Review of Agricultural Subsidy Programmes in Sub-Saharan Africa: The Impact of the Russia – Ukraine War

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Summary Findings

The vast experiences drawn from the review of Input Subsidy Programmes in Sub-Saharan Africa denote that their cost of implementation often tends to surpass the benefits.

In retrospect, the rate of returns on ISP programmes expenditures is lower than on investments in core public goods. The benefits of ISPs are often eroded by high transaction costs, including transport costs.

However, ISPs have been successful in increasing input use, maize production, maize yields and food security, at least under favourable economic and weather conditions.

ISPs have also contributed to increasing income, reducing poverty, and improving food and nutrition security albeit exiguously.

The Russia – Ukraine war has caused havoc on the global energy and food markets, thus resulting in a surge in the prices of agricultural inputs, energy, and food.

These disruptions have caused the prices of fertilizers to surge higher by approximately 78% than the average prices recorded in 2021.

Increased input prices, especially for fertilizers have triggered governments to ramp up input subsidy programmes as a means to support farmers and cushion consumers from food insecurity and high cost of living.

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Introduction

In a quest to foster economic growth through agriculture development in Sub-Saharan Africa (SSA), input subsidies became state-led agricultural development policy toolkits in the 1960s and 1970s. Notably, agricultural inputs were one of the primary ingredients in the green revolution that easily succeeded in Asia and Latin America during the same time (Gollin et al., 2005). The inception of the state-led Input subsidy programmes (ISPs) in SSA were widely accepted to promote technological change in smallholder production through the use of modern inputs (mainly high-yielding seeds and fertilizers) with irrigation (where possible) to drive large land and labour productivity increases and expand the production possibility frontier. The uptake of these technologies by smallholder farmers (who are the predominant group in SSA) has been quite lethargic because of a plethora of factors i.e., lack of knowledge to use these inputs efficiently and effectively, lack of capital to invest in farm infrastructure, lack of market infrastructure etc (Oyetunde-Usman, 2022). Despite the reasons enlisted above, there were some African countries like Malawi and Zimbabwe that successfully implemented a combination of subsidy programmes and other interventions and flourished in raising production and productivity. However, for varying political and economic reasons, these countries failed to either maintain the fiscal investment and market systems needed for sustained benefits or to develop unsubsidized alternatives (Smale and Jayne, 2009).

In the 1980s and 1990s, the employment of state-led agricultural input subsidies became obsolete in a market-led policy thinking that dominated international development thinking. This was also the era of structural adjustments/reforms hence SSA could not fully implement agricultural input subsidy programmes. Remarkably, the input subsidy programmes never lost the interest and support of certain governments and politicians in SSA and other middle-income countries, so in the 2000s the input subsidy programmes relished a rather contentious revival in SSA. In the same aforementioned period, SSA farmers were using an average of 9 Kg/Ha of fertilizer on arable land which is a minute quantity in comparison to South Asia, Southeast Asia and Latin America which were using 100, 135 and 73 Kg/Ha (Crawford et al, 2006). The implication of this is that agricultural production and productivity in SSA had substantially stagnated whilst in Asia and Latin America it had markedly soared. This resulted in SSA countries being heavily dependent on the import of grains (staples) (Wiggins and Brooks, 2010).

With this in mind, a new ideology on agricultural input subsidies ensued in the 2000s and 2010s, viz, often referred to as the smart subsidies. This ideology emphasizes the development of sustainable input supply systems (Morris et al., 2007). Smart subsidy programmes focus on promoting fertilizer as part of a wider strategy of market-based solutions and competition in input supply; paying attention to demand and economic efficiency; empowering farmers; pursuing regional integration, sustainability, pro-poor economic growth and an exit strategy; giving precedence for poverty reduction or food security over efficiency and sustainability goals only in exceptional circumstances. In retrospect, this new ideology requires that governments rethink their role in agricultural subsidies in particular in the early stages of agricultural development (Dorward et al., 2004). Furthermore, government intervention is extensively needed in promoting markets in order to give smallholder farmers access to and use the available resources and technologies.
This backdrop of the evolution of agricultural input subsidies in Africa gives the impetus for this paper. This paper, therefore, reviews how the subsidy programmes have fared with respect to what they were designed to achieve, the outcome of the programmes, exit strategies and assessment of the programmes’ performance.

The paper then looks at the future impact of the Russia-Ukraine war on the availability, affordability, and accessibility of fertilizer inputs to SSA.

Input Subsidy Implementation and Impact in Africa

There are twelve (12) countries in SSA that have been identified to have operated smart subsidy programmes. Nigeria started its subsidy programme in 1992, ten years later (2002) Zambia followed, and then came the much-publicized Malawi programme in 2005. The Malawi programme stimulated wider uptake of the smart subsidy programme because Kenya and Rwanda started their programmes in 2007, and Tanzania, Senegal, Mali, Ghana and Burkina Faso followed in 2008. Burundi started their programme in 2012. It is important to note that two other countries had programmes – Mozambique piloted their programme from 2009 – 2011 whilst Ethiopia does not consider its policy of selling fertilizer below cost as a subsidy programme (Carter et al., 2013), yet it could be construed as such. The nature of these programmes varies, and they also have evolved over the years. Some offer a universal price subsidy while others ration supplies to targeted farmers and crops (normally food crops), often using vouchers. Some rely on and seek to develop the private sector for fertilizer and seed supply, while others rely on parastatals. The objectives of these programmes converged on improving household or national food security, input (seeds and fertilizer) adoption and producer welfare. Another common but not universal objective is meant to improve input access and input supply systems. Only three out of the twelve programmes recognized the probability for producer subsidies to benefit poor consumers (apart from subsistence producers). Only the Tanzanian programme was explicitly intended to promote input use efficiency and soil fertility replenishment (Chirwa and Dorward, 2013).

In as much as emphasis has been put on countries in Sub-Saharan Africa to implement smart subsidy programmes, it appears that the extent to which these programmes are actually pursuing smart subsidy objectives is quite contentious and limited, to say the least (Wanzala-Mlobela et al., 2013). Notably, analysis has revealed only two of these programmes (Ghana and Kenya) are more market-friendly – they encourage private sector development in both importation and accessible distribution.

The impact of input subsidies in Africa is quite contentious and disputable because of the unreliability of the data and poor-quality information. Available data show that the estimated cost of the total agricultural input subsidy programme (ISP) in Sub-Saharan Africa stood just under US$1.2 billion in 2011, a little over 28% of total public expenditure on agriculture across these countries (Jayne and Rashid, 2013). In recent years, total expenditures on ISPs by the Sub-Saharan African countries have ranged from approximately 600 million to 1 billion USD per year and accounted for roughly 14-26% of their combined annual public expenditures on agriculture.

Despite the arguments for ISPs outlined above, by as early as the 1990s there was widespread agreement that their costs generally exceeded their benefits (Kherallah et al., 2002). However, African leaders had many incentives to revive ISPs: they are politically popular and are often considered an appropriate response to former colonial policies that discriminated against smallholder farmers. Political economy analyses (e.g., by van de Walle, 2001; Jayne et al., 2002) contend that influential rural elites benefitted from ISPs and lobbied forcefully for their re-emergence. Starting around 2000, many African governments experienced a relaxation of the constraints on public budgets resulting from the Highly Indebted Poor Countries (HIPC) debt forgiveness programs and a shift by international donors from highly conditional aid to direct budget support (Jayne and Rashid, 2013). Thirdly, multiparty-political systems had emerged in much of Africa by the early 2000s, spurring competition to attract and reward constituents with public coffers (Levy, 2005). ISPs, featuring free or highly discounted inputs to millions of farmers, were one of the promises that leaders often made (e.g., in Malawi, Nigeria, and Zambia) to garner the rural vote.

A review of several documents to collate data on subsidies expenditure and their share of agricultural and national budgets over a four-year period (2011 – 2014) (see Figure 1) revealed that Ghana and Malawi apportioned a third of their agricultural budget, 31.8% and 31.0% respectively, to subsidies. Tanzania allocated the least share (9.9%) of their agriculture budget to subsidies (Jayne et al., 2016; 2018). However, the annual data from these countries depict that in 2014 Malawi apportioned 44% of the agriculture sector budget to subsidies whilst in 2012 Tanzania only allocated 2% of the agriculture budget to subsidies. This, therefore, implies the year-to-year range within a country, and amongst countries is quite wide. Most countries on average allocated between 10% - 15% of their agriculture budget to subsidies. The overall average over four years and all countries is 18%. According to Theriault et al. (2018), the share of the rural and agricultural budget allocated to the fertilizer subsidy programme constantly increased over the (2008 – 2014) period, accounting for less than 10% in 2008 to about 25% in 2014.
<table>
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<th>ISP Fertilizer Distributed (Thousand MT)</th>
<th>Public Expenditure on Agriculture (Million USD)</th>
<th>ISP Cost as % share of Public Agriculture Spending</th>
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Source: Jayne et al. (2018)
In Ghana, Malawi, and Zambia the amount spent on subsidies represents, respectively, 58%, 47% and 37% of every US Dollar spent elsewhere in the agriculture budget (as shown in Figure 2). In the other countries, this is between 11% - 18% of every US Dollar; Kenya (18%), Senegal (16%), Mali (14%), Burkina Faso (13%), Nigeria (12%), and Tanzania (11%).

In regard to the supply and demand balances of fertilizers by region in Africa, North Africa is the only region that is inorganic fertilizer self-sufficient (Figure 3). In the rest of the regions (East, Central, Southern and West Africa) the domestic demand surpasses the domestic supply hence these regions import their fertilizer from the rest of the world (as shown in Figure 3). This implies that the East Africa region is the largest fertilizer importing region in Africa, followed by west Africa. North Africa is the only region with a positive trade balance of inorganic fertilizers.

![Figure 1: Average subsidy share of the agricultural budget, 2011-2014](source)

![Figure 2: Average ratio of subsidy costs to all other agricultural expenditures from 2011-2014](source)
Impact of SSA ISPs

The demand for unsubsidized inputs in Sub-Saharan Africa fluctuates substantially due to the effects of the implementation of ISPs. Reviews have depicted that an additional 100 Kg of ISP fertilizer crowds out up to 50 Kg of commercially sold fertilizer in Kenya, 35 Kg in Nigeria, 18 Kg in Malawi, and 13 Kg in Zambia (Takeshima et al., 2012; Jayne et al., 2013; Mather and Jayne, 2015). The impact of the ISP fertilizer has been considerably felt by the well-developed private sector fertilizer markets in Kenya. Yet, most farmers already used fertilizer before the re-introduction of subsidies (Mather and Jayne, 2015; Sheahan et al., 2014). In general, the extent to which ISP inputs decrease commercial demand is lower among female-headed households, households with less land or fewer assets, households that did not previously purchase the inputs, areas with lower agroecological potential. In fact, indications from the robust review depict that targeting female-headed households to be recipients of ISPs has not been prioritized. Overall evidence suggests that in Malawi and Zambia, targeting of smaller-scale farmers appears to have been achieved. However, ISP programmes in Kenya and Ghana appear to favour larger-scale farmers and results for Tanzania show no significant effect.

Evidence of the positive effects of ISP on maize yields is limited to a few countries (Kenya, Malawi and Zambia) (Chibwana et al., 2014; Holden and Lunduka, 2010; Karamba and Winters, 2015; Mason et al., 2013; Mason et al., 2017a, 2017b; Wossen et al., 2017). In Kenya, ISP inputs increased maize production by 361 kg per 100 kg of ISP fertilizer on average (Mason et al., 2017), in Malawi (165 kg of maize per 100 kg of ISP fertilizer) and Zambia (188 kg of maize per 100 kg of ISP fertilizer) (Mason et al., 2013; Ricker-Gilbert and Jayne, 2012). The effects of the ISP programmes as denoted by the evidence show that crop income is quite variable. In Kenya, the evidence shows that the income is insignificant but increased net crop income among the poor. For Malawi and Zambia, the ISP programmes have had positive effects (albeit minute) on the overall net income of smallholder farmers (Mason et al., 2016; Mason and Tembo, 2015; Ricker-Gilbert and Jayne, 2012).

Today, the fact of the matter is that, while implementing ISPs, the continent is incurring a huge bill from importing food (as depicted in Figure 4), especially from the rest of the world (about USD 64 Billion in 2020). The expectation was that with the implementation of ISPs African member states would produce adequate food to allow them to be self-sufficient and to trade among themselves. Intra-African trade in food was a meagre USD 16 Billion in 2020 (representing about 17% of total food imported).
With regards to the expansion of crop area planted or land under different crops, evidence shows a mixed record. In Kenya, a country that is land-scarce, the ISP programme doesn’t seem to have an effect on the total crop area planted (Mason et al., 2017). On the other hand, in Zambia which is land abundant, the ISP programme induced an expansion of land under maize production without adversely affecting the area of land devoted to other crops (Goeb, 2011; Mason et al., 2013; Zulu et al., 2014). In Malawi, evidence suggests that the effect of the ISP has had acceptable results, Chibwana et al. (2012) found that smallholder farmers increased the land dedicated to maize production whilst Holden and Lunduka (2010) and Karamba (2013) found the ISP programme encouraged maize production intensification on the same total area under maize production. The deduction from this is that ISP programmes have had heterogeneous effects on the area under maize and other crops.

Figure 5 emphasizes the above sentiments; it also depicts that food production (in blue) has been rising in Africa growing by 10% between 2014 and 2019. This is mostly driven by area expansion rather than productivity improvement. Per capita, food production (in orange) has been on a slight decline which is a grave food security concern.

![Figure 4: Food Import Expenditure Bill from 2001-2020](Source: Author’s compilation from FAOSTAT data (2021))

![Figure 5: Gross Food Production and Gross Food Production Per Capita from 2014-2019](Source: Author’s compilation from FAOSTAT data (2021))
Empirical evidence of the Kenya and Zambia ISP programmes indicate that severe poverty was attenuated by a considerable percentage. However, they did not reduce the poverty incidence (Mason et al., 2017; Mason and Smale, 2013; Mason and Tembo, 2015). The evidence from Malawi depicts that the effects of the ISP programme on poverty are mixed – Chirwa (2010) found that those that received ISP inputs had an 8.2% increase in per capita incomes, but then again Ricker-Gilbert and Jayne (2012) found no substantial and significant effect on the household assets, total income, or off-farm income.

The effects of ISPs on food prices in Malawi and Zambia connote modest reductions, between 2 to 3%, and between 1 and 4%, respectively. Though not directly comparable, Dorward and Chirwa’s (2013) findings indicate a decrease in the maize-to-wage price ratio as a result of the ISP programme due to both reductions in maize prices and increases in wages. In Nigeria, the ISP programme had an insignificant effect on local maize and rice prices (Takeshima and Liverpool-Tasie, 2015). Overall, evidence depicts that ISP programmes in Sub-Saharan Africa have little or no effect on local grain prices. The ISP programme in Malawi contributed to the increase in average farm wages by 5–8% (Arndt et al., 2016). At the same time, the ISP programme in Malawi is suggested to have reduced the national poverty headcount ratio by 1.6–2.7 percentage points and that reductions in poverty in rural and urban areas were similar, if not slightly greater in urban areas. In Nigeria, the ISP programme is attributed to a 17.7 percentage points reduction in the poverty headcount ratio. The evidence base is still too thin to draw broad conclusions about the effectiveness of ISPs as poverty reduction strategies. Relatedly, a major knowledge gap is understanding the cost-effectiveness of ISPs in SSA relative to other types of poverty reduction programs and investments (e.g., cash transfers, investments in rural roads, agricultural research and development, etc.).

The Impact of the Russia – Ukraine War on SSA Fertilizer Supply

The Russia-Ukraine war has caused havoc on the global energy and food markets, thus resulting in a surge in agricultural inputs, energy, and food prices. Russia and Belarus (Russia’s heavily sanctioned neighbour and ally – EU sanctions Belaruskali, Belarus’s main potash producer, and its export arm, Belarusian Potash Co.) export approximately 20% of the world’s nitrogen fertilizers and 40% percent of the world’s exported potassium respectively. Russia and Belarus produce more than a third of global potash. Yara, a conglomerate and Europe’s principal producer and supplier of fertilizers has one of its biggest production plants in Ukraine (The Conversation, 2022). The impact of these disruptions in the global supply chain of agricultural inputs i.e., fertilizer has been greatly felt by Sub-Saharan countries that source their fertilizer supplies for their ISPs from Russia, Belarus and Ukraine, this impact is exacerbated by multiple climatic shocks and lethargic macro-economic recovery from the COVID-19 pandemic. These disruptions have caused the prices of fertilizers to surge higher by approximately 78% than the average prices recorded in 2021 – Phosphorus and Potash fertilizer prices surged to US$1200/tonne from US$450/tonne in 2021. Nitrogen fertilizers prices have surged to well over US$1000 from US$ roughly US$500 – 550 in 2021.

Figure 6: Fertilizer Import Dependency (Net Importers only) from Russia (SSA counties are in Red).
Source: FAO, 2022
It is postulated that if fertilizer supplies drop by 30%, there will be a 30 million MT decrease in food supply – equivalent to the food requirements of 100 million people (FAO, 2022).

The trends depicted in Figure 6 above connote a gloomy picture in terms of SSA countries being able to implement their ISPs appropriately because of the scarcity in the supply of the fertilizers or rather the high cost of the fertilizers makes it unaffordable to holistically implement the ISP.

Supply outlooks look bleak in many SSA countries with some SSA countries already indicating the reduction of their procurement of fertilizer under their ISP this year by 50% as a result of higher prices (AGRA, 2022). Also, application rates by farmers are predicted to reduce between 20-50%.

Alternative markets to source the fertilizer from have also restricted global exports/supply. The USA had the production of nitrogen-based fertilizer reduced by up to 60% due to the diversion of natural gas away from fertilizer production to heat homes. Some nitrogen-based fertilizer manufacturers in Lithuania, and Poland have restricted exports until domestic demand has first been met (The Courier 2022; Food Manufacture 2022). China banned exports of phosphate and Urea (nitrogen-based) fertilizers until their domestic demands were met (Chemical and Engineering News 2021; Westra 2022). Africa's largest producers of inorganic fertilizers (Morocco and Nigeria) are currently selling the bulk of their fertilizer to India and Brazil leaving a paltry quantity for SSA countries implementing ISPs.

Since the affordability of fertilizers is precipitously falling as depicted in Figure 7, the targeting of ISP input recipients in SSA countries becomes much more difficult because of the limited inputs available for the programme. The SSA countries cannot afford to purchase the same quantity of ISP inputs and the prices of commercially sold fertilizers are too high for farmers to such an extent that farmers aren't buying what they need; they are buying what they can afford.

Figures 8a and 8b clearly show that despite having ISPs in the continent, especially in SSA there is still a
heavy reliance on imported cereals especially wheat and maize from the rest of the world. However, of particular concern is that SSA imports 37% of the cereals from both Russia and Ukraine and with the impasse between these two countries SSA’s food security is sternly dented (losing out on 37% of cereal imports).

Combining the diminished fertilizers (for the ISPs) and cereals imports from both Russia and Ukraine, Africa, in general, is in quite a dire ordeal when it comes to producing food and feeding its inhabitants.

**SSA Governments Responses to both the COVID-19 Pandemic and the Russia - Ukraine War**

Empirical evidence from the AUC CAAADP Biennial Review process and FAO analysis depicted that the impact of the COVID-19 Pandemic and the Russia – Ukraine war resulted in a decrease in access to input, food production, food transportation and distribution, food processing, food marketing & trade, and consumption. To further compound the grim situation, the pandemic and the Russia – Ukraine war also resulted in an increase in food prices while no significant effect was reported for food waste. In response to this dire situation two-thirds of the AU Member States distributed fertilizer to farmers to mitigate the effect of the pandemic and the Russia – Ukraine war.

Overall, about 90% of Member States, governments supplied both seeds and fertilizer to their farmers. Except for some Member States (Burkina Faso, Gambia, Niger, Nigeria, and Togo) in West Africa, most Member States did not introduce new fertilizer policies to combat the effect of COVID-19. Pre-COVID-19, a majority (75%) of Eastern Africa Member States did not supply subsidized fertilizer to farmers. However, following the effects of the pandemic and the Russia-Ukraine crises, countries in Eastern Africa have ramped up input support to farmers. In Kenya for example, the fertilizer prices have been heavily impacted by both the pandemic and the effects of the Russia – Ukraine war. It is in this regard that the newly inaugurated Government led by H.E President Willaim Samoei Ruto has availed USD29.58 million, to subsidize 71,000 Mt (1.42 million x 50 kg bags) of fertilizer, for growing food crops during the 2022 short rain season. The President directed that a maximum of 100 x 50kg bags of fertilizer be availed per farmer at a maximum subsidized price of USD 29 per 50kg bag down from USD 54.

In Tanzania, the Ministry of Finance through the 2022/23 financial year budget speech proposed to zero rate locally manufactured fertilizers for one year and to exempt from VAT raw materials and machinery used in the manufacturing of fertilizers. These actions are part of the Government’s interventions to address the high cost of fertilizer, food insecurity, and the high cost of living in general.

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**Figure 8(b): SSA Imports of Cereals from Russia and Ukraine**
(Source: FAO, 2022)

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4 Prevailing exchange rate is KES 120/USD
Conclusion

Numerous experiences can be drawn from this review of the ISP programmes implemented in Sub-Saharan Africa. Paramount, ISP programmes are not an investment by themselves. The cost of implementing ISP programmes in SSA often tends to surpass the benefits. The rate of returns on ISP programme expenditures is lower than on investments in core public goods. The benefits of the ISP programmes are often eroded by high transaction costs, including transport costs. Irrespective of the aforementioned drawbacks experienced by SSA countries implementing the ISPs, it is worth retorting that the ISPs have been successful in increasing input use, maize production, maize yields and food security, at least under favourable economic and weather conditions. The impacts of ISPs on increasing income, reducing poverty and improving food and nutrition security have been scantily positive.

Compounding the aforementioned detriments of the ISPs is the impact of the Russia – Ukraine war which has made it unaffordable for countries to source inputs like fertilizer due to restricted and disrupted global supply and high prices. The paltry supply of fertilizer in the world markets has resulted in high prices of fertilizer making it uneconomical for countries in SSA to secure adequate quantities for ISPs. The limited quantities of ISP inputs make it quite difficult to target appropriately who the recipients of the inputs should be. The commercial prices of fertilizer in SSA countries from the private sector are also exceedingly high to such an extent that farmers are seeking alternatives like manure. Food production is greatly affected, and the prices of food have also risen astronomically especially in the coastal countries of Africa that are innately net importers of food. The Russia – Ukraine impasse has also dented the continent’s food imports (especially cereal) from both countries and thus gravely affecting food security. Food prices have thus drastically increased especially in countries that are net importers of food.

It is thus essential that Africa heavily invests in the production of its agricultural inputs i.e. fertilizers so that the next generation of ISPs implemented by SSA countries embrace a pragmatic approach aligned to the African Continental Free Trade Area (AfCFTA) in order to sustainably improve agricultural productivity. In the same vein countries in the SSA need to increase food production, this will reduce the exposure to global shocks occasioned by the heavy dependency on imports from the rest of the world.

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About HAPA

Across African countries today, there is a need for better, more timely use of evidence, and more targeted approaches, to improve the quality of policymaking by governments. The Hub for Agriculture Policy Action (HAPA), is a Unit within AGRA that provides policy advisory services to governments seeking to reform, refine, and/or develop a more clearly defined policy direction. The approach recognizes the urgent need for timely policy support to the agriculture sector, which plays an important role in ensuring inclusive growth. It also recognizes the demands for political expediency and the need to ensure that a particular policy direction is anchored in evidence.

The purpose of the Hub for Agriculture Policy Action (HAPA) is to support AGRA to catalyze and sustain an inclusive agricultural transformation in Africa to increase incomes and improve food security of millions of Africans. The creation of HAPA was in response to a noticeable gap in the utilization of evidence within the policy-making cycle to drive policy change. Through Consolidation and Translation (C&T) of evidence, HAPA’s work entails collating existing evidence, expertise and best practice that are relevant to a government request for policy support and processing these into a set of rationalized and costed policy options. Through HAPA, AGRA aims to increase the use of evidence to inform decisions for policymaking and implementation. HAPA works with local partners such as research actors to collate existing data and evidence, expertise, and best practices that respond to a government request for policy support and package these into a set of actionable policy recommendations.

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