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Actors and Strategies for Change – Towards Global Sustainabilities
Spring 2018

**Actors in Action Group Report:
Monsanto/Bayer merger Case Study**

Introduction

On September 14th 2016, it was announced that Bayer bought Monsanto for \$66 billion. This merger is one of the many mergers in big agribusiness in recent years and combines two leading agricultural businesses (Waltz, 2016). Monsanto, based in the US, is one of the key players in genetic modification and production of seeds. They focus on cash crops like soybeans, corn, cotton and canola. Besides seeds, Monsanto also sells glyphosate, which is the most commonly used pesticide for weed reduction (Brook, 2007 and European Commission, 2018). Bayer is a German company and is the second largest supplier of pesticides. Besides crop science, Bayer is mainly involved in healthcare, developing technology and pharmaceuticals. Bayer developed for example aspirin (European Commission, 2018 and Waltz, 2016). The merger between the two creates the largest global integrated seed and pesticide player, heavily dominating the industrial agricultural market (European Commission, 2018).

The Bayer-Monsanto merger was facing antitrust laws and had to be approved by the two-thirds of the jurisdictions that allow this transaction to go through. At this point Bayer-Monsanto has almost reached that point, with the approval of both the US and EU won there are little hurdles left. The merger is set to be finalized in June (Waltz, 2016 and Cassey et al. 2018).

1. Actors and Strategies for change

1.1 Hugh Grant, CEO Monsanto

The world is currently facing global challenges of climate change, water scarcity and food security. Climate change is contributing to farmer vulnerability, and combined with this is the issue of a growing population. By 2050 the world will have 10 billion people which will cause the demand for food to double (Varinsky, 2018). For farmers and growers, this means increasing agricultural productivity while also reducing resource inputs. Reduction in inputs is required not only because of pressure on land use because of population growth, but also because of the potential for large-scale uptake of negative emission technologies.

As CEO of Monsanto, Hugh Grant sees this merger as an opportunity to pave the way towards sustainable agriculture. While there has been discontent over the merger in terms of the market monopoly held by these two agricultural giants, it should be acknowledged that such a merger fosters innovation of the agricultural industry which is much needed in the face of the challenges approaching. The merger is a response to the

call for new solutions to produce more with less while allowing growers to become more sustainable and profitable at the same time. The combination of these two world-class research and development teams will fuel innovation and growth, accelerating advancements and utilizing a broader set of emerging science and digital applications (Grant, 2016). There is a commitment by the companies to spend \$16 billion on innovation over a period of six years (Varinsky, 2018). This is so that better solutions can be brought to farmers faster than ever before by working alongside a company that also shares a vision of sustainable agriculture.

While there has been farmer dissatisfaction over this merger with the argument that it will drive up the prices for farmers and the increase the usage of GMOs, Bayer and Monsanto argue that the opportunity for R & D provided by the merger counters this as they are better able to research new products to help farmers produce more food (Zhao and Casey, 2017). Regarding the increased usage of GMOs, Europe already allows the use of GMOs as prior to the merger, both were in competition regarding genetically modified seeds (European Commission, 2018). The merger will be beneficial for global society as a whole and should not be subject to attacks from the likes of Anonymous Activist or La Via Campesina.

1.2 Stock-market speculator

The Bayer/Monsanto deal is a historical mega-merger and both companies deal in crops with total sales summing up to \$30 billion last year, thus teaming up to be an agricultural conglomerate (Harwell, 2016). The stock would in the merger sell at \$128 per share of Monsanto which is currently lower than market value although the Monsanto stock has increased in value since the merger negotiations started (Jones, 2018).

The stock-market investor would on the one hand be appealed by the fact that the stock is currently trading at a discount and that the merger is expected to create synergies worth at least \$1.5 billion annually (Jones, Market Realist, 2017). Also attractive is the market dominance of crops in a time with global population growth, along with the stability and the technological advantage the two multinational companies have had historically. In terms of sustainability, more innovative crops could potentially make agricultural production processes smarter and less energy and water reliant. And the two companies' executives are legitimizing the merger by saying that the merger would increase innovation, production lines and geographic offering as there is little overlap between the products (Harwell, 2016).

However, the merger is highly controversial and a negative opinion from important stakeholders is detrimental to business. Firstly, the use of pesticides is a probable cause of cancer and destroys fragile ecosystems. Secondly, corporate crops are increasingly turning farmers to monocultures which lead to a fragile food system if crops are diseased. Lastly, consumers could end up with a poor and expensive selection of

groceries with one major seed corporation (Stucke, 2016). Innovation would be the key value of the merger but evidence shows that conglomerates decrease in innovation capacity (Wessel, 2012). Also, investors are increasingly using ESG metrics (environmental, social and governance) to evaluate an organization's performance as there is increasing evidence that there is a strong link between corporate sustainability performance and financial performance (Unruh, 2016). Thus, the companies' sustainability reporting will be of significant value when deciding on stock investment.

The stock-market investor cannot use her power of capital to influence the merger as the deal will sell (per share) at a higher price than market value. Also, anti-trust agencies in several countries will need to approve the merger without regard to stock market value. Public opinion will be a major driver in favour or against market dominance as food production is in the core of human survival. The scientific community will hold power over knowledge in the debate over hazards and benefits of genetically modified crops and consequences of its use.

1.3 Zellipah Githui, former Kenyan subsistence farmer, now employee of Monsanto

The case of Zellipah Githui offers hope that anyone, regardless of background or income status can be catalysis for social change. Born in rural Kenya Githui was raised from a family of farmers. Though in her late teenage years, Zellipah Githui's parents encouraged her and her siblings to pursue an education. This led to Githui studying the field of agricultural science in the United States and consequently she landed a job at Monsanto, the world's largest biotechnology establishment. Here Githui worked for over 14 years as one of Monsanto's Metabolite Analysis Platform Logistical Coordinators. Because of Githui's deeply embedded roots in her home Kenya, after 14 years working for Monsanto she decided to try to help her own community. In 2012, Githui established The Rural Women Development Initiative of Kenya her own non-profit organisation to develop agricultural skills and knowledge for females in her home country.

In chapter 4 of Garath Massey's *Ways of Social Change* technology is secondly defined as 'skills, routines, methods and knowledge' (Massey, 54). "[In Kenya] What we lack is knowledge and finances" (St. Louis Post-Dispatch, 2012). What is clear: benefits of knowledge and skills Githui received from Monsanto have already had a significantly positive impact on her own NGO in Kenya. Contrary to conventional relationships between corporations and NGOs described by Teresa Anderson where by NGOs 'organise protests and demonstrations to raise public pressure' (The Power of Strategy, 270). Zellipah Githui's NGO was born out of corporate knowledge and perhaps wouldn't exist without corporate knowledge.

The benefits of GMO knowledge and practices in Kenya are clear. In the first year of Githui NGO in 2012, the organisation helped 16 female farmers develop improved growing practices through the use of use of hybrid seeds and enhanced fertilizers (St. Louis Post-Dispatch, 2012). In particular, areas such as rural Kenya where harsh

conditions are present, the use of GMO crops can be hugely beneficial. Despite the previous points made it is important to note that the contrary information discussed previously could be due to a lack of information despite aligning with information found.

Githui's position reveals the benefits corporate power can have in the transfer of knowledge. If individuals within corporations such as Monsanto can maintain their own moral compass, the opportunities for multinational corporations to 'transfer technology and knowledge' (Massey, 87) can be beneficial for all. As well as this, the case revealed positive examples of GMO crops in rural agriculture despite the beliefs of Roxendal.

1.4 Member of La Via Campesina

La Via Campesina (LVC) is an transnational social movement, bringing together about 200 million farmers from all over the world (La Via Campesina, 2018). Their goal is to band their voices together in solidarity to defend peasant agriculture and to promote social justice and dignity. They are against corporate agriculture as it 'destroys social relations and nature'(La Via Campesina, 2018).

LVC was founded in 1993, at a time that the globalization of agricultural policies and agribusiness gained foothold, which required farmers to band together to make their voices heard and defend their rights in these developments (Martinez-Torres et al., 2010 and La Via Campesina 2018). The motto of LVC is 'Globalizing hope, globalizing the struggle'. They define the following four struggles and action points (La Via Campesina, 2018):

1. Defending Food Sovereignty
2. Promoting Agroecology and Defending Local Seeds
3. Defending Peasant Rights
4. Climate and Environmental Justice

Although all four points are relevant in the Monsanto-Bayer merger case, the first two points are especially important. Food sovereignty is the right of people to decide their own food and agriculture, producing healthy food through sustainable methods. Food sovereignty focuses on small scale and local food production and consumption (Martinez et al. 2010). Secondly, agroecology is an alternative to industrial, monoculture and chemical-intensive agriculture using GMO's (Martinez-Torres et al. 2010). Agroecology uses ecological theory in their management and design of agricultural systems as to be productive but also to sustain resources. It aims to minimize the negative impacts of modern agriculture on the environment and society (Mayhew, 2015). Seeds are important according to LVC as they form the foundation of food production. LVC fights for the right of farmers to use, develop, reproduce their own seeds and against the attempts of transnational corporations to control this resource (La Via Campesina, 2018).

LVC also defines three things they are fighting against:

1. Transnational companies and agribusiness
2. Capitalism and free trade
3. Patriarchy

Mainly the first two are relevant for this case of the Monsanto-Bayer merger. Bayer and Monsanto are both transnational companies and two powerful actors in agribusiness. La Via Campesina has expressed their opinion on the merger of these two: they are against it. The merger gives a lot of power to a very small and increasingly smaller set of actors. Pooling power together and creating monopolies, leaving small farmers at their mercy (La Via Campesina, 2016). By merging, these companies increase their lobbying power, increasing their influence on policy (La Via Campesina, 2016). LVC quote Terry Boehm, Chair of NFU Seed and Trade Committee on this merger: “By controlling seed, you control the food system. When you control the food, ultimately you control people. Should this kind of power be in the hands of so few?” (La Via Campesina, 2016).

LVC has clashed with Monsanto and Bayer separately before. Even though it could be argued that their ultimate goal is the same, namely to feed the world population, they have very different methods of reaching that goal which stand linearly opposite of each other (Lappé, 2011).

1.5 Representative of UNEP

The United Nations Environment Programme (UNEP) is considered as an important actor for potential change in different fields, which is leading global environmental authority and promoting a coherent implementation of the global environmental agenda within the United Nations system. UNEP categorizes its work into seven broad thematic areas. Besides this, the organization hosts the secretariats of many critical multilateral environmental agreements and research bodies, bringing together nations and the environmental community to tackle the greatest challenges of modern times. Several multilateral environmental agreements, intergovernmental decisions and the 2030 Agenda for Sustainable Development stress the importance of mechanisms to support the transfer of technology transfer.

The organization is committed to making all information regarding to its work, partnerships and projects available to the public. Through creating different types of partnership, the organization is looking to active positive results to tackling environmental and agricultural issues. Member of UNEP and Bayer had launched in 1998 the UNEP-Bayer Young Environment Envoy Programme, that aims to improve knowledge of environmental issues among young people and support them in developing and implementing projects on sustainable development, conservation, green technology, and other environmental issues in their own communities. Moreover, Bayer became in 2004, the first private-sector partner to the UNEP in the area of youth and environment.

There are many debates involving UNEP and their concerns in topics such as: GMOs and efforts to promote the safety on international trade (Cartagena Protocol on Biosafety, 2004). Other examples of activities and projects, like the collaboration with the National Programmes of Action (NPAs) for the prevention of pollution from land based sources and activities including agricultural run-off of pesticides and direct or indirect discharges of POPs (Persistent Organic Pollutants). In this case, UNEP is aiming to participate and symbolize an important actor for change inside matters of agriculture improvements and the future of green economy.

1.6 Member of Anonymous Activists group

Anonymous is a decentralized NGO of 'hacktivists', widely known for many cyber attacks targeting anything from governments, government institutions, agencies, big corporations, to child sex abuse sites. In relation to Monsanto, their underlying motivations towards this agricultural biotech is revealing truth, creating awareness of the destruction they are causing and evidently putting an end to GMO seeds. Anonymous believes the best way to hold companies like Monsanto responsible for their unethical practices is through direct communication, grassroot journalism and social media (Chen, 2014).

In the past few years anonymous have attempted several attacks against the merger. Anonymous' battle with Monsanto catalyzed in 2011. Hacking in to Monsanto's website, the 'hacktivists' managed to release data on around 2,500 individuals associated in this agricultural industry (Mills, 2011).

In their latest strike against them, Anonymous published an outdated database of the companies' information and emails, CNET reports (Mills, 2011). This outreach was triggered by Monsanto's lawsuits against 9,000 organic dairy farmers who stated on their labels that they didn't use growth hormones. Revealing private conversions and information about Monsanto, Anonymous published this with "Your continued attack on the world's [sic] food supply, as well as the health of those who eat it, has earned you our full attention"... "Your crimes against humanity are too many to name on one page" (Greenaway, 2018).

Nonetheless, the recent cyber attack seemed to be fueled by more than just an ethical argument. Despite what health problems may be caused, the Monsanto Protection Act prevents federal courts from banning the sale and/or production of genetically modified foods. Although over 250,000 citizens signed a petition against the bill and grassroots groups, as well as protesting outside the white house, the bill was still passed (Spear, 2011). A clear disadvantage of Anonymous' group is the power and unlimited resources of Monsanto's company in comparison to this particular group of activists.

2. Actors for change: scenarios for the future

Chosen article from Horrigan et al. (2002) strongly criticises the negative environmental impacts occurring from Monsanto's practices. As well as this, Horrigan et al. (2002) discuss the significant health and security impacts of current large scale agricultural practices. Further, the article goes on to suggest ways in which current agricultural practices can be made more sustainable. Methods such as crop rotation, cover crops, no-till and low-till farming and soil management are key to sustainable agriculture. The article from Horrigan et al. (2002) has significant implications for Monsanto/Bayer as many of its current methods are what may be considered 'unsustainable' in the context of the article.

Furthermore, chosen article from the ETC group (2009) identifies two main methods of world food supply. The first, 'The Industrial Food Chain' explains what is very much a top-down approach. While the second, 'The Peasant Food Web' presents a more bottom-up approach. Again, as a major player in 'The Industrial Food Chain', this article has significant implications for Monsanto's supposed current unsustainable agricultural practices. The ETC group report (2009) goes on to suggest policies which support the bottom-up approach of the 'The Peasant Food Web', consequently calling for the exclusion of companies such as Monsanto from agricultural practices.

2.1 *Hugh Grant, CEO Monsanto*

Horrigan et al. (2002) reading is indicative of changes to be made to the agricultural system moving it away from industrialisation. As CEO of Monsanto, and regarding the upcoming merger, Grant would criticise this article as not serving the best interests of the population as a whole. Climate change is only going to exacerbate the most extreme weather events which challenges farmer resilience worldwide. The use of genetically modified seed strains and pesticides offers a level of protection against this vulnerability which would assist in ensuring food security as we deal with a growing population. Zero hunger is listed as number two in the sustainable development goals where it is stated that "a profound change ... is needed if we are to nourish today's 815 million hungry and the additional 2 billion people expected by 2050" (UNDP, 2018).

These times of uncertainty require an increased farmer resilience. This can be best achieved by combining two leading research and development engines of Bayer and Monsanto. Monsanto-Bayer merger can most likely be categorised as an industrial food system, which is criticised in this reading as being insufficient to feed the world's populations. Here there has been concentration on the peasant food web as the most likely agricultural system to have the ability to meet the needs of a growing population.

However, it is said to "lack efficiency and resilience in tackling climate change and issues of food production". Therefore, from the perspective of Monsanto-Bayer merger,

the research and development that could help ensure agricultural innovation could then be spread throughout the peasant food network in order to ensure surplus yield and stable food supplies. Such an example is in agreement with the position of Zellipah Githui where use of GMOs in Kenya have been hugely beneficial in terms of crop production, with said genetically modified seeds coming from Monsanto.

2.2 Stock-market speculator

If the stock market investor read the article by Horrigan et al., (2002) they could potentially be affected by the authors' view as it puts effects of the industrial agricultural model in a systemic context and highlights excessive use on finite resources and hazards for human health. Actors such as Monsanto and Bayer are very much a part of the unsustainable system the article describes and investors have a choice to direct capital away from this system. A questionnaire to Bayer shareholders showed that only 7% supported the merger of different reasons, not only ethical. However, the relationship between the company and its shareholders is not of moral nature. In fact, the company's responsibility is to make a profit and benefit shareholders.

The ETC group report (2009) suggest that policymakers enforce and encourage business models that support sustainable and local farming practises and biodiversity. Should these kinds of policy measures come into effect, farmers would look to more sustainable products thus leaving the stock market investor with little hope of a growing market and little incentive to invest in Monsanto nor Bayer as their product portfolio stands at the moment. And a decreased stock market value would give Monsanto/Bayer less capital to continue expansion and improve products. There are trends that policymakers are moving in favour of more sustainable farming practises. For example, the EU commission have decided to ban the use of pesticides containing neonicotinoids from December 2018. These pesticides have been linked to the decrease of bee colonies. Bayer CropScience are heavily against this ban as their fertilizer products contain neonicotinoids (Nosowitz, 2018).

On the other hand, other countries move in an opposite direction and are more focussed to increase economic growth in the country. In a recent report studying the agricultural transformation in Ethiopian, authors conclude that the Ethiopian are likely to move policy in favor to turn the agricultural sector into an engine for growth with focus on *intensified agriculture with chemical fertilizers, improved seed and high-value crops drive yield increases and the commercialization of the agricultural sector* rather than to support "green niche actors" (Järnberg, 2018). This kind of development would be a signal for the stock market to invest, unless investors are following investment principles guided by sustainability performance measures.

2.3 Zellipah Githui, former Kenyan subsistence farmer, now employee of Monsanto

Despite the strong arguments put forth in Horrigan et al. the case of Zellipah shows mainly positive impacts of this large-scale industrial farming. Githui's case shows the potential for use of technologies industrial farming has. As an employee of Monsanto, Githui was able to educate herself on the beneficial technologies of industrial farming. Githui was then able to transfer skills and technologies learnt from Monsanto to her NGO in Kenya where females enhanced their own skills. Horrigan et al. concludes that "hunger and food insecurity are currently problems not of resource scarcity but of insufficient political will or moral imperative." Githui's case proves this statement, revealing a strong 'moral imperative' that has consequently aided issues of hunger and food security in Kenya, therefore supporting the argument of the issue being food security opposed to a resources issue.

The ETC group report (2002) presents two main approaches to world food supply. The article suggests policy which favours the peasant food web. Zellipah Githui as both as an employee of Monsanto and head of her own NGO is a perfect example of how both of the two approaches impact world food supply. Suggested policy measures to ensure more sustainable agriculture would marginalise her position as a Monsanto employee. However in her position as the head of her own NGO, creating sustainable agriculture in Kenya through policy may be more beneficial. With experience in the global north (Northern America) and the global south (Kenya) Zellipah Githui may feel both positive and negative impacts of the scenarios the ETC group offer.

2.4 Member of La Via Campesina

LVC has power as a grassroots movement by combining the voice of 200 million farmers together, in a 'international peasant's voice (Via Campesina, 2018 and Martinez-Torres et al. 2010). This makes standing up against giants like Monsanto more feasible than one farmer by him or herself.

What LVC stands for is in line to what Horrigan et al. (2002) describes in their article. They too stress the adverse effects of monocultures, chemical pesticides and fertilizers on the environment and people. The authors also bring up more sustainable methods of farming, which LVC also advocates for, like for example crop rotation (European Coordination Via Campesina, 2018 and Horrigan et al., 2002).

For the second source by the ETC Group, the same is true. Criticism of big transnational companies monopolizing the food supply as well as support for peasant farming is central to both LVC's view and this article. In their report they underline the importance of peasants as producers of the food the world eats. They advocate for a 'Peasant Food Web' instead of an 'Industrial Food Chain'. The ETC-group also calls upon policy makers to review the underlying assumptions that peasant agriculture lacks efficiency and resilience to deal with the food production and climate change and that

industrial agriculture is the only way to effectively feed the world population (ETC Group, 2009).

LVC on one hand empowers its members by providing information. They for example set up a manual as to how farmers can start growing food without pesticides and a guide to food sovereignty which stresses agroecology, as well as their own university teaching agroecology (<https://viacampesina.org> and Martinez-Torres et al., 2010). On the other hand LVC also provides information to 'the outside' and raising awareness by publishing reports, campaigning, organising petitions and protests. They also lobby governments to ameliorate peasant's rights via policies (<https://viacampesina.org>).

LVC can play a role in the switch from industrial agriculture, requiring the products Bayer-Monsanto provides to a more sustainable based on agroecology which does not require these products. This would reduce the control of these companies on the world's food supply and might even make them obsolete. By putting issues on the table for policy-makers, defending small farmers and teaching farmers the know-how, LVC can make a difference. It is no easy feat, as they are fighting against big companies, with a lot more financial capacity which are continuing to grow and gain more power, as this merger shows.

2.5 Representative of UNEP

Throughout the aim of inspiring leadership and encourage partnership in caring for the environment, UNEP can emerge as a valuable tool in relation to support and promote positive dialogues between opponent's actors within the agricultural field, together with their future challenges, such as: Monsanto/Bayer and La Via Campesina. During Horrigan et al. article (2002), it's possible to perceived different categories of concerns connecting the current industrial agriculture system and its numerous forms of environmental degradation and waste of basic natural resources. In this case, Horrigan et al. (2002, p.446) considers that "developing a sustainable economy involves more than just a sustainable food system, and the food system involves more than just agriculture".

Regarding UNEP opportunities and projects in relation to the article beliefs, there exists the UNEP Sustainable Food Systems Programme, which aims to address existing challenges evolving food demands and accelerating actions to raise awareness,. Therefore, UNEP can be easily categorized as a central and powerful platform to spread information and new forms of sustainable agriculture, thus its focusing in different players within the current agricultural sector. Horrigan et al. (2002) describes that a more sustainable food system would also involve closer relationships between producer and consumer. The authors suggestions are also connected to some of the UNEP main focuses areas regarding sustainable food system thinking, which aims to interconnect policy making on food and agriculture, and other topics of interests, such as: climate change, urbanization and sustainable consumption/production (UNEP, 2018).

Horrigan et al. (2002) explains about the importance of governments, international organizations programs and research to influence moves toward sustainability inside the industrial agriculture system. In this case, it's possible to UNEP to guide and influence big companies, but ultimately, this shift links decisions by individual farmers and local consumers. In relation to this reflection, UNEP has been emerged as an actor with the need of reassure farmers and companies that sustainable methods are economically viable and it will be worth it for our future generations.

Concerning to the matters explained by the ETC group report (2009), the UNEP can perform as a significant actor which is aiming to tackle climate change and food crises. Through operating by the aims suggested within the SDGs and contributing during international meetings and conferences, it's possible to UNEP to enforce its viewpoints and works as a central actor for transformation inside political and corporate contests connected to agricultural issues. Therefore, the ETC group report (2009) together with UNEP researches had already suggested that the logical policy response to reduce food production problems is through investing in educational and regulatory initiatives that encourage sustainable consumption. The role of UNEP, it is on improving a progressive debate between different actor, such as: Monsanto/Bayer and La Via Campesina. There are many obstacles regarding different points of view and goals towards a sustainable agriculture. Consequently, UNEP has been developed to help and to unify information through contributing inside different topics and bridging the gap of communication between other actors.

2.6 Member of Anonymous Activists group

In relation to our first chosen literature by Horrigan et al., the article does exactly the intentions of 'Anonymous'- expose the truth about industrial farming like Monsanto. Considering the challenges Anonymous are facing with Monsanto- which is merely having less power within laws and bringing about change due up against the wealth of this agriculture industry. Anonymous believes that this is the kind of information that the public needs to know in which will make it easier to stand behind Anonymous and stand opposed to any more unsustainable regulations Monsanto is trying to make happen. "The pesticides used heavily in industrial agriculture are associated with elevated cancer risks for workers and consumers and are coming under greater scrutiny for their links to endocrine reproductive dysfunction..." states Horrigan et. al (2002).

As Monsanto is the world's largest seed company, controlling 23 percent of the global seed market, this is a huge problem for our already exceeding world hunger problem and can only be seen as detrimental to our health systems as Monsanto is completely transforming the world's food supply. (Smaller, 2016). Being one of the very few who can get access to inside information, Anonymous has a strong chance and potential for change.

Examining the second article on the ETC group report (2009), Anonymous has the same agreement and stance. Because this article has significant implications for Monsanto's supposed current unsustainable agricultural practices, this yet again agrees with Anonymous' voice. "The truth is that policymakers don't know enough about our food supply. We don't know where our food comes from and we don't know who is feeding the hungry today" (ETC group report, 2009). This is exactly what the hacktivists aim to achieve, exposing the truth and educating people about the importance of our health and the environment" states the ETC movement.

3. Best and Worst Case Scenarios

Best outcome on the long term would be that Monsanto(-Bayer) eventually goes out of business due to produce and demand and trends of 'sustainable agriculture', whether or not the merger goes through. There could be space for GM seeds in this scenario, as they could be an advantage in food production with the reality of climate change but not in a monopoly. Ideally seeds (GM or otherwise) would be an open-source resource, leaving farmers free to exchange, produce and use seeds, keeping diversity as a key principle in mind.

The worst-case scenario is that Monsanto continues to gain power in the agriculture field due to their power and wealth. As they increasingly monopolize the market, they will be able to raise prices uncontrolled by competition, trapping farmers and increasing food prices overall. On top of that the reduction in biodiversity by a monopoly on seeds can leave the food system increasingly vulnerable and undermine its resilience, possibly leading to a systems-collapse due to pressures caused by external events like for example climate change. The increased use of fertilizers and pesticides can also harm the environment and human health.

Much of the possible scenarios will depend on technology development for better seeds and fertilizers, that can be cultivated in a sustainable ecosystem harmless to living organisms. These can be delivered by commercial actors such as Monsanto/Bayer and/or other alternative organizations such as seed banks. Massey describes how technological innovation leads to much unforeseen social change and it is likely that the continuous development in the agricultural sector will push actors into new paths of change (Massey, 2016:125). It is likely that strategies such as the UN Sustainability Goals "Agenda 2030" will push regulators and business leaders into more sustainable practises, thus meeting some of the grassroots' needs.

References

Brook, M.M. (2007). 'Monsanto,' *Encyclopedia of Environment and Society*, Sage Publications, Thousand Oaks.

Cartagena Protocol on Biosafety, 2004. Available at: <https://www.globalpolicy.org/component/content/article/220/47311.html>

Cassey, B. and Kresge N. (2018, 9 april) 'Bayer Soars as Monsanto Takeover Inches Closer to Finish Line,' *Bloomberg*. Available at <https://www.bloomberg.com/news/articles/2018-04-09/monsanto-jumps-after-report-that-doj-will-allow-bayer-takeover> [Accessed 13 May 2018]

Greenaway, T. (2018). *Put your hack into it: Anonymous targets Monsanto*. [online] Grist. Available at: <https://grist.org/food/put-your-hack-into-it-anonymous-targets-monsanto/> [Accessed 10 May 2018].

European Commission (2018). *Mergers: Commission clears Bayer's acquisition of Monsanto, subject to conditions*. [online] Available at: http://file:///Users/vitajex-blake/Downloads/IP-18-2282_EN.pdf [Accessed 7 May 2018].

ETC Group. *Who will feed us? Questions for the Food and Climate Crises*. ETC Group Report, 2009.

Grant, H. (2016). *Commitment and Collaboration Will Dictate Our Success in Addressing Climate Change | Monsanto*. [online] Monsanto. Available at: <https://monsanto.com/company/sustainability/climate-change/articles/commitment-collaboration-will-dictate-success-addressing-climate-change/> [Accessed 9 May 2018].

Greenaway, T. (2018). *Put your hack into it: Anonymous targets Monsanto*. [online] Grist. Available at: <https://grist.org/food/put-your-hack-into-it-anonymous-targets-monsanto/> [Accessed 10 May 2018].

Harwell, D. (2016, September 14). *Washingtonpost.com*. Retrieved from <https://www.washingtonpost.com>: https://www.washingtonpost.com/news/business/wp/2016/09/14/bayer-and-monsanto-merge-in-mega-deal-aimed-at-domi-worlds-food-supply/?noredirect=on&utm_term=.3835962a43fc

Horrigan L; Lawrence R; Walker Polly. *How Sustainable Agriculture Can Address the Environmental and Human Health Harms of Industrial Agriculture*. Environmental Health Perspectives, volume 10, 2002.

Jones, A. (2017, December 8). *Market Realist*. Retrieved from marketrealist.com: <https://marketrealist.com/2017/12/update-bayer-monsanto-merger>

Jones, A. (2018, April 6). *Market Realist*. Retrieved from <https://marketrealist.com>: <https://marketrealist.com/2018/04/the-monsanto-bayer-merger-what-are-the-updates>

Järnberg, L. (2018). *Stockholm Resilience Center*. Retrieved from [www.stockholmresilience.org: http://www.stockholmresilience.org/research/research-news/2018-04-16-growth-overriding-green-in-ethiopias-agricultural-transformation.html](http://www.stockholmresilience.org/research/research-news/2018-04-16-growth-overriding-green-in-ethiopias-agricultural-transformation.html)

Martinez-Torres, M.E. and Rosset P.M. (2010) 'La Via Campesina: The Birth and Evolution of a Transnational Social Movement,' *The Journal of Peasant Studies*, 37 (1): pp. 149-175.

Massey, G. *Ways of social change: making sense of modern times*. SAGE. University of Wyoming, 2016.

Mayhew, S. (2015) 'Agroecology,' *Dictionary of Geography*, Oxford University press.

Mills, E. (2011). Monsanto confirms Anonymous hacking attack. *CNet*. [online] Available at: <https://www.cnet.com/news/monsanto-confirms-anonymous-hacking-attack/> [Accessed 10 May 2018].

Monsanto CEO Hugh Grant comments on the Monsanto-Bayer announcement. (2016). [video] Youtube.

Nosowitz, D. (2018, April 30). *modern farmer*. Retrieved from www.modernfarmer.com: <https://modernfarmer.com/2018/04/eu-issues-near-complete-ban-on-neonicotinoid-pesticides/>

Lappé, A. (2011, March 28). 'The Battle for Biodiversity: Monsanto and Farmers Clash,' *The Atlantic*. Available at <https://www.theatlantic.com/health/archive/2011/03/the-battle-for-biodiversity-monsanto-and-farmers-clash/73117/>. [Accessed 13 May 2018]

La Via Campesina. 2018. *The International Peasant's Voice*. [ONLINE] Available at: <https://viacampesina.org/en/international-peasants-voice/>. [Accessed 13 May 2018]

La Via Campesina. 2016. *Bayer-Monsanto deal latest in agribusiness merger and acquisition trend*. [ONLINE] Available at: <https://viacampesina.org/en/bayer-monsanto-deal-latest-in-agribusiness-merger-and-acquisition-trend/>. [Accessed 13 May 2018].

Roxendal, D, 2018, Quoted from A&S class, February 26.

UNDP. (2018). *Sustainable Development Goals*. [online] Available at: <https://www.un.org/sustainabledevelopment/sustainable-development-goals/> [Accessed 9 May 2018].

UNEP. (2018) Food and food waste. Sustainable Food Systems. [online] Available at: <https://www.unenvironment.org/explore-topics/resource-efficiency/what-we-do/sustainable-lifestyles/food-and-food-waste/>. [Accessed 10 May 2018].

Spear, S. (2013). President Obama Signs 'Monsanto Protection Act'. [online] *EcoWatch*. Available at: <https://www.ecowatch.com/president-obama-signs-monsanto-protection-act-1881714153.html> [Accessed 10 May 2018].

St. Louis Post-Dispatch, 2012, Monsanto Employee Looks Homeward, Available at: http://www.stltoday.com/business/local/monsanto-employee-looks-homeward/article_db113b4c-5e40-11e1-9fba-0019bb30f31a.html.

SumOfUs. (2016). *SumOfUs*. Retrieved from www.bayermonsantomerger.com: <https://www.bayermonsantomerger.com/>.

The Power of Strategy – Environmental NGO Influence in International Climate Negotiations, Fair Shares: A Civil Society Equity Review of INDCs, 2015.

Unruh, G. (2016, May 11). *MIT Sloan Management Review*. Retrieved from www.sloanreview.mit.edu: <https://sloanreview.mit.edu/projects/investing-for-a-sustainable-future/>

Varinsky, D. (2018). The \$66 billion Bayer-Monsanto merger just got a major green light — but farmers are terrified. *Business Insider*. [online] Available at: <http://nordic.businessinsider.com/bayer-monsanto-merger-has-farmers-worried-2018-4?r=US&IR=T> [Accessed 7 May 2018].

Zhao, J. and Casey, S. (2017). Monsanto Gives CEO Hugh Grant 64% Raise Ahead of Bayer Acquisition. *Bloomberg*. [online] Available at: <https://www.bloomberg.com/news/articles/2017-12-21/monsanto-gives-ceo-hugh-grant-64-pay-raise-as-bayer-deal-looms> [Accessed 7 May 2018].

Wessel, M. (2012, September 27). *Harvard Business Review*. Retrieved from www.hbr.org: <https://hbr.org/2012/09/why-big-companies-cant-innovate>