D1.2: MINUTES OF THE WORKSHOP AND OTHER RELEVANT DOCUMENTS

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0.1	Version 0.1	30/5/2018	Draft for revision send to Partners
0.2	Version 0.2	31/5/2018	Revision

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TABLES

Executive summary

Changes with respect to the DoA

No changes

Dissemination and uptake

This paper is based on the first Stakeholder Workshop held on 1st March, 2018 in Brussels.

Short Summary of results

The paper describes 1st SUPREMA Workshop 'Needs' where the understanding of the challenges and needs posed to the future development of models and model based support for policy actions was achieved. The focus was on agri-food systems and policies influencing the agri-food system locally, nationally and on a global scale. It deals on the concept and the proceedings of the interactive 1st SUPREMA Workshop 'Needs'. Two objectives were addressed from a policy perspective: We aimed to capture views of stakeholders on the future societal challenges of the Common Agricultural Policy (CAP) and other related policy areas as well as to identify stakeholder needs for model-based analysis (both medium-term until 2030 and long-term until 2050) which may affect the future agri-food system and may require model based policy analysis for an evidence-based decision making.

Evidence of accomplishment

Deliverable D1.2

Glossary / Acronyms

AGMEMOD	AGRICULTURAL MEMBER STATE MODELLING FOR THE EU AND EASTERN EUROPEAN COUNTRIES
AGMIP	AGRICULTURAL MODEL INTERCOMPARISON AND IMPROVEMENT PROJECT
AI	ARTIFICIAL INTELLIGENCE (AI)
BMEL	(GERMAN) FEDERAL MINISTRY OF FOOD AND AGRICULTURE
CAP	COMMON AGRICULTURAL POLICY
CAPRI	COMMON AGRICULTURAL POLICY REGIONALISED IMPACT MODELLING SYSTEM
DG	DIRECTORATE-GENERAL
DG AGRI	DIRECTORATE-GENERAL FOR AGRICULTURE AND RURAL DEVELOPMENT
DG CLIMA	DIRECTORATE-GENERAL FOR CLIMATE ACTION
DG ENV	DIRECTORATE-GENERAL FOR ENVIRONMENT
EC	EUROPEAN COMMISSION
FADN	FARM ACCOUNTANCY DATA NETWORK
FP7	FRAMEWORK PROGRAMME 7
FTA	FREE TRADE AGREEMENT
GDP	GROSS DOMESTIC PRODUCT
GLOBIOM	GLOBAL BIOSPHERE MANAGEMENT MODEL
GTAP	GLOBAL TRADE ANALYSIS PROJECT
IFM-CAP	INDIVIDUAL FARM MODEL FOR. COMMON AGRICULTURAL POLICY ANALYSIS
IFPRI	INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE
IIASA	INTERNATIONAL INSTITUTE FOR APPLIED SYSTEMS ANALYSIS
IMAP	INTEGATED MODELLING PLATFORM FOR AGRO-ECONOMIC COMMODITY AND POLICY
IT	INFORMATION TECHNOLOGY
JRC	JOINT RESEARCH CENTRE

LCA	LIFE CYCLE ASSESSMENT
LDC	LEAST DEVELOPED COUNTRIES
LULUCF	LAND USE, LAND USE CHANGE, FORESTRY
MACSUR	MODELING EUROPEAN AGRICULTURE WITH CLIMATE CHANGE FOR FOOD SECURITY
MAGNET	MODULAR APPLIED GENERAL EQUILIBRIUM TOOL
MITERRA	INTEGRATED NITROGEN IMPACT ASSESSMENT MODEL ON AN EUROPEAN SCALE
MT	MEDIUM TERM
NDC	NATIONALLY DETERMINED CONTRIBUTIONS
NGO	NON-GOVERNMENTAL ORGANIZATION
NTM	NON TRADE MEASURES
NZ	NEW ZEALAND
NGO	NON-GOVERNMENTAL ORGANIZATION
OECD	ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT
PE	PARTIAL EQUILIBRIUM MODEL
SANCO	HEALTH AND CONSUMERS
SDG	SUSTAINABLE DEVELOPMENT GOAL
SLU	SWEDISH UNIVERSITY OF AGRICULTURAL SCIENCES
SUPREMA	SUPPORT FOR POLICY RELEVANT MODELLING OF AGRICULTURE
THUENEN	JOHANN HEINRICH VON THÜNEN INSTITUTE
TRQ	TARIFF RATE QUOTAS
UPM	UNIVERSIDAD POLITÉCNICA DE MADRID
VC	VALUE CHAIN
WP	WORK PACKAGE
WR	WAGENINGEN RESEARCH

1 Introduction

The paper describes the 1st SUPREMA Workshop 'Needs', scope and outcome hereof can to be found in Deliverable D1.1. The aim was to sharpen the understanding of the challenges and needs posed to future development of models and model-based support for policy actions. The focus is on the area of agri-food systems and policies influencing the agri-food system locally, nationally and at global scale. It establishes perceived requirements to shape the future development of quantitative models so that they can deal better with the challenges and needs for policy support. It also defines priorities for model improvements and model related actions.

The report details the concept and the proceeding of the 1st SUPREMA Workshop 'Needs'. The Workshop "Needs" aimed to capture views of stakeholders on the future societal challenges of the Common Agricultural Policy (CAP) and other related policy areas as well as to identify stakeholder needs for model-based analyses (both medium-term until 2030 and long-term until 2050) which may affect future agri-food systems and may require adaptation in model-based policy analyses for an evidence-based decision making.

Prior to the Workshop a number of areas had already been anticipated as likely candidates with respect to required future policy analysis:

(i) climate change and low carbon economy;
(ii) land and water constraints;
(iii) sustainable development goals (SDGs);
(iv) international integration of the agri-food sectors;
(v) integration of agriculture with up- and downstream sectors;
(vi) societal concerns and ethical issues; and
(vii) adoption of new technologies, including remote sensing, robotics and new mitigation technologies related to climate change.

However, stakeholders' perceptions partly differ from the researchers' point of views. Therefore, the report tries to capture their unbiased perspectives. Also current short-comings in impact assessment and desired improvements in applied models to cover better their (future) needs are tackled as well as option to present outcomes in a more understandable way. Carefully attempts to shape stakeholders' view were avoided. Hence, challenges already mentioned by the SUPREMA Partners were also addressed during discussion with the participating stakeholders. It was not an aim to seek for consensus among the participants, but definitely it was a key to clarify different points of views and arguments.

2 Concept of the Workshop “Challenges and Needs”

2.1 Objective

Following the inventory of challenges from the modelers’ perspective the objective of the Stakeholder Workshop “Needs” was organized to get insights into the view of stakeholders with respect to their view on future challenges of the agri-food sector and related policies and to identify stakeholders’ needs for model-based analyses, both in medium-term until 2030 and in long-term until 2050, to support evidence based on policy making. Also current short-comings in impact assessment and desired improvements in models to better cover future needs were emphasized as well as option to present outcomes in a more understandable way. In addition priorities of stakeholders were identified. Not in all cases a consensus among the participants was achieved and also not aimed at because different stakeholders may follow diverging objectives; however different arguments were clarified.

2.2 Participants

In total, about 50 participants respectively organizations were invited to the Workshop. In a first go, lists of 42 designated stakeholder organizations were compiled and were invited per email. If there was no reaction, a second email with a reminder was send. In course of time additional organizations were addressed and persons were also contacted on an individual, bilateral basis to guarantee broad participation which was significant to conduct a successful Workshop. However, in total 36 persons participated, hereof 15 from the Partnership, 6 persons from the External Advisory Board and 15 stakeholders. The Workshop “Need” required participation of each project partner which had been assigned active and passive roles which explains the relatively high participation rates of partners. In contrast, stakeholder participants are in one way or the other active in a policy environment so that their final participation depended on the daily business and no-show numbers are mostly quite high.

Stakeholder participants came preferable from different actor groups along the agro-food supply chains including actors and stakeholders like farmer organisations, industries, NGOs and society, policy makers and public officials, as well as the scientific community. The group of invited persons also includes participants from the Validation Workshop ‘Medium-term development of agri-food markets in EU Member States’ held on February 28, 2018 in Brussels actively contributing to the validation of the Baseline projected by the AGMEMOD model.

2.3 Design of the Workshop “Needs”

The Workshop “Need” was planned as an interactive Workshop with an active participation of each attendee. The design includes the following components:

- Introduction of the project by the SUPREMA partners;
- Round table introduction of the participants;
- Initial statements concerning the topic by the External Advisory Board (EAB);
- Setting the scene by stakeholders: defining of future challenges for agriculture and agri-food systems by writing topics on cards with respect to challenges and needs
    - in the medium-term (up to 2030)

- in the long-term (up to 2050).

Each participant got a set of yellow and green cards (with a maximum of 5 each) to note challenges and needs with regard to the medium-term up to 2030 (yellow) and to long-term up to 2050 (green), and then they were asked to put the cards to two separate flipchart sheets which was done in plenary.

- Interactive session with three parallel expert group discussions on different selected aspects whereas challenges, needs, and shortcomings of the current model outcomes were discussed. Following aspects were grouped under three following headers:
  - Global perspective on
  - climate change and low carbon economy;
  - sustainable development goals (SDGs);
  - land and water constraints;
  - Market and value chain perspective depicting;
  - international integration of agri-food sectors;
  - integration of agriculture with up- and downstream sectors;
  - societal concerns and ethical issues;
  - Farming and supply adaptation comprising;
  - new mitigation technologies related to climate change;
  - adoption of new technologies, including remote sensing, robotics;
  - restrictions in farming related to environmental regulation.

Given that under the Chatham House rules no recording of any part of the Workshop "Needs" were taken, a moderator and a rapporteur were allocated for each discussion group. Rapporteurs took notes of the discussion groups and prepared an overview of the group discussions. Moderators and rapporteurs were given detailed instruction on how to conduct respectively to report on the expert groups.

These expert groups were held in parallel for 60 minutes. Participants of each group were defined prior to the Workshop to avoid choosing of participants. The moderator was supposed

- to ensure the questions are discussed adequately, taking into account the planning of time;
- to facilitate each participant to come-up with contributions (e.g. What is your idea about …),
- to ask and discuss issues that were unclear (e.g. I understood that you want XYZ? Is that correct? Or could you please provide an example?),
- to raise obstacles when needs cannot easily be achieved (e.g. to cover the need we will require data which we currently do not have. Do you have any idea how to deal with it?), and
- to steer the discussion that all questions were covered.

The moderators were asked to act relatively guarded and to minimize their personal interventions.
Questions which were addressed in the discussion were the following:

- Which future challenges do you see in the area of the indicated topic (mentioned above) which will require model based analysis?
- If you need to take a decision what would you need to do that?
- Which shortcomings to do see with respect to already available results?
- What options do you see to overcome obstacles to achieve the required outcomes?

Based on the notes of the rapporteurs, with the help of the moderator and of other participants from the partnership first results of the discussion groups were compiled and put in key words on six flip charts (two per heading). Preliminary wrap-ups of outcomes were shortly presented by the moderators of the expert groups. Afterwards the six flip charts were used as starting points for the running world café.

- Running World Café

Each of the three headers had two flip charts with preliminary outcomes from a stakeholder perspective and again moderators respectively rapporteurs were assigned. The external participants were asked to go from flip chart to flip chart and to provide additional challenges and needs, supplements or comments to the different flip charts and to discuss the topic with others at the flip chart.

- Members of the EAB gave some insights and observations from their perspectives.
- Priorities

Finally stakeholders' priorities were identified. Each participant were handed five points in different colours (assigned to the different headers global, value chain, farming) which they were asked to attribute to issues on the flip charts in order to mark their importance. The points could be allocated individually or aggregated.

3 Proceedings Workshop

3.1 Agenda

Programme

Defining the Needs for future model-based policy analysis of European Agriculture

An interactive stakeholder workshop

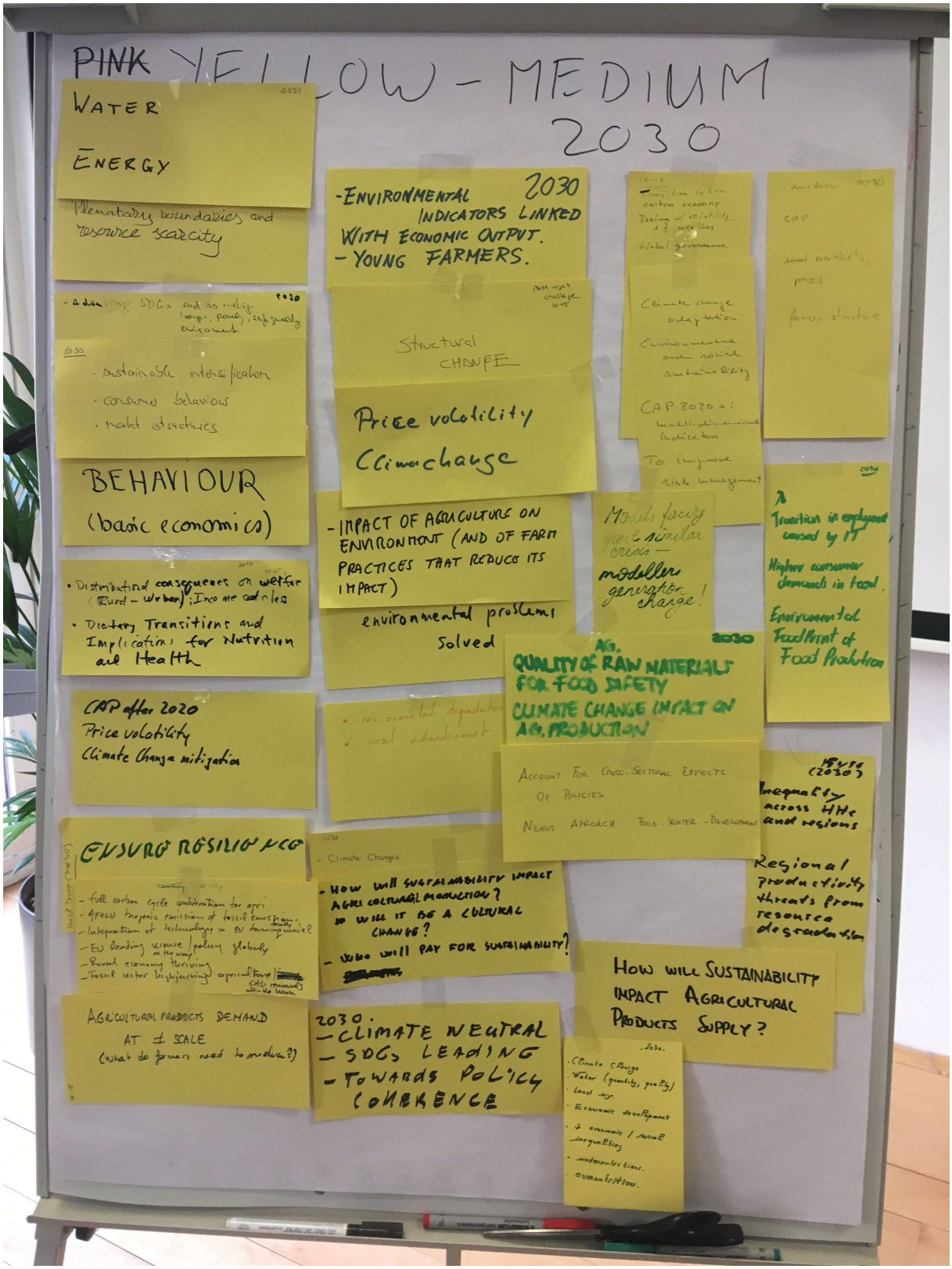
Date: Thursday, 01 March 2018, 10:00 - 15:30

Location: Representation of Lower Saxony to the European Union, Rue Montoyer 61, B-1000 Brussels

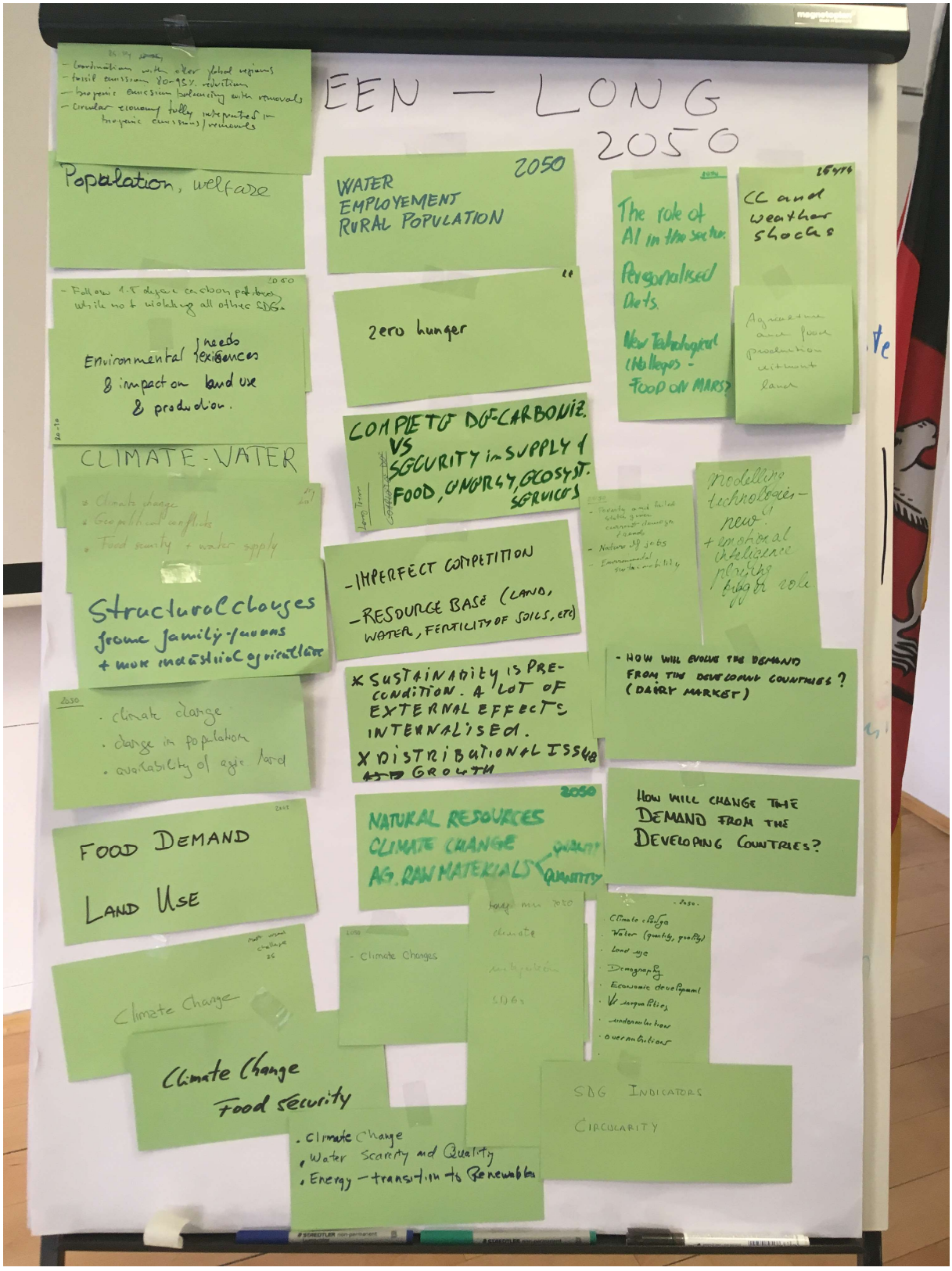
9:30 – 10:00:	Welcome coffee and registration
10:00 – 10:05:	Welcome by the state of Lower Saxony (tbc)
10:05 – 10:15:	Welcome and introduction into the project SUPREMA (Floor Brouwer, executive project coordinator, Wageningen Economic Research)
10:15 – 10:25:	Introducing the 1st SUPREMA Workshop (Petra Salamon, WP1 lead, Thünen Institute)
10:25 – 10:35:	Introducing participants
10:35 – 10:45:	Initial statements to the topic by the External Advisory Board (EAB) (Mark Rosegrant, IFPRI and Dominique van der Mensbrugghe, GTAP Center)
10:45 – 11:00:	Setting the scene – defining of future challenges towards agriculture and food systems (by stakeholders)
11:00 – 12:15:	1st interactive session (3 groups to discuss selected aspects / challenges, needs, and shortcomings)
12:15 – 13:15:	LUNCH BREAK - A sandwich lunch will be offered
13:15 – 13:30:	Wrap-up of the discussion groups on flip charts (in plenary)
13:30 – 14:15:	2nd interactive session (Running World Café with flip charts)
14:15 – 14:35:	Observations by members of the EAB (Alan Matthews, Trinity College and Frank van Tongeren, OECD)
14:35 – 14:50:	Wrap-up by the Partnership of the interactive sessions together with participants (Martin Banse, Thünen Institute)
14:50 – 15:10:	Defining priorities by Stakeholders and response by the SUPREMA Consortium
15:10 – 15:20:	Summary and first conclusions (Hans van Meijl, Wageningen Economic Research)
15:20 – 15:30:	Closing by Floor Brouwer

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 773499 SUPREMA.

3.2 Setting the scene – defining of future challenges towards agriculture and food systems (by stakeholders)



Medium-term challenges until 2030, ©Martin Banse (Thuenen).



Long-term challenges until 2050, ©Martin Banse (Thuenen).

Wrap-up of medium-term and long-term challenges, ©Tania Runge (Thuenen).

3.3 Expert Group Discussions

3.3.1 Global

The expert group "Global" concentrated on the issues with a strong global perspective comprising topics like climate change and low carbon economy, sustainable development goals and constraints in resources like for example land and water. Following questions were addressed and discussed:

- Which future challenges do you see in the area of the indicated topic (mentioned above) which will require model based analysis?
- If you need to take a decision what would you need to do that?
- Which shortcomings do you see with respect to already available results?
- What options do you see to overcome obstacles to achieve the required outcomes?

The following statements reflects the view of stakeholders' participants; however, it may not have been the consensus in the group but it does captures at least single views within the group which may indicate the diversity and the range of topics of interest which might come up later as questions for policy analysis.

Participants mentioned that – on a perspective of 15 years - future projections would be unreliable with respect to trade outcome. Especially in fast growing countries Income growth would be very high and how this growth would translates in food demand and other use is unreliable as the development would be non-linear. Also the future situation in other sectors like in energy and services would be important for the baseline. Participants emphasised that demand based on income projections may be tricky because income distribution and its development will play an important part in future food demand globally. In this context a participant indicated that Japan has developed a simple indicator "food security" which might be worthwhile to consider. Deeper food demand analysis in combination with already mentioned challenges will be key for baselines; similar like the development of the GDP itself.

Participants also discussed that environmental back loops should be taken into account as environmental degradation would have impacts on agriculture and vice versa and would lead to opportunities and constraints. If environmental degradation would be societal unacceptable new or changed legislation would follow imposing constraints on agriculture like e.g. less inputs which would in turn reduce environmental degradation and at the same time would induce benefits for agricultural economy. Hence, those types of feedback loop(s) would be difficult to model. Damage to the environment can affect water, soil, biodiversity which would be needed to be integrated into economic models. It would be good to have such loops already in the baseline, but it might be easier to have them in a scenario. At Member State level, it appears quite fuzzy how developments in certain sectors might be restricted therefore it was considered to be easier done by scenario analysis.

Another view was that environmental restrictions would affect the output and that environmental degradation itself would have a negative impact on economy, e.g. water over-extraction, soil degradation, water pollution. Also climate change feedbacks should be considered which would be very complicated but would be required. In this context it is questionable what the baseline should cover. The example of the Paris agreement (1.5 °C) was raised and asked whether this would be considered in the baseline or in a scenario. For an impact assessment it would be very important whether a full implementation of the legislations would be simulated in the baseline (and otherwise the need for other measures would arise) and whether legislation would be implemented as binding or as non-binding. The topic low carbon economy was mentioned and how it would affect the sector also in connection - from a policy point of view – with the biofuel and the bioenergy issue.

From a decision perspective it was regarded necessary to zoom into the topic of global ramifications of increased European standards in production and processing which may lead to more trade or may act as trade barriers. Within the EU, the CAP would compensate for higher standards in raw material production. With respect to SDGs demographic issue in Africa were discussed.

In the case of trade agreements sustainability aspects should be addressed more deeply. Participants saw that societal demand would exist for healthy food but whether this is equivalent to sustainable food was discussed. There was a perception of "pesticide polluted" food produced outside the EU which might induce a "snowball effect" of increased societal worries outside the EU.

Participants stated that to their mind policy should be about people and that subsidies could have opposing effects by hampering people as sometimes subsidies are (too) simplistic constructed in respect to targeting and tailoring. Researchers and policy makers should be more active and should additional approaches like carbon tariffs, carbon taxes and international pricing of carbon.

Some participants perceive trade policies would only provide limited options with regard to bilateral agreements therefore multilateral approached should be pursued. Others stated that food security would be strongly influenced via non-tariff barriers on trade flows.

Weaknesses and shortcomings of models for current policy decisions are seen in a limited reflection of demand dimensions in the models as well as in data unavailability and data limitations.

Participants pointed out that agricultural trade should reflect better empirical results. If outcomes were unreliable it might be a better option to ignore those outcomes and to turn – instead - to qualitative analysis often provided from consultants. To revise parameter estimates to achieve better fitting results might be a long way to go.

Participants presumed an implementation of the Paris agreement would have greater impact than any trade agreement and would affect also trade balances.

Needed improvements were seen by participants also in the area of land use in general. Rural abandonment in Europe and outside of Europe should be better explained. Also issues like land use in competing sectors, land withdrawal and urban sprawl on agriculture land and maintenance of traditional landscape should be tackled in a more detailed way. Also changes in policies in a kind of non-intervention direction which could lead to a more sustainable land use where not all hectares would need to have a function. But some functions are exclusive and should not be hampered. Yet another issue discussed was to provide insights where the land for massive growth of biomass would be planted. Also the loss of certain habitats, not only forests, where discussed while currently the EU protects "man-made" habitats (keep them managed) which would contrast positions of other countries.

Several contributions dealt with climate change and climate mitigation. Here the interaction between growth and climate change were addressed and that growth would be still more relevant at policy level driven by e.g. fear of "slowdown of growth". Insights were required in "quasi competing " versus "complementary activities". Mitigation should be analysed more, but not on aggregated level with models for trade agreements. Also reductions of GHG emissions from livestock should be studied more whereas marginal improvements may already have significant effects. Harmonizing rules for investment upfront was also discussed as helping climate change mitigation.

Participants saw it as relevant to do model adaptations with respect to water to allow studying effects like, e.g. change to less water intensive crops or to withdrawal more water. In this context a better link

between hydrological and economic model(s) was asked for. Participants requested to handle spatial issue of water like water basins, like for example in Morocco which would be very data intensive. Issues of water quality and water quantity were regarded as key as well as modelling water markets.

Some model specific problems were mentioned: like the estimation or calibration of certain model parameters, e.g. if new technologies, new products, new policies, new activities should be integrated cannot be observed or the resolution of models.

In the view of the participants a number of topics are implemented only partly, not satisfactorily or not at all:

- Population developments, migration rates and changes, demography;
- Models should go far beyond the representation of the agricultural sector to cover, e.g. employment;
- Distributional issues and 2nd pillar measures;
- Loss in social capital (demographic in regions and movements of people);
- Representation of biodiversity in models;
- SDGs' role which have very big mandate and would require to study sustainability across different topics;
- Deeper environmental analysis;
- Regional equity which could be acquired by sharing and sparing (example: actively put policy in place to reduce meat consumption which would allow developing countries to increase meat consumption);
- Lifestyle developments;
- Legal difference of between different types of subsidies to derive whether they are crop specific or not with respect to WTO
- Input – output database
- The use of pesticides which could make use of a huge monitoring network where as a concentration should be on hot spots and less on modelling flows
- Interaction between economists and other experts

With respect to the long-term horizon it was deeply discussed what long-term would mean and should be modelled with respect to long-term. 2050 should reflect more strategic developments and should be used more for strategic communication, whereas a desired future should be checked for consistency by model results. With time horizon of 2020 many impacts would lag behind while when shocks would be implemented today effects could be considered in the year 2030 or 2050. Whether SDGs should be considered the long term or in 2030 was an open topic. Additionally there was a debate if long-term would not better be regarded in 2070. For low carbon economy, a development path was discussed between 2030 and 2050. However, it was unclear whether climate change would not be required to the reflected not only in scenarios but in the baseline as well or only in explorative scenarios. Until new geopolitical conflicts would pop-up and it is unclear how they can be modelled. Different SSP would be inconsistent with real world. Participants also presumed that diets and health would change dramatically until 2050. In all, medium and long-terms simulations would be needed. But a circular economy would require not the business as usual options but thinking out of the box. In this context, the focus should be on the global level and models would be made fit enough to take on board technology transfers from developed countries to developing countries, additional migration or increasing productivity. Technology diffusion in models would be technology dependent. To reflect (international) share efficient technologies in contrast to trade options would require that trade

models could start new manufacturing sectors; new productions or new trade flows from zero and also to cover imperfect competition. The question was raised how the models could deal with to major shocks and changes in the dynamics of the systems as only average price responsiveness is represented. Also a conversion of "unused" land to agricultural land and the switch from forestation to deforestation and the other way round should be implemented in models for future use. Participants would also like to see economic impacts of biodiversity degradation.

3.3.2 Value chain

The expert group "Value Chain" concentrated on the area of markets and value chains depicting in more detail the international integration of agri-food sectors, the integration of agriculture with up- and downstream sectors, as well as societal concerns and ethical issues. Like in the expert group "Global" the following questions were addressed and discussed:

- Which future challenges do you see in the area of "Value Chain" which will require model based analysis?
- If you need to take a decision what would you need to do that?
- Which shortcomings do you see with respect to already available results?
- What options do you see to overcome obstacles to achieve the required outcomes?

Participants stated that models should be prepared to cover on the medium-term (10-15 years) the following issues:

- Productivity should be covered in entire value chain and not only in the primary sector;
- Qualified labour would be or would become a topic in future in developed countries as well as the transition of employment;
- Models should be prepared for BREXIT and FTAs, RTAs;
- GHG emissions and the soil situation and their imparts would need to be captured;
- Sustainability in the value chain would be asked for by customers (e.g. dairy), which would require additional efforts and accrued cost should be integrated in models at every level of the value chain;
- Food and nutrition would need to be prepared for climate change while most models only have represented agriculture;
- Health issues;
- In addition, competition between biomass and other uses than food and feed should be analysed by going beyond the agricultural sector;
- Major challenges would be seen data availability and data quality. It would be important for developing strategic plans under the new CAP. Especially the use of FADN data should be improved;
- Use of antibiotics challenges to reduce it and developments in microbe-resistance would have impacts on markets and models should reflect on them;
- Consumers would ask increasingly for shorter and local value chains;
- Strong structural changes in agriculture and processing (induced by new technologies, innovations, digitising, generational renewable at farms) would be expected which cannot be covered by models yet; especially as it would be unclear what would drive those structural changes.

On the medium-term participants perceived the following risks:

- BREXIT specifically and trade agreements in general would have a huge influence on the value change;
- Weather circumstances and extreme weather events like droughts (also influenced by climate change) could have big impacts on yields and shorten supply for the value chains;
- Increasing lack of cooperation between countries and groups of people (BREXIT is a symptom) with the growing risk of trade wars and dispersion of technological changes hampered;
- Private entities could take over the role of public entities inducing more technological changes;
- Renationalization of food supply with regional food production systems although there is no evidence this would be more sustainable;
- Climate changes and it emphasis on dairy trade was mentioned as well;
- Feedback loops could have mitigating effects, but also enhancing effects. The question was raised what changes in technologies could be done for the climate and what it would mean for productivity.

To tackle these challenges and risks models should focus under limited resources on

- On items on which they have ideas and not on items where they have no clue about;
- Depict results in a way so that people understand what the result means;
- Concentrate on resource degradation in quantity and quality;
- Distributional aspect with respect to food security because if the situation looks globally good it does not mean it is everywhere good thus it should be ensured production is dispersed and not just concentrated;
- Implement linkages between several models (so that models start to speak to each other)
- Improve communicate to policy makers in a harmonized and easy understandable way as often results are not understood, additionally model results should be coherent (not one model for biofuels and one for agricultural production). Policy makers should have clear ideas where result differences come from. Therefore it is Important that model results are understandable. If policy makers, companies and media do not understand outcomes of model simulations their policy relevance might be limited or counteracting. With respect to communication, modelers should focus
- On what the input is, how the model works, and how the results are achieved;
- When new policy issue are discussed new studies should be conducted but taking into account work already been done;
- Improve credibility of model so that model results are independent from the researchers doing the analysis (outcome should not depend on who does the analysis using the same data);
- Should provide logical explanations for model results;
- In presenting outcomes a balance needs to be stroked between straightforwardness/simplicity and coverage of relevant issues;
- Provide a rich depth in detail depending on the research question (coverage of new technology, reality is much more complex than modelling one region, one farmer is not like the other farmer);

- Future values of exogenous variables put in models should be quite sure (e.g. environmental restrictions are fixed, but future exchange rate are very uncertain and should be only used in scenarios), out of e.g. 20 factors, in the end only 3 are used to do projections because others are too uncertain. Policy makers and other decision makers need to anticipate uncertainties
- Basic economics should be correctly inserted in the models so that maybe complex model need to give a simple message otherwise the public will lose interest; however, most decisions are taken under a lot of uncertainties. To communicate uncertainties to policy makers is not primarily a modelling question but way of communication, therefore packages are required to deal with uncertainties;
- Determine which model to use for what research question;
- Focus on the CAP and CAP reforms which intend to go more on local or farm levels (on the supply side).

If one looks more than 20 to 30 years ahead a number of changes would come additionally like increasing uncertainties due to more choices, growing white noise. Scenario should reflect more of different worlds, requiring to think out of the box and to provide more foresights. Participant mentioned it might make more sense not to conduct scenario analysis in models but to bring together people with room for imagination, doing more of a brainstorming. It would be more like a joint foresight and storytelling activity than modelling. Others rejected the opinion especially models would fulfil the task described. Also in this contest communication was seen as important. Other aspects mentioned and discussed by participants were:

- Change in priorities of the society could affect basic interactions between inputs and outputs, sectors, drivers which, then, are not reflected model results. Thus longer time scales would need more reflection how the society should shaped in future and by which policy design that aim could achieved accordingly. Models could be useful to assess different future societies but it would be a long time frame to go there. Policies have the opportunities and the obligation to adjust certain things year by year or decade by decade.
- Human brainstorming could be replaced by machine brainstorming in the future. Participants presumed that there would be more data in the future; but machine would be better equipped or better tools to analyze the processes involved.
- On the long-term models would be extremely important and strong tools for quantifying the storytelling => here models are strong
- On the long-run feedback loops between agriculture impact on resources and climate change on one hand and on the other hand impacts of resources and climate change on agriculture would be required.

As an important shortcoming, insufficient communication between modelers, policy makers, decision makers, and the media have been discussed in detail. Another divergent topic participants mentioned was whether models need to align their outcomes or not. Some expressed their opinion that convergence would only be good if a mistake would have been discovered but “an outlier” would be not necessarily wrong because other models show different results. Models should not be “unified” but consistent with respect to basic parameters and assumptions. Other participant rejected the idea of a one and only true model by using the same parameters. Models should start at least with the same set of assumption e.g. policy representation. One participant saw it as risky to link models because it would remove competition between them. It would be better to use models in parallel and determine which model would be best in a few years. But it would be important to transport the idea that results are uncertainties, some expectations could not be met but e.g. could provide support by showing alternatives. Participants also discussed whether a deeper involvement of the public in the

modelling would be a helpful approach or not, but that might depend on the topic and for who would be the addressee of the model outcomes (policy makers or private companies). Other participants requested transparency and then one could not differentiate between clients. It would also prove to be a challenge between model outcomes for policy makers and those for the public and it would be difficult in the end to bases political decision hereon.

When asked for their wish list when participants receive model results the listed the following items:

- Write result in one page with an extended appendix giving detail;
- Improve communication of results by provision of a coherent story covering all results;
- Impact analysis of trade agreements at member state level and for specific sectors;
- Plug-in a "Google translator" so that all can have access to the non-English studies in English (with main results) and no duplicate research would be done;
- Conduct impact assessment on regulations and NTMs and reflect impacts on environment and health, provide assessments on Pillar 2 measures;
- Models optimize in economic way but should cover other dimensions as well e.g. risk, social dimensions.

3.3.3 Farming

The expert group "Farming" concentrated on the area farming and supply adaptation comprising new mitigation technologies related to climate change; adoption of new technologies, including remote sensing, robotics; restrictions in farming related to environmental regulation. Like in the expert group "Global" the following questions were addressed and discussed:

- Which future challenges do you see in the area of "Value Chain" which will require model based analysis?
- If you need to take a decision what would you need to do that?
- Which shortcomings do you see with respect to already available results?
- What options do you see to overcome obstacles to achieve the required outcomes?

Participants perceived the following issues as challenges:

- Modelling of farm practices and farmers behavior which may change with farmers' education;
- Adoption of new technologies, e.g. block chain technologies into account; incorporating educational levels of farmers into technological adoption
- Endogenisation of technological change (not only adoption but also development of new technologies as response to policy or markets);
- Minimization of resource inputs;
- Modeling of public goods like animal welfare, food safety, needs with respect to societal and cultural changes in the whole supply chain and related to those an adaption to consumers' needs (organic products, animal welfare);
- Need to move from markets to farms and even beyond to farming systems and from prices and quantities (profit maximizing) to practices and sustainability (driven by farmer behavior and some other maximization objective function);
- Covering all three dimensions of sustainability (ecological, economic and social);
- Introducing of the "culture" of sustainability into the modelling (both in terms of product differentiation and consumer demand);

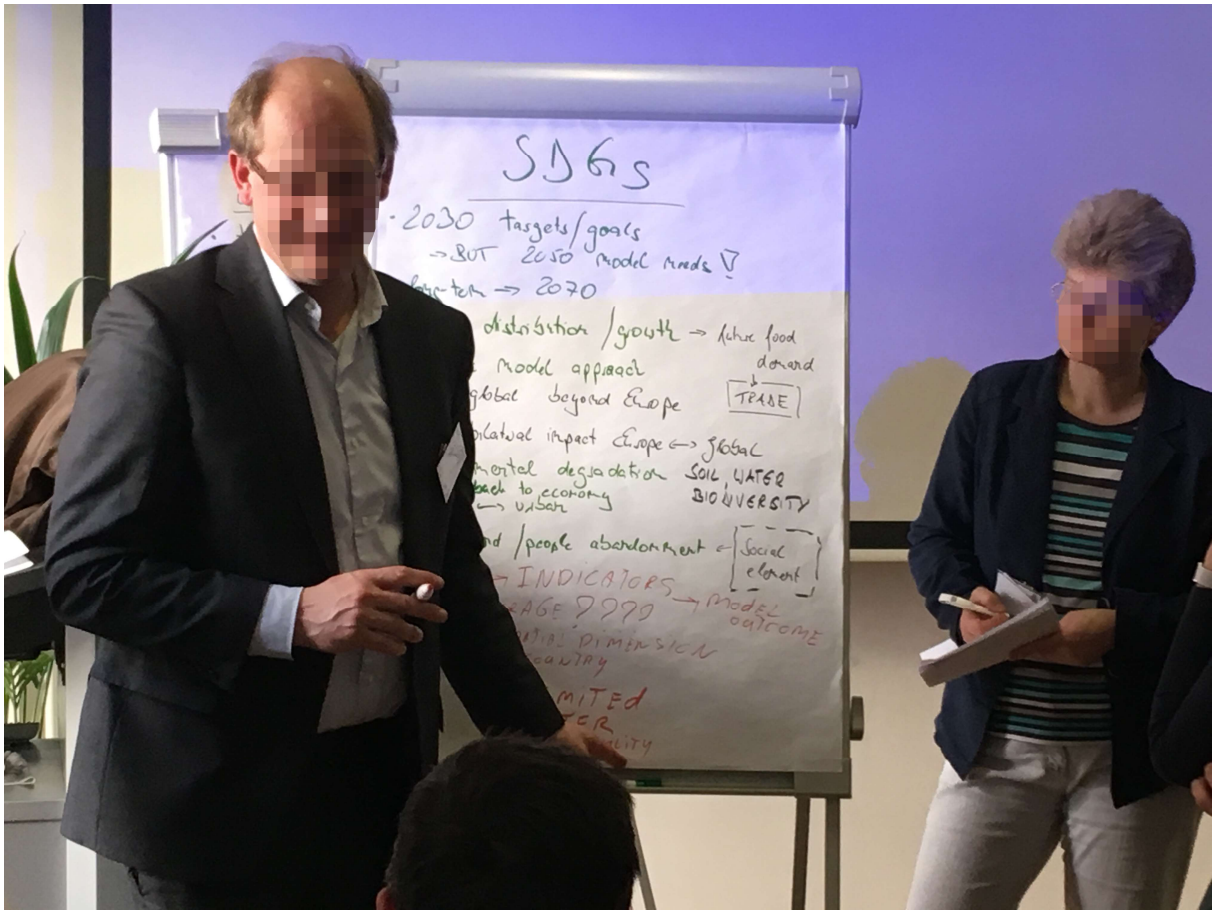
- Who will pay for public goods? (EU-COM, national and international consumers, national governments) Here, the need arises to measure the cost of provision of different public goods and to see who would pay for them. Differentiated costs of provision occur across farm types;
- Differentiated yields by practices (organic, no pesticides, irrigation) and uncertainty how key parameters may change;
- Past trends may not explain the future

Participants saw as the following foci of future model development:

- Modeling of water management, whole carbon cycle, soil management, positive externalities
- Need to model whole supply chain and interlinkages as decision unit is no longer the farm, but the whole chain
- Impact of farmers' behavior on environmental goods;
- Better representation of
    - Mitigation techniques;
    - Industrialized farms (large farms), structural change and organization of farms, modelling big farms with respect to production, but all farms with respect to environment;
    - Investments of other sectors in agriculture;
    - Incorporating the persistence of negative income farming (off-farm income);
- Modeling of income differences among farmers;
- Move from modeling the impact of policies to model how farmers adapt to policies which may require new approaches;
- One model or different types of models to answer different questions was considered. Combination of different approaches might also be needed, e.g. models and choice experiments;
- Introduction of market demand for bioenergy;
- Capture the role of market size and impacts on competitiveness via the value chain;
- Distribution of value generation and distribution along the value chain for different products – organic might mean higher prices for farmers, but also additional costs imposed by retail;
- Better reflection of land markets and access to credit, new actors from outside agriculture are active owning increasing parts of agricultural land

3.4 Running World Café

Preliminary outcomes of the expert group discussions reflecting the stakeholder perspective were noted on flip charts by the moderator and the rapporteur of the group. Each of the three groups (global, value chain and farming) had two flip charts each. Then participants were asked to go from flip chart to flip chart and to provide additional challenges and needs, supplements or comments to the different flip charts and to discuss the topic with other participants standing at the flip chart.



Group "Global" ©Martin Banse (Thuenen).

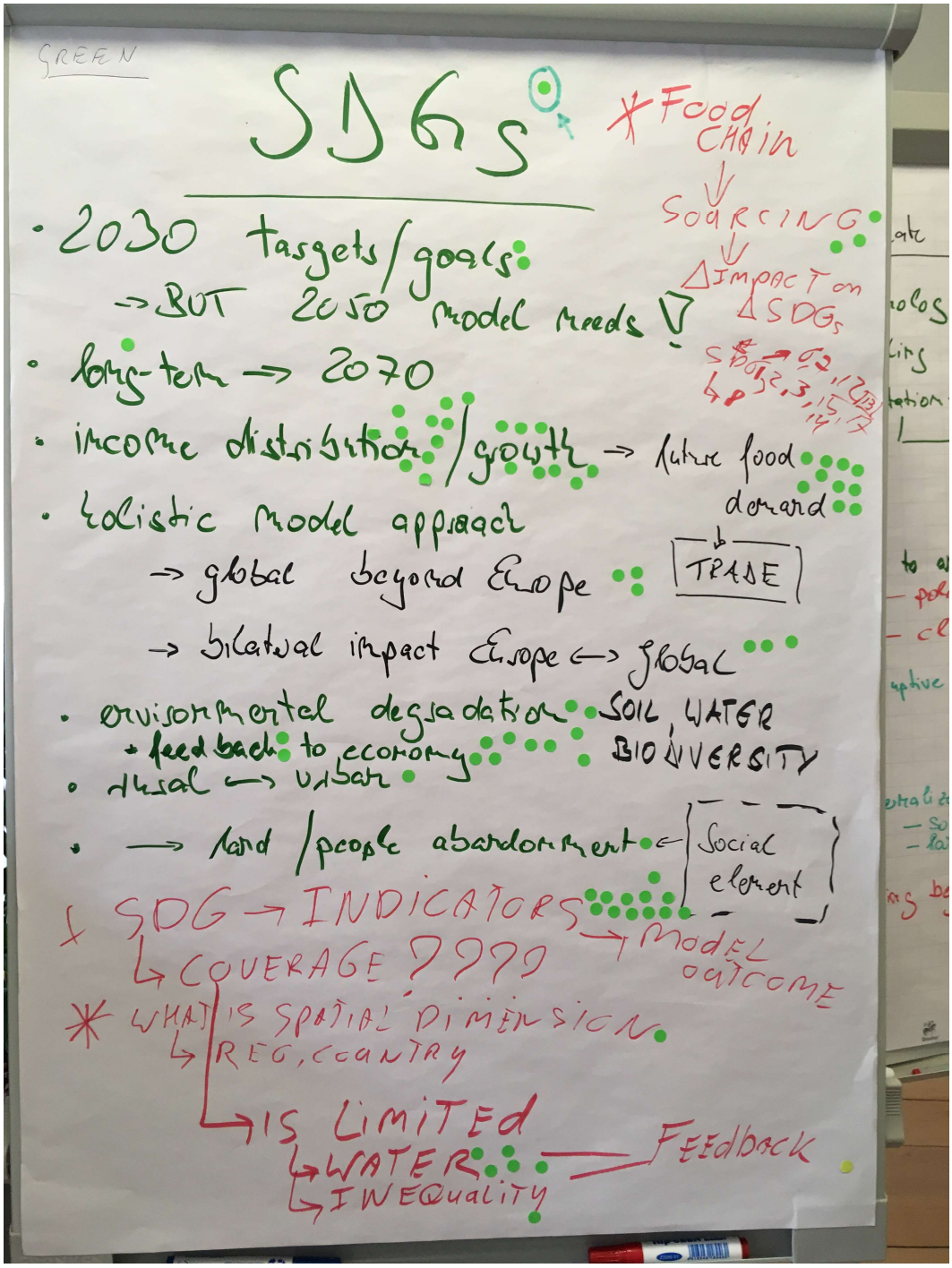
Group “Value chain” ©Tania Runge (Thuenen).

Group “Farming” ©Martin Banse (Thuenen).

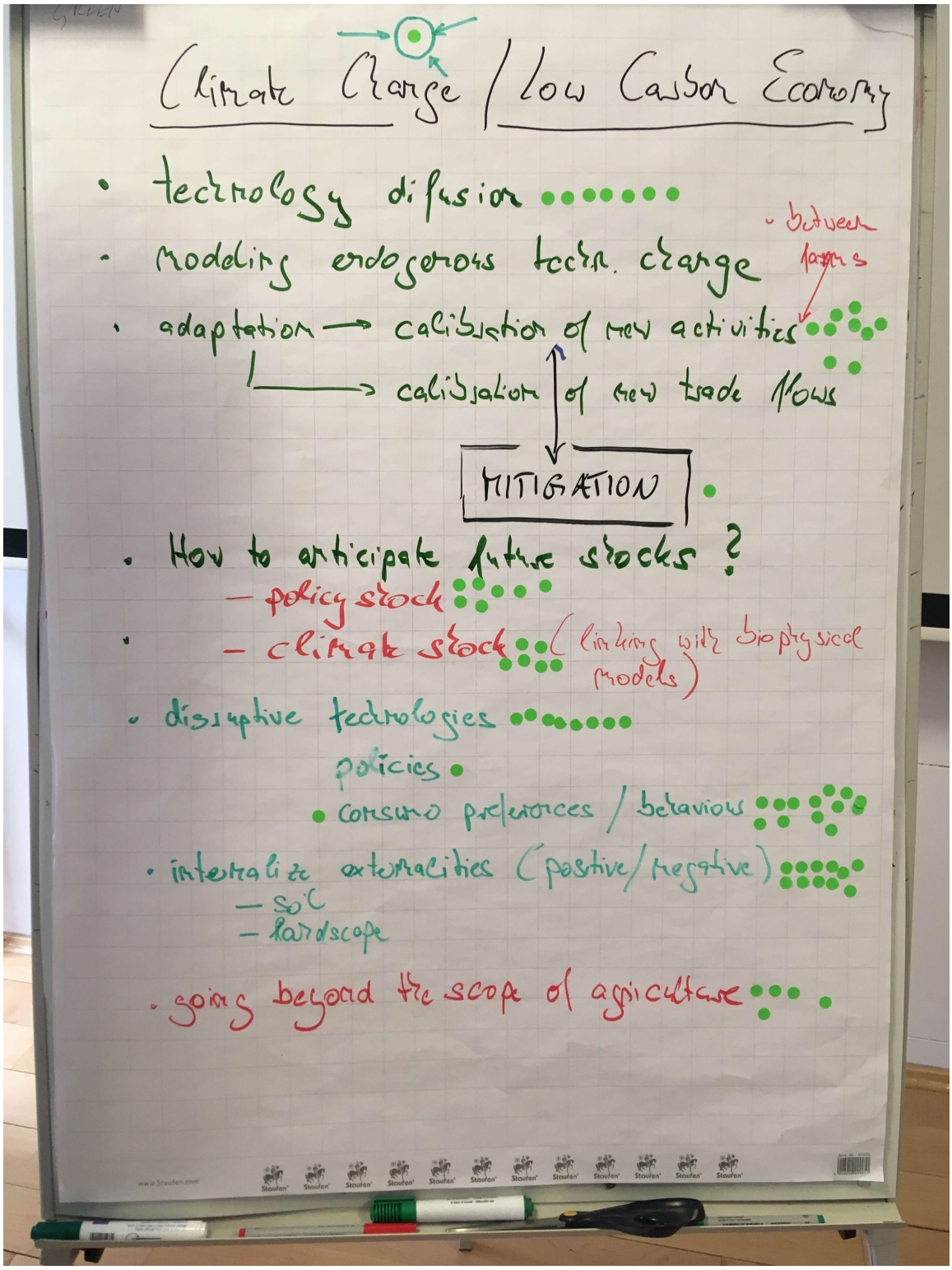
3.5 Priorities

Then stakeholders' priorities were identified. Each participant were handed five points in different colours (assigned to the different headers Global, Value chain, Farming) which they were asked to attribute to issues on the flip charts in order to mark their importance. The points could be allocated individually or aggregated. Outcomes between the different groups cannot be compared as the number of stated topics was quite different.

3.5.1 Group "Global"

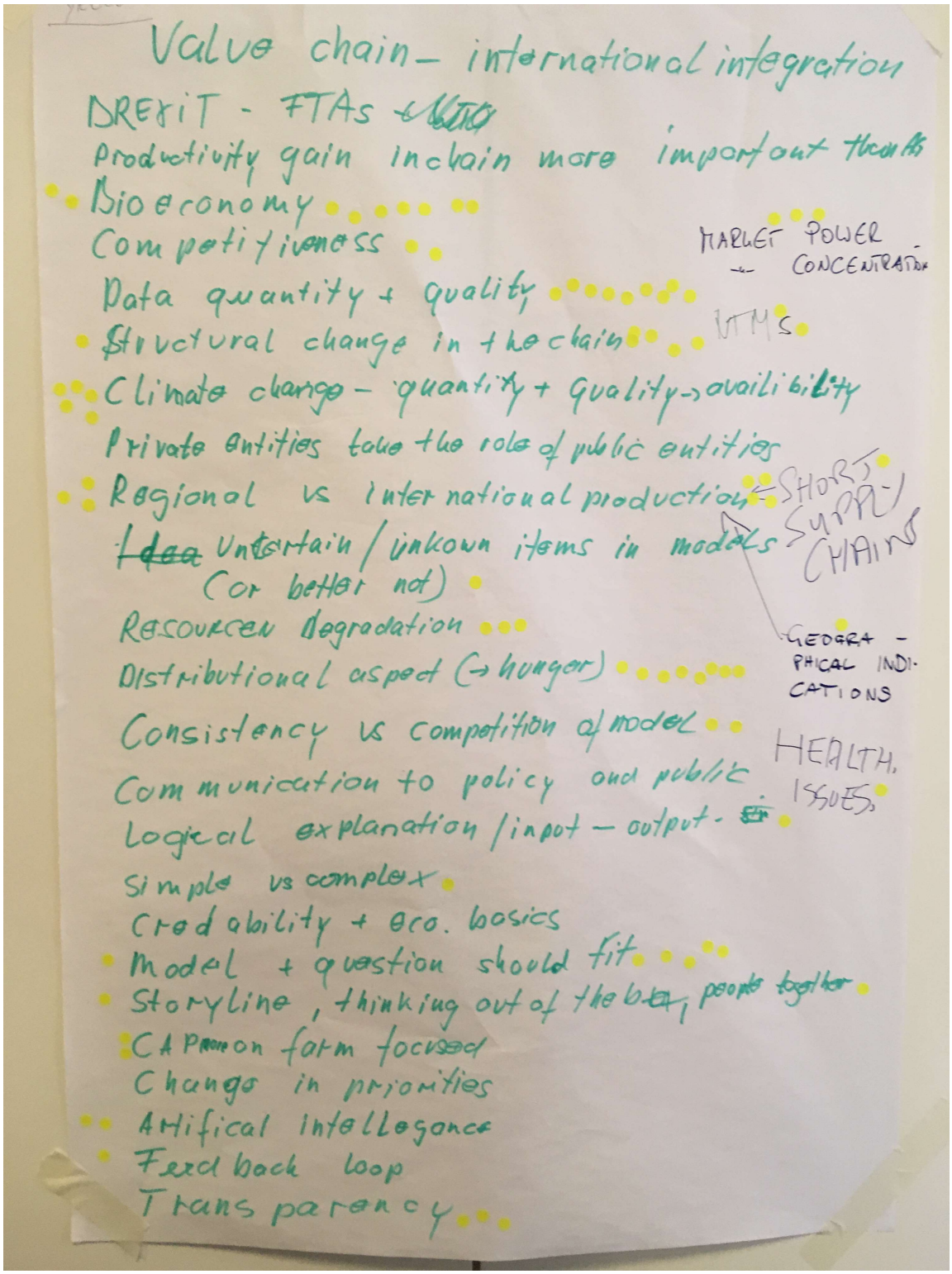


SDGs ©Martin Banse (Thuenen).

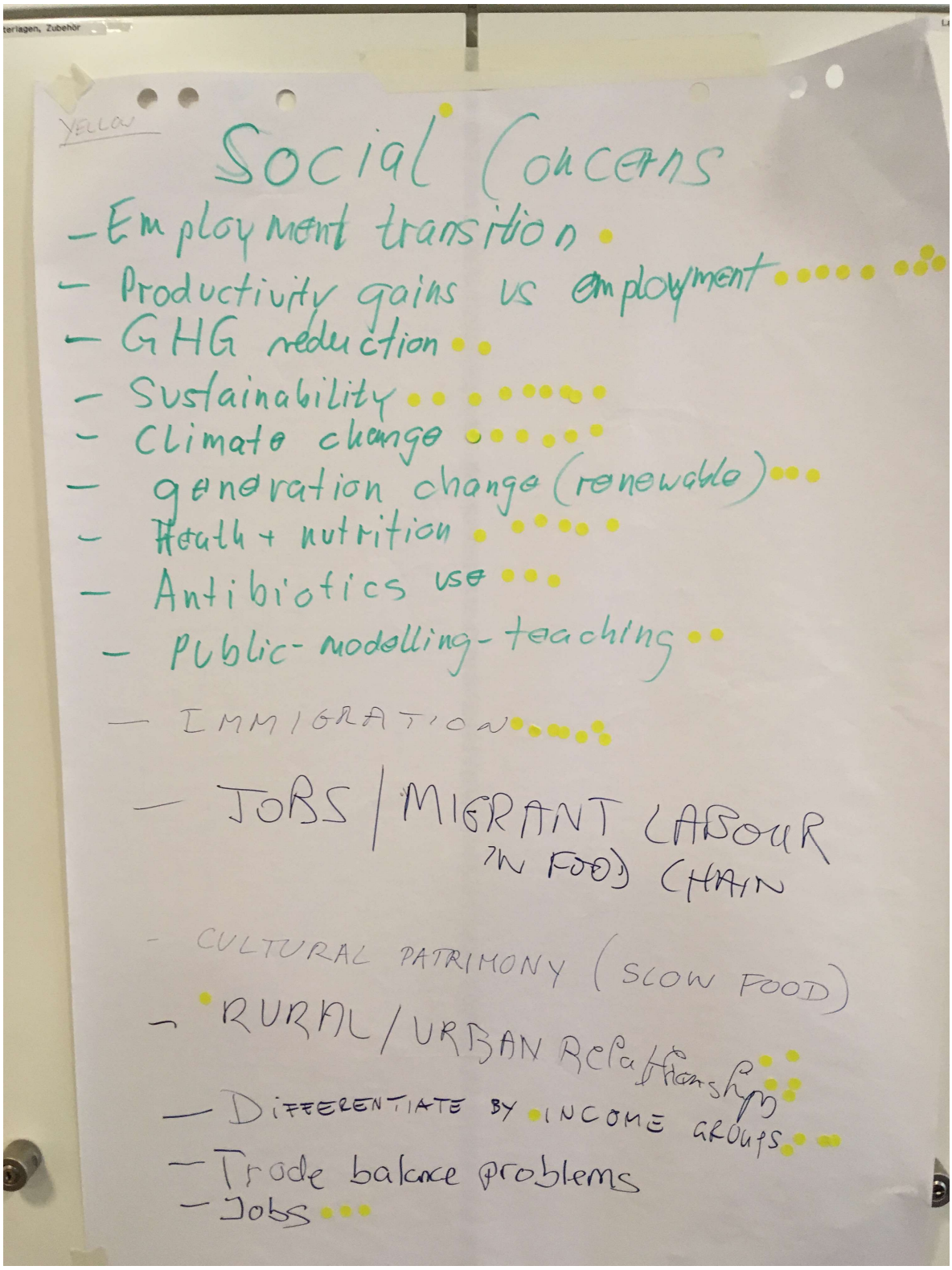


Climate Change, low Carbon Economy ©Martin Banse (Thuenen).

3.5.2 Group “Value Chain”

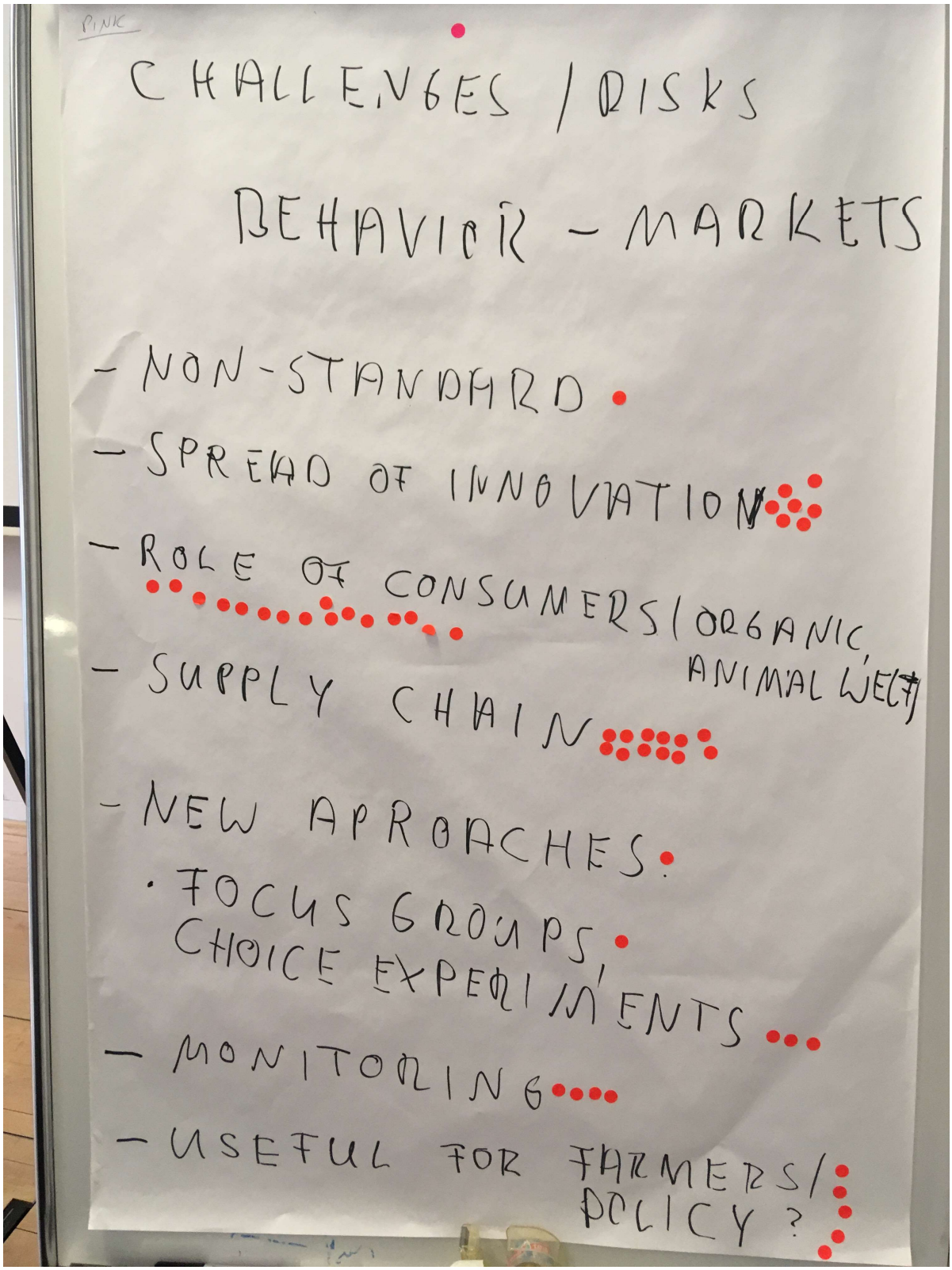


Value chain, international integration ©Martin Banse (Thuenen).

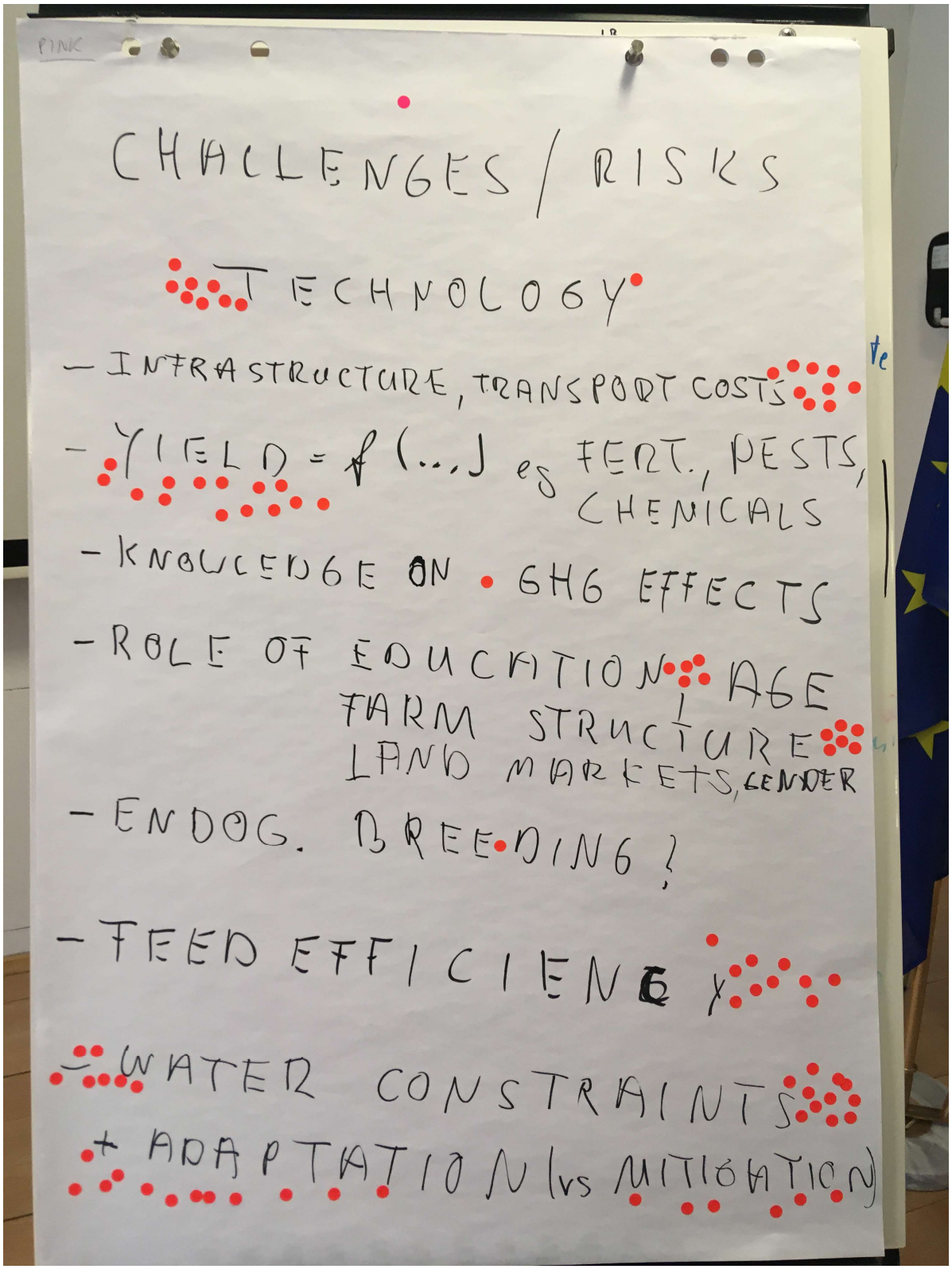


Social Concerns ©Martin Banse (Thuenen).

3.5.3 Group “Farming”



Challenges, Risks: Market - Behaviour ©Martin Banse (Thuenen).



Challenges, Risks: Technology ©Martin Banse (Thuenen).

4 Participant list

Table 1. List of Participating Institutions and Members of the EBA

ORGANISATION	NUMBER OF PERSONS
MAGRAMA	1
BMEL (GERMAN FEDERAL MINISTRY AGRICULTURE)	1
DG AGRI	3
FOODDRINKEUROPE	1
DANISH AGRICULTURE AND FOOD COUNCIL	1
INRA	1
CLAL	2
TRINITY COLLEGE	1
COPA-COGECA	1
DG TRADE	1
DG ENV	1
AKI	1
WWF	1
IFPRI	1
FRENCH LIVESTOCK INSTITUTE	1
DG MARKET	1
GTAP CENTER AT PURDUE UNIVERSITY	1
OECD	1

Table 2. List of Participating SUPREMA Partners

ORGANISATION	NUMBER OF PERSONS
THUENEN	6
DG JRC	3
UNIVERSITY OF MADRID	1
WECR	3
IIASA	1
EUROCARE	1

5 References

- SUPREMA Deliverable 4.1

Appendix A: Information Consent Form for Stakeholder engagement, communication and outreach

Your involvement as a participant is entirely voluntary and you may withdraw your participation at any given time. SUPREMA research includes the involvement of natural persons through participatory events like today's event. With respect to the nature of the activities to be conducted, these will involve group discussions of different sorts. SUPREMA anticipates to provide both immediate and long-term benefits for the involved participants and their associated networks.

To organise it, SUPREMA partners may have collected some **personal data** which could be for instance your name, your professional/personal email address or your professional/personal telephone number (most often from publicly available sources). Furthermore SUPREMA research activities may indirectly result in collecting other personal data information as part of the wider consultation process, e.g. through interviews.

It should be noted that the collection of personal data per se is not the main purpose of SUPREMA, but personal data may be information necessary to the research (e.g. the Member State/region in which you are located) or to carry out mandatory communication activities (e.g. publication of an attendance list). As part of the research project, we will need to be able to attribute your position/view to the organisation you are representing or to you as an independent expert - depending on what capacity you have been invited to contribute to this event.

If you do not wish your contact details to be made available to other participants, please let the event organiser know in advance.

During this event, **photos and/or videos** may be taken to contribute to the communication objectives of this Horizon 2020 research project. During the performance of these activities, care will be taken to minimise the potential collection of personal data such as name tags.

The collection and processing (e.g. creating a list of invitees for future events) of any personal data will otherwise remain strictly confidential - unless it is relevant for this study, in which case it will be anonymised, unless specifically discussed and agreed with you in advance.

As a general rule, the SUPREMA team will ensure that all presentations and reports are made available to all of those attending workshops and participating in the research.

Source: SUPREMA Deliverable 4.1