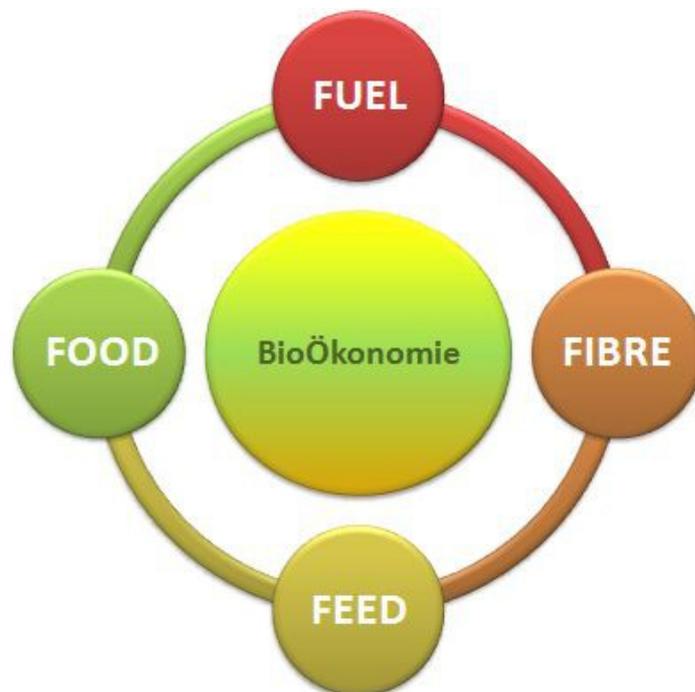


The bioeconomy controversy

Considering the bioeconomy from a development policy perspective

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The bioeconomy controversy

Considering the bioeconomy from a development policy perspective

As it stands, bioeconomy concepts rarely feature in public debate. Yet the relevant stakeholders are investing a lot of energy in developing their bioeconomy strategies and, at least as a research strategy, the bioeconomy is in full swing. Great hopes evidently rest on the bioeconomy and the concept is beginning to influence key policy fields.

Both in the Global South and North, bioeconomy strategies have become the target of critical interventions by environmental groups and social movements. In the discussions and analyses of German development policy groups, however, the term bioeconomy has surfaced only very recently. A critical debate and careful analysis of the recent wave of bioeconomy strategies that have developed against the backdrop of the climate crisis and, within this context, the increasing popularity of the notion of a 'green economy', is still in its very early stages. While the bioeconomy is clearly an important yet problematic strategy that is being promoted by actors in the fields of business and politics, our options to counter this offensive remain unclear.

In light of these developments, this position paper produced by the Centre for Research and Documentation Chile-Latin America (Forschungs- und Dokumentationszentrum Chile-Lateinamerika e.V., FDCL) provides a basic analysis of the problem and perspectives for political intervention from a development policy standpoint and, in so doing, hopes to stimulate a more profound debate concerning the bioeconomy as a field of action.

Lacking a clear-cut delineation, the bioeconomy has a number of definitions that all share the concept's weakness of being very broad in scope and having no clear boundaries. In general terms, the bioeconomy describes an economy that is built on biomass instead of on fossil resources.

The German Bioeconomy Council *'regards the bioeconomy as a key element of the social transformation towards a more sustainable economic system. Bioeconomy is defined as the production and utilization of biological resources (including knowledge) to provide products, processes and services in all sectors of trade and industry within the framework of a sustainable economy.'* (<http://biooekonomierat.de/en/bioeconomy>)

This broad definition summarises the key aspects of the concept. Other definitions and strategies each emphasise particular elements.

Germany's National Policy Strategy on Bioeconomy, for example, explains that *'the concept of the bioeconomy takes natural cycles of materials as its point of orientation; it encompasses all sectors of the economy that produce, work and process, use, and trade with renewable resources, such as plants, animals, micro-organisms, and their derivatives.'* (National Policy Strategy on Bioeconomy, p.8)

The OECD describes the bioeconomy in the following terms: *'From a broad economic perspective, the bioeconomy refers to the set of economic activities relating to the invention, development, production and use of biological products and processes.'* (<http://www.oecd.org/futures/long-termtechnologicalsocietalchallenges/thebioeconomyto2030designingapolicyagenda.htm>)

Such definitions include all types of agriculture, even organic farming. However, the broadness of these definitions alone did not spark the current interest in the concept and lead to its rapid spread during the past years. Of greater importance has been the fact that specific fields of activity (and strategies) have incorporated the concept of the bioeconomy and used it for their own interests.

The OECD, for example, has identified three pillars of a future bioeconomy: '*advanced knowledge of genes and complex cell processes, renewable biomass, and the integration of biotechnology applications across sectors.*' (ibd.)

The concept derives its importance from the political and economic context in which it has developed and the strategies that have resulted.

I. The politico-economic context

1. The bioeconomy is a programme for the proclaimed end of the fossil era

Talk of the end of the fossil era is widespread and the notion that we must overcome our dependency on fossil fuel has long left the niche of dyed-in-the-wool environmentalists and become a mainstream critique – albeit one that is found more in mainstream declarations than in actual mainstream politics. One clear indication of this was the final declaration of the G7 summit in Elmau in June 2015, which stated the goal of decarbonising the economy. For such a perspective, which now resonates at the heart of global policy, the bioeconomy is an important field of development. Whatever specific form decarbonisation strategies take, they all hinge on replacing fossil fuel with biomass-based energy and products – a process that has already begun.

2. The bioeconomy as a pillar of global climate policy

Whereas decarbonisation remains a more long-term future prospect, attempts to prevent climate change already affect current policy-making. Climate change is now the central challenge of the global environmental crisis and a starting point for numerous political initiatives focused on reducing CO₂ emissions.

Unlike decarbonisation, which remains a long-term objective, the notion is that the bioeconomy can already make a significant contribution to the reduction of CO₂ emissions. The bioeconomy was initially conceived as a strategy that would eventually substitute the fossil based system; today, however, the focus is on the concept's potential to solve environmental challenges: '*While only a few years ago, peak oil was the driving force behind the political support for the bioeconomy, now it is the climate protection targets and the innovation potential for sustainable development.*' (Recommendations of the German Bioeconomy Council - Further Development of the "National Research Strategy BioEconomy 2030", p.6)

The introduction and further development of so-called biofuels (which we will subsequently refer to as 'agrofuels') is the most important and visible front in this field. Agrofuels in particular, however, have become a contested issue, and cast the first shadows on a nascent *bio-optimism*.

3. The bioeconomy as part of a green growth strategy

Often the bioeconomy is presented as a core component of a green economy and, within this context, as a strategy for sustainable and *green* growth. Central to many mainstream green economy and bioeconomy concepts is the growth perspective, which is written into the DNA of the concept.

The corresponding EU strategy leaves no doubt: '*The bioeconomy is therefore not a niche area – it is about growth and jobs.*' (Innovating for Sustainable Growth. A Bioeconomy for Europe, p.7)

This sets a clear framework: no transformation of the economy and dominant growth-based economic model and instead a transition from fossil to biological resources. The proverbial engine is still running, the only difference is the fuel.

4. Technological innovation as the key to the future

The bioeconomy puts its faith in the power and viability of technological innovation. It views knowledge-based technologies as the key to solving future challenges. Our problems are analysed and defined as a lack of adequate technology: food security requires advanced precision farming techniques and new (genetically modified) seed. Effectively, this draws attention away from social innovations as well as from considering inequalities and the need to change consumption patterns and lifestyles.

5. Turning to the bioeconomy to increase competitiveness

In particular, the EU's Bioeconomy Strategy focuses on ensuring the competitiveness of the European economy. Europe's future lies not in the continent's resources, but in its knowledge and know-how. From such a perspective, Europe's future hinges on a knowledge-based economic strategy. In the English-speaking world, the corresponding term is the *knowledge based bio-economy* (KBBE).

Against this backdrop, Germany – as an industrial location – must make intelligent use of its capacity for innovation and resources. (Recommendations of the German Bioeconomy Council - Further Development of the "National Research Strategy BioEconomy 2030", p.17)

6. Size does matter – or: *big is beautiful*

Bioeconomy strategies aim to solve significant challenges (decarbonisation, climate change) and are therefore necessarily broad. They focus on industrial processes and aim to transition industrial production from fossil to bio-based inputs. This requires a new mode of industrial production: a key focus within many bioeconomy strategies are bio-refineries that are capable of processing all kinds of biomass. The Bio-based Industries Consortium (BIC) categorically states: 'Biorefineries are the heart of the bioeconomy' (<http://news.bio-based.eu/map-of-224-european-biorefineries-published-by-bic-and-nova-institute/>). In its *Biorefineries Roadmap*, the German government describes the great '*opportunities presented by biorefineries for climate protection, value creation and resource efficiency. First and foremost, this is thanks to the possibilities presented by the complete utilisation of biomass.*' (Biorefineries Roadmap, p.16). Meanwhile, over 200 biorefineries are thought to exist in Europe.

7. Primacy of the economy

The fixation on technological solutions is paired with a great faith in economic mechanisms. Market mechanisms will allegedly ensure that the most efficient and affordable technologies become established. The blueprint for this approach is European emissions trading, which is justified also by pointing to technological neutrality. The goal is to put a cap on CO₂ emissions, yet, whether companies resort to nuclear energy, CCS (Carbon Capture and Storage), agrofuels or wind energy to achieve this is a decision that is left to the markets. Moreover, economic mechanisms will allegedly also solve the undeniable problem of competing land needs (i.e. for food or energy crop production).

'Ultimately it is primarily the relative prices that decide concerning use in the food, feed, energy or industry sector.' (Germany's National Policy Strategy BioEconomy 2030, p.68) This economic-technological fixation inherent to bioeconomy approaches tends to devalue political participation and civil society involvement; science and business take centre stage.

II. The bioeconomy as a narrative and paradigm

Debates surrounding the bioeconomy are fundamentally also debates concerning narratives. Narratives are more than just stories: they provide meaning, help explain developments and influence strategies. They inspire imagination and create tools to order things and processes as well as to help us picture how the future may look. Narratives do not necessarily have to be 'true'; they must, however, be convincing and provide incentives if they want to influence actual practices.

1. Redefining nature

Bioeconomic discourse reduces the whole of nature – plants, animals and microorganisms – to a resource called 'biomass', which is there for us to harvest and process. Nature, in the form of biomass, acquires (potential) productive force. This blurs the boundary between agriculture and use of nature. Economic discourse then conceives of nature in terms of natural capital, i.e. a way of speaking and thinking that focuses on nature's economic functions and which is becoming ever-more dominant. Redefining nature in this way corresponds to the bioeconomic view of nature as biomass: nature can now be subdivided into substitutable and exploitable elements.

The OECD definition of natural capital:

"Natural capital are natural assets in their role of providing natural resource inputs and environmental services for economic production." (<https://stats.oecd.org/glossary/detail.asp?ID=1730>)

2. An optimistic outlook: *'The world is progressing, the future is bright'*

This Mao quote could very well be the bioeconomy motto: yes, we face a severe global environmental crisis, but we have the means to overcome it. The bioeconomy discourse is developing against the backdrop of crises and challenges. Bioeconomic solutions allegedly exist not only for climate change, but also global hunger and other problems (e.g. soil erosion). This optimism is paired with an almost religious belief in the power of technological innovation. For politicians, the optimistic narrative of the bioeconomy turns it into an attractive proposition. People who criticise the concept are dismissed as 'moaners'; it is simply the knee-jerk reaction of perennial naysayers.

The bioeconomy solves all problems: the narrative of the bioeconomy council

*"Bioeconomy: a narrative
It provides food for people.
It provides clothing.
It warms us.
It moves us.
It gives us shelter.
It cares and heals us.
It connects us with nature.
And it develops solutions for a better and sustainable future."*

(Recommendations of the German Bioeconomy Council - Further Development of the "National Research Strategy BioEconomy 2030", p.4)

III. Key challenges

1. Agrofuels reloaded

Biomass for energy production, with a clear focus on agrofuels, remains the most important bioeconomy field. Exiting the fossil era is a Herculean task and a promising business sector. Nevertheless, the recent history of agrofuels clearly demonstrates the challenges: the evident competition over land between agrofuels and other agricultural products has become an important environmental and development policy issue. In Germany the spread of ever-larger maize monoculture fields to produce resources for biogas plants, mainly electricity and heat became an important issue. Food vs. fuel - the production of crops that are then used not to feed people but turned into fuel, particularly on land in the Global South - was another hot topic, one which has become a recurrent theme in public and political debate. A critical agrofuels discourse has developed and left its mark. The promoters of agrofuels – in practice and ideologically – survived the first round rather shaken.

Next generation agrofuels are purported to avoid these problems: the focus is now mainly on the potential of inedible ligno-cellulosic biomass sourced from wood, grass or industry by-products as a basis for fuel production. Attempts to establish the term *advanced biofuels* for these so-called second-generation agrofuels indicates how much this is also a struggle over narratives.

Second-generation agrofuels are a very recent development and progress is not as fast as technology-focused optimism would have us believe. Moreover, in Germany at least, it is becoming clear that wood is also not an unlimited resource and sustainable forms of forest management are already under pressure due to the increased use of wood for energy (mainly for heating). Nonetheless, this will most likely be the most important field for the future development of the bioeconomy, at least if the ambitions to decarbonise the energy supply are taken seriously.

2. Genetic engineering – reinventing nature

The environmental and political debates of recent decades have also greatly damaged the image of genetic engineering. In Europe, the push for genetically modified plants was not successful. Against this backdrop, the bioeconomy appears to offer the ideal opportunity to launch a new offensive. Biotech is a pillar of the bioeconomy and thus offers a much sought-after opportunity to *re-brand* genetic engineering as an element of a sustainability-oriented bioeconomy.

Moreover, genetic engineering technology is itself undergoing radical and rapid development; even the politically conscious public is finding it hard to keep pace. New technologies such as gene drives based on the CRISPER-CAS *gene scissor* are transforming the way we edit genes. The biotech industry is now fiercely battling to make sure these new forms of genetic engineering are exempt from the old rules.

A special branch within these new genetic engineering approaches is *synthetic biology*, which aims – according to a definition by the German Research Foundation (DFG) – to create ‘*new systems mainly designed by researchers.*’

(http://www.dfg.de/dfg_magazin/forschungspolitik/synthetische_biologie/index.html)

Synthetic biology or extreme genetic engineering thus strive to *reinvent nature* (G. Church and E. Regis). As it aims to not only genetically modify organisms but to re-build or even newly develop living organisms, and all for very practical reasons, synthetic biology goes far beyond what *classical* genetic engineering strove to achieve. The notion that, in theory, any bacterium, microbe or algae can be turned into a kind of miniature factory, fed with any type of biomass to produce something (from fuel, to plastics or vanilla extract), goes far beyond the possibilities of classical genetic engineering. Such a vision encompasses a completely new form of production and therefore also an entirely new economy – one that ultimately turns nature into a factory to fulfil our desires and makes man the master of natural processes. It would render the difference between *natural* and *artificial* meaningless.

This branch of the bioeconomy leads to a number of ethical questions and blurs the distinction between *green* and *red* (in particular, medical) biotechnology. However, the field where this technology remains the most visible and has the greatest impact is agriculture. Synthetic biology aims to re-structure bio-based production, yet to do this, it requires natural resources such as land, water, air or biodiversity – but it also does not promise *creatio ex nihilo*.

Questions concerning regulation and the assessment of risks remain and will have to be revisited. While the controversy over genetic engineering continues, it has taken on new forms and will thus be an important arena to decide the future contours of the bioeconomy.

3. The bioeconomy as a solution to hunger

Germany's bioeconomy strategy emphasises the importance of awarding food security primacy over all other possible uses for biomass. *"The German federal government, however, is determined that transformation to a bio-based economy must not lead to use conflicts over fertile land. Safeguarding the supply of food has priority over the material or energetic use of biomass."* (Bioeconomy International - Global collaboration for bio-based economy, p.4)

But how should this be achieved? How do we guarantee the priority of food within a capitalist framework where the decision over who consumes what is decided by money? Which regulatory political measures could ensure the primacy of food? The bioeconomy approach does not provide an answer. Far from being a real strategy, the commitment to the primacy of food thus seems little more than lip service to add currency to the bioeconomy discourse.

Yet, corporations such as *Bayer* and *Syngenta* offer a specific road map to solving the problem of food. A new generation of seed and new products, such as genetically modified *golden rice*, are sold as the biotech industry's answer to the challenge of global hunger. Increasingly, the critics of genetic engineering are portrayed as irresponsible in the face of the challenge 'to feed nine billion people'. To overcome the fiasco of the *fuel vs. food* debate, industry hopes to replace such discussions with the narrative of a struggle between a 'high-tech form of agriculture to end hunger and its irresponsible critics'.

IV. Blind spots

1. Justice

The bioeconomy defines key questions concerning our future development as technological deficits. New or improved bio-based products will supposedly end hunger in the world and provide people with sufficient energy. A second green revolution is allegedly on the horizon, yet it disregards the lessons we should have learned from the first: new, high yield rice varieties alone will not solve hunger, especially when combined with high fertiliser and pesticide inputs. Moreover, greater yields do not guarantee just access to resources. Technological innovation and a more just society are, of course, not mutually exclusive; bioeconomic approaches, however, attempt to solve questions of justice and of just distribution simply through greater yields and increasing production efficiency.

Justice also has a global dimension. The development of the bioeconomy is strongly linked to patents and takes place in the context of an increasing concentration of agribusinesses that are growing into *bioscience* conglomerates. The patent regime intensifies the concentration of power in the *North* and is an important factor in the reprimarisation of the economies of the Global South, which reproduces the old pattern of the South as a supplier of raw materials.

2. Power, structure and rule

The technology-oriented future strategies of the bioeconomy do not reflect the models and structures under which they are being developed. Again, agrofuels are a prime example: they are a response that aims to give continuity to the current system of mobility. Under present conditions, they serve to perpetuate our model of individual car mobility. They hope to continue the dominant mode of production and consumption on a different energy basis, which alone suggests that continuity is possible. This dismisses the alternative approaches numerous civil society stakeholders have voiced and ignores the perspective of those directly affected.

The agenda of the bioeconomy is thus developing within the given structures of power and rule, and subsequently being shaped by them. Bioeconomic approaches in agriculture are dominated by a few seed giants: the new *bio-mas(s)ters*. Biotech is not simply a model for progress; it is governed by powerful interests.

3. Biodiversity

Cultivating energy crops not only competes with those who wish to grow food, it also threatens biodiversity, for example, when highly biodiverse ecosystems are destroyed to plant oil palms. This is recognised as a blatant conflict of interest. Yet, the public are not as aware of it as they are the *food vs. fuel* dilemma. Moreover, the promises of the biotech industry offer no similarly simple solution as in the case of food. While genetic engineering produces food, it does not maintain biodiversity.

Declaring biodiversity a resource is also a questionable approach. We cannot mine or harvest biodiversity. Yet, the recognised and undeniable value of biodiversity is diametrically opposed to the re-definition of nature as biomass and therefore as a resource for the biotech industry.

4. Indigenous peoples and local communities

Biodiversity is, of course, by no means the only concern: the world's last intact ecosystems are generally populated and cultivated by indigenous peoples and local communities. Often they owe their survival and the intactness of their natural environment not to their rights being legally guaranteed but to the marginal geographic location of their territories, such as the remote areas of the Amazon basin. So far often either unattractive or inaccessible for traditional forms of agriculture, such marginal land is now in the sights of the bioeconomy. Suddenly, indigenous peoples and local communities are living on *capital assets*, provide *ecosystem services* and cultivate biomass.

The bioeconomy views indigenous peoples and local communities from the perspective of economic efficiency, which can underpin arguments for their protection, for example, regarding the preservation of biodiversity. Still, such approaches link the perspective they offer for indigenous peoples and local communities to their economic and/or ecological performance instead of to specific rights.

5. The global appropriation of land

The category 'marginal (or degraded) land' is key to bioeconomy approaches. It holds great potential to relativise the conflict over land use: there is now sufficient 'underused fallow land' with low productivity for agriculture, degraded land and poor-quality soil for biomass production. This establishes a global perspective on land that classifies it according to productivity criteria and assesses it based on the principle of production optimisation. As a category, land is stripped of its social dimensions. Nomadic herders, for example, who use such land are then, at best, merely viewed as making suboptimal use of the area.

Categorising large parts of the earth in this manner is part of a dynamic to transform land into a global investment. Willingly or unwillingly, the bioeconomy is part of this process – and we still seem unable to systematically analyse this fact.

V. The significance of bioeconomy concepts from a development policy perspective

1. The Global South as a biomass giant

The bioeconomic perspective on the world focuses not only on agricultural production and its alleged deficits, but also on global net primary biomass production (NPP). This stands the world on its head: countries from the Global South, in particular those located in the tropical rainforest belt, are NPP giants. Focusing on biomass brings countries to the fore that have so far been characterised by low productivity and relatively intact ecosystems – and that are home to indigenous peoples and traditional communities.

2. New dynamics of land use: soy, sugarcane and palm oil plantations

Agriculture was, and remains, an extremely dynamic economic sector. Over the past centuries, land use has changed dramatically and, during the process of colonisation, was quick to take on a global dimension. Cotton was a key commodity for the early phases of industrialisation in Europe and its production led to fundamental changes in both land use and social structure in the southern states of the US, the Caribbean and, via the slave trade, Africa.

When viewed through the lens of the bioeconomy, the expansion of three specific plants over the past decades has been remarkable: sugarcane, palm oil and soy. Producing 30 billion litres of ethanol annually, Brazil is the only major producer of ethanol in the world (alongside the US). In spite of its many contradictions, Brazil's sugarcane-ethanol complex is the first established building block for a global bioeconomy.

The spread of palm oil plantations in Indonesia and Thailand, and the related environmental and social impacts, have drawn worldwide attention. Palm oil is a highly versatile product and one of the most important ingredients for global biodiesel production. Argentina and Brazil have seen an impressive expansion of soy cultivation, and today soy defines entire regions of these countries. In Brazil, 30 million hectares are currently planted with soy, a figure that nearly doubled between 2001 and 2016. This is nearly three times the total of Germany's arable land. Biodiesel production in Brazil and Argentina is mainly soy-based.

These three crops share one important trait: they are plants with flexible uses (*flex-crops*) and are used to produce food, feed, as an energy crop or as a raw material. Sugar, for example, is an essential ingredient for making bioplastics and palm oil is a sought-after raw material for the chemical and food industry.

These three plants also share another feature: they are linked to large-scale monoculture plantation production systems, require an infrastructure that depends on massive capital inputs and cannot be combined with local systems of food production. They are production systems for the global market. Currently, this trend is very visible in the expansion of palm oil production in Latin America. Smallholder farming systems play either no or only a marginal and subordinate role.

Soy is the plant with which genetic engineering registered its first big success: nearly all cultivated soy is genetically modified.

The increased cultivation of these three plants, which are also key elements for a bioeconomy, highlights how the production of biomass is linked to, deepens and expands social and environmental structures.

3. Reprimarisation of the economy

With its increased demand for biomass, focus on biomass production in agriculture and biomass-based energy production, the bioeconomy threatens to exacerbate old global divisions. Integration of the Global South into the global economic framework is once again oriented towards its role as a provider of raw materials. Latin America, Africa and South East Asia are ideally equipped for the bioeconomy's needs: they could produce gigantic amounts of biomass and both Latin America and Africa have areas that are currently

only being used extensively yet would be suited for more intensive forms of agricultural production. Replacing traditional forms of land use, such as pasture farming as practiced by nomads, or shifting cultivation is already increasingly in the sights of productivity-centred development policies.

The focus of the bioeconomy is on resource availability, not on overcoming injustices within societies and the global order. The boom in export-oriented agriculture in Latin America (mainly based on soy, cellulose, sugarcane and meat production) has already led to a development which is being discussed under the unwieldy term of *reprimarisation*. The share of non- or hardly processed goods being exported from the region is increasing. Reprimarisation, however, means more than simply returning to old patterns and is driven by technologically advanced stakeholders, often in the context of the *green economy*.

4. Expansion of a *greenwashed* agricultural model based on genetic engineering and high inputs

The bioeconomy aims to perpetuate and perfect, not to overcome, the agricultural model built on monoculture production and high inputs of agrottoxins and fertilisers that dominates large parts of the Global North and South, and which is expanding, particularly in many countries of the Global South. A bioeconomy conceived in these terms clearly plays a biased role in socially contested development models in the countries of the Global South. The bioeconomical approach thereby aims to underpin the rationality of this exclusive development model, for example, by bringing it in line with global environmental policy, which is then called *climate smart agriculture*.

NGOs and social movements in the Global South have already begun to critically revisit and contest this model. While the bioeconomy has no concern for these stakeholders, engaging in a dialogue with them will be key to developing a critique of this model based on a development policy approach.

5. The bioeconomy promotes economic concentration and the development of monopolies

Many have recognised the severe development policy implications of the concentration of power in the seed and fertiliser industries and promoting alternative approaches that allow producers to regain control over their seed is a central area of work for many stakeholders in development policy. Potentially, the bioeconomy will increase the power of the few corporations that currently dominate the market and make them even more attractive to politicians and investors. Correspondingly, development policy approaches need to be analysed in terms of whether they further or block this tendency. Another important question concerns the people who hold patents on plants, animals and cells and the regulations that apply in diverse international organisations (WTO, CBD, FAO or the *World Intellectual Property Organization* – the WIPO). Bioeconomic approaches give new relevance to preventing patents on life as an important field of action.

The unlimited power of corporations

“In 1996, the ten largest seed corporations held a joint market share of under 30 per cent; by 2007, this figure had jumped to 67 per cent, and today it stands at over 75 per cent. Just three corporations, two of them from G7 countries (Monsanto and DuPont), and one from Switzerland (Syngenta) collectively own 50 per cent of the commercial seed market.” (Konzernmacht Grenzenlos, S.10)

VI. Preliminary conclusions

The arguments put forth in this position paper are an attempt to structure bioeconomy themes and fields of action. Here the focus lies on the bioeconomy's resource basis. The end of the fossil era is nearing and strategies to combat climate change strengthen the role played by biomass. Yet, as the available biomass is sourced largely from land areas (using aquatic biomass remains experimental), this is redefining land use strategies – leaving old structures of power untouched or even intensifying them. Large-scale agriculture and monoculture plantations are seen as a way to combat climate change and are therefore gaining new legitimacy as elements of a *green economy*, i.e. *agribusiness goes green*. Access to land therefore remains a key factor in development and will probably become even more important in the future. Woven into the fabric of the bioeconomical discourse, new forms of land grabbing are already beginning to surface.

1. The bioeconomy is interested in production and efficiency, not in rights

The bioeconomic approach marginalises other approaches such as agroecology, respect for indigenous knowledge or also *buen vivir* (the *good life*) that emphasises the rights of nature. Production and efficiency are the focus of the bioeconomy, not rights. The controversy surrounding the bioeconomy and *green economy* is therefore also a struggle over interpretations and narratives.

We must not forget that this new round of struggles builds on past experiences. The biotechnological discourse also responds to the industry's (partial) defeats in the debates surrounding genetic engineering and agrofuels. The storms circulating in the current discourse will only grow stronger.

In the context of development policy, we need to further analyse how to react to bioeconomic approaches. Currently, it is certainly clear that civil society has little influence on the shaping and development of the bioeconomy. But what comes next? Should interventions by civil society focus on gaining greater influence in concept development and seek more regulation? Or should development policy stakeholders attempt to prevent or block dangerous developments by focusing, for example, on legally banning patents on life, stopping the expansion of genetic engineering and preventing land grabs for palm oil plantations? Can we identify bioeconomic approaches that are actually beneficial to society and may provide a bridge to agroecology? Put differently, does the bioeconomic narrative offer space for alternative models, or is it too deeply rooted in false solutions and should we therefore focus on deconstructing it? We would need to discuss these and further related questions in a dialogue with social movements from the Global South. Importantly, we would also have to consider how issues relevant to the bioeconomy are being discussed in different contexts – for example, in trade or resource policy.

2. More than just a detached research agenda, the bioeconomy is a re-orientation of society's relation with nature with very practical consequences

Already today, the bioeconomically underpinned appropriation of biomass is leading to conflicts with the rights of indigenous peoples and local communities. In addition to conflicts over access to land, there are now conflicts over access to biomass. Bioeconomic strategies focus not only on agricultural and arable land, but on all ecosystems that produce biomass or so-called ecosystem services. New ways to valorise such ecosystems economically will particularly affect the people who live in and off them. Approaches such as REDD+ that put a price on ecosystem services and aim to valorise them, while only being the first relevant approach to an appropriation strategy, have already resulted in fierce debate and vehement criticisms.

In Latin America, bioeconomic approaches have long been on the radar of social movements and some NGOs as well. Via Campesina no longer just struggles for agrarian reform and access to land, but is also engaged in the struggle against (old and new) forms of genetic engineering. Under the banner of protecting traditional seed, and therefore opposing the patenting of life by advocating an alternative concept, a broad

movement has formed. A lively debate over new approaches to valuation, such as REDD+ or biodiversity offsetting, has also developed.

Landscaping a biofuture

“What are the contradictions and limitations posed by venturing into a global bioeconomy? How can this global trend serve to legitimize further agribusiness expansion, which is historically violent, rebooting its image from a key driver of social and environmental conflicts to an anchor for development strategy?”

The bioeconomy has been framed as an epochal challenge. Under the constraints of climate change, the engaging narrative of “development” is being renewed to operationalize a political agenda in which the bioeconomic approach appears integrated into a broader set of policies related to green growth, a circular economy, low carbon/climate-resilient development, and the global sustainability agenda of the SDGs. In this context, the transition to a bioeconomy offers a consistent narrative, operating a “futuring” effect, laying out a vision to the future of production, work, and the relation between society and nature.”

(Landscaping a Biofuture in Latin America, p.26; https://www.fdcl.org/wp-content/uploads/2017/07/FDCL_BIOEC_EN18072017-2.pdf)

More than just a detached research agenda, the bioeconomy is a re-orientation of society’s relation with nature that entails very practical consequences. We will need to analyse the concepts and implementation of this development systematically and critically, and to build alliances, we will have to listen to the voices of the people who are directly affected.

Further reading

- Germany's **National Research Strategy BioEconomy 2030**:
https://www.bmbf.de/pub/National_Research_Strategy_BioEconomy_2030.pdf
- Germany's **National Policy Strategy BioEconomy 2030**:
http://www.bmel.de/SharedDocs/Downloads/EN/Publications/NatPolicyStrategyBioeconomy.pdf?__blob=publicationFile
- **Recommendations of the German Bioeconomy Council - Further Development of the "National Research Strategy BioEconomy 2030"**:
http://biooekonomierat.de/fileadmin/Publikationen/Englisch/BOER_Empfehlungspapier_ENG_final.pdf
- **Innovating for Sustainable Growth. A Bioeconomy for Europe**:
<https://publications.europa.eu/en/publication-detail/-/publication/1f0d8515-8dc0-4435-ba53-9570e47dbd51>
- **Bioeconomy International** - Global collaboration for bio-based economy:
https://www.bmbf.de/pub/Bioeconomy_International.pdf
- TNI has published a detailed and critical discussion of Europe's bioeconomy strategy. Their publication **The Bioeconomy – a Primer** includes further references:
<https://www.tni.org/en/publication/the-bioeconomy>
- Camila Moreno: **Landscaping a Biofuture in Latin America**, Berlin 2015:
https://www.fdcl.org/wp-content/uploads/2017/07/FDCL_BIOEC_EN18072017-2.pdf
- A good introduction to synthetic biology and other new trends in genetic engineering is: Then, Christoph: **Handbuch Agro-Technik**. München 2015 [only available in German]
- G. Church / E. Regis: **Regensis: How Synthetic Biology Will Reinvent Nature and Ourselves**. 2012 by Basic Books
- Inkota, Brot für die Welt and other authors have published a detailed overview of the **power of corporations in the agriculture sector**:
https://www.inkota.de/fileadmin/user_upload/Themen_Kampagnen/Ernaehrung_und_Landwirtschaft/Agrarkonzerne_grenzenlos/broschuere_INKOTA_u.a._Konzernmacht_grenzenlos_2015.pdf
[only available in German]
- The *etc group* is one of the pioneers in the critical debate of bioeconomy concepts. Under its motto **Monitoring Power, Tracking Technology, Strengthening Diversity**, the etc website features analyses and up-to-date reports:
<http://www.etcgroup.org/>
- The *etc group* has published a study on **the concentration of power in the bioeconomy sector** in co-operation with the Heinrich Böll Stiftung:
https://www.boell.de/sites/default/files/assets/boell.de/images/download_de/06_2012_Die_Macht_der_Biomasters_Wer_kontrolliert_die_Gruene_Oekonomie.pdf
- A **comprehensive introduction to a critique of the bioeconomy** can be found in: Gottwald, Franz-Theo / Krätzer, Anita: **Irrweg Bioökonomie**. Frankfurt 2014 [only available in German]

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Biomasse für die Green Economy (November 2015)

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