



## Transformations in Technology, Transformations in Work

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# IMPROVING AGRICULTURAL LIVELIHOODS THROUGH E-VOUCHERS IN ZAMBIA

*Leveraging technology to streamline and strengthen farm subsidies*

**Felix Mwenge & Gibson Masumbu, The Zambia Institute for Policy Analysis and Research**

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# ZAMBIA



39,586

GDP per person  
employed  
(constant 1990 PPP \$)



44.4

Internet users  
(per 100 people)



82

Mobile cellular  
subscriptions  
(per 100 people)



0.5

Research and development  
expenditure  
(% of GDP)



15

High-technology exports  
(% of manufactured exports)

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## Introduction

The Zambian government has provided agricultural subsidies since the early 2000s in an effort to improve food security, raise the incomes of rural farmers and reduce poverty. The subsidies are intended to enhance smallholders<sup>1</sup> – access to inorganic fertilizer, improved seeds and other modern inputs required to increase crop yields and production. More recently the Zambian government has been testing a new market-based technology that could help the country improve the administration and management of these agricultural subsidies.

*With the e-voucher system problems such as late delivery of agricultural inputs and the presence of ghost beneficiaries associated with the current administration system could soon become a thing of the past.*

Over the next few years the electronic voucher or e-voucher, system will replace the existing system of administering agricultural subsidies under the country's Farmer Input Support Program (FISP). The e-voucher program has already been piloted in 13 districts in the country, reaching about 198,000 farmers during the 2015-16 agricultural season.<sup>1</sup> The successful implementation of the e-voucher across Zambia suggests that problems such as late delivery of agricultural inputs and the presence of ghost beneficiaries associated with the current system could soon become a thing of the past.

<sup>1</sup> According to the Ministry of Agriculture, Zambia, the working definition of smallholders is farmers who cultivate less than five hectares of land. Those who cultivate between 5 to 20 hectares are referred to as emerging farmers.

Under the existing system – the Farmer Input Support Program (FISP) – beneficiaries access inputs through approved farmer cooperatives and other farmer groups.<sup>2</sup> The cooperatives and groups apply to receive subsidies for their members through their local district agricultural committee. They collect beneficiary payments and deposit them into local bank accounts, a pre-requisite for the government to release the inputs.

Private firms, selected through a national tender process, then deliver inputs to the districts. Local transporters distribute the inputs to satellite depots for release to the approved beneficiaries through the same cooperatives and farmer organizations. This process has created a number of intermediaries and loopholes that have diminished the effectiveness of the FISP. The e-voucher system was designed to address the shortcomings of the current system.

This chapter focuses on the new e-voucher system that relies on technology to eliminate intermediaries, limit loopholes and enhance efficiency in the disbursement of agricultural subsidies.

Data from the e-voucher pilot in 13 districts highlights that the new technology successfully engaged more private sector companies, was readily taken-up by farmers and reduced leakages. Yet it also faced several challenges including delays in e-card issuing and activation; a heavy bias toward maize production and thus a lack of crop diversity; a built-in bias benefiting wealthier families, due to a required upfront contribution; due to their ability to provide the upfront contribution required to avail the subsidy; price volatility due to currency fluctuations; and limited farmer knowledge of the benefits of the voucher.

This chapter offers four policy recommendations to overcome these challenges as the program is scaled up. These include promoting crop diversification by way of spreading awareness and flexible rollout of the voucher, addressing leakages through verification by community leaders, reducing price volatility by encouraging domestic input production, and providing training to increase uptake of the e-voucher system among farmers.

## The importance of agriculture in Zambia's economy

Zambia has experienced strong macroeconomic growth in recent years. Its economy grew at an average annual rate of 7.3 percent between 2010 and 2014.<sup>3</sup> However, the country has not been able to reduce poverty commensurate with the increase in its Gross Domestic Product (GDP). More than half of Zambians still live on less than US\$ 1.25 a day.<sup>4</sup> The rural population, which is mostly employed in agriculture, accounts for 77 percent of the poor population, but only 59 percent of its total population.<sup>5</sup>

Agriculture is the fourth largest contributor to Zambia's GDP, accounting for 10.5 percent in

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2010.<sup>6</sup> The sector also accounts for nearly half of the country's total employment and provides livelihoods for more than 85 percent of the rural population.<sup>7</sup> As it is the main economic activity in rural areas, policymakers view the agriculture sector as an important target for poverty reduction. Nonetheless, the sector is plagued by low productivity and slow growth. Agriculture grew at an annual rate of one percent in the decade between 1996 and 2006.<sup>8</sup> The majority of agricultural workers are subsistence farmers who produce just enough for household consumption.

## Historical context and the existing system of agricultural subsidies

Since independence in 1964, agricultural reform has been a priority for successive governments in Zambia. Farmers frequently report that access to agricultural inputs is a key constraint to enhancing their productivity. While commercial

farmers can mobilize resources with relative ease, smallholders are constrained by limited access to credit and high interest rates that make it especially difficult for them to obtain agricultural inputs.

In the late 1990s, overall economic stagnation hit the nation's agricultural sector particularly hard. The Ministry of Agriculture later estimated that less than one-third of smallholder households had access to improved maize seed and just 20 percent of farmers had access to fertilizers.<sup>9</sup>

Following a decade of market liberalization, policymakers realized that small-scale farmer incomes were too low to afford farming inputs.

To improve the situation, the government experimented with providing inorganic fertilizer and hybrid maize seed to smallholder farmers on credit from 1997-98 through 2001-02. But poor credit recovery and concerns about sustainability rendered this approach unsuccessful. Low farmer productivity and increased cases of food insecurity and poverty at the household and national levels persisted. By the early 2000s, poverty had intensified with nearly 78 percent of the rural population classified as poor.<sup>10</sup>

The Zambian government therefore started exploring an alternative support system for direct credit provision. Instead of a credit system managed by the public sector, the government

opted to sell inputs on a direct cost-sharing basis. In 2002, in the midst of a stagnant economy, the government introduced a new cash-based (versus a credit-based) program called the Fertilizer Support Program (FSP). The government conceptualized the FSP to be a step in the transition to a more liberal economy. It aimed to build the capacity of both smallholder farmers and the private sector by increasing maize production and opening up new market opportunities for supply of inputs to rural areas.

***In 2002, in the midst of a stagnant economy, the government introduced a new cash-based (versus a credit-based) program called the Fertilizer Support Program (FSP).***

The FSP, which was implemented through 2008-09 before being renamed to the Farmer Input Support Program (FISP) in 2009-10, supplies a combination of basal and urea fertilizer and a

pack of hybrid maize to farmers. Each beneficiary can receive 200kg of fertilizer and 10kg of hybrid maize seed, enough to cultivate half a hectare of land.<sup>11</sup> Farmers with a larger land size and capacity to grow additional maize or other crops have to source additional inputs through alternative means.

The FISP primarily subsidizes maize production as it is the country's staple food. In 2011, 86 percent of small-scale farmers grew maize and the crop

accounted for 70 percent of the cultivated land in 2014.<sup>12</sup> The government's initial aim was to stabilize the farmers' incomes and then gradually ease them out of the program. But over the years, more farmers have been added to the program than have graduated. The program has expanded

in scale, from about 100,000 farmers in 2002 to covering about a million farmers by 2015.<sup>13</sup> Its budget allocation has increased tenfold, from about ZMW 100 million or US\$ 10 million in 2002 to ZMW 1 billion, or US\$ 100 million in 2016.<sup>ii, 14</sup>

## Challenges with the existing system

How has the FISP fared in improving agricultural productivity and rural livelihoods? Studies show that despite the huge public investment in the program, there has not been a significant reduction in poverty, especially in rural areas.<sup>15</sup> Studies have also found that the FISP may be exacerbating inequality, as subsidized fertilizer is disproportionately allocated to wealthier households.<sup>16</sup>

Although there is evidence of increased maize production and increased incomes due to the existing system, the amount of the increase has been small.<sup>17</sup> The FISP has also been blamed for perpetuating dependence on a single crop at the expense of crop diversification. The lack of

crop diversification and heavy reliance on maize is associated with increased risks through price volatility, climate change and limited supply of inputs for production.

The setup of the FISP limits private sector participation in providing input and output marketing services.<sup>18</sup> Subsidized fertilizer and inputs crowd out higher-priced commercial fertilizer and make it financially unattractive for the private sector to invest in the sector. The FISP is also associated with leakages before the subsidies reach the farmers.

The e-voucher system offers a potential solution to these challenges. Other countries' experiences

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<sup>ii</sup> Currency conversion based on ZMW10/US\$.



with e-voucher programs have produced positive results. For example, in Zimbabwe, a similar e-voucher program contributed to reducing corruption and increasing linkages between retailers, farmers and wholesalers.<sup>19</sup> In Malawi, the technology-based agricultural subsidy

system proved to be an effective way to target the population eligible to receive subsidies.<sup>20</sup> These experiences in other countries underscore the potential for the e-voucher to improve the administration of agricultural subsidies in Zambia.

## How does the new e-voucher technology work?

The government explored the new e-voucher technology as an alternative approach to resolve long-standing concerns about the FISP; including concerns such as beneficiary targeting and selection, delays in inputs distribution, corruption, high administrative and logistical overhead costs, and limited private sector or agro dealer participation.

The e-voucher is a card similar to a debit card, powered by Visa, that farmers can use to purchase subsidized inputs (see **Figure 1**). Each card is linked to farmers' names and National Registration Card (NRC) numbers. The government, through a financial institution, usually a bank, loads money onto the card. The amount loaded on the card is equal to the per beneficiary subsidy contribution for a particular year. Registered beneficiaries also have to deposit a personal contribution, which

would be on top of the subsidy amount, into the same bank which loads the additional amount onto the card. The card is then activated and issued to the farmer to acquire inputs at a local agro dealer at her/his convenience.

In the 2015-16 farming season, the government subsidized farm inputs up to 80 percent of the total cost, the equivalent of approximately US\$ 170.<sup>iii</sup> To this amount, beneficiaries were required to add another US\$ 40 as an upfront personal contribution, bringing the total value loaded on the card to US\$ 210 to be used for the entire farming season.

Registration of beneficiaries starts at the village level where small-scale but "viable farmers" are identified. The FISP defines "viable farmers" as those farmers who demonstrate commercial

<sup>iii</sup> Information obtained from the Zambia National Farmers Union officials who are helping government implement the e-voucher program. The exchange rate used is ZMW10/US\$.

sense in their farming activities or those who run their farming activities for business purposes rather than for subsistence. Once the FISP prepares a list of viable farmers, they send it to the District Office where a register of beneficiaries is produced. The register is then sent to the Ministry of Agriculture in the capital, Lusaka. The Ministry of Agriculture provides the register to a bank, or multiple banks, and authorizes them to produce cards for each beneficiary on the register to load the pre-determined amount of money. Once the cards are ready, the Ministry of Agriculture sends them to the district offices who in turn distribute them to local registered farmers. In order for the farmers to use the cards, they have to deposit their personal contribution at the bank to have it loaded on the card. The bank activates the card, after which it is ready for use by the beneficiaries.

The Ministry of Agriculture shortlists agro dealers who meet the minimum requirements for supplying inputs to farmers in various localities through a tender process. Minimum requirements include certification from regulatory bodies such as the Zambia Bureau of Standards, the Zambia Environmental Management Agency and the Zambia Public Procurement Authority. The government expects agro dealers or their agents to be present in localities where the farmers are found and have a range of agricultural and livestock inputs such as day-old chicks, livestock feed, drugs, chemicals, seed and fertilizers to be shortlisted. Additionally, all agro dealers should have and operate Visa Point-of-Sale facilities without which farmers would not be able to complete the transaction.

Figure 1

### Sample of the E-voucher visa card



Source: Zambia National Farmers Union (ZNFU).

## How is technology improving the disbursement of subsidies in Zambia?

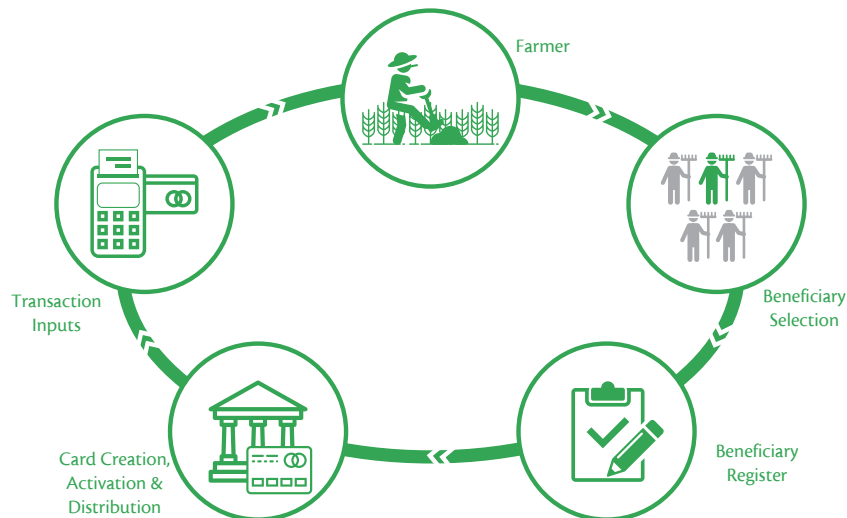
Although the e-voucher system has only been active for less than a year with limited geographic coverage, its design offers several improvements over the FISP system in Zambia.

First, payments for supplies have improved and are now made in real time. Once the farmer purchases inputs using her/his e-voucher at the agro dealer, the money is immediately transferred into the agro dealer's account at the bank. In the past, agro dealers would need to wait for a considerable period of time after supplying inputs for the government to make the payment. Second, farmers are required to be physically

present with their identity documents and have their photos taken as part of farmer profiling at the time of e-voucher collection. This aspect alone has eliminated ghost beneficiaries. Only those who have registered in advance and have been verified are permitted to collect the cards.

In contrast, under the old FISP system, inputs were issued even in the name of those who did not qualify or had already passed away. In one of the districts where the e-voucher technology has been implemented, only 13,000 out of a total of 23,000 beneficiaries that had initially been registered were confirmed as eligible to

Figure 2  
**How the E-voucher system works**



Source: Zambia National Farmers Union (ZNFU).

receive inputs, highlighting the more extensive verification process.<sup>iv</sup> The rest were either deceased or under-age children, and many had duplicate names or simply could not be identified.

Third, under the new e-voucher system, beneficiaries as well as agro-dealers can produce online weekly, monthly or quarterly transaction reports, making it easy to monitor subsidy-related activities. This is rich information that can be used for various purposes such as monitoring the frequency of input purchases by geographic location, timeliness with which inputs become available at various points of sale, and the mix of inputs obtained in each district. Similarly, it is much easier to obtain corresponding bank statements whenever necessary. In the absence of an electronic system, obtaining such information is a tedious and drawn-out process.

Fourth, the e-voucher system is more cost-effective for the government as they do not have to incur transportation costs. Agro dealers also have the responsibility of delivering inputs to localities under the new system. Since they face

competition from other agro-dealers in providing inputs to various localities, they try reducing costs to attract farmers. The government no longer has to bear the cost of transportation as is the case under FISP where the government not only has to contract inputs suppliers but also transporters.

Fifth, the e-voucher system shifts decision-making power to farmers with respect to the type of farming activities they engage in rather than incentivizing them to produce maize by subsidizing maize production and fertilizers only.

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This, in theory, should help promote agricultural diversification. The money loaded on the card can be used to purchase a range of inputs from seeds to chemicals. Nevertheless, the diversification benefit of e-vouchers has not been realized yet – a point

that the chapter will elaborate on in the next section.

The e-voucher system is being introduced to improve the way agricultural subsidies are administered and disbursed. The new system is expected to be rolled out to more than 75 districts in the country over the next few years.

<sup>iv</sup> This information is obtained from field officers from the Zambia National Farmers Union who monitor the e-voucher operations on behalf of the Government.

## Results from the e-voucher pilot

Data from the e-voucher pilot from 13 districts highlight how the new system administered subsidies in the 2015-16 season.<sup>v</sup> Although the new technology had significant benefits, the pilot identified some limitations that should be addressed as the technology is scaled up.

The e-voucher system, its greater efficiency and ease of use, increased private sector and farmer participation in the agricultural sector. During the season, 230 new agro-dealers registered with the government as a result of the e-voucher. From the perspective of the farmers, uptake was high. About 90 percent of beneficiaries who received e-voucher cards had activated them by February 2016.<sup>vi,21</sup>

The new system reduced leakages but still led to some wealthier beneficiaries getting more subsidies than poorer ones. Due to the in-person collection requirements and security measures, the system managed to decrease leakages. The Ministry of Agriculture estimated that more than

20,000 ghost beneficiaries were eliminated from the list of those eligible to receive subsidies.<sup>22</sup> However, since farmers had to load a personal contribution, or down payment, onto the card in order to activate it, the system disproportionately favored richer households with the means to make this payment. Further, since they had the means to make multiple down payments, richer families often had more than one beneficiary.

About 24 percent of households interviewed in the baseline survey conducted by the Ministry of Agriculture reported having two or more beneficiaries.

The new system did not lead to significant crop diversification away from maize, which was a key goal. About 85 percent of households redeemed their e-cards for maize seed and fertilizer. Of the remaining 15 percent, the highest share of households redeemed livestock inputs such as veterinary drugs. Data also show that almost half of households redeemed their vouchers on one type of input, 41.5 percent bought two types of inputs and a small share

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<sup>v</sup> The Ministry of Agriculture, together with the IAPRI, monitored the implementation of the e-voucher pilot program. The monitoring exercise includes interviews with government officials, focus group discussions with smallholder farmers to collect data on initial e-voucher use in May 2016 and interviews with cooperatives.

<sup>vi</sup> The Ministry of Agriculture reported that 198,004 e-voucher cards were activated out of 219,891 cards by February 2016.

(9.5 percent) bought three or more inputs. This highlights that they intend to produce a single crop, which was most commonly maize.

Beyond beneficiaries' purchasing patterns, the timing of the e-voucher rollout was also biased toward maize production. The start and end period for redemption of the voucher coincided with maize production season. There may therefore be more variation as time goes by when farmers purchase inputs in different seasons, but this remains to be seen.

Price volatility limited the effectiveness of the system, and the government had to provide additional funds to counter rising input prices. Between the time the card was distributed, loaded, and then utilized, rising fertilizer prices and a depreciating Zambian Kwacha made it unaffordable for farmers to purchase a sufficient amount of inputs. The government ultimately provided additional funds to counter the volatility, increasing the value of the voucher from 1,400 to 2,100 Kwacha, inclusive of the farmer's contribution of 400 Kwacha.

Figure 3

### Pilot districts for E-voucher program in Zambia



Source: Ministry of Agriculture, Zambia.

The e-voucher pilot faced operational challenges such as limited awareness of the voucher's benefits and slow issuing and activation of e-cards. Although about 90 percent of interviewed farmers reported being aware of the e-voucher system, not all of them were familiar with its specific provisions. From the supply side, about half of beneficiaries had experienced difficulties in redeeming their inputs due to delays in the issuing and activation of cards by the government. These delays originated because

district personnel had not submitted beneficiary names to the central agency in Lusaka. In addition to delays in issuing cards, lags in activation also posed a challenge. About 92 percent of interviewed farmers said they perceived delayed card activation as a major problem. Forty-six percent did not know whether or not their card had been activated. Card activation was also delayed by incorrect beneficiary information on the cards.

## The way forward: Expanding the e-voucher system in Zambia

As the Zambian government implements the e-voucher program beyond the 13 pilot districts to the rest of the country, policymakers should take into account lessons from the pilot, other countries' experiences in using e-vouchers in agriculture and Zambia's economic landscape.

### ***1. Promote crop diversification through increased awareness and flexibility in the timing of e-voucher rollouts.***

The persistence of maize-farming by many farmers despite the e-voucher providing for other crops and livestock inputs reflects Zambia's past agriculture policy, which has always been

biased towards maize. Various stakeholders, including the government, have been advocating to move away from growing maize as the sole crop. Dependence on maize affects agriculture productivity. Unlike other crops such as cotton, tobacco and soy beans, maize is a low value-added crop.

In order for the e-voucher to be successful in promoting a diverse agriculture sector, the Ministry should build in flexibility in the timing of the e-voucher rollout policy, and policy makers should spread awareness among farmers on the benefits of diversification and higher earning

potential from other crops. If the provision of the subsidy does not coincide with the beginning of the maize production season, farmers will have more options with respect to what to produce. The Ministry of Agriculture can conduct campaigns to educate farmers on these benefits through agriculture extension officers who are situated in every district.

## **2. Designate community leaders to verify beneficiaries for improved targeting.**

The problem of targeting relatively wealthier beneficiaries was not fully resolved with the e-voucher. The Ministry of Agriculture can draw lessons from other poverty reduction programs in Zambia such as the Social Cash Transfer Scheme, which has well-defined eligibility criteria.<sup>vii</sup> The selection process of beneficiaries under the Cash Transfer Scheme also involves community leaders who can verify the eligibility of households and beneficiaries per household who are eligible for benefits under the scheme. This approach can be used under the e-voucher system.

<sup>vii</sup> The conditions that households must meet to be eligible for the cash transfer scheme include a female-headed household keeping orphans; a household with a disabled member; or an elderly-headed household (over 60 years old) keeping orphans. There is also the category of a special case which is for cases that are critical, but do not qualify under the other categories; for example, a household of two elderly people who are unable to look after themselves.

## **3. Encourage domestic production of farm inputs, regularly reassess the subsidy amount, and designate contingency funds to protect against uncertainty.**

Price volatility, especially with respect to fertilizer, affects the ability of the farmer to buy inputs. The depreciation of the Zambian Kwacha in December 2015 put inflationary pressure on a number of goods and services in the economy, especially imported goods. As most of the fertilizer and many inputs are imported, price and currency volatility will continue to affect the operations of the e-voucher in the future. As a longer term solution, the government should encourage domestic production of farm inputs in order to reduce dependence on imported inputs and lower its exposure to currency fluctuations. As a medium-term solution, the Ministry of Agriculture should regularly reassess the subsidy amount by taking into account inflation and economic trends. As a more immediate solution, the government should set aside a contingency fund to factor in any price or currency fluctuations.

***Flexibility in when the e-voucher is rolled out, and more information on the higher earning potential of other crops will help promote diversity in agriculture.***



**4. Provide training to increase farmer awareness of the provisions of the e-voucher and foster familiarity with the technology.**

The low levels of knowledge on the specific provisions of the e-voucher among farmers also reflect low levels of general technological adoption and poor schooling. Many farmers lack the basic education needed to understand and use new technologies such as the e-voucher. Policymakers should implement non-formal education programs designed specifically for farmers. These programs should educate them on how to use new technologies such as the e-voucher. Communities can implement such programs at the local level to ensure that they are acquainted with the benefits of the technology before it is scaled up.

***As a longer term solution, the government should encourage domestic production of farm inputs in order to reduce dependence on imported inputs and lower its exposure to currency fluctuations.***

The above policy recommendations will help promote crop diversification, address leakages, reduce volatility and increase awareness with respect to the e-voucher. Other challenges such as delays in issuing and activating the e-voucher cards by the government will likely improve as implementers become more familiar with the system and processes.

Despite the current challenges in the e-voucher system in Zambia, it is a much improved method of delivering agricultural subsidies for the purchase of farm inputs. In time, this technology based intervention offers the potential to deliver greater efficiency in farming and better incomes for farmers toward improving food security and decreasing poverty in Zambia.

## Endnotes

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# JustJobs

WORKING FOR SHARED PROSPERITY

JustJobs Network is a private, nonpartisan organization finding evidence-based solutions to one of the most pressing challenges of our time: How to create more and better jobs worldwide. We produce empirical research on good job creation, focusing our work on the critical knowledge gaps in the global employment landscape.

JustJobs convenes a global network of diverse stakeholders—including policy shapers, academics, and grassroots leaders — to deepen the practical implications of our research endeavors and amplify their impact. Through the combination of cutting-edge research and global knowledge sharing, we aim to forge a fresh, dynamic channel for policy dialogue on employment at national, regional and international levels. Our team members are based in New Delhi and Washington, D.C.

**For more information visit**  
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