Advisory Report

Prospects of Earmarking Africa's Oil and Mineral Revenues for Sustainable School Feeding Programmes

Technical Note 3 developed for the Sustainable Finance Initiative of the School Meals Coalition

Olha Homonchuk and Tom Hart

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Key Messages

National school meal programmes aimed at reaching all students are estimated to cost between 0.05% and 0.26% of GDP in low- and middle-income countries (LMIC) or roughly US$77 per child per school year. In countries with moderate natural resource revenues, ranging from 1% to 5% of GDP, such as Senegal, these revenues could easily fund essential social protection systems such as school meals.

However, the feasibility of earmarking Africa's oil and mineral revenues for sustainable school feeding programmes will be contingent on country-specific nuances of political economy and the government institutional capacity.

Countries with competitive and fragmented power structures, combined with weak civil society and public institutions, are likely to experience a 'resource curse' and struggle to translate natural resource revenues into ambitious school meal programmes.

Successful conversion of natural resource revenues into school meals is most likely to occur in settings with stable political settlements. This typically involves limited competition among elite groups, policy continuity across electoral cycles, and a robust civil society capable of disrupting the status quo, thereby incentivizing governments to redistribute resources broadly across society.

Due to the climate crisis and the volatile nature of natural resource windfalls, funding for national school feeding programmes through non-renewable revenues should be short term while more stable sources of financing for school meals are secured.

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About This Publication

This note is one of a series of papers commissioned by the Sustainable Finance Initiative of the School Meals Coalition – a government-led partnership bringing together research groups, United Nations agencies, and nongovernmental organizations (NGOs) working to support the expansion of school feeding programmes. The note contributes to SFI's innovative financing work stream, which is supported by the Rockefeller Foundation. The innovative financing for school meals series also includes research on debt relief (Hurley & Matrin, 2024) and climate finance (Mason et al., 2024). Selection criteria applied for the innovative financing research include the potential for mobilising resources at scale through predictable and sustainable revenue streams, technical feasibility, and – critically - political buy-in.

About the Authors

Olha Homonchuk is a Research Fellow of ODI Global's Development and Public Finance Team, working on education finance and the politics of donor coordination

Tom Hart is a Senior Research Fellow of ODI's Development and Public Finance Team. He works on understanding how public financial management can support the improved delivery of public services.

Acronyms

AFD	Agence Française de Développement
CCM	Chama Cha Mapinduzi
DoC	Department of Commerce
FRELIMO	Front for the Liberation of Mozambique party
GAAHP	Global Alliance Against Hunger and Poverty
GPE	Global Partnership for Education
HGSF	home-grown school feeding
JETP	Just Energy Transition Partnership
LICs	low-income countries
LMICs	lower-middle income countries
NGSFNSBES	National Guidelines on School Feeding and Nutrition Services to Basic Education Students
NMNAP	National Multi-sectoral Nutrition Action Plan
PRONAE	Programa Nacional de Alimentação Escolar
RENAMO	Mozambican National Resistance party
SFI	Sustainable Financing Initiative for School Health and Nutrition
SSA	Sub-Saharan Africa
Tcf	trillion cubic feet
WFP	World Food Programme

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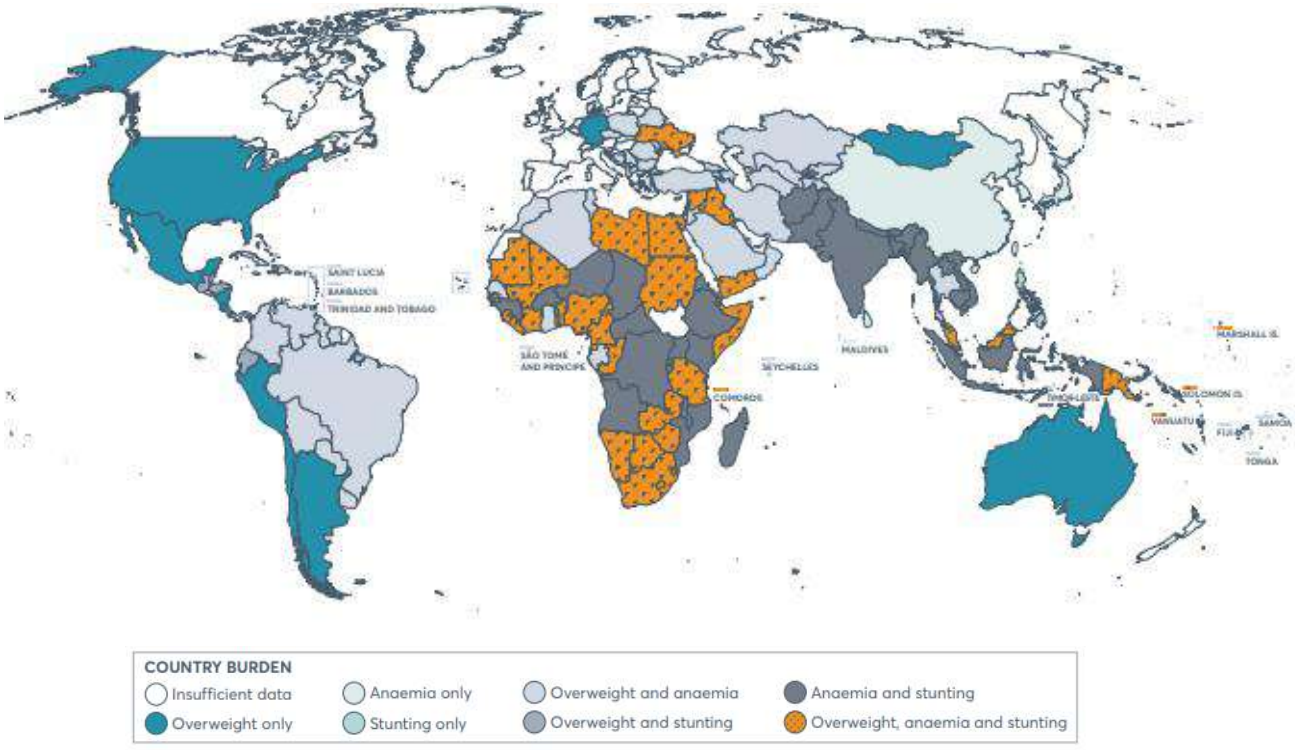
1. Introduction

The human suffering driven by insufficient and unhealthy diets is immense. At the global level, one in nine people are hungry or malnourished, with children in low-income countries (LICs) 10 times more likely to experience malnutrition compared to children in high-income countries (Mannar & Micha, 2020). At the same time, one in three people globally are overweight or obese (ibid) due to the rise of ultra-processed, high-fat, and sugar-intensive diets (Watkins, 2023). Overall, about 153 million children and young people worldwide are experiencing acute hunger (WFP, 2022), while 390 million young people aged 5-19 are overweight (WHO, 2024). Given the scale and prevalence of the nutritional crisis, it is evident that poor diets are not simply a matter of personal choice but a structural issue impacting an increasingly large proportion of the global population, particularly those left behind due to rising global inequality.

The African continent has the greatest need for systematic interventions to address malnutrition (Mannar & Micha, 2020). By 2030, Africa is projected to be home to half of the global population facing hunger and 80% of the world's poor (Cust & Zeufack, 2023; FAO et al., 2024). Last year, one in four people on the continent experienced hunger (FAO et al., 2024). Fragile countries, particularly those prone to recurrent climate shocks, are the most vulnerable, as they have the highest need for food support but the least financial capacity to fund such programs (Nwajiaku-Dahou et al., 2024; UNESCO, 2019). The prevalence of undernutrition has not fallen since 2015 and has worsened in some regions (Watkins, 2023).

Figure 1. Global Nutrition Report (2022, p. 40) map of countries with overlapping forms of stunting, anaemia, and high overweight rates in women



In response to the dual nutritional crises, a School Meals Coalition,[1] led by several governments, including those of Benin, Bangladesh, Kenya, Rwanda, Nepal, and Senegal, has emerged to promote **universal healthy school feeding programs**. Looking at malnourishment of children in particular, schools are an exceptionally cost-effective platform for delivering an essential integrated package of nutrition and health interventions, including school meals, deworming, micronutrients supplementation, and health behavioural change trainings (WFP, 2022). These programs are among the world's most extensive social protection programmes (Bundy et al., 2024) and are well-positioned to reduce undernutrition and encourage healthy diets.

The evidence supporting the **improvement of nutrition** through school feeding programs is well-established (Escher et al., 2024). The world's largest school feeding programme – the Mid-Day Meal (MDM) scheme in India – reduced national stunting rates by up to 32% (Chakrabarti et al., 2021). Similarly in Brazil, undernourishment rates among children under the age of five decreased from 13% to 5% during the rollout of the national Zero Hunger Strategy (2003–2008), in which school feeding was the central pillar (Alderman et al., 2024; Drake et al., 2016).

School feeding programmes also **increase school enrolment and attendance**, especially among girls from low-income families (Drake et al., 2018; GEEAP, 2023). A review of 44 randomized controlled trials (RCTs) on school meals found that, on average, school meals result in a 3% increase in school attendance (Wang et al., 2021). Effective national programs include those in India (Jayaraman & Simroth, 2015); Cambodia (Cheung & Berlin, 2015); Burkina Faso (Kazianga et al., 2012); and Uganda (Alderman et al., 2012). In cases of severe malnutrition, school feeding can also improve learning outcomes, enhancing cognition (e.g. attention and short-term memory), especially when paired with educational quality interventions such as structured pedagogy[2] (Angrist et al., 2020; Conn, 2017; Drake et al., 2018; Glewwe & Muralidharan, 2015).[3] However, evidence of long-term improvements in learning outcomes is limited as many RCTs capture only short-term effects (Alderman et al., 2024).

Lastly, there is growing recognition that large-scale school feeding programs can promote **sustainability of food systems**, supporting smallholder farmers, environmentally sustainable agriculture, and the development of local supply chains. School feeding can drive rural job creation, provide investment opportunities for farmers, and build more resilient livelihoods in the face of climate change. Home-grown school feeding (HGSF) programmes, which typically source meals from local producers, aim to provide children with nutritious fresh foods while offering smallholder farmers a reliable market. Thus expanding these programmes could deliver wide-ranging benefits across various Sustainable Development Goals (SDGs), including those related to nutrition, health, education, and poverty reduction.

Overall, it is estimated that for every US$1 invested, school feeding programmes in LMIC deliver US$9 in human capital returns in the form of health and nutrition gains,

[1] https://schoolmealscoalition.org/

[2] Structured pedagogy tends to have the largest and consistent positive impact on learning outcomes compared to school meals (GEEAP, 2023; Snilstveit et al., 2015).

[3] In contexts with most severe levels of malnutrition, micronutrient supplementation is more cost-effective than school feeding (GEEAP, 2023)

social protection benefits, education, and local agriculture economies (Verguet et al., 2020). However, current estimates indicate that only around 20% of school children in LICs and 39% in lower-middle income countries (LMICs) receive school meals (Watkins, 2022), with many governments in LMIC struggling to roll out universal school feeding programs due to unsustainable debt, sluggish economic growth, and rising food prices. The significant gap in coverage, despite evidence of the benefits of school feeding, highlights the need for increased investment and support for these vital programs.

Natural resource revenues could finance universal school feeding in countries where the cost of expanding school meals to all pupils is modest compared to the scale of natural resource revenues. Several nations in Sub-Saharan Africa have recently discovered significant natural resources, which now contribute 9% to Africa's gross domestic product (GDP) and a third of its stock wealth (Cust & Zeufack, 2023). The potential contribution of these and future resource discoveries vary, ranging in the long-term from about 2% of GDP for Tanzania to 4%–5% of GDP for Mozambique (see Table 1). However, typically the cost of expanding school meals to all pupils (around US$64 per child[4] based on Watkins et al., 2024) is well below the level of natural resource revenues once production has scaled up (see Table 1 below).

Table 1. Cost of school feeding compared to hydrocarbon revenues, as percent of GDP

	Cost of school feeding, 2023	Medium-term resource revenues (2024–2028)	Long-term resource revenues	Natural Resource Deposits
Mozambique	2.6%	0.5%	4% (over 2023-–2048)	150 trillion cubic feet (Tcf) of natural gas
Senegal	0.6%	0.6%	2%–3% (over 2024–2054)	1 billion barrels of oil and 40 Tcf of gas reserves
Tanzania	1.2%	0.0%	2% (over 2030–2059)	47 Tcf of natural gas reserves

Sources: The cost of school feeding was calculated from 2023 school enrolment data for pre-primary, primary, and lower secondary levels, with a school meals unit cost of US$64 per pupil based on the mid-point of estimates, as reported in Watkins et.al. (2024). Data for Mozambique and Tanzania enrolment is from national statistical reports. For Senegal, data is from UNESCO enrolment data. Mozambique does not report enrolment for pre-primary, and 2023 GDP estimates are from the International Monetary Fund (IMF) World Economic Outlook database. Estimates for medium-term resource estimates come from IMF reports, the 2024 Article IV report for Mozambique, and the *2023 First Review under the Extended Fund Facility for Senegal.* Long-term resource estimates were estimated from Ministère des Energies, du Pétrole et des Mines (2023); Republic of Mozambique (2018); and Stanbic Bank Tanzania (2022). Natural resource deposit estimates for Mozambique, Senegal, and Tanzania were obtained from IMF eLibrary.

[4] This figure is based on a mid-point of the 2008 data, adjusted for inflation, from Gelli and Daryanani (2013). Estimates should be treated with caution since data on school meals are often unreliable due to sparce reporting and inconsistencies in reporting between countries and between actors in the same country. Variations in cost for LMICs are driven by the amount and quality of food provided; the country-specific costs of food procurement, transportation, and storage; as well as cost of staff time monitoring and implementing the program (Watkins, 2023).

In Senegal, hydrocarbon resources are already sufficient to provide universal school meals to all pupils at pre-primary, primary, and lower secondary levels (see Table 1). In Mozambique, natural gas revenues are only just coming on stream, and they are only likely to reach the level needed to fully fund universal school feeding towards the end of the 2020s. However, they will exceed this amount in the longer run as revenues build up to around 4% of GDP against a universal school feeding cost of around 2.6% of GDP. More conservative estimates of revenues for Mozambique (West & Lépiz, 2021) suggest that through the 2030s, resource revenues should be roughly equal to the cost of school feeding and more than twice the amount needed in the 2040s.

Similarly in Tanzania, gas revenues are not forecast to come on stream until 2030. But when resource revenues reach a projected 2% GDP, they will be sufficient to cover the 1.2% of GDP required for universal school meals. These observations align with previous research showing that moderate natural resource revenues (2% of GDP or higher) are sufficient to fund national basic social protection programs (Haglund et al., 2015).

The specific calibration of a country's natural revenues management framework will of course depend on the context and the government's objectives, but if a government is to invest natural resource revenues in development, then school feeding could be an effective way of doing that. However, green energy transition may prevent some countries from reaching large-scale production, as investors might consider such projects too risky in the long run. For countries that proceed with resource extraction, oil and gas projects are expected to last around 12 years on average (Mihalyi & Scurfield, 2020).

Given the potential benefits of expanding school meals coverage and governments' de-facto plans to continue using natural resources in the short term, **this research examines the technical feasibility and political support for leveraging natural resource revenues for school feeding expansion**. More specifically, this paper explores six case study countries:

- Ghana, Bolivia, and Botswana serve as examples of countries that have experienced natural resource windfalls and implemented school feeding programs, helping us identify barriers and enablers to earmarking revenues for these initiatives.
- Senegal, Tanzania, and Mozambique serve as case studies of countries where school meal coverage is relatively low, and the governments are in the process of determining how to best allocate their newly found natural resource revenues.

Building on the lessons learned from our retrospective case studies (Botswana, Bolivia, and Ghana), the analysis shows that, in the near future, only Senegal among the three prospective case countries is expected to have enough hydrocarbon revenues and political support to establish universal school feeding for basic education (pre-primary, primary, and lower secondary levels). Even in contexts where earmarking is technically feasible due to the volume of natural resources, the chances of success depend largely on country-specific political economy dynamics that shape the distribution of power and rents among the elites, quality of institutions,

and ideological commitment to redistributive social protection programs such as school meals.

Successful conversion of resource revenues into effective school meal programs is most likely in contexts with stable political settlements, which entails low-stakes competition among elite power groups, policy continuity across electoral cycles, and strong disruptive potential of civil society, which incentivises the government to redistribute resources broadly across society. Countries with competitive and fragmented power structures, combined with weak civil society and public institutions, are likely to experience a resource curse, resulting in neutral or negative impacts of natural resource revenues on human development. In such contexts, top-down, nationwide approaches to school feeding are likely to disappoint.

This analysis is not intended to evaluate countries' approaches to financing school feeding. Instead, it aims to identify insights that could inform government and development partners in countries expecting significant natural resource as they formulate strategies for financing school meals.

2. Politics of Natural Revenue Windfalls

The prospects of earmarking natural resources for school meals cannot be considered outside of political economy forces that shape governance. Unfortunately, over the past century, only a few countries have successfully managed their natural resource wealth, with most falling victim to the resource curse. Notable exceptions, such as Indonesia and Botswana, successfully turned resource wealth into an advantage (Rosser, 2004; Smith & Waldner, 2021). However, on average resource-rich nations are more likely to experience slower economic growth, prolonged conflicts, or authoritarian rule compared to resource-poor countries.

The curse arises from the distorting effects of large oil revenues, which skew government incentives and weaken the accountability between policymakers and citizens. During an oil boom, governments become less reliant on taxes and other non-oil revenues to fund public programs and projects (Karl 1997; Moore 2004; Ross 2001; de la Briere et al., 2017). This, in turn, undermines transparency, accountability mechanisms, administrative and institutional capacity, and quality of social systems, such as health and education, which ultimately weakens human capital (Barma et al 2012; de la Briere et al., 2017). Struggles among elite groups for control over natural resource revenues can sometimes lead to a complete collapse of the state. To make matters worse, oil-rich economies often shrink below their pre-oil boom size once resources are depleted or global demand for that resource drops, leaving nations grappling with debt crises as part of the boom-and-bust cycle (Cust et al., 2022). In some instances, such as Mozambique, mere expectations of future resource revenues can lead to economic problems (Bauer & Mihalyi, 2018; Scurfield & Mihalyi, 2017).

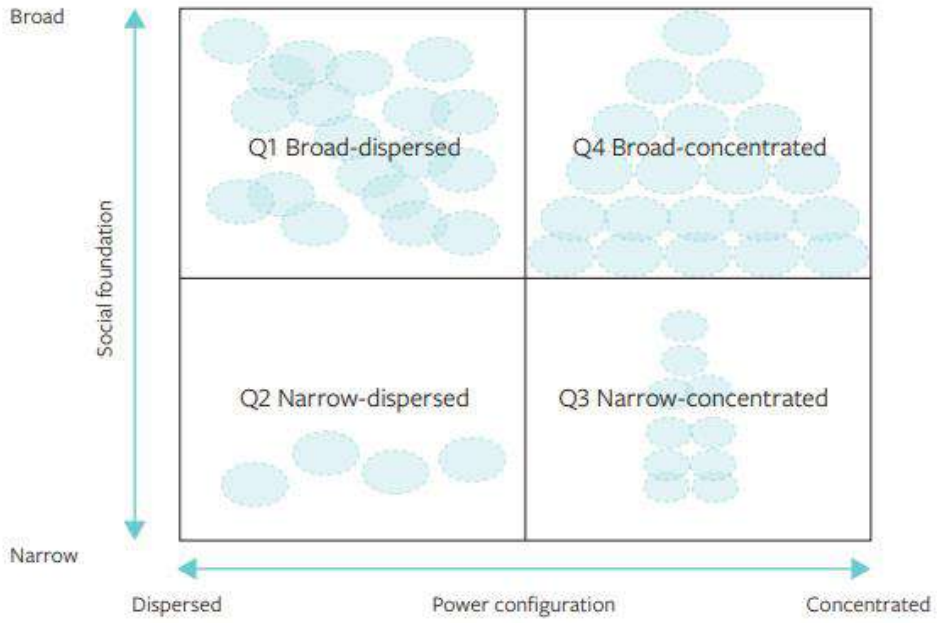
For a while, the common explanation for rare cases where oil has supported democratic consolidation and development has been the quality of public institutions (Cust and Mihalyi, 2017). This explanation suggests that countries with effective

public finance management; the capacity to generate non-oil revenues; and transparent, efficient bureaucracies are less likely to suffer significant setbacks in growth and development due to spikes in natural resource revenues (Savoia and Sen, 2021).

However, institutionalist explanations often fall short. Many countries that avoided the resource curse, such as Botswana, did not have particularly strong institutions or democratic systems at the time of the mineral discovery (Hickey et al., 2020; Poteete, 2009). Additionally, countries with similar initial institutional capacity and oil revenues have taken very different paths in managing their wealth, with varying degrees of success. As a result, purely descriptive institutional analyses are not enough to explain the emergence of effective bureaucratic systems and to offer a clear road map for newly oil-rich nations to achieve similar outcomes.

To deepen our understanding of the relationship between oil wealth, development, and democracy, scholars have increasingly focused on analysing the underlying power dynamics that shape governance institutions and the effectiveness of redistributive fiscal policies (see Hickey et al., 2020; Whitfield et al., 2015). Analyses of ‘political settlements’, the ‘understanding among a society’s most powerful groups about the basic rules of the political and economic game’ (Kelsall et al., 2024, p. 1), suggest that specific types of political settlement are more effective in explaining variations in outcomes among resource-rich countries than disjointed analyses of public institution quality or democratic indicators (Hickey et al., 2015; Khan, 2017; Kelsall, 2018), The study of the dynamics of political settlements can provide insights into counterintuitive findings, such as how certain ‘semi-authoritarian’ governments manage oil resources more effectively than ‘democratic’ countries such as Ghana, which struggle to do so despite good intentions and a more vibrant civil society (Hickey et al., 2015).

Figure 2. *Political settlements typology. Source: Kelsall, Colenbrander, and Simpson (2024, p. 2)*



Note: Categorisation of countries against this framework often changes over time. Examples of country categorisation as of 2024 – Q4: Senegal, Bolivia, and Botswana; Q3: Viet Nam and Angola; Q2: Mozambique; and Q1: South Africa, Tanzania, Ghana, and Indonesia

Applying Kelsall's political settlements typology[5] (Kelsall, 2018; Kelsall et al., 2024) to our inquiry, governments with dominant-party political settlements – where power is concentrated among a small group of actors and remains largely unchallenged even during elections – are more likely to effectively regulate oil wealth management and curb rent-seeking activities if this concentrated power is paired with a broad social foundation. In such cases, those in power are more responsive to the needs of a wide segment of society and are therefore incentivized to implement large-scale development programs (Figure 2: 'Q4 broad-concentrated' political settlement).

Governments underpinned by a **broad-concentrated** political settlement are most likely to have the capacity and incentives to prioritize long-term investments in human development and institution building (Hickey, 2020), including the implementation of nation-wide social protection programmes such as universal school meals. In the context of natural resource management, these types of governments are more likely to engage in thorough and unhurried negotiations with oil companies and implement preventative resource curse measures, as their political longevity is not solely dependent on the oil sector. Botswana is a classic example of a resource-rich country with a concentrated political settlement and a good practice of managing natural resource revenues. Among our case studies, Bolivia and Senegal also fall into this category. In such contexts universal school

[5] The framework was developed drawing on work of ESID (Effective States and Inclusive Development) at the University of Manchester (https://www.effective-states.org/political-settlements/)

meals have a good chance of success as elites have the power and incentives to implement systemwide inclusive reforms.

In political settlements without a broad societal base—where large segments of society lack influence over high-level political and decision-making processes—governments with a concentrated power structure are likely to serve the interests of only a small segment of the population (Figure 2: 'Q3 **narrow-concentrated'** political settlement; Kelsall, 2018). Examples of this type of political settlement include Vietnam (Kelsall et al., 2024), which has a one-party state, and Angola (Croese, 2017). In Angola, powerful groups distributed oil rents primarily among a small circle of stakeholders close to the president, often through foreign business allies and the state-owned oil company.

On the other hand, in competitive clientelist political settlements – where power is dispersed across different elite groups due to intense 'winner-takes-all' political competition (Figure 2: 'Q1 **broad dispersed'** political settlement) – natural resources are less likely to be managed effectively or used for long-term human development. This is because these governments are constantly at risk of losing power, which drives them to use oil revenues to maintain political control by offering discretionary rents to their allies and engaging in selective short-term social spending to secure voter support. Countries such as Ghana, Indonesia, and South Africa are examples of this type of political settlement (Hickey et al., 2015; Kelsall et al., 2024). The latest dynamics in Tanzania, as will be discussed in more detail in proceeding sections, lead us to categorise it as having a broad-dispersed political settlement as well (Nyamsenda & Collord, 2024). Previously, Tanzania was categorised as a narrow-concentrated political settlement. In such contexts, top-down, systemwide approaches to school feeding are likely to disappoint, as elites, despite being incentivized to deliver social benefits to a broad range of social groups, often revert to clientelism and populism due to intense competition among the most powerful factions.

Finally, countries with political settlements that have dispersed elite power groups and narrow social foundations (Figure 2: 'Q2 **narrow-dispersed'** settlement) are likely to use natural resource revenues to compete among themselves and neglect development initiatives (Kelsall, 2018), including school meals. Mozambique's political settlement falls into this category – power is highly fragmented due to intense competition among elites for oil rents, and there is little incentive for the elites to cater to the needs of the public.

3. Technical Challenges of Managing Natural Resource Revenues

Establishing an effective framework for managing natural resource revenues presents significant challenges. Governments must navigate the urgent development needs of their populations while ensuring long-term sustainability. They must also consider the absorptive capacity of their economies alongside realistic assessments of their ability to deploy funds effectively. Moreover, the exhaustible nature of many resources, coupled with the volatility and uncertainty of commodity markets, complicates long-term planning.

To address these challenges, the typical approach is to combine immediate spending needs with saving a portion of revenues to cushion against price volatility via a stabilization fund, which can supplement revenue when prices are lower than average, and to establish a sovereign wealth funds, which can save rents to fund future consumption and investment. For some countries, using resource windfalls to pay down national debt may be the most effective strategy for enhancing overall fiscal stability (Bauer & Mihalyi, 2018).

However, the precise details of these options depend on the balance between maintaining a permanent future income stream from savings versus scaling up spending and investment to meet immediate development needs, which will depend on multiple factors, not at least the ability to absorb increased expenditure so it can be invested effectively (Van Der Ploeg & Venables, 2012). Governments thus face the technical challenges of managing revenues that are uncertain, volatile, needing to be smoothed across price fluctuations, and time limited, meaning that at least part of these resources must be reinvested into productive physical or human capital that can permanently lift the productive capacity of the economy beyond the temporary levels of a resource boom (Barma et al., 2012; Venables, 2016).

However, beyond these technical challenges are a set of political constraints, and as discussed above, different configurations of political power generate different incentives in how to deploy resource revenues. The time horizon of a government matters. If shorter-run pressures do not dominate decision-making, and the government is able to commit to fiscal rules or long-run investment and growth strategies, then pro-cyclical and unsustainable spending, with excessive consumption compared to investment, are less likely (Venables, 2016). The visibility of resource revenues, especially in the context of broadly clientelist regimes, has frequently created strong incentives for decisions about their allocation to be concentrated at the highest levels of government, bypassing the regular budget processes and reducing the quality of spending (Barma et al., 2012).

Investing resource rents into education more broadly, and into school feeding in particular, will depend on governments being able to at least partially overcome these challenges, and at least be partially committed to long-term investments. Investments in school feeding programmes may also have the benefit of being less complex and facing less absorptive capacity constraints than other investments, particularly those aimed at improving learning outcomes

In recent years there has been a revived discussion around the potential of the **earmarking of resource revenues** for specific development programmes to help reduce these political challenges. While earmarking may not be the most efficient method for allocating public funds, its value lies in its potential to engage the public in fiscal policy, thereby serving as a tool for enhancing public trust and accountability in revenues spending (Abounabhan et al., 2023). Given the history of the resource curse in many countries, earmarking of natural resource revenues is an attractive option. Linking specific revenue streams to designated public services can offer voters greater understanding and transparency about how national resources are utilized, and potentially expand fiscal space for chronically underfunded sectors such as education.

Nonetheless, **evidence and opinions on the efficacy of earmarking are mixed**. Implementing earmarking mechanisms presents an array of challenges: rigid earmarking may require spending cuts during economic downturns, undermining the quality of services, while more flexible approaches, involving fund accumulation and borrowing, could lead to increased complexity of the funding mechanism diminishing the aims of improving public understanding around fiscal spending. Earmarking from resource revenues may be particularly vulnerable to these issues given their volatility.

Furthermore, earmarking could lead to economic distortion, fragmentation, and an inefficient allocation of funds (Flores-Macías, 2018; Ozer et al., 2020; Prakongsai et al., 2008). It could also create tensions in decentralized settings, such as Mozambique, where autonomous municipalities might not approve of the centrally driven and sector-specific prioritization inherent in earmarking (Brikci, 2024). Therefore, the appropriateness of earmarking is highly country-context dependent, hinging on the capacity of local actors to design an earmarking mechanism that effectively balances transparency, accountability, and fiscal flexibility.

A further problem for earmarking is that where a sector, such as education, is funded both by earmarked revenue and general taxation through a standard budget allocation, over time any increase in resources from the earmarked revenue can dissipate if general budget allocations to the sector are reduced in real terms. This appears to be the case in the health sector, where earmarking alone has been relatively ineffective at increase resources for health compared to a broader commitment to expand the share of the budget devoted to the health sector (Barroy et al., 2018). Without such a commitment, it is the rationale that if there were large increases in an earmarked revenue stream, a ministry of finance would offset this with lower growth or reductions in general budget allocations. In Ghana, for example, although oil revenues were meant to finance public investment, capital spending as a whole fell after oil production began, as more resources were shifted away from capital spending than the total amount of new oil revenues (Evans, 2015). Without a commitment to ensure that education spending maintains, or increases, its share of the budget, earmarking might thus be seen as a way of protecting spending on school meals in particular and a way for politicians to visibly demonstrate that resource revenues are being invested in human capital, than as a way of increasing revenues for the education sector overall.

4. Learning from Past Experiences

This section focuses on the intersection of natural resource revenues and school feeding programs in three countries – Ghana, Bolivia, and Botswana—that have already experienced natural resource windfalls and implemented school feeding programs. As part of the analysis, we provide an overview of school feeding programs' student population coverage levels, administrative arrangements, and adequacy of financing. Table 2 summarises the size of their resource revenues in the immediate past and their projections for the future.

Table 2. Natural resource revenues, as percent of GDP

	Pre-pandemic average (2015–2019)	Medium-term resource revenues (2024–2028)
Bolivia	6.0%	3.5%
Botswana	10.8%	8.8%
Ghana	1.4%	1.4%

Sources: Pre-pandemic estimates are from the UNU-WIDER Government Revenue Dataset, 2023. Medium-term estimates are from IMF country reports, Bolivia 2022 Article IV report, Botswana 2024 Article VI report, and Ghana 2024 Second Review of the Extended Credit Facility. Bolivia revenue estimates are only to 2027.

4.1 Ghana

Oil production in Ghana was minimal until the 2007 discovery of an estimated 600 million (Oppong, 2020) to 1.8 billion barrels of light crude oil (Aryeetey & Ackah, 2020) in the offshore Jubilee Fields, with production commencing in 2010.[6] Subsequently, production expanded to Tweneboa–Enyenra–Ntomme (TEN) and Sankofa fields in 2016 and 2017. At the time of the discovery, Ghana performed relatively well in securing profits from production, negotiating a 40%–50% government take of the profits from oil production (Amoako-Tuffour & Owusu-Ayim, 2010). External experts recognized that Ghana's oil windfall would be modest and temporary, potentially exposing Ghana at the risk of the resource curse. They advised that the government use these resources strategically to diversify economy, invest in the human development, and pay off public debt to reduce the long-term interest burden (van den Bremer & van der Ploeg, 2013). It was estimated that Ghana would earn US$20 billion from oil production between 2012 and 2030 (Aryeetey & Ackah, 2020). In the first 10 years of production, the state received only around US$6.5 billion[7] (Suleman et al., 2023).

Unfortunately, the competitive clientelist nature of Ghana's political settlement, in conjunction with the 'winner takes all' 2008 elections, incentivised the government to rush into oil production without a revenue regulatory framework in place (Hickey et al., 2020). The narratives surrounding petroleum discovery were extensively used for

[6] In addition, Ghana has 2.1 Tcf of proven gas reserves (Suleman et al., 2023).
[7] The US$6.5 billion comprises of Carried and Participating Interest (58.1%), Royalty Payments (25%), and Corporate Income Tax (16.5%) (Suleman et al., 2023).

political gain, creating unrealistic public expectations about the fiscal leeway natural resource revenues would provide (Page & Finn, 2020). Opportunistic forecasting errors further led to gaps in the public budget, which had to be compensated for from other revenue sources (Prempeh & Kroon, 2012). Following criticism from civil society, public fora[8] were set up to solicit public input on how to manage the resources (Sharma & Strraus, 2013). As a result of pressures from civil society and donors, Ghana enacted several laws to preventing the resource curse phenomenon (Ackah et al., 2020), with the Petroleum Revenue Management Act (PRMA) being the cornerstone of these regulations.

PRMA stipulates that each year petroleum revenues (net of income due to Ghana National Petroleum Corporation) are split, with up to 70% allocated towards financing the national budget (referred to as Annual Budget Funding Amount) and 30% allocated to the Ghana Petroleum Holding Fund (GPF), which is further divided between the Stabilization Fund (70% of GPF) and Heritage Fund (30% of GPF) to provide economic stability and save for future generations when the oil resources are depleted (Sharma & Strauss, 2013; Suleman et al., 2023). The Annual Budget Funding Amount is divided between development priority areas, the Ghana Infrastructure Investment Fund, and the Public Interest and Accountability Committee.

In the first 10 years of petroleum production, only 31% of the total government petroleum revenues, equivalent to US$2.5 billion, were allocated to annual budgets (Suleman et al., 2023). This means petroleum revenues constituted around 4% of the total national budget on average (Adam, 2017), having limited impact on the overall trajectory of human development in Ghana. Moreover, Ghana's public debt levels have been so high that the interest rate paid on borrowed money exceeded any interest earned from saving natural resource revenues (Bauer & Mihalyi, 2018). Lack of accountability remains a key issue of managing natural resources in Ghana, with development projects often being arbitrarily selected without reference to the National Development Plan, prioritizing the party manifestos of the ruling party (Suleman & Ennin, 2024).

While Ghana has not earmarked it petroleum revenues for human capital investments, it has earmarked other revenue sources for this purpose. Out of total value-added tax (VAT) revenues, up to 17.5% is set aside for 16 development streams (Ministry of Finance, 2023). For example, 3.5% is ringfenced for the National Health Insurance Levy (NHIL) to fund the national health insurance scheme; 2.5% is earmarked for the Ghana Education Trust Fund (GETFund) for maintenance of essential academic facilities and infrastructure, particularly in tertiary institutions; and 1% is earmarked for the COVID-19 health recovery levy (Ministry of Finance, 2023; Tornyi, 2024). These measures were introduced as a compromise amid

[8] Ghana became compliant with the extractive Industries Transparency Initiative in 2010, created a National Steering Committee, comprising of 16 members including NGOs, trade unions and companies, and community representatives, Civil Society Platform on Oil and Gas, and Africa Centre for Energy Policy and PWYP-Ghana (Oppong & Andrews, 2020).

widespread public dissent against unpopular VAT tax increases (Abounabhan et al., 2023; Prichard, 2015)

School Feeding Coverage, Impact, and Financing

The Ghana School Feeding Programme (GSFP) is feeding close to 3.6 million children across 10,000 schools, covering nearly 85% of country's public schools (Bedasso et al., 2022; Fosu, 2023), making it the largest social protection programme in the country. The programme was piloted in 2005 starting with 10 schools (Mohammed, 2022) and then expanded in 2007. Impact evaluations of the programme are mostly positive. The programme has led to moderate improvements in average learning outcomes measured by test scores for maths and literacy (Awojobi, 2019) and to the reduction in stunting rates (Gelli et al., 2019). The impact was most substantial for children living below the poverty line as their improvements in learning adjusted years of schooling (LAYS) was double the average (Alderman et al., 2021). However undernutrition and anaemia remain prevalent in Ghana, including in schools with GSFP support (UNICEF Ghana, 2023).

The programme is managed and financed predominantly by the Ghana Ministry of Gender, Children and Social Protection (MoGCSP) and delivered by private sector caterers on a prefinance basis (at a government-determined feeding rate per child). The initial funding for GSFP came from the Government of Ghana (78%), the Dutch Government (17%), and the World Food Programme (WFP; 5%). Currently, the programme continues to be financed predominantly by the Government of Ghana with support from the World Bank and the World Food Programme (WFP, 2023).

The creation of a school feeding programme in Ghana was directly inspired by the 2003 Comprehensive African Agricultural Development Programme (CAADP) and the 2000 Millennium Development Goals on universal school enrolment. Under CAADP, locally sourced school feeding programmes were regarded as a means to ensure the country's food security (Blunch, 2020). Consequently, support for smallholder production was the key part of the design. It is estimated that 80% of food is procured from local farms near the schools (GCNF, 2021).

Initially, as of 2010, less than a quarter (21%) of GSFP went to the poor regions, with the wealthiest regions of Ghana receiving the bulk of the support. After external evaluations and public outcry on the misuse of the programme, GSFP targeting was revised in 2013, shifting 70%–80% of GSFP funding to the poorer households and regions (Blunch 2020). Re-targeting effectively shifted the focus of programme operations to the northern parts of the country (Alderman et al. 2021).

Following this shift, GSFP faced several significant challenges that hindered its overall effectiveness. Since 2018, inflation has eroded the value of government GSFP payments, resulting in a 60% decline in real value despite a substantial increases in budget nominal value (see Figure 3; UNICEF Ghana, 2023)).

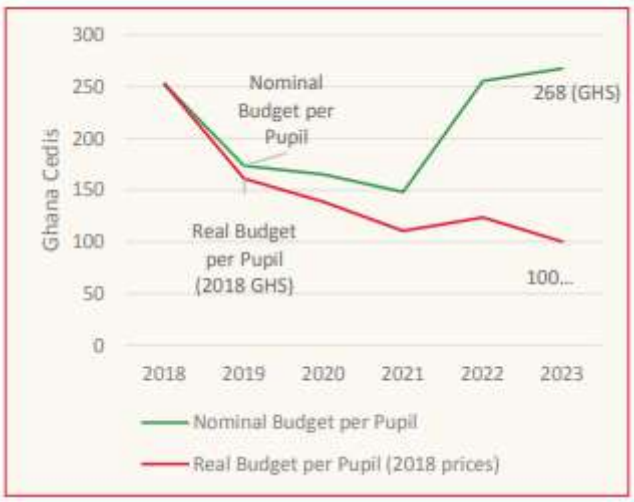


Figure 3 GSFP nominal and real budget per pupil (UNICEF, 2023, p.9).

Moreover, budget execution is weak, with pervasive delays in payments for caterers. In 2022, more than 30% of caterers did not receive payments at all, which led to strikes (Bedasso et al. 2023). Due to delays in payment, caterers often reduced the quality and quantity of food. Moreover, caterers frequently disputed the government estimates on costs of providing the food baskets (Aurino et al., 2023). Since 2013, the estimates have been frequently frozen, for up to three years at a time, due to austerity, rendering government cost estimates unrealistic. As a result, service providers are often not fully reimbursed for provided services, leading to 12-months arrears (Mohammed, 2022).

Lastly, the process for GSFP service delivery contract awards is not transparent and is allegedly used to reward loyal party supporters. The politicisation of the programme undermines the quality of supervision and the monitoring of the frontline delivery of the programme (Mohammed 2022). Some evidence suggests that nearly half (43%) of caterers are appointed through political connections (Bedasso et al., 2023).

4.2 Bolivia

Bolivia has been a major producer of natural resources since colonial times, and post-independence, it has been dependent on silver, rubber, and more recently hydrocarbons. The exploration of Bolivia's hydrocarbon deposits dates back to 1920s, with the state first establishing it's control over the sector in 1930s (Pellegrini, 2018). While Bolivia has been managing modest exports to neighbouring countries since 1930s, the hydrocarbon sector began to fully flourish in the late 1990s, following the economic crisis of the 1980s and the restructuring of Bolivia's tax system as part of international economic stabilization support (Arauco & Pozo, 2023). As part of stabilisation reforms, the government reduced royalty and taxation rates for all new discoveries from 50% to18%. This change led to a sharp increase in the investment and extraction levels in the gas industry. By the early 2000s, Bolivia had 12.5 trillion cubic feet (Tcf) of natural gas reserves and approximately 360 million barrels of proven and probable reserves of crude oil reserves (U.S. Department of Commerce, 2024), making it the second largest reserve of natural gas in South America at the time (Kaup, 2010).

Highly favourable conditions for foreign oil companies and plans to export gas to the United States and Chile led to deep public discontent, making hydrocarbon sector reform a focal point of social movement demands (Kaup, 2010). This discontent culminated in a three-year period (2003–2006) of social struggle and extensive state-led repression and violence. Following this period of the 'Gas War', Bolivia elected Evo Morales, the world's first Indigenous president, and held a referendum on the country's hydrocarbon sector, essentially creating a new social contract (Kaup, 2010). This 'left-wing wave' led by Morales and Movimiento al Socialismo (MAS) displaced the previous neoliberal model of government (Veltmeyer and Petras 2014) and fundamentally shifted the political axis of competition from a left-versus-right competition to one characterized by ethnic/rural versus cosmopolitan/urban divides (Bonifaz & Faguet, 2022; Faguet, 2019).

The groundwork for this transformation was laid by the decentralization policies of 1993–1997, which established 311 municipalities and transferred a significant share of public resources to local authorities, ultimately empowering local actors to contest national political elites instead of appeasing their concerns (Bebbington, 2018). Redistribution of oil revenues to a subnational government is part of the legacy of this decentralisation reform (Irarrazaval, 2020).

Since 2006, Bolivia's political settlement has increasingly consolidated under the leadership of the Movimiento al Socialismo (MAS) while maintaining broad social foundations. During Evo Morales presidency in particular, the government launched several ambitious social redistributive programmes leveraging natural resources revenues, including the Juancito Pinto and Juana Azurduy cash transfer programmes aimed at keeping children in school and supporting low-income mothers. Among the many leftist governments elected throughout Latin America during this period, Bolivia's MAS party is one of the few still in power as of 2024 and can reasonably claim success in reducing poverty and inequality (Wolff, 2019).

Bolivia's school feeding programme (Alimentación Complementaria Escolar, or ACE) was first launched in 2000 as part of the broader strategy to address high rates of poverty and is now nearly universal, covering 95% of Bolivia's municipalities and reaching over 80% of school-aged children (SFI, 2022a). Even though there is no mandate or earmarking for school feeding,[9] municipalities chose to invest more than US$110 million in school meals each year. ACE is funded largely by domestic funding (98%), with the majority of domestic funds (71%) coming from the Direct Tax on Hydrocarbons. The rest of the funding comes from tax co-participation scheme, royalties from mining activities (4.31%), and funding from municipal and native rural Indigenous governments (8.4%; ibid). Municipalities have further discretion as to how they implement the programme, usually setting up partnerships with NGOs, private companies, and international organizations for meals delivery. In rural areas, breakfast and/or lunch are typically cooked on the schools' premises. Meanwhile in the urban areas, ready to consume foods for breakfast are provided by private companies (Sidaner & Torres, 2014). As per the laws of the 2009 constitution, non-

[9] Municipalities have discretion on how the funding is divided among social, health, and educational programs.

commercial small-scale farmers have to be prioritised as providers for ACE, particularly if they are run by Indigenous families (Mercado & Hjortsø, 2023). In the most deprived areas of the country, school ACE is complemented by the WFP support of locally sourced fresh foods, dry foods, and micronutrient powders that enable schools to provide two meals instead of only one meal a day (WFP, 2015).

Unfortunately, due to a chronic lack of data on Bolivia's human development indicators, there are no impact evaluations assessing the effectiveness of the ACE programme in improving health and education outcomes. Since the 2000s, the learning and health outcomes in Bolivia have improved to such an extent that the average rates of anaemia among children under the age of five decreased from 56.9% in 2001 to 36.9% in 2019 (SFI, 2022), while the percentage of children who are stunted has dropped from 31% in 2000 to 17.39% in 2021 (Our World in Data, 2024). However, there is no strong evidence that this was driven by the school feeding programme specifically, with most evidence being limited to case studies from specific municipalities (Chavez, 2015) or individual anecdotal accounts, such as parental testimony (SFI, 2022). Socioeconomic disparities in health outcomes persist, with 46% of children from the lower wealth tertile experiencing malnourishment compared to 6.5% of children in the wealthiest tertile (Miranda et al., 2020).

The modest improvements in human development indicators, despite ambitious social investments since 2006, may reflect the volatile nature of natural resource revenues and the time required to achieve significant progress in average human development at the national level. Between 2016 and 2020, Bolivia's public finances fell into deficit, similar to the 1980s crises, due to international drops in raw material prices. The Covid-19 pandemic compounded this crisis, and the economy did not start to recover until 2021 (Arauco & Pozo, 2023). Moreover, the value of social safety nets, including school feeding, is currently low[10] (Our World in Data, 2024b) and therefore can lead to only marginal improvement in the well-being.

At the same time, school meals play an important role in the social contract between Bolivian families and the government, with any signs of cuts in school meals provision, as was the case during the Covid-19 pandemic, leading to parental demonstrations throughout most cities, road blockages, and clashes between parents and police forces (SFI, 2022a). The new discoveries of natural gas in 2024, estimated at 1.7 Tcf (Moura, 2024), might enable the government to continue financing school meals using natural resource revenues.

4.3 Botswana

As the second largest producer of diamonds globally,[11] Botswana is a rare exception to the resource curse, achieving upper-middle-income within one generation (Acemoglu et al., 2003; Drake et al., 2016; Studwell, 2022). Since independence in 1996, the government has maintained prudent financial management, a merit-based

[10] Only 5% of total welfare of beneficiary households as of 2021.
[11] Second-largest diamond producer in the world after Russia (De Beers Group, 2024)

civil service, and high levels of transparency. A small, relatively homogeneous population (2.7 million, with 77.3% of the population speaking Setswana), political stability,[12] and favourable mining agreements have all contributed to Botswana's success. While human development progresses more slowly than GDP growth from mineral wealth, Botswana has made significant strides. In 2021, 20.8% of Botswanan were multidimensionally poor (Botswana Office of the President, 2021) and 15% lived below extreme poverty of US$2.15/day (Our World in Data, 2024) – rates far lower compared to other countries in Sub-Saharan Africa. With one of the region's best Corruption Perceptions Index scores, Botswana aims to become a high-income economy by 2036 (Calleja & Prizzon, 2019).

Remarkably, Botswana's government captures one of the highest shares of mineral rents globally, with over 80% of De Beers' mining income going to the state (Krawitz, 2023). These favourable revenue-sharing terms were secured through multiple rounds of negotiation since the early 1970s (Jefferis, 2024). Initially, diamond revenues contributed only 10% of government income, but as De Beers expanded, Botswana renegotiated to take 65%–70% of profits. In 2011, the government successfully compelled De Beers to relocate its global diamond trading operations from London to Gaborone. Over a decade, Botswana's tax revenue more than doubled, from 15.9 billion pula in 2006 to nearly 39.9 billion in 2017 (Calleja & Prizzon, 2019). The concentration of diamond resources and a single company to negotiate with simplified the bargaining process (Jefferis, 2024). Centralized control also limited opportunities for resource looting, a problem seen in countries such as Angola and Sierra Leone (Auty, 2008). Unsurprisingly, Botswana remains heavily dependent on mining, with diamond revenues and Southern African Customs Union (SACU) receipts comprising 60%–70% of government income, and the remaining 30%–40% coming from VAT and taxes.

Since the onset of its diamond windfall, Botswana implemented various fiscal policies to mitigate risks. Since the 1990s, a portion of revenues has been invested into the Sovereign Wealth Fund via two linked subaccounts: the Pula Fund and the Government Investment Account (Jefferis, 2024). Botswana has also maintained fiscal and current account surpluses, capped its debt at 20% of GDP, and introduced VAT in 2002 as part of a 'cost recovery' strategy (Calleja & Prizzon, 2019; Seekings, 2017). Crucially, the country delinked mineral wealth from recurrent spending, **now financing all recurrent expenditure from non-mineral revenues**, including non-mineral income tax, VAT, sales tax, and customs revenues (Lewin, 2011). Recently, Botswana also added progressive taxation on alcohol (10%), which is earmarked for health spending as part of the legislative Road Traffic Act reform (Brikci, 2024). Botswana also established a Sustainable Budget Index (SBI), which stipulates that recurrent spending on areas other than education and health does not exceed revenues from mineral source. The SBI is part of a broader fiscal framework that allocated up to 60% of mineral revenue to physical and human capital investment, with up to 40% saved for future generations (Kojo, 2016).

[12] The same political party has been in place since independence.

Providing food to those in need, including the school feeding programme, is a key pillar of Botswana's welfare state, especially in drought-prone areas (IFRC, 2024). In the first year of independence (1977/78), only 7% of households could feed themselves through their own production (Seekings, 2019). Historically, food provision was the responsibility of chiefs. Aiming to establish legitimacy, the Botswana Democratic Party (BDP) took on these responsibilities, as reflected in the Chieftainship Act, and negotiated food aid from the WFP for half the population. This intervention positioned school feeding as a vital part of the social contract rather than merely a political tool (Botlhale et al., 2015). The commitment to national school feeding was consolidated in late 1990s due to the combination of a five-year drought, rapid economic growth, and rising political opposition, prompting DBP to secure rural support through a universal school feeding programme (Auty, 2008; Seekings, 2017, 2019). By 2015/2016, 76% of the poor and nearly 56% of the total population benefited from at least one social protection programme (Kojo, 2016).

At the same time, the government maintained a high degree of transparency via the Tswana tribal tradition of community consultation, which led to a high degree of trust in the government (Lewin, 2011). Given the high levels of transparency, there was little need for civil society organisations (CSOs) to scrutinise the government and advocate for reforms (Calleja and Prizzon, 2023), which is why they played such a small role in securing pro-poor spending of diamond revenues.

Botswana currently has one of the highest rates of school feeding coverage in the world, reaching 91% of children (UNICEF & Government of Botswana, 2019). In 2020, the programme covered 758 public schools (GCNF, 2022), providing daily mid-morning hot meals, with some rural and marginalized communities receiving a second meal. From a budgetary perspective, school feeding is managed by the Ministry of Local Government and Rural Development (MLRD), whose Department of Food Relief Services (DFRS), within its Department of Local Government Finance and Procurement, are responsible for the procurement and distribution of food ratios to school facilities (UNICEF, 2019; UNICEF & Government of Botswana, 2019).The procurement process is highly centralised, although Botswana has been experimenting with decentralization for local procurement of fresh produce. Staffing and monitoring of the programme is led by district commissioners who are employed by DFRS. The DFRS also overseas the development of infrastructure (e.g. school kitchens and equipment), while district councils undertake the routine maintenance of facilities (PCD et al., 2014, p.23). The district councils tend to manage the decentralized part of food procurement, although in some cases, funds are transferred via the councils directly to schools.

The budget for the primary school feeding programme reached US$39 million in 2012–2013, with an average annual cost of 769.77 Pula (US$104.02) per child annually and 4.16 Pula (US$0.56) per child per day (Drake et al 2016). This cost is considered exceptionally high compared to similar programs in other upper-middle-income countries. A 2019 assessment of the Vulnerable Group Feeding Program recommended phasing it out due to the high level of inefficiencies, with its young child nutrition function being absorbed by a multisectoral nutrition programme and its

social protection function integrated into relevant components of the social protection system (WB IBRD 2022).

5. Looking Forward: Potential for Leveraging Oil Revenues for School Feeding Expansion

This section focuses on the prospects of leveraging natural resource revenues for school meals in Senegal, Tanzania, and Mozambique, as they have recently, or could soon, become new producers of natural resources and would benefit greatly from expanded school feeding initiatives due to the high levels of out-of-school children (Senegal) and high levels of malnutrition (Mozambique and Senegal).

5.1 Senegal

The revenues from recently discovered oil fields are expected to amount to 0.6% of the nation's GDP in the short term and around 3% of GDP in the long term (see Table 1, based on IMF estimates; also Davis et al., 2021; IMF, 2019: 11; ITIE, 2023, p.182). The revenues streams will come from three key oil fields – Sangomar, Greater Tortue Ahmeyim, and Yakaar-Teranga. The Sangomar oil field began production in June 2024 and is projected to produce 100,000 barrels per day (Petroleum Australia, 2024). The Greater Tortue Ahmeyim project[13] is expected to also come online in 2024. Meanwhile the Yakaar-Teranga natural gas project is scheduled to begin commercial production in 2026 or 2027, with the final investment decision on the project expected at the end of 2024 (RANE, 2024).

Despite long-term commitments to green energy transition[14] (Diene et al., 2024), the government faces strong incentives to leverage fossil fuel discoveries, at least in the short term, as that would enable Senegal to reduce its dependency on oil imports,[15] reduce energy poverty levels[16] (Diene et al., 2024; van den Bold, 2022), and boost investment in human capital. Following the leadership of former President Macky Sall, who had close ties to the oil and gas industry and served as the chief executive of the national oil company Petrosen, Senegal is one of the proponents for using Africa's fossil fuels as a 'bridging fuel' for the green transition, arguing that they could balance the intermittency of solar and wind energy.

[13] The project is jointly owned by BP and U.S/-based Kosmos Energy.
[14] Senegal has been one of the key advocates about climate change adaptation because by 2030, 45% of the Senegalese population will be affected by sea-level rises in low elevation coastal zones. Consistent advocacy and high levels of need enable Senegal to attract substantive infrastructure investment and technical support for climate change adaptation and mitigation (Hiraldo & Böhm, 2023). In fact, Senegal was a pioneer in signing the Paris Climate Accord in 2014 (Fent, 2021) and in setting up a Just Energy Transition Partnership (JETP).
[15] At present, about three quarters of Senegalese electricity is produced from imported oil (Kelsall et al., 2024).
[16] 25% of Senegalese do not have access to electricity (Diene et al., 2024). In rural areas, a little more than half of the people (55%) have access (IEA, 2023).

In regard to political settlement dynamics, Senegal enjoys one of the strongest democracies in West Africa, although its recent political landscape has faced challenges. In 2023, then President Sall attempted to position himself for an unconstitutional third term in office ahead of the elections, nearly jeopardizing the process of voluntary handover of power. Sall's move was met with widespread protest and condemnation from a coalition of about a dozen civil society organizations, unions, academics, and religious and youth leaders (NDI, 2024). Swift civil mobilization prevented an unconstitutional postponement of elections, ensured the release of political opposition leaders from prison, and prompted high voter turnout. The April 2024 victory of left-wing President Bassirou Diomaye Faye and Prime Minister Ousmane Sonko, who secured their win by obtaining 54% of the vote in the first round, marked a significant achievement for Senegalese democracy (Al Jazeera, 2024).

The new Senegalese government came to power with a pledge to challenge existing contracts with foreign oil companies, aiming to allocate more revenues for domestic development (Rukanga, 2024). This stance is rooted in the political history of Faye and his champion, Vice President Ousmane Sonko. Sonko was previously imprisoned for speaking out against corruption in Senegal's oil industry (Sonko, 2017), while Faye was jailed for social media posts supporting Sonko (Adeoye, 2024). Just 20 days after his prison release, Faye became Senegal's youngest president (at 44 years old) propelled by Sonko endorsement. Faye's manifesto promises radical changes, including new taxes on oil and gas revenues and improving opportunities for the rapidly growing youth population. At present, youth constitute the core of Faye's electoral base.

More than 40% of Senegalese are under the age of 15 (World Bank, 2024a), and frustrations are growing over the government's inconsistent provision of essential public services. In rural areas, only half (55%) of the people have access to electricity (IEA, 2023). Around half (50.8%) of the population are experiencing multidimensional poverty (UNDP, 2023), and up to 18% of children under the age of 5 are malnourished (World Bank, 2024b). As of 2022, only about 6 out of 10 children of primary school age complete primary education. Among those in school, only 13% have minimum proficiency levels in reading and 34% in mathematics, with major disparities between rural and urban areas (UNESCO, 2022).

Senegal's current school feeding programme has limited coverage (about 20% of public schools (SFI, 2022b), but all the necessary conditions for significant expansion are in place. In 2021, Senegal piloted a school meals programme with the financial support from the Global Partnership for Education (GPE) and operational support from WFP as part of the COVID-19 pandemic recovery. The initial set of schools targets rural and deprived suburban areas, prioritizing regions with the highest health, education, and food vulnerability indicators (GPE, 2021). This initiative came as an addition to an already excellent record on reducing malnutrition and stunting (Akseer et al., 2024) with the support of the Coordination Unit for the Fight Against Malnutrition in the Prime Minister's Offices.

The intention is to gradually expand coverage of public schools and build Senegal's technical and financial capacity to run the food programme autonomously. This is reflected in several national development strategies that incorporate school feeding. These strategies include the 2016–2035 National Social Protection Strategy; the 2018–2030 Programme for Improving Quality, Equity and Transparency in the Education and Training Sector; the 2015–2025 Multisectoral Nutrition Development Plan; and the 2015–2035 National Strategy on Food Security and Resilience (SFI, 2022b). Unlike in many countries in West Africa, the school feeding programme in Senegal falls under the purview of the General Secretariat of the Ministry of Education. The monitoring of the programme is the responsibility of the canteen officers at the School Canteen Division (DCaS), the Academy Inspectorates (IA), and the Education and Training Inspectorates (IEF).

Currently, most funding for school meals comes from external donors. However, the recent discovery of large offshore oil and gas deposits presents a significant opportunity for the government to increase its financial contribution. During the 2020-2021 academic year, government contribution to school feeding was only US$653,500, as the majority of the public education spending had to absorb the rising costs of teacher salaries and rapidly growing school-age population (SFI, 2022b). As such, the majority of school meals funding (80%) came from external donors such as WFP (SFI, 2022b).

Earmarking oil revenues for education could not only help reduce malnutrition and school drop-out rates but also fulfil Faye and Sonko's campaign promises of equitable distribution of oil profits. Additionally, it could signal a departure from the colonial-era education system that habitually overlooked local needs and preferences for education (Fisher, 2024). Lack of jobs and economic prospects is the key concerns of Senegalese youth and civil society. Investing in education and social protection for young people could be a significant step towards addressing these challenges.

Of course, there are several potential barriers that should be taken into consideration. System-level reforms to channel oil revenues for the benefits of basic services may face opposition from Senegal's elite. Historically, basic education, where school feeding could be housed, has been significantly underfunded compared to university education, which constitutes the largest share of the education budget (Jalles & Mulas-Granados, 2018), and which caters to the French-speaking urban population that is more likely to attend university (SFI, 2022b). In such a context, it might be difficult to shift spending priority to basic education. Furthermore, the national oil company PETROSEN has been accumulating debt, which might pose significant risks for public finances relying on these revenues as the revenues in the short term are likely to go to repaying these debts (Davis et al., 2021). Lastly, Faye's PASTEF-backed coalition holds only 60 out of the 165 seats in Senegal's National Assembly, requiring support from other parties to pass legislation around natural revenue spending (RANE, 2024).

5.2 Tanzania

In 2010, Tanzania discovered substantial offshore natural gas reserves in its southern regions, with major finds totalling approximately 47.1 Tfc in deep-water blocks off the coast of Lindi and Mtwar (Tashu, 2022). The discovery was valued at roughly 15 times the country's GDP (Sandefur et al., 2020). Resource revenue projections suggested that oil could boost the GDP by 1%–2% (Scurfield & Mihalyi, 2019). However, prospects of these discoveries materialising are very uncertain as production would start in 2028 at the earliest, and revenues are now not expected to come on stream until 2030 (Stanbic Bank Tanzania, 2022). The development of new oil projects has been slow due to local wariness of foreign exploitation and investor concerns about long-term profitability given global shifts toward a green transition.

Back in 2017, the Magufuli government accused Royal Dutch Shell and Norway's Equinor of extracting excessive profits and attempting to economically colonize Tanzania, leading to the collapse of several negotiations that started in 2014 (The EastAfrican, 2018). At the same time, during the Magufuli's 2015–2021 presidency, Tanzania was grappling with significant shifts towards authoritarianism and diminishing civil society participation (Kelsall, 2018). Starting in 2016, the government imposed a ban on political rallies, suspended several newspapers, implemented restrictive social media laws, and arrested opposition leaders. Moreover, the Magufuli introduced laws requiring NGOs to re-register, essentially giving the government more control over civil society organizations.

Since 2021, there has been a gradual reversal in Tanzania's political and economic landscape, offering a more optimistic outlook for democracy and investment into social development. The unexpected death of President Magufuli was the turning point, as his successor and former Vice-President, Samia Suluhu Hassan, took the opportunity to adopt a more conciliatory approach towards international oil companies and domestic political opposition. Her revival of discussions with Shell and Equinor led to the signing of a memorandum of understanding in 2022 (Tashu, 2022), with a Host Government Agreement expected soon (MarineLink, 2024). Concurrently, Hassan ended a six-year ban on political rallies in 2023 and facilitated the return of exiled opposition leaders such as Tundu Lissu and Godbless Lema to return (Human Rights Watch, 2024). At the same time, the government has maintained its focus on economic development, emphasising the importance of a welcoming business environment and attracting foreign investment.

However, not all challenges around inclusive governance have been resolved, with contestations over power, positions, and resources continuing to hinder the implementation of ambitious development projects (Nyyssölä et al., 2021). A lack of institutional trust poses a significant barrier to reforms in financial architecture, particularly given the strained relationships between the central government and local authorities (Fjeldstad et al., 2019). Moreover, public protests against poor social services provision tend to be more individualistic rather than collective in nature, limiting the public's capacity to generate sufficient collective pressure for change (Nganyanyuka et al., 2018).

In the upcoming 2025 election, President Hassan is likely to prolong her presidency,[17] with education and youth empowerment as key pillars of her campaign. This sets promising grounds for financing and scaling up of school feeling programs. Hassan's administration has shown some commitment to social development, with increased allocations to health (+13%) and education (+5%) budgets to offset depreciation of budgets due to inflation (Pudussery, 2023). Hassan's focus on education is further evident in her decision to sign Tanzania up for the School Meals Coalition in 2022 (SMC Secretariat, 2023) and the investment of approximately US$3 million in school feeding programs in the Monduli District (Kadoke, 2024). Furthermore, her campaign rhetoric emphasizes vocational training, aiming to equip graduates with skills that contribute directly to community development and economic growth (ibid). However, political barriers of ensuring access and quality of education for the most disadvantage children is likely to remain, as higher education still consumes 60% of the Ministry of Education budget (Mosenda, 2024), limiting resources for supporting primary and secondary education students.

So far, the government has demonstrated normative commitment to school feeding but has not established a clear strategy for financing school meals. Normative commitments are reflected in policies such as the 2016 National Multisectoral Nutrition Action Plan (NMNAP), setting its principles for cross-actor and cross-sectoral coordination, as well as the 2021 National Guidelines on School Feeding and Nutrition Services to Basic Education Students (NGSFNSBES). Unfortunately these policies have largely premised that the financial responsibility for school meals in public day schools lies with parents and guardians, while the government responsibility remains limited to school feeding in public boarding schools (SFI, 2022c). The policy documents suggest that the school meals will be supported via home-grown food initiatives or school farms historically financed by WFP. However, there are no guidelines for school meal quality, and participation in school feeding programs is voluntary, resulting in many students in public day schools not having access to food during the school day (Roothaert et al., 2021).

With approximately 32% of children under the age of five in mainland Tanzania being stunted due to chronic malnutrition (SFI, 2022c), a well-implemented school feeding initiative could significantly enhance the well-being of future generations, thereby contributing to the country's overall economic and social progress. Earmarking natural resource revenues for school feeding programs would likely garner strong public support, as recent deliberative democracy surveys indicate that Tanzanians overwhelmingly favour allocating these funds to health and education (Sandefur et al., 2020). Moreover, several studies conducted in Tanzania have provided evidence that school meals have a positive impact on enrolment, attendance, and sometimes learning outcomes (Ash et al., 2003; Chaula, 2015; Lukindo, 2018).

5.3 Mozambique

Mozambique is endowed with substantial natural resources, including coal, natural gas, and graphite, as well as high-quality cooking and heating coal (Hill, 2024;

[17] In the lead-up to the elections, Hassan is skilfully navigating Chama Cha Mapinduzi (CCM) internal party divisions,[17] balancing the interests of various factions while consolidating her power.

Macuane et al., 2018). The natural gas reserves in the Rovuma basin were discovered in 2010 (Salimo et al., 2020), with the first exports starting in 2022 (BP, 2022). Beyond fossil fuels, the country is rich in minerals such as graphite, iron ore, titanium, gold, and precious stones such as rubies, further diversifying its natural resource base. In the short to medium term, resource revenues are projected to range between 0.4% and 1.5% of GDP (IMF, 2024, p. 30). In the long term, after 2028–2029, the revenues could account for as much as 5% of GDP (Haglund et al., 2015; see Table 1). Unfortunately, the resource discoveries have been gradually crippling Mozambique instead of bringing prosperity (Gaventa, 2021). Heightened expectations of windfalls have reignited the long-standing conflict between the Front for the Liberation of Mozambique (FRELIMO) and the Mozambican National Resistance (RENAMO) parties, which resulted in a spike in borrowing.

Since its 1975 independence, Mozambique's political landscape has been dominated by FRELIMO, which managed to maintain control by distributing rents across various party factions and leveraging public narratives around national unity (Salimo et al., 2020). At the same time, RENAMO remained a significant opposition force, continuously challenging FRELIMO's dominance. Between 1977 and 1992, the one-party state led by FRELIMO was at war with the rebellious opposition. Through various negotiations and agreements, the country enjoyed relative stability between 1992 and 2012.

When lucrative gas contracts were signed around 2012, periodic violence between FRELIMO and RENAMO resurfaced. RENAMO's engagement in conflict has been sustained by strong support for RENAMO in resource-rich regions of Mozambique. Meanwhile the government financed its conflict efforts by illegally securing a US$2.2 billion loan from Swiss and Russian banks based on anticipated profits from the upcoming gas extraction in the Rovuma Basin (Macuane et al., 2018; Salimo et al., 2020). The loan led to a breach of trust and a temporary suspension of aid from IMF, hampering ongoing development efforts (Macuane et al., 2018). By 2017, the conflict morphed into an Islamist insurgency called Ansar al Sunna, which progressively worsened over time (Mokanye, 2023). Contended regions have received further hits from the 2019 cyclones Idai and Kenneth, and the economic contraction following the COVID-19 pandemic.

At present, natural resource revenues are used predominantly as rents for the elites via sales of natural gas to domestic business groups at below-market prices and long-term lucrative contracts for electricity by the main public electricity company (EBM). The contracting usually does not involve public tendering, transparency for wider Mozambican public, or significant formal tax payments (Salimo et al., 2020). Financial mismanagement and corruption remain entrenched, chronic issues (Tyson, 2022).

Due to chronic underinvestment in human capital and recent insurgency, Mozambicans are now, on average, poorer than they were a decade ago (Mokanye, 2023). The country ranks 186 out of 189 on the Human Development Index, with the highest levels of deprivation in northern resource-rich regions, especially Cabo Delgado province (Sida et al., 2024). As of 2022, there were over 1 million internally

displaced persons in Mozambique (UNHCR, 2023), over half of whom were children (de Andrade, 2021). Recently the WFP started to expand its coverage of emergency food provision beyond displaced populations as approximately 3.3 million people face crisis levels of food insecurity (Sida et al., 2024; WFP, 2024).

Most recently, the government established a Sovereign Wealth Fund (SWF). For the first 15 years the fund will receive 40% of gas revenues, with the rest flowing into the state budget (Hill, 2024). As part of the fund set up, the government is promising to publish quarterly revenue reports and set up a supervision committee. After the initial 15-year period, the revenues will be split evenly between savings and annual spending (ibid). Unfortunately, at the current revenue levels, it is unclear whether saving 60% of them via the SWF is optimal (Bauer & Mihalyi, n.d.)

Mozambique National School Feeding Program was approved by Council of Ministers in 2013 (Programa Nacional de Alimentação Escolar, PRONAE). However, the programme did not get included in the state budget and, consequently, struggled to expand to provide wide coverage. In 2017, WFP facilitated a debt swap to temporarily finance the school feeding programme and offset the lack of domestic resourcing. As part of the debt swap agreement, Russia waived US$40 million of Mozambique's public debt, freeing up resources for WFP to expand coverage to 300 schools and provide meals to 150,000 children (Jerving, 2017; WFP, 2018). In addition, during the period of debt swap, Mozambique was enrolled in the pilot of Purchase from Africans for Africa programme (PAA Africa) funded by the Brazilian and UK governments. A five-year debt swap brokered by the WFP alongside the additional support from the PAA was supposed to give the government enough time to arrange for the domestic financing of the programme (Jerving 2017).

As of 2024, the programme is still not included in the state budget. However, the Ministry of Education continues to make calls of inclusion of school meal programme in budget plans, hoping that reference to school feeding in the latest Education Strategic Plan provides enough leverage for change. In the meantime, WFP continues to fund PRONAE, reaching over 239,000 beneficiaries across 340 schools (WFP 2024), and to implement the complementary HGSF programme, reaching additional 112,000 students across 141 schools. These efforts are supplemented with stand-alone school meal projects in areas of greatest need (e.g. the 2019 GPE-funded Emergency School Feeding Programme in areas affected by Cyclones Idai and Kenneth).

6. Discussion

As established early on in the report (Table 1), **natural resource revenues could technically finance universal school feeding in countries where the cost of expanding school meals to all pupils is less than the level of natural resource revenues**. In Senegal, hydrocarbon resources, currently at 0.6% of GDP, already meet the threshold of expenses required to provide universal school meals to pupils at pre-primary, primary, and lower secondary levels. In Mozambique, natural gas revenues are likely to be more than sufficient to fund universal school feeding once they come on stream around 2028 (up to 5% of GDP). In Tanzania, liquified natural gas (LNG) production is not forecast to start until 2030, but it is expected to average around 2% of GDP from 2030 to 2050. Even with potential increases in enrolment in countries such as Senegal—where 25% of children are still out of school[18] – the costs would remain under 3% of GDP natural resource revenue projections, making the funding of school meals well within reach.

However, our retrospective case studies, focusing on Bolivia, Ghana, and Botswana, show that **the success of converting natural resource revenues into school feeding programmes depends largely on country-specific political economy dynamics**. In the three countries examined, there was a real or perceived threat that the dominant political party will lose its electoral base unless they start catering to the needs of large groups of population. This threat prompted the consolidation of national school feeding programs as a strategy to secure public support. Without such in-country pressures, it would be difficult to generate financial commitment to school meals. The global development initiatives from the early 2000s, such as the Millennium Development Goals (MDGs) on universal school access and poverty reduction, helped create additional incentives; however, the internal political economy dynamics mattered more and determined the level of success in leveraging natural revenues for school meals.

In **Botswana**, the dominant ruling party has enjoyed continuity since 1996, supported by a relatively small and homogeneous population. Political stability combined with fairly high levels of natural resource revenues (of around 9%–10% of GDP) enabled the government to commit 769.77 Pula (US$104) for school meals per child annually (Drake et al., 2016) – an exceptionally high level of spending compared to similar programs in other upper-middle income countries.

In contrast, **Ghana's** attempt to implement a national school feeding programme was repeatedly undermined by competitive clientelist dynamics between the elites. Even with strong civil society putting pressures on government to distribute natural resource revenues inclusively, budget allocation for the school feeding programme frequently fell prey to clientelist and patronage practices. Over the years, budget execution remained weak, real spending per pupil declined, and issues with timely and adequate catering payments persisted. This dynamic is an example of a competitive clientelist political settlement with broad social foundations – elite groups are preoccupied with maintaining their power during 'winner-takes-all' electoral competitions and are less able to leverage natural resource wealth for long-term development despite the pressures from civil society (Whitfield et al., 2015; Khan, 2017; Kelsall, 2018; Hickey, 2020). Combined with relatively modest natural resource

[18] Senegal has the highest OOS numbers among our case studies: Botswana 12%, Bolivia 7%, Ghana 14%, Senegal 25%, Tanzania 19%, Mozambique 5% (Appendix 1 based on UNESCO data)

revenues (1.4% of GDP), Ghana is spending nearly six times less (US$17) per student per year compared to Botswana (Drake et. al 2016; UNICEF, 2023)

In Bolivia, school meals have also become a success story, although the Bolivian government employed a very different implementation approach compared to Botswana. Instead of pursuing an ambitious nationwide scheme orchestrated from the capital, they decentralized financing of school meals and created pockets of effectiveness that overtime built towards nearly universal school meals coverage. Even though there is no mandate or earmarking for school feeding, municipalities invest more than US$110 million in school meals each year, reaching over 80% of school-aged children. The programmes is funded largely by domestic funding (98%), with the majority of domestic funds (71%) coming from the Direct Tax on Hydrocarbons.

Importantly, Bolivia's **decentralised approach has been strengthening the social contract between the government and the public**. Having local authorities manage school meals using natural resource revenues transferred directly to them, families are more likely to see the funds as benefiting local communities rather than being siphoned off by elites. This decentralized approach to school feeding is also enabling Bolivia to more easily shift towards home-grown school meals in line with their sustainability objectives. However, it is important to note that decentralised approaches to implementation in other contexts might come with the risk of perpetuating disparities across locations and creating greater administrative capacity challenges at the subnational levels.

Balancing the benefits of localization with the efficiency of centralized systems will be a key consideration for countries looking to roll out national school meals programmes. On one hand, centralization enables economies of scale and reduces transaction costs. On the other hand, centralized procurement systems tend to create negative consequences for climate, environment, biodiversity, and food sovereignty, with current food chain systems contributing to approximately one-third of global greenhouse gas emissions (Pastorino et al., 2023). Based on this and other drivers, there has been a push for localization of school feeding programs through HGSF programs. These initiatives aim to source food from local small-scale producers, supporting local economies, and potentially reducing the environmental impact of long-distance food transportation. However, the transaction costs associated with searching for and dealing with many small suppliers may pose challenges to HGSF initiatives (Khincha et al., 2022).

In terms of **administrative arrangements** for school meals across countries with already established provision, school feeding programmes typically fall under the jurisdiction of the ministries of education (GCNF, 2022). The budget for school feeding rarely comes from centralised education funding streams. In Botswana, the responsibility falls under the Ministry of Local Government and Rural Development, while in Ghana it is under the Ministry of Gender, Children and Social Protection. Large-scale procurement of nonperishables is often handled at the central level for economies of scale and then delivered to the local level, while fresh vegetables and other perishables are increasingly procured locally. Local government bodies tend to be responsible for contracting NGOs or local private caterers to prepare and deliver the meals. Local governments work in close collaboration with schools (e.g. with regard to hiring cooks, parts of local vegetable procurement, and setting the menu);

however, schools do not shoulder the bulk of responsibility for delivering school meals. This might be because of already limited capacities of schools in LMICs.

Table 3. *Overview of institutional and budgetary arrangements for case countries with national school feeding programmes*

Country	Non-standardised annual cost per child	Government budget stream	Lead government body	Lead institution core functions
Botswana	2012: 104 USD[19]	Ministry of Local Government and Rural Development	District Commissioners at Department of Local Government Finance and Procurement	Policies and standards, planning, funds management, food procurement, contract catering, monitoring and evaluation
Ghana	2023: 17.29 USD[20]	Ghana Ministry of Gender, Children and Social Protection	Local government plus private food catering in urban areas and NGOs in local areas	Policies and standards, planning and budgeting, oversight, monitoring and evaluation, contract catering
Bolivia	2019: 48.96 USD[21]	Not applicable since municipalities have discretion on how to allocate social spending	Local government (Municipalities)	Budget expenditure, procurement or contract catering (depending on whether it is rural or urban location); oversight, monitoring, and evaluation,

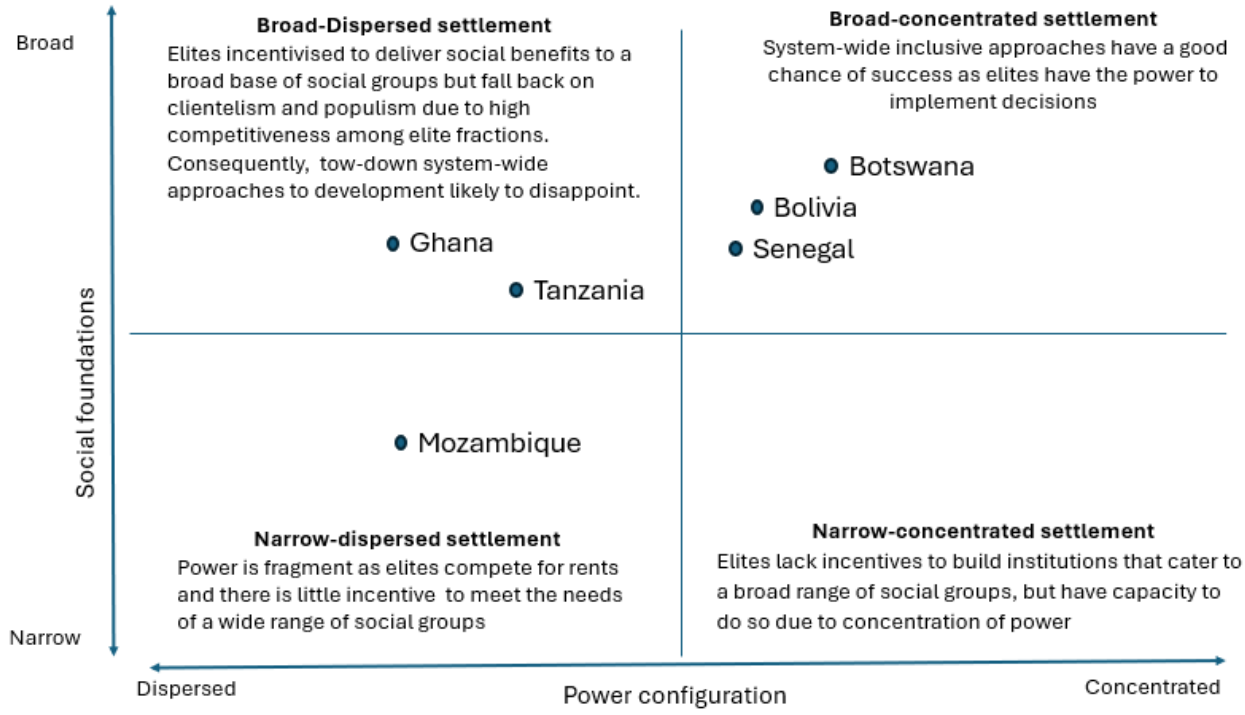
The share of natural resource revenues allocated to the national budget varies significantly among our case countries. In Botswana, this share is intentionally kept low as a preventive measure against the resource curse. Recurrent expenditures, including those for school meals, are funded through non-mineral revenue streams, such as income tax, VAT, sales tax, and customs revenues. In Ghana, natural resource revenues account for only about 4% of the annual budget, partly due to challenges in resource production. In contrast, Bolivia allocates a much higher share of natural resource revenues to the national budget – 71% of local municipal budgets – following the restructuring of resource distribution in the early 2000s. Although we did not find specific instances of earmarking natural resource revenues for school feeding, there are numerous examples of earmarking other revenue types for social spending, particularly in education and health. For example, Botswana imposes a 10% tax on alcohol specifically for social spending.

Looking ahead, **Senegal** is the most likely among the three case studies to follow a trajectory similar to that of Botswana and Bolivia (see Figure 5). With its relatively centralized power structure and civil society pressures to distribute natural resource benefits to youth, Senegal is well-positioned to implement centrally made decisions. Given its substantial natural resource revenues, amounting to 3% of GDP, most of the funding for school meals could come from domestic sources. This policy choice

[19] (Drake et. al 2016)
[20] (Drake et. al 2016; UNICEF, 2023)
[21] (SFI, 2022).

would be consistent with Senegal's already high levels of spending on education, which stands at 6% of GDP and 22% of total government expenditure (World Bank, 2022). Technical support and strategic coordination among donors will remain essential to support the newly established leadership and expansion of school meals coverage.

Figure 1 Case countries categorised against Kelsall (2018) political settlements typology



In **Tanzania,** the government would likely struggle to follow through with the promise of a national school feeding programme because of the competition among elite factions and incentives to use resource rents to court economic and political elites. President Samia Suluhu Hassan's rule is increasingly leading to a more dispersed power configuration, due to internal tensions within the ruling Chama Cha Mapinduzi party. Moreover, the government has historically shown low commitment to health and education spending (1% of GDP on health and 3% of GDP on education; see Appendix 1). At the same time, her government has adopted a more tolerant stance toward formal opposition and reintegrated previously excluded political factions, broadening social foundations (Nyamsenda & Collord, 2024). One way forward could be to embed school feeding finance within Tanzania's existing decentralized education financial structure. Expanding the current system of conditional grants to include school feeding programs could leverage established funding streams and local administrative frameworks, enhancing programme efficiency within the constraints of Tanzania's political and administrative landscape.

For **Mozambique,** the prospects of leveraging natural resource revenues for school meals are even more uncertain. There is an active conflict among elite factions, and

very few social groups have the power to influence high-level political struggles, with large segments of society excluded from resource benefits. Because of these dynamics, past attempts by WFP and the Ministry of Education to incentivise the government to take on the lead and finance school meals fell short.

However, Mozambique does spend considerable amounts of public budget on education (7% of GDP, 18% of the total government expenditure; see Appendix 1). Implementing a school meals programme could serve as a constructive step towards mending the relationship between the government and its citizens, particularly in addressing the public's mistrust surrounding the equitable distribution of oil revenues. In line with this, the rollout of a school meals initiative could complement the recent establishment of a Sovereign Wealth Fund, which is supposed to allocate 60% of revenues into the state budget.

In countries where malnutrition and learning poverty remain acute issues, such as in Mozambique and Tanzania, the implementation of school meal programs is the most challenging, but implementation would also lead to the greatest levels of improvement. In Tanzania, 23.5% of the population is malnourished, and 30.6% of children under five suffer from stunting. Similarly in Mozambique, 30.5% of the population is malnourished, with 36.4% of children under five experiencing stunting. Given these stark realities, introducing or expanding school meal programs in challenging contexts such as these could significantly mitigate long-term impacts of malnutrition, improve school enrolment levels, and foster long-term human capital development essential for sustained economic growth.

7. Conclusion

The world is facing a nutritional crisis, with one in nine people going hungry or malnourished (Mannar & Micha, 2020; Watkins, 2023). By 2030, half of all chronically malnourished people will be living on the African continent (Mannar & Micha, 2020), where an estimated 20% of the population is currently malnourished (Giyose et al., 2022). LICs are particularly vulnerable due to limited government spending on food assistance and declining donor support. International financing for food aid dropped from US$267 million in 2020 to US$214 million in 2022 (WFP, 2022). High levels of hunger despite a global abundance of food are unacceptable and clearly highlight the need to provide nutritious meals to children in LICs and LMICs. Recent global disruptions to food supply chains caused by the COVID-19 pandemic and Russia's war in Ukraine further highlight the critical need to build locally-led, resilient, and sustainable food systems.

Encouragingly, many governments are already taking proactive steps to address these challenges. With the leadership of the global School Meals Coalition and Global Alliance Against Hunger and Poverty (GAAHP), several countries are aiming to achieve universal school feeding by 2030. It is estimated that as much as 80% of the total budget for school feeding already comes from governments themselves (Watkins et al., 2024). Substantial new discoveries of natural resource deposits could partially, if not fully, cover the costs of these programs in some contexts.

This technical note considered whether natural resource revenues could be earmarked for universal school feeding programmes drawing on case studies of

Mozambique, Tanzania, Senegal, Ghana, Botswana, and Bolivia. Findings show that technically even low-income resource-rich countries could finance school meals using natural resource revenues. Estimates suggest that natural resource revenues will vary between 2% and 5% of GDP, while school meals will cost only between 0.6% and 2.5% of GDP (based on US$65 median per child per school year cost estimated by Watkins et al., 2024, and IMF natural resource revenue projections).

However, the feasibility of earmarking Africa's oil and mineral revenues for sustainable school feeding programmes will be contingent on country-specific political dynamics and the quality of governing institutions. Nations with fragmented power structures and weak public institutions may struggle to effectively channel natural resource revenues into comprehensive school meal initiatives, potentially falling victim to the resource curse. Conversely, countries with more stable political settlements, where elites support public interest and enshrine a long-run perspective that traverses election cycles, are better positioned to successfully convert these revenues into effective school feeding programs. A strong civil society also plays a crucial role, as it can challenge the status quo and encourage governments to distribute resources more fairly. Therefore, any plans to pursue earmarking of resource revenues should take into account country-specific contextual factors.

When financing school meals through natural resource revenues, it is crucial to take into account the implications on climate crisis and the volatile nature of these windfalls. Reliance on nonrenewable resources can be unpredictable due to fluctuating market prices, and they can have detrimental environmental impacts. Thus, funding national school feeding programs with such revenues should ideally be a short-term strategy. In the long term, securing more stable and sustainable financing sources, such as income tax, value-added tax, sales tax, or customs revenues, is essential for the continuity and reliability of essential school meal programmes.

Appendix 1: Indicators on social welfare financing and wellbeing outcomes

		Resource-rich countries with national school feeding programmes			Countries with recent resource discoveries without national school feeding programmes		
		Botswana	Bolivia	Ghana	Senegal	Tanzania	Mozambique
GDP per capita 2023, PPP constant 2021(Word Bank, 2024)		17,471	9,669	6,730	4,356	3,581	1,494
Population as of 2024 (World Bank)		3 million	12 million	34 million	18 million	67 million	34 million
Public spending on social assistance programmes (% of GDP)		2018-19: 3%	2015: 1.9%	n/a	2015: 0.9%	2016: 0.2%	2015-19: 1.9%
Gov expenditure on **health** as % of GDP (WB 2021 estimates)		5%	6%	2%	1%	1%	3%

Gov expenditure on **education** as % of GDP (WB 2020 estimates)		8%	n/a	n/a	6%	3%	7%
Education spending as a share of total government expenditure (WB 2022 estimates)		21.47%	22.2%	13.36%	22.48%	13.36%	18%
Adult literacy rate (age 15+)		2013: 87%	2020: 94%	UNESCO 2020: 80% DHS 2015: 51%	2017: 52%	2015: 78%	2020: 60%
Out of school children rate approximate estimates		12%	7%	14%	25%	19%	6%
Prevalence of undernourishment in overall population	2001	23.8%	27.8%	14.9%	24.5%	32.8%	36.9%
	2020	22.9%	19.4%	5.1%	5.7%	23.5%	30.5%
Percentage of children under 5 years of age who are stunted (FAOSTAT 2022 modelled est.)		21%	11%	12.7%	17%	30.6%	36.4%
Percentage of children under 5 years of age who are overweight (FAOSTAT 2022 modelled estimates)		10%	9%	1.9%	3.4%	4.6%	5.5%

Sources: Most figures presented are based on World Development Indicators; Adult literacy rates on UIS data via World Bank; Out of school children rate approximate estimates based on World in Data enrolment estimates for 2018-2019 (2017 for Senegal) using data from Lee and Lee (2016) and UNESCO via World Bank; Prevalence of undernourishment in overall population based on Our World in Data, 2024 based on FAOSTAT. Undernourishment is measured as the share of the population that has a daily food intake that is insufficient to provide, on average, the amount of dietary energy required to maintain a normal, active and healthy life. Percentage of children under 5 years of age who are stunted are modelled estimates from FAOSTAT (2022). These estimates are comparable with the Joint Child Malnutrition Estimates calculated by UNICEF, WB and WHO https://data.unicef.org/resources/dataset/malnutrition-data/

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