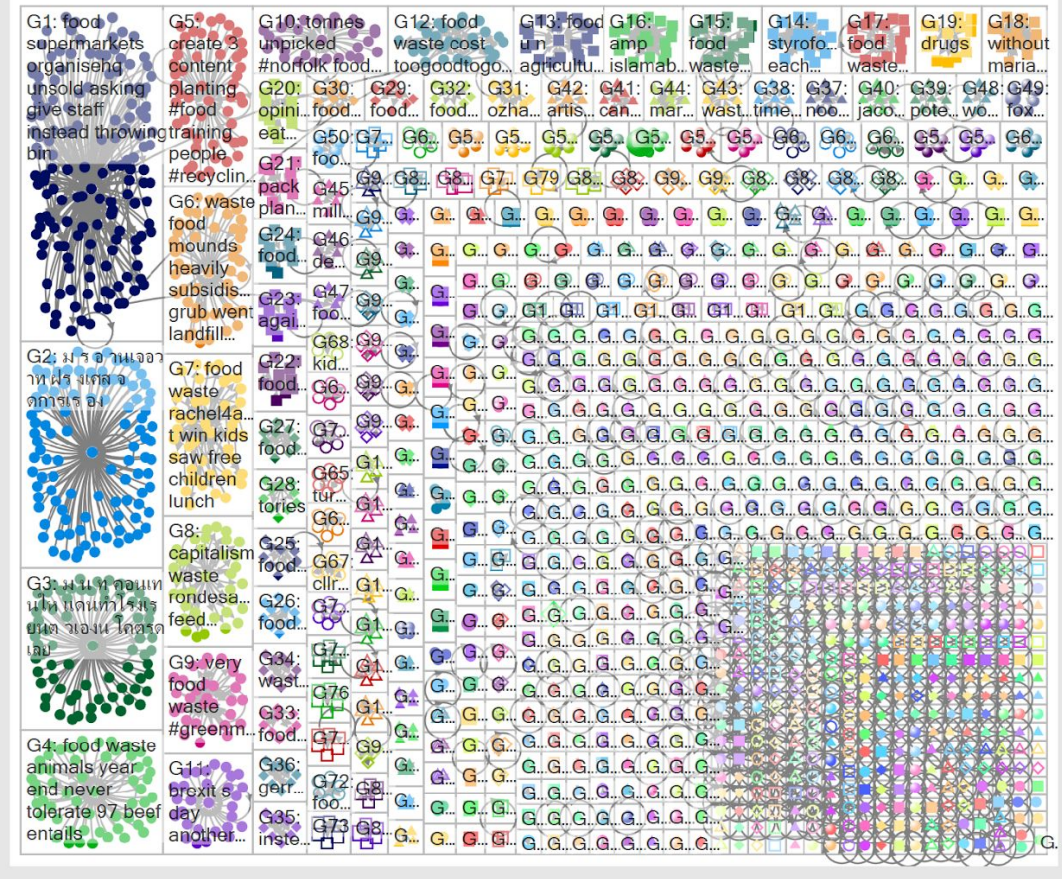
B1 : X ✓ fx

| | A | B | C | D | E | F | G | H | |
|----|---------------|----------|-------------------|-------|------|---------|---|------------|--|
| 1 | | | Visual Properties | | | | | | |
| 2 | Vertex | Subgraph | Color | Shape | Size | Opacity | Image File | Visibility | |
| 3 | trishahileyu | | | Image | 1,5 | | https://pbs.twimg.com | | |
| 4 | vsansome | | | Disk | 1,5 | | https://pbs.twimg.com | | |
| 5 | scobie | | | Image | 1,5 | | https://pbs.twimg.com | | |
| 6 | sholamos1 | | | Image | 1,5 | | https://pbs.twimg.com | | |
| 7 | _truthseeker | | | Image | 1,5 | | https://pbs.twimg.com | | |
| 8 | miu_mill | | | Image | 1,5 | | https://pbs.twimg.com | | |
| 9 | thomasdwy | | | Disk | 1,5 | | https://pbs.twimg.com | | |
| 10 | lakotaman1 | | | Image | 1,5 | | https://pbs.twimg.com | | |
| 11 | iaimaimch | | | Disk | 1,5 | | https://pbs.twimg.com | | |
| 12 | thavisin | | | Image | 1,5 | | https://pbs.twimg.com | | |
| 13 | megraeb | | | Disk | 1,5 | | https://pbs.twimg.com | | |
| 14 | acsilton | | | Image | 1,5 | | https://pbs.twimg.com | | |
| 15 | crowsplay1 | | | Image | 1,5 | | https://pbs.twimg.com | | |
| 16 | jerseygirlk8 | | | Disk | 1,5 | | https://pbs.twimg.com | | |
| 17 | mickcarrollk | | | Disk | 1,5 | | https://pbs.twimg.com | | |
| 18 | zombywoof | | | Image | 1,5 | | https://pbs.twimg.com | | |
| 19 | jacob_rees | | | Image | 1,5 | | https://pbs.twimg.com | | |
| 20 | charlielfarle | | | Image | 1,5 | | https://pbs.twimg.com | | |
| 21 | sadiefoster | | | Image | 1,5 | | https://pbs.twimg.com | | |

Document Actions

* Refresh Graph * Lay Out Again * Dynamic Filters * Graph Options

Zoom: 100 Scale: 100 Autoscale



| Top URLs in Tweet in Entire Graph | Entire Graph Count |
|---|--------------------|
| https://www.mirror.co.uk/news/politics/outrage-m-ps-lords-bin-26-27792491 | 49 |
| https://www.edp24.co.uk/news/business/crops-was-ted-on-norfolk-farms-amid-workforce-shortages-9213878 | 30 |
| https://resource.co/article/workforce-shortages-res-ult-60-million-worth-food-waste | 30 |
| https://www.bbc.co.uk/sounds/play/m001b3kj | 26 |
| https://foodtank.com/news/2022/08/companies-tur-ning-food-waste-into-fashion-statements/ | 26 |
| https://the.organise.network/campaigns/network-b-p-and-all-supermarkets-to-cut-down-on-food-waste-31f50dfd45e81d5e?utm_campaign=name&utm_medium=twitter&utm_source=share | 19 |
| https://www.nytimes.com/2022/08/18/climate/gm-o-food-soybean-photosynthesis.html | 16 |
| https://the.organise.network/campaigns/network-b-p-and-all-supermarkets-to-cut-down-on-food-waste-31f50dfd45e81d5e | 15 |
| https://bit.ly/3QRV7H1 | 9 |
| https://the.organise.network/campaigns/network-b-p-and-all-supermarkets-to-cut-down-on-food-waste-31f50dfd45e81d5e?utm_campaign=4PVQ0FkqfL&utm_medium=twitter&utm_source=share | 8 |

| Top Domains in Tweet in Entire Graph | Entire Graph Count |
|--------------------------------------|--------------------|
| organise.network | 156 |
| co.uk | 125 |
| twitter.com | 89 |
| bit.ly | 42 |
| resource.co | 31 |
| foodtank.com | 26 |
| trib.al | 19 |
| nytimes.com | 16 |
| theguardian.com | 16 |
| buff.ly | 13 |

| Top Hashtags in Tweet in Entire Graph | Entire Graph Count |
|---------------------------------------|--------------------|
| food | 73 |
| recycling | 53 |
| charity | 52 |
| foodwaste | 36 |
| brexit | 30 |
| norfolk | 29 |
| brexitreality | 29 |
| greenmoneyshow | 25 |
| waste | 13 |
| summer | 9 |

| Top Word Pairs in Tweet in Entire Graph | Entire Graph Count |
|---|--------------------|
| food,waste | 870 |
| waste,food | 173 |
| instead,throwing | 158 |
| unsold,food | 157 |
| organisehq,asking | 155 |
| supermarkets,give | 155 |
| give,unsold | 155 |
| food,staff | 155 |
| staff,instead | 155 |
| throwing,bin | 155 |

Co-funded by the
Erasmus+ Programme
of the European Union

