READ ME - Database survey for DynAEs

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1. Context

These data were collected by the **Walloon Agricultural Research Centre** (CRA-W - https://www.cra.wallonie.be/en) in the framework of the project **Agroecology-TRANSECT** https://www.agroecology-transect.net/ which aims at contributing to release the full potential of agroecology for European agriculture by **strengthening the knowledge base for farmers and advisors and supporting decision makers**. Agroecology-TRANSECT involves 19 European partners and is co-funded by the European Union.

More specifically, Work Package 5 (WP5) of the project addresses the characterisation and scaling out of agroecological practices at the European level. Task 5.1 is part of this WP and is more specifically dedicated to the **characterisation of a large diversity of dynamic agroecological systems (DynAEs)** and the identification of their biophysical and socioeconomic factors of success and failure.

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DynAEs have been defined as all kind of **initiatives implementing or directly supporting the implementation of agroecological practices at the agroecosystem level**, which does not exclude that they might also act or have an impact at the food system level. This includes research activities, farms, farmers' networks, approaches of co-creation and exchange of knowledge, businesses, education, training and awareness-raising activities, living labs, … However, it does not include movements, associations or organisations solely dedicated to lobbying or activism in favour of agroecology development.

Data have been collected from these DynAEs using an **online survey**, with a focus on those located in the **European Union, Switzerland and the United Kingdom**. More details about the data collection process can be found in Section 4 of this document.

2. General information about the database

Database title: Database survey for DynAEs

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Date of data collection:

- From May 15th 2023 until August 24th 2023 for the first version of the survey
- From November 27th 2023 until January 18th 2024 for the second version of the survey

Geographical scope:

- European Union
- Switzerland
- United Kingdom
- Serbia

3. Access to data

Licence: CC-BY

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4. Methodology for data collection

Data have been collected from DynAEs using an online survey with the aim to collect 100 to 120 answers. To achieve this goal, four strategies have been used:

- **Direct contact by email to a list of pre-selected DynAEs:** relevant European agroecological research projects involving agroecological initiatives have been identified. Initiatives from these projects have been pre-selected while ensuring the coverage of a diversity of European countries (European Union, Switzerland and the United Kingdom), production systems, sectors of activity and involved actors. This pre-selection was made among the projects for whom the information was still available during the pre-selection period (from November 2022 to February 2023) and that provided enough information about the initiatives on their websites. This pre-selection was completed by doing web searched using the key words Europe, agroecolog*, initiative, farm, sustainable. The pre-selection was shared with and approved by the project's partners.
- **Direct contact by email within the networks of the project's partners**
- **Share of the survey link on Agroecology-TRANSECT's website and social medias, partners' website and social medias**
- **Participation of agroecological initiatives already involved in the project (Innovation Hubs)**

The survey was developed using an XLSForm and deployed on KoboToolbox.

A **first version** of this survey was deployed between May and August 2023 in 12 languages (English, French, Slovenian, Dutch, German, Hungarian, Romanian, Bulgarian, Italian, Portuguese, Danish and Spanish). You can see it in READ ME - Appendix 1.

Based on the first results and feedbacks from the respondents, the survey was adapted and a **second version** has been developed **without compromising the capacity to analyse the results of both versions altogether**. This was ensured by limiting the changes to the removal of some questions without changing the wording nor the possible options to be selected of the remaining questions. You can see it in READ ME - Appendix 2.

5. Data description and content

5.1. General information

Number of variables/columns: 519

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Number of initiatives/rows: 89

Code for missing values:

- NA: missing value (occurred when a respondent did not answer a question or when an inconsistent answer was given)
- unknown : when the respondent selected "I don't know" as an answer to a question
- na: when the respondent selected "Not applicable to the initiative" as an answer to a question OR when the question was not asked because the respondent did not select a particular answer to another question (more details about the dependency between the variables is given in section 5.3)

5.2. List of variables

The variables of the database are detailed (variable name, definition, unit, format and possible values) in READ ME - Appendix 3. It only includes the variables that are common to both versions of the survey. The variables related to the questions that have been removed from the second version of the survey have thus been removed from the database.

For some of the variables, the possible values that can be taken (modalities) are detailed in Appendix 4.

5.3. Dependency between survey's questions and variables

The survey has been designed so that, for certain questions, the answer to a previous question is taken into account to determine whether the question is relevant and whether it should appear or not. This is specified in the column "relevant" of the survey (READ ME - Appendix 1 and READ ME - Appendix 2).

Therefore, specific links exist between the variables related to these questions. These links are described in the column "RELEVANCE" of READ ME - Appendix 3.

Due to these links between variables, extra data manipulation was required in addition to the management of missing data and outliers. This is detailes in section 6 of this document.

6. Methodology for data processing

6.1. Replacement of outliers/incorrect data

There were three types of incorrect data in the original data set.

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1. Cells containing “na” and/or “unknown” along with other options as an answer to a question
2. Negative numbers
3. GPS coordinates that are not correct (obvious outliers).

For the **first type of incorrect data**, the following R code was applied to the anonymised data set (survey_anony). Cells containing “unknown” or “na” along with a ” ” (blank) were checked visually to identify the cells to be processed. “unknown” or “na” were removed from these identified cells, thus taking into account only the other selected options.

```
#First we checked the rows that contain "na" or "unknown"
row_potentially_invalid<-sapply(survey_anony,function(x) which(
  str_detect(
    x,
    "unknown|na"
  )
))
#The output was a list with each element corresponding to a column of the dat
a frame.
#For each column, the value gives the indices of the rows containing "unknown
" or "na", or is empty when there is no "unknown" or "na" in any row.
#We can remove the latest (empty elements of the list) from the potentially i
nvalid rows.
row_potentially_invalid<-row_potentially_invalid[lengths(row_potentially_inva
lid)!=0]
#Invalid answers should also **contain a " " string** that separates the "na"
/"unknown" answer from the other selected options.
  #First for the incorrect data with "unknown"
  row_potentially_invalid_unknown<-sapply(
  survey_anony[,c(names(row_potentially_invalid))],
  function(x) which(str_detect(x," unknown")))
  row_invalid_unknown<-row_potentially_invalid_unknown[lengths(row_potentiall
y_invalid_unknown)!=0]
  #Then for the incorrect data with "na"
  row_potentially_invalid_na<-sapply(
  survey_anony[,c(names(row_potentially_invalid))],
  function(x) which(str_detect(x," na")))
  row_invalid_na<-row_potentially_invalid_na[lengths(row_potentially_invalid_
na)!=0]
#We visually checked the incorrect data before processing them.
    #First for the incorrect data with "unknown"
    invalid_cells_unknown<-list()
    for (element in 1:length(row_invalid_unknown)){
```

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```
      invalid_cells_unknown[[element]]<-survey_anony[row_invalid_unknown[[ele
ment]],names(row_invalid_unknown[element])]
    }
    print(invalid_cells_unknown)
    #Then for the incorrect data with "na"
    invalid_cells_na<-list()
    for (element in 1:length(row_invalid_na)){
      invalid_cells_na[[element]]<-survey_anony[row_invalid_na[[element]],nam
es(row_invalid_na[element])]
    }
    print(invalid_cells_na)
```

Here are the outputs of the previous chunk of code that has been visually checked.

row_invalid_unknown

$market_channels [1] 40

$source_income [1] 82

$subsidies [1] 13

row_invalid_na

$other_regions [1] 35

$inputs_dependence [1] 80

$other_funding [1] 17

invalid_cells_unknown

[[1]] [1] long unknown Levels: direct direct long direct short direct short long long long unknown na short short long unknown

[[2]] [1] agri_production unknown 32 Levels: agri_production agri_production agritourism … food_processing

[[3]] [1] direct_basic direct_young rural_farms_dev rural_organic unknown 20 Levels: direct_basic direct_basic direct_coupled … direct_basic rural_forest

invalid_cells_na

[[1]] [1] It's a national organisation, covering the whole area of the country, it's memebers are even across the border with Hungarian speaking individuals from neighbourhood countries 9 Levels: All of Sweden …

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[[2]] [1] seed na 49 Levels: energy fertilizer energy fertilizer material energy fertilizer PPP energy material ... seed na

[[3]] [1] proiecte cu finantare nationala sau europeana 12 Levels: European research funding (Horizon2020) ... we apply for project funding supporting development work (e.g. EIP project calls for proposals)

```
#Change the identified cells
survey_anony$subsidies<-as.character(survey_anony$subsidies)
survey_anony$market_channels<-as.character(survey_anony$market_channels)
survey_anony$source_income<-as.character(survey_anony$source_income)
survey_anony$subsidies[13]<-str_remove_all(survey_anony$subsidies[13],"unknow
n")
survey_anony$market_channels[40]<-str_remove_all(survey_anony$market_channels
[40]," unknown")
survey_anony$source_income[82]<-str_remove_all(survey_anony$source_income[82]
," unknown")
survey_anony$subsidies<-as.factor(survey_anony$subsidies)
survey_anony$market_channels<-as.factor(survey_anony$market_channels)
survey_anony$source_income<-as.factor(survey_anony$source_income)
survey_anony$inputs_dependence<-as.character(survey_anony$inputs_dependence)
survey_anony$inputs_dependence[80]<-str_remove_all(survey_anony$inputs_depend
ence[80]," na")
survey_anony$inputs_dependence<-as.factor(survey_anony$inputs_dependence)
```

For the **second type** of incorrect data, the following R code was applied to the anonymised data set (survey_anony). Cells containing negative numbers were identified and replaced by "NA".

```
#List the columns containing numbers
columns_with_numbers<-c("number_actors","farms","number_farms_outputs","numbe
r_inputs_dependence","number_market_channels","number_funding","number_source
_income","number_subsidies")
#Replace negative answers by NA
survey_anony[,columns_with_numbers]<-sapply(survey_anony[,columns_with_number
s],as.numeric)
for(column in columns_with_numbers ){
  for (row in 1:nrow(survey_anony)){
    if(is.na(survey_anony[row,column])==FALSE){
      if(survey_anony[row,column]<0){
      survey_anony[row,column]<-NA
      }
    }
  }
}
```

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For the **third type of incorrect data**, the following R code was applied to a data set containing only the geographical information of the initiative (data_geo).GPS coordinates that are obviously incorrect have been identified by plotting the GPS coordinates on a map in QGIS.From this we could see that the initiative with the ID 238380115 had incorrect GPS coordinates (-39.639538,-78.529696 - located in the ocean near South America while the initiative is located in Italia). These incorrect GPS coordinates have been replaced by "NA".

```
#Find the indice of the row containing the invalid GPS coordinates based on t
he X_id
invalid_row<-which(data_geo$X_id==238380115)
#Find the columns containing information related to the GPS coordinates and r
eplace the incorrect cell by NA
columns_gps<-which(str_detect(colnames(data_geo),"gps"))
data_geo[invalid_row,columns_gps]<-NA
```

6.2. Replacement of variables based on the dependency between variables

The dependencies between variables are highlighted in Figures 1 to 4.

In the chunks of code that will be detailed afterwards, data_influence, data_typology and survey_anony are data frames respectively containing only the columns related to the factors of influence, only the columns related to the typology of initiatives, and all the relevant anonymous data collected through the survey.

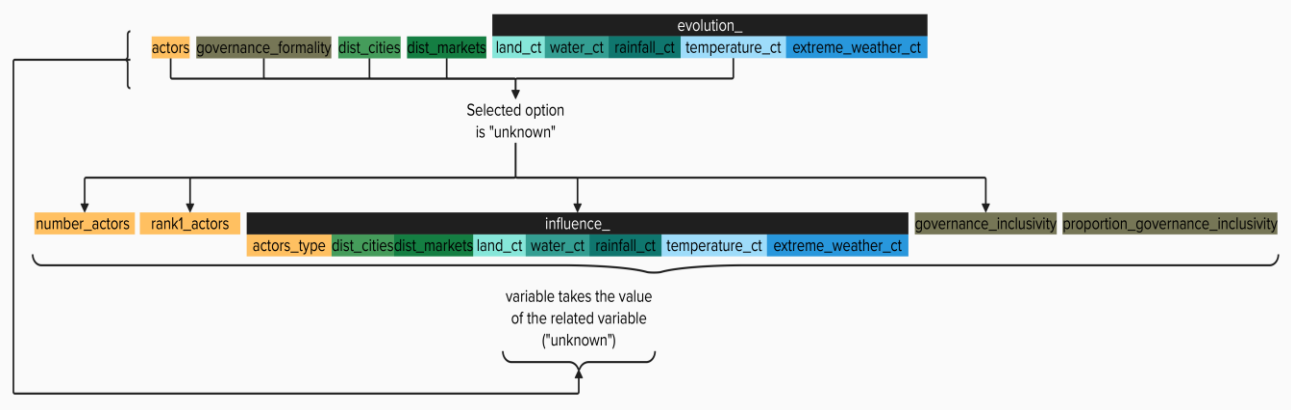

Figure 1 - Dependency between variables: variables taking the value "unknown" when "unknown" has been selected as an option for the related variable (variables highlighted in the same color in the figure are related)

For the dependencies illustrated in Figure 1, the following chunks of code were run to replace the variables number_actors, rank1_actors, influence_actors_type, influence_dist_cities, influence_dist_markets, influence_land_ct, influence_water_ct, influence_rainfall_ct,

influence_temperature_ct, influence_extreme_weather_ct, governance_inclusivity and proportion_governance_inclusivity by "unknown" when "unknown" has been selected as an answer for the related variable (the variables in the same color in Figure 1 are related).

```
#For influence_actors_type
data_influence$influence_actors_type<-as.character(data_influence$influence_a
ctors_type)
for(row in 1:nrow(survey_anony)){
  if(survey_anony$actors[row]=="unknown"){
    data_influence$influence_actors_type[row]<-"unknown"
  }
}
data_influence$influence_actors_type<-as.factor(data_influence$influence_acto
rs_type)

#For influence_dist_cities
data_influence$influence_dist_cities<-as.character(data_influence$influence_d
ist_cities)
for(row in 1:nrow(survey_anony)){
  if(survey_anony$dist_cities[row]=="unknown"){
    data_influence$influence_dist_cities[row]<-"unknown"
  }
}
data_influence$influence_dist_cities<-as.factor(data_influence$influence_dist
_cities)
#For influence_dist_markets
data_influence$influence_dist_markets<-as.character(data_influence$influence_
dist_markets)
for(row in 1:nrow(survey_anony)){
  if(survey_anony$dist_markets[row]=="unknown"){
    data_influence$influence_dist_markets[row]<-"unknown"
  }
}
data_influence$influence_dist_markets<-as.factor(data_influence$influence_dis
t_markets)
#For influence_land_ct
data_influence$influence_land_ct<-as.character(data_influence$influence_land_
ct)
for(row in 1:nrow(survey_anony)){
  if(survey_anony$evolution_land_ct[row]=="unknown"){
    data_influence$influence_land_ct[row]<-"unknown"
  }
}
data_influence$influence_land_ct<-as.factor(data_influence$influence_land_ct)
```

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```r
#For influence_water_ct
data_influence$influence_water_ct<-as.character(data_influence$influence_wate
r_ct)
for(row in 1:nrow(survey_anony)){
  if(survey_anony$evolution_water_ct[row]=="unknown"){
    data_influence$influence_water_ct[row]<-"unknown"
  }
}
data_influence$influence_water_ct<-as.factor(data_influence$influence_water_c
t)
#For influence_rainfall_ct
data_influence$influence_rainfall_ct<-as.character(data_influence$influence_r
ainfall_ct)
for(row in 1:nrow(survey_anony)){
  if(survey_anony$evolution_rainfall_ct[row]=="unknown"){
    data_influence$influence_rainfall_ct[row]<-"unknown"
  }
}
data_influence$influence_rainfall_ct<-as.factor(data_influence$influence_rain
fall_ct)
#For influence_temperature_ct
data_influence$influence_temperature_ct<-as.character(data_influence$influenc
e_temperature_ct)
for(row in 1:nrow(survey_anony)){
  if(survey_anony$evolution_temperature_ct[row]=="unknown"){
    data_influence$influence_temperature_ct[row]<-"unknown"
  }
}
data_influence$influence_temperature_ct<-as.factor(data_influence$influence_t
emperature_ct)
#For influence_extreme_weather_ct
data_influence$influence_extreme_weather_ct<-as.character(data_influence$infl
uence_extreme_weather_ct)
for(row in 1:nrow(survey_anony)){
  if(survey_anony$evolution_extreme_weather_ct[row]=="unknown"){
    data_influence$influence_extreme_weather_ct[row]<-"unknown"
  }
}
data_influence$influence_extreme_weather_ct<-as.factor(data_influence$influen
ce_extreme_weather_ct)

#For number_actors and rank1_actors
data_typology$number_actors<-as.character(data_typology$number_actors)
data_typology$rank1_actors<-as.character(data_typology$rank1_actors)
for(row in 1:nrow(survey_anony)){
```

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```
  if(survey_anony$actors[row]=="unknown"){
    data_typology$number_actors[row]<-"unknown"
    data_typology$rank1_actors[row]<-"unknown"
  }
}
data_typology$number_actors<-as.factor(data_typology$number_actors)
data_typology$rank1_actors<-as.factor(data_typology$rank1_actors)

#For governance_inclusivity and proportion_governance_inclusivity
data_typology$proportion_governance_inclusivity<-as.character(data_typology$p
roportion_governance_inclusivity)
survey_anony$governance_inclusivity<-as.character(survey_anony$governance_inc
lusivity)
for(row in 1:nrow(survey_anony)){
  if(survey_anony$governance_formality[row]=="unknown"){
    data_typology$proportion_governance_inclusivity[row]<-"unknown"
    survey_anony$governance_inclusivity[row]<-"unknown"
  }
}
data_typology$proportion_governance_inclusivity<-as.factor(data_typology$prop
ortion_governance_inclusivity)
survey_anony$governance_inclusivity<-as.factor(survey_anony$governance_inclus
ivity)
```

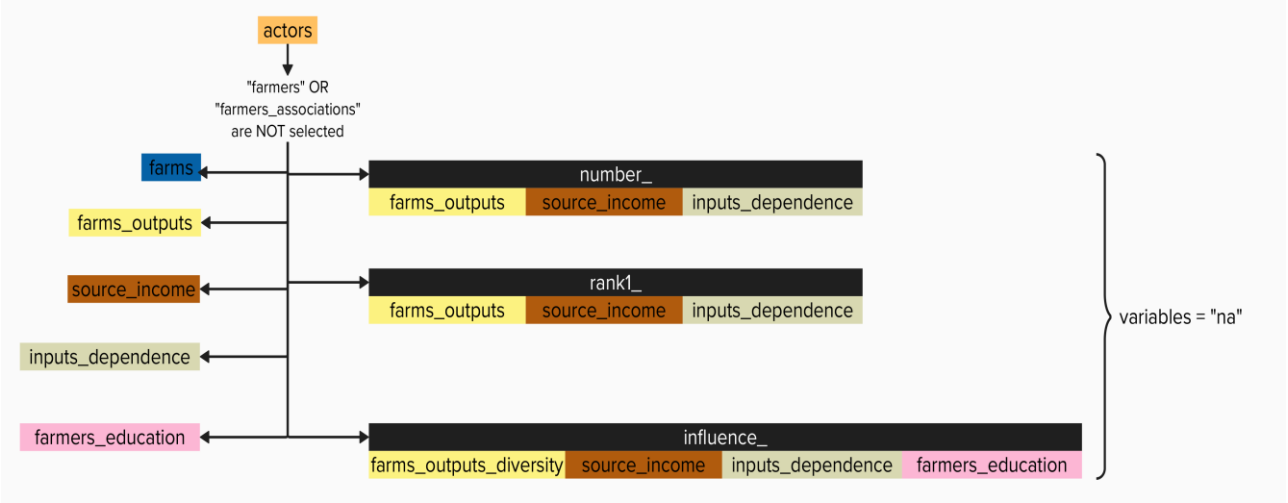

Figure 2 - Dependency between variables: variables taking the value "na" when "farmers" or "farmers_associations" have not been selected as an option for variable "actor"

For the dependencies illustrated in Figure 2, the following chunks of code were run to replace the variables farms, farms_outputs, source_income, inputs_dependence, farmers_education,

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number_farms_outputs, number_source_income, number_inputs_dependence, rank1_farms_outputs, rank1_source_income, rank1_inputs_dependence, influence_farms_outputs_diversity, influence_source_income, influence_inputs_dependence and influence_farmers_education by "na" when "farmers" or "farmers_associations" have not been selected as answers for the variable actors (the variables in the same color in Figure 2 are related).

```
data_influence$influence_farms_outputs_diversity<-as.character(data_influence
$influence_farms_outputs_diversity)
data_influence$influence_source_income<-as.character(data_influence$influence
_source_income)
data_influence$influence_inputs_dependence<-as.character(data_influence$influ
ence_inputs_dependence)
data_influence$influence_farmers_education<-as.character(data_influence$influ
ence_farmers_education)
rows_farmers<-which(str_detect(survey_anony$actors,"farmers",negate=TRUE))
for(row in rows_farmers){
  data_influence$influence_farms_outputs_diversity[row]<-"na"
  data_influence$influence_source_income[row]<-"na"
  data_influence$influence_inputs_dependence[row]<-"na"
  data_influence$influence_farmers_education[row]<-"na"
}
data_influence$influence_farms_outputs_diversity<-as.factor(data_influence$in
fluence_farms_outputs_diversity)
data_influence$influence_source_income<-as.factor(data_influence$influence_so
urce_income)
data_influence$influence_inputs_dependence<-as.factor(data_influence$influenc
e_inputs_dependence)
data_influence$influence_farmers_education<-as.factor(data_influence$influenc
e_farmers_education)

data_typology$farms<-as.character(data_typology$farms)
data_typology$number_farms_outputs<-as.character(data_typology$number_farms_o
utputs)
data_typology$number_source_income<-as.character(data_typology$number_source_
income)
data_typology$number_inputs_dependence<-as.character(data_typology$number_inp
uts_dependence)
data_typology$rank1_farms_outputs<-as.character(data_typology$rank1_farms_out
puts)
data_typology$rank1_source_income<-as.character(data_typology$rank1_source_in
come)
data_typology$rank1_inputs_dependence<-as.character(data_typology$rank1_input
s_dependence)
```

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```
survey_anony$farms_outputs<-as.character(survey_anony$farms_outputs)
survey_anony$source_income<-as.character(survey_anony$source_income)
survey_anony$inputs_dependence<-as.character(survey_anony$inputs_dependence)
survey_anony$farmers_education<-as.character(survey_anony$farmers_education)
survey_anony$actors<-as.character(survey_anony$actors)
rows_farmers<-which(str_detect(survey_anony$actors,"farmers",negate=TRUE))
for(row in rows_farmers){
  data_typology$farms[row]<-"na"
  data_typology$number_farms_outputs[row]<-"na"
  data_typology$number_source_income[row]<-"na"
  data_typology$number_inputs_dependence[row]<-"na"
  data_typology$rank1_farms_outputs[row]<-"na"
  data_typology$rank1_source_income[row]<-"na"
  data_typology$rank1_inputs_dependence[row]<-"na"
  survey_anony$farms_outputs[row]<-"na"
  survey_anony$source_income[row]<-"na"
  survey_anony$inputs_dependence[row]<-"na"
  survey_anony$farmers_education[row]<-"na"
}
data_typology$farms<-as.factor(data_typology$farms)
data_typology$number_farms_outputs<-as.factor(data_typology$number_farms_outp
uts)
data_typology$number_source_income<-as.factor(data_typology$number_source_inc
ome)
data_typology$number_inputs_dependence<-as.factor(data_typology$number_inputs
_dependence)
data_typology$rank1_farms_outputs<-as.factor(data_typology$rank1_farms_output
s)
data_typology$rank1_source_income<-as.factor(data_typology$rank1_source_incom
e)
data_typology$rank1_inputs_dependence<-as.factor(data_typology$rank1_inputs_d
ependence)
survey_anony$farms_outputs<-as.factor(survey_anony$farms_outputs)
survey_anony$source_income<-as.factor(survey_anony$source_income)
survey_anony$inputs_dependence<-as.factor(survey_anony$inputs_dependence)
survey_anony$farmers_education<-as.factor(survey_anony$farmers_education)
survey_anony$actors<-as.factor(survey_anony$actors)
```

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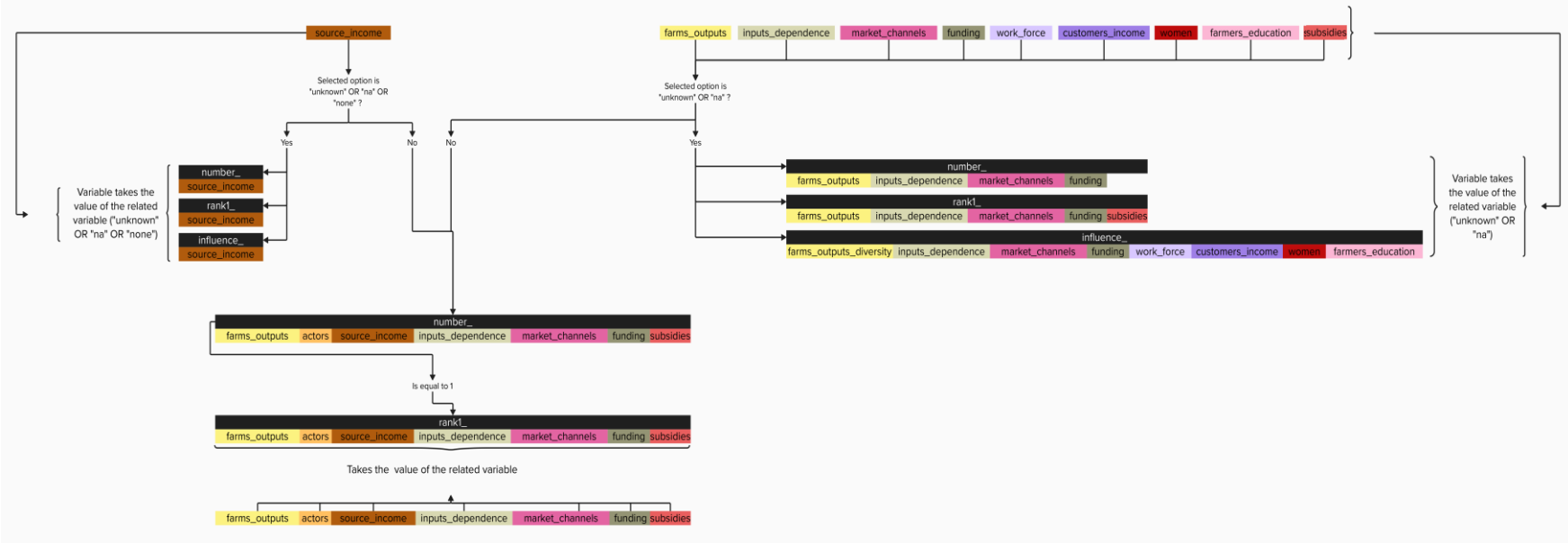

Figure 3 - Dependency between variables: variables taking the value of the related variable when "unknown", "na" or "none" have been selected as an option for the related variable, and variables taking the value of the related variable when only one option has been selected for the related variable (variables highlighted in the same color in the figure are related)

For the dependencies illustrated in Figure 3, the following chunks of code were run to replace the variables:

- number_source_income, rank1_cource_income and influence_source_income by the value of variable source_income if “unknown”, “none” or “na” have been selected as an answer for variable source_income

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- number_farms_outputs, number_inputs_dependence, number_market_channels, number_funding, rank1_farms_outputs, rank1_inputs_dependence, rank1_market_channels, rank1_funding, rank1_subsidies, influence farms_outputs_diversity, influence_inputs_dependence, influence_market_channels, influence_funding, influence_work_force, influence_customers_income, influence_women and influence_farmers_education by the value of the related variable if "unknown" or "na" have been selected as an answer (the variables in the same color in Figure 3 are related)

- rank1_farms_outputs, rank1_actors, rank1_source_income, rank1_inputs_dependence, rank1_market_channels, rank1_funding, rank1_subsididies by the value of the related variable if the number of selected option is equal to one (the variables in the same color in Figure 3 are related).

```
data_influence$influence_source_income<-as.character(data_influence$influence_source_income)
survey_anony$source_income<-as.character(survey_anony$source_income)
for(row in 1:nrow(survey_anony)){
  if(!is.na(survey_anony$source_income[row]) && (survey_anony$source_income[row]=="na"|survey_anony$source_
income[row]=="unknown"|survey_anony$source_income[row]=="none")){
    data_influence$influence_source_income[row]<-survey_anony$source_income[row]
  }
}
data_influence$influence_source_income<-as.factor(data_influence$influence_source_income)
survey_anony$source_income<-as.factor(survey_anony$source_income)

#For influence_farms_outputs_diversity
data_influence$influence_farms_outputs_diversity<-as.character(data_influence$influence_farms_outputs_diver
sity)
survey_anony$farms_outputs<-as.character(survey_anony$farms_outputs)
for(row in 1:nrow(survey_anony)){
  if(!is.na(survey_anony$farms_outputs[row]) && (survey_anony$farms_outputs[row]=="na"|survey_anony$farms_o
utputs[row]=="unknown")){
    data_influence$influence_farms_outputs_diversity[row]<-survey_anony$farms_outputs[row]
  }
```

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```
}
data_influence$influence_farms_outputs_diversity<-as.factor(data_influence$influence_farms_outputs_diversit
y)
survey_anony$farms_outputs<-as.factor(survey_anony$farms_outputs)

#For influence_inputs_dependence
data_influence$influence_inputs_dependence<-as.character(data_influence$influence_inputs_dependence)
survey_anony$inputs_dependence<-as.character(survey_anony$inputs_dependence)
for(row in 1:nrow(survey_anony)){
  if(!is.na(survey_anony$inputs_dependence[row]) && (survey_anony$inputs_dependence[row]=="na"|survey_anony
$inputs_dependence[row]=="unknown")){
    data_influence$influence_inputs_dependence[row]<-survey_anony$inputs_dependence[row]
  }
}
data_influence$influence_inputs_dependence<-as.factor(data_influence$influence_inputs_dependence)
survey_anony$inputs_dependence<-as.factor(survey_anony$inputs_dependence)

#For influence_market_channels
data_influence$influence_market_channels<-as.character(data_influence$influence_market_channels)
survey_anony$market_channels<-as.character(survey_anony$market_channels)
for(row in 1:nrow(survey_anony)){
  if(!is.na(survey_anony$market_channels[row]) && (survey_anony$market_channels[row]=="na"|survey_anony$mar
ket_channels[row]=="unknown")){
    data_influence$influence_market_channels[row]<-survey_anony$market_channels[row]
  }
}
data_influence$influence_market_channels<-as.factor(data_influence$influence_market_channels)
survey_anony$market_channels<-as.factor(survey_anony$market_channels)

#For influence_funding
```

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```
data_influence$influence_funding<-as.character(data_influence$influence_funding)
survey_anony$funding<-as.character(survey_anony$funding)
for(row in 1:nrow(survey_anony)){
  if(!is.na(survey_anony$funding[row]) && (survey_anony$funding[row]=="na"|survey_anony$funding[row]=="unkn
own")){
    data_influence$influence_funding[row]<-survey_anony$funding[row]
  }
}
data_influence$influence_funding<-as.factor(data_influence$influence_funding)
survey_anony$funding<-as.factor(survey_anony$funding)

#For influence_work_force
data_influence$influence_work_force<-as.character(data_influence$influence_work_force)
survey_anony$work_force<-as.character(survey_anony$work_force)
for(row in 1:nrow(survey_anony)){
  if(!is.na(survey_anony$work_force[row]) && (survey_anony$work_force[row]=="na"|survey_anony$work_force[ro
w]=="unknown")){
    data_influence$influence_work_force[row]<-survey_anony$work_force[row]
  }
}
data_influence$influence_work_force<-as.factor(data_influence$influence_work_force)
survey_anony$work_force<-as.factor(survey_anony$work_force)

#For influence_customers_income
data_influence$influence_customers_income<-as.character(data_influence$influence_customers_income)
survey_anony$customers_income<-as.character(survey_anony$customers_income)
for(row in 1:nrow(survey_anony)){
  if(!is.na(survey_anony$customers_income[row]) && (survey_anony$customers_income[row]=="na"|survey_anony$c
ustomers_income[row]=="unknown")){
    data_influence$influence_customers_income[row]<-survey_anony$customers_income[row]
```

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```
  }
}
data_influence$influence_customers_income<-as.factor(data_influence$influence_customers_income)
survey_anony$customers_income<-as.factor(survey_anony$customers_income)

#For influence_women
data_influence$influence_women<-as.character(data_influence$influence_women)
survey_anony$women<-as.character(survey_anony$women)
for(row in 1:nrow(survey_anony)){
  if(!is.na(survey_anony$women[row]) && (survey_anony$women[row]=="na"|survey_anony$women[row]=="unknown"))
{
    data_influence$influence_women[row]<-survey_anony$women[row]
  }
}
data_influence$influence_women<-as.factor(data_influence$influence_women)
survey_anony$women<-as.factor(survey_anony$women)

#For influence_farmers_education
data_influence$influence_farmers_education<-as.character(data_influence$influence_farmers_education)
survey_anony$farmers_education<-as.character(survey_anony$farmers_education)
for(row in 1:nrow(survey_anony)){
  if(!is.na(survey_anony$farmers_education[row]) && (survey_anony$farmers_education[row]=="na"|survey_anony
$farmers_education[row]=="unknown")){
    data_influence$influence_farmers_education[row]<-survey_anony$farmers_education[row]
  }
}
data_influence$influence_farmers_education<-as.factor(data_influence$influence_farmers_education)
survey_anony$farmers_education<-as.factor(survey_anony$farmers_education)

data_typology$number_source_income<-as.character(data_typology$number_source_income)
data_typology$rank1_source_income<-as.character(data_typology$rank1_source_income)
```

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```r
survey_anony$source_income<-as.character(survey_anony$source_income)
for(row in 1:nrow(survey_anony)){
  if(!is.na(survey_anony$source_income[row]==TRUE) && (survey_anony$source_income[row]=="na"|survey_anony$s
ource_income[row]=="unknown"|survey_anony$source_income[row]=="none")){
    data_typology$number_source_income[row]<-survey_anony$source_income[row]
    data_typology$rank1_source_income[row]<-survey_anony$source_income[row]
  }
}
data_typology$number_source_income<-as.factor(data_typology$number_source_income)
data_typology$rank1_source_income<-as.factor(data_typology$rank1_source_income)
survey_anony$source_income<-as.factor(survey_anony$source_income)

#For number_farms_outputs and rank1_farms_outputs
data_typology$number_farms_outputs<-as.character(data_typology$number_farms_outputs)
data_typology$rank1_farms_outputs<-as.character(data_typology$rank1_farms_outputs)
survey_anony$farms_outputs<-as.character(survey_anony$farms_outputs)
for(row in 1:nrow(survey_anony)){
  if(!is.na(survey_anony$farms_outputs[row]) && (survey_anony$farms_outputs[row]=="na"|survey_anony$farms_o
utputs[row]=="unknown")){
    data_typology$number_farms_outputs[row]<-survey_anony$farms_outputs[row]
    data_typology$rank1_farms_outputs[row]<-survey_anony$farms_outputs[row]
  }
}
data_typology$number_farms_outputs<-as.factor(data_typology$number_farms_outputs)
data_typology$rank1_farms_outputs<-as.factor(data_typology$rank1_farms_outputs)
survey_anony$farms_outputs<-as.factor(survey_anony$farms_outputs)

#For number_inputs_dependence and rank1_inputs_dependence
data_typology$number_inputs_dependence<-as.character(data_typology$number_inputs_dependence)
data_typology$rank1_inputs_dependence<-as.character(data_typology$rank1_inputs_dependence)
survey_anony$inputs_dependence<-as.character(survey_anony$inputs_dependence)
```

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```
for(row in 1:nrow(survey_anony)){
  if(!is.na(survey_anony$inputs_dependence[row]) && (survey_anony$inputs_dependence[row]=="na"|survey_anony
$inputs_dependence[row]=="unknown")){
    data_typology$number_inputs_dependence[row]<-survey_anony$inputs_dependence[row]
    data_typology$rank1_inputs_dependence[row]<-survey_anony$inputs_dependence[row]
  }
}
data_typology$number_inputs_dependence<-as.factor(data_typology$number_inputs_dependence)
data_typology$rank1_inputs_dependence<-as.factor(data_typology$rank1_inputs_dependence)
survey_anony$inputs_dependence<-as.factor(survey_anony$inputs_dependence)

#For number_market_channels and rank1_market_channels
data_typology$number_market_channels<-as.character(data_typology$number_market_channels)
data_typology$rank1_market_channels<-as.character(data_typology$rank1_market_channels)
survey_anony$market_channels<-as.character(survey_anony$market_channels)
for(row in 1:nrow(survey_anony)){
  if(!is.na(survey_anony$market_channels[row]) && (survey_anony$market_channels[row]=="na"|survey_anony$mar
ket_channels[row]=="unknown")){
    data_typology$number_market_channels[row]<-survey_anony$market_channels[row]
    data_typology$rank1_market_channels[row]<-survey_anony$market_channels[row]
  }
}
data_typology$number_market_channels<-as.factor(data_typology$number_market_channels)
data_typology$rank1_market_channels<-as.factor(data_typology$rank1_market_channels)
survey_anony$market_channels<-as.factor(survey_anony$market_channels)

#For number_funding and rank1_funding
data_typology$number_funding<-as.character(data_typology$number_funding)
data_typology$rank1_funding<-as.character(data_typology$rank1_funding)
survey_anony$funding<-as.character(survey_anony$funding)
```

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```
for(row in 1:nrow(survey_anony)){
  if(!is.na(survey_anony$funding[row]) && (survey_anony$funding[row]=="na"|survey_anony$funding[row]=="unkn
own")){
    data_typology$number_funding[row]<-survey_anony$funding[row]
    data_typology$rank1_funding[row]<-survey_anony$funding[row]
  }
}
data_typology$number_funding<-as.factor(data_typology$number_funding)
data_typology$rank1_funding<-as.factor(data_typology$rank1_funding)
survey_anony$funding<-as.factor(survey_anony$funding)

#For number_subsidies and rank1_subsidies
data_typology$number_subsidies<-as.character(data_typology$number_subsidies)
data_typology$rank1_subsidies<-as.character(data_typology$rank1_subsidies)
survey_anony$subsidies<-as.character(survey_anony$subsidies)
for(row in 1:nrow(survey_anony)){
  if(!is.na(survey_anony$subsidies[row]) && (survey_anony$subsidies[row]=="na"|survey_anony$subsidies[row]=
="unknown")){
    data_typology$number_subsidies[row]<-survey_anony$subsidies[row]
    data_typology$rank1_subsidies[row]<-survey_anony$subsidies[row]
  }
}
data_typology$number_subsidies<-as.factor(data_typology$number_subsidies)
data_typology$rank1_subsidies<-as.factor(data_typology$rank1_subsidies)
survey_anony$subsidies<-as.factor(survey_anony$subsidies)
```

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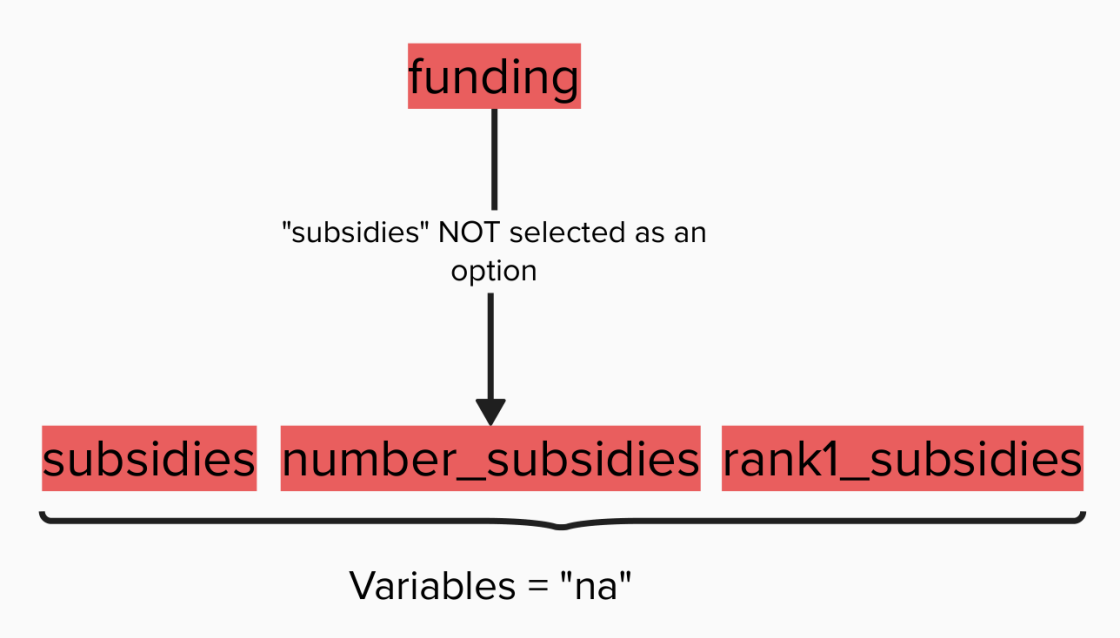

Figure 4 - Dependency between variables: variables taking the value "na" when "subsidies" has not been selected as an option for the variable "funding"

For the dependencies illustrated in Figure 2, the following chunks of code were run to replace the variables subsidies, number_subsidies and rank1_subsidies by “na” when “subsidies” has not been selected as an answer for the variable funding.

```
initiatives_no_subsidies<-which(!str_detect(
  survey_anony$funding,
  "subsidies"
))
to_be_replaced_no_subsidies<-c("rank1_subsidies","number_subsidies")
for(column in to_be_replaced_no_subsidies){
  data_typology[Reduce(intersect,list(initiatives_no_subsidies,which(is.na(da
ta_typology[,column])))),column]<-"na"
}
for(row in initiatives_no_subsidies){
  survey_anony$subsidies[row]<-"na"
}
```

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