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Sebastian Purwins

DYNAMICS AND CONSEQUENCES: THE ECONOMIC/ ECOLOGICAL DOUBLE CRISIS IN CHINA AND THE BAUXITE-ALUMINIUM INDUSTRY IN GHANA

Contents

Abstract
The economic/ecological double crisis has long since reached China. In order to stabilise the growing economy, access to new markets and resources is indispensable. At the same time, the associated environmental damage is steadily increasing, causing public pressure on the government in Beijing. This article argues that, in the sense of David Harvey (1982), crises are not solved, but rather spatially managed. Ghana as a market and the predominantly untapped bauxite reserves have aroused China's interest. In 2017, the two countries signed a Memorandum of Understanding concerning the development of an integrated bauxite-aluminium industry in Ghana. What may be interpreted as crisis management for China leads to an increased exploitation of natural resources in Ghana and to the problem of leaving this development path. Based on field research in March 2018 and intensive research on the literature, these dynamics and possible consequences are discussed here using the concept of the *spatial fix* and the *economic/ecological double crisis*.

Keywords
China – development path – spatial fix – Ghana – bauxite-aluminium industry

1 Introduction

In the past, the economic development of Ghana was characterised either as '*growth without development*' (Ayelazuno 2014: 95) or as '*progress and poverty at the same time*' (Obeng-Odoom 2014). However, the new government, elected in 2016, aims at comprehensive industrialisation in order to create growth and prosperity. Natural raw materials and their valorisation have central significance within this strategy: '*We have huge infrastructure needs in areas of roads, bridges, water, electricity, housing, hospitals and schools and the problem has always been where to find the money*'

(Akufo-Addo 2018). Although the susceptibility to crisis of such raw material-based development models is well-documented, Peters and Burchardt (2016) believe that a departure from raw material extractivism in the Global South is unlikely. For resource-rich African countries such as Ghana, the role of raw material supplier in a global economy seems to be manifesting itself. The reason given for this is that the economic structures usually have a one-sided orientation towards the exploration and mining of natural resources, and the lack of diversification of the economy blocks a change of direction towards other development paths in the medium term. In the process, the impression is created that, above all, the countries' own internal structures are inefficient and inadequate. External influences and systemic constraints are often disregarded. At the same time, since the financial crisis of 2008, increasing numbers of investors have concentrated on Africa in order to use the economic starting position as a *spatial fix* for capital (Ayers 2013; Klare 2012). Thus, Zhang (2017) interprets China's Belt and Road Initiative (BRI) as a *spatial fix* in order to manage the internal economic crisis tendencies. Meanwhile, China is not only facing the challenge of continuing to achieve high economic growth rates; at the same time, ecological problems are drastically increasing. This economic/ecological double crisis is becoming a challenge for the capitalist centres as well as for aspiring nations such as China. This article addresses the question of how far China's investment in the bauxite-aluminium industry in Ghana can be interpreted as managing its own double crisis. Here, it is argued in the spirit of David Harvey (1982) that crises are spatially managed or displaced, and resource-rich African countries such as Ghana continue to play an important role in this context as raw material suppliers and sales markets.

1.1 Structure and methodology

This article will firstly analyse the concepts of double crisis and *spatial fix* before explaining the dynamics in the bauxite-aluminium sector in more detail. The article will then address China's double crisis, discussing the extent to which Chinese investment in the development of a bauxite-aluminium industry in Ghana can be understood as a way of managing this crisis. Finally, the article offers a critical discussion of the dynamics and consequences of these phenomena. These findings are based on an intensive examination of the theoretical foundations, an appraisal and analysis of secondary data (media reports, political documents and reports by companies and NGOs), and field research in Ghana in March 2018. During the field research, the infrastructure of the bauxite-aluminium industry in Ghana was mapped. Free, informal conversations also took place. The persons interviewed were not brought into a traditional interview situation, such as in narrative interviews. Free conversations serve to generate contextual knowledge in order to make corresponding classifications when combined with secondary data; they are, therefore, only suitable as a supplementary method.

1.2 Theoretical background

The term 'crisis' is often used to characterise the current world situation. For example, Brand and Wissen write (*BUKO* [Federal Coordination of Internationalism] 2013:

2): '*The situation in Germany and internationally is characterised by various crises', and Machnig (2011: 19) also ascertains: 'Crisis is becoming the permanent category of modernity.*' However, the term 'crisis' is sometimes used arbitrarily and inconsistently in political, scientific and public discourse, according to Machnig (2011). Bader, Becker, Demirović et al. (2011), following other authors such as Altvater (2009), Brand (2009), Candeias (2009) and Wolf (2009), reject the limitation of the current constellation as a crisis dynamic of capitalism to the economic and financial crisis, and include other crises such as that of energy supply, climate or food supply. This so-called multiple crisis denotes four central crisis complexes: the crisis of finance-dominated accumulation; the socio-ecological crisis; permanent crises of reproduction; and the crisis of parliamentary democracy. The term 'multiple crisis' is sometimes used synonymously here, since the core aim is to search for connections between the individual crises and for system-dependent effects of their simultaneity. Ulrich Brand (2009) conceives the multiple crisis in a more differentiated way. For example, in the social field, he makes an additional distinction between forced migration, the crisis of gender relations or of hegemonic masculinity, as well as social integration. Klaus Dörre (2017) argues that the term 'multiple crisis' suggests that all areas are in crisis. However, this would mean losing the analytical sharpness of the concept. He defines (transformation) crises as a '*spatiotemporal hardening of disruptions, or more precisely, of the limits of capitalist accumulation, which constantly make themselves noticeable over the course of time but are now causing a social turning point, a fundamental decision-making situation*' (Dörre 2012: 2). At the same time, he argues that Europe is experiencing an economic/ecological crisis and that the economic and financial crisis can be described as a crucial turning point for this (Dörre 2017). Accordingly, in order to stabilise capitalist societies, increasing and repeated growth is needed in order to intermittently overcome the periodically occurring economic crises, but for which – in the Marxist sense – the sources of growth and prosperity, i.e. work and nature, must continue to be exploited. Economic growth as a strategy to overcome economic crises thus becomes the driving force of increasing ecological damage. The double crisis consequently describes the intersection of two lines of development: '*rapid and permanent economic growth on the one hand and accelerated energy and resource consumption as well as increasing emissions on the other*' (Dörre 2017: 3). Meanwhile, threshold countries such as China are now also massively affected by this double crisis and must grapple with it (Dörre 2018). The economic/ecological double crisis is managed using various strategies, although it should be emphasised that these are '*strategies without strategists behind them*' (Foucault 1978: 132) when speaking of crisis management. The consequences of this development are not necessarily congruent with the original strategic objectives pursued by the stakeholders. At the same time, as Dörre (2017) also emphasises, stakeholders have an influence on the system, and the systematic growth compulsion is not necessarily without an alternative.

In addition to the concept of double crisis, the theory of *spatial fix* also plays a major role in the argument of this article. For David Harvey (1997, 2003), one of the central problems of the capitalist economic system is the danger of over-accumulation, i.e. the accumulation of capital above the limit of profitable usability. In his seminal theory, Harvey assumes that the continuing reproduction of capitalism is essentially based on the possibility of shifting the necessarily occurring surpluses of investment-

seeking capital temporally or spatially (by means of geographic expansion and restructuring). He terms this the *spatial fix*. The term *fix* does not mean to set in place, but to repair or stabilise, in the original sense used by David Harvey (1982). He argues that the *fix*, i.e. the stabilisation of the inner crisis of the economy, takes place by means of the spatial expansion of economic networks, i.e. the colonisation of new markets. This also involves the question of whether perhaps new locations of raw materials and energy carriers can be identified which could lead to a price decline and therefore cheapen production, or whether new fields of capital accumulation are being opened up: for example by privatisation, the acquisition of natural resources, or the acquisition of knowledge and its transformation into a good (Harvey 2001; Harvey 2003; Wiegand 2013). Because of their unexploited raw material sources, the peripheral regions of global capitalism represent the greatest potential here. However, these conceptually produced regions are limited, and their resource potential means that they are correspondingly contested. In this context, the state plays a central role for Harvey. However, its relation to the economy remains undefined in his statements. Wolff (2016) argues that without a state as a political form which regulates the basic transport and ownership conditions, the capitalist production method is unthinkable; capital accumulation processes can only be realised by the state. Nevertheless, the state exhibits a so-called relative autonomy, both with regard to social classes and to the economy – relative because the state is structurally dependent on successful capital accumulation, since the tax revenues necessary for its existence can only be collected through this. It is therefore in the state's own interest to support the accumulation of capital by geopolitical initiatives (Wolff 2016).

In the following, these theoretical assumptions will now be connected with Chinese investment in Ghana's bauxite-aluminium industry. Knierzinger (2018) emphasises that research on African bauxite mining and its developments is rare. In his work, Knierzinger (2016) investigates mining in Guinea; for Ghana, however, there have hitherto only been predominantly historical studies which focus on bauxite and its role in the era of the country's independence. The present article, in contrast, attempts to classify the current dynamics using the theories described above.

2 Bauxite in Ghana

Bauxite is an aluminium ore which predominantly exists in a belt around the equator. It is currently the most important ore used for the commercial production of aluminium. In the tropics, bauxite occurs in horizontal layers a few metres underneath the earth's surface. These layers are mixed with further, different clay minerals, iron oxides and titanium oxides, which firstly have to be washed out for further processing. The material is then crushed in refineries and converted into aluminium using energy-intensive electrolysis (Knierzinger 2016). The most important bauxite mining areas in Africa are located in Guinea, Ghana and Sierra Leone. In 2014, Guinea, as the fourth-largest producer worldwide, produced 17.3 million tonnes of bauxite; Sierra Leone produced 1.16 million tonnes and Ghana approx. 837,000 tonnes (USGS 2016). Although Ghana possesses extensive reserves, the bauxite-aluminium industry is not very significant in terms of the national economy. The country exports cheap bauxite, imports aluminium oxide, processes this in a smelter and then in turn exports alu-

minium. This fragmented supply chain, which was established in the 1970s, was advantageous for the companies concerned, but was not in the economic interests of the country (Hart 1977). The insufficient energy supply for the smelter, as well as the outdated rail network, resulted in Western companies gradually withdrawing from this sector (Knierzinger 2018).

3 The development of an integrated bauxite-aluminium industry

In the context of Ghana's presidential elections in 2016, however, bauxite as a raw material greatly increased in significance. From then on, bauxite was not just to be extracted but also to be processed in Ghana. Export income from the aluminium could, in turn, fund social programmes such as schools, infrastructure or the water supply. The new president of Ghana emphasised: '*My government is going to implement an alternative financing module to leverage our bauxite reserves in particular to finance a major infrastructure programme across Ghana. This will probably be the largest infrastructure programme in Ghana's history without any addition to Ghana's debt stock*' (Akufo-Addo 2018). In June 2017, after extensive previous negotiations, Ghana signed a Memorandum of Understanding with the People's Republic of China, which provides for the development of a bauxite-aluminium industry by means of a US$ 10 billion loan. The loan is provided by the Chinese Development Bank, and construction measures are carried out together with China Railway (Oxford Business Group 2018).

In March 2017, Ghana's finance minister published a six-point plan for the development of an integrated bauxite-aluminium industry. The plan includes the opening of new bauxite mines near Awaso, Nyinahin and Kyebi (cf. Fig. 1), the construction of refineries and the development of the corresponding infrastructures, such as an energy supply and the building of new transport routes (Ghana Ministry of Finance 2018). In addition, the aluminium smelter at Tema is to be expanded and an industrial park created for the further processing of aluminium (Oxford Business Group 2018). In July 2018, the government entered into a contract with the Chinese firm SinoHydro. The firm is investing US$ 2 billion in the expansion of the infrastructure and, in return, will receive processed bauxite for the next 15 years. In return, the government will endeavour to develop refineries in order to process bauxite (Kpodo 2018).

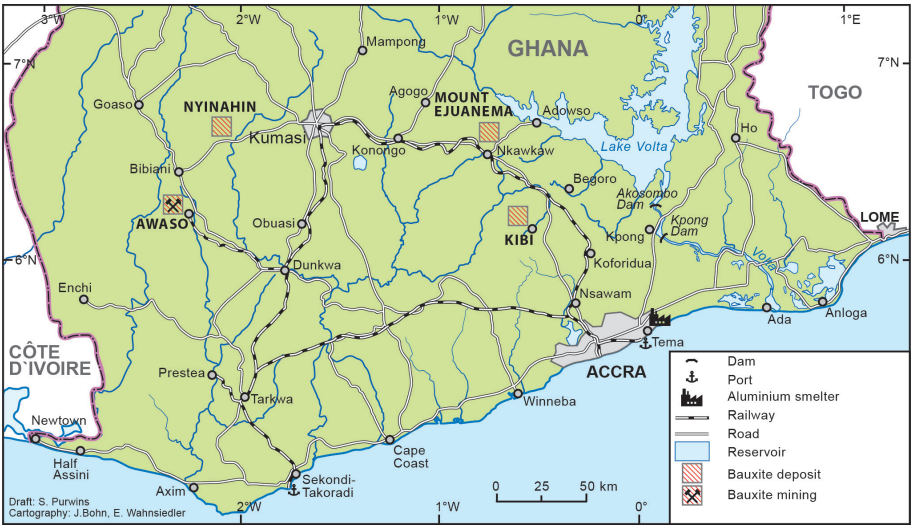

Fig. 1: Infrastructure of the bauxite-aluminium industry in Ghana

In Ghana itself, the investment is intended to stimulate economic growth, particularly against the background of growing foreign debts. When the world market prices for raw materials fell drastically in 2013 and 2014, Ghana's GDP dwindled from US$ 47.81 billion in 2013 to US$ 38.62 billion in 2014 (Jones 2016). At the same time, its debt burden greatly increased, since the country increasingly had to take out loans. Measured against the GDP, the debt burden rose from 47.9% in 2012 to 73.4% in 2016 (Jones 2016). In addition, in view of its high debt burden and declining income from the export of raw materials, the state does not have much money available for infrastructural measures. In order to counter the growing debt burden, the government is aiming to generate higher tax income by means of more economic growth; in China, it has found an interested partner which can not only finance these projects but also use it as a way of managing its own crisis.

4 China and the double crisis

In the last few decades, the People's Republic of China has become known as the workbench of the world and has become embedded in a capitalist global economy. China's economic growth and current development are largely based on exports. For Lardy (2012) as well as Peck and Zhang (2013), the export sector is crucial for the country's economic stability. In 2017, with exports valued at around US$ 2.26 trillion, China was the largest export country in the world, beating Germany (US$ 1.44 trillion) and the US (US$ 1.54 trillion) (Statista 2018). China predominantly exports computers, TVs and telephones, and imports oil, integrated circuits and iron ore. Carpintero, Murray and Bellver (2016) argue that, in the last few decades, the BRICS states have experienced high and accelerated economic growth, which goes hand in hand with increasing social inequality and ecological damage. In order to stabilise its national

economy in the long term, China is accordingly dependent on (1) raw materials for production and (2) sales markets to purchase the consumer goods. After the financial crisis of 2008, the Chinese government reacted to the drop in GDP with a recovery package of over US$ 586 billion (Schmalz/Ebenau 2011). The Central Bank relaxed the issuing of loans and lowered the key interest rate by 1.8%; in addition, export tax was reduced and household goods such as televisions, refrigerators and mobile phones were subsidised in rural areas (Schüller 2009). In 2013, the Chinese government began its Belt and Road Initiative (BRI) in order to open up new markets and develop infrastructure. The BRI pursues the aim of connecting economic areas worldwide, and is geographically structured along various land and sea corridors (Silk Maritime Road). In the sense of David Harvey's *spatial fix,* the BRI can be understood as a '*displaced crisis of over-accumulation through geographical expansion*' (Sum 2017), since, as Schmalz (2018) argues, China is using these measures to try to avert a possible financial crisis, and its domestic policy has to cope with the increasing overcapacity of industry and a growing debt burden. Through the BRI, China exports its surplus through the expansion of infrastructure into other countries and supports economic growth at the same time. Thus, Ghana, too, is increasingly embedded in a '*China-based globalisation*' (Kanungo 2017) and, as a resource-rich country and rapidly growing sales market, attracts the interest of Chinese companies. The close interconnection of politics and the commercial sector in China enables targeted agreements to be made between the public administration and companies, as well as a joint approach in foreign markets. For Asche and Schüller (2008: 15), the impression of a comprehensive strategy for the economic provision of local public infrastructure for Africa is reinforced by the fact that '*the Chinese government formulates clear industrial policy objectives and deploys a mixture of market economy and interventionist instruments in order to achieve its objectives*.'

However, growing ecological risks are increasingly threatening the prosperity which China has created for itself. Seven of the ten cities with the highest air pollution in the world were in China in 2005. 60% of China's river systems are classified as Class IV and are considered unsuitable for human consumption (Schmalz/Ebenau 2011). According to Heberer and Rudolph (2010), over 750,000 people in China die each year from environmental pollution. Above all, the increasing air pollution is becoming a severe health risk for the population. Mortality in cities with heavy air pollution is 15 to 20% higher than in cities without heavy pollution (Bundschuh/Klingelhöfer 2013). The escalating environmental pollution has sporadically triggered environmental movements (Wen 2006), to which the government reacted in 2008 with a US$ 600 billion environmental and climate protection package. This included reforestation and investment in renewable energies. As part of this, the environmental authority was also upgraded to a ministry of the environment (Schmalz/Ebenau 2011). At the National People's Congress in early March 2017 in Beijing, the incumbent prime minister of China, Li Kequiang, announced the Blue Sky programme to tackle environmental problems in industrial cities. Greenstone and Schwarz (2018) determined in a comprehensive analysis that China did indeed manage to significantly reduce the fine dust pollution by taking drastic measures. According to them, an action plan initiated by the government to reduce air pollution achieved a reduction in fine dust values by 32% between 2013 and 2017. They mainly attributed this to the fact that many factories were closed or partially had to cut back production. Particularly the heavy industry in

the north of the country, which is responsible for around 50% of fine dust pollution, was subjected to restrictions. Thus, in the winter months of 2017 and 2018, production in 28 aluminium smelters was reduced by 30% (Daly/Mason 2018; Liu/Zhang 2018).

Since 2013, China has been attempting to make e-mobility the future of the Chinese automotive industry (Merics 2014). By 2025, China aims to be the world market leader in medical technology, aircraft construction, the chip industry and electric mobility (Wübbeke/Meissner/Zenglein et al. 2016). Especially for aircraft construction and the production of particularly light electric cars, aluminium as a material is irreplaceable. While aluminium processing is to be further expanded within the country, its production is being partially relocated abroad. For example, numerous investments have been made in aluminium smelters or bauxite mining abroad, for example in Tajikistan[1] (US$ 1.6 billion), Guinea[2] (bauxite-aluminium production

US$ 2.8 billion), Iran[3] (co-financing of an aluminium smelter), Jamaica[4] (US$ 2 billion), Indonesia[5] (expansion of existing production) and Ghana (US$ 10 billion). The high proportion of investment in Ghana is due to the fact that US companies are active in Guinea, for example. Conversely, China has been able to establish a monopoly position in bauxite mining in Ghana: the only stakeholders in the bauxite-aluminium industry are China and Ghana (through shares in the smelter). At the same time, this relocation also addresses the ecological crisis in China and thus also defuses public resistance against the government. This brings a double advantage, since both economic development and clean air seem equally feasible. The *dirty industries* are relocated to the peripheries, and the aluminium produced is needed for the production of electric vehicles, for example. In February 2018, Borton wrote an article entitled '*Blue Skies and a Booming Economy: China can have both*' , which described how China is successfully averting the economic crisis while, at the same time, reducing air pollution in China's large cities to the satisfaction of the population. From a political/ecological point of view, however, there are justified doubts about this notion of a win-win situation: this apparent success is only based on spatially shifting the double crisis rather than on solving it.

5 Discussion

According to Dörre (2012), the economic/ecological double crisis only poses two genuine alternatives: either economic development becomes socially and ecologically sustainable, which also means robust and crisis-proof, or the forms of capitalism which have developed must converge with the still very vague guiding principle of steady state economies and enable stability despite a lack of growth. However, the

1 See Eurasianet 2017.

2 See Samb 2017.

3 See Onstad 2018.

4 See CGTN 2018.

5 See Xinhua Finance 2018.

simultaneous challenges result in ever new reproduction possibilities for capital. Firstly, the development of an industry is intended to generate growth, yet this growth should not be based on fossil fuels, since many African countries wish to bypass this fossil development level. Thus, alongside investment in industry and agriculture, environmental technologies and renewable energy also offer diverse investment possibilities for capital. For example, Ghana has been in possession of a second solar farm since 2016. Whereas the solar farm opened by the Volta River Authority in 2013 only generates 2 MW, the second, which is owned by the Xiaocheng Company, generates almost 20 MW (Kumi 2017). The possibilities for investment in green technologies, particularly in the energy sector, present a further means of binding capital in the sense of the *spatial fix*, while at the same time creating economic growth by generating energy. The provision of energy offers the prerequisites for further industrial growth. However, the energy sector in Ghana also shows that China is not the only stakeholder which is increasingly investing in this country. Currently, a third solar farm is in the final phase, which is built and owned by the British company Blue Energy. After its completion, this is to be the largest solar farm in Africa and the fourth largest in the world, generating 155 MW (Blue Energy 2015). Even though the focus of this article is on China, the very significant influence of other powers should not be forgotten. Brazil is active in Ghana with an investment volume of US$ 200 million and is creating almost 9,000 affordable apartments near Accra with an affordable housing project (GTAI 2018). Carpintero, Murray and Bellver (2016: 218) state that Africa is becoming the contested territory between the old dominating capitalist centres and aspiring competitors such as the BRICS nations, and even describe Africa as '*the last frontier for international capital*': not least because Africa will soon be among the last low-wage regions, according to Paul Collier, the former Director of the Development Research department at the World Bank (2010). In the sense of the *spatial fix*, these peripheral regions of global capitalism present the greatest potential for stabilising manifestations of economic crisis. Thus, Carpintero, Murray and Bellver (2016: 200) characterise an increasingly identifiable development path for Africa, '*specialized in resource extraction and waste disposals from the rest of the world*'. This development – as this article argues – is not caused by inadequate economic diversification, but is above all the result of external forces which exert a strong influence for various reasons and are able to benefit from the specific baseline situation.

6 Conclusions

The present article has addressed the question of how far China's investment in the development of an integrated bauxite-aluminium industry in Ghana can be interpreted as crisis management, in order to offer a differentiated explanation of why there is continuing exploitation of the resources in the countries of the South and why it is increasingly difficult to leave this development path. Questions remain unanswered as to who benefits from this comprehensive investment and who loses, as well as the ecological consequences it entails. However, many of these questions cannot yet be satisfactorily answered. Carpintero, Murray and Bellver (2016) argue that the growing influence of China in Africa and its possible effects are being increasingly appraised in the media, as well as in the academic community. However, particularly given that Harvey and Nak-chung (2017: 253) describe the current investment in Africa as '*the*

latest and biggest spatial fix by neoliberal capitalism', the focus should rather be on the critical questioning of unequal developments and asymmetries.

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