Chapter 6
Maxims of Risk Ethics for Sustainable Agriculture

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On Risks in Agriculture

All over the world, agriculture has impacted both the environment and ecology in very particular ways, as it interacts directly with both the environment and nature. It changes landscapes positively and negatively. Excessive amounts of nutrients introduced, of climate-relevant and soil- and water-polluting emissions and a worldwide reduction in biodiversity in industrially, respectively intensively farmed agricultural landscapes raise questions about ecological and social sustainability of agricultural production. Further there are discussions concerning the negative impacts of farming upon world climate, e.g. due to factory farming. All of these are critical factors concerning good agricultural practices in the twenty-first century (Gottwald and Fischler 2007).

Generally, it can be stated that intensive agriculture as practiced worldwide puts the foundation of its productivity rapidly and measurably (or scientifically controllable and verifiable) at risk (Agriculture at a Crossroads: IAASTD findings and recommendations for future farming 2016, and World Climate Report 2016); (see also Grambow/Korck in this book, especially Annex 1). It is neither ecologically acceptable nor socially sound, and therefore neither sustainable nor a viable path for securing global food systems in keeping with the 2015 goals of the Paris Agreement on Climate Change.

Therefore, the Sustainable Development Goals (SDGs) enacted on January 1, 2016, specifically address the need for transformation of agriculture. Goal no. 2 "aims to end hunger, achieve food security and improved nutrition and promote sustainable agriculture." Under the same heading, sub-goal 2.4 states: "By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems,

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that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality" (UN Sustainable Development Goals 2016).

These statements list the (negative) expectations with regard to consequences of present-day agriculture. They clearly point to all the perceived risks inherent in future agricultural operations: the preservation of ecosystems is at risk, and in many regions of the world, the adaptability of agricultural practices to counter the effects of climate change cannot be guaranteed. This poses great risks, even without including the risk of droughts, flooding or natural catastrophes facing agriculture. According to the insurance sector, these events can be measured and calculated in part, i.e. covered by insurance premiums. (Munich Re 2010). These comprise risks that fall within the narrow definition of the word: measurable, calculable uncertainties modeled in keeping with probability calculation and expected impact.

What Is Sustainable Agriculture?

Thus far, no generally accepted concept has been developed for sustainable science-based agriculture that could replace additional industrialization. However, there are a number of more or less successful approaches that wrestle with the goal of sustainability (Gottwald and Lutzenberger 2000). Judging from the vantage point of ethically normative assessments or material-value ethics, more sustainable or less sustainable agricultural practices in farming, animal husbandry, horticulture, viniculture, fisheries and silviculture can be identified. Applicable yardsticks such as the Ecological Footprint (Global Footprint Network http://www.footprintnetwork.org/en/index.php/GFN/page/footprint_basics_overview/), the Carbon Footprint (Carbon Footprint Ltd. http://www.carbonfootprint.com) and material input per service unit (MIPS: Green EcoNet http://www.greeneconet.eu/material-input-service-unit-mips) or similar methods of calculating the socio-ecological consequences of agriculture are useful. They are all of a normative nature, adhering to the maxim: less is more sustainable and therefore morally more desirable. They could help farmers—if applied in on-farm decision-making—use more appropriate agricultural, i.e. sustainable practices. They establish what is morally tenable in order to meet the debt owed to an ethically responsible future life on planet earth.

In keeping with these tenets, the Deutsche Landwirtschaftliche Gesellschaft e.V. (German Agricultural Association), for instance, developed a certification system for sustainable agriculture which has been in use at German farms (DLG 2016). It promises to reduce the risks of unsustainable agriculture, while helping individual farmers work towards sustainable agricultural practices. It further promises to increase efficiency of resource management, improve environmental protection, ensure economic efficiency and guarantee social responsibility in farming, to list but four of the dimensions of this audit and certification system.

In this context, organic agriculture using legally standardized environmentally friendly farming and food-processing procedures plays a special role, given that

these practices are more favorable for biodiversity and more socially sustainable than those of intensive agriculture (IFOAM EU Regulations 2007/2008).

In summary, the present focus on good technical practices clears the way for a more sustainable future for agriculture. Ethically speaking, this direction should be maintained with the emergent ethos of sustainability providing the necessary moral orientation (Gottwald 2011). This leads to the applicable maxim: take from available knowledge morally desirable values in order to use sustainable practices to farm the land responsibly. And the natural outcome is this ethical command: refrain from anything that might be seen as irresponsible by present-day society or future generations. There are a number of valid reasons giving rise to the assumption that certain aspects of agriculture, food and environmental ethics are instrumental in a transformation of agriculture towards sustainability, which in turn reduces the risks inherent in traditional, conventional intensive farming practices. One might even call it an ethics of survival.

Maxims of Risk Ethics for Sustainable Agriculture

A number of essential directional decisions in keeping with SDGs will have to be made in the transformation of farming into a more sustainable type of agriculture. Some of them are more business administration-oriented and concern managerial decisions by the individual farmer. They also present a macroeconomic aspect and concern innovative strategies of knowledge communities of the twenty-first century, for instance, smart farming technologies. In both cases, risks are taken, given that the final consequences due to the deployment of new technologies in rural areas frequently manifest themselves only in the long term. For example, a new epidemic of "superweeds" has been shining a spotlight on industrial farming practices. Therefore, it is correct to talk about long-term risks that will require funds, knowledge and new technologies to offset them in the end—always provided there is any real chance of ever "fixing" them (PhysOrg http://phys.org/news/2014-01-superweeds-epidemic-spotlight-gmos.html).

Another risk case could be made with reference to new synthetic biology technologies used in animal breeding. New ways of genetic manipulation using nucleases (DNA cleavers) are expected to allow for more specific genome manipulation. However, these procedures are neither free of side effects, nor as precise as claimed. Just like known genetic manipulations, they require several intermediary steps which result in more "wasted" animals.

In recent years, official numbers have proven the trend towards more experiments with genetically altered animals. 2015 was the first year when the number of genetically altered animals used in tests in Germany exceeded one million for the first time.

Genetically altering mammals is not ethically neutral, given that it clearly entails suffering and pain. Many animals are born genetically defective, stillbirths are common, or the animals have to be killed due to illness or failure to produce the

desired genetic qualities. Therefore, the production of individual genetically altered mammals leads to the sacrifice of a large number of animals. Moreover, other animals are used as surrogate mothers and egg or embryo donors, exposing them to additional pain and suffering. Unfortunately, novel genetic engineering procedures demand all of these steps. They are not free of risks and side effects. In addition to the desired genetically altered traits, there may be unwanted changes in the genome. Releasing these animals into natural environments may seriously impair biodiversity. Contact with or consumption of the meat of these animals may ultimately endanger human health.

In addition to ethical problems, this poses questions of human and environmental security: before interfering with the genome of animals used in agriculture or released into the environment, it is important to realize how little is certain. The structure of the genome and its manipulation not only determine the frequency of illness, but complex manifestations of social and environmental interactions. There is no way of gauging long-term consequences for biodiversity once these new genetic recombination processes have been allowed to proliferate among natural populations (Then 2016).

This shows very clearly that decisions for the future always carry risk. But doing nothing is no option. This also proves that a special risk ethics need to be established to keep possible transformative paths for sustainable agriculture open. There are a number of required maxims that stipulate how areas of transformation like farming, risks, uncertainties and improbabilities have to be dealt with to achieve more sustainability (Beck 1999).

The present political debate about new breeding methods in farming highlights this requirement. The "Grünbuch Ernährung, Landwirtschaft, Ländliche Räume" (Green Book on Food, Agriculture and Rural Areas of the German Federal Ministry of Food and Agriculture) published at the end of 2016 states: "We want to strengthen the power of innovation of predominantly mid-size German breeding enterprises. We need productive food plants, resistant to disease, pests, heat and drought. This is an important building block of sustainably productive agriculture, ready to tackle environmental and climate changes." And it continues: "New breeding technologies in farming like CRISPR/Cas-Technologies need to be thoroughly vetted scientifically. This is the only way to create a sound basis for proper assessment. We must not cut ourselves off from all new developments. We plan to conduct an open and transparent discussion process with all stakeholders involved" (BMEL 2016, p. 29).

This draws on two maxims of contemporary risk ethics: First, developmental paths should be kept open, provided they have no obvious foreseeable detrimental impact. This is the message behind the statement: "We must not cut ourselves off from all new developments"—it is a statement of political ethics designed to allow for sufficient developmental space for science and research, but moreover to keep a door open for German agriculture to make use of innovations involving living organisms. A second maxim in the spirit of an ethos of risk management is added: "We plan to conduct an open and transparent discussion process with all stakeholders involved." It is designed to help shareholders assess risk-relevant decisions

concerning introduction into the market and food cycle of genetically altered organisms. It also aids in preparing political standardization of actions as desired by society.

Beyond questions concerning sustainability of certain agrarian technologies there are other conflicts inherent in values and differing farming practices that need to be agreed upon by societies. They all comprise a number of risks for a more sustainable type of agriculture. These include:

- Conflicts in land use (for human use, animal feed production, raw fibers, fuel, etc.)
- Conflicts between local use of plants and animals and export of plant and animal-based products
- Conflicts between use and protection of landscapes (for instance, rain forests)
- Conflicts of use: What takes precedence? (e.g. food products or energy plants)
- Conflicts concerning patents on life
- Conflicts between technological innovations and social changes (structural changes in rural areas)

Depending on the political, economic and technical solutions of these conflicts, there will be winners and losers and thus clear ecological and social risks for the future of agriculture in certain regions of the world. In view of all these looming conflicts and in the hope of keeping paths open for the future, an additional maxim in keeping with the ethos of proper handling of conflict risk will have to be applied: the precautionary maxim. The ethically, easily justified "precautionary principle" is constitutional within the European legal framework with regard to novelties (always a wellspring of conflict) (Beyer 2004). But more threatening is the higher risk of time-ecology: the critical speed of innovation has to be kept in check, given that there are no useful lessons to be learned from the consequences when it is too late. It is this realization that forces compliance with an additional maxim of risk ethics: the speed of socially and politically controllable innovations is determined by the possibility of reversibility (reversibility maxim).

At this point, more additional risk ethics maxims for sustainable agriculture could be developed. Suffice it to refer to the "General Recommendation for Action to Decision-Makers in Politics, Economics and Society" published at the beginning of this book. Most of these recommendations are comparable to ethical maxims. They are the absolute and most general statements for the social establishment of sustainable risk management. Their aim is the creation and establishment of institutions for safeguarding risk. These institutions, set up "in the interest of reason" (Immanuel Kant), are designed to uniformly align human desires in economy, politics, science and (agri)culture. Risky ventures will have to be assessed and measured in keeping with basic principles applicable to all of humanity. In other words, institutions of this kind, e.g. round tables, real-life workshops, town hall meetings and other forms of stakeholder management, investigate the risks of collectively desired actions and make informational contributions for politically and economically acting risk regulators.

Ethically Informed Agricultural Policy

Sustainable risk management for sustainable agriculture requires an ethics of risk closely meshed with real agricultural policies. There are three ways of interlocking: The first instance is the creation of dependable principles for those working in agriculture. These have to be invested with legal powers and legitimacy and have to be legally and politically empowered. Furthermore, incentives for responsibly acting entrepreneurs have to be created, and sanctions in the case of irresponsible business actions have to be introduced and enforced. Additionally, consumer policies have to be put in place, enabling members of the public to make decisions based upon ethical aspects, e.g. to consider the quality of farm products rather than be swayed by quantity.

All efforts in the creation of reliable, resilient (guaranteed to be enforced) governmental frameworks for agricultural and on-farm economic activities have to present motivation for better ecological, social and agricultural performance that help meet as many SDGs as possible. No more furtherance of orientation towards the lowest possible expenses will be allowed, whereas competition for the best possible quality will be encouraged. Setting the lowest price will have to be tolerated, except if this action can be proven to increase social and ecological costs and will in turn have to be borne either by the general public or passed on the next generations.

Seen from the vantage point of governance, the creation of reliable frameworks is advanced if (minimum) standards in the production of farm and other food items, including all input and output created along the value chain of agriculture, are framed by policymakers following the tenets of climate protection, environmental protection, soil and water protection, and consumer protection, thus rewarding actors who display integrity when dealing with the common good and protecting them from market losses or restrictions. In other words, any monetary disadvantage due to better material ethical production procedures, processing or distribution of farm products or food items, has to be kept to a minimum. In addition, everything has to be done to reduce unfair cost benefits, or socially discredited activities in agriculture and food production.

To achieve this goal, “fair rules of game” have to be ethically based and legally established. Global competitive conditions force German agricultural policies to lobby worldwide for the establishment and protection of a “level playing field.” Ethically based agricultural policies can produce standardized orientation, fair rules of game and reliable frameworks that are generally justifiable. The internal control frameworks are simple: they check for “good” or “bad,” viability is measured and the impact on the future assessed. Clearly, lack of responsible behavior has to be sanctioned.

Ethically based agricultural policy taking recourse to generally understandable standards and value orientation that make sense is capable of creating enlightened order, even in cases of conflict. It gives direction for activities of all engaged in the

economy and allows room for decision making, such as choice at the level of individual economic production or consumption.

Enterprises and organizations competing in the market share responsibility for upholding the standards of competition of their trade mentioned above. Government holds the regulatory claim to the rules of the game. These are the guidelines for law-abiding and legitimized entrepreneurial activities for businesses and organizations. Thus, the business world is legally bound to set up their processes and products in such a way that they correspond to the legally binding competitive framework.

This also means that each respective line of agricultural business has to be able to ethically justify any technologies applied in individual enterprises or organizations. Ethical justification applies to both the desired outcomes of technologies used and to the manner in which this chosen technology is used (the means used) and its possible consequences, even if unintentional. Extensive, comprehensive and verifiable documentation is required (e.g. sustainability report).

An ethically informed agricultural policy reflects criteria for good corporate governance, corporate social responsibility, good corporate citizenship, and corporate responsibility, and in cases of doubt, will reward responsible enterprises with all political means available (e.g. export business), rather than those showing less business integrity (for instance, those causing social or ecological problems).

Additionally, appropriate agricultural policies are constructive, solution-oriented tools that help enterprises find trade-offs stemming from conflicting stakeholder expectations and interests in economics, society and culture (e.g. in emission trading).

Ethically informed agricultural policy of the twenty-first century includes consumers and customers in the decision-making process. The highly diversified field of agricultural production more than ever before needs politically supported consumer information. In view of the vast number of technological innovations related to agricultural products and food items, the responsible public has to be kept abreast of origin, quality, content and socio-ecological consequences inherent in their purchasing decisions. Clever nudging may further socially preferable and desirable eating habits.

A responsible individual is accountable for all purchasing decisions and their consequences. However, clever information and education campaigns informing the public of their dual roles as consumers (in relation to the product, or means of production or distribution) and as members of the public (in relation to society and politics) have proven helpful.

The spectrum of informational, educational and nudging measures available to governments is extensive: from making consumers more aware of consumer policies—which can be seen as market policies strengthening emerging and expanding markets (see campaigns in Bavaria for the expansion of organic agriculture to a 20% share), to the creation of transparency via labels (government animal welfare label), and finally, to various consumer information campaigns addressing individual topics in the fields of health and nutrition.

Visionary agricultural policies are guided by the above maxims. Their measures help advance the desired transformation towards sustainable agriculture, without increasing the risks inherent in processes of change.

References

Agricultural Knowledge, Science and Technology for Development (IAASTD: Agriculture at a Crossroads. Retrieved November 12, 2016, from http://www.globalagriculture.org/fileadmin/files/weltagrarbericht/EnglishBrochure/BrochureIAASTD_en_web_small.pdf.

Beck, U. (1999). World Risk Society. Cambridge UK: Polity Press.

Beyer, P. (2004). The Future Directive on Environmental Liability. Retrieved January 6, 2017, from http://ecologic.eu/sites/files/download/projekte/900-949/929/929_prec_prin.PDF.

Bundesministerium für Ernährung und Landwirtschaft (2016). Grünbuch Ernährung, Landwirtschaft, Ländliche Räume.

Carbon Footprint. Retrieved January 4, 2017, from http://www.carbonfootprint.com/.

Deutsche Landwirtschaftsgesellschaft e.V. (2016). Retrieved January 5, 2017, from http://www.dlg.org/nachhaltigelandwirtschaft.html.

Global Footprint Network Ltd. Retrieved January 4, 2017, from http://www.footprintnetwork.org/en/index.php/GFN/page/footprint_basics_overview/.

Gottwald, F-Th. (2011). *Esst anders!*. Vom Ende der Skandale: Über inspirierte Bauern, innovative Handwerker und informierte Genießer, Metropolis Verlag Marburg.

Gottwald, F-Th, &Fischler, F. (2007). *Ernährung sichern weltweit*. Bericht an die Global Marshall Plan Initiative, Murmann Verlag, HamburgÖkosoziale Gestaltungsperspektiven.

Gottwald, F.-Th., & Lutzenberger, J. (2000). Ernährung in der Wissensgesellschaft. Vision: Informiert essen—EXPO Bd. 7. Campus Verlag Frankfurt.

Green EcoNet. Retrieved January 5, 2017, from http://www.greeneconet.eu/material-input-service-unit-mips.

IFOAM: EU-Regulations 2007/ 2008. Retrieved January 5, 2017, from http://www.ifoam-eu.org/sites/default/files/page/files/ifoameu_reg_regulation_dossier_201204_en.pdf.

Munich Re Farming between Opportunity and Risk. (2010). Retrieved January 4, 2017, from https://www.munichre.com/en/reinsurance/business/non-life/systemagro/risk-situation/index.html.

National Centers for Climate Information NOA: State of the Climate. Retrieved January 6, 2017, from https://www.ncdc.noaa.gov/sotc/.

Phys.Org. US Superweed Epidemic Shines Spotlight on GMOs. Retrieved January 5, 2017, from http://phys.org/news/2014-01-superweeds-epidemic-spotlight-gmos.html.

Then, Ch. (2016). Gentechnik, Patente und die Tierversuchsindustrie. Eine Studie im Auftrag der Fraktion Bündnis 90/Die Grünen im Bundestag 2016. https://www.gruene-bundestag.de/fileadmin/media/gruenebundestag_de/themen_az/agrar/PDF/160809-analyse-gentechnik-tiere-ethik.pdf.

UNEP—DEWA Agriculture at a Crossroads. Retrieved January 6, 2017, from http://www.unep.org/dewa/Assessments/Ecosystems/IAASTD/tabid/105853/Defa.

United Nations 2016 Sustainable Development Goals. Retrieved January 4, 2017, from https://sustainabledevelopment.un.org/sdg2.