

## Impact of belt and road initiative on supply chain resilience and sustainability in the agri-food industry

Nikola Zivlak<sup>1\*</sup> and Nicolas Quilfen<sup>2</sup>

<sup>1</sup>*Emlyon business school, 69130, Ecully, France*

<sup>2</sup>*Air Liquide, Dubai, UAE*

\*Corresponding author: zivlak@em-lyon.com

### Abstract

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The Agri-food Supply Chain (AFSC) is characterized by overriding risks due to globalized and fragmented chains. Operations also lack consideration of sustainability and in particular environmental sustainability due to the threats posed by AFSC to resource availability and global warming. However, there is an obvious growing awareness to incorporate more sustainability and resilience into AFSC to keep up with the issues and challenges ahead. To move towards this, BRI seems to be a project that could have a notable impact. Many projects planned by BRI should affect all stages of the AFSC to improve the capacity of stakeholders. Through the quantitative and qualitative improvement of the factors of producers and infrastructure, the benefits seem to be considerable for the AFSC. The findings of the analysis of BRI's impact of AFSC sustainability and resilience, for the time being, are quite mixed. BRI's consideration of sustainability seems to be quite low while its impact on resilience is much more positive. The vision of this megaproject, however, requires a long-term analysis to determine whether the short-term costs will be offset in the long run.

*Keywords:* Belt and Road Initiative; Agri-food supply chain; Resilience; Sustainability; Food security

### Introduction

In 2013, China revealed its intention to revive the Silk Road with a project now known as the Belt and Road Initiative (BRI). BRI's priorities are policy coordination, financial integration, developing unhindered trade, expanding connectivity through infrastructure, and increasing the connection between people. At least 60 countries are expected to be involved in the project, comprising 64% of the world's population (4.4 billion people) and 30% of the world's GDP. Also, one of the major points of BRI is the collaboration and to have a win-win situation for all the countries that take part in the initiative. Thus, it is believed that a project like BRI could bring a lot to the development of countries and stimulate their economy.

Many of these projects involve agriculture because of the importance of this sector in BRI countries. The importance

of this sector to the Belt and Road Initiative is rising, as evidenced by the publication "Vision and Action on Jointly Promoting Agricultural Cooperation on the Belt and Road" four years after the initiative's start (Ministry of Agriculture of the People's Republic of China, 2017). The complementarity of products traded between BRI nations is one of the factors that encourage cooperation. However, one of the issues that many BRI nations encounter is a lack of infrastructure, which has an influence on agricultural production and prevents the country from taking advantage of its resources while having a high potential (World Bank Group, 2019). BRI will not only impact production but also the other stages, notably processing and distribution. What emerges from this is that countries will see their production capacities improve and will also be able to greatly benefit from the transport network developed by BRI, which will enable them to develop their

export capacity. Thus, many more producers will be able to take part in the value chains and this will disrupt the agri-food supply chain (AFSC).

The AFSC is today characterized by a great complexity because the chains are more and more globalized and put under tension because of a greater demand and a stronger pressure on the resources. Other problems that weigh on the AFSC include GHG emissions, food waste, the impact on land fertility and biodiversity, and global warming. In this regard, the sustainability of the AFSC is one of the biggest challenges for the future. In addition, the fact that the chains are increasingly fragmented poses significant risks to each operation. Cooperation between each stage is necessary to make the process as efficient as possible, but the larger the distance from the customer, the more uncertain the situation. As a result, in addition to being sustainable, tomorrow's AFSC must also be resilient (Tsolakis et al., 2014).

Through the quantitative and qualitative improvement of the factors of producers and infrastructure, BRI benefits for the AFSC seem to be notable. However, attention should be focused on the concepts of resilience and sustainability of the AFSC as these are the biggest challenges for tomorrow.

Hence, in this paper, research will be conducted to answer two major questions:

1. What is the impact of BRI on the sustainability and resilience of the AFSC?
2. Will BRI's outcomes lead to a majority of benefits for AFSC considering the tremendous cost surrounding the project?

The framework of BRI will then be explained in further depth in section 1 before the reasons that motivated China to undertake such a project. Section 2 will discuss the AFSC, detailing its main characteristics and some of the problems and challenges it faces. Section 3 will provide a picture of AFSC in BRI countries at present with a specific focus on agricultural productivity as well as BRI projects planned for AFSC in these countries. Then, sections 4 and 5 will address the impact of BRI on AFSC, first addressing the impact on sustainability before looking at the impact on resilience. Finally, the Discussion section will review the results and place them in the existing literature.

## Literature Review

### *1. Supply Chain Resilience and Sustainability*

Today, supply chains are increasingly global and complex, leading to a greater uncertainty and risks of disruption for companies (Pettit et al., 2010). The concept of resilience refers to the design of a robust supply chain that anticipates risks and provides an effective and efficient solution to dis-

ruptions by returning to the initial stage or to a better stage after the disruptive event in order to gain a competitive advantage (Ponis & Koronis, 2012). Supply chain resilience is therefore important because it provides a response to vulnerabilities inherent in business operations that can have operational and financial impacts (Ponomarov & Holcomb, 2009). However, the implementation of a resilient supply chain will not make the risks induced by the supply chain of a company disappear but rather allow it to improve the management of these risks because response from disruption also needs to come from suppliers and customers (Pettit et al., 2019).

At the same time, companies are aware of the imperative to adopt a sustainable supply chain that considers social, economic and environmental aspects because of the negative externalities resulting from their activities (Agyabeng-Mensah et al., 2020). Sustainability has been studied from different angles and from the company's point of view, the reference approach is the Triple Bottom Line (TBL) of John Elkington (Elkington, 2004). TBL strategy states that in order to be profitable, a company needs people and resources and consequently, the company's decisions must be based on taking the three dimensions of sustainability (Kenton, 2021). More generally, sustainability refers to the management of information, capital and materials by considering the three dimensions of sustainable development: economic, social, environmental (Seuring & Müller, 2008). As soon as a company incorporates these three aspects of sustainability, it tends towards a supply chain that can be described as sustainable.

The growing importance of adopting a sustainable supply chain has led to numerous studies. Using data from the international manufacturing strategy system, it has been shown that sustainability can reduce the supply chain risks of companies (Gouda & Saranga, 2018). Moreover, a meta-analysis of 20 years of research on environmental practices in supply chain showed that sustainable supply chain increases the performance of companies (Golicic & Smith, 2013). Simultaneously, in order to move towards a sustainable supply chain, it will be key for companies to work with their suppliers (HBR, 2020). Research on fast moving consumer goods showed that by working on sustainability issues at the source, significant sustainability gains could be made thanks to reliable suppliers and the efficient use of resources (McKinsey&Company, 2016). With this focus on resource efficiency, many authors agree that Industry 4.0 should have a major role and that the use of technology will help companies in their quest for sustainability (Luthra & Mangla, 2018).

The concepts of resilience and sustainability are therefore major themes in today's supply chain and there is no real consensus on their relationship. Three possible forms of relationship: resilience as component of sustainability, sustain-

ability as component of resilience and reliance and sustainability as separate concepts (Marchese et al., 2017). Many authors agree that there are many intersections between the two concepts and that the joint integration of these strategies to achieve a “resilient sustainable” supply chain is essential (Ivanov, 2017; Fahimnia & Jabbarzadeh, 2016; Zavala-Alcivar et al., 2020). Finally, the Covid-19 health crisis suggests that supply chain resilience and sustainability are concepts that will be of major importance to increase trust and risk management in the supply chain (Sarkis, 2020).

## 2. Agri-food Supply Chain (AFSC)

The Agri-food industry is one of the most important sectors in the world and is facing strong pressures due to many challenges. With a world population that could reach 10 billion in 2050 but a level of agricultural land that will remain the same while taking into account that the growth of income in poor and middle countries changes the food habits with an increasing consumption of meat, fruits and vegetables, the pressure on natural resources as well as on this industry is even stronger (FAO, 2018). This sector is also witnessing an increasing awareness of the environmental, social and economic impacts of its operations and a change in consumer behavior towards the search for transparency and traceability of products (Iakovou et al., 2014). Rethinking the agri-food system to manage this sector is therefore crucial because current issues and practices are not sustainable to meet future challenges (Tsolakis et al., 2014). Thus, it is necessary to develop more robust and sustainable supply chains in order to address concerns about climate change, resource scarcity and reduce emissions, energy consumption and food waste along the chains (Borsellino et al., 2020). In the food industry, the supply chain is characterized by many actors, processes and activities ranging from the farmer who supplies raw materials, to food manufacturers and distributors (Xing & Amer, 2016). The AFSC, known as “farm to fork”, is characterized by certain specificities that are unique to it, such as quality standards, the temperature of the systems, the perishability of the products or the seasonality that increases the complexity of the supply chain (Zecca & Rostorgueva, 2014). Finally, in relation to some of these specificities, logistics has an essential role to play, particularly transport, in order to maintain product quality.

Sector’s challenges generate change and sustainability can no longer be ignored. Considering that the gain in food supply by 2050 compared to its current level is 70%, the systems will have to change in order to avoid a similar increase in emission as well as in food wastes (30% global food production) and therefore the adoption of a sustainable vision is not preferable but necessary (Krishnan et al., 2020). This

context has also intensified the importance of adopting the circular economy to better manage resources (Esposito et al., 2020). This point was also put forward by the former CEO of the food giant Danone when he mentioned that in this industry the chains are more and more global inducing more risks and many issues must be addressed in order to move towards sustainability (McKinsey & Company, 2016).

One of the major points of sustainability in the agri-food industry is to work directly at the source and especially with the suppliers. It is obvious that suppliers at the beginning of the chain have a major role to play in order to implement sustainability and this has notably led to the growth of standards and certifications along the chain (Von Hagen et al., 2010). At the same time, AFSC is characterized by increasing volatility and vulnerability due to variations in raw materials (quantity, price, quality) and this is leading to the rise of the need for a resilient supply chain. This is supported by the fact that AFSCs are increasingly globalized and complex and therefore more exposed to disruptive events (Stone & Rahimifard, 2018; Davis et al., 2021). This is especially true for AFSCs based in developing countries where farmers often have smaller and less accessible farms, which increases costs, risks and uncertainties.

In this perspective of adopting resilience and sustainability within the supply chain in the agri-food industry, recent research highlights the benefits that digital technology could bring. Agri-food 4.0 (industry 4.0 applied to the Agri-food industry) could prove to be an opportunity in the management of resources, transparency and efficiency of the AFSC (Saetta & Caldarelli, 2019; Lezoche et al., 2020).

## 3. AFSC within Belt and Road Initiative

During the autumn 2013, first in Kazakhstan and then in Indonesia, Chinese President Xi Jinping shared the first insights of the “Belt and Road Initiative”. This project aims to enhance cooperation and foster policy coordination, unimpeded trade, facilities connectivity, financial integration and people to people bond (Chinese Ministry of Foreign Affairs, 2015). Given the large scope of the project, BRI has been attracting a lot of attention and due to the priority that is given to the development of infrastructures, trade is among the main impacted sectors. Trade costs could be reduced by up to 2.8 percent for BRI countries and 2.2 percent for the world only considering infrastructure projects (De Soyres et al., 2019). Beyond trade costs, shipment time will also be positively affected via BRI through new trade routes, diversified routes and modal shifts and it can be estimated that average trade shipment time will be reduced by 4.4 percent (Baniya, S. et al., 2020). The contribution of this paper goes further by relating the importance of trade facilitation and point-

ing out that deeper cooperation agreements may more than tripled trade flows intensification. Although trade cost and shipment time are likely to reduce, trade barriers have also to be significantly improved so as to create and promote a favorable trade environment. Combining both soft and hard infrastructures is essential, if not conjunctively implemented potential trade flow increase may be hampered (Ramasamy et al., 2017; Ramasamy & Yeung, 2019).

The impact of infrastructure development will also undoubtedly have repercussions on the supply chain. Infrastructure development will enhance supply chain resilience and lead to a better adaptation to disruption (Butt & Shah, 2020). Taking the example of the port of Colombo in Sri Lanka and the improvement of domestic logistics infrastructure a positive effect on lead time and the integration of the supply chain and therefore the increased reliability of transport thanks to BRI can be observed (Park & Dossani, 2019). Other changes brought about by BRI such as connectivity will alter the supply chain. The collaborative environment promoted by BRI and the new axes will open up new challenges and make the supply chain more resilient, particularly through multisource (Butt & Shah, 2020). At the same time, BRI will lead to the opportunity of reaching new markets and therefore modify labor, costs, logistics and strategic access for countries and companies (Thürer et al., 2019). Finally, for the development of BRI, a point of honor is put on the consideration of sustainability in construction. In line with the sustainable development goals set for 2030, there is a definite desire to work on environmental protection and promote green development by integrating it into all aspects of the project, such as the green supply chain and green infrastructure (Chinese Ministry of Foreign Affairs, 2015). As a result, supply chain sustainability will be improved.

Within the BRI project, one of the industries that is closely looked at is agriculture because of the important place it occupies in each of the BRI countries, about 25% of GDP in these countries (FAO, 2018). It is certain that the history of these countries and their resources have made them indispensable in the world trade of agricultural products and in 2014 they represented 13% of the world agriculture trade (UNCTAD, 2014). Moreover, if we consider the structure of the products traded, we can see that there is a complementarity that suggests a bright future of agricultural cooperation and benefits under BRI (He et al., 2016). At the same time, many BRI countries are facing the challenges of hunger and poverty and given the importance of the agricultural sector, the project is well positioned to address these issues while developing the agricultural sector through sustainable production systems, agro-industrial parks as well as transport and warehouse infrastructure (Gale, 2017). In addition,

BRI's agriculture-related investments and objectives are likely to increase the sector's productivity, reduce risks, and harmonize practices and regulations (Yao et al., 2020). Under the aegis of BRI, the need and the will to build agricultural cooperation is emerging. This project is a concrete opportunity to develop sustainable agriculture and establish a green Agricultural Silk Road that would benefit all the countries involved and improve the quality, safety and traceability of products (Ministry of Agriculture P.R China, 2020; Weihai Silk Road Trade Cooperation Promotion Center, 2018).

## Research Methodology

### *Primary Data*

Primary data was collected through interviews that took place between April and June 2021. Interviewees were identified through their expertise or work related to the topic and research questions. In order to find the most relevant people to interview, keywords or combinations of words related to the research were used. There were 21 interviews organized in total. Thus, some of the academics interviewed had previously worked exclusively on BRI or, for example, on the impact of BRI on the supply chain, or even on climate issues in relation to agricultural production. The selection was based on their proximity to the subject as a whole or to a specific point of it. A second selection was made with the language of articles and only French and English were retained. As a result, several dozen articles and authors were identified. Overall, exchanges were conducted with about twenty people with different and complementary profiles. Moreover, no filter was made on the location of the persons insofar as both people in BRI and non-BRI countries were interviewed. The exchanges consisted of open-ended questions in order to gather as much understanding as possible on the work or expertise of the interviewees. An analysis of the content of each interview was then made to extract the most relevant information from each discussion.

### *Secondary data*

The secondary data used was derived from previous research on the subject. The data regarding agriculture and agricultural production is from FAO reports and also on the well-known article on the characteristics of farms in the world (Lowder et al., 2016). The data regarding the environmental impact of BRI are mainly taken from the work of Alice Hughes on minimizing the environmental risk of BRI (Hughes, 2019). These data refer to the comparison of transport projects in particular and key biodiversity areas, which refer to areas that are of high value for global biodiversity. Other environmental data used are from the EDGAR-FOOD database. This data source provides a precise study of the greenhouse

gas emissions of the food system as well as the evolution over a period of 25 years from 1990 to 2015 by taking each step of the AFSC. Much of the financial data is derived from the reports of the Green Belt and Road Initiative Center. This center provides comprehensive economic research and reports on the distribution of BRI investments since its inception. Another part of the financial data used in this paper comes from the World Bank and the Council on Foreign Relations (CFR).

Data on transportation projects and the reduction of shipping times are adapted from an article that used a Geographic Information System analysis and algorithms with respect to the network of cities studied in order to estimate their result (De Soyres et al., 2019).

It should be noted that obtaining full and easily accessible data on some of the BRI components is challenging. As BRI is such a large initiative, it encompasses several subjects that are frequently difficult to quantify. Moreover, the research topic studies elements have rarely been studied together. As a result, in this article, the most complete data on the investigated aspects are used to provide the most comprehensive responses to the issue. Interviews allowed to gather feedback and a precise analysis thanks to the field elements and the expertise of the interviewees. In the end, the data in this paper is well placed to respond to the research question because it covers precise fields that have been measured by studies or organizations during research work and also mixes precise opinions to better understand the research questions.

## Discussion

### *AFSC in BRI countries*

The AFSC is crucial for the world. The AFSC of tomorrow will have to respond to many challenges because today's food systems are totally unsuitable with the projections of the world demands of the next centuries. The AFSC is complex because it involves a significant number of phases and requires close coordination among the operations to function as effectively as possible. The AFSC has evolved a lot during the last decades and especially thanks to globalization. One of the consequences of this is the intensification and liberalization of trades but also the creation of much more fragmented and globalized food systems. This undeniably increases the risks for the AFSC because the chains are more complex. The unique characteristics of the AFSC such as the dependence on climate and the perishability of the products make the complexity of the chains even more important. These characteristics are inherent to the AFSC and cannot be circumvented.

Furthermore, the current AFSC is a real threat to water resources and the climate. Without water there would be no

food, but if 70% of the world's water consumption is used for agriculture, an obvious problem appears when considering the population growth and thus the demand. This is even more alarming considering that 1/3 of the world's production is being thrown away or wasted. In addition, the AFSC is a major emitter of GHGs and consequences are considerable for the climate. The AFSC is therefore partly responsible for the consequences and also one of the sectors impacted by its own functioning because it is dependent on the climate and vulnerable to extreme meteorological events. All of this affects production through lower yields, food insecurity and price instability, and so major disruptions for worldwide food systems.

Consequently, one of the necessary features for addressing the shortcomings of today's food systems is sustainability. Sustainability is a very broad concept as it covers several elements that are grouped into three pillars of sustainability: economic, social and environmental. The AFSC is also subject to much more volatility and the fact that the chains are increasingly globalized makes them more complex and exposed to more disruptions. The AFSC of tomorrow will therefore have to be resilient as well.

When we develop this image of the AFSC, we naturally wonder if BRI is a project that could have an impact on it, and if so, how? BRI is, first and foremost, an initiative that strives to increase connectivity. Therefore, the more global chains would gain tremendously from this. This is correct, but it goes even further.

Agriculture has been and is being studied a lot because it turns out that it is the sector that best explains income inequalities between countries. As the previous information shows, the poorer countries are, the higher the share of agriculture in their GDP. The importance of agriculture is notably linked to their development, but it turns out that these countries are also particularly unproductive in this sector. There is therefore a real paradox in that the most unproductive countries in agriculture are those that have a larger share of employment in this sector. Moreover, these countries have a very small amount of agricultural land per worker, so the productivity gap between countries is even greater.

As several studies have shown, agriculture plays a significant economic role in many BRI countries and these countries have high productivity potential and there are numerous BRI ambitions in this sector (Chinese Ministry of Agriculture, 2017; Grain, 2019). As a result, the outcome of BRI on the AFSC will be promising.

Agriculture will benefit from BRI since infrastructure development will help countries to enhance their production because the outcome of infrastructure development will be agricultural inputs. In addition, as countries develop, they

will be able to take greater advantage of their resources and participate in value chains, which will boost their economies. Transportation projects are also key. With increasingly globalized chains, transport infrastructures are essential to ensure the transit of products. First, there is product transit within the country, followed by product transport outside the country's boundaries. Domestic transportation is what many nations lack and explains agricultural inequalities, since a lack of infrastructure hinders certain farmers from reaching high production if they know they would be unable to sell their produce (Liu, 2017).

The BRI countries recognize that agricultural cooperation is a critical component in addressing the current food challenge, which may worsen as the population grows. In some ways, BRI is the project that was needed for this industry since the exchanged products are complimentary, but the quantity of trade remains relatively low due to insufficient export infrastructure, as well as low productivity.

At first glance, it appears that the AFSC as a whole is likely to be positively impacted by BRI. The benefits appear numerous for all stages and there is a lot of potential for further development and cooperation. However, the question to be asked is at what cost this will be done. For any project, and especially one of this magnitude, it is natural to wonder whether the long-term benefits would outweigh the costs. Starting with the issue of sustainability and resilience, we may take stock of the outcomes to determine what BRI implies for the future.

#### ***BRI impact on AFSC sustainability***

The impact of BRI on the AFSC will mainly occur with the development of infrastructures. At present, we cannot say that environmental criteria are a priority for BRI. Road and rail projects sometimes represent a threat to biodiversity and potentially increase in the carbon footprint, especially in areas where the value of the ecosystem is very high. In addition, some projects, particularly energy projects, are not always in line with what one would associate with sustainable development because of the environmental degradation observed on several projects. The findings of this study are consistent with the vast majority of research that has been conducted on this subject. However, throughout a project of this nature, any gain comes with risks and expenses. If the environment is often pushed to the sidelines, it is because the projected advantages outweigh the costs that the project could generate. Furthermore, BRI's investment trend shows a field of opportunity. In recent years, the share of green investments has increased, and this is a good indication that BRI is giving more and more consideration to greening the project. The interviews for this study are in line with previous research in that the environment appears not always

to be the first concern. This is an issue since the agriculture industry as a whole is heavily reliant on the weather and the environment. If the environment suffers as a result of BRI, the AFSC will bear most of the consequences.

The outcome regarding environmental sustainability is rather mixed and the same is true for social sustainability. This project can bring a lot to the development of the countries and therefore to the stakeholders of the AFSC. In addition, BRI seems to be well placed to help to address food security concerns by establishing an environment for increased agricultural yields and improved commodity exchange. However, BRI does not develop without its consequences, especially on land. Land grabbing, especially of agricultural land for BRI projects, is sometimes controversial because it could undermine many people, especially small farmers. BRI wants to be inclusive but for the moment there are certain people who do not seem to be able to benefit from the project and take part in the supply chain. Finally, regarding economic sustainability, BRI's project brings economic benefits, but the financing of the project sometimes could threaten the risk of indebtedness of countries. Nevertheless, the projects will place countries in value chains because of their increased competitiveness and attractiveness. This will enable them to capture a greater share of value added and contribute to the economic development of the countries.

The conclusion on sustainability is mixed and this is reflected in the existing literature. However, the existing literature has focused extensively on environmental sustainability and has frequently reached more unfavorable findings. In this study, all three pillars of sustainability are considered in order to provide a more complete picture. Thus, this research is somewhat at odds with others (Tian et al., 2019). Indeed, including all sustainability aspects enables for additional variables to be evaluated in order to better understand the influence of BRI on sustainability and identify some opportunities.

#### ***BRI impact on AFSC resilience***

From a resilience perspective, the conclusion is less mixed when looking at the results. All stages are dispersed, globalized and located far from the consumer. Transport is therefore central to the functioning of the AFSC but also a source of risk at the same time. Trade routes will be more secure as there will be opportunities for alternative routes or means of transportation. Companies will be better prepared for disruptions and risks to the transportation that surrounds their business. This is one of the most important points because the further away from the consumers the risks are. With average shipping cost and times between countries expected to decrease, companies will see distanc-

es reduced in a way that will allow them to have a better control of their supply chain resulting in better capacity to react and adapt. Moreover, BRI is expected to positively impact the resilience of the AFSC through multisource. Producers will see their productivity and ability to export increase as a result of BRI's infrastructure and this will allow them to leverage their resources and participate in value chains due to improvement in their competitiveness and attractiveness. This will greatly benefit companies who will have a wider choice of suppliers and more flexibility to avoid being paralyzed in the event of a problem with one of the suppliers. This result is aligned with existing research that estimated that a large part of the disruptions occurred at the supply level.

This research also joins the existing literature on the combination between the aspects of sustainability and resilience of the supply chain. Indeed, this research agrees with those that put forward the possibility of developing a "resilient sustainable" supply chain (Fahimnia & Jabbarzadeh, 2016). It was demonstrated that the two notions are distinct, and that while combined development is feasible, it also necessitates separate approaches.

## Conclusion

BRI is subject to a fair amount of controversy, as the damage to land, biodiversity and climate has sometimes been quite severe since the project was born. As of now, there are opportunities for the development of green infrastructure and in particular for solar or wind energy but investments for green infrastructure must be intensified. Economic and social sustainability under BRI is also debatable but long-term impact of this project appears to be much more positive.

Furthermore, production gains and infrastructure improvements and development will facilitate multisource, near-shoring, and increased partnerships. Reduction in risk for the AFSC will emerge from BRI and that will bring resilience.

In view of this rather mixed picture, we can only partially answer the research question. While the benefits to resilience are quite measurable and observable, the outcomes to sustainability cannot be judged on such a short time horizon. Longer term analyses are needed to get a true picture of the impact of BRI on the sustainability of the AFSC even if we can estimate at this point that sustainability, and in particular environmental sustainability, is sometimes compromised in the development of the projects.

This study has implications for the agri-food sector in terms of the consequences that are currently not necessarily visible for now in relation to BRI. If the AFSC must be sustainable in order not to jeopardize the ability of food systems

to meet the needs of a growing world population, the influence of BRI is difficult to quantify but exists at the same time. In this study, we have seen that the impact of BRI on sustainability could sometimes be quite controversial. It sometimes seems that BRI is mainly focusing on food security, even though costs of achieving this goal could be comparatively high. Various elements of BRI have been identified as potential barriers to improving the sustainability of the AFSC. This is consistent with much of the research that has studied this issue without necessarily applying it to the AFSC. From a resilience perspective, BRI seems to provide much more benefit.

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