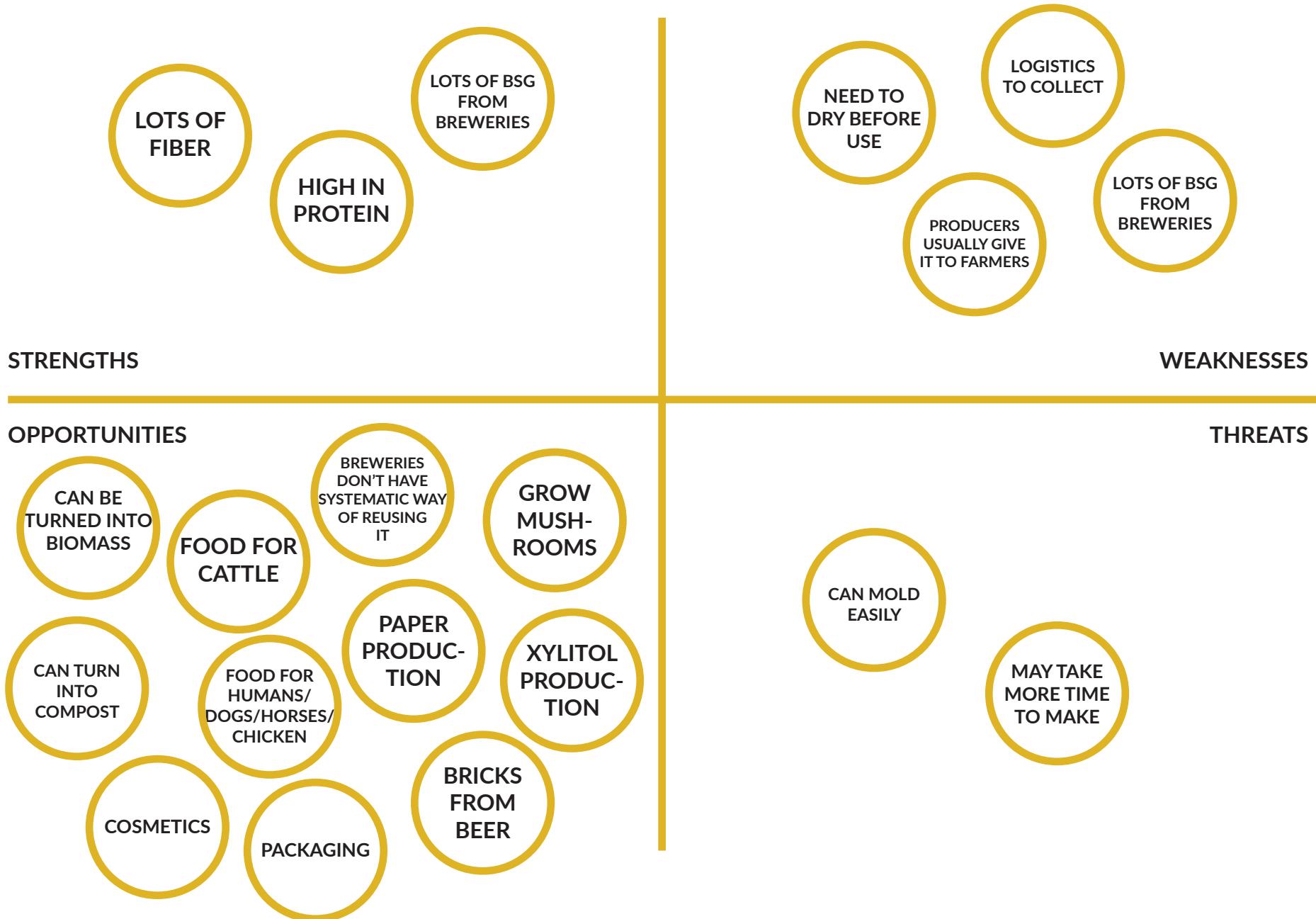


# **BEER SPENT GRAINS**

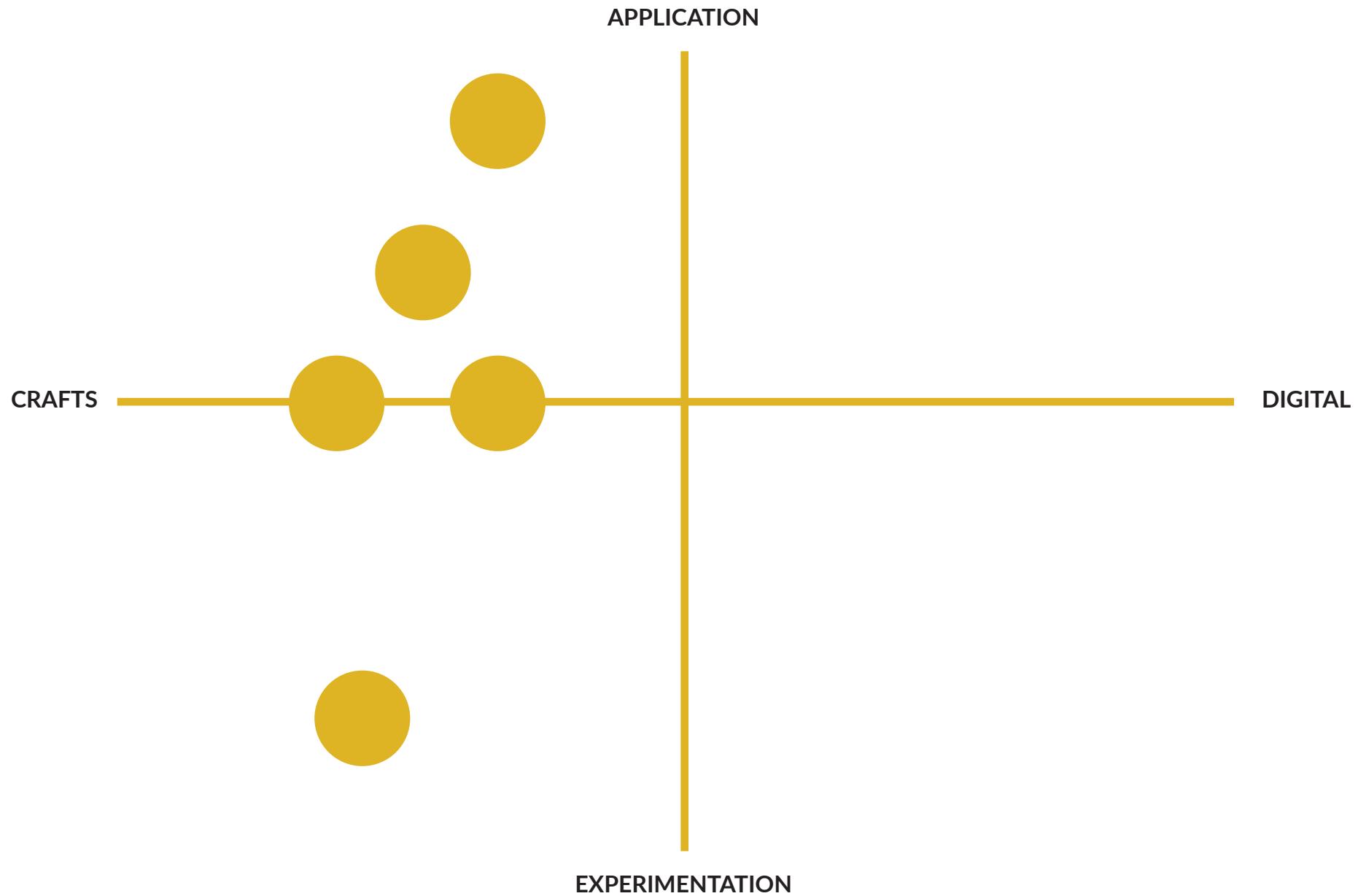
BIOMATERIAL EXPLORATION

ANGEL, AUDREY, GERDA, PAULA B.

# MATERIAL SWOT



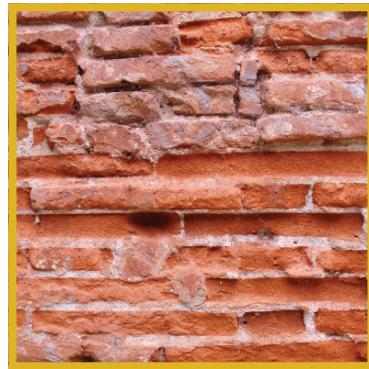
# MATERIAL FEEDBACK



# PROCESS DOCUMENTATION



PACKAGING



BRICKS



PAPER



GROW MUSHROOMS



COSMETICS

## 2. OBJECTIVE OF THE EXPERIMENTATION

ANALIZE THE PROPERTIES AND POSSIBLE APPLICATIONS OF BEER SPENT GRAINS. OUR FIRST EXPLORATION WAS TO TRY AND SEE IF WE CAN DO PAPER MACHÉ WITH THEM. SECONDLY WE WANTED TO TEST HOW IT BEHAVES IN OTHER APPLICATIONS AND RECIPES LIKE WITH AGAR AND WET GRAINS, AGAR AND DRY GRAINS, RESIN AND JUST WATER PAPER AND GRAINS.

## 3. LIST OF MATERIALS



BEER SPENT GRAINS



SOME PAPER & WATER



A TRAY AND SPATULA



MOLDS

#### 4. STEP BY STEP PROCESS



RECOLLECTION



200 GR BSG



GRIND WITH WATER



GRIND WITH PAPER



LAY MIX ON TRAY



SET INTO MOLDS

## 5. PHOTOS OF THE RESULTS



DRY, COARSE



FINE, PINE RESIN



COARSE, RESIN



AGAR, FINE, WET



DRY, FINE, PAPER



AGAR, COARSE, WET



FINE, DRY



COARSE, WET

## **6. OPPORTUNITIES IDENTIFIED DURING THE EXPERIMENTATION.**

WHILE DOING DIFFERENT TECHNIQUES AND RECIPES WE IDENTIFIED THAT THE ONES DONE WITH DRY BSG WERE HOLDING BETTER TOGETHER. IT IS ALSO EASIER TO GRIND THE DRY GRAINS. WHEN MIXING THE BSG WITH PAPER WE REALIZED THAT THE FINAL RESULT WAS FIRMER AND BROKE LESS EASILY.

## **7. CONCLUSIONS OF THE RESULTS ACCORDING TO THE STATED OBJECTIVE.**

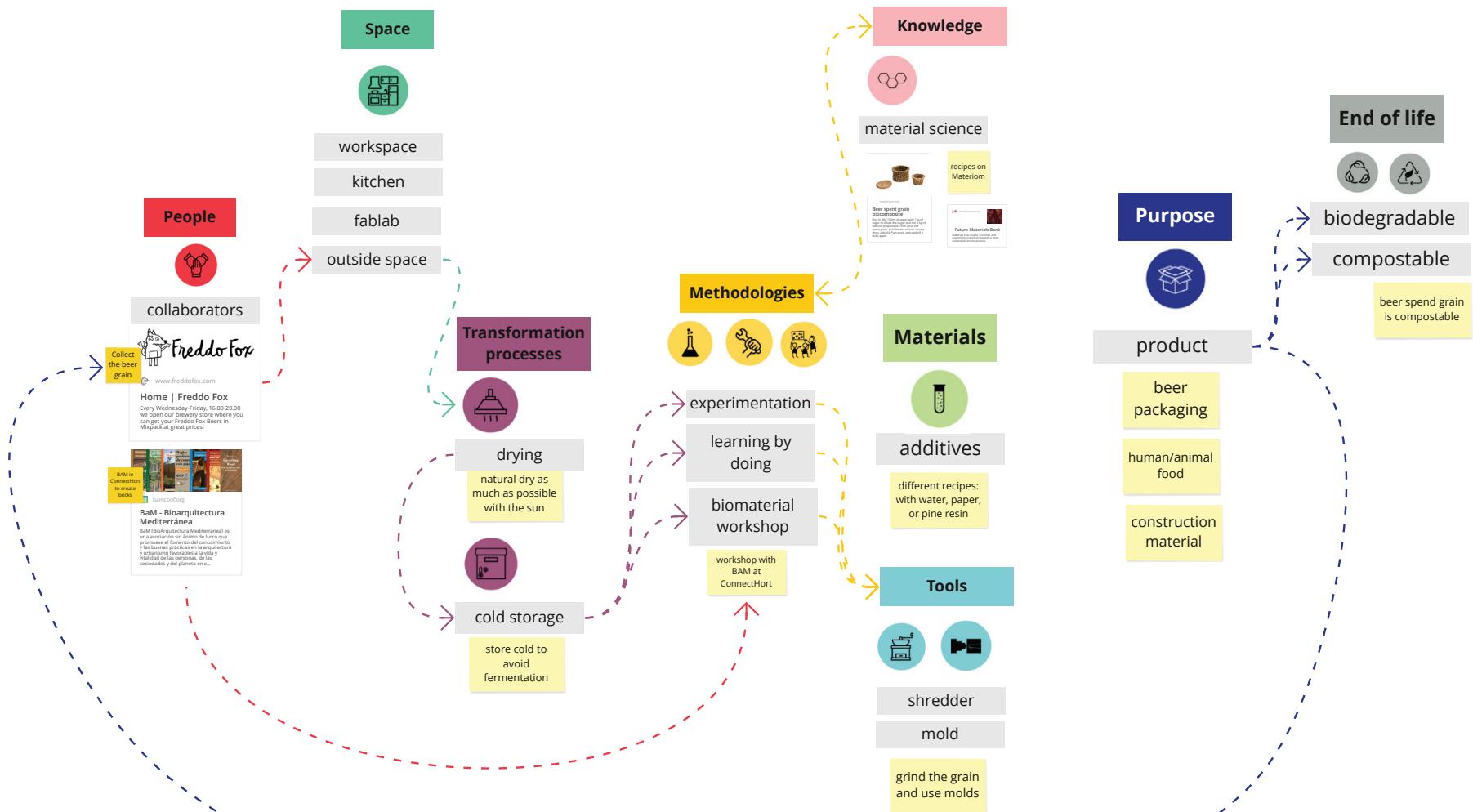
IT IS BETTER TO DRY THE GRAINS BEFORE USING THEM FOR THE BIOMATERIALS. BSG HAS A LOT OF FIBER WHICH HELPS THE BIOMATERIAL HOLD WELL BUT CAN ALSO BE IMPROVED IF ADDING PAPER.

## **8. NEXT STEPS OF THE PROJECT.**

WHILE DISCUSSING OUR FINDINGS, WE CAME TO WONDER IF WE COULD USE RICE WATER TO MAKE THE PAPER STICK BETTER TOGETHER AS IF WE WERE ADDING A SORT OF GLUE. WE ARE GOING TO START TESTING AND SEE IF WE CAN PRODUCE SHEETS OF PAPER TO WRITE ON OR LASER CUT.

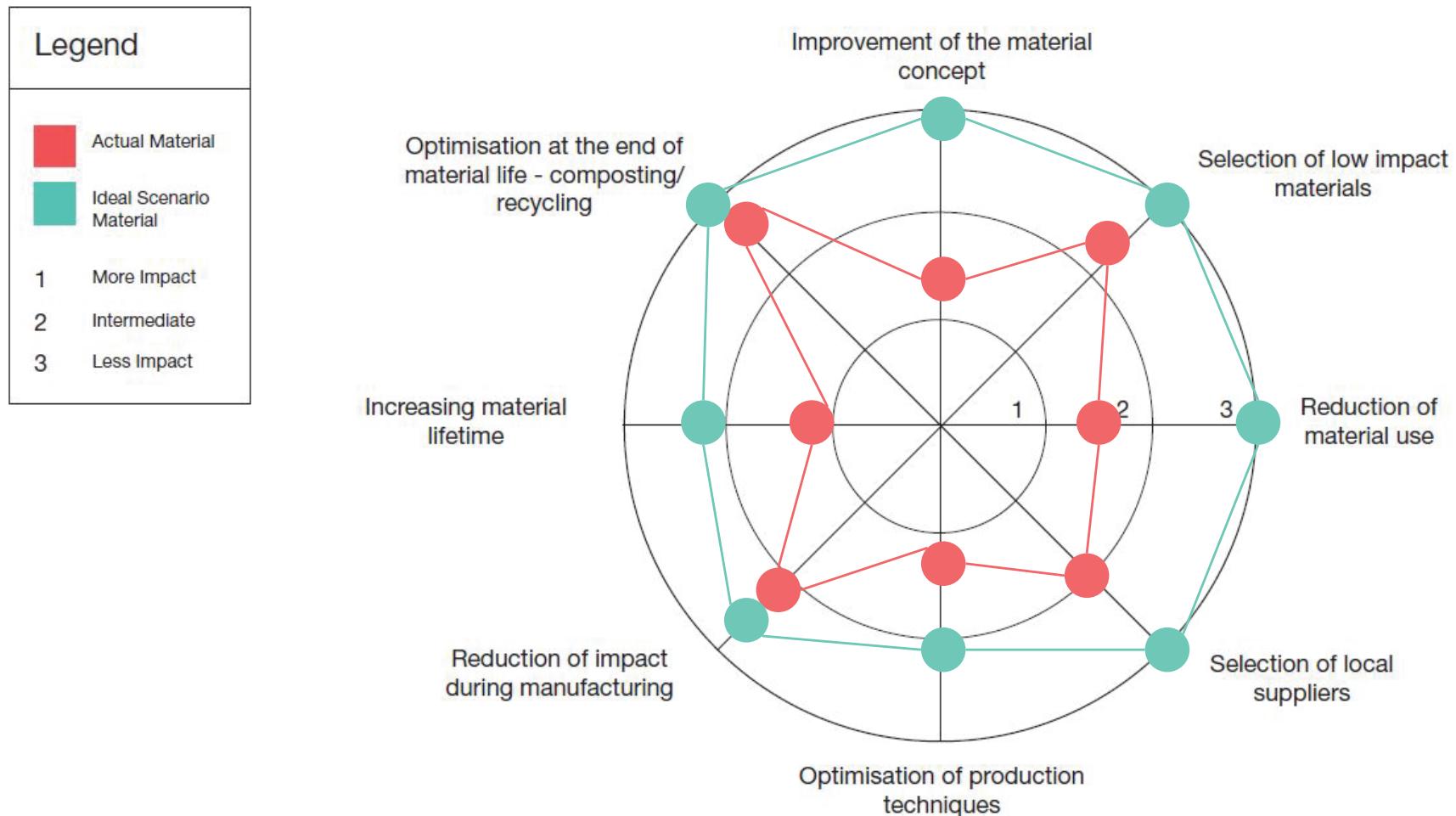
WE ALSO WANT TO EXPERIMENT WITH MYCELIUM AND USE BSG AS A BASE FOR THE MYCELIUM TO GROW AND FIND DIFFERENT APPLICATIONS TO IT.

# MATERIAL LIFECYCLE



# ECODESIGN STRATEGY WHEEL

Assessing the impact of material explorations



# MATERIAL REFLECTIONS

## A) WHERE DOES THE MATERIAL COME FROM? WHICH RESIDUES?

RESIDUE THAT IS LEFT FROM BREWING BEER.

## B) WHY IS THE MATERIAL INTERESTING FROM AN ENVIRONMENTAL, SOCIAL AND ECONOMIC POINT OF VIEW?

RESIDUE THAT IS LEFT FROM BREWING BEER.

## C) WHY DOES YOUR MATERIAL FIT IN A CIRCULAR ECONOMY?

OUR MATERIAL IS THE OUTPUT OF BREWING BEER, WE THEN CAN USE THIS MATERIAL TO CREATE PACKAGING IN WHICH THE BEER CAN BE SOLD. WE CAN ALSO COOK SNACKS FOR THE BAR, CREATE PAPER FOR MARKETING OR OTHER USES. THE MATERIAL THEN CAN BE COMPOSTED EASILY.

## D) MENTION 5 POSSIBLE PRODUCTS WHERE YOUR MATERIAL COULD BE APPLIED.

BEER PACKAGING, BEER PAPER, MYCELLIUM BLOCKS/BRICKS, FOOD FOR HUMANS/ANIMALS, COSMETICS.

## E) IS THE ELABORATING PROCESS OF YOUR MATERIAL SIMILAR TO EXISTING INDUSTRIAL PROCESSES? WHICH ONES?

YES, FOR RECYCLED PAPER THEY HAVE AN INDUSTRIAL PROCESS WITH MACHINES THAT MAKE IT EASIER.

## F) WHAT ARE THE REQUIRED NEXT STEPS TO INDUSTRIALIZE MATERIAL?

TO ORGANIZE THE LOGISTICS FOR THE RECOLLECTION, TO MAKE MORE EFFICIENT THE DRYING PROCESS, STORAGE THAT CAN KEEP IT FROM FERMENTING FAST AND CAN KEEP IT FRESH, MAKE THE GRINDING PROCESS EASIER AND THEN COME UP WITH MOLDS THAT ARE FEASIBLE TO USE WITH THE GRAINS.