AgriMyths – The Ethics and Economics of Modern Agricultural Myths/ Ethik und Ökonomik moderner Agrarmythen

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In Politik, Öffentlichkeit und Wissenschaft herrscht eine übereinstimmende Vision vor, landwirtschaftliche Produktion an Nachhaltigkeitskriterien auszurichten. Eine wichtige Strategie dafür ist die Transformation zur Bioökonomie. Ein Hindernis für solche nachhaltige Agrarsysteme besteht darin, dass die moralische Engführung öffentlicher und politischer Diskurse über landwirtschaftliche Produktion den Blick auf mögliche Lösungsoptionen verstellen kann („landwirtschaftliche Mythen"). Ein besonders hervorstechendes Beispiel dafür bietet die Gentechnikdebatte. Das Projekt untersucht die Argumente und Positionen zur Gentechnik aus ethischer und (agrar-)ökonomischer Sicht und leistet damit einen wissenschaftlichen Beitrag zur Aufklärung öffentlicher Kommunikationsprozesse, indem es Mythen identifiziert und gesellschaftliche Diskurse stärker auf eine erfolgreiche Umsetzung des Anliegens nachhaltiger Entwicklung ausrichtet.

I. Project Parameters

1. Topic, open question and purpose

Genetically modified foods (GM foods) have long been the topic of an emotionalized controversial public discourse. Likely, this discourse heavily contributed to the stable and strong resistance of the public against such foods. This public resistance is striking, since the scientific community generally approves GM foods. The debate is framed not only by extraordinarily rigid mental models (i.e. myths) but also by moral semantics. For these reasons, the assessment of risks and benefits of such biotechnological innovations seems to remain particularly impervious to scientific evidence. The project contributes to rationalizing these debates by combining the tools of ethical and economic analysis. The goal is to better understand the underlying moral drivers of the debating parties. Then, through linking the prevalent positions in the discourse to moral values, recommendations for enhancing public discourses on biotechnologies can be deduced.

Bringing together different disciplines, such as ethics, economics and moral psychology, the *AgriMyths* project is highly interdisciplinary: We use diverse analytical tools, e.g. quantitative

statistical analyses and qualitative text analyses, to understand conflicts and disentangle participant´s underlying debating strategies, motives and value conflicts. The knowledge gained from these analyses helps us to discover the underlying normative claims and resulting moral conflicts. Through understanding these moral conflicts and the driving values that discourse participants pursue, we can develop strategies which help both to identify and implement win-win potentials that benefit all of society.

So far, acceptance of technologies mainly has been investigated using experiments and quantitative analyses of consumers. In contrast, using qualitative methods to analyze the public discourse in the media is a fairly new and innovative approach, both regarding the methodology as well as regarding the analyzed group. An additional innovative feature of the project is to investigate underlying mechanisms of GMO opposition with a focus on moral values and related emotions such as anger, fear and disgust. Previous studies have already addressed the question of how to improve communication about the benefits of GE foods (e.g. Siegrist, Sütterlin, Hartmann 2017). However, to our knowledge, none of them had a closer look into potentially underlying moral convictions that guide attitude.

2. Interdisciplinarity of the project

Bringing together different disciplines, such as ethics, economics and moral psychology, the *AgriMyths* project is highly interdisciplinary: We use diverse analytical tools, e.g. microeconomic analyses as well as qualitative text analyses, to understand conflicts and disentangle participant´s underlying debating strategies, motives and value conflicts. The knowledge gained from these analyses helps us to discover the underlying normative claims and resulting moral conflicts. Through understanding these moral conflicts and the driving values that discourse participants pursue, we can develop strategies which help both to identify and implement win-win potentials. In order to understand the arguments of the topics we analyze, e.g. genome editing or the use of chemical pesticides, we are in rolling contact with scientific experts to receive consultation about scientific knowledge relevant to the issues and the state-of-the-art insights in the respective fields.

3. Innovativity of the research

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4. Application-oriented research

The *AgriMyths* project attempts to enhance the communication between science and the public, thus developing applicable solutions to prevent failures of public discourse.

5. Relevance of the project

The earlier mentioned discrepancy between the public opinion and opinion of the scientific community results in significant problems for policy makers and the plant production technologies themselves. The project aims at understanding the public perceptions of biotechnologies and, with that, eventually enhancing the communication between science and the public, thus developing applicable solutions to prevent failures of public discourses. Since addressing economic and social aspects related to technologies and products developed at *ScienceCampus Halle (SCH)* is one special interest of the *SCH,* the *AgriMyths* project provides crucial contributions to the *SCH* and its affiliated institutes.

II. Theory and methods

Conceptually, we use the *Ordonomic Approach* to develop win-win solutions for the parties involved in the debate on GM foods. In addition to the ordonomic approach, we also use Haidt´s *Moral Foundations Theory* as a guide to identify addressed moral values.

The methods that we use are a text analysis of the public debate and a survey of the public opinion. The discourse analysis of the current debate on GM foods identifies the arguments that support side and opposition side make for their position towards GM foods. These arguments are then linked to moral values, in order to see which value is particularly relevant for which side. The representative survey of the public opinion in Germany identifies positions on GM foods in the public, the arguments that are most relevant for the stated positions and moral values that are mostly linked with these arguments.

III. Results and perspectives

Our extensive text analysis included official statements of NGOs that are actively campaigning against GM foods, as well as official statements from research institutes that are involved in developing GM technology and GM products. Generally, our results show that roughly 80% of the arguments used in the debate do not address GM foods as a product but rather their producing agent. More specifically, roughly 30% of the counter arguments criticize the behaviour of large corporations by imputing disloyal or unfair behaviour. On the other hand, roughly 30% of supporting arguments reassure loyalty of scientists by emphasizing that they are committed to the healthiness and safety of GM foods. These results indicate mainly two things: First, GM foods are not the focus of the debate. Potentially, the hesitations of the opposition rather come from mistrust in large corporations, or the market system in general. This provides a potential explanation why the debate could continue for so long: the actual worries regarding large corporations have not yet been addressed. And second, both parties talk past one another. This could be another reason for why the discourse has been deadlocked for decades.

Similar to our results analyses of our survey data collected from a representative sample of the German population indicates that GMO opposition is motivated by moral convictions. Most relevant values are *Care, Sanctity,* and *Loyalty*. For example, among the most

frequently stated reasons of GE opponents were the following: "Genetically modified crops have disadvantages for human health" (*Care*), "GM crops contaminate our nature" (*Sanctity*) and "Companies involved in GMOs only care about profit (*Loyalty*).

Our results provide crucial insights on how to enable a constructive public discourse on new biotechnologies. This is a necessary step in the transformation towards a sustainable bioeconomy. Consequently, the *AgriMyths* project provides crucial contributions to the *ScienceCampusHalle* and its affiliated institutes.

IV. Index (publications and talks)

Hielscher S, Winkin J, Pies (2018) Co-Evolution of Institutions and Ideas in Self-Regulation: Insights from the Civil Society Initiative "Accountable Now", Conference Paper accepted for presentation at the 13th International Conference of the International Society for Third Sector Research (ISTR), Amsterdam 2018, Netherlands.

Jauernig J; Waldhof G; Uhl M (2019) How absolutist are GMO skeptics? An experimental investigation**.** 3rd Research network on Economic Experiments for the Common Agricultural Policy (REECAP) meeting, Osnabrück, Germany..

Pies I; Valentinov V (2018) Brauchen wir NGOs?, in: Ingo Pies: Hunger durch Agrarspekulation? – Zur Analyse eines zivilgesellschaftlichen Fehl-Alarms, Berlin (Wissenschaftlicher Verlag Berlin, wvb), S. 413-423.

Pies I, Hielscher S, Valentinov V, Everding S (2017) Gesellschaftliche Lernprozesse zur Förderung der Bioökonomie – eine ordonomische Argumentationsskizze, in: Forum Wirtschaftsethik.

Pirscher F, Kalhoff A, Waldhof G (2020) Gesellschaftliche Spannungen bei der Akzeptanz neuer Pflanzenzüchtungsverfahren: moralische Werthaltungen und ethische Argumente. Abstract accepted for an organised session at GEWISOLA 2020, Halle, Germany.

Valentinov V, Hielscher S, Everding S, Pies I (2018): The anti-GMO advocacy: an institutionalist and systems-theoretic assessment, in: Kybernetes.

Waldhof G (in preparation) Why Morality blinds and divides – Moral Values in the debate on GM foods.

Waldhof G (unpublished manuscript) Enabling the social transition towards a circular and sustainable Bioeconomy through improving the Public Debate on new Biotechnologies.

Waldhof G (2019) Moral values can be interpreted differently - Empirical evidence from the GMO debate. Bioeconomy Workshop, Hamburg, Germany.

Waldhof G (2019) Wie unsere Moral zu Konflikten führen kann – eine Textanalyse der Gentechnikdebatte. Lange Nacht der Wissenschaften 2019, Halle, Germany.

Waldhof G (2019) Our Morality tells us what to eat – A systematic literature review on moral values and moral emotions in GMO opposition. Manuscript accepted for presentation at the 23rd International Consortium on Applied Bioeconomy Research, Ravello 2019, Italy.

Waldhof G (2019) The Debate on GMOs – When Morality blinds and divides. Abstract accepted for presentation at the 8th International Bioeconomy Conference, Halle 2019, Germany.

Waldhof G (2019) A Text Analysis of the GMO Debate. Invited talk at the Department of Psychology, University of Toronto, Toronto 2019, Canada.

Waldhof G (2019) Different Moralities hinder Consensus on Biotechnologies - Evidence from the German GMO Debate. Plant Science Student Conference, Halle, Germany.

Waldhof G (2019) Die Moral der Gentechnikgegner - Eine Textanalyse. Workshop für Angewandte Ethik, Jena, Germany.

Waldhof G (2018) Moral Values in Anti-GMO Campaigns. Abstract accepted for presentation at the IAMO Forum 2018, Halle 2018, Germany.

Waldhof G (2018) Akzeptanzprobleme in der Biotechnologie – Moralische Emotionen in der Gentechnikdebatte. Jahrestreffen Wirtschaftsethik, Wittenberg, Germany.