GALUP

Systemic design of Galup store

Thesis For Master Of Science Degree In Design Sistemico

Dipartamento di Achitettura e Design

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POLITECNICO DI TORINO

ABSTRACT

Galup (Piedmonte accent pronunciation [ga'ly:p]) is an Italian food company, It particularly be famous in the production of sweets,and founded in Pinerolo (Piemonte) in 1922 by Monsù Ferrua who is a Piedmontese dessert chef. The most famous product of the company is the Panettone with hazelnut glaze from Piedmont, created by the company in 1922.

Since 1922, the Galup has been founded here, which in the same territory that saw it born.Over time, the company has grown.It has acquired a commercial national and international market.Their panettone has been around the world and The Galup has become a recognized Italian sweet production brand ,but nowadays it is important that the locationof the Galup are still located in Pinerolo where began to produce panettone from 1948.

But in 2018,as the explosion of population,in order to satifiey human's desire,many forest is destroyed rapidly. and the pollution became increasingly serious problem.therefore we urgently need a method to sovle these problem. The galup factory get raw material from different place around the Italy and european ,even the world(the sultanas got from Turkey),it is bad for economy of Pinerolo and also for Galup.

So I decided to solve these problem by systemic method,The aim of this project is to transform the linear method in which the Pinerolo cultivated and replace it with a systemic model.

The process of determining the title and writing of this thesis was conducted under the guidance of Prof. Luigi Bistagnino and prof. Pier Paolo Peruccio, Thanks the professors for giving me knowledges, and paid more attention to cultivating my ideas, methods, and innovative abilities to solve problems, which laid a solid foundation for my future study and work and broadened my horizons.

In addition, I would like to thank my classmates who have given me a lot of care and help. Many of them have brought me a lot of joy in learning and living.

Finally, I would like to thank my parents in particular for their unselfish love, encouragement and support during my long career in school. This is the source of my continuous advancement. Thank you very much.

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SYSTEMIC DESIGN

CONCLUSION

INTRODUCTION

Nowadays,start from desgin of architecture living by us,to the daily production produced.All it need to update rapidly in order to our desire. The designer is more and more important from 20 century, because in those time,they more focused on how to rebuild the country destroyed by war,but now they are role who keep balance with relationship,in which contained production environment and social.Efforts to take some measures which can keep balance,moreover interact in many subjects in order to improve himself.

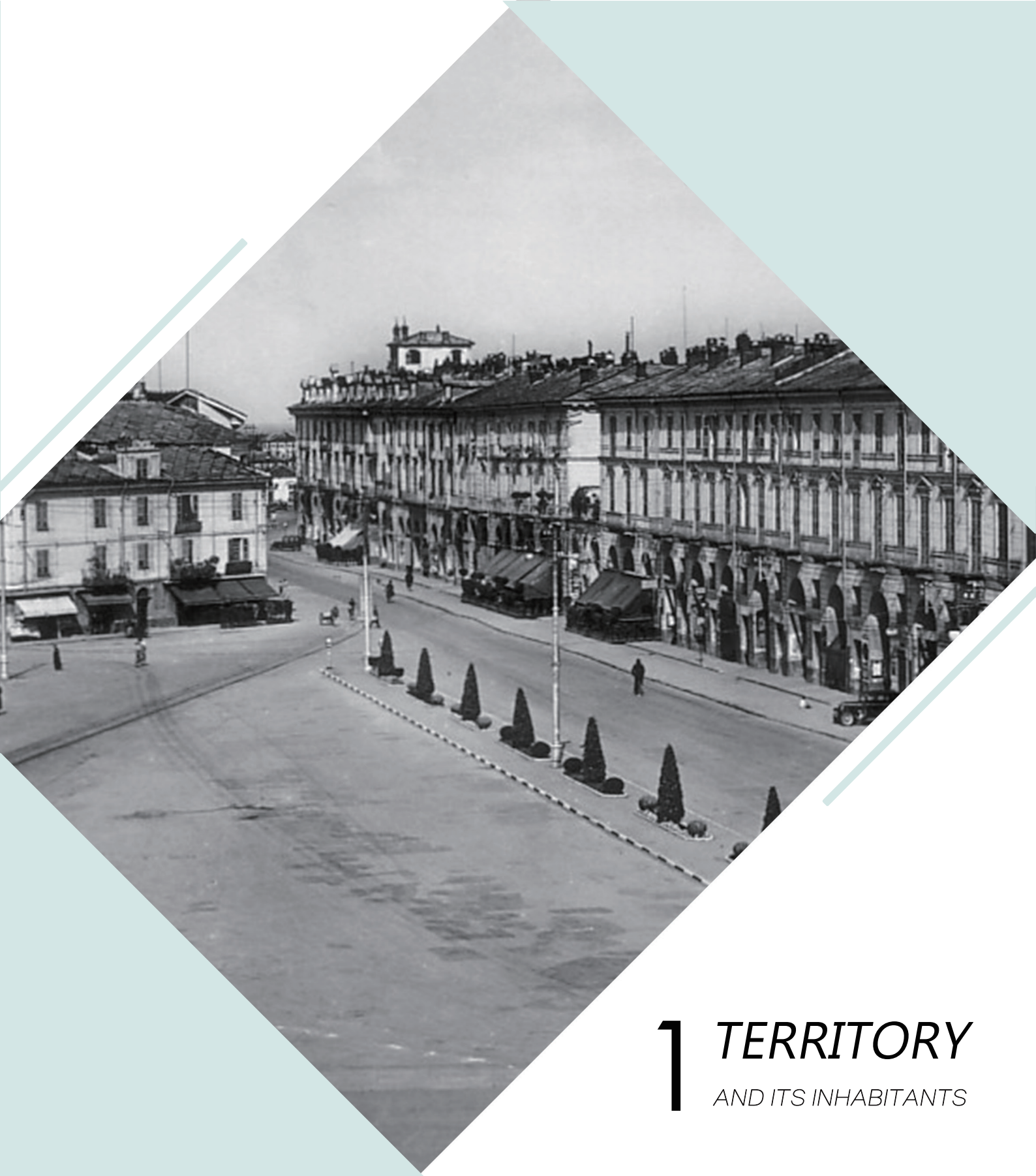
Since the information explosion began,participants in a design process (politicians, economists, manufacturers, designers, consumers) can jointly influence the new direction of the goal, change consumer habits, and create new sources of revenue: redesigned The production process abandons the traditional linear production model and does not focus on the fanaticism of unit repetition.

For the reason that a systematic design method is proposed here.Base on the local territory (Pinerolo),Through cooperated with agricultural 、background of territory 、industrial process and nature connection, in which build a relation net,use output emission of production system to be reuse to another production system.

01

TERRITORY

basic information about Pinerolo and
local resource on the territory



1 TERRITORY

AND ITS INHABITANTS

PINEROLO

the gate of France

Pinerolo is a town and comune in the Metropolitan City of Turin, Piemonte, northwestern Italy, 50 kilometres (31 mi) southwest of Turin on the river Chisone. The Lemina torrent has its source at the boundary between Pinerolo and San Pietro Val di Lemina.

It is around Pinerolo that revolves the economy of the waldensian valleys (right slope of Val Chisone, Valle Germanasca and Val Pellice) and of the plain between these valleys and the Po (river) course.Several industries have their base in this area, particularly mechanical, paper making, chemical and textile industries, and also absorb manpower from the nearby centres.It also is the trade center of the surrounding mountain area.

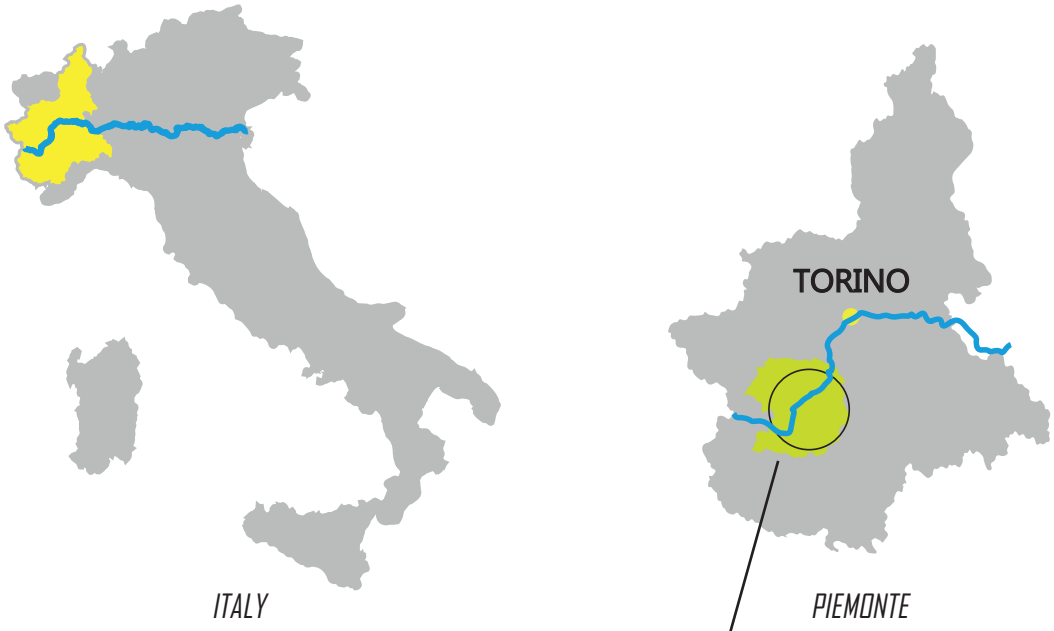
The territory of Pinerolo can be distinguished in three distinct areas ,such as plains, hills, mountains. In fact, there is a minimum altitude of 291 meters at the border with the municipality of Scalenghe and a maximum altitude of 1,358 meters of Monte Sette Confini, located in the Val Lemina.

From a geomorphological point of view, the municipality of Pinerolo is limited to the south by the Chisone stream, to the north by the hills of Pinerolo and to the north-west by the Lemina stream. The Pinerolo concentric extends mainly at the foot of the hills, on a sub-alpine area crossed by the Lemina stream.

The plain area of the municipality of Pinerolo is the largest, representing about 77% of the entire territory; the hilly area

Pinerolo has special meaning that is discovered to be medieval heart, it's history of Savoy, the three French dominations until the birth of the School of Cavalry. Pinerolo is located in the gates of Italy, Due to this is front of French ,it has heavily influenced the history and culture of the city. Pinerolo is located in the center of the 'Pinerolese' which extends from the belt of Turin to the border with France; It characterized by a plural identity, which is proposed to the visitor with a varied and interesting cultural and environmental heritage. These places contained heavily culture heritage more than others moreover it has experienced varied religious.

Rich agricultural environment


TORINO
ITALY
PIEMONTE


Susa
Bruzolo
Rubiana
Rivoli
Torino
Fenestrelle
Giaveno
Piosasco
Pinerolo
Pinerolo
Cercenasco
Villar felice
Moncalieri
Barge
Cavallerleone
Oncino
Saluzzo

Territory

Basic information

About population of land, rainfall etc.

Pinerolo (Pinareul in Piedmontese, Pineiròl in Occitan, Pignerol in French, Pinarolium / Pinerolium in Latin) is an Italian municipality of 35 829 inhabitants of the metropolitan city of Turin in Piedmont.

The territory of Pinerolo can be divided into three areas: plains, hills, and mountains. In fact, the minimum elevation on the border of Scalenghe in Val Lemina is 291 meters, and the maximum altitude of Monte Sette Confini is 1358 meters.

From a geomorphological point of view, the city of Pinerolo is confined to the Chisong River in the south, Pinerolo in the north and the northwest of the Leminer. Pinerolo concentricity is mainly located at the foot of the mountain, in the subalpine area where the Lemina River crosses.

The city of Pinerolo has the largest area of plains, accounting for 77% of the entire territory; the hilly area accounts for about 20%, while the mountainous area has the smallest area, accounting for the remaining 3%.

In Pinerolo, the average annual temperature measured by the Arpa hydrometeorological station is 13.5°C.

On average, at least 506 millimetres and a maximum of 1157 millimetres of rainfall were recorded during the year. According to the classification of Mennella, the rain gauge system is a type before the Alps, with the highest in spring and the second highest in autumn; the main minimum requirement is winter. In more detail, May is the wettest month; January and February have fewer months.

TERRITORY-BASIC INFORMATION

SOIL TYPE
sandy/
argillranceous

RESIDENTS
504.355

TOTAL CATTLE
AND BUFFALOES
304.818

PIGS
457.866

SURFACE
239.365,97ha

POUTRY
1.141.133

TOTAL SHEEP
AND GOATS
27.115

WOODED AREA
18.781,41ha

UTILIZED AGRICULTURAL
AREA
197.461,24ha

kitchen gardens
317,6ha

permanent crops excluding
vineyard
13.002,58ha

vine yard
647,71ha

permanent grassland,
pastures and meadows
88.773,91ha

land with short rotation
coppices
2.317,36ha

arabe land
97.817,33ha

unutilised agricultural land
and other land
20.825,971ha

DEMOGRAPHIC DATA

~27.5%
age 0~14

~59.3%
age 15~64

~13.2%
age 65+

RESOURSE

research field

1.CUITURE AND TRANDITION:

Iron Mask Festival

Every October, in Pinerolo, the historical re-enactment of the Iron Mask takes place, which is one of the largest and most important events in the city.

Military base

Pinerolo has always been a city of military traditions: in fact,there are numerous barracks in the city.

Until the early nineties, the School of the Military Veterinary Corps was located at the headquarters of which was also the veterinary component of the Military Interforces Academy of Health (NEASMI), founded in 1968 with headquarters in Florence, and the Military School of Mascara , founded in 1882, where the farrier's craft was learned for a long time. Today the school is located in Grosseto, annexed to the Military Veterinary School, once also present in Pinerolo, near the Villy Pasquali barracks.

1.WILD ANIMAL

Territory

Territory

Territory

Territory

There are 18,000 protected hectares that welcome all alpine ungulates: chamois, goatmeat, deer, roe deer, wild boar and even muflon. The Cozie Alps Protected Areas Management Authority is a public body set up by the Piedmont Region in 2012 to protect and manage a vast natural

2.ARCHITECTURE

Piazza Vittorio Veneto

Basilica di San Maurizio

Palazzo del Comune

Palazzo Vittone

- Piazza Vittorio Veneto (better known as "Piazza Fontana"): it is located in the central meeting point of the Pinerolo area; designed in 1738, it was built by flattening the moats in front of the seventeenth-century walls
- The Basilica of San Maurizio is located in Pinerolo, already mentioned in documents from 1078, it was rebuilt in 1470 and restored in 1897: it has a late Romanesque bell tower from 1336 and contains 15th-century frescoes, an Ascension of Jesus Christ
- Palazzo del Comune: overlooks from the north of Piazza Vittorio Veneto. It's Originally an arsenal of the military bastion, in the years of fascism the facade was restored and the civic tower was built. It houses the Civic Museum (bodoni

relics, weapons, coins, nineteenth-century paintings of the local school) and the remarkable Alliaudi Municipal Library (over 100,000 volumes, manuscripts, incunabula, and a precious collection of rare books).

- It's Located in the central Piazza Vittorio Veneto, the ancient Piazza d'Armi, which is nowadays commonly known as Piazza Fontana not so much for the large fountain that stands out, but for the memory of the architect Fontana who designed it, the Palazzo called Vittone, it was erected in 1740 for commission of the King Carlo Emanuele III, on project of the architect Bernardo Vittone, student of the Juvarra

3.RESOURCE

Geoparco alpi cozie

Rocca Di Cavour

Rich land

wood

- It's discovered from more than a hundred location of cross-border area and half a million hectares, between the province of Turin and the French departments of the Hautes-Alpes and Savoie, sites that reveal the different phases of the history of the alpine chain. Visitation the mining sites including copper, silver, iron, coal, talc, which talk the story of human exploitation of underground resources since prehistoric times.
- The Cavour Natural Reserve is located in Cavour, near Turin. The reserve protects a particular hill dominating the country. The Rocca is an alpine peak rising on the alluvial plain of 162 meters. It is particularly visible because it rises in a flat area and it gives the impression of being out of nothing. The reserve, a step for migratory birds as only highland in a wide range, intends to protect flora and fauna

2.TYPICAL FOOD

salsa-alle-noci

The salsa-alle-noci is a typical Piemonte dressing made from chopped walnuts along with olive oil, garlic, salt and bread softened in milk.

trota-in-carpione-grassi

The "carpione" is a typical Piedmontese dish that takes its name from a freshwater fish, the carp.

All over Italy has similar preparations for it, but they have different names.

Stracotto

Beef stew is a typical Italian dish to be savored hot and steaming. It is very substantial and appetizing but its realization requires a little time and patience because the meat has to be marinated for a night together with a bottle of red wine, vegetables and flavorings

il panettone basso Pinerolese

Panettone is an Italian type of sweet bread loaf originally from Milan ,usually prepared and enjoyed for Christmas and New Year in Western, Southern and Southeastern Europe as well as in the Horn of Africa

Pesche ripiene

Pesche ripiene is a typical Italian dish to be savored hot and steaming. It is very substantial and appetizing but its realization requires a little time and patience because the meat has to be marinated for a night together with a bottle of wine, vegetables and flavorings

3.SPORT

Cycling

Due to the proximity of the Alps with its wonderful climbs (Colle Vars, Izoard, Maddalena, Sestriere, Monginevro) both the Tour of Italy and the Tour de France have selected the Pinerolo and Pinerolo several times as a biecycle station.

Hiking

The Alps of Turin , from the Olympic mountains to the small alpine resorts, offer exceptional landscapes, splendid views and encounters with alpine culture, in which offering opportunities for fun and relaxation for everyone, hiking enthusiasts and families.

3.INDUSTRIAL ACTIVITIES

ACEA Pinerolese Energia Srl

ACEA Pinerolese Energia is the local company which is in order to supply of methane gas, About the property consisting of the Municipalities, which is oriented to ensure the economic development of the area ,in which it operates the protection of its customers.

Pulizie industriali Torino Max Molina

Max Molina is a company that for over thirty years has been working in the field of the supply of industrial cleaning products in Turin, focusing in particular on technical equipment for cleaning, machinery, detergents and single-use items. It is the point of reference for companies, local administrations, hospitals and healthcare companies.

Galup

La Galup is an Italian food company, specialized in the production of sweets, founded in Pinerolo in 1922 by Pietro Monsù Ferrua, a Piedmontese pastry chef. The most famous product of the company is the low panettone with hazelnut glaze from Piedmont, created by the company in 1922.

CURRENT PROBLEM OF TERRITORY

what do we see

SPIECES DIVERSITY

USAGE OF LOCAL RAW MATERIAL

REDUCTION OF WOOD AREAS

EUTROPHICATION OF RIVERS

PASTRY TRADITONS

ORGANIC WASTE

INTENSIVE AGRICULTURE

DEEPLY BASED ON AGRICULTURAL TRADITIONS

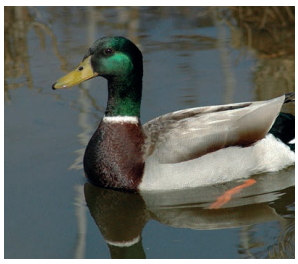
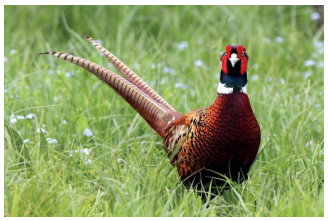
POLLUTION

PINEROLO AND THE SU

TERRI
RESEARC

WILD ANIMAL



⚠ speices diversity ⚠ Eutrophication of rivers

Deeply based on agricultural tradi

CULTURE AND



RESOURCE





⚠ Reduction of wood areas

INDUSTRIAL ACTIVITIES

⚠ intensive agriculture
⚠ Polluted areas
⚠ organic waste



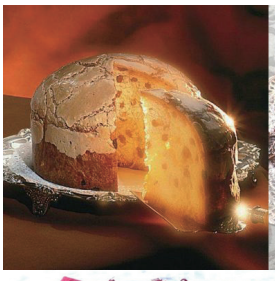
URROUNDING OF 50KM

TORY
H FIELD

itions

TRANDITION

SPORT



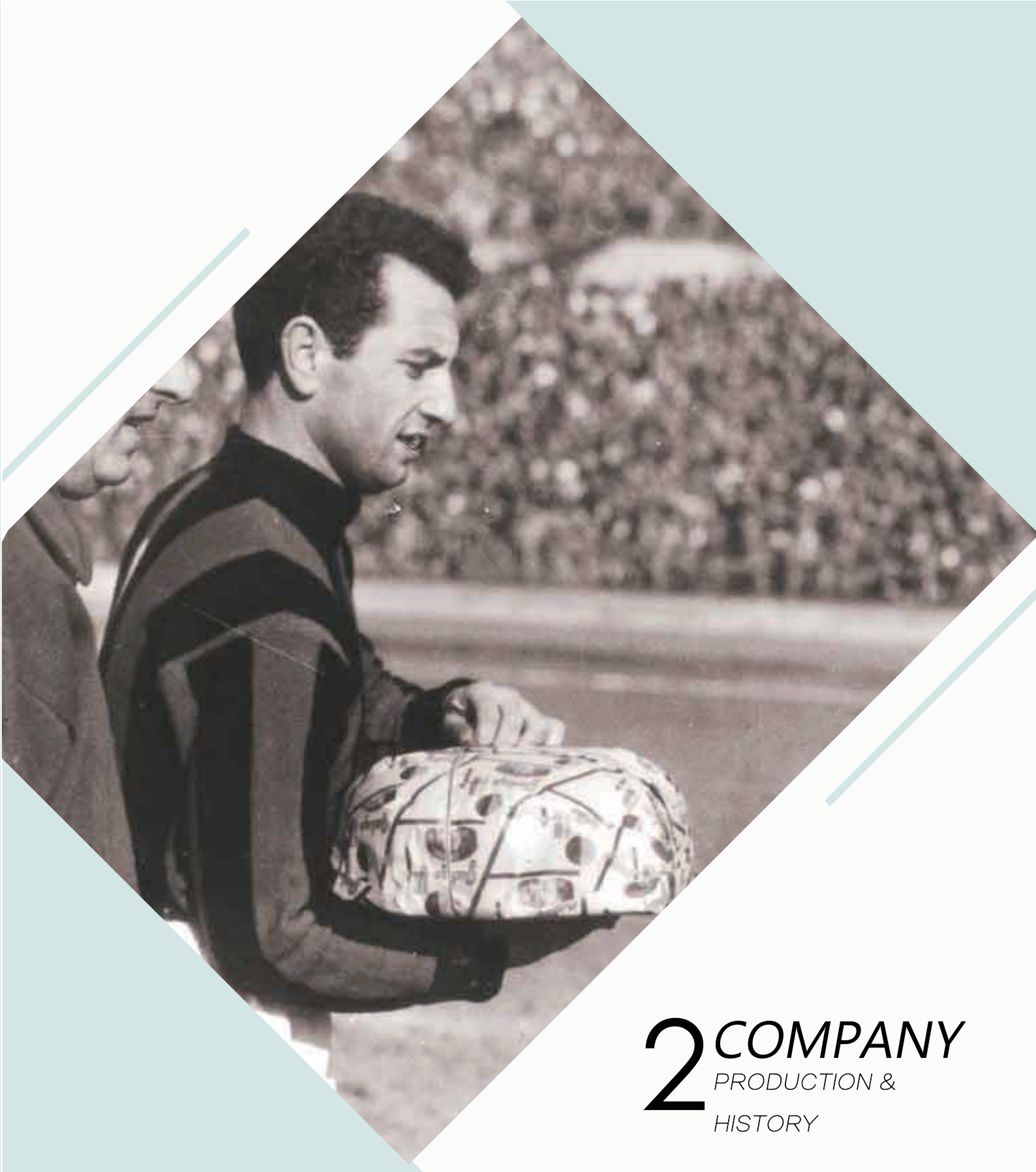
- usage of local raw material
- Pastry traditions

TYPECAL DIESHES

02

COMPANY

some introduction of GALUP and
local territory history



2 COMPANY
PRODUCTION & HISTORY

GALUP

A cake shop with a rich history

Galup (Piedmonte accent pronunciation [ga'ly:p]) is an Italian food company, It particularly be famous in the production of sweets,and founded in Pinerolo （Piemonte) in 1922 by Monsù Ferrua who is a Piedmontese dessert chef.

Over time, the company has grown, It has acquired a national and international commercial success. The panettone has been around the world and Galup has become a recognized Italian brand, but the important direction of the Galup are still developed in Pinerolo. Pietro Ferrua and his wife Regina took over an old red brick oven located in Via del Duomo and Via del Pino to transform it day after day into the most beloved pastry shop in the local territory, the streets of the old town and via Fenestrelle, where industrial history since in 1948 of the company and it's still produced today.

Galup is not only a brand. but also a story,a beautiful italian story.

Galup is a name, an original recipe, a panettone different from the others. Before Galup, the panettone was only Milanese.But it was changed fron the low panettone with hazelnut glaze created by Pietro Ferrua

Pietro Ferrua called Monsù Ferrua. Its the idea, its the recipe. An innovation, brilliant and tasty, which reinterprets an ancient Lombard tradition to give life to a new classic of the Piedmontese fine pastry. Over time, the recipe has been refined, but the characteristic of the dessert is always the same that Pietro Ferrua gave him in 1922

History

Rich history of panettone

Panettone is an Italian type of sweet bread loaf originally from Milan,it has experienced varied religious.

It usually prepared and enjoyed for Christmas and New Year in Western, Southern and Southeastern Europe as well as in the Horn of Africa, and to a lesser extent in former French, Spanish and Portuguese colonies.

A legend tells of a story that takes place in the 15th century when Ludovico il Moro was the Duke of Milan. It begins, one evening when the Duke's cook was asked to prepare a delicious banquet, for himself and a number of nobles. The cook was successful in his feast, however, he had forgotten about the dessert in the oven, which had burnt by the time he realized. The cook was in despair but thankfully the little kitchen boy, Toni, suggested using the sweet cake he had made for himself in the morning using flour, butter, eggs, lime zest, and raisins. The cook was afraid he had no other solutions, so agreed to offer the cake to the guests. They both nervously stood behind the door to see the reactions of the Duke's friends.

To the cook's relief, everybody loved the cake. The Duke enjoyed it so much that he asked for its name. The cook responded "L'è 'l pan de Toni", meaning 'the bread of Toni'. The name has since evolved to Panettone.

Inventor of legends

Toni, lowly scullion at the service of Ludovico il Moro, was the inventor of the Italian panettones

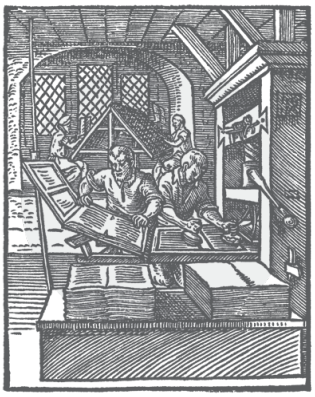
1395

Other legends

Other legends attribu invention to other pastry such as Ughett Atellani or Sister Ughet

1395 in Milan

Up to 1395 all bakeries in Milan (except for Rosti bakery, supplier of the richest families) were allowed to bake wheat bread just for Christmas in order to give it as a gift to their customers



1660 DC

Certain phases of this long evolution are documented. In 1606, according to the first Italian-Milanese dictionary (Varon milanes), the “Panaton de Danedaa” was a big bread, like the one baked at Christmas. Francesco Cherubini gives us a richer description in his famous Milanese-Italian dictionary in five volumes

MIddle Ages

The true origin of the cake can be found in the Middle Ages when people used to celebrate Christmas with a bread richer than the one ate every day.

ute the creative to degli ta.

1500 DC

A manuscript of late fifteenth-century written by George Valagussa, tutor for Sforza family, reports the tradition of celebrating the so-called “rito del ciocco”.

On Christmas Eve a large piece of wood was placed in the fireplace and three wheat bread were served on the table.

Galup
1922

1922

The cake company producing panettone which refreshed the recipe of Milan's panettone created by Mr Pierro Ferruo in 1922,and then,He and his associates built up the company producing specificly panettone and candies so called "galup" in Pinerolo.
The company's most well-known product is the low panettone with Piedmont Hazelnut icing

Galup had become a factory in 1948

Galup had become a factory in 1948, when monsoon Pietro Ferrua had set up a small industrial workshop

rattato di cucina, pasticceria moderna（1854）

The presence of the cake in a book written in Piedmont in the nineteenth century proves that it is well known since antiquity in the region chosen by Flamigni as site for its production plant.

1853

The first reference to yeast is dated 1853 and can be found in "Il nuovo cuoco Milanese economico"

70's-80

And from the 80's, lished the

Revive(2013)

A group of young entrepreneurs in Turin ,It has acquired the historic panettone factory of Monsù Ferrua

In 2013 ,it reopened with the formalization of the acquisition of the company by of the new property

2017

bankout(2012)

In the 90‘s the decline began, with the first loss account in 1994, of about 200 million lire. Due to the economic downturns and increased competition, the company has since continued to reduce production and staff until it ceases business on 1 October 2012.

0’s of 20 century

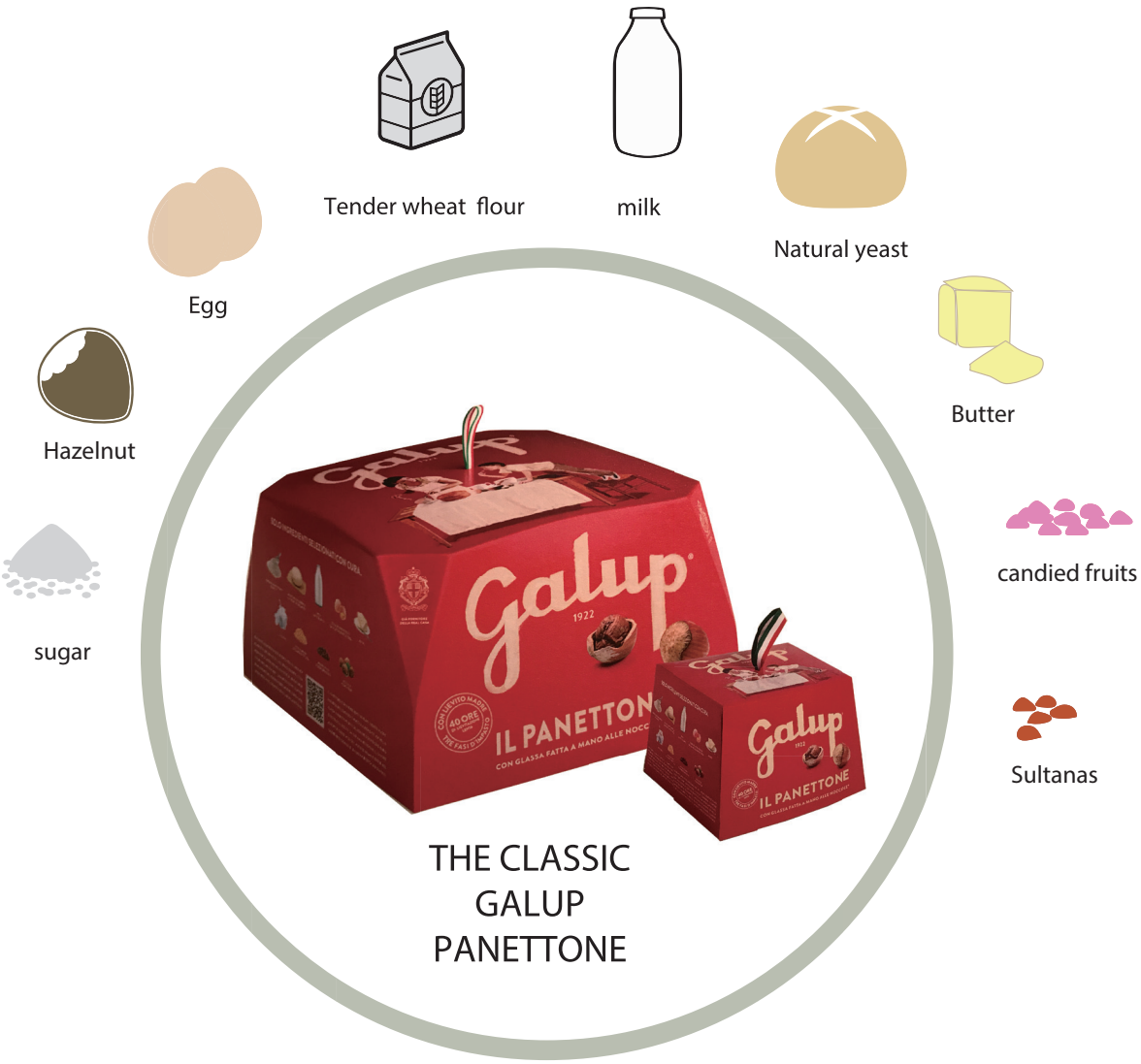
the 70's until the triumph of
Galup Panettons had estab-
emselves around the world.

PRODUCTION

Some serie of panettone

Galup company has many type of panettone having delicious taste and good odour.When I went to the main store of Galup located in Pinerolo,I saw more than 10 types panettone put on the Shelves that include many differents taste,chocolate、classical、cherry、paradiso、pears and apple so on.

Now,we would introduce main products panettone and mainly focus on the classical one.

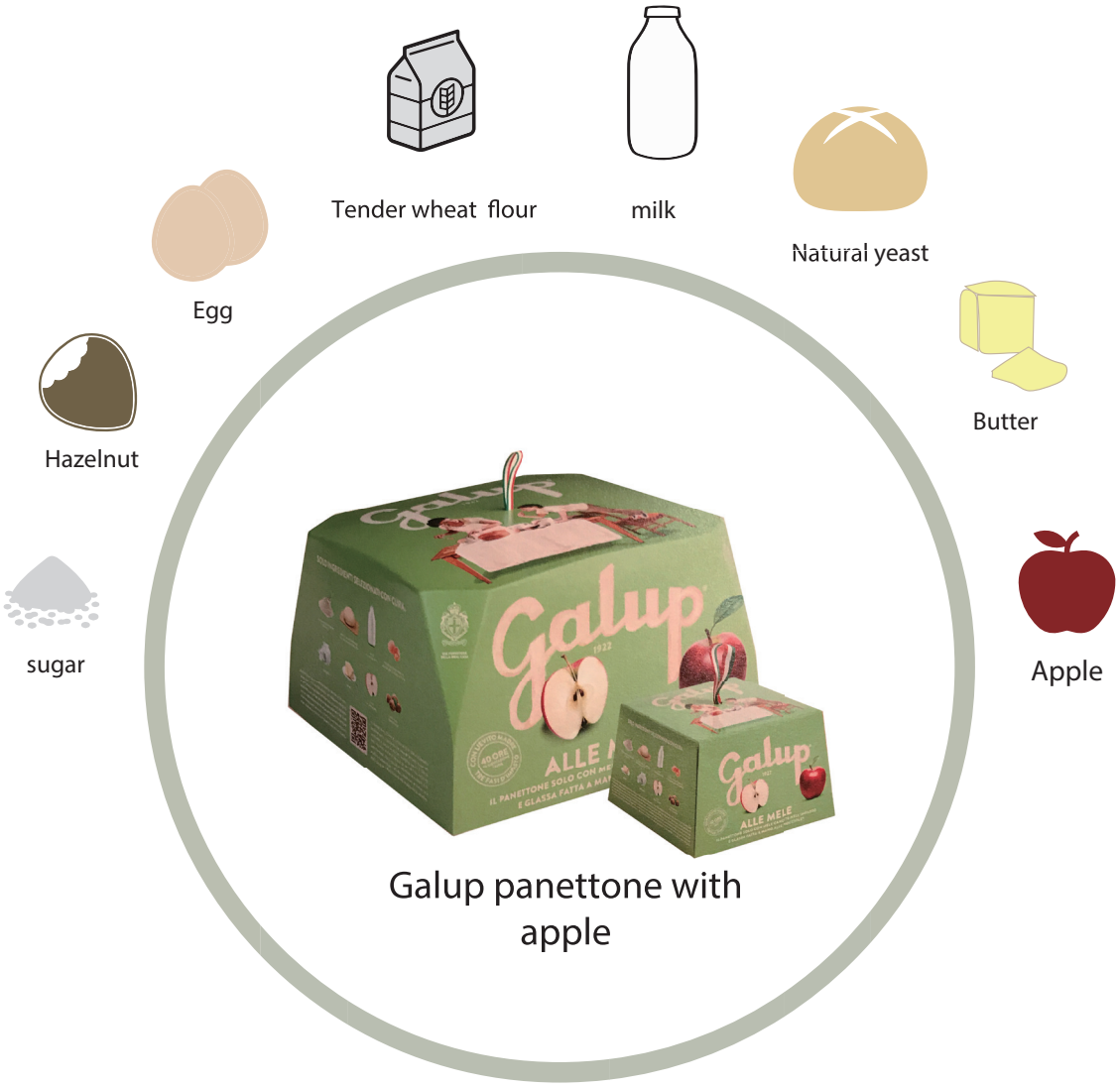


The classic galup panettone is most famous product of tradition recipe,includes IGP hazelnut and nature natural yeast by local territory.

The type of milan panettone is original type panettone,It includes Sultanas and other raw material which like other panettone

It's specially panettone with pear and chocolate.It has special taste with other type of panettone

The paradiso panettone has more sugar than other type of panettone,It used some special type of yeast.



It's specially panettone with apple and chocolate.It has special taste with other type of panettone

It's good tasty panettone which rich in chocolate and special cream

Other types
of backage
(same raw material)

PROCESSING

Process of panettone production

The panettone tastes like desserts made by mother and feeling like home.Producing panettone is complecate procesion includes fermenting、cuting、mixing、shaping、toasting、puching、packing etc.

It's mechanized production Without dyes and preservatives. but in other hand

The Galup does not forget to produce by hand,because when you open the package you can see and feel that the glaze is handmade: irregular and different in every Galup, thick and crisp.

The panettone still produced today in a family atmosphere, with the contribution of men and women who know each other and keep the memory of an important story.

- *1. Fermenting*

  Preparation of natural yeast.

  The word "natural yeast" refers to a mixture made of water and wheat flour, acidified by the fermentation activity of yeasts and lactic bacteria deriving from the mother. "Mother" means a portion of dough made of natural yeast taken from a previous process that acts as a microbial graft.

- *2. Cuting 2 times*

  Cuting 2 times is benefits for the succession of additions of the various ingredients which consists in incising the upper surface of the dough with a cross-shaped cut.

- *3. Mixing*

  Additions of the various ingredient will be mixed in this step.

- *4. Shaping*

  The forming phase conditions for obtaining of the final appearance of the product

- ***5. Toasting***

  The final leavening takes place in the baking mold in conditions of time, temperature and humidity depend on the personal experience of the craftsman

- ***6. Puching***

  In order to refresh the taste of panettone, they will be punched the hole under the products

- ***7. PACKING***

  At this stage the product is overturned. then they will be packaged at the end of the cooling.

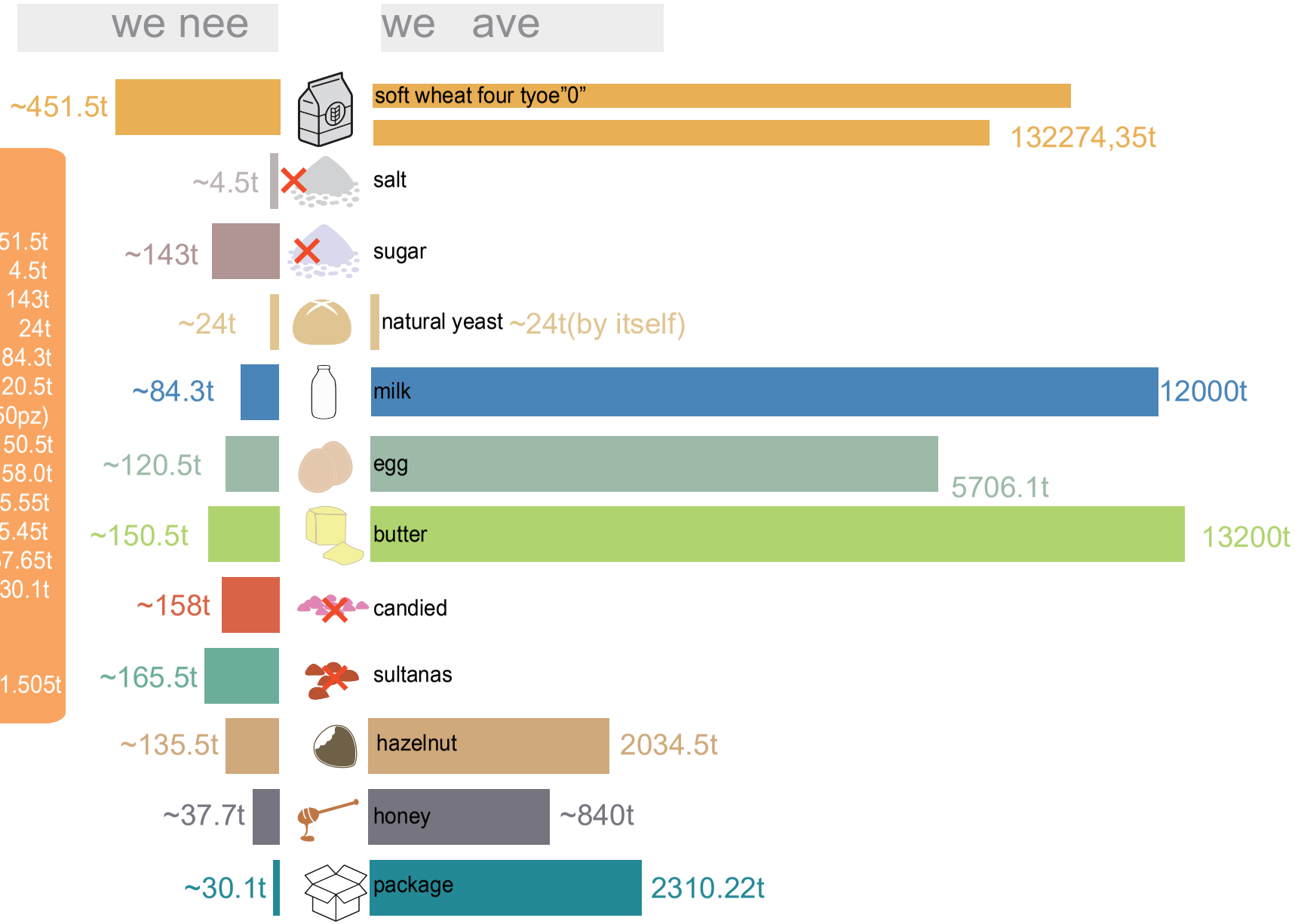
RECIPE WITH SUPPLY AND DEMAND

Base on researching territory

In the galup panettone, many raw materials were used. After investigation, it was found that each 1KG of palmetone needs 300g of soft wheat four type 0, 3g of salt, 95g of sugar, 16g of natural yeast 2pz (80g) of eggs, butter, candy, Raisins need 100g, 105g, 110g respectively. Need 90g of piemote hazelnut, honey needs 25g, packaging needs 20g. the classic panettone annual production is 1.505ton.Of all the production months, the production in June and July was the lowest, while the production in November and December was the highest. Because of Christmas reasons.

After calculation, the amount needed for each raw material in a year can be calculated. After that, the relationship between supply and demand and the amount of raw materials produced locally can be calculated.

RAW MATERIAL NEEDS OF PANETTONE OF GALUP PER 1 YEAR



LIST(1year)

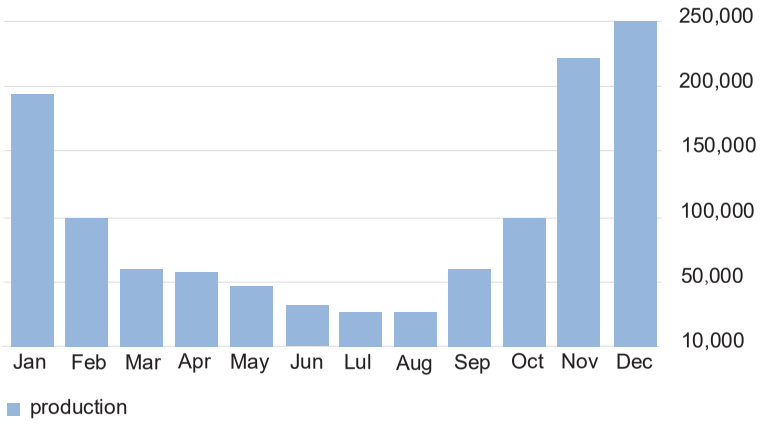
soft wheat four tyoe"0"	451.5t
salt	4.5t
sugar	143t
Natural yeast	24t
Milk	84.3t
Egg	120.5t (301150pz)
Butter	150.5t
Candied	158.0t
Sultanas	165.55t
Piemonte hazelnut	135.45t
Honey	37.65t
Package and others	30.1t
The classical panettone 's annual production	1.505t

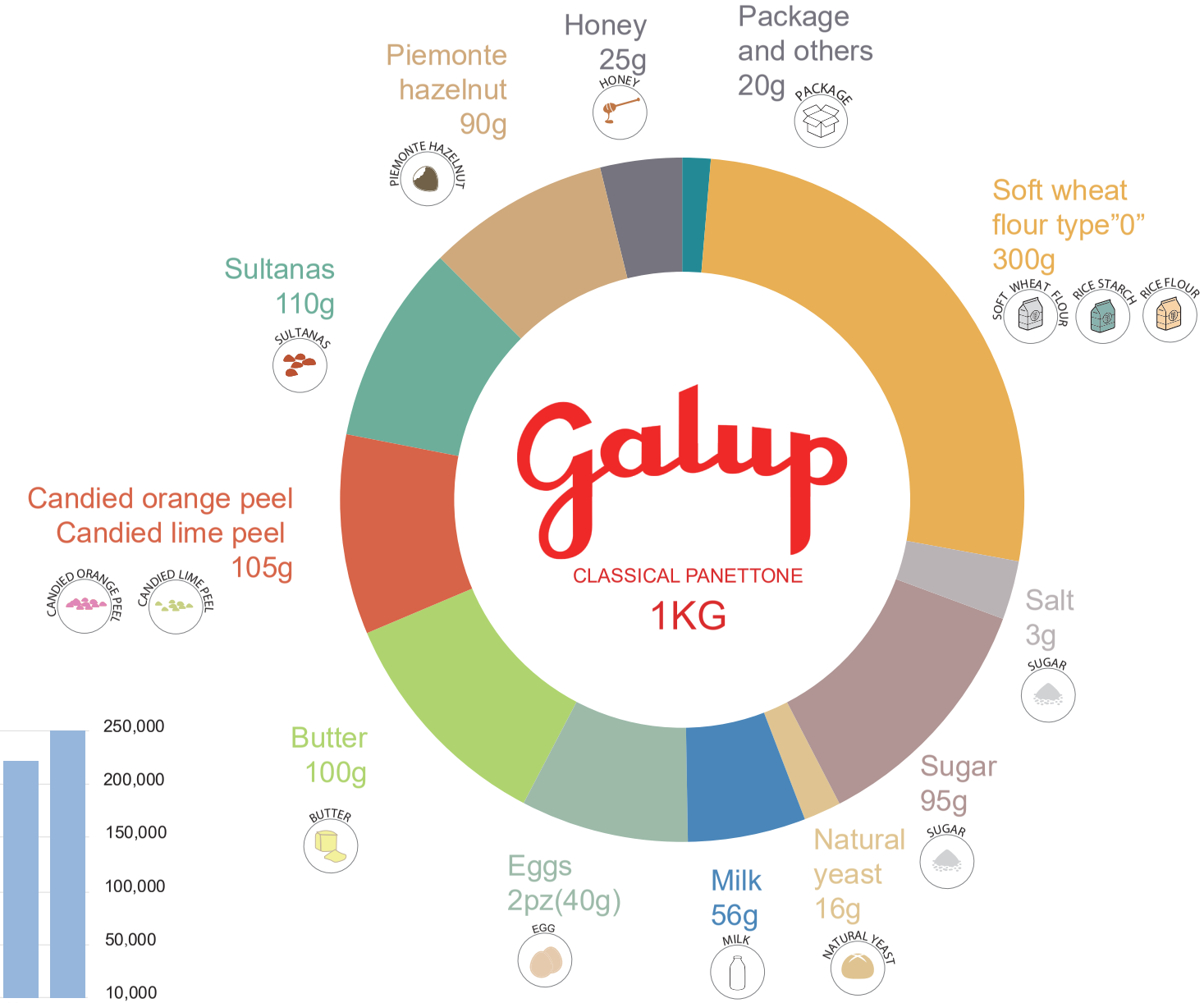
recipe of classical panettone of galup

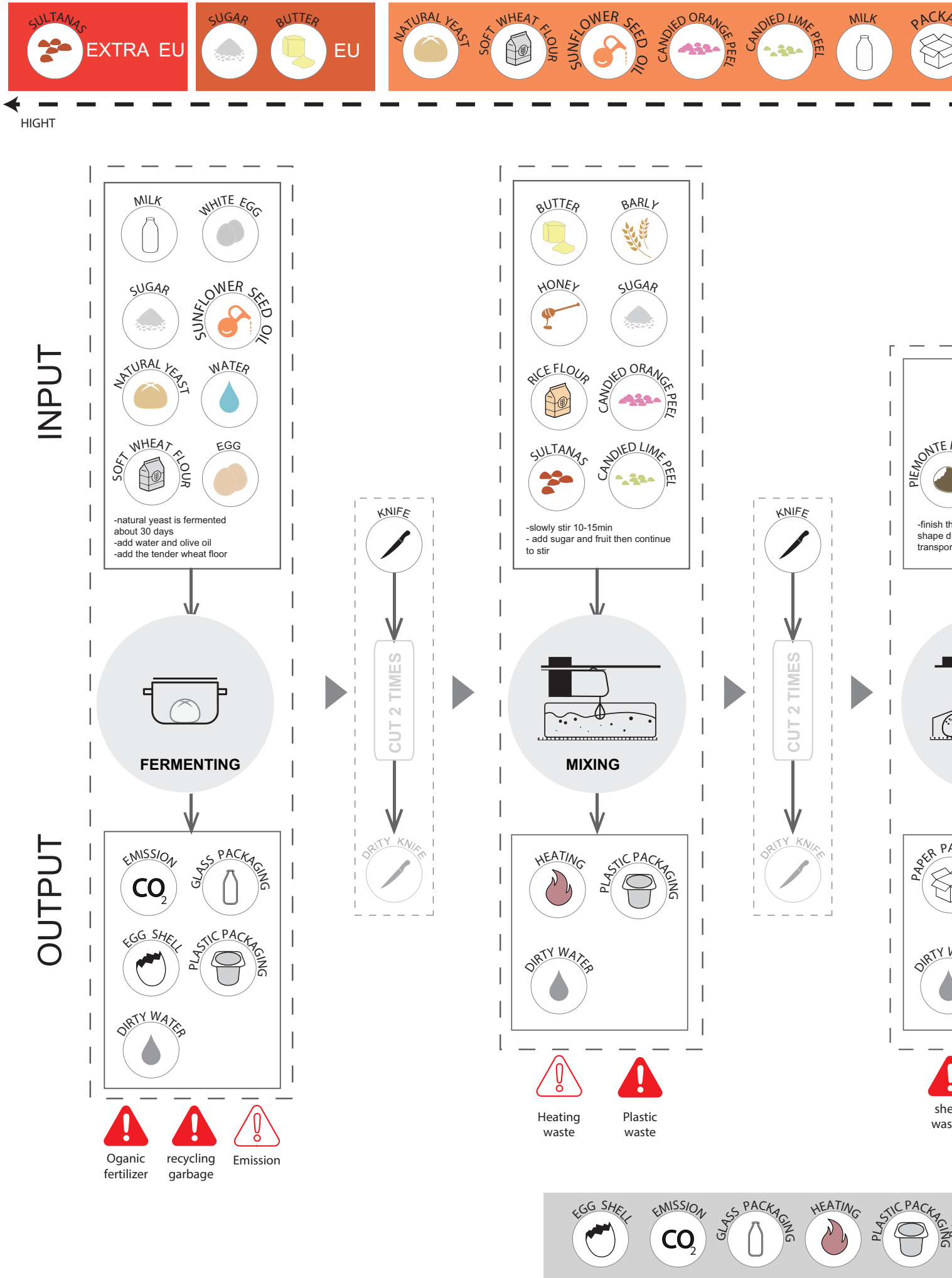
LIST(1KG)

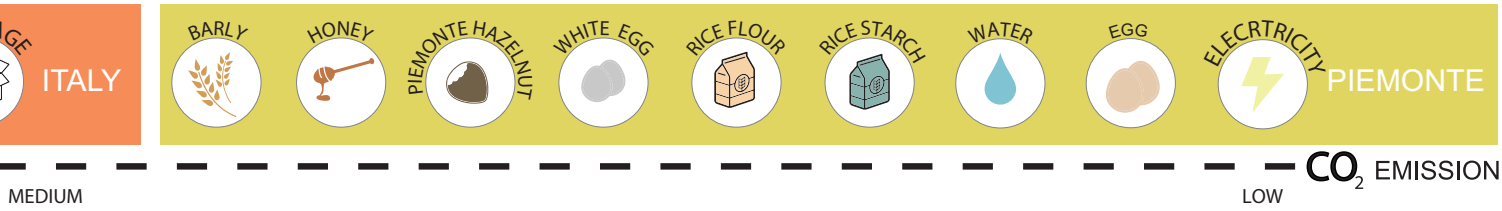
soft wheat four tyoe"0"	300g
salt	3g
sugar	95g
Natural yeast	16g
Milk	56g
Egg	2pz(80g)
Butter	100g
Candied	105g
Sultanas	110g
Piemonte hazelnut	90g
Honey	25g
Package and others	20g

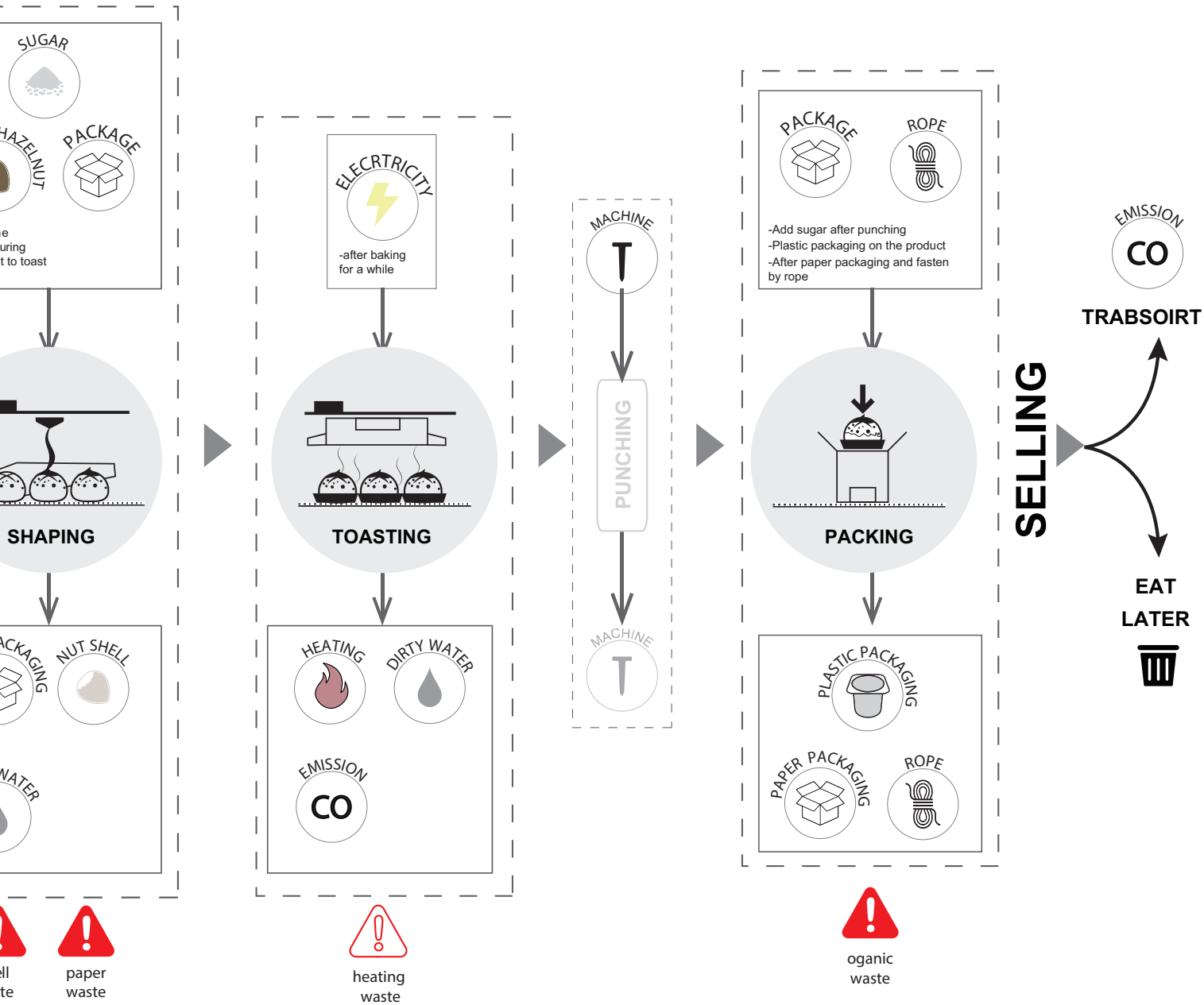
The classical panettone 's annual production 1.505t






SULTANAS
EXTRA EU
SUGAR
BUTTER
EU
NATURAL YEAST
SOFT WHEAT FLOUR
SUNFLOWER SEED OIL
CANDIED ORANGE PEEL
CANDIED LIME PEEL
MILK
HIGHT
INPUT
MILK
WHITE EGG
SUGAR
SUNFLOWER SEED OIL
NATURAL YEAST
WATER
SOFT WHEAT FLOUR
EGG
-natural yeast is fermented about 30 days
-add water and olive oil
-add the tender wheat floor
FERMENTING
OUTPUT
EMISSION
CO2
GLASS PACKAGING
EGG SHELL
PLASTIC PACKAGING
DIRTY WATER
KNIFE
CUT 2 TIMES
DIRTY KNIFE
BUTTER
BARLY
HONEY
SUGAR
RICE FLOUR
CANDIED ORANGE PEEL
SULTANAS
CANDIED LIME PEEL
-slowly stir 10-15min
- add sugar and fruit then continue to stir
MIXING
HEATING
PLASTIC PACKAGING
DIRTY WATER
KNIFE
CUT 2 TIMES
DIRTY KNIFE
Oganic fertilizer
recycling garbage
Emission
Heating waste
Plastic waste
EGG SHELL
EMISSION
CO2
GLASS PACKAGING
HEATING
PLASTIC PACKAGING


ITALY
BARLY
HONEY
PIEMONTE HAZELNUT
WHITE EGG
RICE FLOUR
RICE STARCH
WATER
EGG
ELECRTRICITY
PIEMONTE
MEDIUM
LOW
CO2 EMISSION


SUGAR
PACKAGE
HAZELNUT
SHAPING
NUT SHELL
ELECRTRICITY
-after baking for a while
TOASTING
HEATING
DIRTY WATER
EMISSION
CO
MACHINE
PUNCHING
MACHINE
PACKAGE
ROPE
-Add sugar after punching
-Plastic packaging on the product
-After paper packaging and fasten by rope
PACKING
PLASTIC PACKAGING
PAPER PACKAGING
ROPE
SELLING
EMISSION
CO
TRABSOIRT
EAT LATER
paper waste
heating waste
oganic waste


PAPER PACKAGING
ROPE
DIRTY WATER
NUT SHELL

03

CURRENT SITUATION

analysis each part of getting raw material
farm and find problem

3 CURRENT SITUATION

ANALYSIS & RESEARCH

CURRENT SITUATION

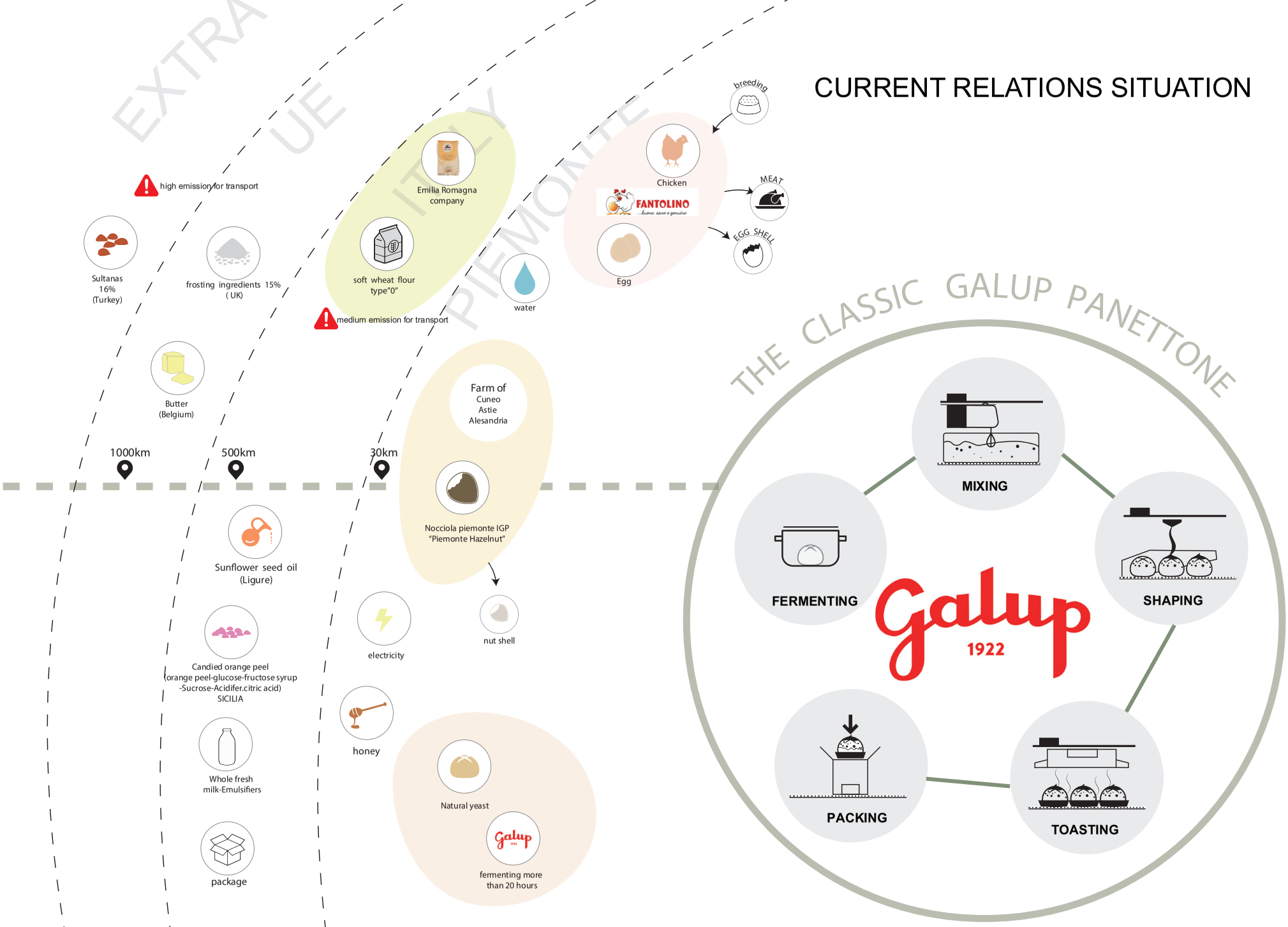
Current situantion of galup

Nowadays,most of percentage of raw materials are dependent to import from outside of piemonte.on the other hand,the local raw material wasn't used to panetone production process.

For example, the sultanas couldn't cultivate in piemonte province but it can be cultivate in Turkey,so we have to import it from extra Europe due to the sunshine and temperature suitable,but for other crops,it's benefit that culticate in local teritory,there is plenty of sunshine here and hardworking famers.for instance,the egg imported from Cuneo province could produce in local territory,it's good opportunity to develop local finance.

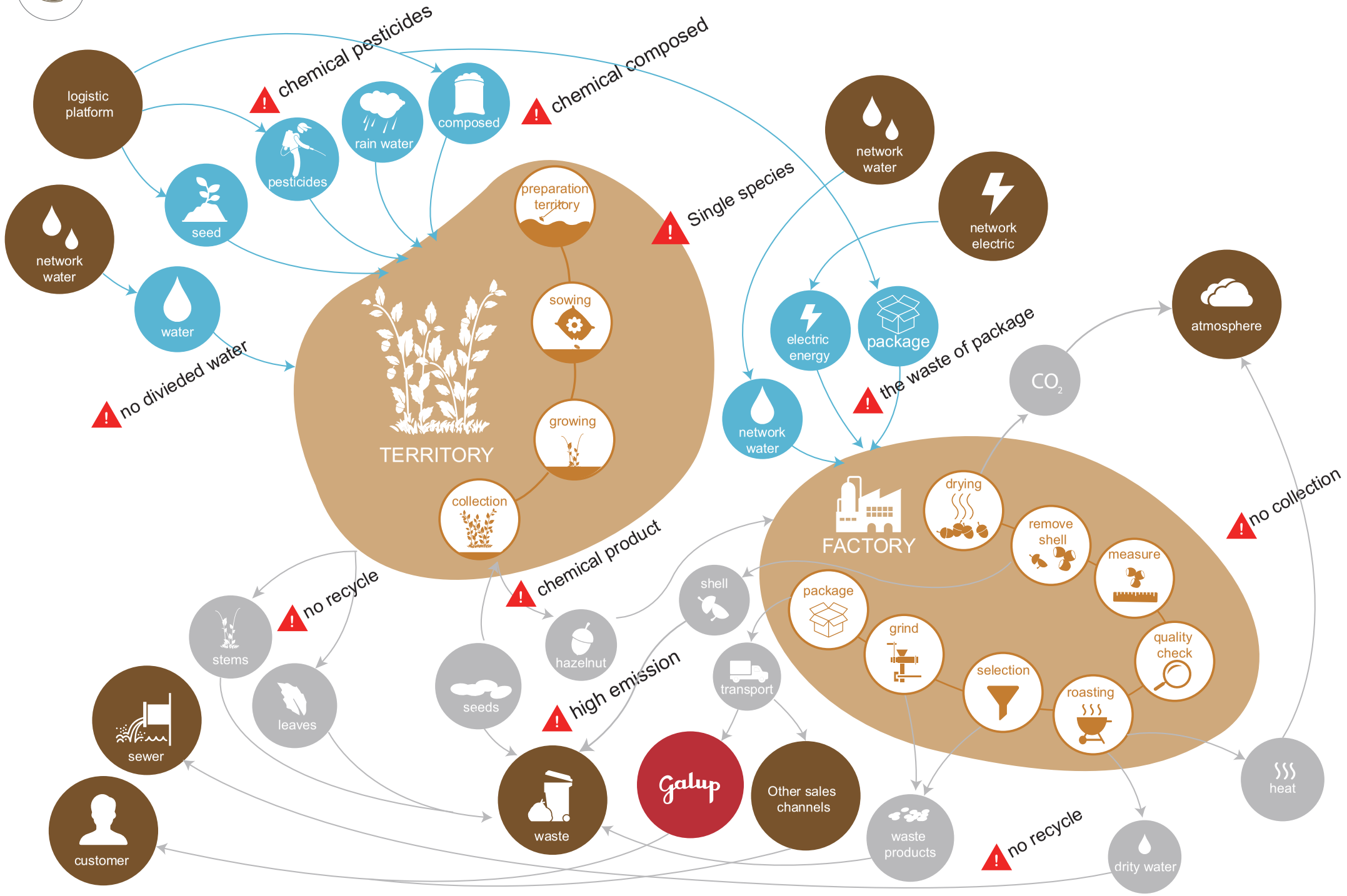
This event will make the local agriculture undeveloped.and caused a large outflow of funds

CURRENT RELATIONS SITUATION



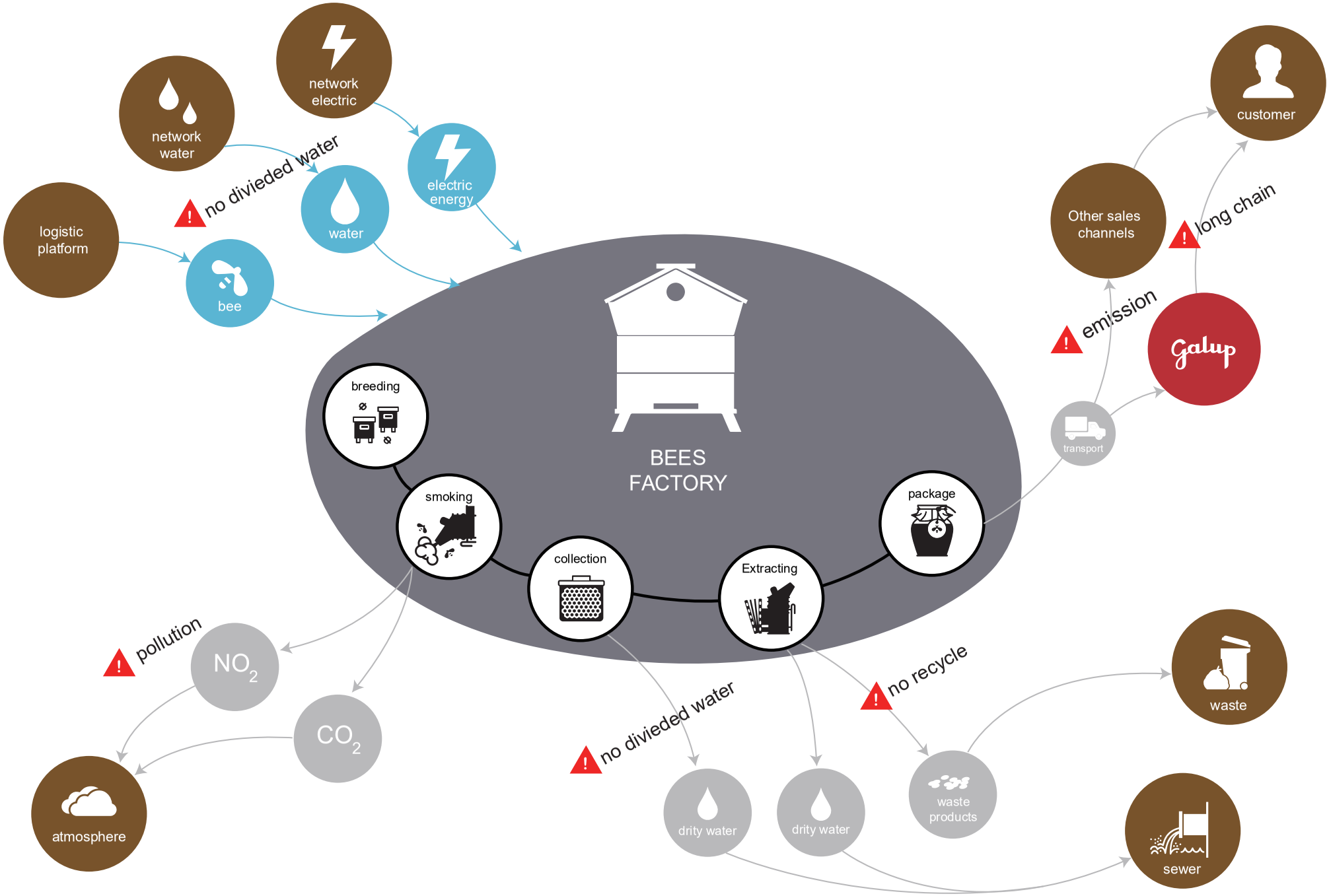
PIEMONTE

Current situation of Nocciole Marchisio company



HONEY ITALY

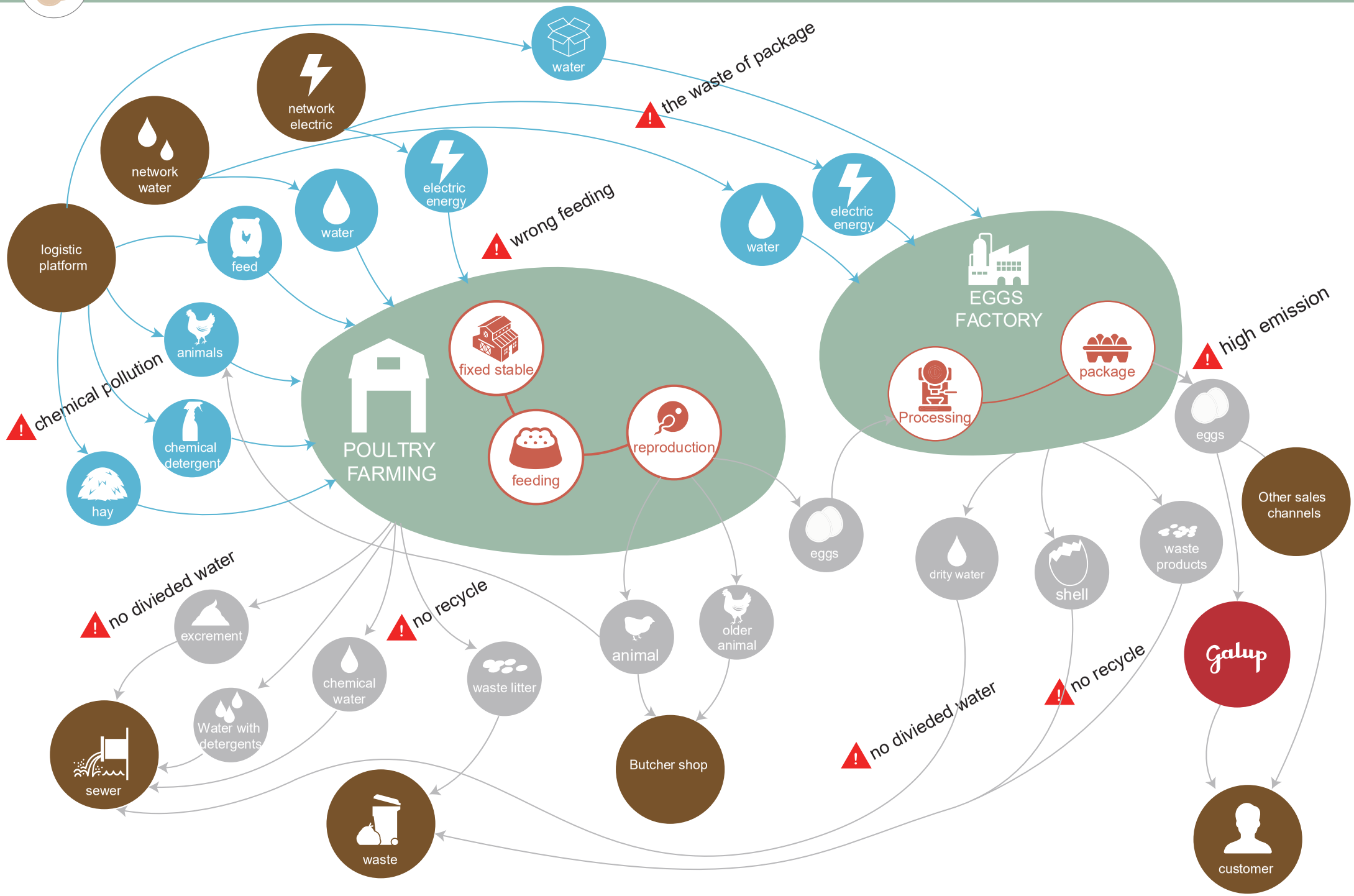
Current situation of Brezzo miele company



EGG

PIEMONTE

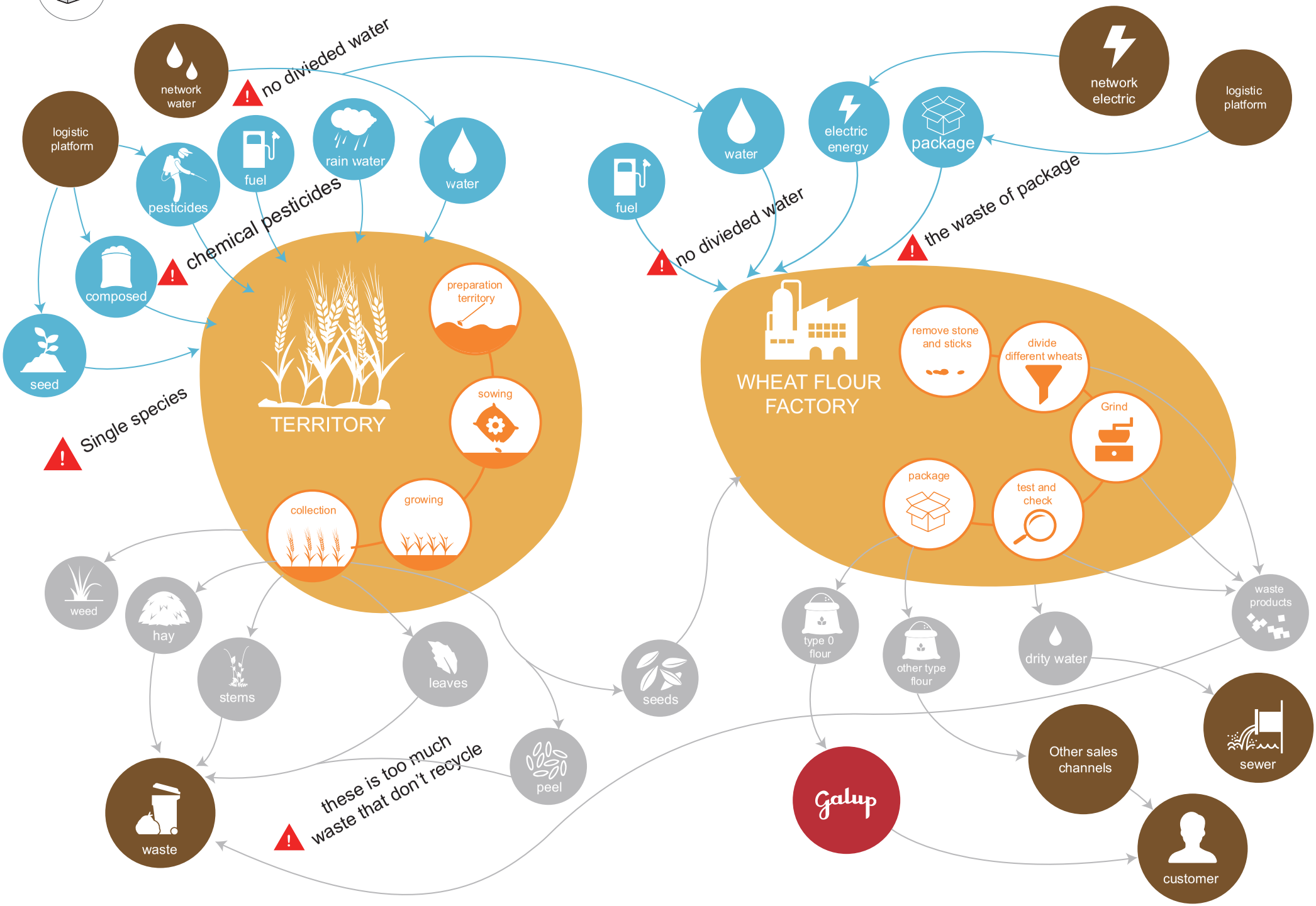
Current situation of Ferraris uova company



SOFT WHEAT FLOUR

ITALY

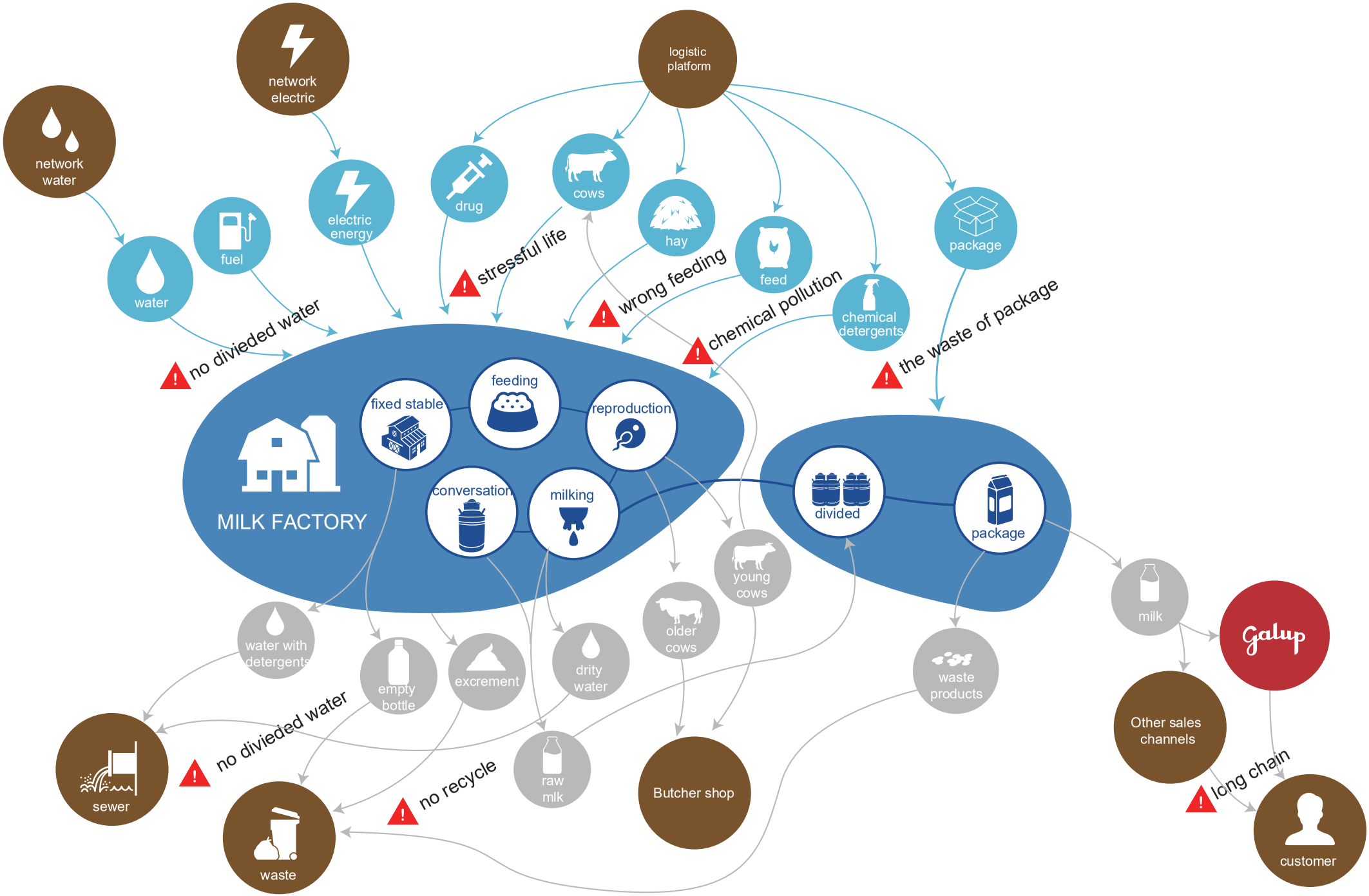
Current situation of Molino Tavano S.P.A.company



MILK

ITALY

Current situation of padania ”è più” milk company

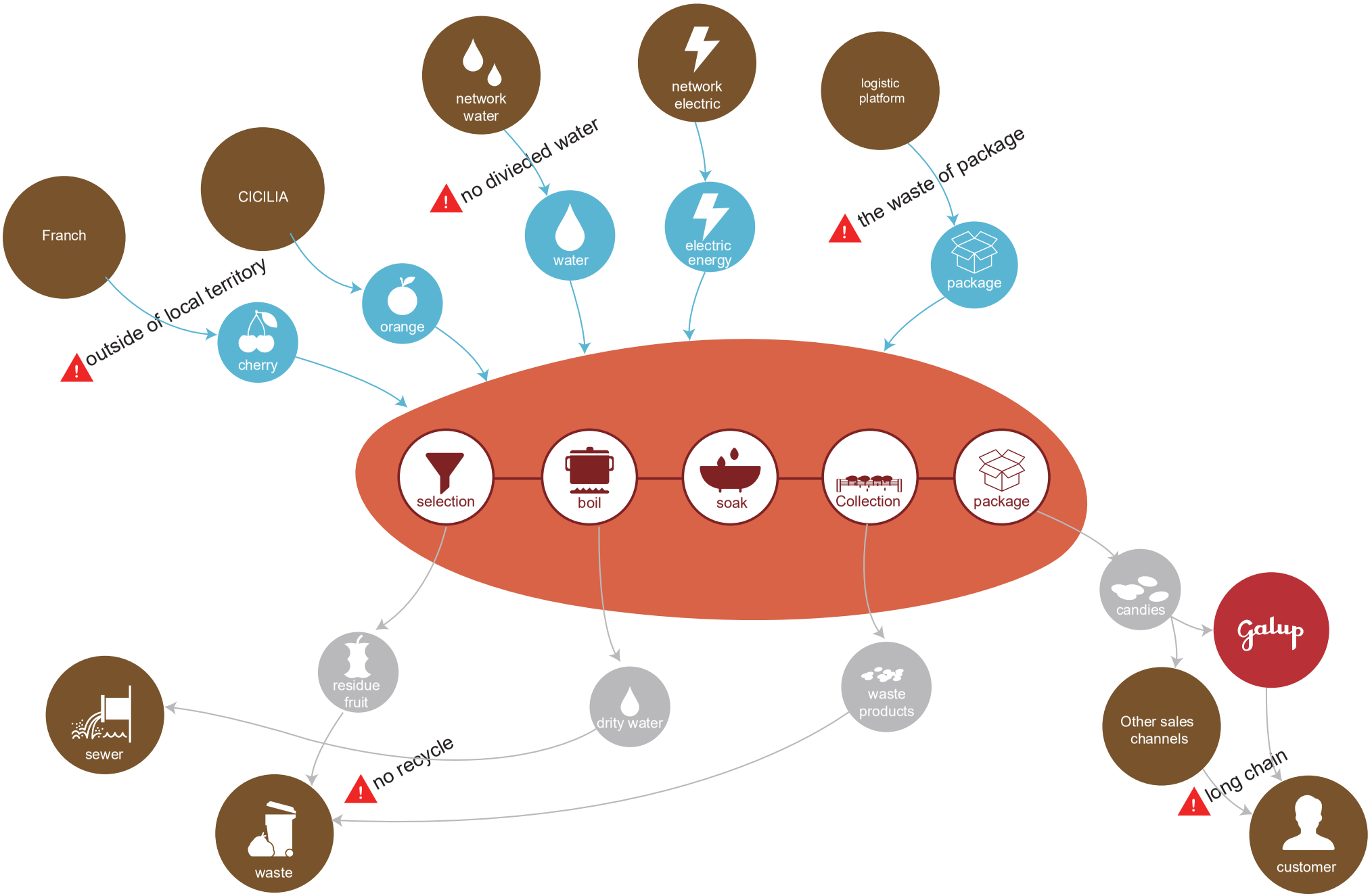


CANDIED ORANGE PEEL

CANDIED LIME PEEL

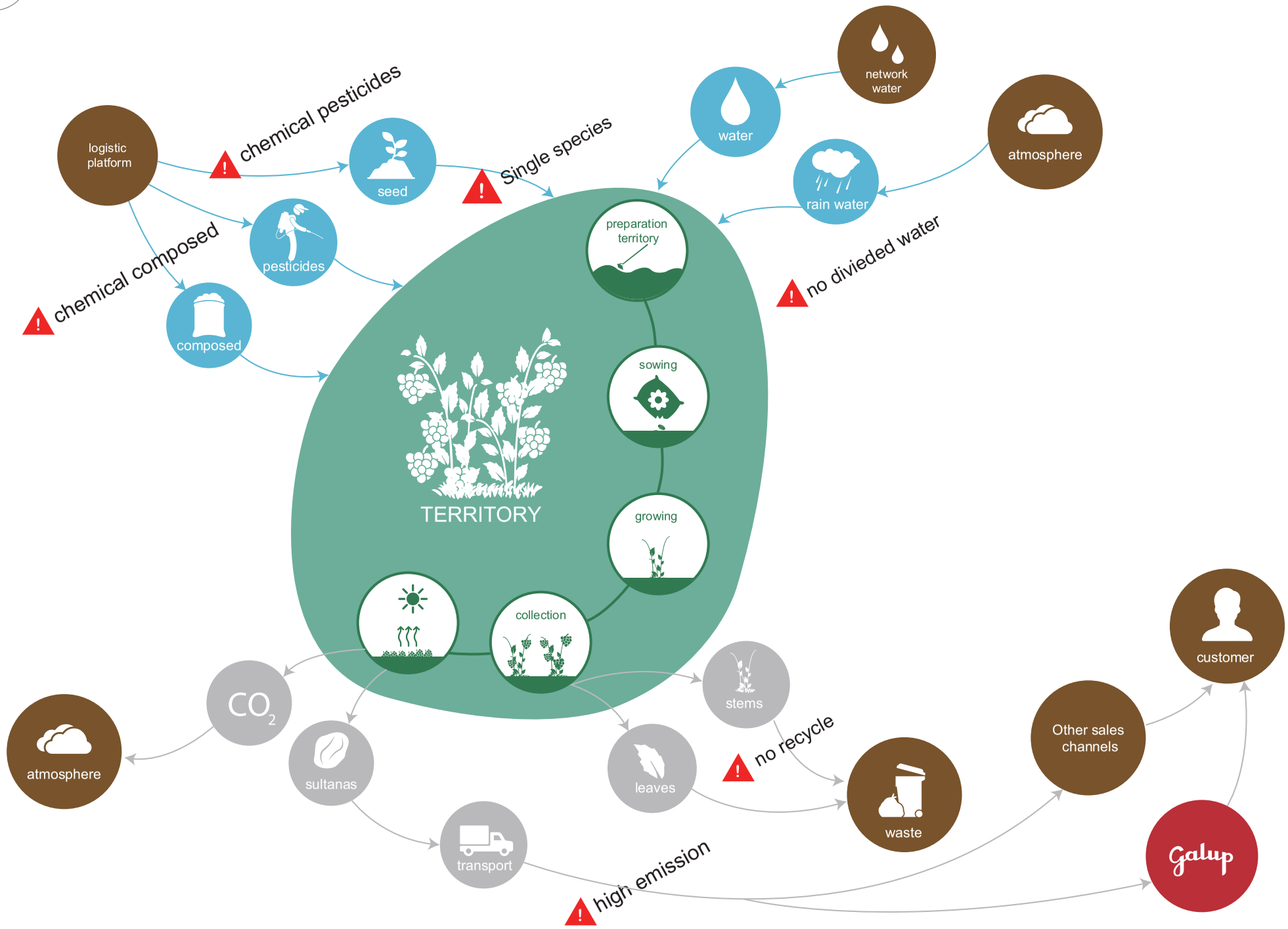
ITALY

Current situation of Cesarin candita company



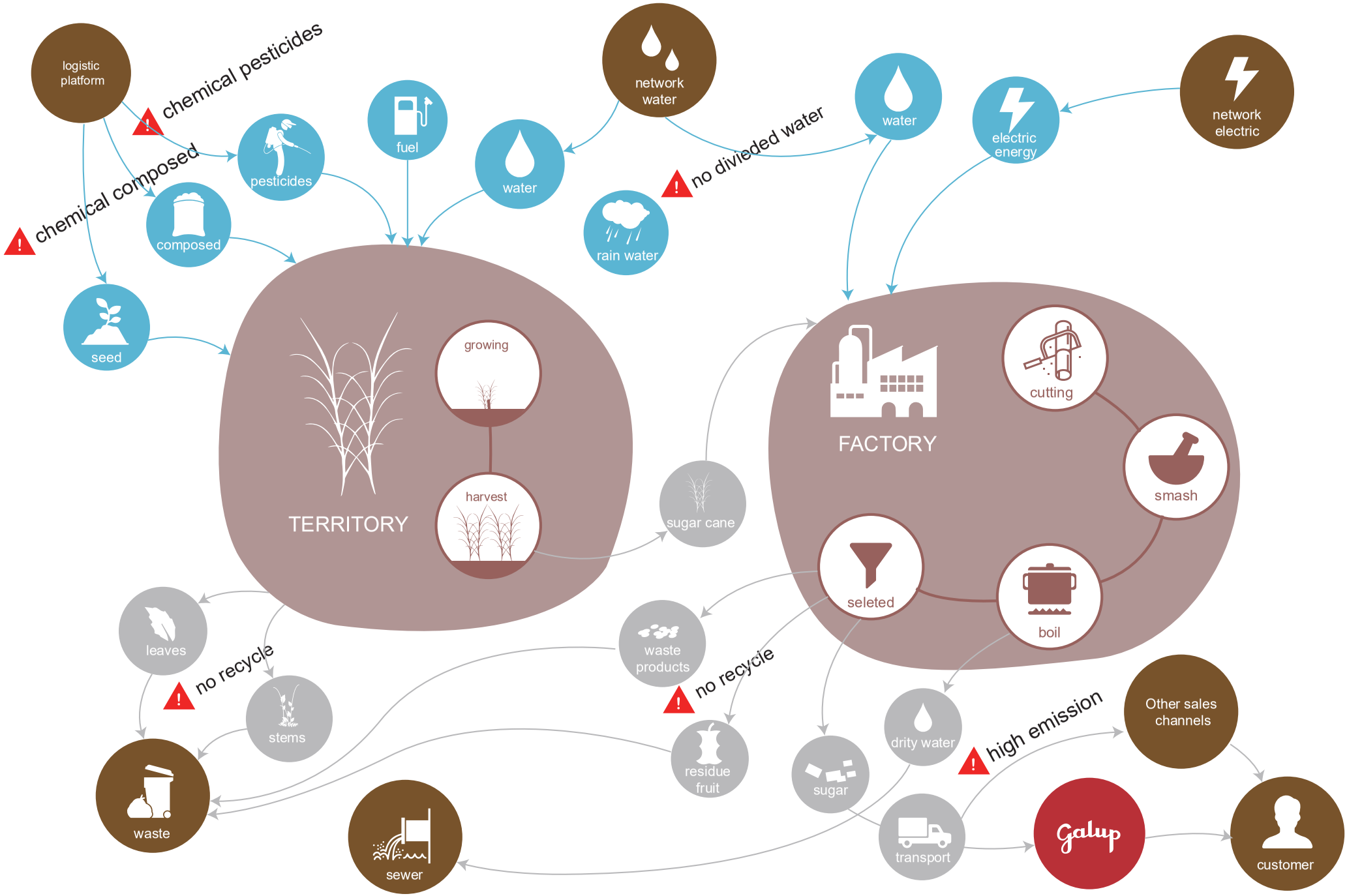
EXTRA UE

Current situation of TAVI Sultanas turkey company



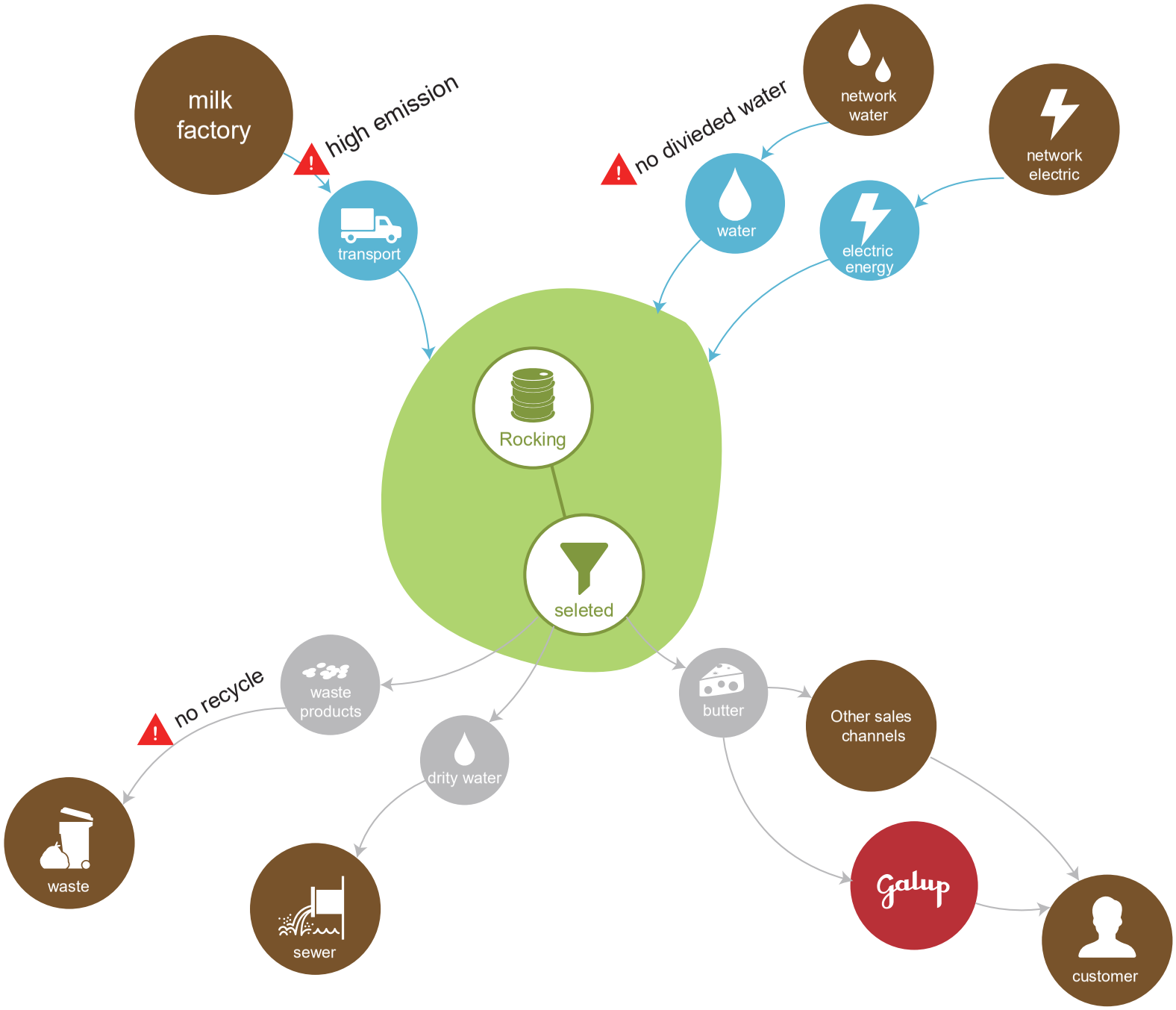
SUGAR EXTRA UE

Current situation of “Dacia” Sugar company(UK)

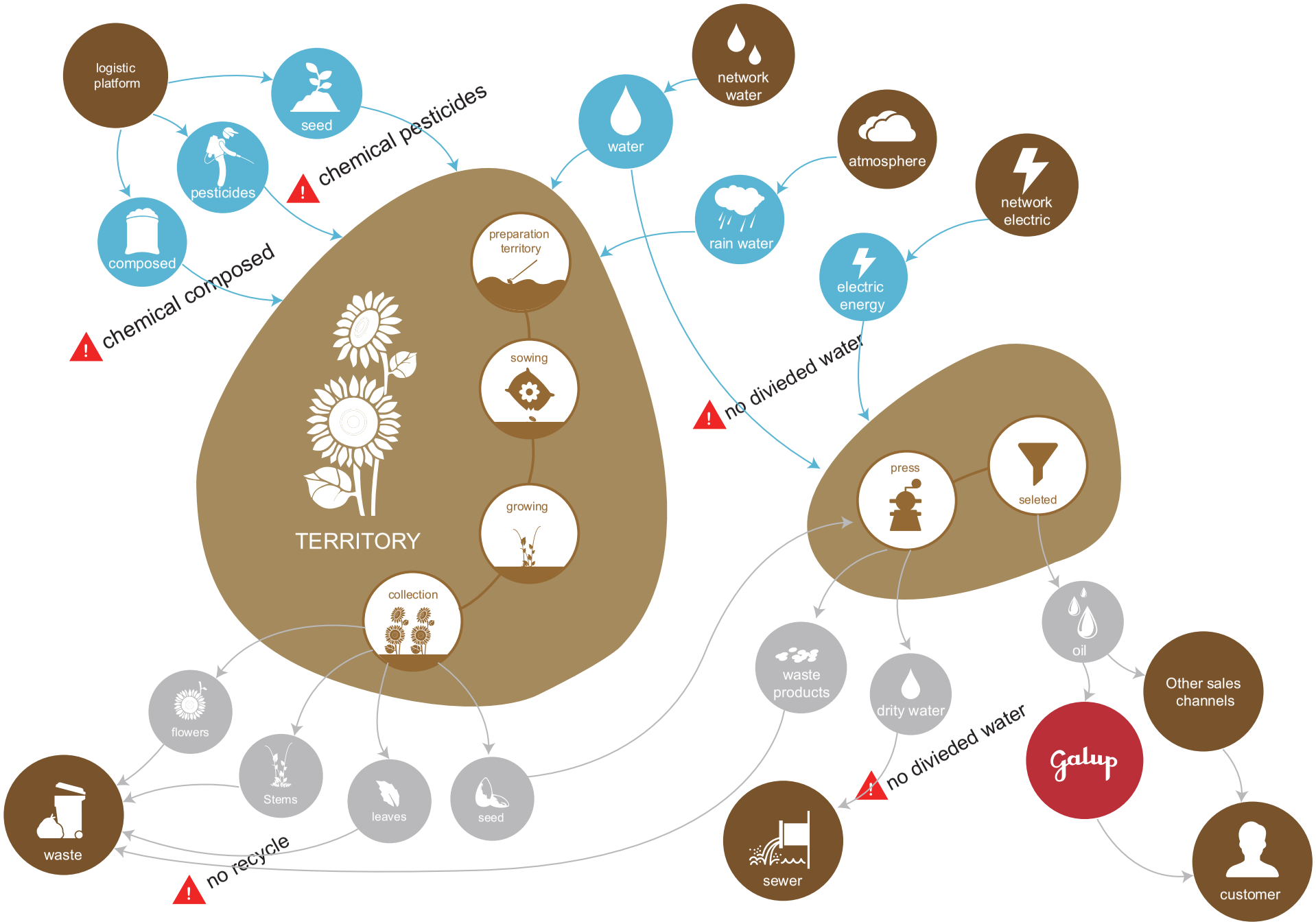


UE

Current situation of corman butter company(Belgium)



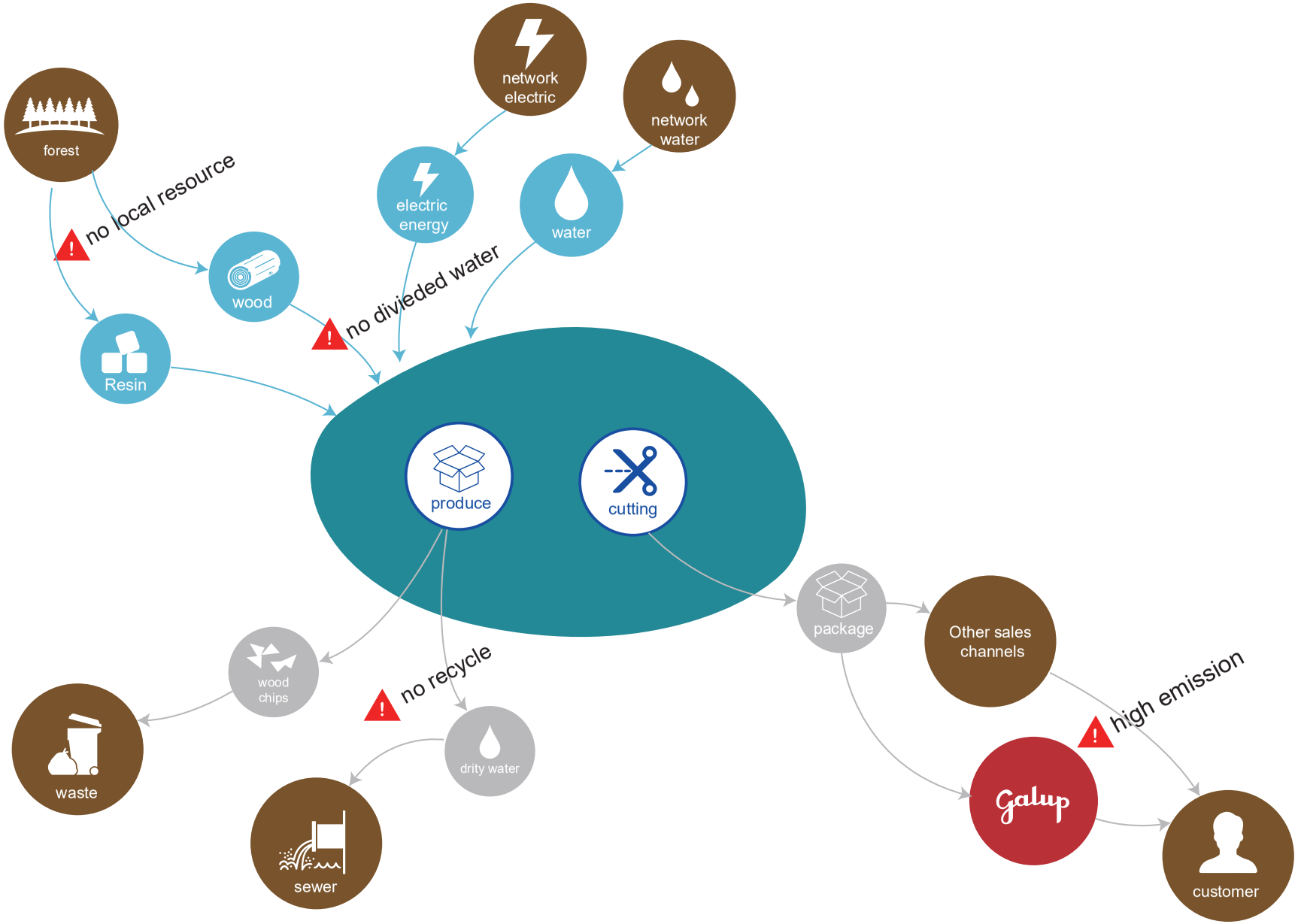
Current situation of “Sacchetto”primia sunflower seed oil company



PAKAGE

ITALY

Current situation of package company



LINEAR APPROACH

what is wrong with linear system

In pinerolo, most of the raw materials used to produce panettone can be grown. However, Galup panettone is extremely dependent on imports of food from outside of pinetolo rather than locally resource.

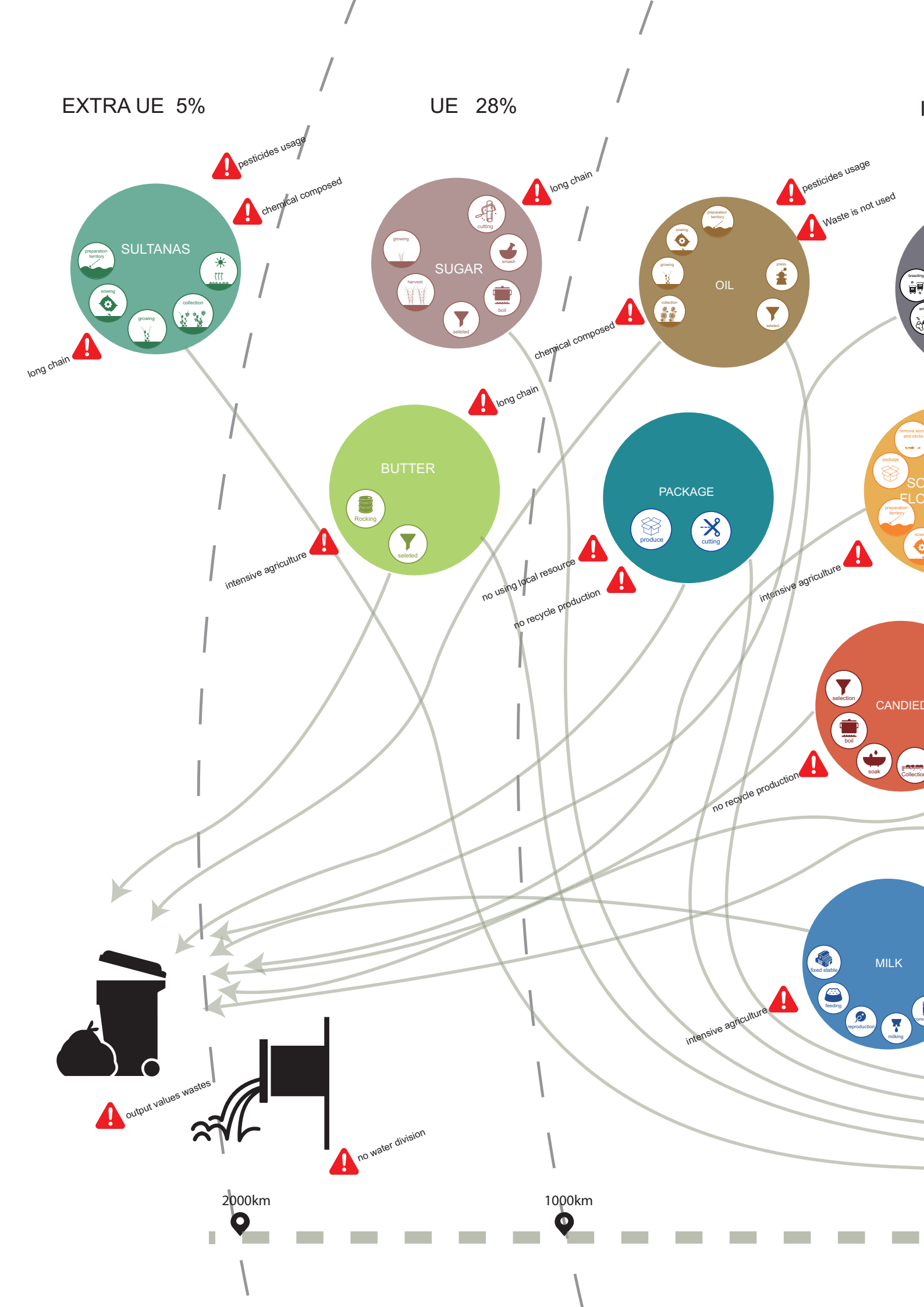
The local agriculture used a lot of chemical fertilizer. These fertilizers would destroy the ecological balance of the land. After the fertilizer has been used through the land, a large amount of chemical substances will remain in the territory, and these substances will remain in the plant with growing,It will be eaten by humans finanlly then it hurts humanity itself.

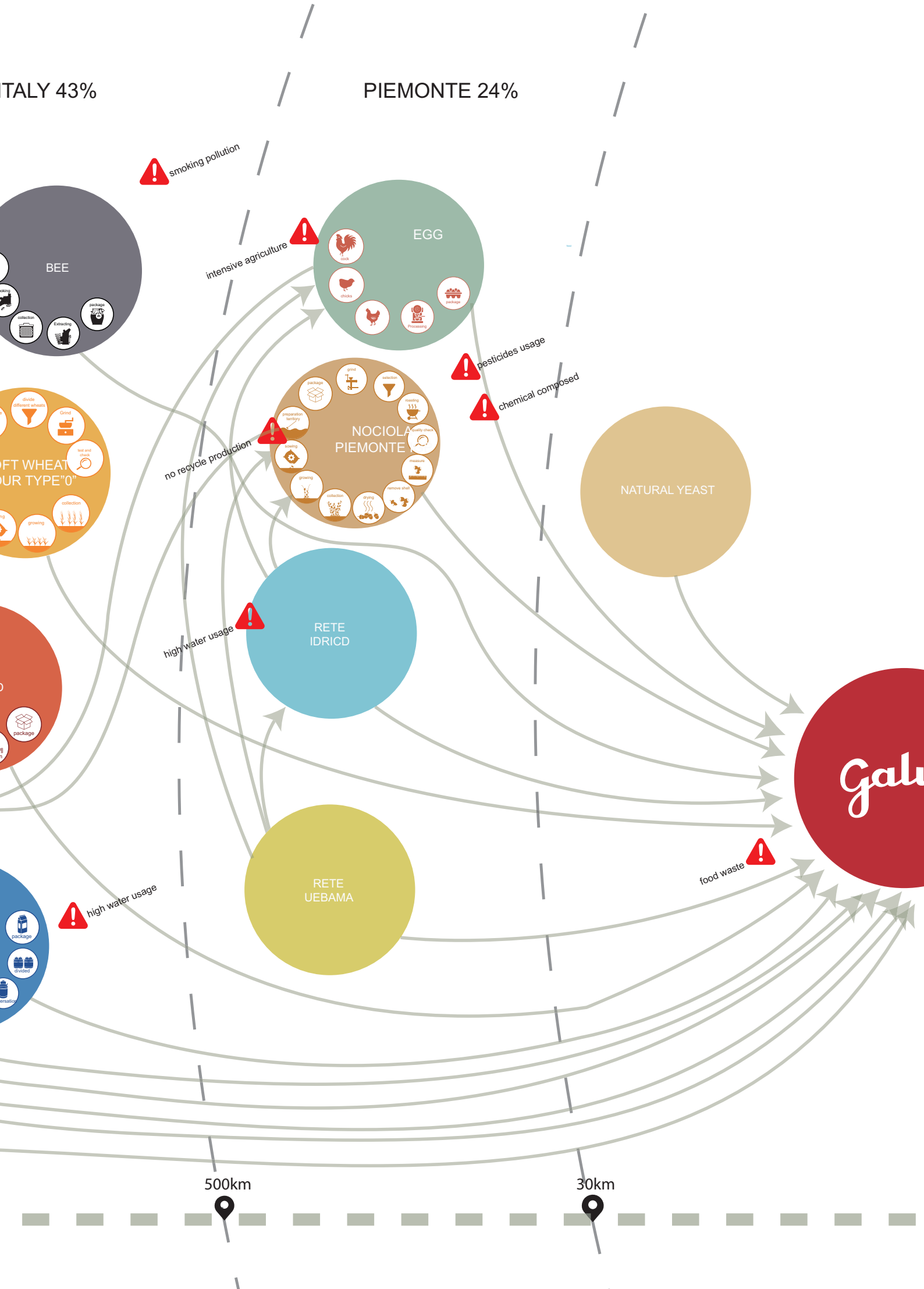
In a linear system, there is no relationship between the elements, which is also causes huge waste.

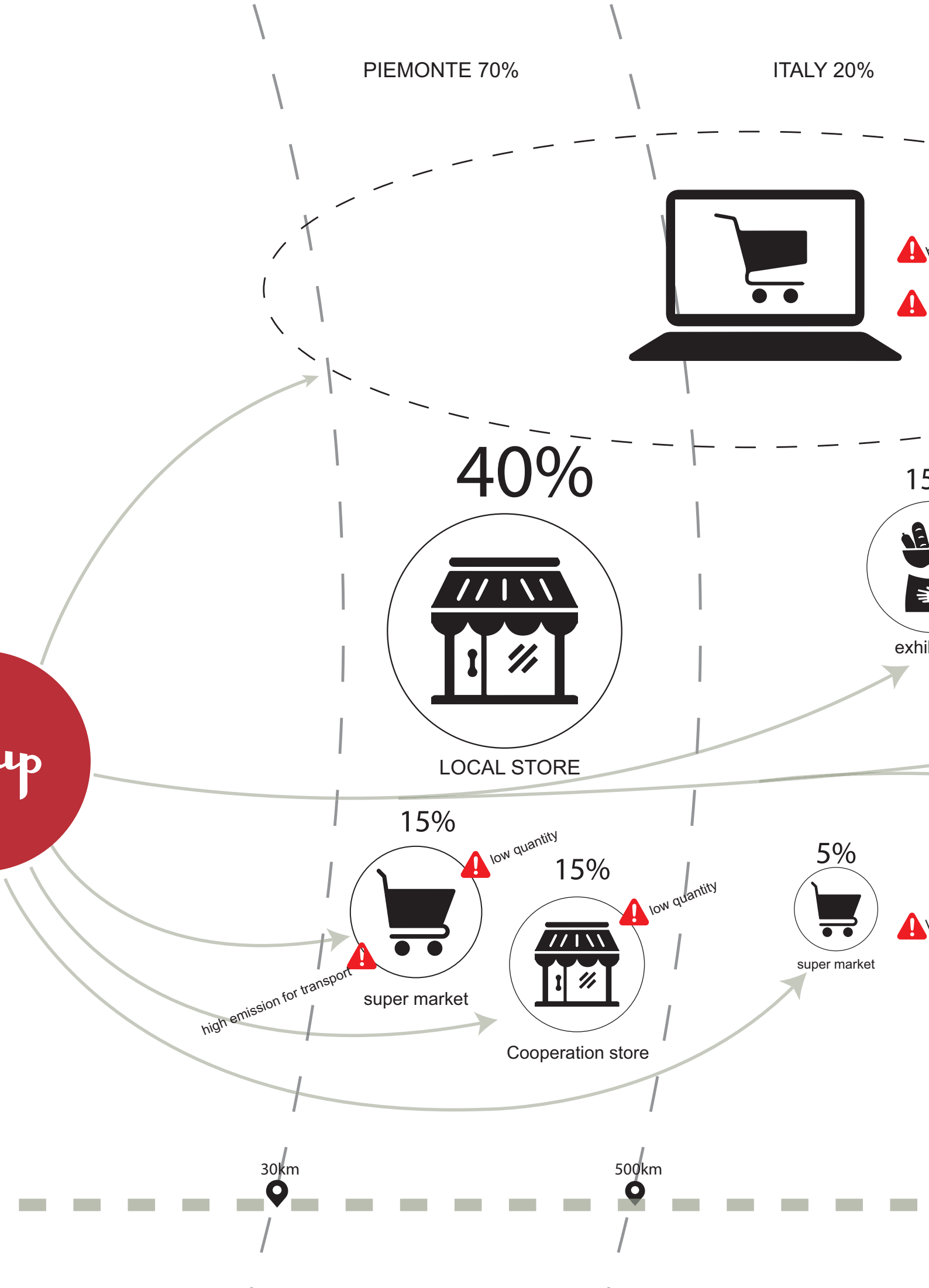
It's a promblem not only for a import raw material,but also a problem exported to outside of pinetolo,even the world.it would make bad influence for local economic, all the earnings that are made by selling the product are going to outside the territory and into the pockets of a few. This practice also weakens the local markets.

We must change the methods of the production sector, switch from a “linear” production model to an advanced “interrelated” production model, and find a solution in a truly interdisciplinary “new theroy”.

Experience of this concept in the industrial field shows that production activities may reflect the principle of nature's metabolism, that is, so called no waste is produced.


EXTRA UE 5%
UE 28%
pesticides usage
chemical composed
SULTANAS
long chain
long chain
SUGAR
pesticides usage
Waste is not used
OIL
chemical composed
long chain
BUTTER
PACKAGE
intensive agriculture
no using local resource
no recycle production
intensive agriculture
CANDIED
no recycle production
MILK
intensive agriculture
output values wastes
no water division
2000km
1000km


ITALY 43%
PIEMONTE 24%
smoking pollution
intensive agriculture
BEE
EGG
pesticides usage
chemical composed
no recycle production
NOCIOLA
PIEMONTE
NATURAL YEAST
high water usage
RETE
IDRICD
RETE
UEBAMA
high water usage
food waste
500km
30km


PIEMONTE 70%
ITALY 20%
40%
LOCAL STORE
15%
low quantity
super market
high emission for transport
15%
low quantity
Cooperation store
5%
super market
30km
500km

UE 9%

EXTRA EU 1%

high emission for transport

high cost of transport producion

5%

low frequency

bition

10%

low frequency

exhibition
（Tutto food）

large scale and local mixed

1%

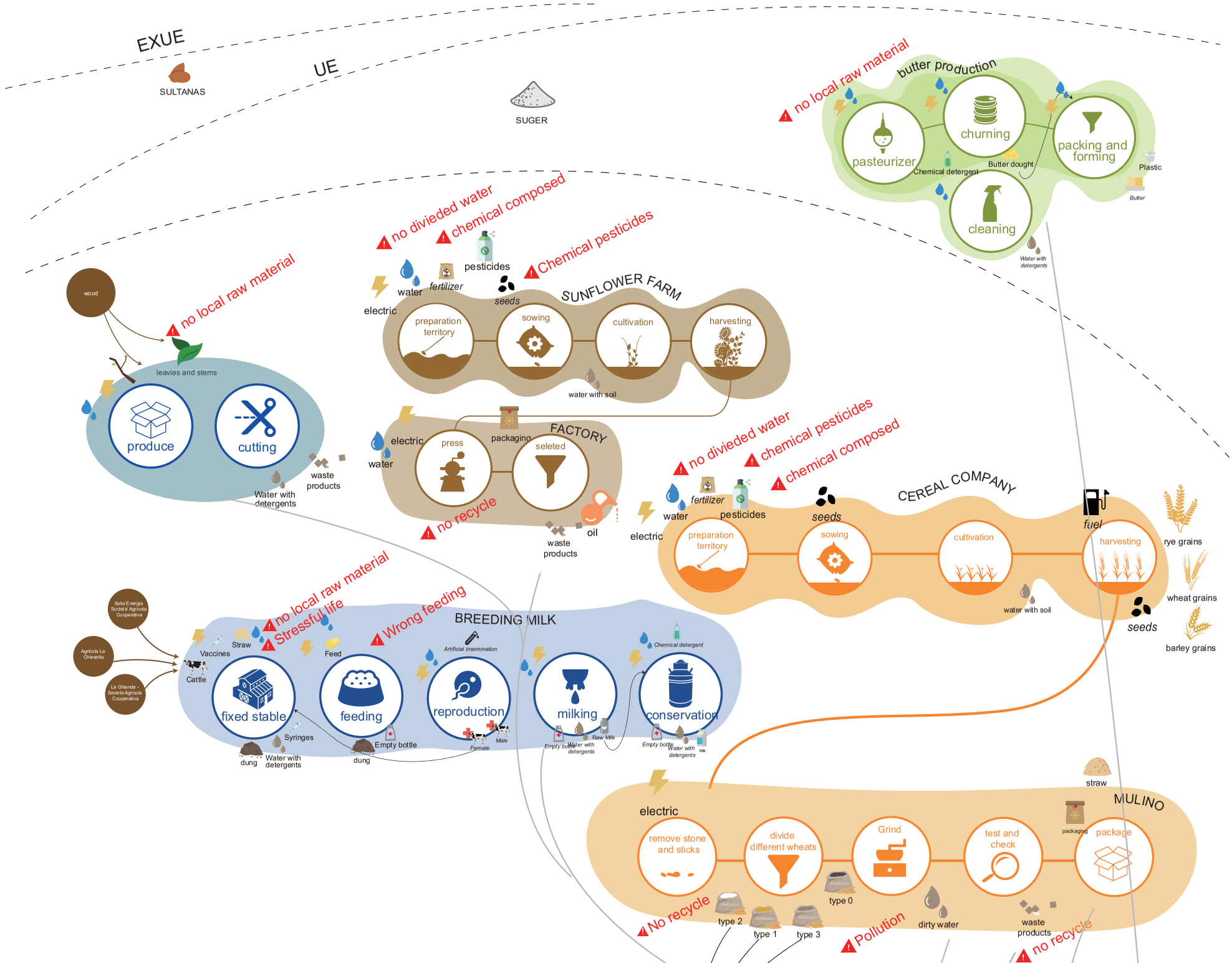
unknow in the world

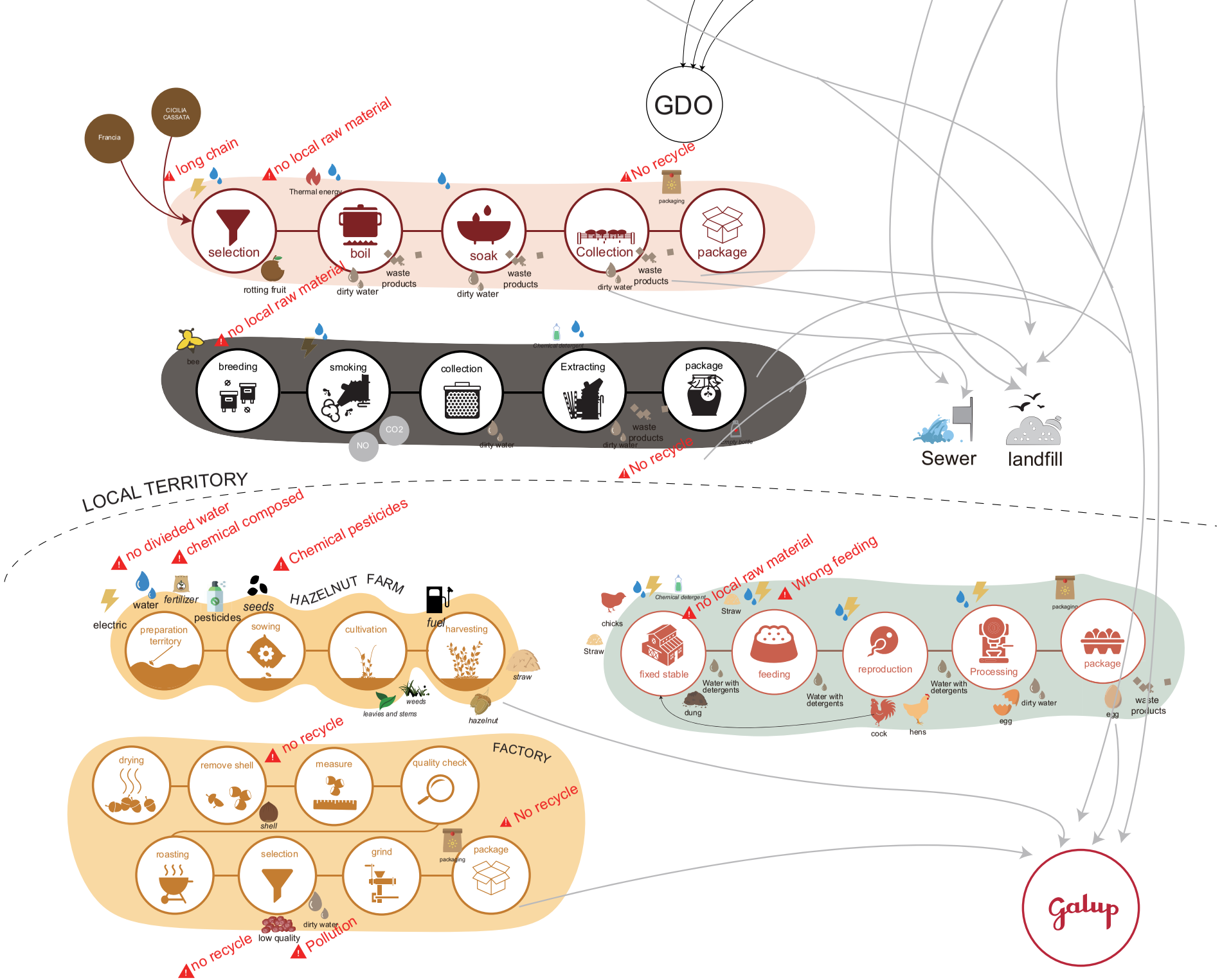
exhibition

CURRENT SITUATION

1000km

2000km


EXUE
UE
SULTANAS
SUGER
butter production
no local raw material
pasteurizer
churning
packing and forming
cleaning
Chemical detergent
Butter dought
Plastic
Butter
Water with detergents
wood
no local raw material
leavies and stems
produce
cutting
waste products
Water with detergents
no divieded water
chemical composed
Chemical pesticides
pesticides
water
fertilizer
seeds
electric
SUNFLOWER FARM
preparation territory
sowing
cultivation
harvesting
water with soil
FACTORY
packaging
press
seleted
oil
waste products
no recycle
no divieded water
chemical pesticides
chemical composed
CEREAL COMPANY
fuel
rye grains
wheat grains
barley grains
water with soil
seeds
Italia Energia Società Agricola Cooperativa
Agricola La Chiesetta
La Ghianda - Società Agricola Cooperativa
no local raw material
Stressful life
Wrong feeding
BREEDING MILK
Vaccines
Straw
Feed
Artificial insemination
Chemical detergent
Cattle
fixed stable
feeding
reproduction
milking
conservation
Syringes
Empty bottle
Raw Milk
Water with detergents
dung
Male
Female
straw
MULINO
electric
remove stone and sticks
divide different wheats
Grind
test and check
package
packaging
type 0
type 1
type 2
type 3
dirty water
waste products
No recycle
Pollution
no recycle


GDO
Francia
CICILIA CASSATA
long chain
no local raw material
Thermal energy
No recycle
packaging
selection
boil
soak
Collection
package
rotting fruit
dirty water
waste products
dirty water
waste products
dirty water
waste products
no local raw material
bee
Chemical detergent
breeding
smoking
collection
Extracting
package
CO2
NO
dirty water
waste products
dirty water
empty bottle
No recycle
Sewer
landfill
LOCAL TERRITORY
no divieded water
chemical composed
Chemical pesticides
HAZELNUT FARM
electric
water
fertilizer
pesticides
seeds
fuel
preparation territory
sowing
cultivation
harvesting
straw
weeds
leavies and stems
hazelnut
no recycle
FACTORY
drying
remove shell
measure
quality check
shell
No recycle
roasting
selection
grind
packaging
package
dirty water
low quality
no recycle
Pollution
chicks
Straw
Chemical detergent
no local raw material
Straw
Wrong feeding
packaging
fixed stable
feeding
reproduction
Processing
package
Water with detergents
Water with detergents
Water with detergents
dung
cock
hens
egg
dirty water
egg
waste products
Galup

PROBLEM

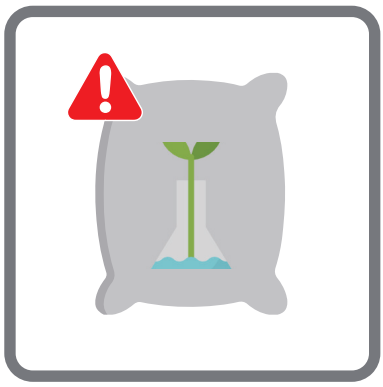
why is it wrong

The linear process works for now,but it also produced many promblems about pullution and ecosystem,It must be changed by system design mind that is in order to be a good system.

Start from the next page ,there will be explained each problem found in the inputs and outputs.

USE OF CHEMICAL PESTICIDES

In order to defence insect being bad for crops ,Many famers would like use chemical pesticide to kill insects,but it's difficult to degrade on the soil after using.the plants are being constantly spread with chemical pesticides and feed with fertilizers. The use of pesticides in long term weakens the plant, making it more easy to get Sillnesses and plague.



USE OF CHEMICAL FERTILIZERS

As bad as pesticides,the chemical fertilizers breaks ecosystem of soil,

The balance of territory will be broken in long term using chemical fertilizers. making it more easy to get Sillnesses and plague.

by the other hand, the animals and insects are in contact with it that will be poisoned.

EXCREMENT DOESN'T REUSE FOR CROPS

A large amount of animal excrement (feces, urine) is produced in the farm everyday. Excessive accumulation of these wastes will destroy the land and affect the normal growth of the land crop.

The used chemicals will remain in the soil.It is difficult to recycle, and if it was possible it would represent hight costs and a waste of supplies.It will polute water when water thourgh out from soil.

INORGANIC POLLUTED WASTE

In a linear farm, many organic fertilizers are produced, but they are not recycled. These organic wastes can be used for composting (branches, leaves, stem of plant, etc.) can be used as fuel after composting

ORGANIC WASTE ARE NOT RECYCLED

A acount of raw material import from outside of Pinerolo,It would make bad influence for local economic, all the earnings that are made by selling the product
are going to outside the territory and into the pockets of
a few. This practice also weakens the local markets.

NOT HELPING LOCAL ECONOMY

INTENSIVE AGRICULTURE

Intensive agriculture can lead to a series of consequences, such as the decline in the quality of the crops produced, and the lack of good feeding of animal husbandry animals.

INTENSIVE AGRICULTURE

There is a lot of waste of drinkable water in every farm, water is not separated at every level,and water used in territoy was not recycled in future. that leads to a lot of waste,and would destroy the ecosystem balance.

04

NEW SOLUTIONS

Find a serie of solution that can solve each problem.

4 NEW SOLUTION

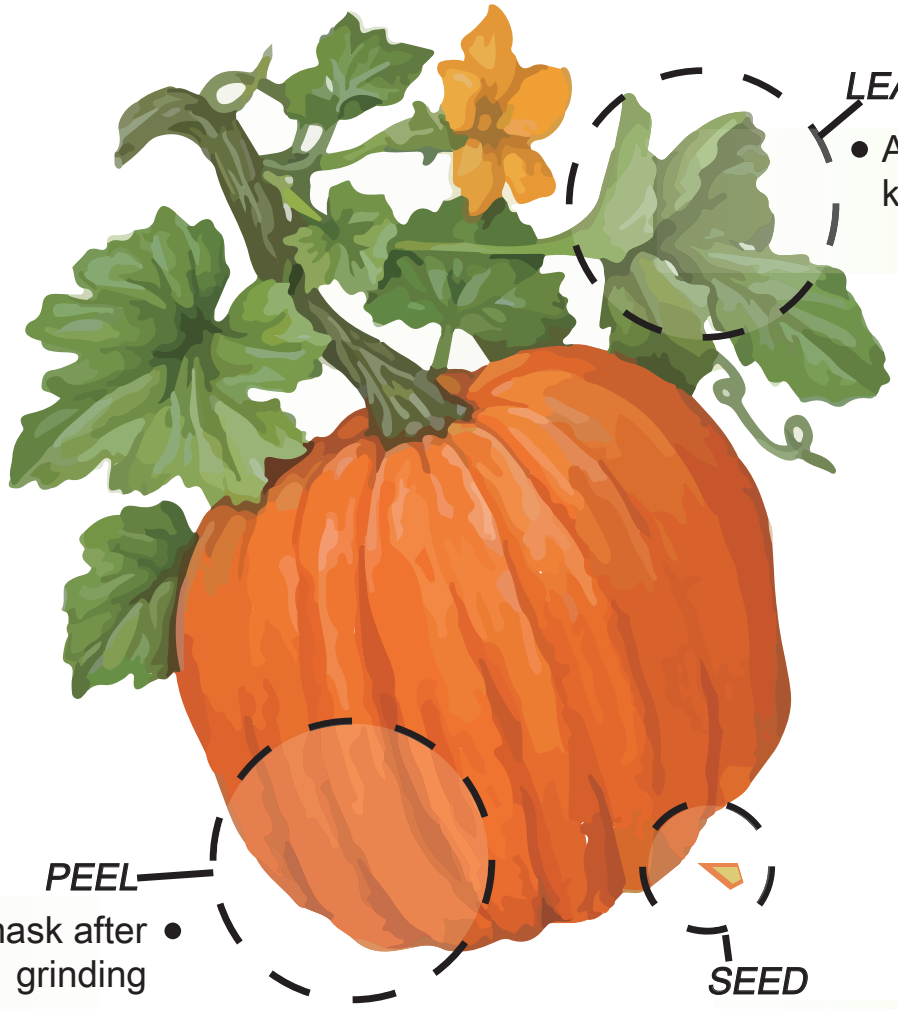
NEW CROPS & NEW ACTIVITIES

SYSTEMIC NEW CROPS

base on the system cultivation

About process of producing raw material in past period of time,Galup store imported material from far away from local territory. however,these materials produced by pesticide and chemical fertilizer make a lot horrible output witch are bad for biosphere,Shocking is that these goods are not only all selected by farmers but also think it's necessary.but in my new system approch,try to use the output of each part as input to other crops. These continue to be used as recyclable resources.

In order to use land efficiency maximize, Introducing specific new system plants connect the natural land and new crops. as for the reason,I added some new crops (protein beans and Liliaceae) which impove crop relation and soil fertility. these plants provide a seire of benefit.For instance,For example, legumes with high protein content, such as beans, peas, clover, etc, can increase soil nitrogen content. There are also some plants that can protect to basic crops, such as growing garlic. Garlic can release substances that inhibit the growth of weeds and acts as a mosquito repellent for some animals and insects.



LEAVES

- A kind of dishe of korean

PEEL

- Used to be skin mask after grinding
- can be feed to poultry, as a supplement to regular feed, during the winter to help maintain egg production

SEED

- a edible and nutrient-rich raw materil of oil
- are a popular snack that can be found hulled or semi-hulled at most grocery stores.

pumpkin

CHARACTERISTICS

- pumpkin stems are rigid, prickly, and angular
- generally weigh between 3 and 8 kilograms

USUALLY GROWS NEAR

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		HARVEST SEASON									

CORN STOVER

- can be used later as fodder, bedding (litter), or soil amendment.
- used as production of ethanol fuel

KERNELS

- the dried kernels are used as feed of livestocks

MAIZE COBS

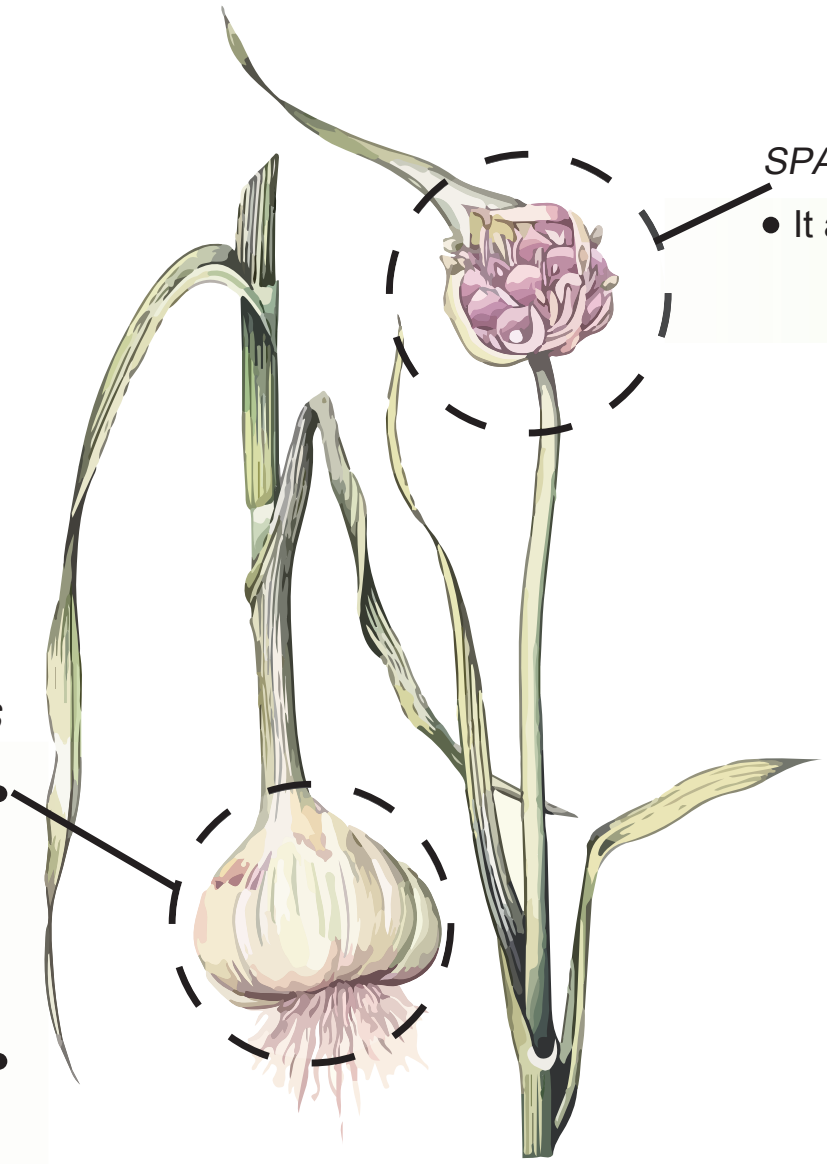
- used as a biomass fuel source
- human generally food

CHARACTERISTICS

- 3 m (10 ft) — 13 m (43 ft) in height
- short-day plant and flowers in a certain number of growing degree days > 10 °C (50 °F) in the environment to which it is adapted
- maize is susceptible to droughts and intolerant of nutrient-deficient soils

USUALLY GROWS NEAR

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			HARVEST SEASON								



SPATHE & LEAVES

- It also can be eaten.

CLOVES

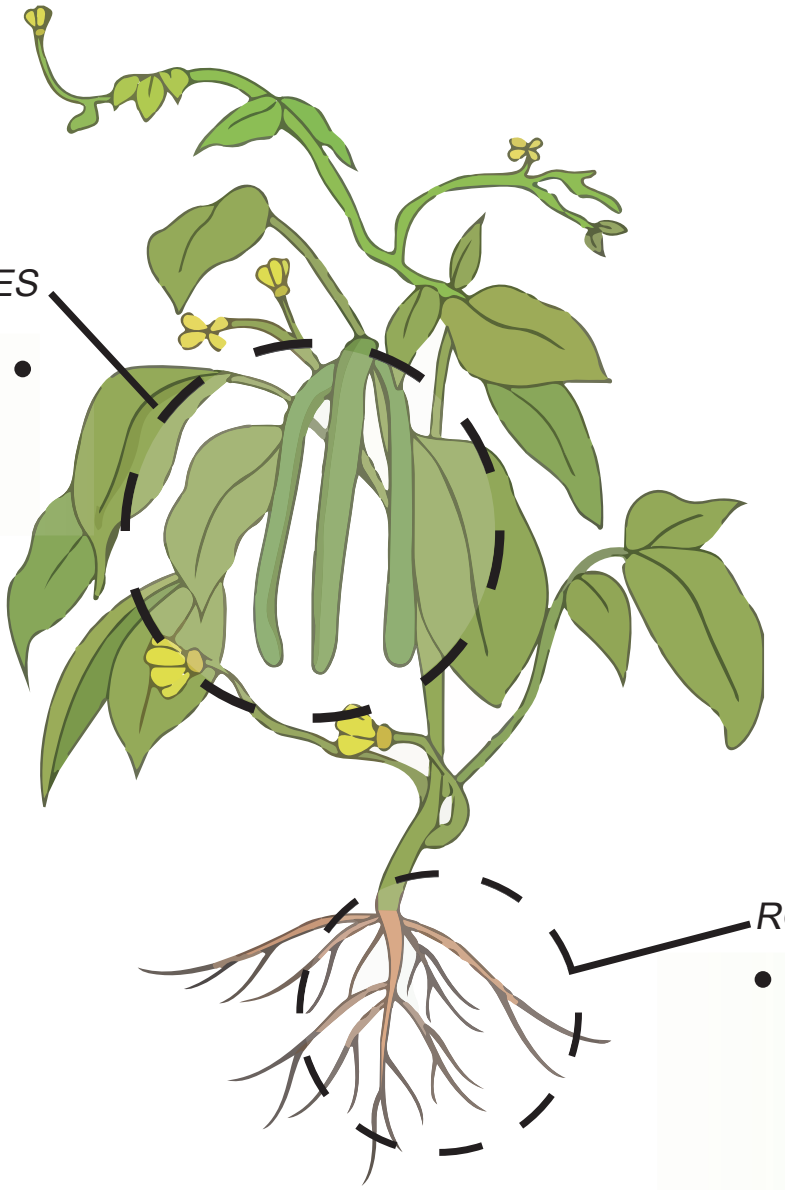
- Garlic cloves are used for consumption (raw or cooked) or for medicinal purposes
- very famous raw material around world

CHARACTERISTICS

- a bulbous plant
- It grows up to 1.2 m (4 ft) in height
- It produces hermaphrodite flowers
- It is pollinated by bees, butterflies, and other insects

USUALLY GROWS NEAR

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HARVEST SEASON									HARVEST SEASON		



LEAVES

- It can be made into dishes in several countries

ROOT

- It has the special ability of fixing nitrogen from atmospheric

potein bean

CHARACTERISTICS

- the seeds may be planted as soon as the soil temperature reaches 10 °C (50 °F)
- the plants growing best at temperatures of 13 to 18 °C (55 to 64 °F)
- grow well in cooler, high altitude, tropical areas

USUALLY GROWS NEAR

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

HARVEST SEASON

RESIDUES

- good bioenergy when burnt it

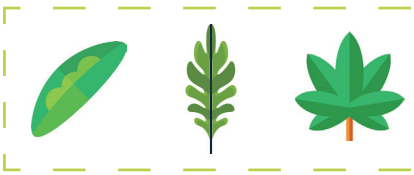
Chaff

- livestock can eat it and in agriculture it is used as livestock fodder

CHARACTERISTICS

- the average daily temperature of the winter-type variety is 16-18°C, that of the mid-winter type is 14-16°C, and that of the spring type is 12-14°C.
- It grows up from 60 to 100 centimeter in height ordinary

USUALLY GROWS NEAR



BARLEY GRAINS AND WHEAT GRAINS

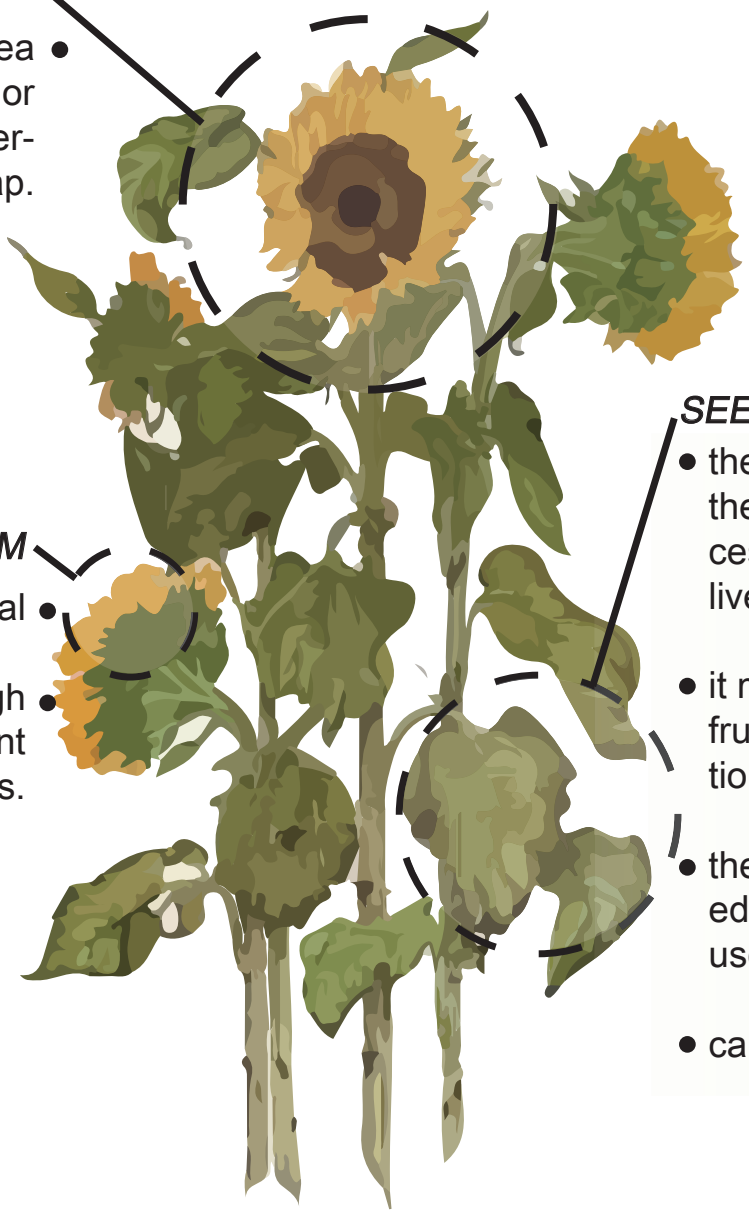
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		HARVEST SEASON									

RYE GRAINS

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HARVEST SEASON								HARVEST SEASON			

PETAL

- it can be a mixture of tea with Chrysanthemum or chrysanthemum flower-soap.



LEAVES & STEM

- medical raw material
- Leaf tea reduces high fevers and has astringent properties.

SEED

- the cake remaining after the seeds have been processed for oil is used as a livestock feed
- it markets its oleginous fruit for human consumption
- the peel of seed is intended as fuel boilers.also used in beds chickens
- can be used as soap.

sunflower

CHARACTERISTICS

- The plant has an erect rough-hairy stem
- It could reach typical heights of 3 metres
- Sunflower leaves are broad, coarsely toothed, rough and mostly alternate

USUALLY GROWS NEAR

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		HARVEST SEASON					HARVEST SEASON				

FLOWER

- it is grown as a mid-summer pollen source for honeybees.
- vetch is as forage for ruminant animals, both as fodder and legume,

vetch

CHARACTERISTICS

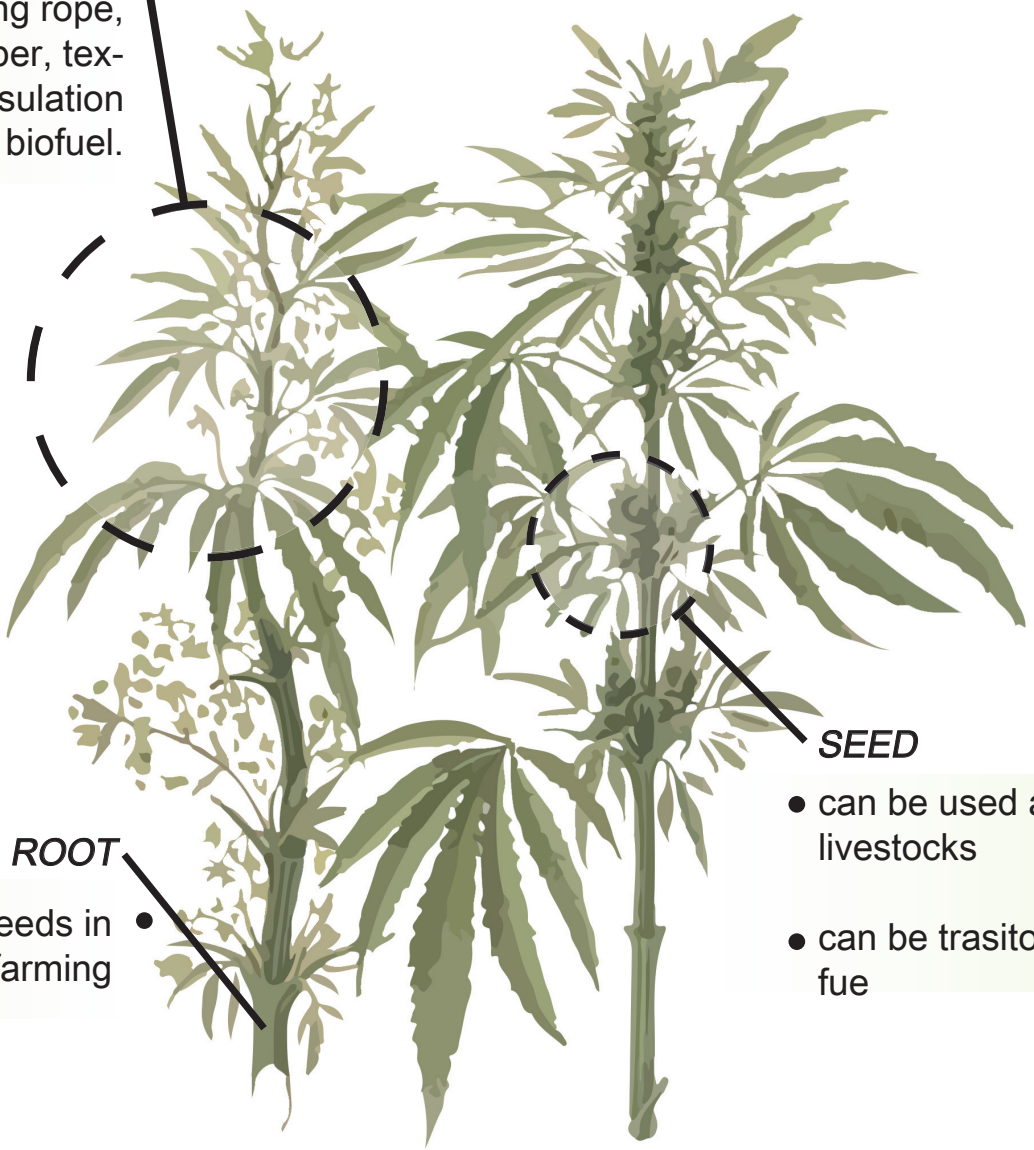
- the plants are 30–120 cm (1–4 feet) tall
- the magenta, white, bluish white, or yellow flowers are borne singly or in clusters and produce legumes with 2 to 10 seeds.

USUALLY GROWS NEAR

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HARVEST SEASON									HARVEST SEASON		

LEAVES

used to make a variety of l products including rope, clothes, food, paper, textiles, plastics, insulation and biofuel.



SEED

- can be used as feed of livestocks
- can be trasiton to alcohol fue

ROOT

can kill tough weeds in farming

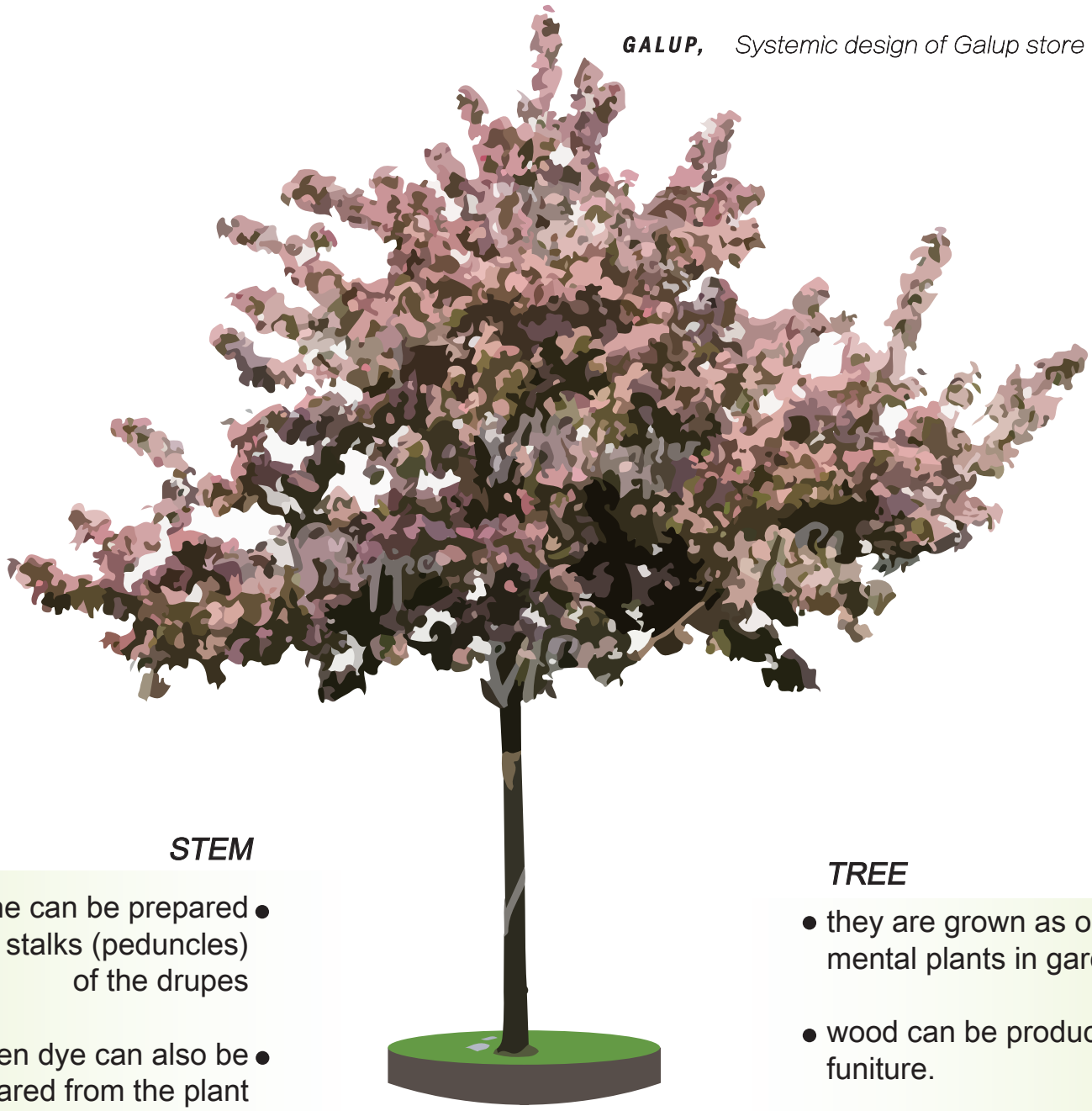
hemp

CHARACTERISTICS

- hemp is grown in temperate zones as an annual cultivated
- can reach a height of up to 5 metres (16 feet).

USUALLY GROWS NEAR

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		HARVEST SEASON									



STEM

- medicine can be prepared from the stalks (peduncles) of the drupes
- a green dye can also be prepared from the plant

TREE

- they are grown as ornamental plants in gardens,
- wood can be produced to funiture.

cherry

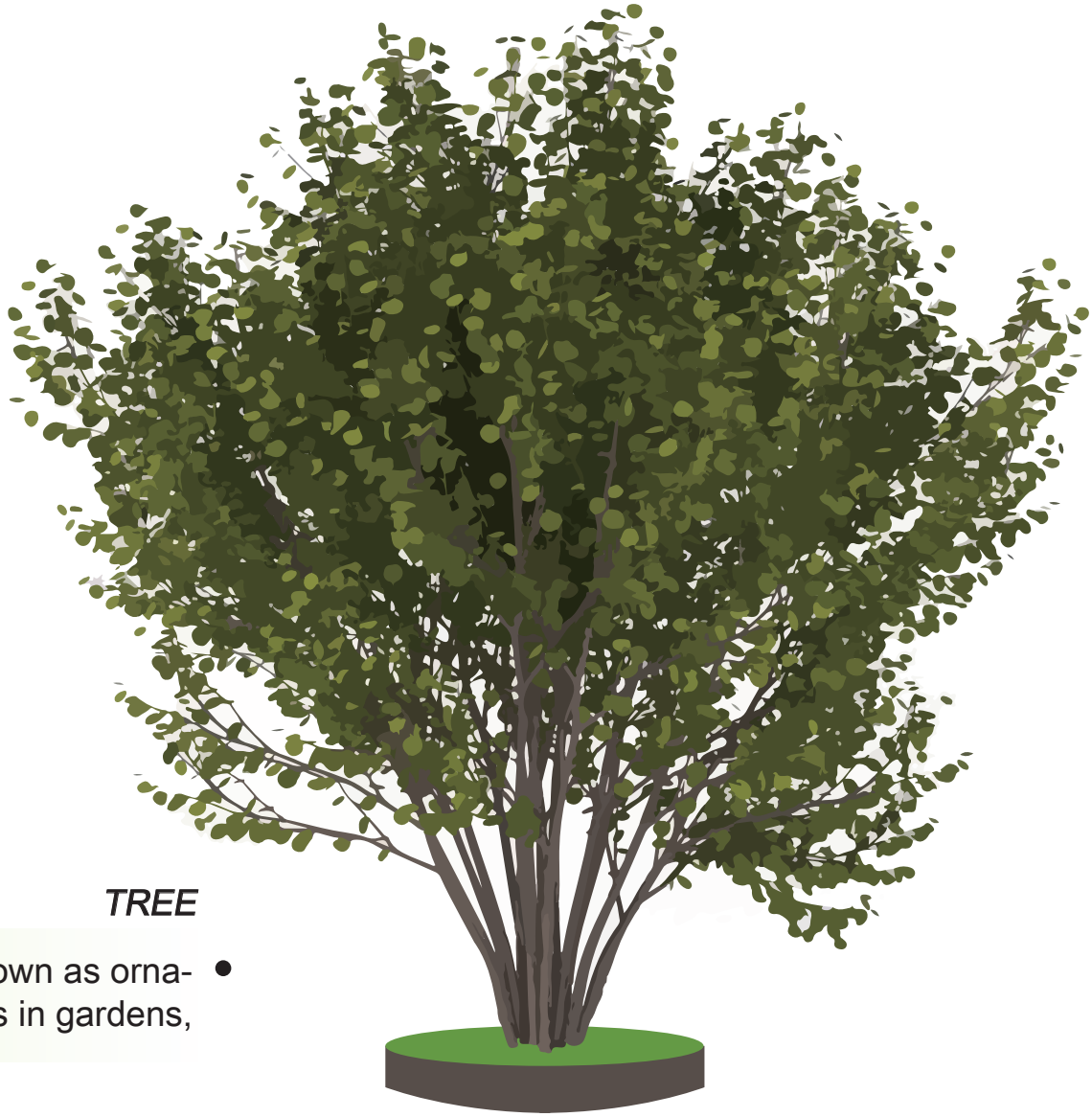
CHARACTERISTICS

- Its tree is a deciduous tree growing to 15–32 m (49–105 ft) tall
- The bark is smooth purplish-brown with prominent horizontal grey-brown lenticels on young trees, becoming thick dark blackish-brown and fissured on old trees.

USUALLY GROWS NEAR

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

HARVEST SEASON



TREE

- they are grown as ornamental plants in gardens,

hazelnut

CHARACTERISTICS

- rounded leaves with double-serrate margins
- The flowers are produced very early in spring before the leaves
- the fruits are nuts 1–2.5 cm long and 1–2 cm diameter,

USUALLY GROWS NEAR

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
								HARVEST SEASON			

NEW ACTIVITIES

relation between activities

My design idea is to convert the company taking in examination from intensive to organic, meaning a philosophy of life to appreciate all the harmony of a cultivated field, the succession of the seasons and of the time.

in fact, implemented in ways that respect and promote fertility and vitality of the soil ,At the same time the typical qualities of plant and animal species.

Our "systemic farm" will be composed of new activities and relationships.Starting from the early stages, the change would already be visible from the absence of fertilizers or chemical fertilizer

Biocompost

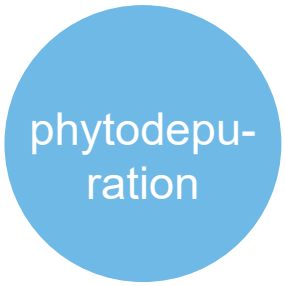
Compost is organic matter that has been decomposed and recycled as a fertilizer and soil amendment. Compost is a key ingredient in organic farming.

Electricity generation from

The generation of a combustible gas from anaerobic biomass digestion, is a well-known technology. There are already millions of biogas plants in operation throughout the world.Whereas using the gas for direct combustion in household stoves or gas lamps is common.

Producing paper from stem

collection of plant stem use to make paper,Greatly increase plant utilization.



Phytodepuration

Phytodepuration is a natural treatment technique that reproduces natural purification processes in a controlled environment.

Biological pest control

Biological control is a method of controlling pests such as insects, mites, weeds and plant diseases using other organisms.

Vermiculture

Vermiculture is the product of the composting process using various species of worms, usually red wigglers, white worms, and other earthworms, to create a mixture of decomposing vegetable or food waste, bedding materials, and vermicast.

BIOCOMPOST & BIOGAS

How does it work?

Collecting residues of crops(especially corn) from the fields does not reduce its soil quality. According to several scientific report, those material could be better used as an energy resource.

For example how to obtain high quelity bioethano from residues of crops, Ethanol is an alcohol that can be obtained from sugary crops and from several cereals. for every kind of fermented cereals could produce about 30 kg ethanol.

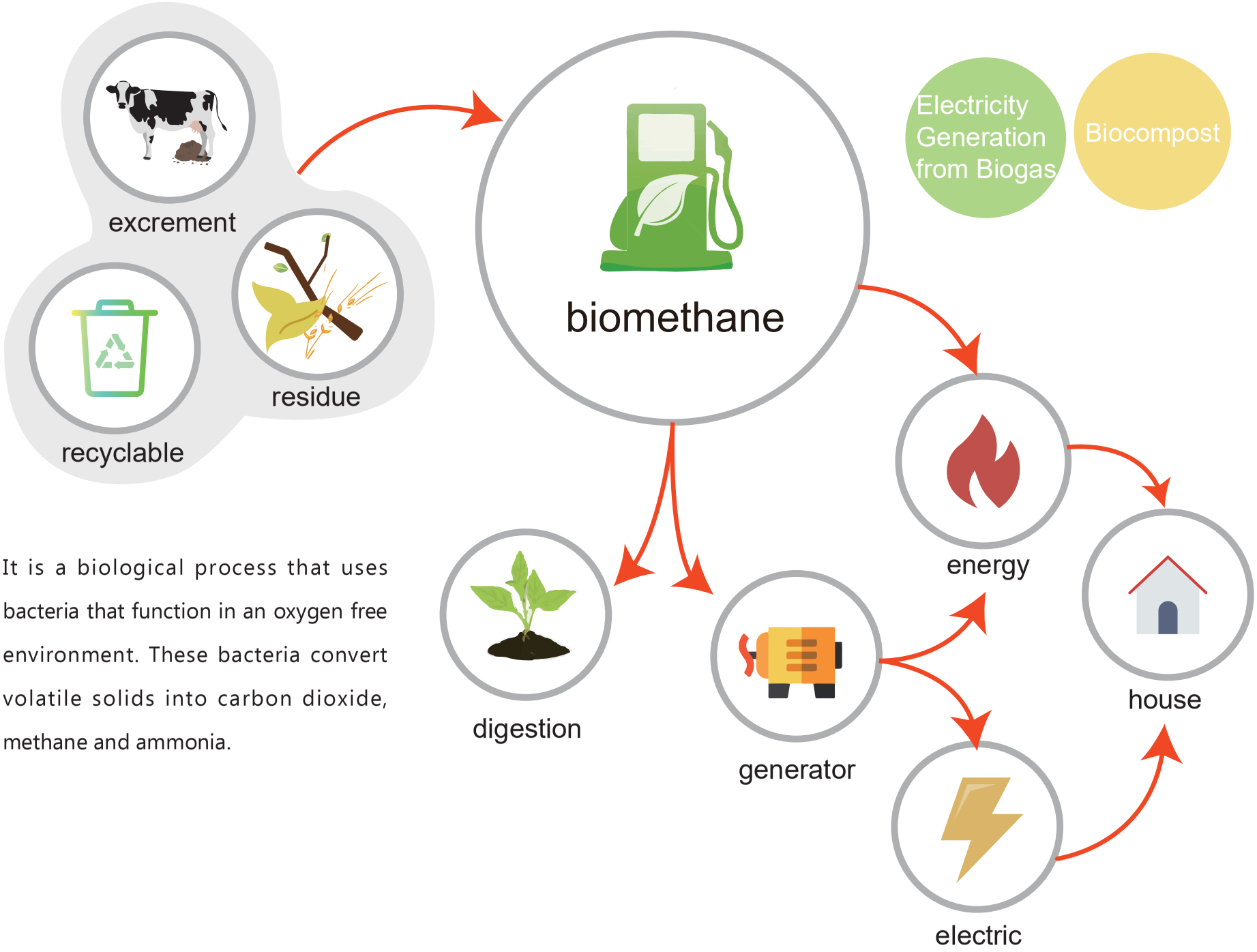
In Brazil ,it almost replaced for petrol. in USA it is made from corn. It can be mixed up to 30% to petrol being to the biofuel that has a lower environmental polution because they produce less CO2 and CO.

How does it work?

Biomethane is a highly efficient and friendly environmental energy. It is produced through the decomposition of organic by anaerobic microorganisms being low temperature conditions, it mainly includes of methane, containing part of carbon dioxide and a amount of nitrogen and other trace gas components.

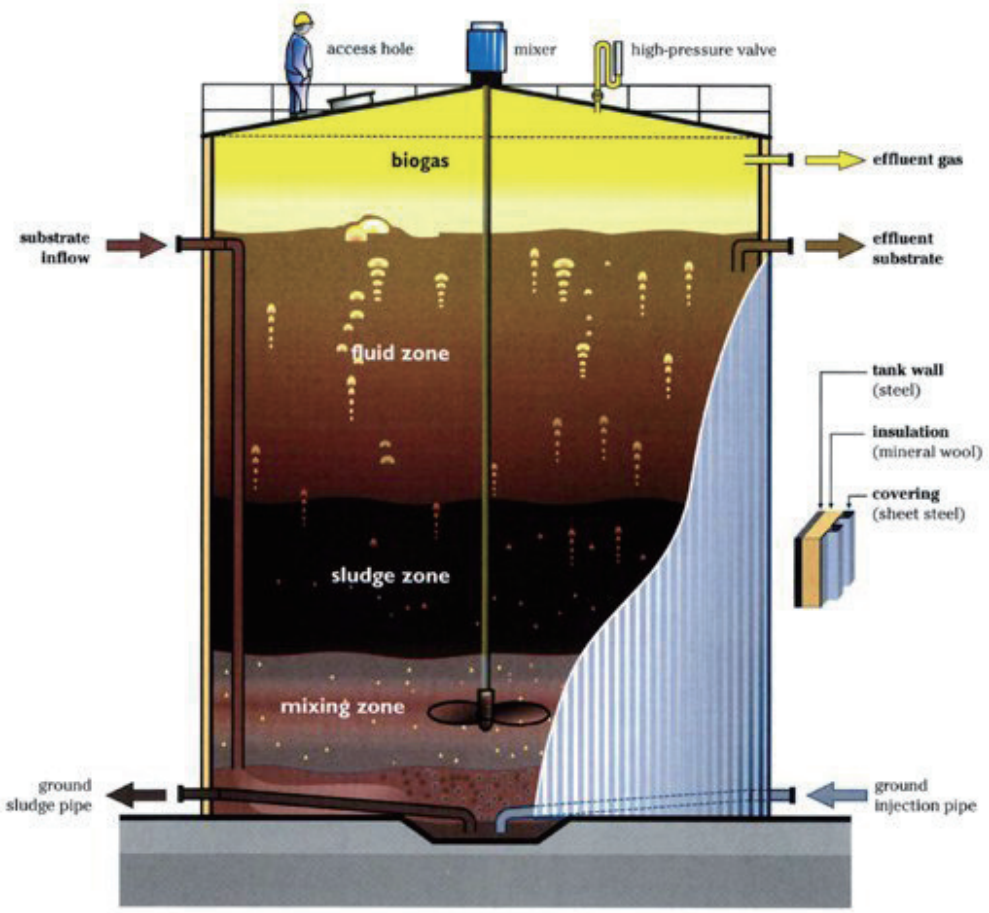
We designed a series of chemical processes that consist of animal manure, plant humus, and recyclable materials from other factories.

Ultimately, the available energy wll be formed. It has also provided energy for other farm equipments and household electricity. The final residue can also be recycled into the soil for degradation.



It is a biological process that uses bacteria that function in an oxygen free environment. These bacteria convert volatile solids into carbon dioxide, methane and ammonia.

Anaerobic Sludge Digestion



HOW DOES IT WORK?

- Anaerobic digestion-absence of oxygen, aka fermentation
- Organic waste is put in a airtight chamber to keep oxygen from entering
- Plant,animal and fecal matter typical
- Methane,Carbon dioxide,Hydrogen sulphide formed

electricity Generation from biogas

ADVANTAGES

- Lessen global climate change
- NO2 changes into CO2 310 less effect on climate
- Reduces waste
- Rural creation of reusable energy higher S of L
- Saves money,resources.

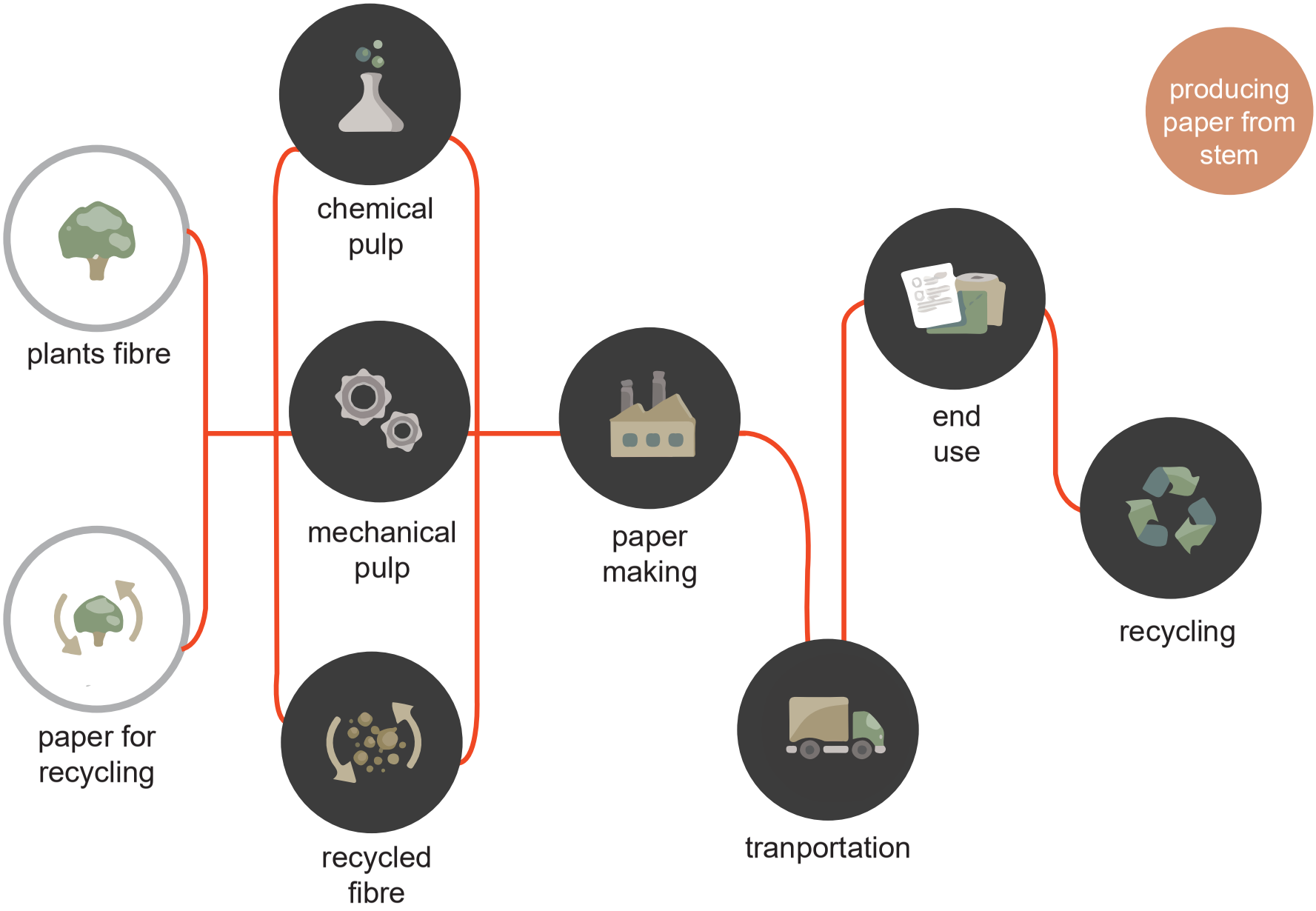
DISADVANTAGES

- Not as clean as natural gas
- Methane has greater effect on climate change
- Contamitive gases can hurt engines
- Limited production,not controllable

PRODUCING PAPER FROM STEM

How does it work?

After 1900, vegetable fibers from various sources have been transported into thin sheets for use in trade, communications, law, and even for shelter. Cotton and linen rags were the first fibrous raw materials to get widespread status in paper making, and they are also needed for specialty producttions. Increasing demands for paper ultimately surpassed the availability of rags, so that other sources of fiber were sought. Near by the year 1800, a lot other materials of agricultural origin began to come into use somewhat temporarily. Although woods have become the prime source of paper making fibers during the last 100-125 years, annual plant fibers retain their importance. The technical feasibility of non-woody materials is substantiated by more than 300 paper mills throughout the world that use such raw materials. Both necessity and special properties account for their use. The potential for various plants is being investigated intensively by the United States Department of Agriculture's Agricultural Research Service, to discover new crops that could be applicated in the national agricultural project and in the commercial products of paper.

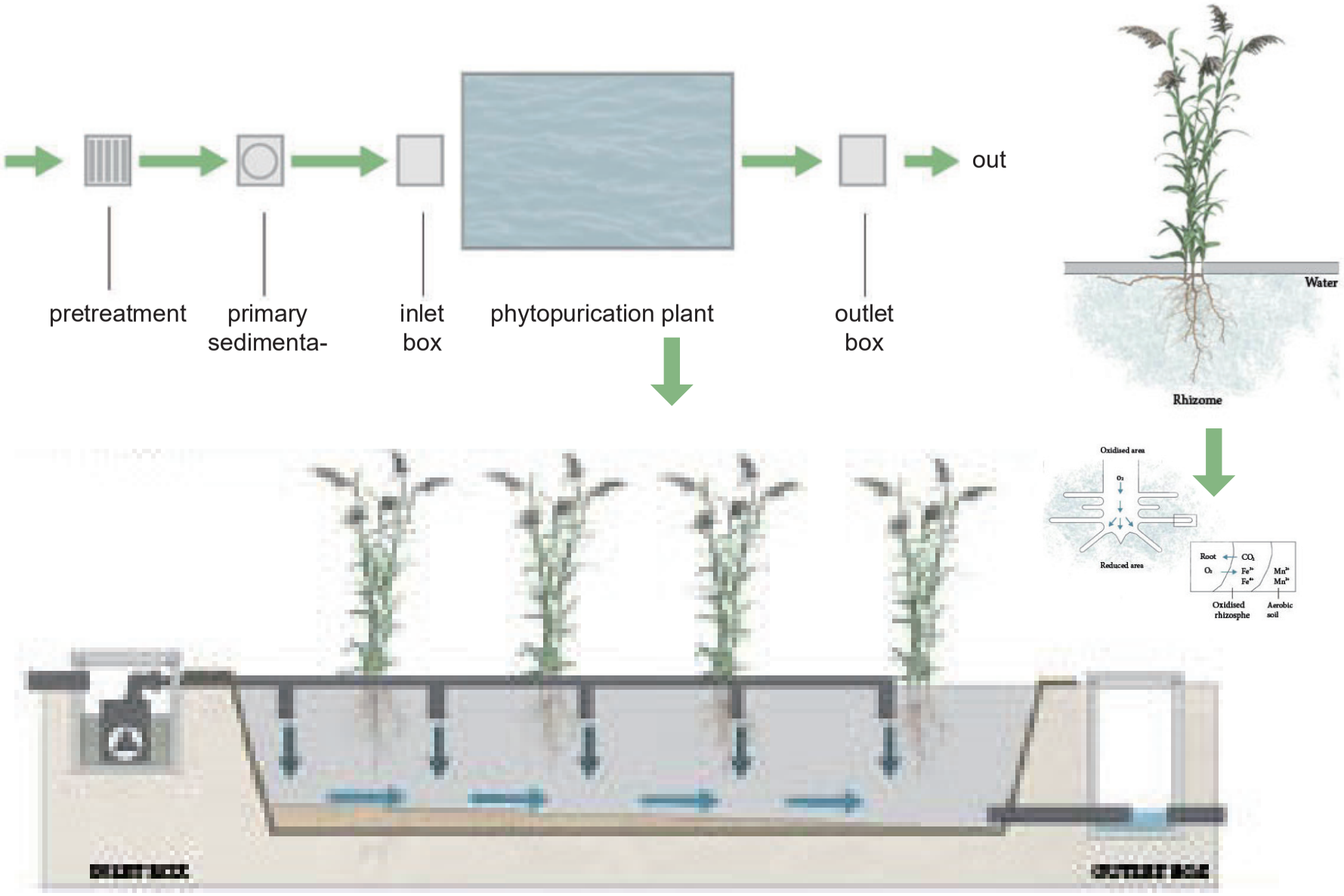

producing paper from stem
chemical pulp
plants fibre
mechanical pulp
paper making
end use
recycling
paper for recycling
recycled fibre
tranportation

PHYTODEPURATION

How does it work?

Phytodepuration is a natural treatment technique that is in order to reproduces natural purification processes in a environment controlled. Phytodepuration systems have been developed before the 80's in the US and in Central Europe. They are artificial little plants, in ordinary filled with inert material and fed with aquatic plants (macrophytes).

These plants reproduce the natural purification processes typical of humid areas. The macrophytes can be floated, flooded or emerging. The systems can have superficial or sub-superficial streams and the sub-superficial stream can be horizontally or vertically oriented. Superficial streams support all the types of macrophytes, sub superficial one only the emerging macrophytes.


out
pretreatment
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inlet box
phytopurication plant
outlet box
Water
Rhizome
Oxidised area
Reduced area
Root
Oxidised rhizosphe
Aerobic soil

bathing bacins:bio-pool

Natural pools are intended to be maintained without any chemicals and or devices that would kill bacteria microbes,animals,or plant life.The filtration,cleaning,and clarifying of bathing water takes place purely by hydranlic and biological processes.All bathers should know that the water is not disinfected or sterilized by any chemical or mechanical means and that the vessel should be regarded as a swimming pool for considerations of health and safety

waste water treatment

Surface area H-SSF systems:232m2

Quantity of treated water available for reuse:14.5m3/day(approximately 5,300m3/year)

it is estimated a period of about 9 years as depreciation time of the construction costs and the annual maintenance costs.

conclusion

ecological water treatment potential increase in bio-diversity costs of realization and management content multifunctional devices(mainly protection and treatment)good integration with the landscape the preservation and protection

BIOLOGICAL PEST CONTROL

How does it work?

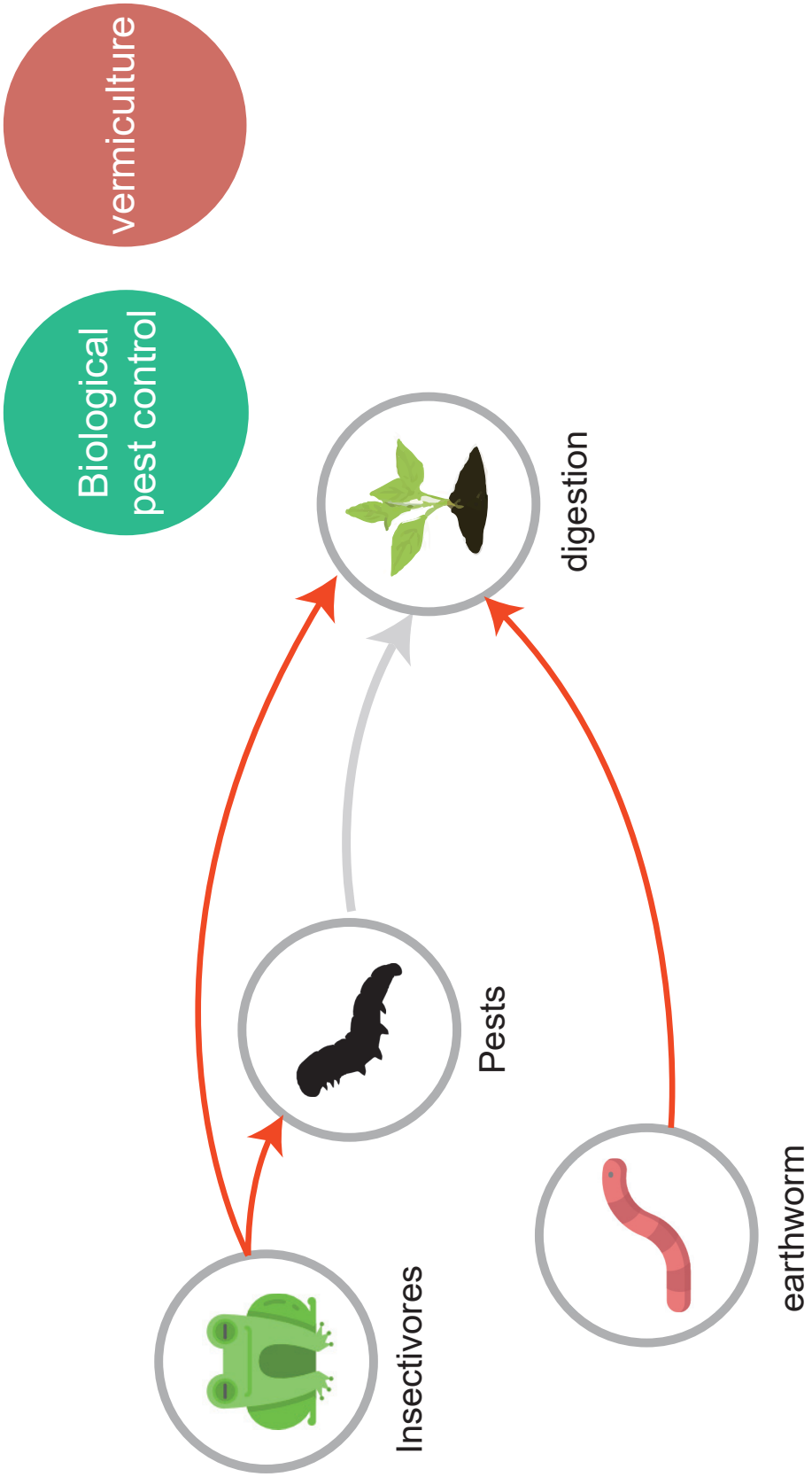
Biological control or biocontrol is a method of controlling pests such as insects, mites, weeds and plant diseases using other organisms.

It relies on predation, parasitism, herbivory, or other natural mechanisms, but typically also involves an active human management role. It can be an important component of integrated pest management (IPM) programs.

There are three basic strategies for biological pest control: classical (importation), where a natural enemy of a pest is introduced in the hope of achieving control; inductive (augmentation), in which a large population of natural enemies are administered for quick pest control; and inoculative (conservation), in which measures are taken to maintain natural enemies through regular reestablishment.

Natural enemies of insect pests, also known as biological control agents, include predators, parasitoids, pathogens, and competitors. Biological control agents of plant diseases are most often referred to as antagonists. Biological control agents of weeds include seed predators, herbivores and plant pathogens.

Biological control can have side-effects on biodiversity through attacks on non-target species by any of the same mechanisms, especially when a species is introduced without thorough understanding of the possible consequences.


vermiculture
Biological pest control
digestion
Pests
Insectivores
earthworm

VERMICULTURE

How does it work?

Vermiculture means the controlled growing of worms in specialty stuctures.they are benefit for the territory,there is many reasons.The earthworms spend a lot of time even their whole life ingesting,grinding,digesting and excreting soil,they treated more than 15tons soil per year.These worm were inriching in nutrients and bacteria for the soil,their underground calves also produce channels in the soil that could be riched the soil.

In the other hand,Worms can help crops and trees to be better.Crops roots need oxygen everytime,and worms caves prefectly provide channels ,which can get air to the roots deep within the ground.

05

SYSTEMIC DESIGN

Using systemic design approach to solve problems

5 SYSTEMIC DESIGN

NEW SYSTEM & NEW APPROACH

SYSTEMIC APPROACH

What is systemic design

In the past, product design only started with the appearance of the product, which means that the product designed would be quite limited, although it also means coordinating and integrating all concepts (functionality, symbolism, culture, technology And productivity) but we need to exceed this approach.

Face to increasing complexity, we must stop to pay our attention to the product as well as its cycle, turning to complex relationships emerging from the production process and shouldering greater social responsibilities.

Therefore, we must change the methods of the production sector from a “linear” production model to an advanced “interrelated” production model. This concept is derived from the metabolic principle of nature, namely the principle of no waste generation.

In my new design for the galup store, I turned the output from a problem into a resource, resulting in good economic benefits.

In the future, we can design and create an ecologically sustainable community. The technological and political choices are in harmony with nature, not to control nature but to learn from it.

METHOD

How to build a new system?

Finding the relationship between each crop is an important factor for designing a new system. Each production part produces a lot of substances. For example, when candies were producing, the fruits are going to be removed peels、cores and processed through a series of processes.

Before they become candies, A large number of leaves, peels. Branches has been wasted in the process producing . In the previous linear system, those waste of resources were extremely serious. Therefore, we start from two pionts and establish a new system design.

1.Investigate the resource what they are going to use and origin of each raw resource.

It is clear that the output resources (leaves, stems, fruits, etc.) of each plant are concerned about the input resources of other factories,For instance the requirement with large amounts of hay at the milk farm, the requirement to supply energy, and so on. The output of one activity is another input that is generated. It's most important idea of system design.

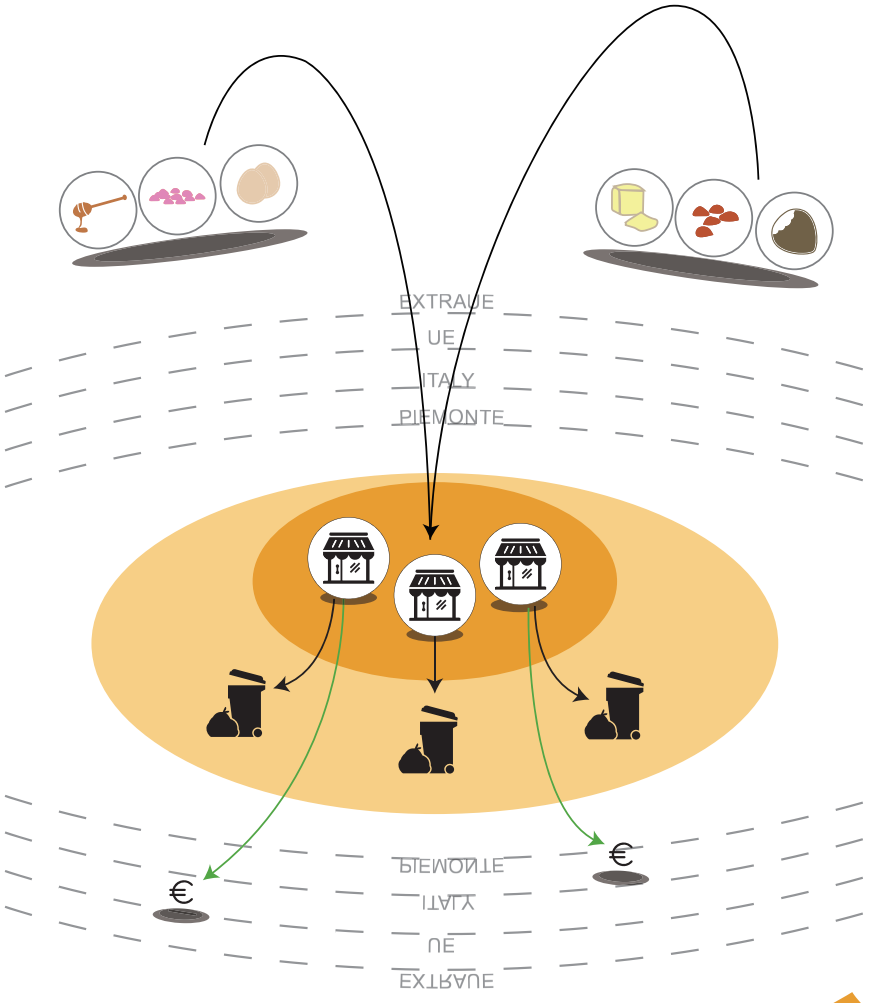
2. Totally understand the relationship between each activity

As we build information, we need to understand the relationship between each activity. This analysis is followed by setting up all systems together to create a macro system.

TARGET

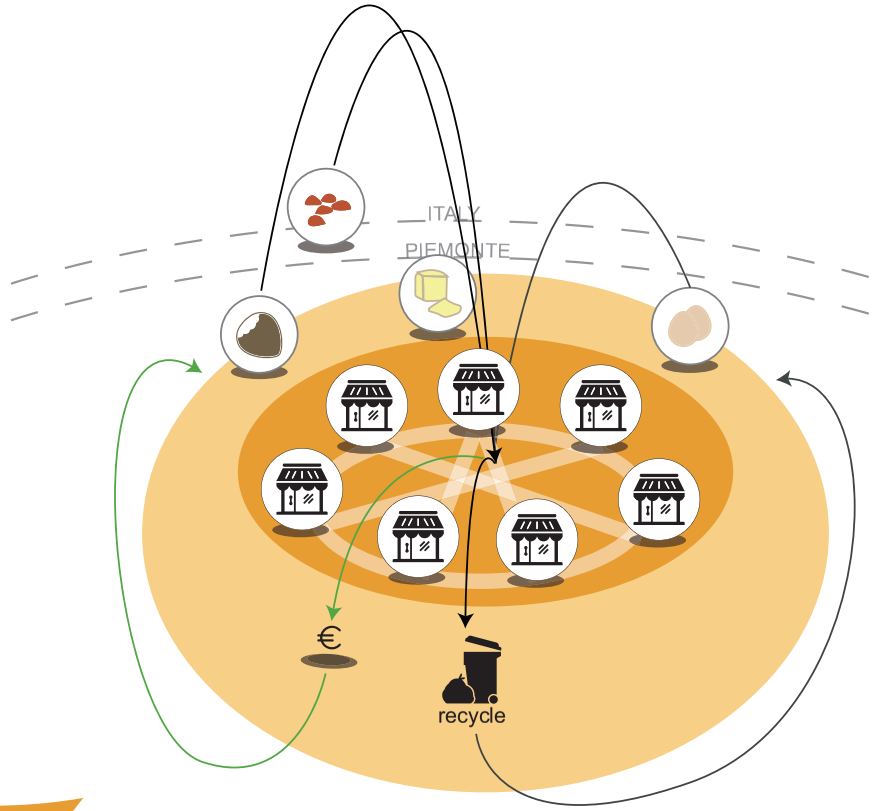
Current situation

PIENOTE PROVINCE



Future situation

PINEROLO



SEREALS FARM

Farm A

Seed: The harvested seeds of each grain were collected and used for re-seeding. This will reduce the cost of buying seeds from GDO.

Small branches: Each part of crops branches can be used for many types handcraft,based on the local territory. these branches recycled are benefit for development of local economic. however,It's also a good compost raw material

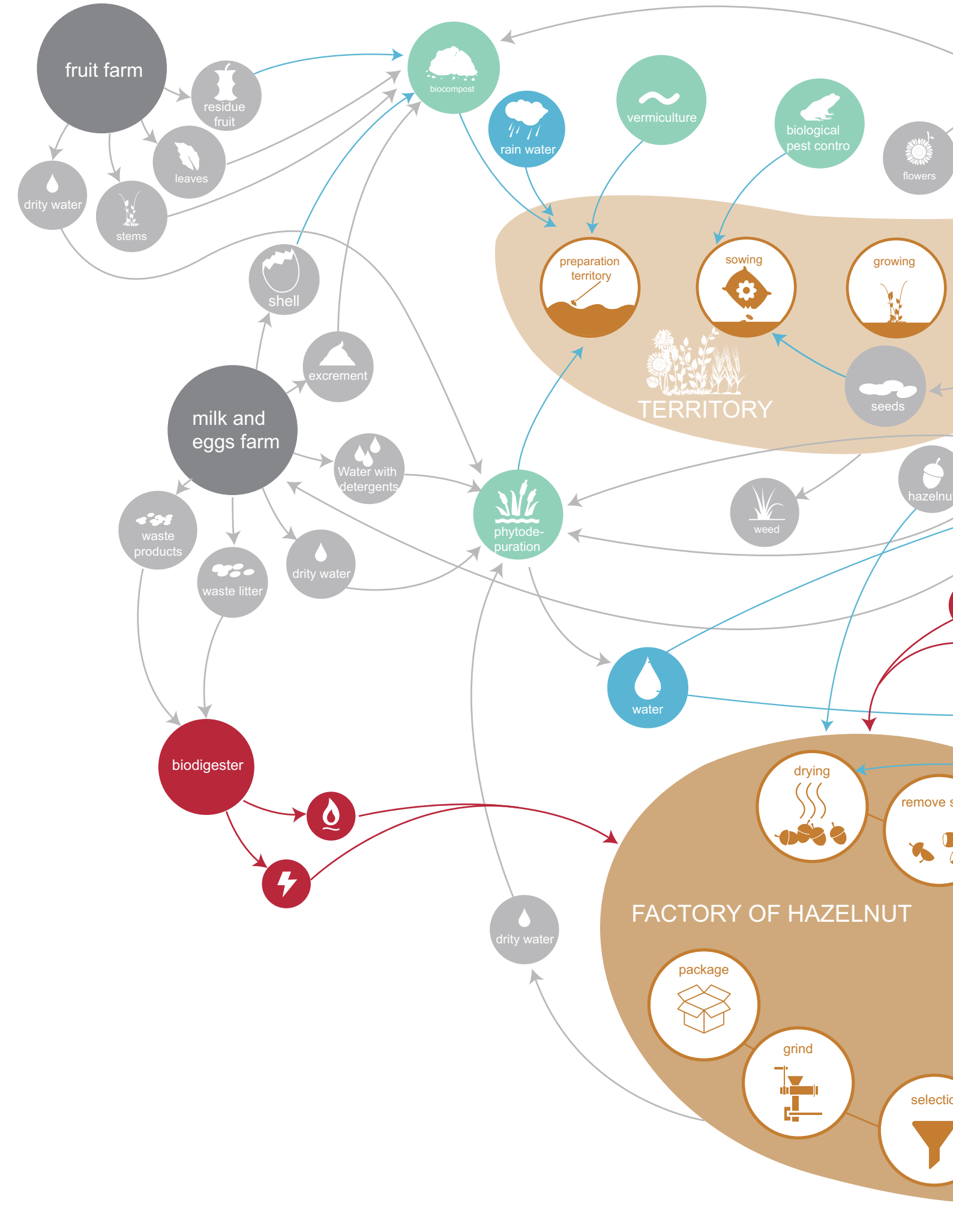
Fruit: The harvested fruit will be transport to different factory for processing,and then,**There are also some fruits (eg:hazelnut) that will produce waste (shell, peel) during the initial processing.these parts also could as livestock feed or compost. some used products waste can be collected that put in the Biogas digesters,contribute to providing bioenergy.**

Leaves: Sunflower leaves can be recycled as papar raw material,neverthenless crops leaves can be recycled as livestock feed and compost.

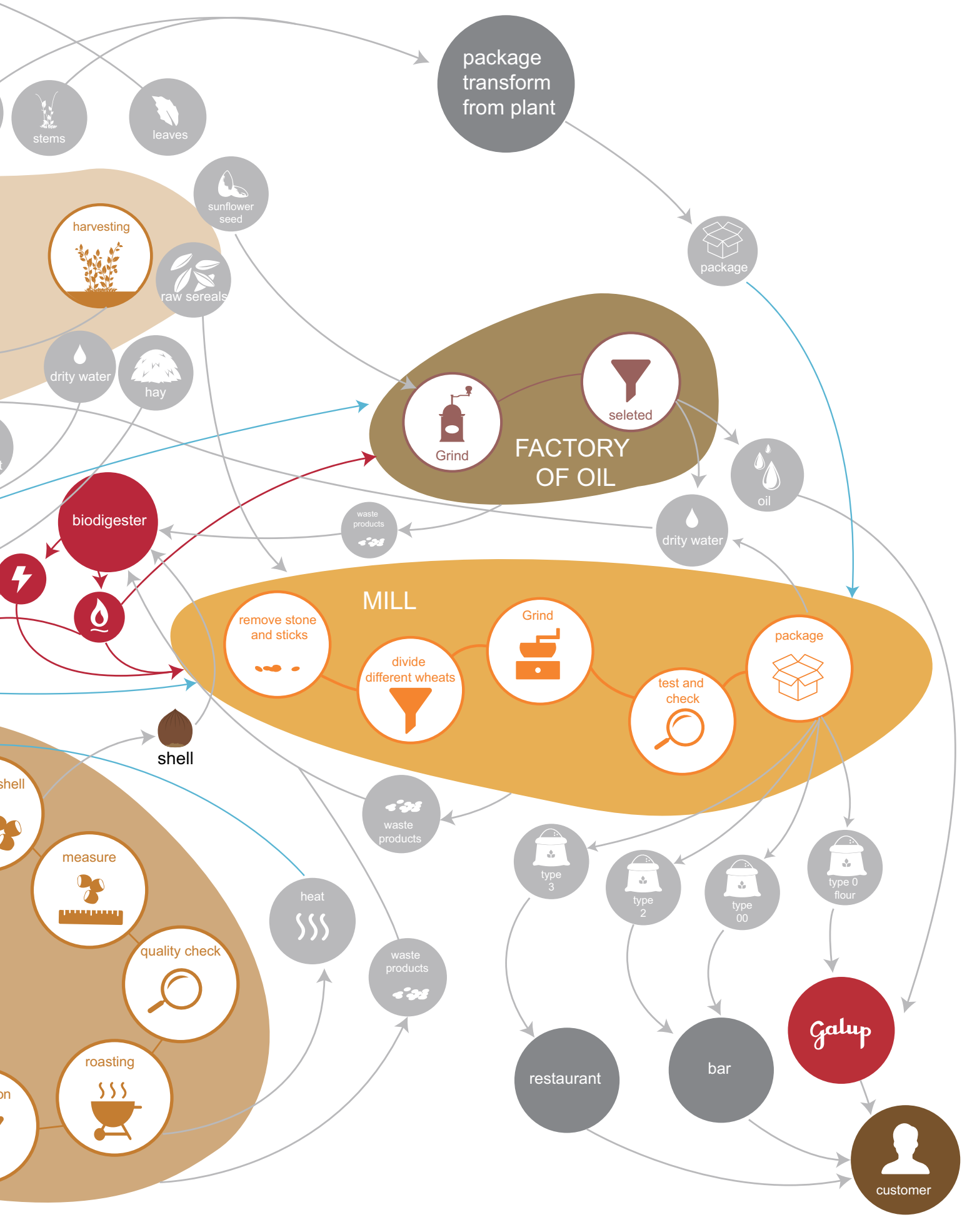
Stems: The wood of big branches is suitable for doing handicrafts.

PIEMONTE HAZELNUT
SUNFLOWER SEED OIL
SOFT WHEAT FLOUR

Cereal farm system chain(sunflower、hazelnut



t、cereal)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type 3
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Galup
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FRUIT FARM

Farm A

Due to there is only 2 speices fruits raw material about panetone of Galup.however one of them is cicilia orange,which must be grown in cicilia. so,I decided to connect both of fruit farm and crop farm.Like this,we not only save the cost,but also improve biodiversity

Seed: In the process of removing core,these seed can be recycled as cultivation seed in next year.

Small branches: These are too small to transform for handicrafts, but they are rich in vitamins nutrients ,It is meaning that are perfect for natural fertilizer production.

Fruit: The fresh cherries is rich in iron element, Cherries are used as a raw material for pharmaceuticals. After the harvest, The fresh cherries are transported to the candy factory, and after a series of process of making candy it becomes a delicious candy. Many waste generated in these processes and then,they can be used as a raw material for composting.

Leaves: Honestly,Cherry leaves are only for Ornamental plants,but when they are withered, it also can be transfromed to feed livestocks.

Wood: The cherrywood is suitable for making funitures,and they are best material for local handcraft.

MILK FARM

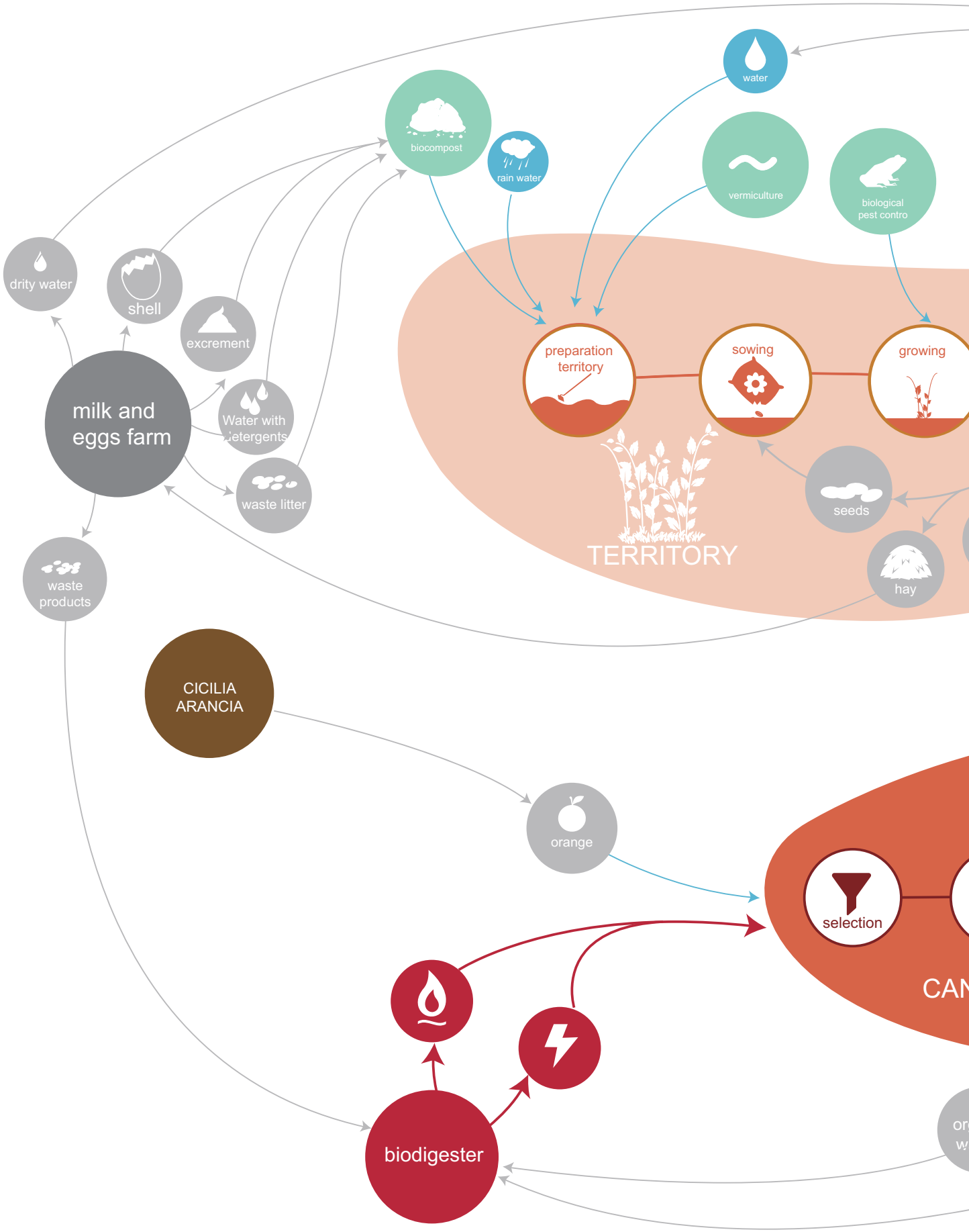
Farm B

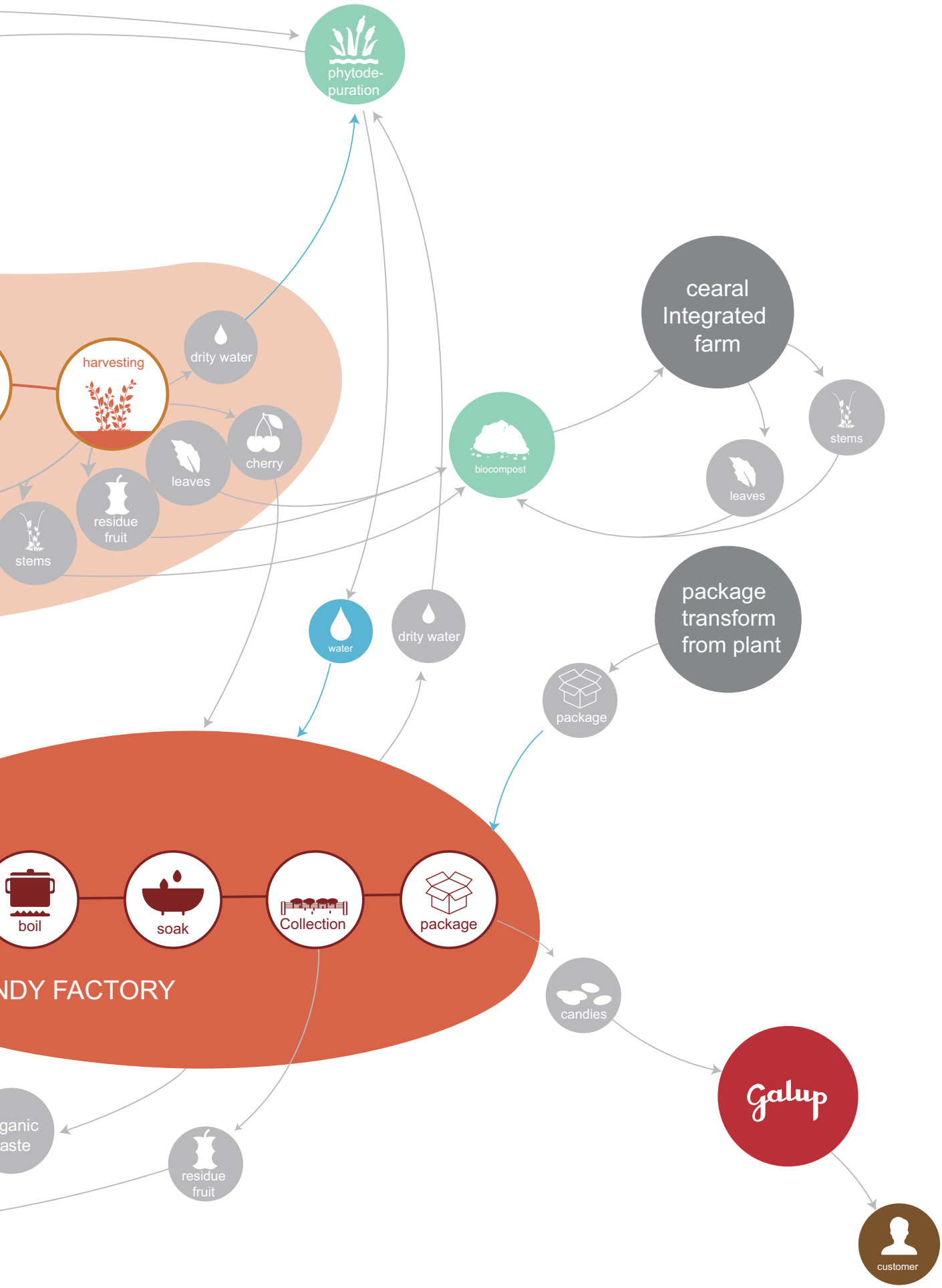
Feed: The animals feeds obtained from residues remaining in each part farm.because there is numerous crops waste in whole farm,whatever farm A or farm B.It has 3 types livestock in my farm B,They are pig chicken and cow.They are each responsible for unique link of the entire system,in order to keep balance of ecosystem. For instance,the pigs can eat food that cows don't eat,chicken excrement also are good digest food that can be eaten by pigs.

Excrement: Livestock dung produced a lot of methane gas.and then,we could collect it in the biogas digesters. The feces of animals also are used as fertilize for the crops. particularly, chicken dung can be eaten by pigs,this material is benefit for pig's digestive system. Some animal feces, especially that of cows, are fuel sources when dried.It means that the energy needed of farm(driving machine,light etc)can get from dung dried.

Other waste: Many other wastes will be produced in the panettone raw material production process. For example, empty milk bottles will be produced after dairy cows are milked. Empty bottles can be used after cleaning. Eggs will be transported to the factory for processing. After galup processing the eggs, many egg shell will be wasted. These egg shells are very good source for the fertilizer.

Fruit farm system chain

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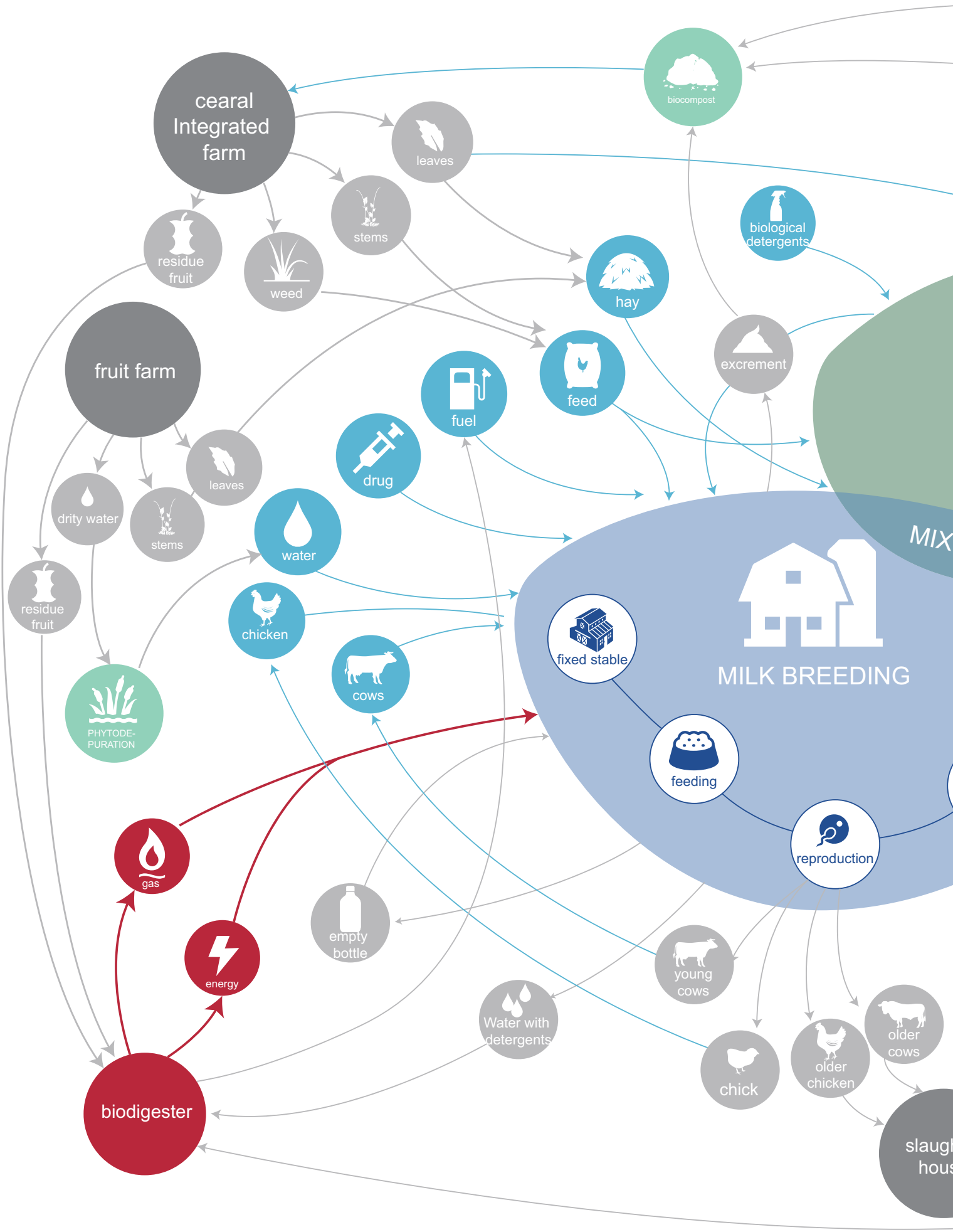
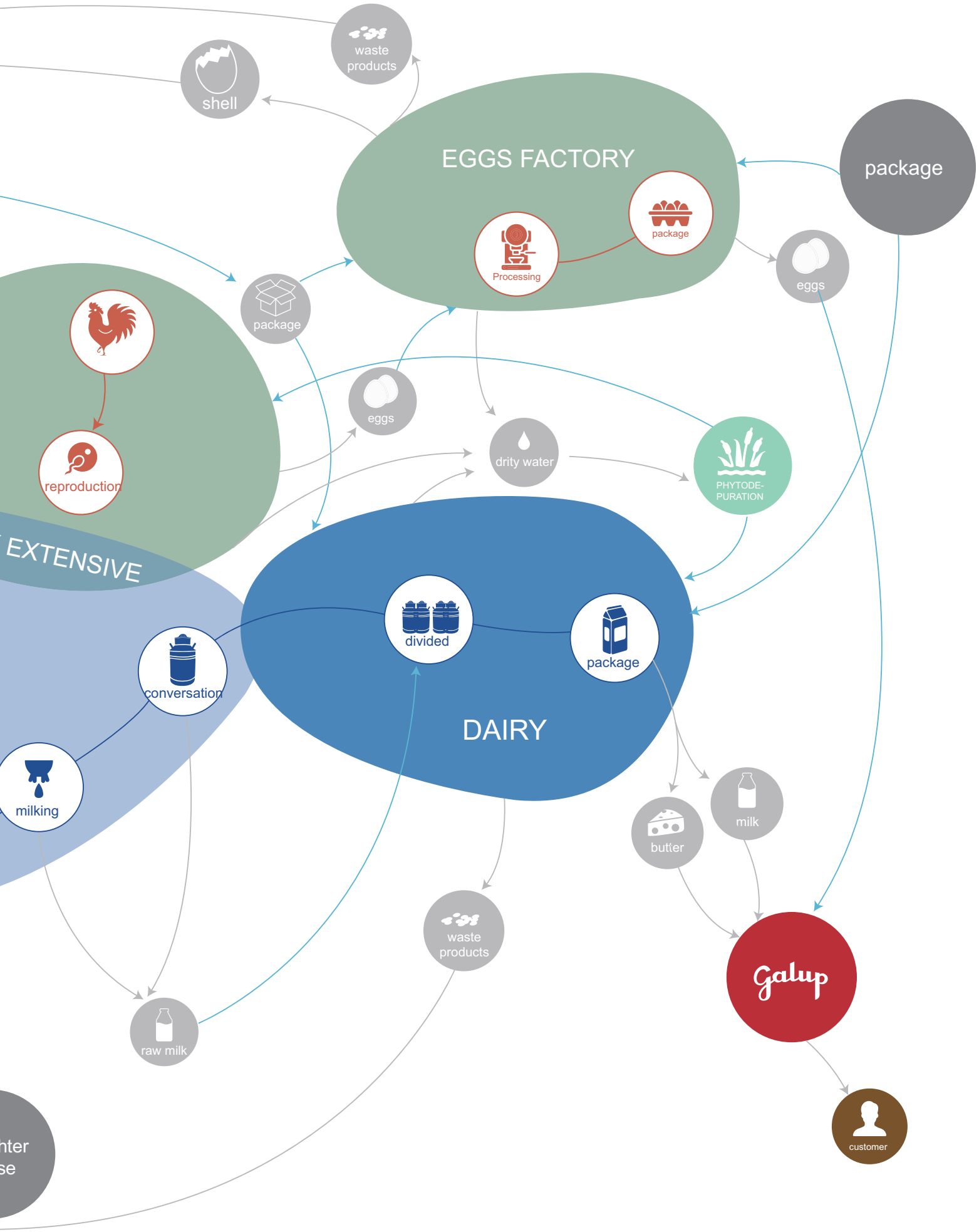
Milk and eggs farm system chain

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DAIRY
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milk
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waste products
Galup
raw milk
customer

HONEY FARM

Farm B

In the farm producing honey, there is not much waste generated, however the main waste is the water which used to clean the producing honey equipment, as well as some similar used containers for honey production, the used beehives and so on. The processing method is also the same as mentioned above. It is used as a compost material to contribute to the improvement of soil fertility.

PAPER FACTORY

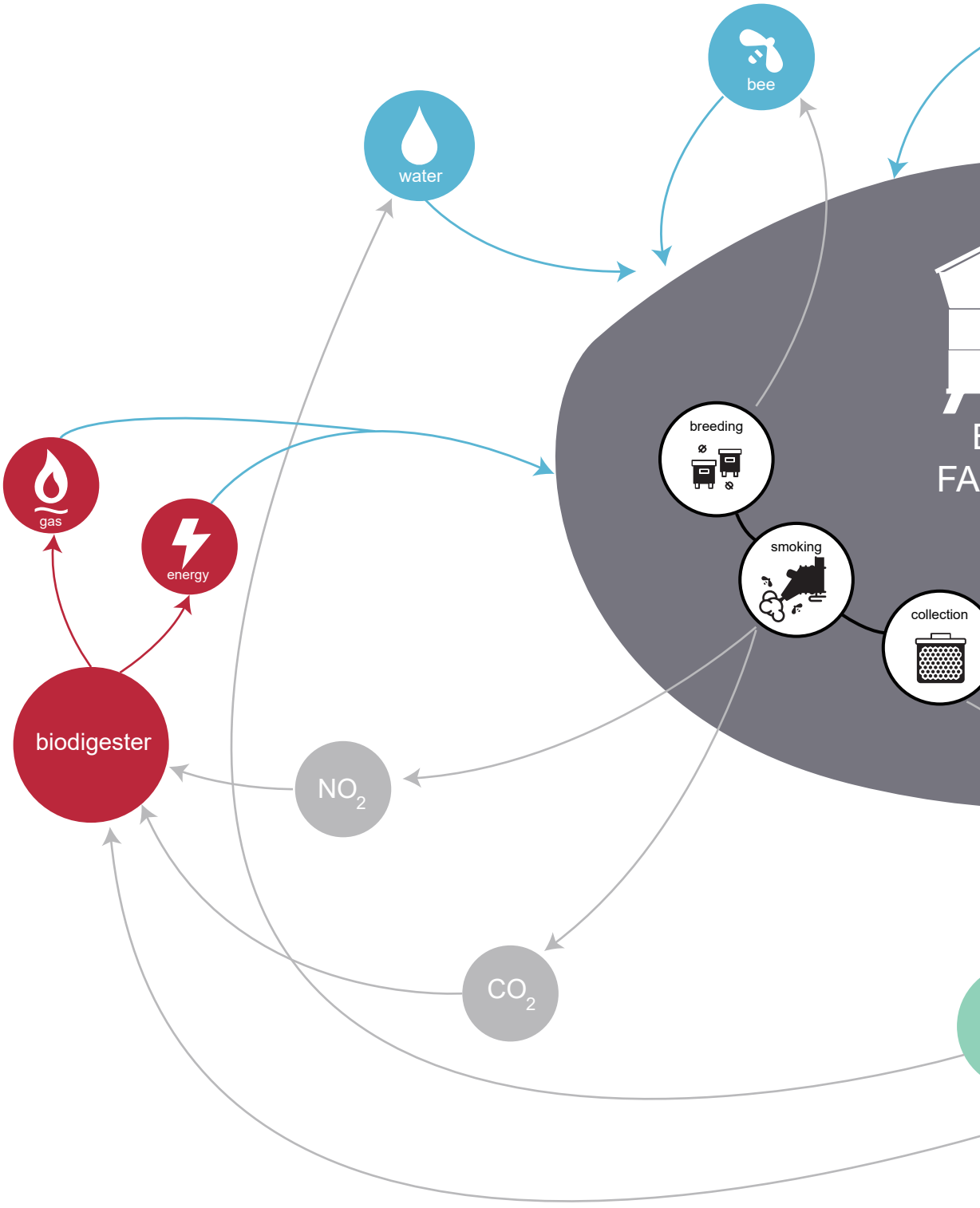
Farm A

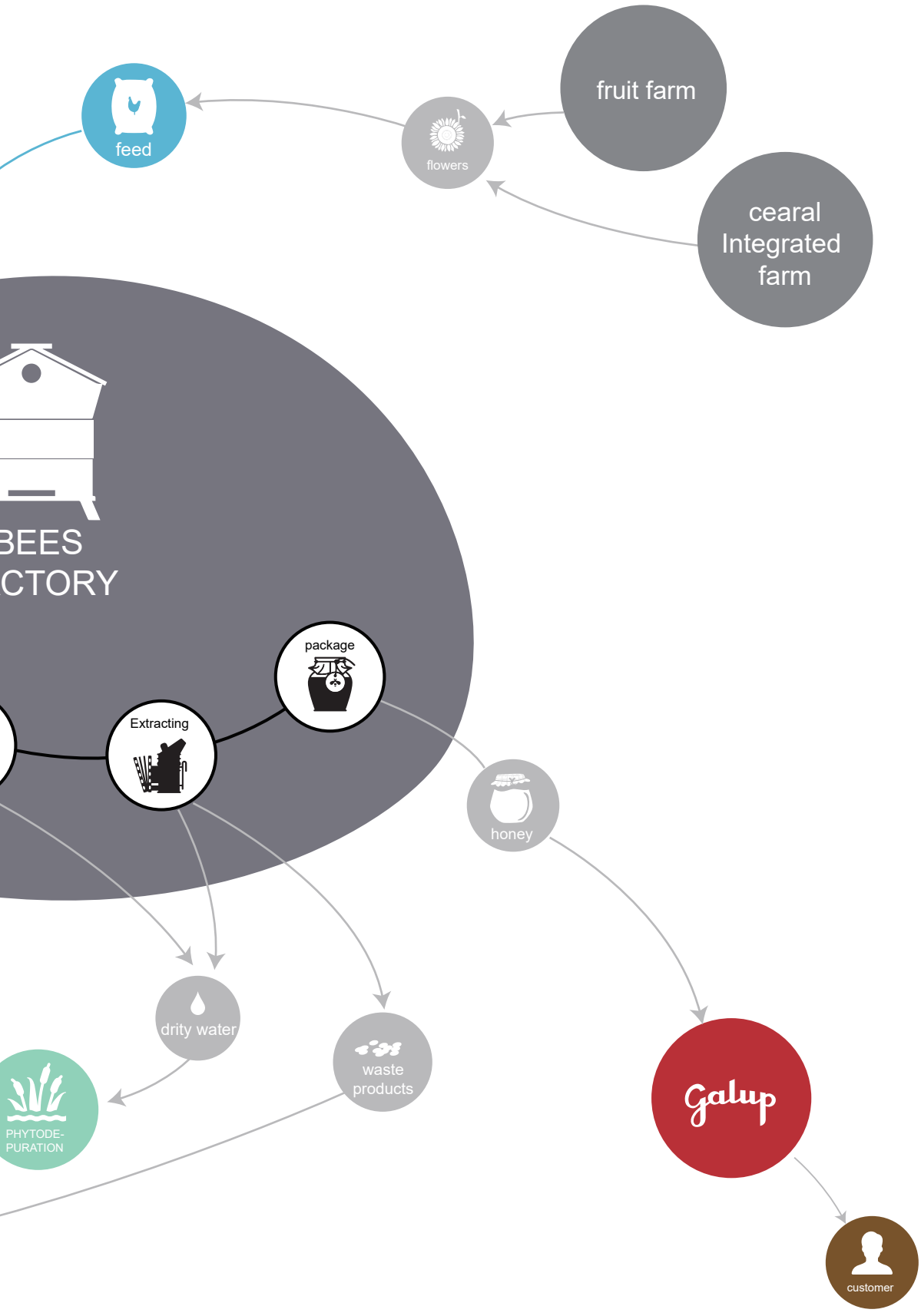
Fiber maker: In this system, a lot of plant fibers are obtained by collecting plant wastes from other farms as well as grass. For example, corn stem are a kind of plants with high fiber, and we extract fiber from the harvested corn.

And, there's an endless variety of techniques for cutting, scraping, cooking, retting, pulping, sheet formation, pressing, and drying that will all affect the resulting paper

Paper recycling: The process of waste paper recycling most often involves mixing used/old paper with water and chemicals to break it down, It is then chopped up and heated, production of panettone process needs a lot of paper package,these paper can be recycled after used.This is a great way to save energy and maintain economic vitality

Honey farm system chain




feed
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fruit farm
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waste
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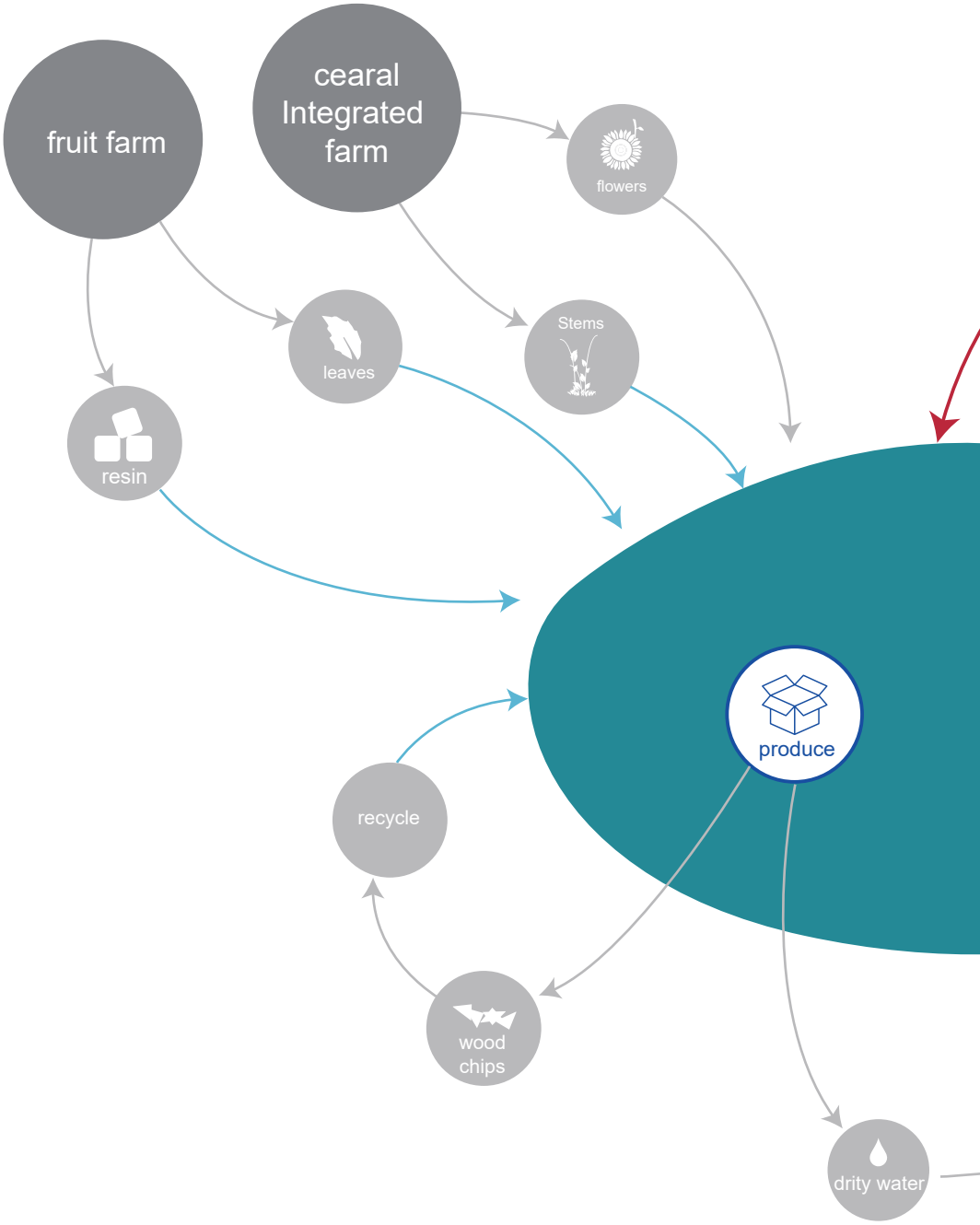
PHYTODE-
PURATION
Galup
customer

Paper factory system chain




biodigester
gas
energy
cutting
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products
milk and
eggs farm
fruit farm
package
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farm
PHYTODE-
PURATION
Galup
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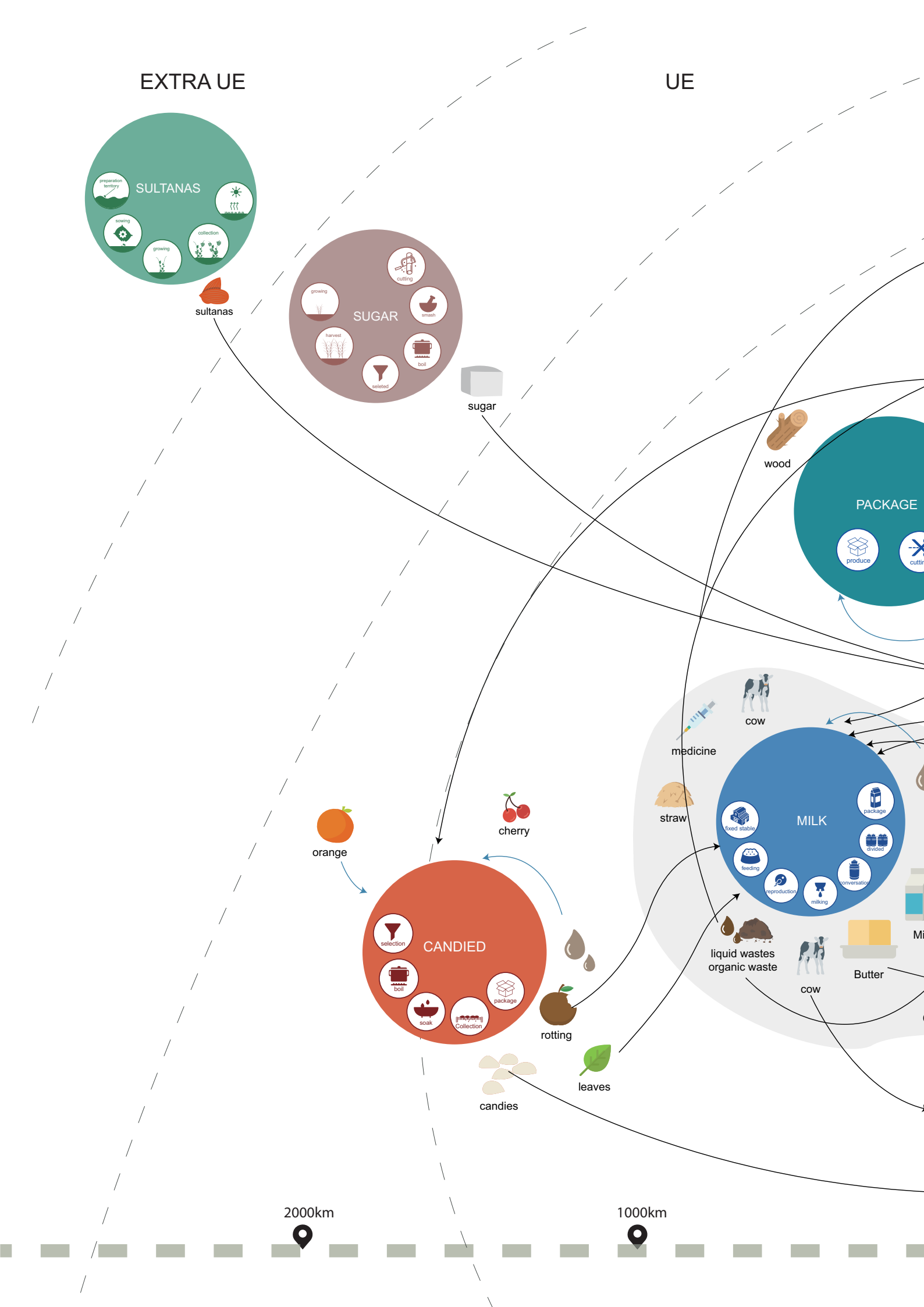
EXTRA UE
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PACKAGE
produce
cow
medicine
straw
MILK
fixed stable
package
divided
feeding
conversation
reproduction
milking
liquid wastes
organic waste
cow
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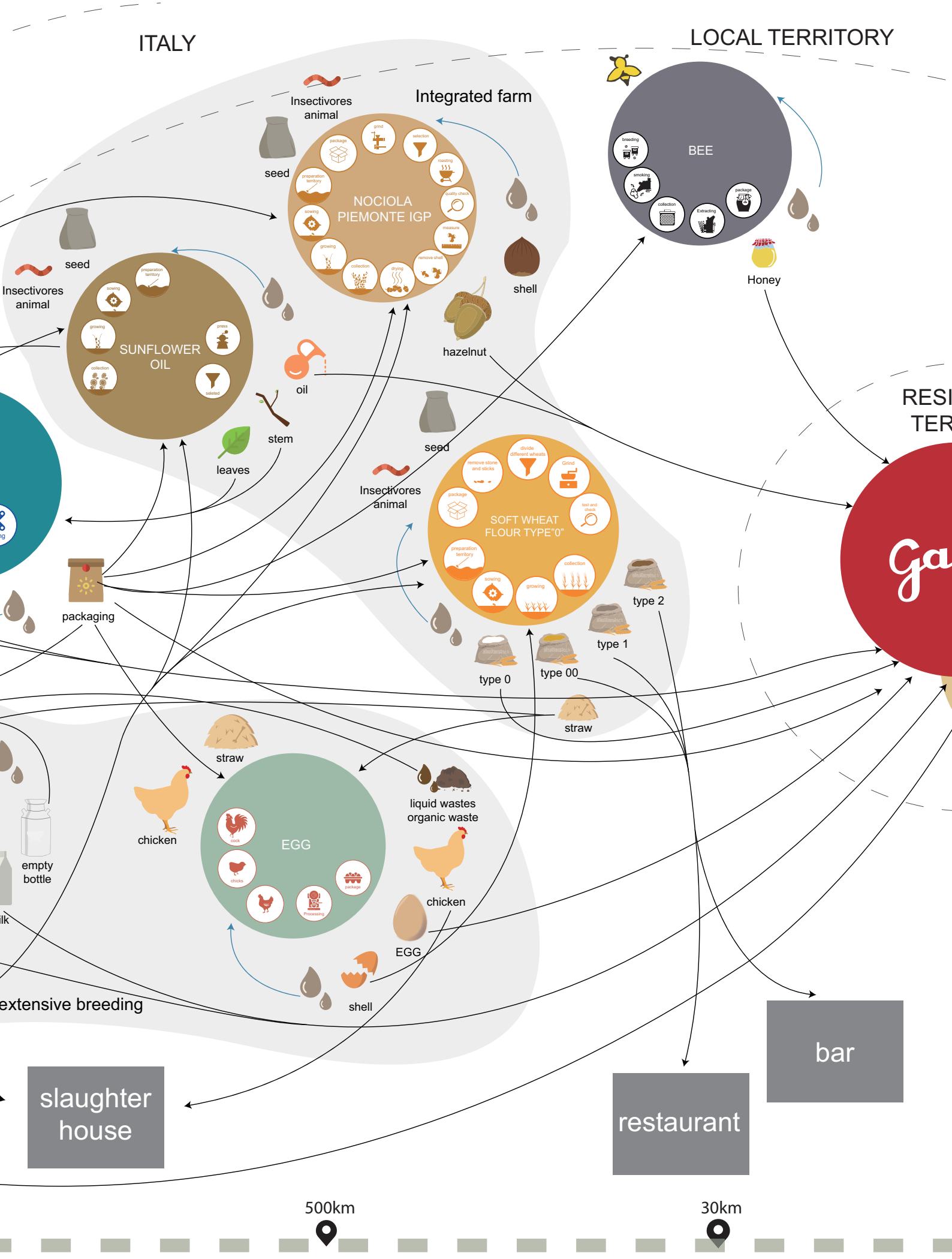
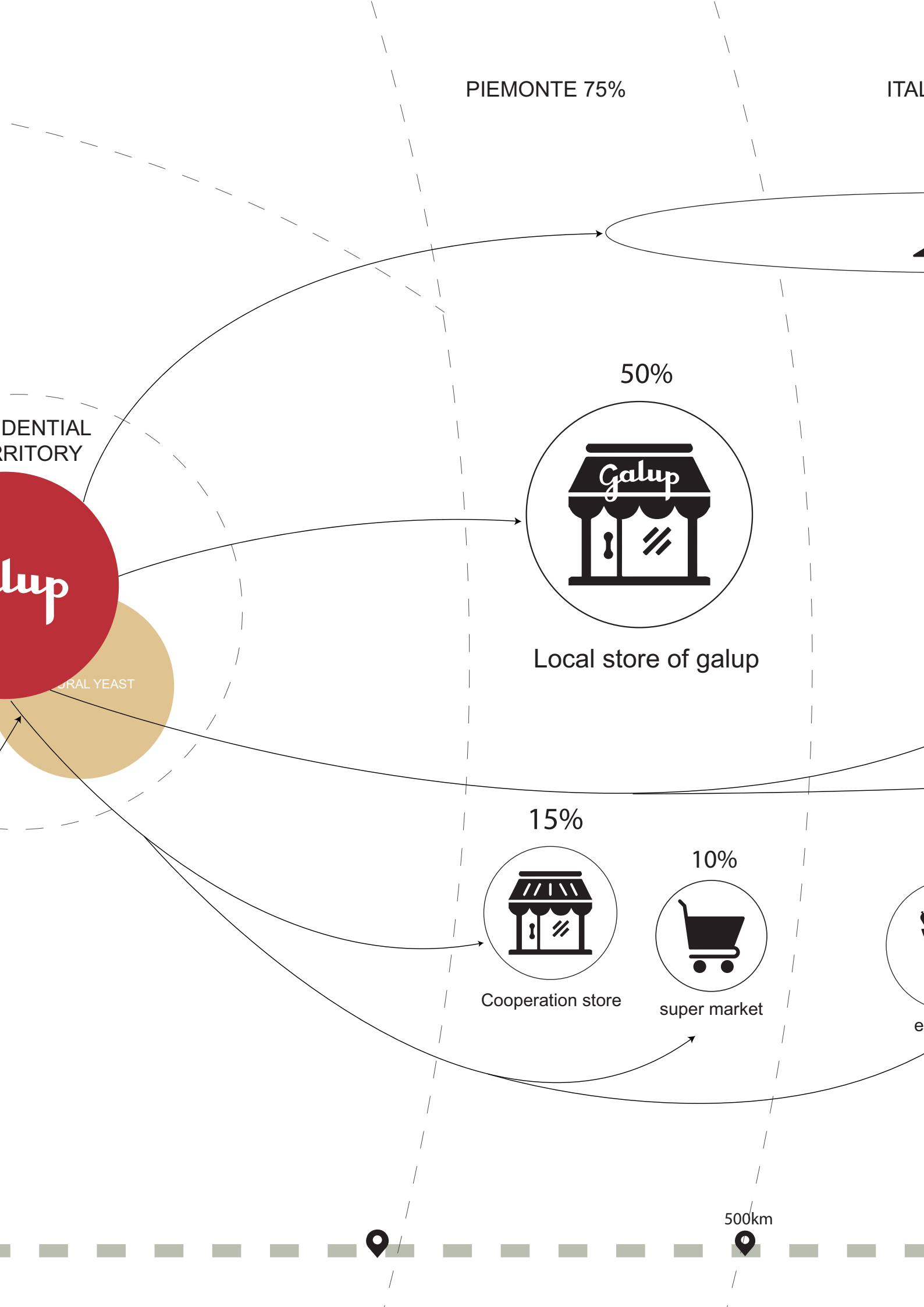
1000km


ITALY
LOCAL TERRITORY
Integrated farm
Insectivores animal
seed
NOCIOLA PIEMONTE IGP
shell
hazelnut
BEE
Honey
seed
Insectivores animal
SUNFLOWER OIL
oil
stem
leaves
seed
Insectivores animal
SOFT WHEAT FLOUR TYPE"0"
type 2
type 1
type 0
type 00
straw
packaging
straw
chicken
EGG
liquid wastes organic waste
chicken
EGG
shell
empty bottle
extensive breeding
slaughter house
restaurant
bar
500km
30km


PIEMONTE 75%
ITAL
DENTIAL
RRITORY
lup
RAL YEAST
50%
Galup
Local store of galup
15%
Cooperation store
10%
super market
500km

LY 22%

UE 3%

EXTRA UE 0%

5%

Online

2%

super market

3%

exhibition

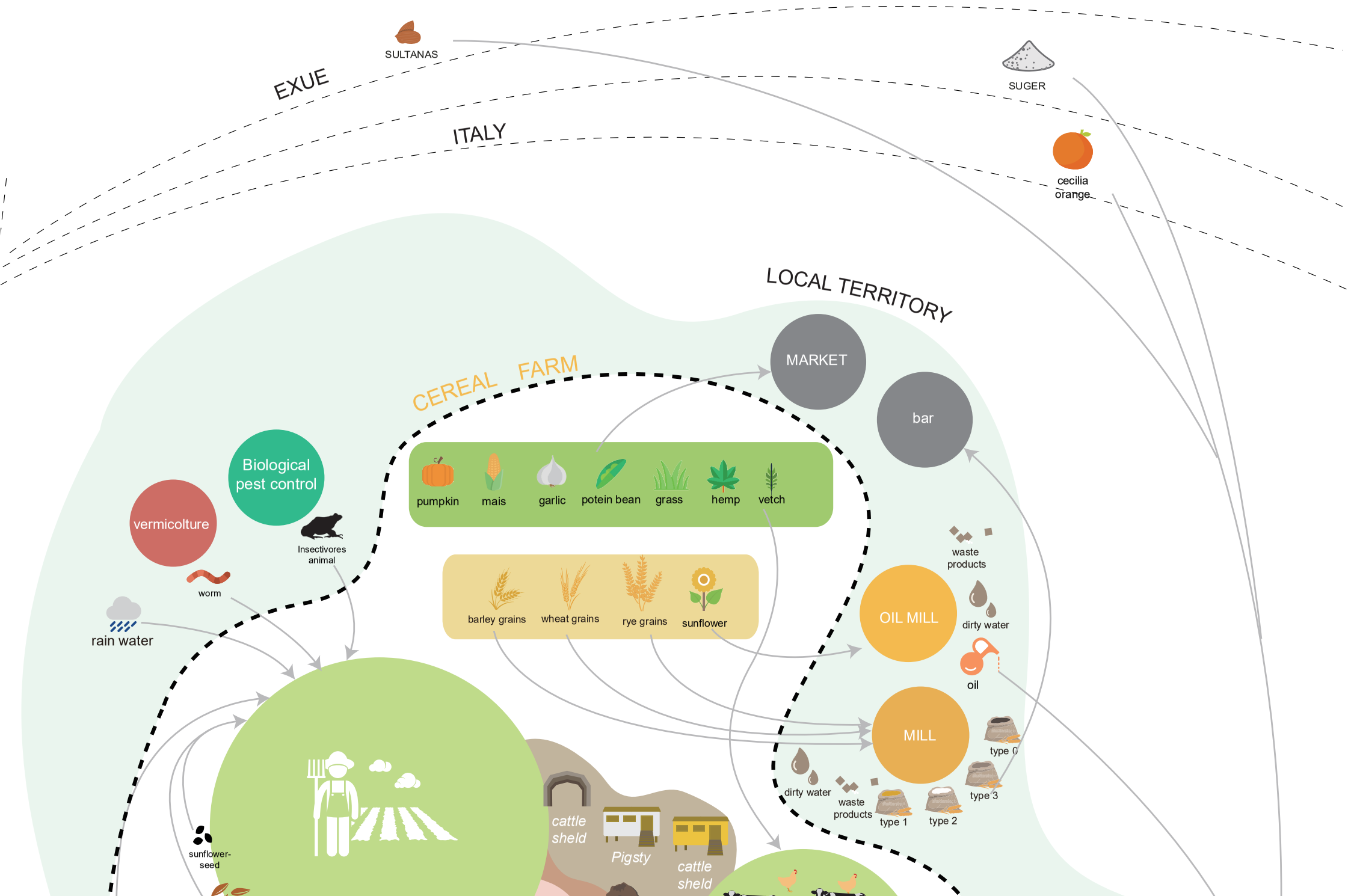
15%

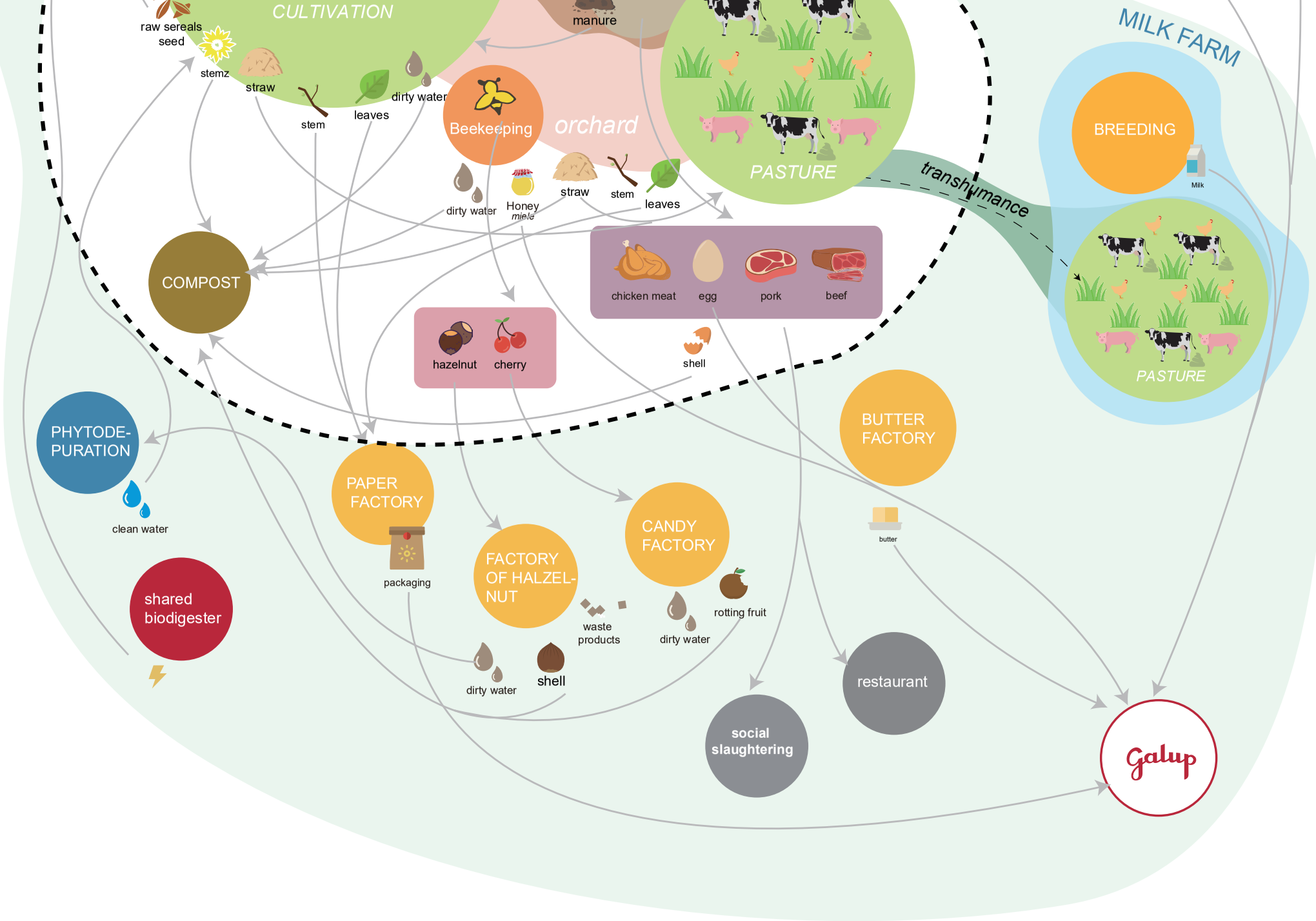
xhibition

1000km

2000km

system map


SULTANAS
SUGER
EXUE
ITALY
cecilia orange
LOCAL TERRITORY
MARKET
bar
CEREAL FARM
Biological pest control
vermicolture
Insectivores animal
worm
rain water
pumpkin
mais
garlic
potein bean
grass
hemp
vetch
barley grains
wheat grains
rye grains
sunflower
waste products
OIL MILL
dirty water
oil
MILL
type 0
type 3
type 2
type 1
dirty water
waste products
sunflower-seed
cattle sheld
Pigsty
cattle sheld



SYSTEMIC FARM OF GALUP

HARVEST SEASON IN ONE YEAR

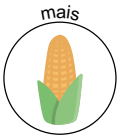
When can they harvest

First of all,realising each growth cycle of crop is extremely useful for our farm.next,It is designed to plant every crop and companion plant that can interact with it,then,base on differents cultivation time about crops,we separated on their characteristic and their harvest,keep it in rotation depended on their harvest seasons ,in order to keep high percentage of use land.

Each one of many crops from our system farm has different life cycle.we need realise every plant because of his characteristic which help us to cultivate them.

YEARS	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
pumpkin			■	■	■	■	■	■				
mais				■	■	■	■	■	■	■		
garlic	■	■	■	■						■	■	■
potein bean					■	■	■	■	■			
grass	■	■	■	■	■	■	■	■	■	■	■	■
barley grains			■	■	■	■	■	■				
wheat grains			■	■	■	■	■	■				
rye grains	■	■	■	■	■				■	■	■	■
sunflower			■	■	■			■	■	■		

Produces pumpkin during harvest season from March to August

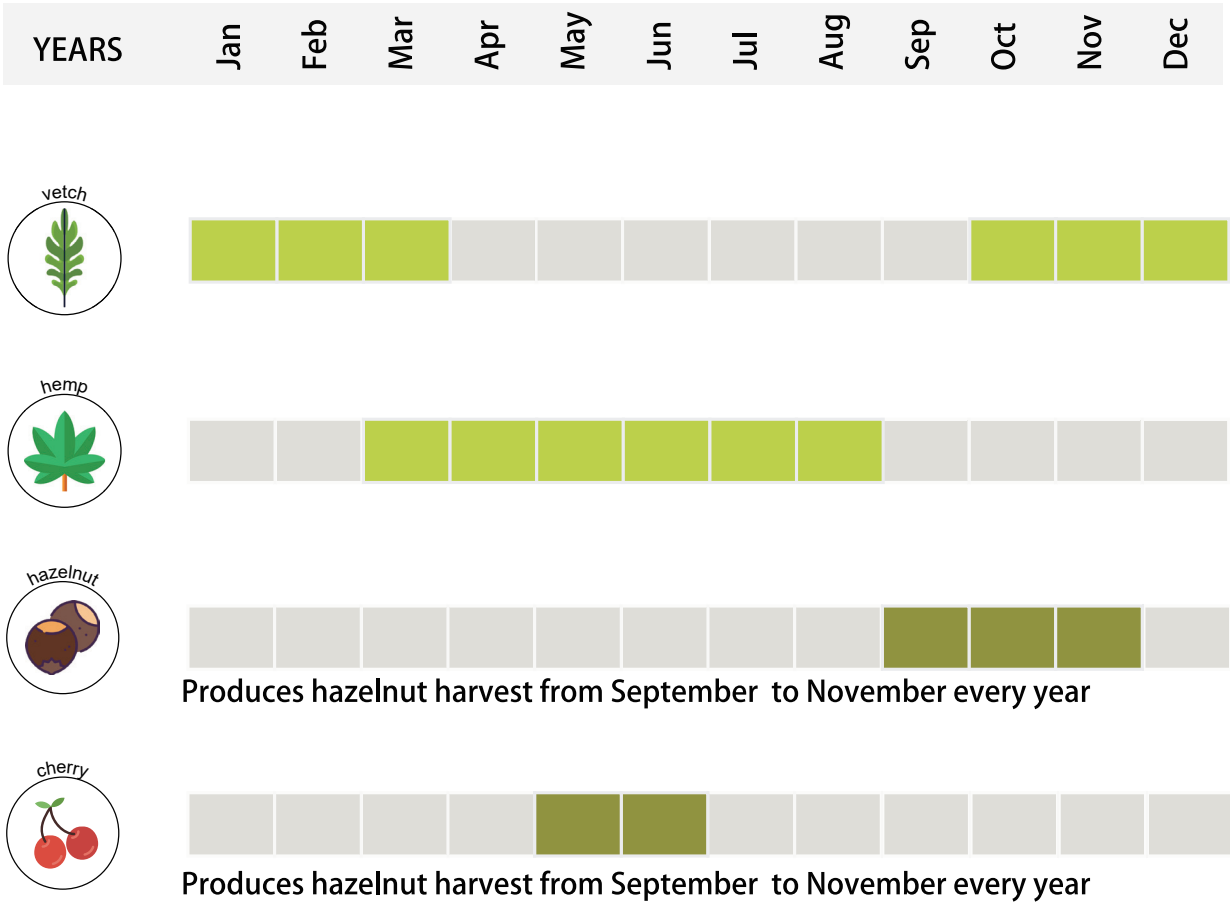


Produces mais during harvest season from March to August and from July to October(2 times for 1year)

Produces potein bean during harvest season from May to September of next year

Grass has many times harvest(6-7 per year) for all year

Sunflower can be sown all year,the cicle of harvest is 80-100 days.


YEARS
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
vetch
hemp
hazelnut
Produces hazelnut harvest from September to November every year
cherry
Produces hazelnut harvest from September to November every year

RELATION BETWEEN EACH CROPS

Companion Plants interaction

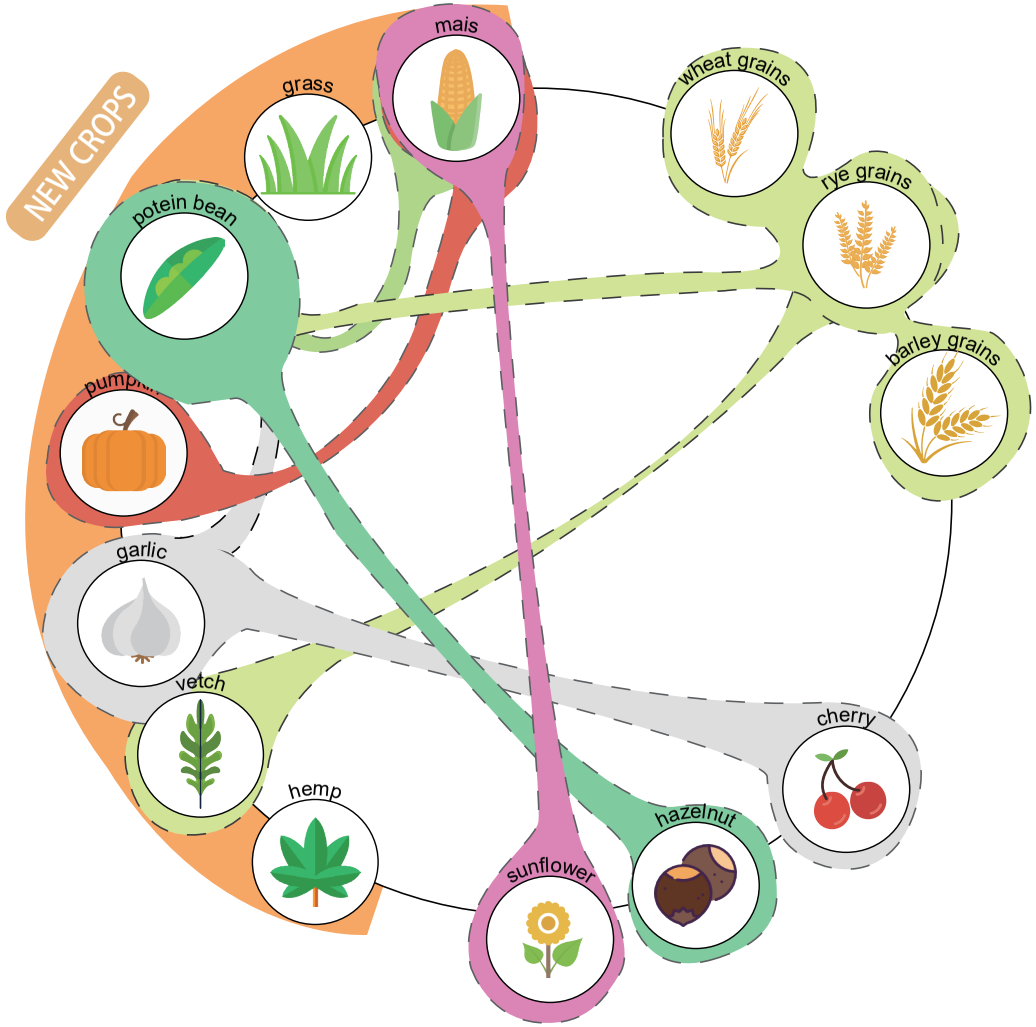
Companion plants means two kinds of plants that are planted together,when they are growing,they will give each other a good influence on another one.for example,garlic can drive away pests that will effectively drive out bean pests.

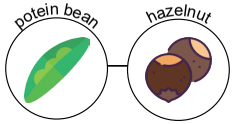
More companion plants also help to land rotation.for instance,natural legumes benefits to the land nitrogen fixation,which results in a reduction of fertilizer used even disapperarance.Not only increased the account of other crops, but also made the land more dynamic.

Excessive weeds also tend to bad influence for local crops,it affect the growth of local crops even make them die.therefore I added hemp that it not only suppresses weeds but also softens the land, making the land more fertile.

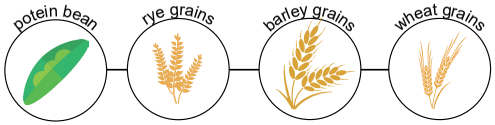
GALUP SISTEM FARM

POSSIBLE COMPANION PLANTS

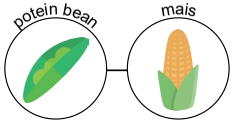




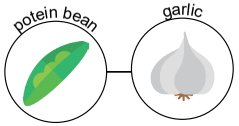
The bean fertilizes the kind of hazelnut



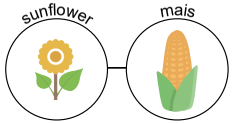
The bean fertilizes the kind of grains



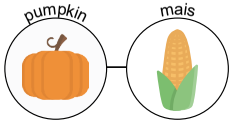
Mais can provide natural scaffolding for beans



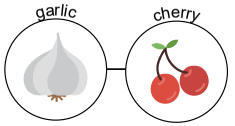
Garlic can drive away pests that will effectively drive out bean pests



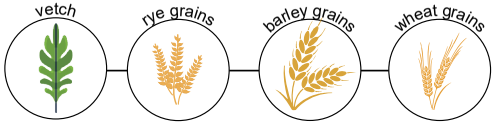
Mutual influence and mutual benefit



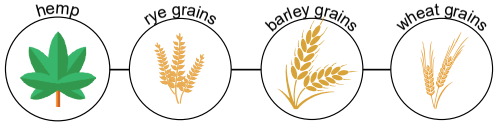
The bean nodules fertilizes the corn, while the leaves of the pumpkin cover the ground to prevent soil moisture evaporation and weed growth.



Garlic can drive away pests that will effectively drive out cherry tree pests



The vetch fertilizes the kind of grains



growth promoter cereals
inhibitor of pathogenic microor-
ganisms
soil fertility promoter

ROTATION

Sereal cultivation

It is important to introduce a soil rotation with specifics cooperation of plants and the cereals that need natural fertilizers in the soil. For this reason ,I have introduced to cultivation analyzed companion plants in the above. These are crops that improve soil fertility in favor of those followers, providing agricultural advantages over the years that are consolidated to several years.

From these soils, sereals cultivated also get different type raw material,for example the legume straw, that is dry and bare stems of broad bean, vetch, bean, pea and other grain legumes. These residues have a eating value lower than hay.however these sereals have more additional value that is used as medicine、making skirt 、feed animals etc.

Other cover crops are vetch, clover and pea, and they are also leguminous, which fix atmospheric nitrogen and thus increase its storage in the soil.Besides of that, other winter vegetables protect the land during the winter months. About the disruptive effects caused by the acid rain and run-off phenomena, particularly harmful in the hilly areas.

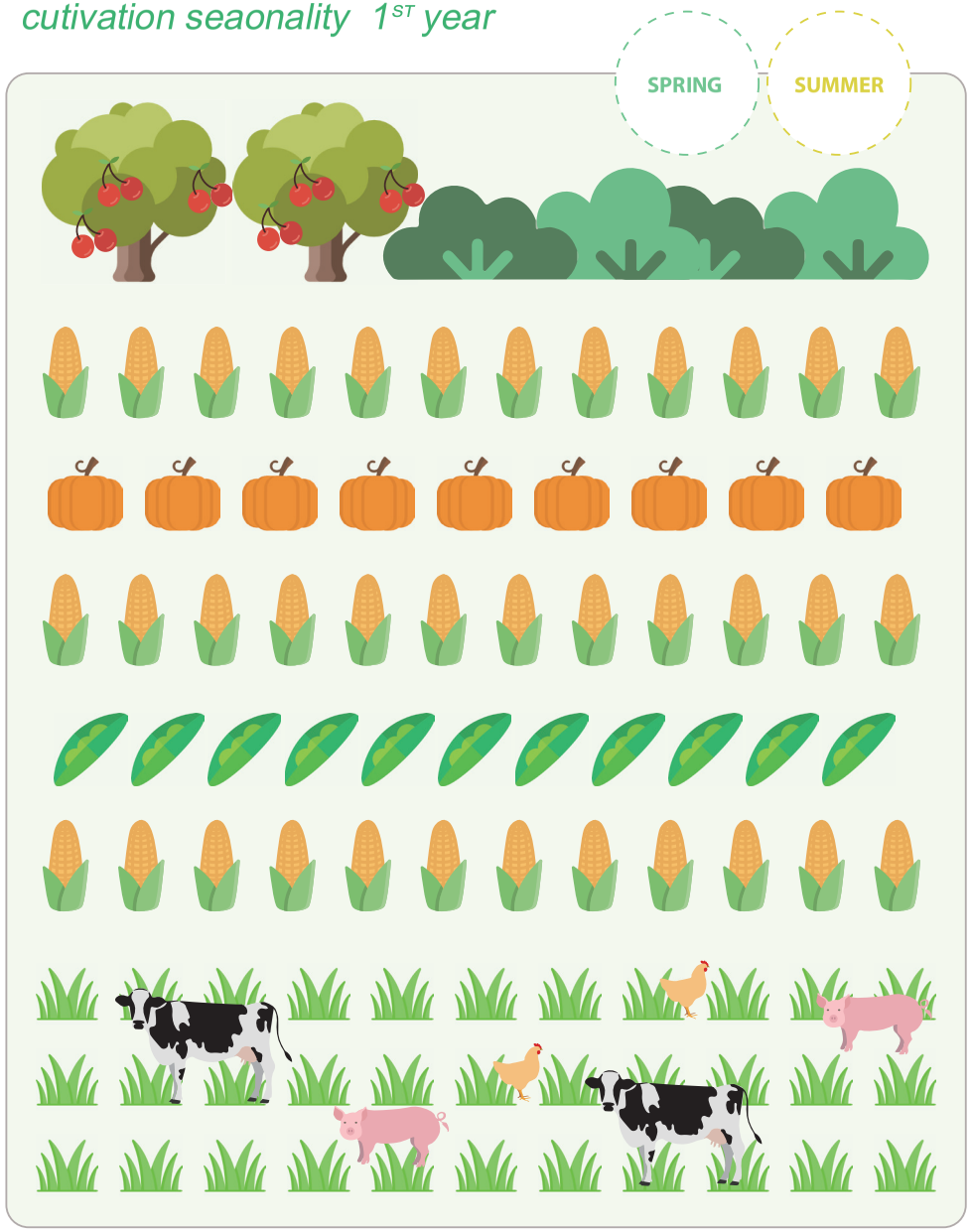
If the ground were covered fully weed,that takes away light from them, and that lead to other crops shielded under the sunshine,even makes them die.Due to developing crops has been limited ,I decided to import plant which used to defense weeds.therefore I designed some cover crops such as
Garlic releases substances that inhibit the growth of weeds on my farm,at the same time,the garlic acts as a repellent for some animals and insects.

The ordinary hemp was also inserted into the rotations.the hemp can be grown repeatedly on the same terrain because it does not impoverish it, reclaiming and softening it as well as keeping the structure of the land.

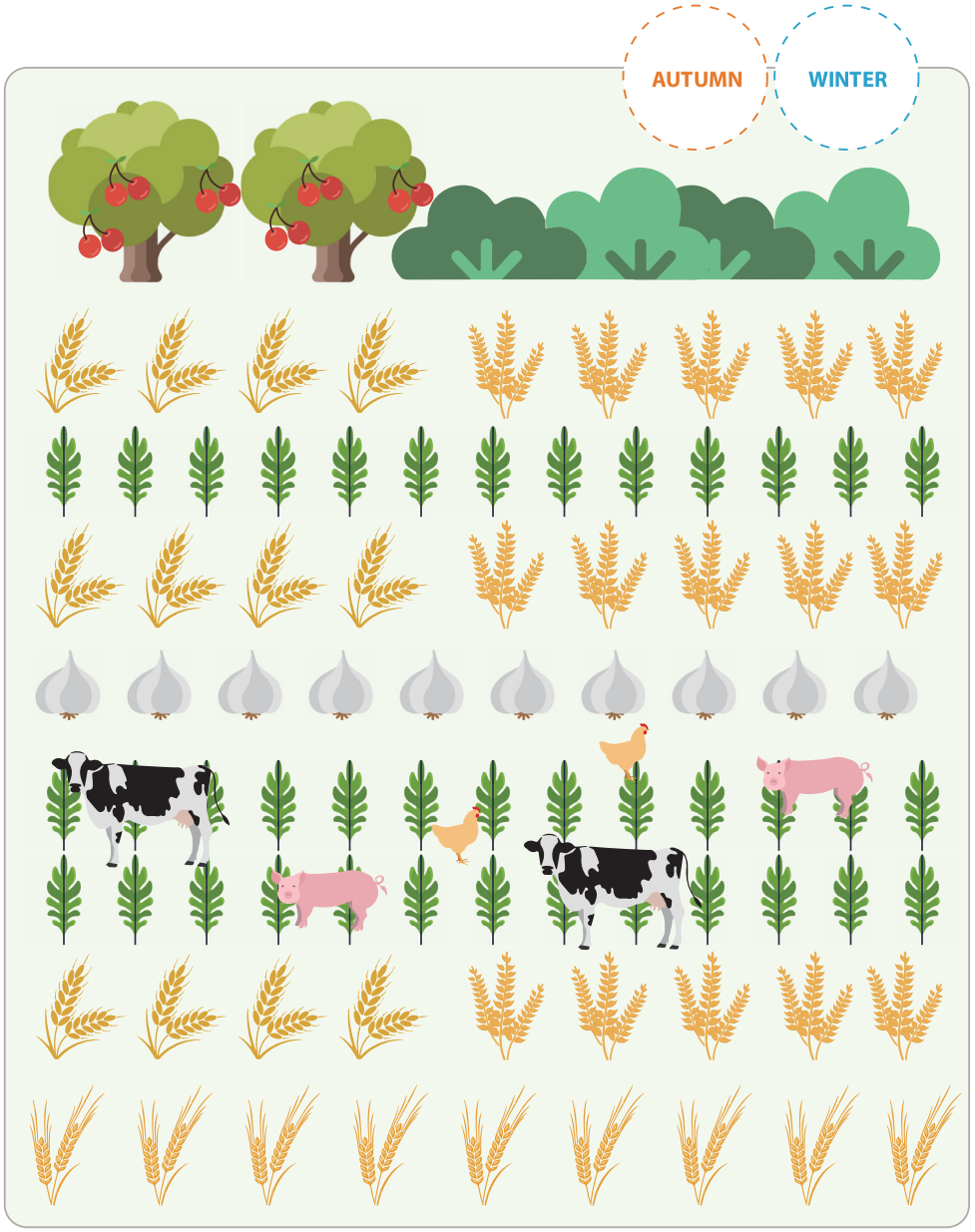
Starting from the graphic of the next page we have hypothesized some usable rotation plan in the company referring to the traditions of the territory;The hypothetical crop rotation is shown over a period of four years.(cold temporature and hot teporature)

GALUP SISTEM FARM

cutivation seaonality 1ST year



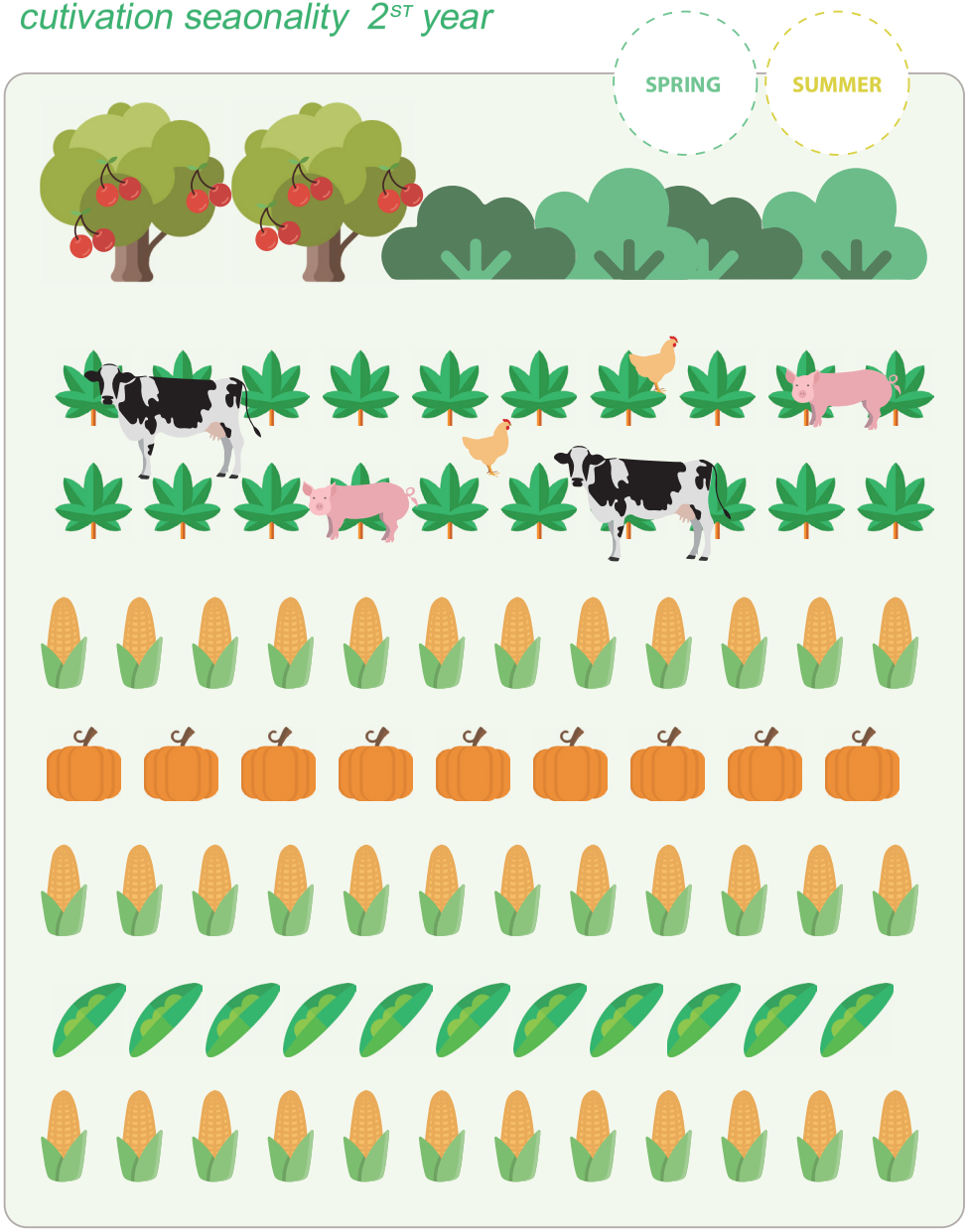
40% mais 30% grass 20% bean&pumpkin 10% cherry&hazelnut



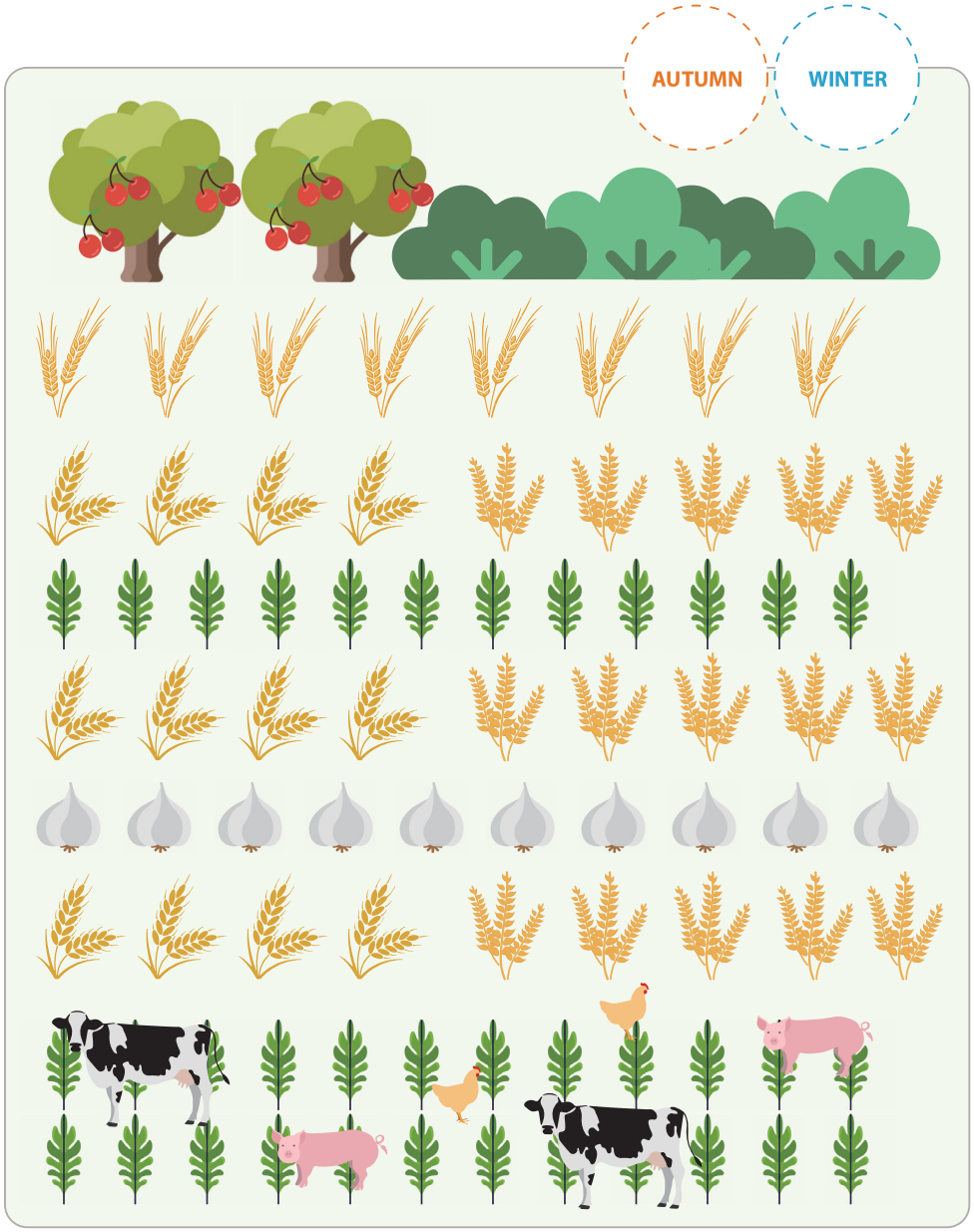
65% wheat grains,barley grains & rye grains 15% garlic&vetch 10% cherry&hazelnut

GALUP SISTEM FARM

cutivation seaonality 2ST year



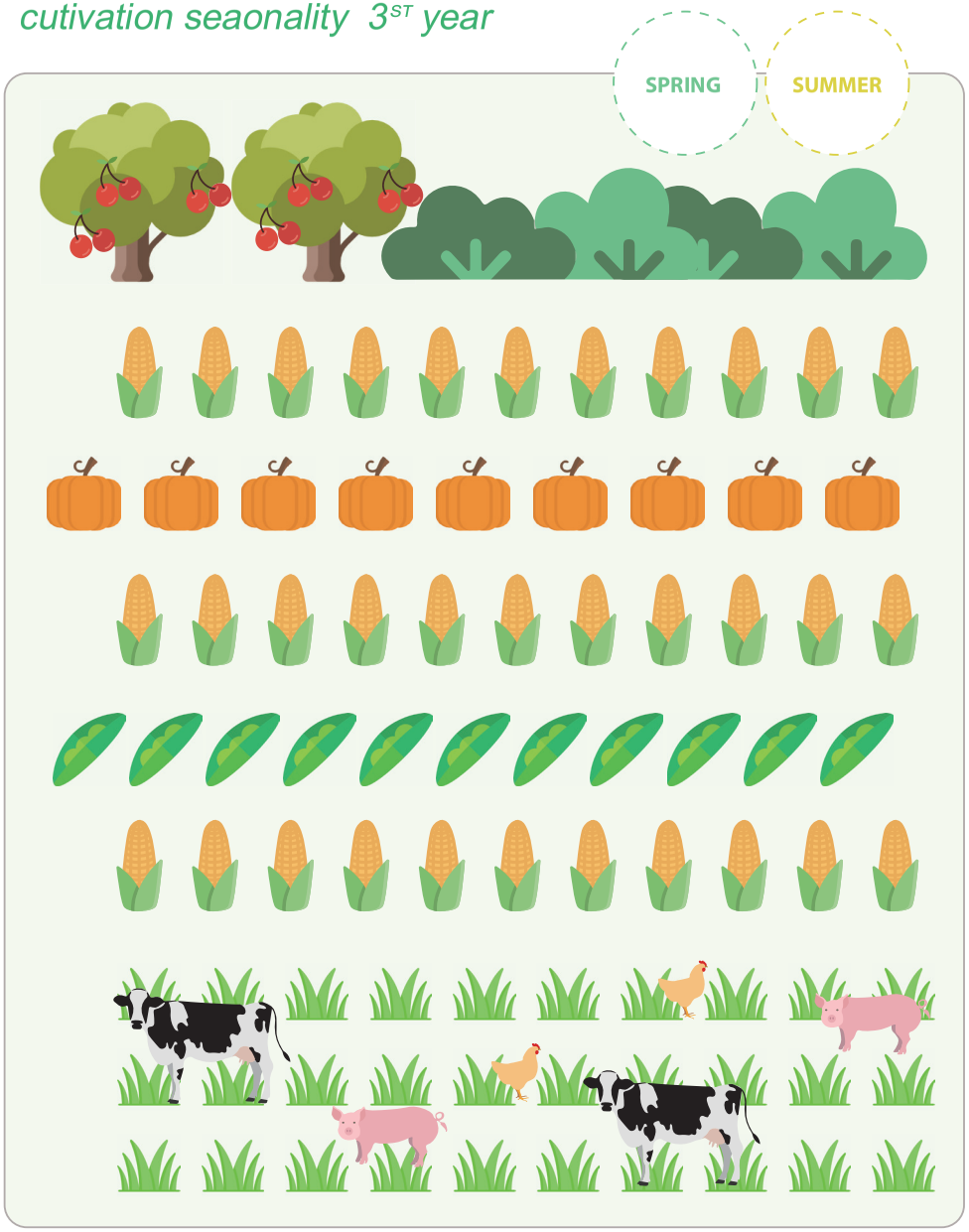
40% mais 30% hemp 20% bean&pumpkin 10% cherry&hazelnut



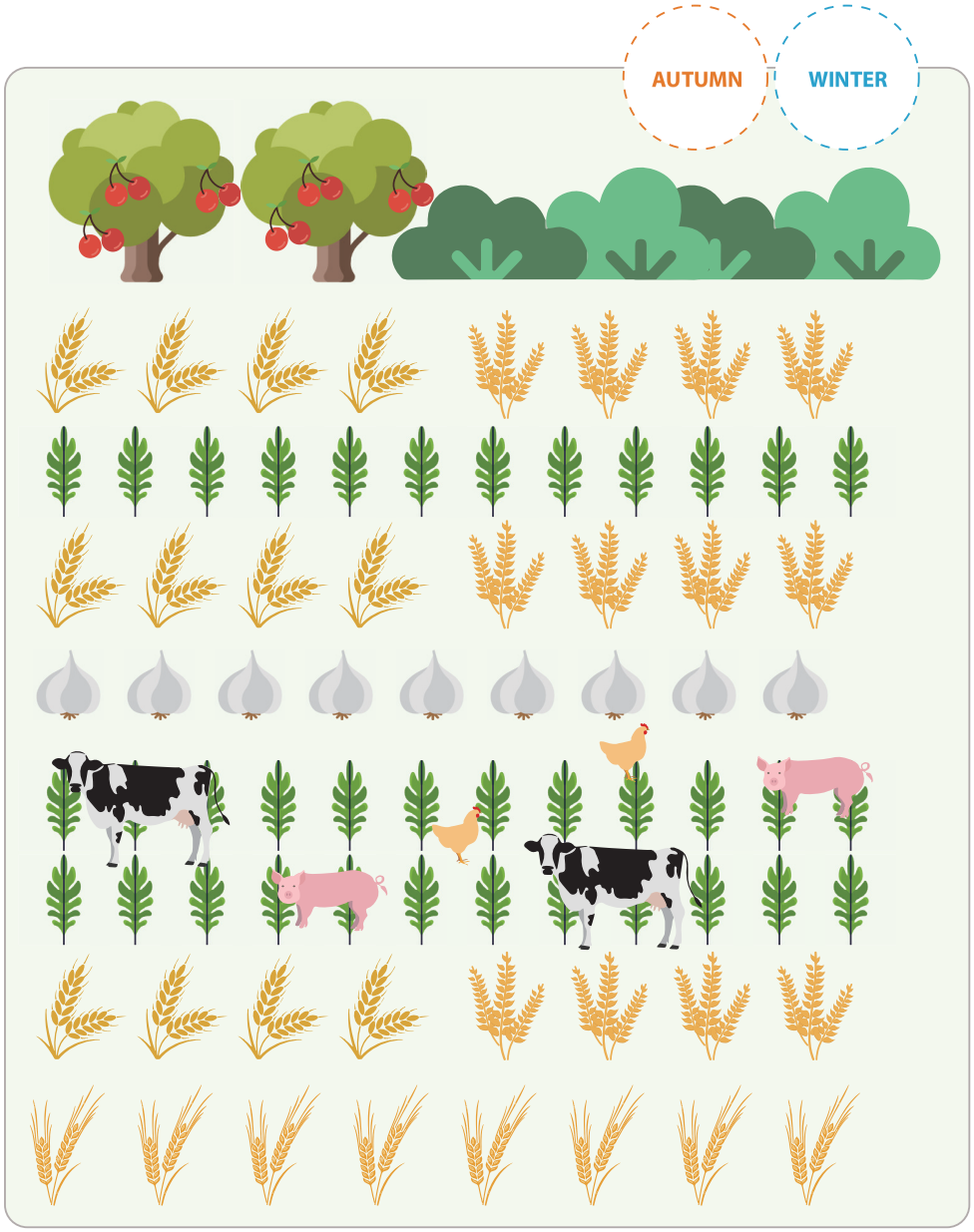
65% wheat grains,barley grains & rye grains 15% garlic&vetch 10% cherry&hazelnut

GALUP SISTEM FARM

cutivation seaonality 3ST year



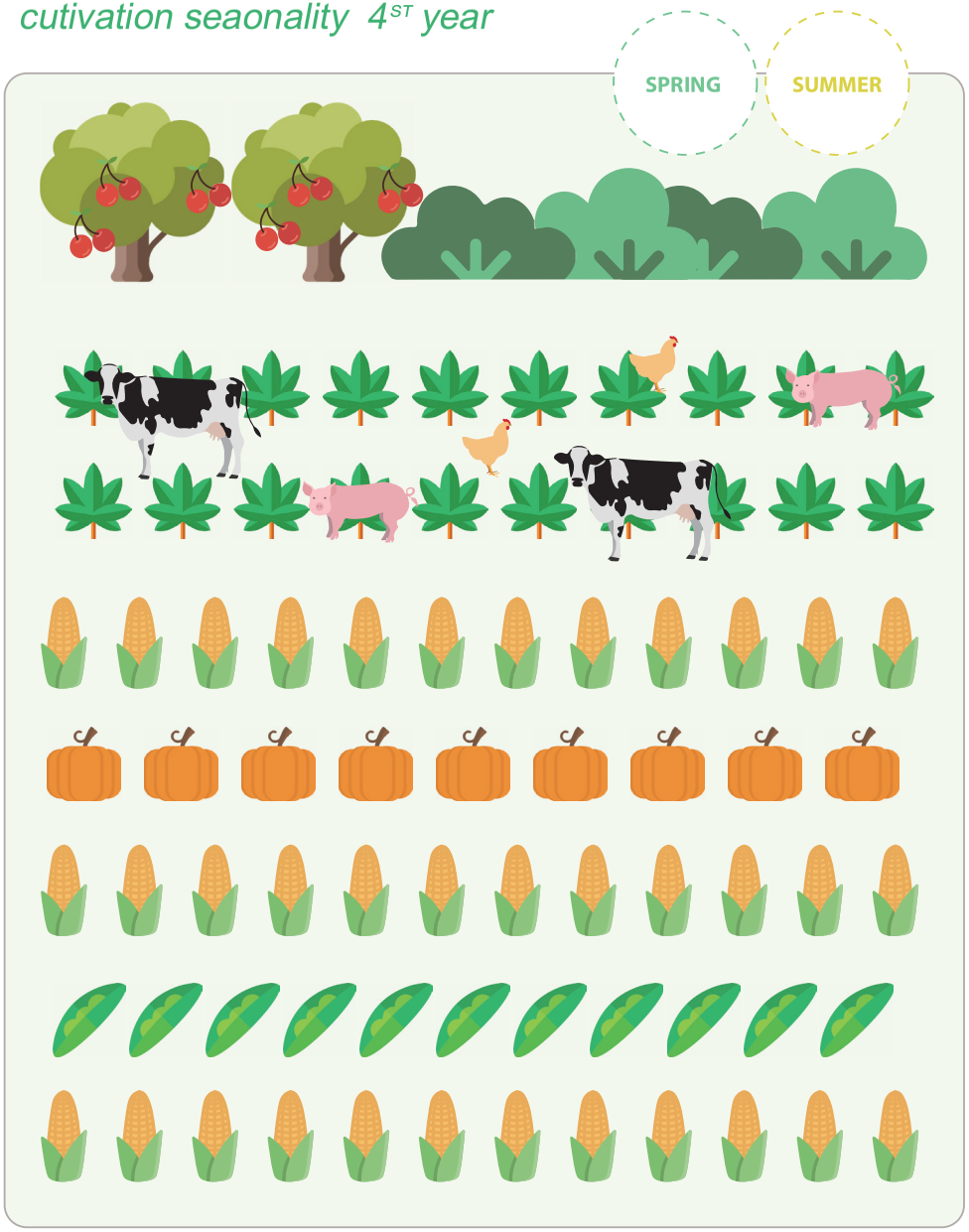
40% mais 30% grass 20% bean&pumpkin 10% cherry&hazelnut



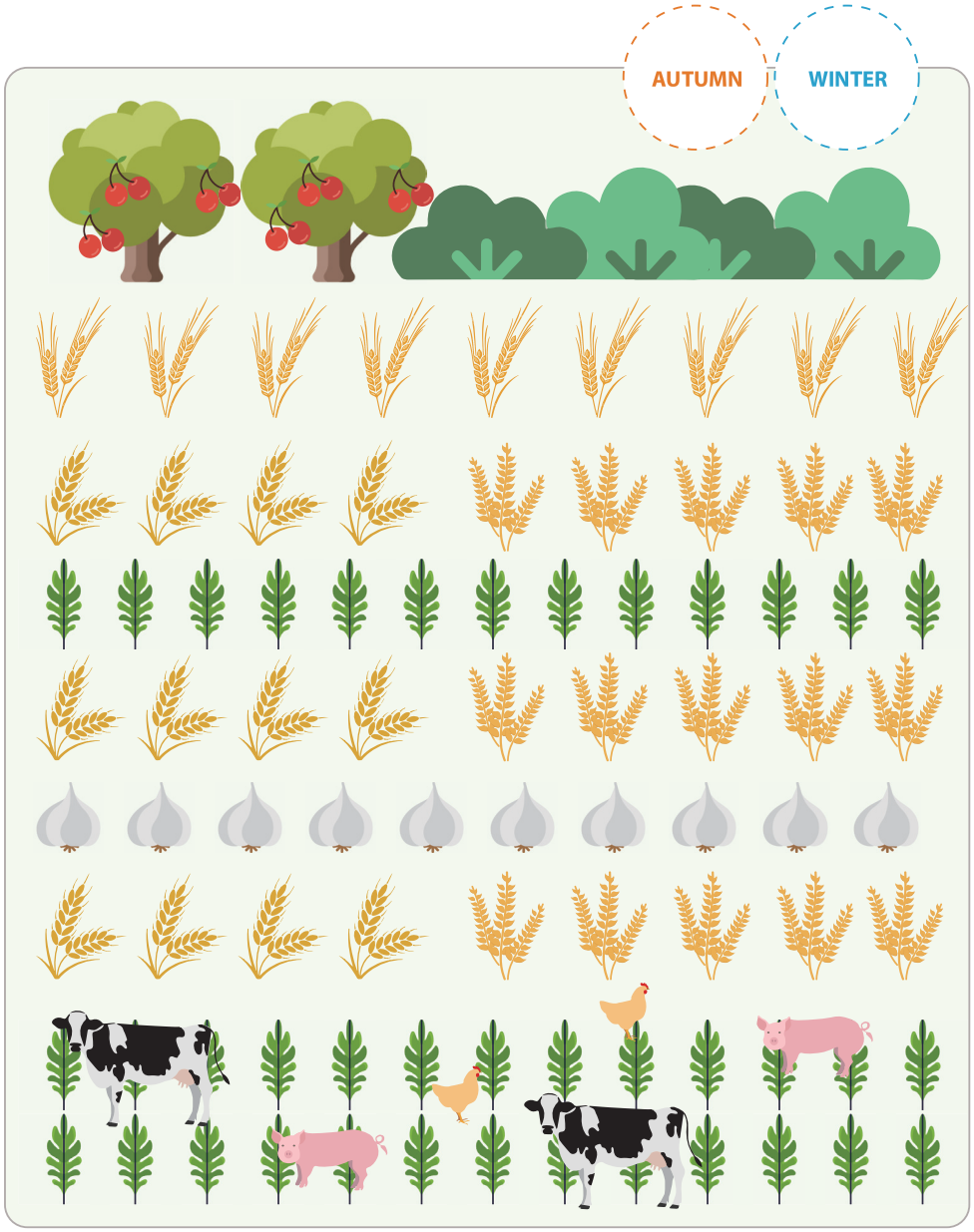
65% wheat grains,barley grains & rye grains 15% garlic&vetch 10% cherry&hazelnut

GALUP SISTEM FARM

cutivation seaonality 4ST year



40% mais 30% hemp 20% bean&pumpkin 10% cherry&hazelnut



65% wheat grains,barley grains & rye grains 15% garlic&vetch 10% cherry&hazelnut

NITROGEN FIXING

The nitrogen cycle

With the technology develop faster and faster,Industrial agriculture increasely uses nitrogen-based fertilizers.It is important that nitrogen-based fertilizers should be responsible for harmful processes ranging from loss of biodiversity as well as global warming,It also a numerous damage for ozone pollution.however, wherever you are,most country depends on nitrogen fertilizers which uses it for food production in agricultural industry.According to an analysis by the Institute of Health, the high presence of nitrogen derivatives will lead to the onset of numerous diseases

In summary,now we need to find a new way to replace nitrogen-based fertilizers with healthier fertilizers.

the total amount of nitrogen on Earth is fixed, there is an abundant supply in the earth's atmosphere - nearly 79% in the form of nitrogen gas (N2). However, N2 is unavailable for use by most organisms because the two nitrogen atoms are held together by very strong and stable chemical bonds. This makes the N2 molecule effectively inert. In order for nitrogen to be used for plant growth it must be "fixed" in the form of ammonium (NH4) or nitrate (NO3) ions.

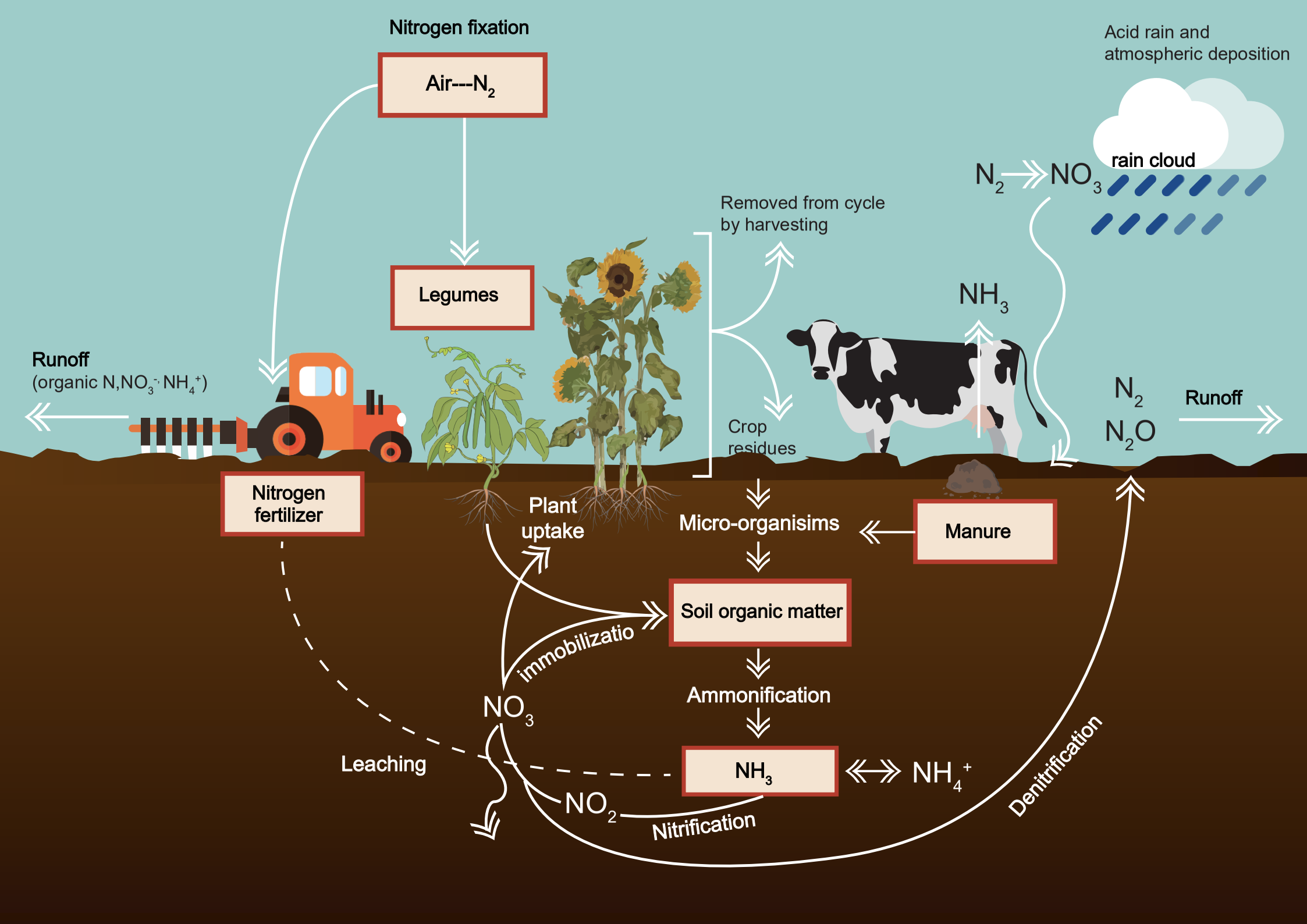
Therefore, I planted a lot of legumes, as well as clover and hemp, on systemic approach farm. The nitrogen fixation process of these plants is mainly driven by the living and symbiotic-related bacteria of the plants. Using the legumes and plants of these legumes, nitrogen, ammonia, and nitrate, which which using available form of plants present in the soil.

How does it work?first of all The plant

may absorb it when plant available forms of nitrogen, ammonium and nitrate exist into the soil.secondly It may be soaked out of the water under the root space or the denitrifying bacteria may use it as an energy source and discharge it back to the atmosphere as N2. finally,Nitrogen released to the atmosphere may start cycling again.

Famers use compost or plant crops over the soil, The nitrogen recycling will be their advantage. In a compost , the same microorganisms (bacteria, fungi, and protozoa) and invertebrates (worms and insects) present in adjacent soils break down organic matter into proteins and amino acids. finally, microorganisms break it down into nitrates and ammonium salts that are absorbed by plants. whatever it is a dead organism or a manure, soil microorganisms can regulate the decomposition and release of available nitrogen in the plant. The decomposition during the nitrogen cycle is a time release process. The decomposition of organic matter by microorganisms is regulated by soil temperature - the higher the soil temperature lead to faster decomposition.

1.https://cals.arizona.edu/yavapai/anr/hort/byg/archive/nitrogencycling2016.html


Nitrogen fixation
Air---N_2
Legumes
Acid rain and atmospheric deposition
rain cloud
N_2 NO_3
Removed from cycle by harvesting
NH_3
Runoff
(organic N,NO_3^-, NH_4^+)
Runoff
N_2
N_2O
Crop residues
Nitrogen fertilizer
Plant uptake
Micro-organisims
Manure
Soil organic matter
immobilizatio
Ammonification
NO_3
Leaching
NH_3
NH_4^+
NO_2
Nitrification
Denitrification

06

CONCLUSION

Summary and review problemand

6 CONCLUSION

SUMMARY &INDUCTION

LINEAR		SYSTEMIC
TERRITORY		
Wasted lots of resources		majority use of local resources
Cultivation without Biodiversity		respect for the local environment
Chemical fertilizer		Healthy, natural and clean
Responds to t requests		Variety of native products
LOGISTICS		
Import raw material from out of territory		Import raw material from local territoy
Long chain for transportation		short chain for transportation
numerous intermediaries		direct sales
ECONOMIC		
Global economy		Promotes local economy
Based in quantity		Based on quality
Wasted resources		Values the resources
Few activities in the territory		Created some new activities
SOCIETY		
Single agricultural culture		Multiculturalis
Global consumption		Created more job opprtunities
globalized culture		Consumption of healthy products
loss of traditions		preservation of local traditions
focus on quantity		quality propensity

BIODIVERSITY

before and after

Local development depends on Whether produce Pinerolo's local own production system.and how it transformed from a single farming model to the integrated farm which has a gap between intercropping patterns.The value of the system approach lies in the role of land in the interaction of species discovered.

The first step, as land, it is worth respecting to understand the nature of each species and How are they interacting with each other so that they can help them become stronger and healthier.It is also important that elimination of such chemical products 、fertilizer and pesticide requirements.

Some benefits of biodiversity

It's:

• Respect the life cycle of the territory: Each species will be produced on its Own time. Every month and every year's material flow will be changed,especially,Land is produced every month.

• Each species has special Features. about this,features are a powerful prevention of plague and plague weapon of disease.

• By producing different species and Its specific output, more activities Feeding that result helps Macro system (territory) comes transformation and development in future.

ACTIVITIES

Before and after

The fuction of activities and importance of each of them changed the way of territorial engineering.

From a perspective of linear relationship,there is no clear relationship between each activitytherefore,there is a lack of connection between each activities ,Any activity is less importance in the system.

Instead, From a perspective of system relationship. you can see all the activities in the point of view,It is of equal importance in the system. redistributed resources play an important role in each activity. It's not only a single activity. but also every activity in the system is like this.

It is a more dynamic system. Each activity helps other activities,And also helped by its activities, They are interconnected by output and input,which is strengthen relations in this system, if an activity disappears,the system can also survive.There is no negative consequence of itself.For the contrary, if an activity fails in linear system,the entire system will nearly crash.on the other hand.In the linear method, there are Only a small amount of activities,and these activities are even harmful to the territory.

In addition, these activities are dependent on and imported from outside, not based on local market. therefore we created new activities,The system model created by these activities eliminates the large monopoly structure between national companies.Strengthen their local economic ties between local activities.These products will be sold in the locamarket.

ECONOMIC

Before and after

The method for increasing the economy of the project is not only relying on higher land use efficiency, but also on the economic benefits of planting different crops.

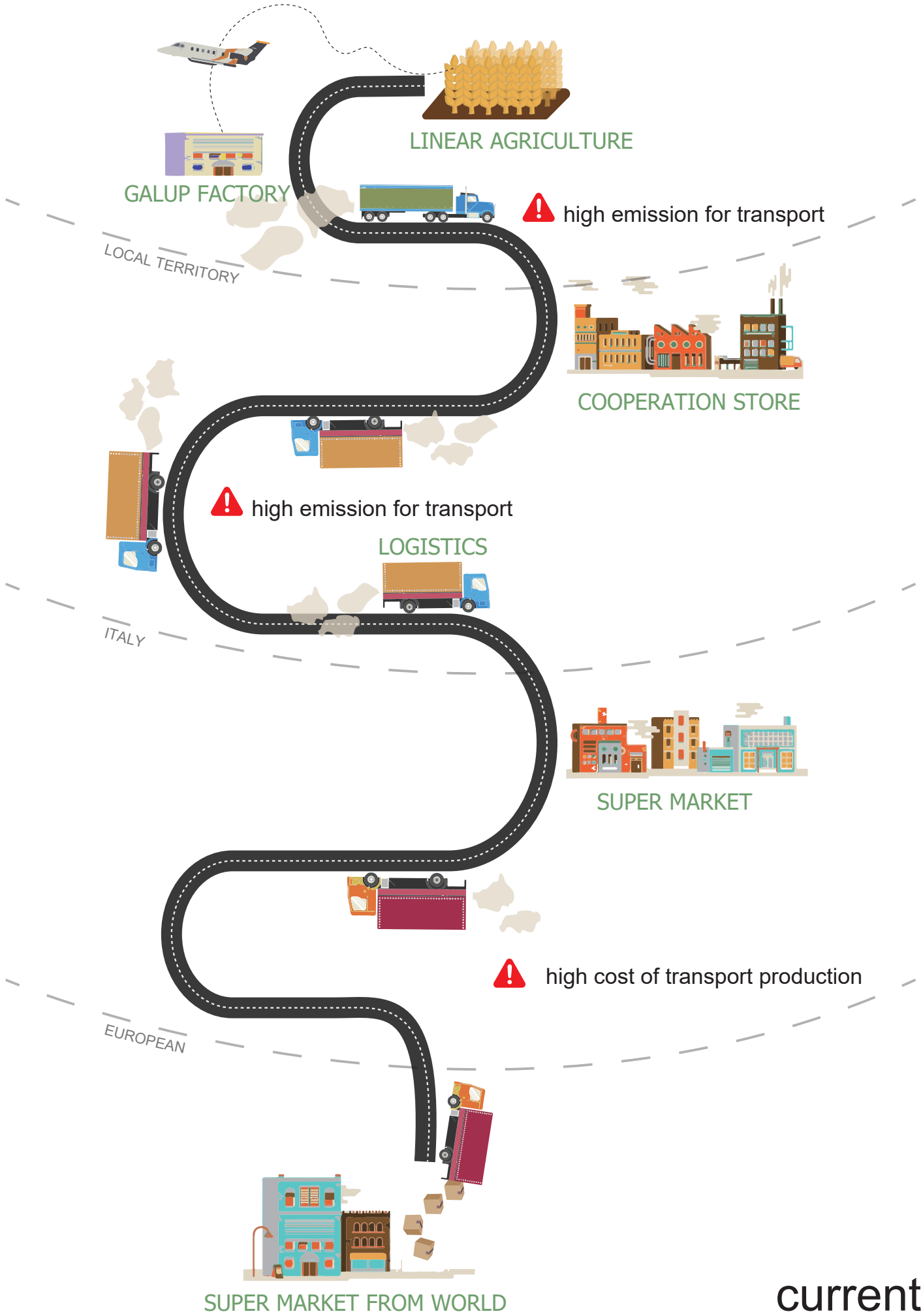
In fact, the key to applying this method is Whether a systematic approach is used, agricultural practices can not only measure by economic means, we must also consider macro system such as territories and products.

However, by improving the quality of all products as a means to increase economic efficiency, it may be lead to pinerolo area profits improved. Importing many products from remote locations into pineloro is changing to localized production, which is also a way to increase economic efficiency. Because it reduces the consumption of transportation distance.

Products resulting from the elimination of chemicals pesticides and fertilizers and low quality species.The new system eliminates chemicals and pesticides and improves product quality.Hazelnut used to be the only source before the local economy ,Income is now not only hazelnut but also corn, wheat, pumpkin and many other different crops.

But their entire existence is beneficial, that is to say, each one of its outputs becomes an input, producing zero waste.

Economic comparison of current and system



current

getting raw material
by their own territory

LOCAL RESOURCES

LOCAL STORE GALUP

low emission of transport

low cost of transport price

LOCAL COOPERATION

LOCAL TERRITORY

system

07

REFERENCE

7 REFERENCE

PEPER & WEBSIDE

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POLITECNICO DI TORINO

2018