



ANALYSIS

Digitising payments in agricultural value chains: The revenue opportunity to 2025

January 2020



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Introduction



This report is aimed at mobile money providers, which have the opportunity to drive growth in rural areas in developing countries by digitising agricultural payments. Two types of payments are ripe for digitisation: procurement payments from agribusinesses to smallholder farmers in formal value chains and subsidies paid out by governments to smallholder farmers. Both offer mobile money providers an entry point to digitise agricultural payments and enhance financial inclusion for smallholder farmers.



Using proprietary methodology, this report looks at the growing opportunity to digitise business-to-person (B2P) payments (typically between agribusinesses and farmers) and government-to-person (G2P) payments (typically between governments and farmers) in agriculture in 72 developing countries. The revenue opportunity for mobile money providers from digital B2P payments is expected to increase from \$2.4 billion in 2021 to \$3.2 billion in 2025, while the revenue opportunity for digitising G2P payments is expected to rise from \$152 million in 2021 to \$210 million in 2025.



Digitisation can reduce transactional costs and make agricultural value chains more efficient, safe and transparent. This report examines the opportunity to digitise agricultural payments and lays out the foundational elements that must be in place for mobile money providers to realise this opportunity. Prerequisites for digitisation include an enabling regulatory environment, the availability of active and liquid agents in rural areas and the presence of agribusinesses and government bodies willing and able to deploy digital tools. While initiatives to digitise B2P payments are beginning to emerge, there are much fewer examples of digital G2P schemes. This report highlights the challenges that have constrained the growth of digital G2P payments.

Despite progress in financial inclusion, smallholder farmers are still more likely to be financially excluded

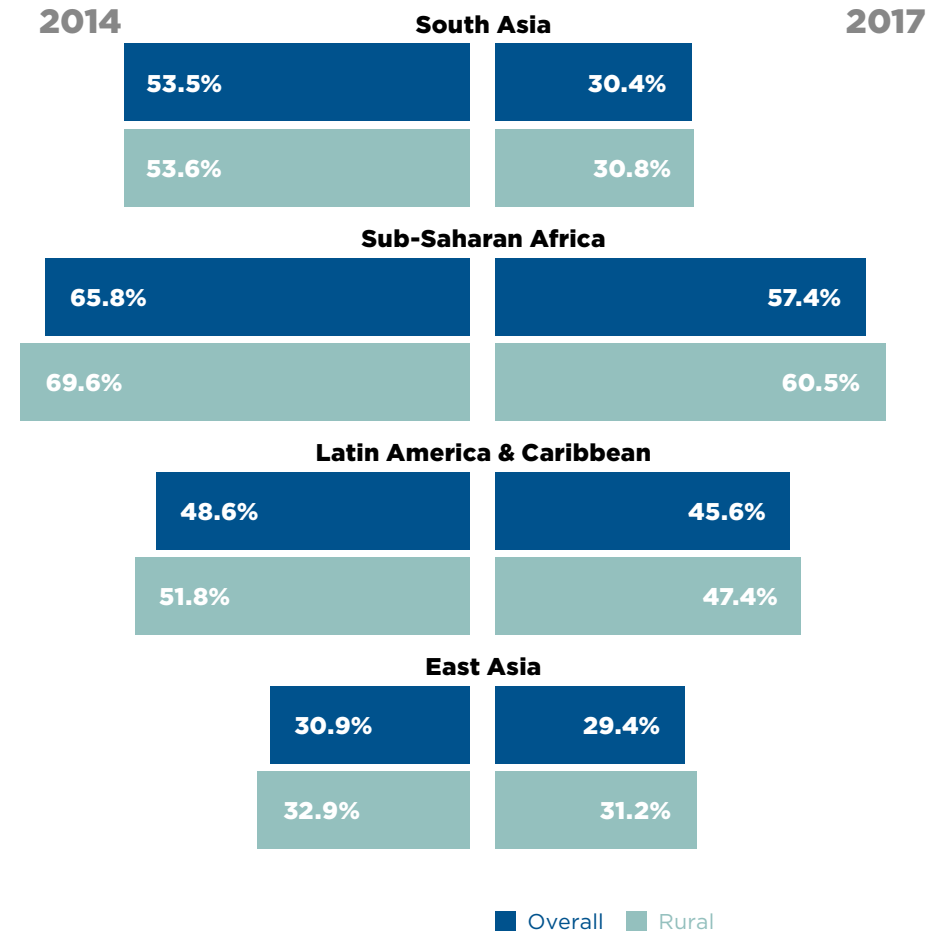
Agriculture contributes between 10 per cent and 35 per cent of GDP in developing countries, where around three-quarters of the world's agricultural value is generated.

There are 450 to 500 million smallholder farmer households worldwide, comprising around 50 per cent of the labour force in developing countries. Smallholder farmers are responsible for 80 per cent of food consumed in much of Sub-Saharan Africa and South Asia.¹

In commercial value chains, agribusinesses and cooperatives buy crops from smallholder farmers, relying heavily on cash payments for procurement. Although some digital subsidy schemes have emerged, governments tend to distribute subsidies through traditional mechanisms, such as vouchers for fertiliser or seed.

Although cash transactions are waning, there is still a wide financial access gap in rural areas in developing regions.² Most smallholders who live in rural areas are still likely to be unbanked or have limited access to formal financial services.

Figure 1 Percentage of financially excluded adults (age 15 and over)³



1 IFAD, (2013). *Smallholders, food security, and the environment*.
 2 Low- and middle-income countries, where about 50 per cent of the population live
 3 World Bank (2018). *2017 Global Findex Database*.

Mobile money providers can benefit from digitising agricultural payments in developing countries

With 290 live mobile money services in 95 countries (as of December 2019), there is an opportunity for mobile money providers to digitise payments to farmers in the last mile⁴ of agricultural value chains, as well as government subsidy payments to farmers. The benefits for mobile money providers and mobile network operators (MNOs) can be both direct and indirect:

Direct benefits of digitisation

Revenue from payment transaction fees

New mobile money customers in rural areas

New mobile network service users

Increased loyalty or stickiness of existing users

Licences for payment platforms and management systems

Indirect benefits of digitisation

Higher use among existing mobile money users

Mobile money ecosystem use by new customers

Increased network use (SMS, calls, data)

Increased agent activity – ecosystem development

Uptake of adjacent products (loans and insurance)

⁴ In agricultural value chains, the "last mile" is the web of relationships and transactions between buyers of crops, such as agribusinesses, cooperatives and middlemen, and the farmers who produce and sell them.

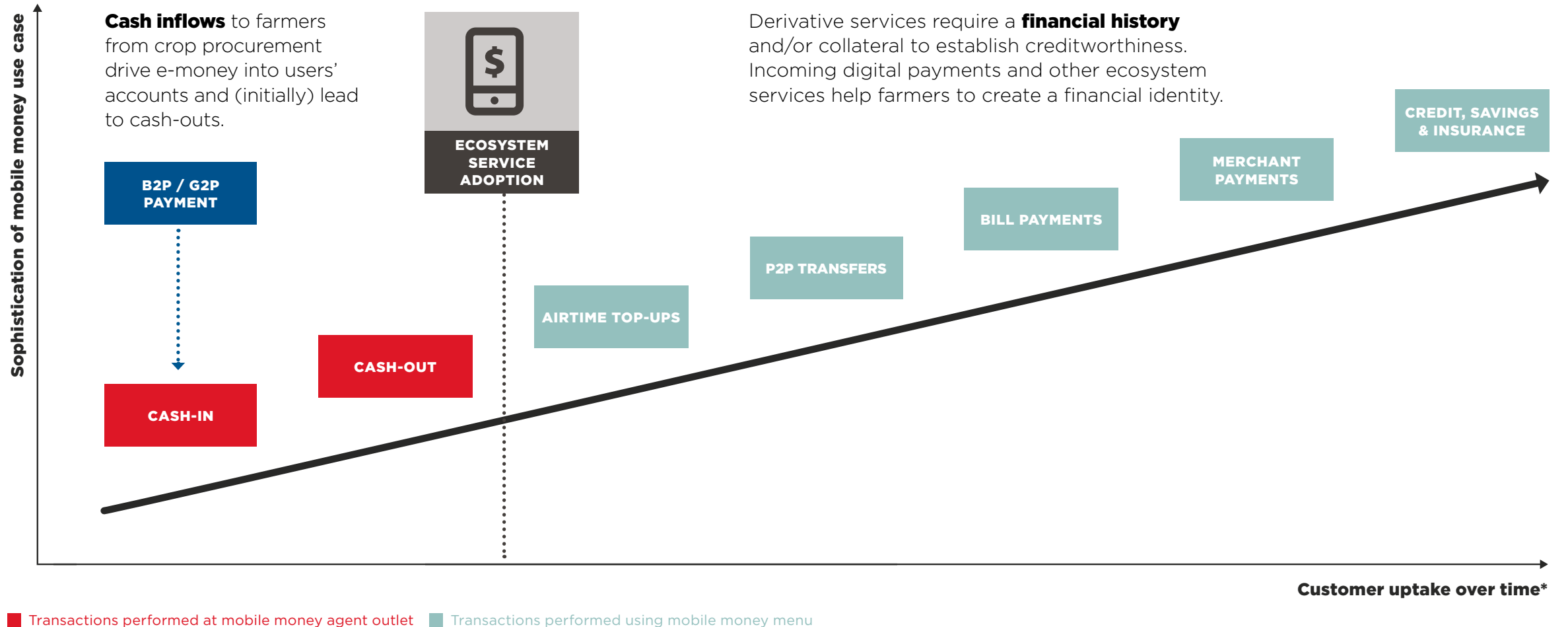
Digital payments in the agricultural last mile benefit farmers and other agricultural actors

Figure 2 **Benefits of digitisation for farmers and other agricultural actors**

	END USERS			SOLUTION PROVIDERS	
<p>Increased financial inclusion: Farmers will have greater access to formal financial services through mobile money and other financial service provider (FSPs),⁵ and will be able to build up a financial footprint and history.</p>	●				
<p>Time and cost savings: Farmers will receive payments faster and at a lower cost. Digital payments are also more secure, allowing multiple real-time transfers to farmers in different locations.</p>	●	●	●	●	●
<p>Efficient cash management: Mobile money keeps farmers' cash secure and could deter them from spending cash as they receive it.</p>	●				
<p>Accountability and transparency: Mobile money can minimise the risks of using cash, such as theft and fraud, while enabling low-cost, transparent and traceable transactions with smallholder farmers.</p>	●	●	●	●	
<p>Wider access to the financial ecosystem: Digital payments open access to use cases such as bill and merchant payments, and other financial services, such as credit and microinsurance.</p>	●	●			●
<p>Economic identity and credit scoring: Mobile money account data, together with agricultural and non-agricultural data, can be used to create a farmer economic identity. AgriTechs can either perform credit scoring for FSPs or share data with FSPs for the latter to generate farmer credit scores.</p>	●	●	●	●	●
<p>Tailored service targeting: Digital payments can offer insight into farmers' production trends, allowing agritechs and agribusinesses to offer additional tailored services.</p>	●	●		●	
	FARMERS	AGRIBUSINESSES	GOVERNMENTS	AGRITECHS	RURAL FSPs

Digitising payments to farmers through mobile money is an entry point to financial inclusion

Figure 3 The pathway to financial inclusion⁶



⁶ Tricarico, D., (2018). Prerequisites to digitising the agricultural last mile.

* Complex use cases may take time to become established. Complexity is defined as requiring the active participation of ecosystem actors. For example, P2P transfers are more complex than airtime top-ups as they involve transfers between two active mobile money users.

Focus countries: value chains in Sub-Saharan Africa, South and East Asia, Latin America & Caribbean

This report focuses on countries with an agricultural value-add (percentage of GDP) greater than 10 per cent in 2017 (source: World Bank). Mexico, Peru and Sri Lanka are exceptions and have been included to show the potential of digitising payments in the agricultural value chain.

Key

Countries with a lighter shade either do not yet have mobile money or do not have an enabling regulatory environment.⁷

LATIN AMERICA & CARIBBEAN
15 COUNTRIES

- | | |
|-------------|-----------|
| Argentina | Guyana |
| Belize | Haiti |
| Bolivia | Honduras |
| Colombia | Mexico |
| Dominica | Nicaragua |
| Ecuador | Paraguay |
| El Salvador | Peru |
| Guatemala | |

SOUTH ASIA
7 COUNTRIES

- Afghanistan
- Bangladesh
- Bhutan
- India
- Nepal
- Pakistan
- Sri Lanka

EAST ASIA
12 COUNTRIES

- Cambodia
- Indonesia
- Laos
- Malaysia
- Mongolia
- Myanmar
- North Korea
- Papua New Guinea
- Philippines
- Thailand
- Timor-Leste
- Vietnam

SUB-SAHARAN AFRICA 38 COUNTRIES

- | | | | | |
|--------------------------|---------------|---------------|---------------------|-----------|
| Angola | Chad | Guinea | Niger | Sudan |
| Benin | Comoros | Guinea-Bissau | Nigeria | Swaziland |
| Burkina Faso | Côte d'Ivoire | Kenya | Rwanda | Tanzania |
| Burundi | DRC | Liberia | São Tomé & Príncipe | Togo |
| Cape Verde | Eritrea | Madagascar | Senegal | Uganda |
| Cameroon | Ethiopia | Malawi | Sierra Leone | Zambia |
| Central African Republic | Gambia | Mali | Somalia | Zimbabwe |
| | Ghana | Mauritania | | |

Formal value chains have the greatest potential to digitise business-to-person payments

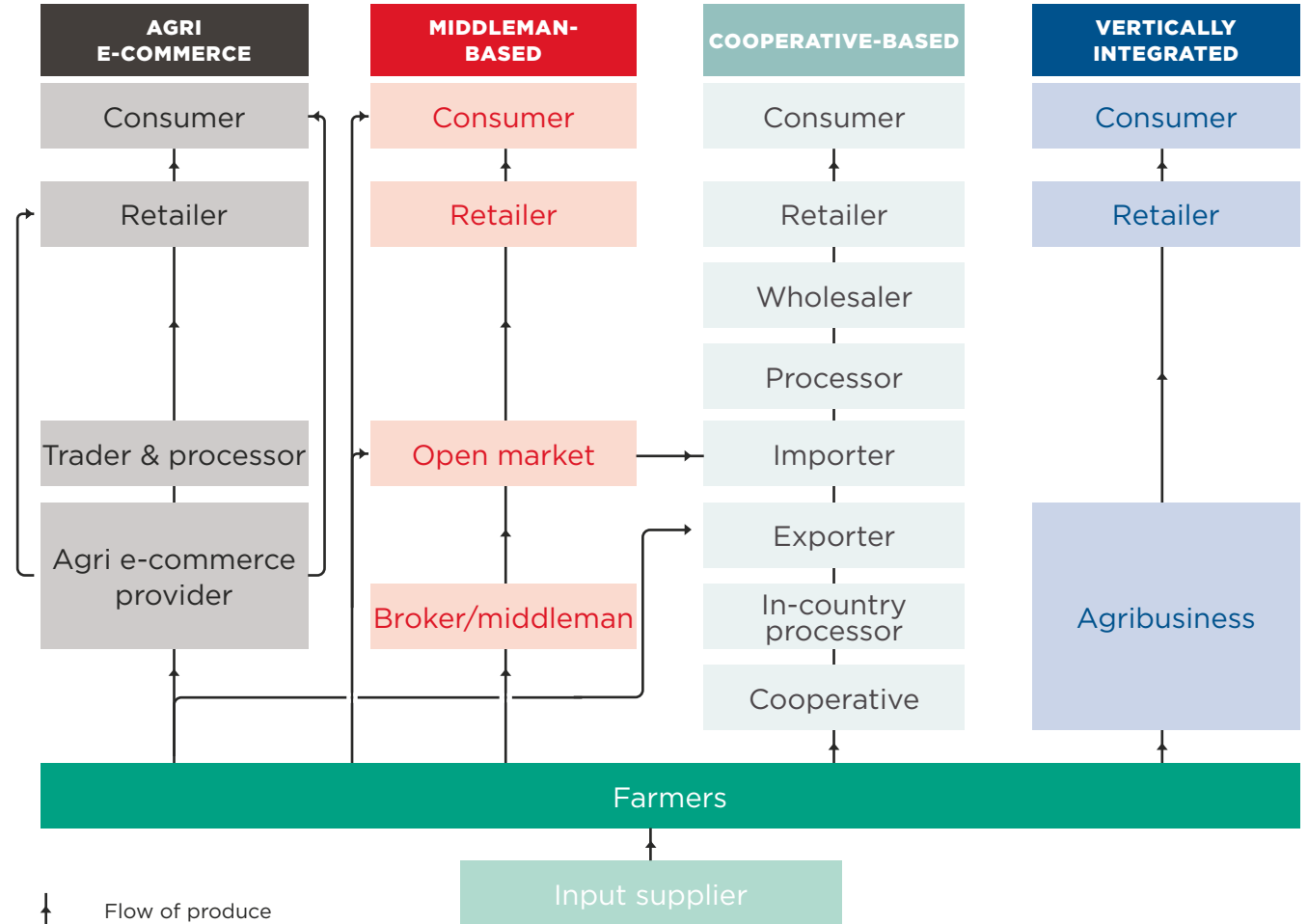
In agricultural value chains, a variety of steps and actors are involved in moving an agricultural product from a farm to the end consumer. The agricultural last mile is the web of relationships and transactions between crop buyers and farmers who produce and sell their crops. The last mile is where global markets connect with rural economies, before transformation and value addition processes take place.⁸

Value chains have varying degrees of formality depending on the involvement of formal buyers, who aggregate and buy crops from farmers. As opposed to informal, middleman-based value chains that are characterised by a high degree of fragmentation, in the last mile, formal value chains are structured around agribusinesses and cooperatives that are responsible for crop procurement and aggregation.

Alongside traditional value chains, agri e-commerce solutions are emerging as entirely new structures that are establishing formal relationships between buyers and sellers of crops through digital tools. Increasingly, agri e-commerce providers are developing procurement relationships with farmers to become crop aggregators.

Formal value chains and agri e-commerce represent ideal entry points for mobile money providers to digitise procurement payments, as they provide strong incentives for buyers to increase transparency, quality and predictability of supply.⁹

Figure 4 **Types of agricultural value chains¹⁰**



8, 9 Tricarico, D., (2018). Prerequisites to digitising the agricultural last mile.

10 Joiner, J. & Okeleke, K., (2019). E-commerce in agriculture: new business models for smallholders' inclusion into the formal economy.

Formal value chains offer attractive transactional volume economics, predictable B2P payment streams and fewer actors

In addition to providing a suitable entry point for digitising agricultural payments in the last mile, there are several other reasons why mobile money providers may find formal value chains better suited to digitisation:



Digitising payments for large buyers can provide the transactional volumes necessary to support a sustainable cash-in/cash-out agent network



Payment streams and transaction frequencies are more predictable (for example, the dairy value chain, involving regular, small ticket-size payments to dairy farmers, is well suited to digitisation)

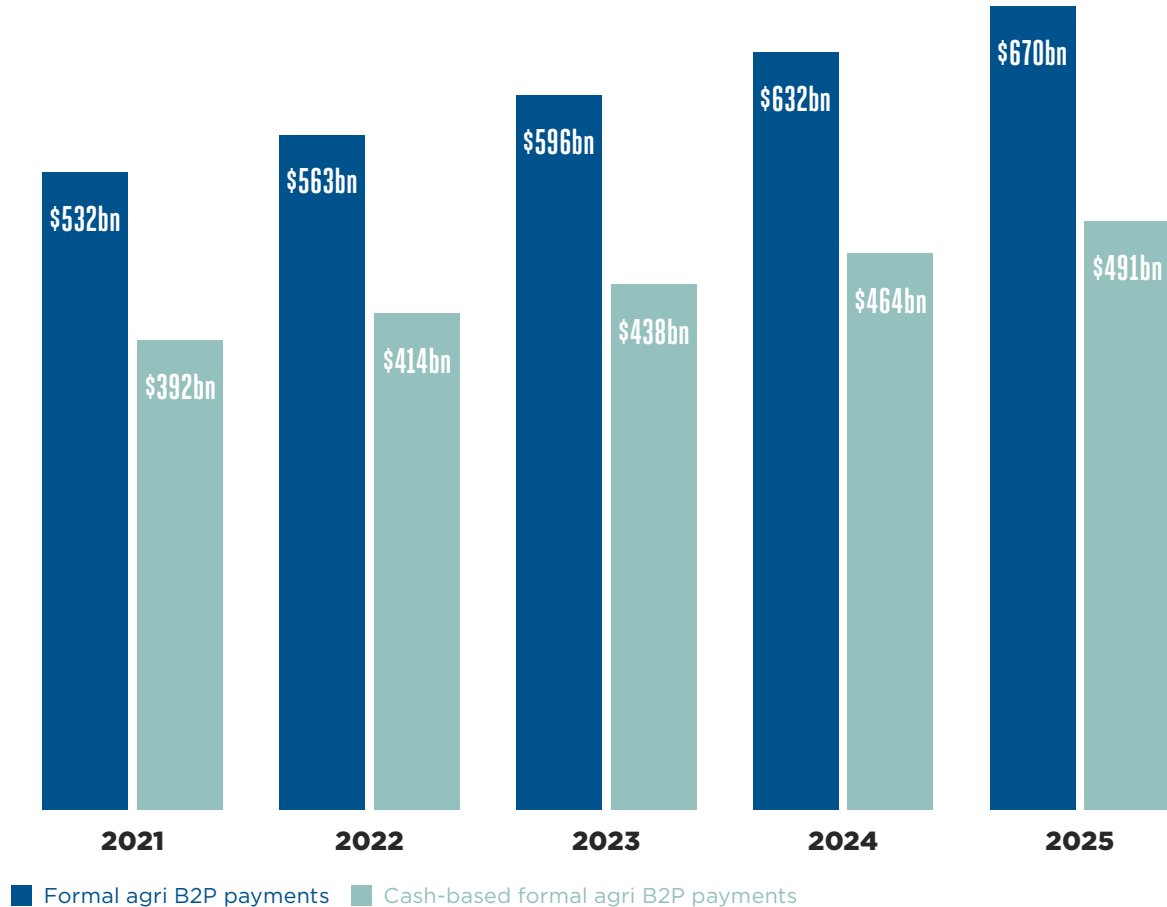


Fewer actors and institutional players make client engagement less complex than in more fragmented informal value chains. Agribusinesses buying from farmers also have an incentive to reduce cash handling and improve transparency.

By 2025, up to \$491bn in formal agricultural B2P cash payments will be available for digitisation

The total value of formal agricultural B2P payments across agriculture-dependent economies¹¹ is estimated to grow from \$532 billion in 2021 to up to \$670 billion by 2025. Of these transactions, the total value of cash-based B2P payments available for digitisation is estimated at \$392 billion in 2021 and is expected to grow to around \$491 billion in 2025.

Figure 5 **Global value of formal agricultural B2P transactions available for digitisation**



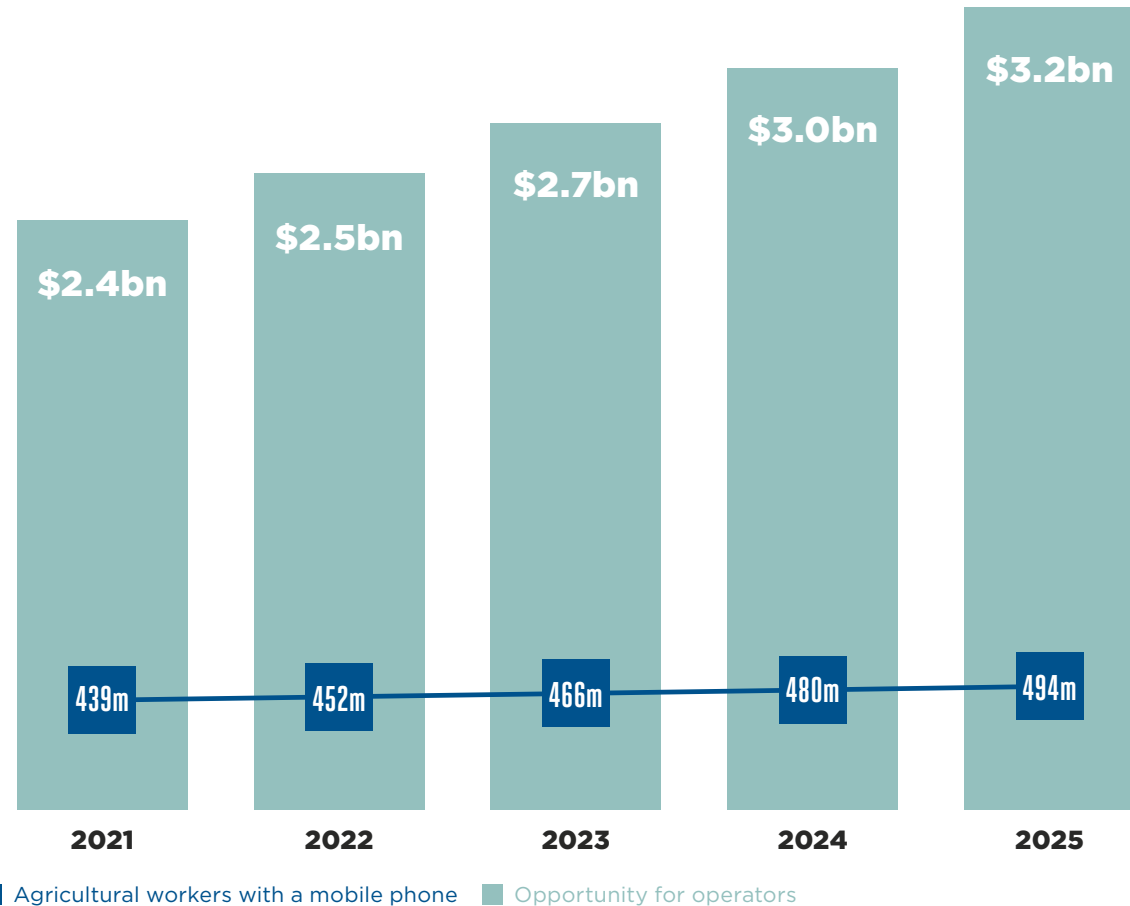
Source: GSMA AgriTech Programme

11 Defined as countries where agriculture's share of GDP is 10 per cent or more.

The potential mobile money revenue opportunity for B2P agricultural payments will rise to \$3.2bn by 2025

Mobile money providers stand to capture up to \$3.2 billion in total direct annual revenue by 2025 through digitising B2P payments in the agricultural last mile.¹² To realise this opportunity, mobile money providers will need to be operating in an enabling regulatory environment and have the necessary assets in place, such as sufficient numbers of agents and available liquidity in rural areas.

Figure 6 **Potential direct revenue opportunity and potential addressable market¹³**



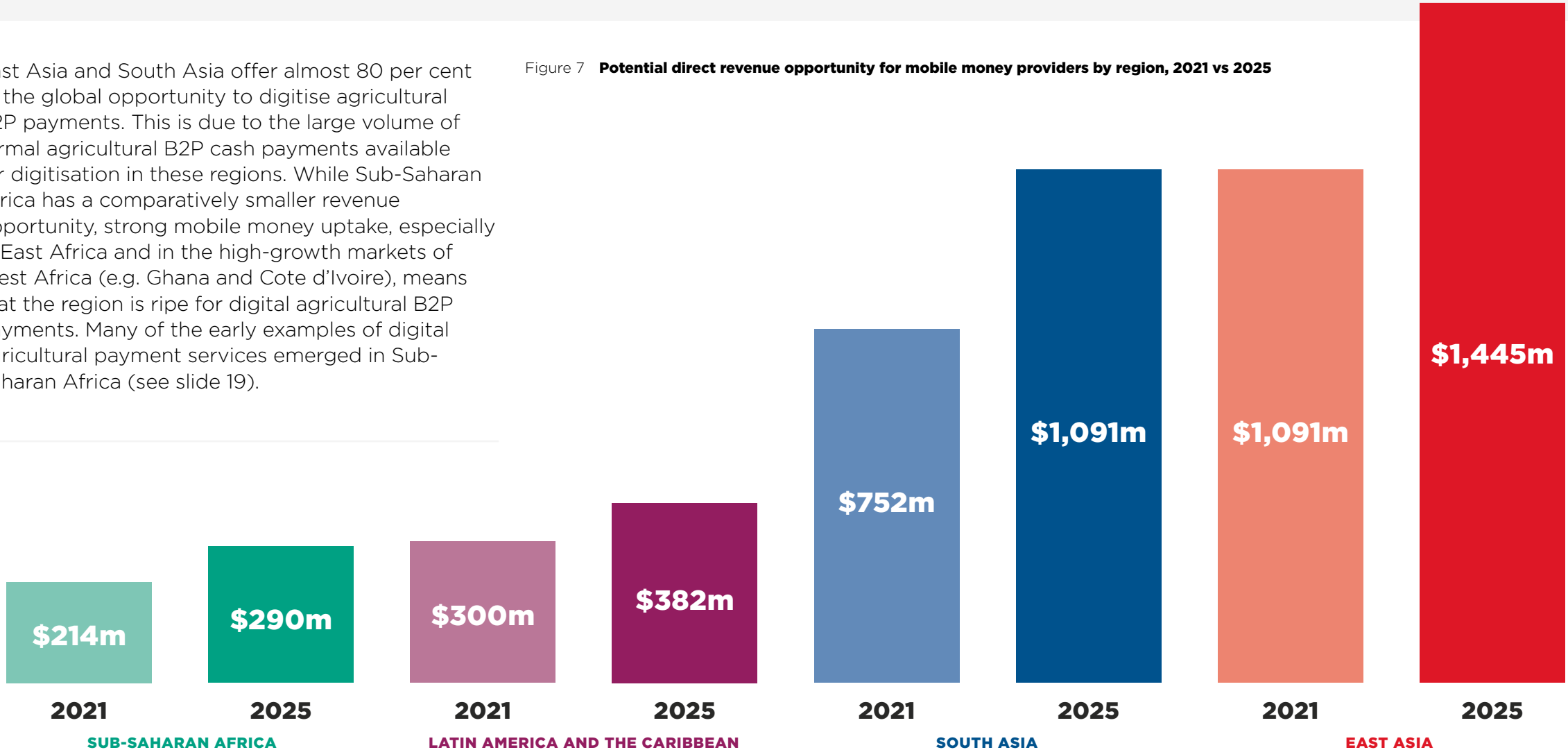
¹² Across Sub-Saharan Africa, South Asia, East Asia & Pacific, Latin America & the Caribbean

¹³ GSMA AgriTech Programme

The opportunity is concentrated in Asia but high availability of mobile money means that Sub-Saharan Africa is ripe for digitisation

East Asia and South Asia offer almost 80 per cent of the global opportunity to digitise agricultural B2P payments. This is due to the large volume of formal agricultural B2P cash payments available for digitisation in these regions. While Sub-Saharan Africa has a comparatively smaller revenue opportunity, strong mobile money uptake, especially in East Africa and in the high-growth markets of West Africa (e.g. Ghana and Cote d'Ivoire), means that the region is ripe for digital agricultural B2P payments. Many of the early examples of digital agricultural payment services emerged in Sub-Saharan Africa (see slide 19).

Figure 7 **Potential direct revenue opportunity for mobile money providers by region, 2021 vs 2025**



Source: GSMA AgriTech Programme

Several elements must be in place to capture the agricultural B2P revenue opportunity

To achieve this revenue potential, mobile money providers should operate in an enabling regulatory environment that allows agriculture-specific mobile money use cases and should also be able to:¹⁴



Offer bulk payments and real-time payment tools for agribusinesses to pay farmers, and enable agritechs to integrate real-time payments as part of a holistic digital agricultural tool



Ensure adequate mobile network coverage in target rural regions



Ensure adequate user education on the benefits of digital payments and the use of mobile money



Implement a suitable market entry strategy around value chain selection and a business model to drive uptake



Ensure that agents are trained to educate and support new mobile money users



Establish a cash-in/cash-out agent network, supported by training and incentivising strategies for agents

In West Africa, Côte d'Ivoire and Mali have almost 30 per cent of the revenue opportunity



Selected value chains suited to digitisation in West Africa



Figure 8 Potential direct revenue opportunity and potential addressable market in West Africa¹⁵

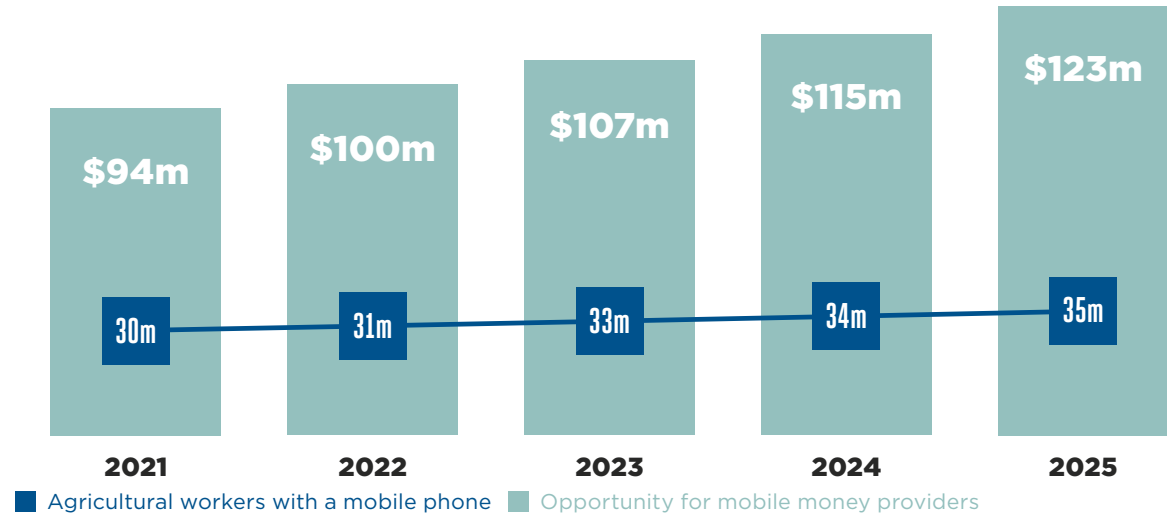
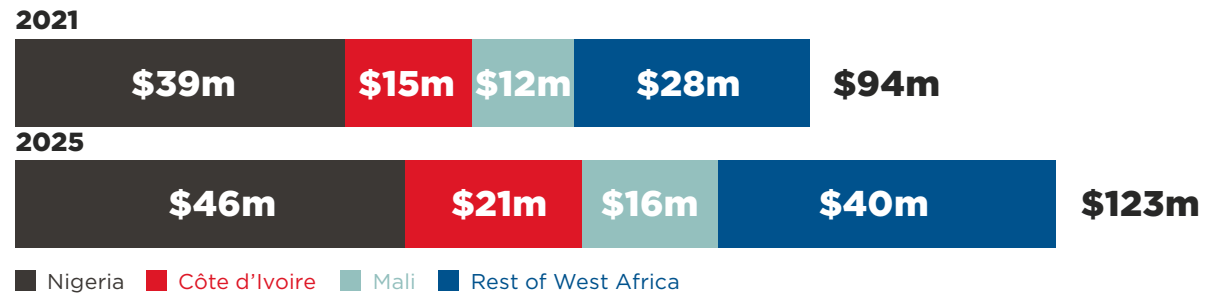


Figure 9 Potential direct revenue opportunity by major markets in West Africa (USD)



Source: GSMA AgriTech Programme

¹⁵ Comprises: Benin, Burkina Faso, Cape Verde, Cote d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Sao Tome & Principe, Senegal, Sierra Leone and Togo.

In East Africa, high mobile money use means that Kenya and Rwanda offer imminent opportunities for digitisation



Selected value chains suited to digitisation in East Africa



Figure 10 **Potential direct revenue opportunity and potential addressable market in East Africa¹⁶**

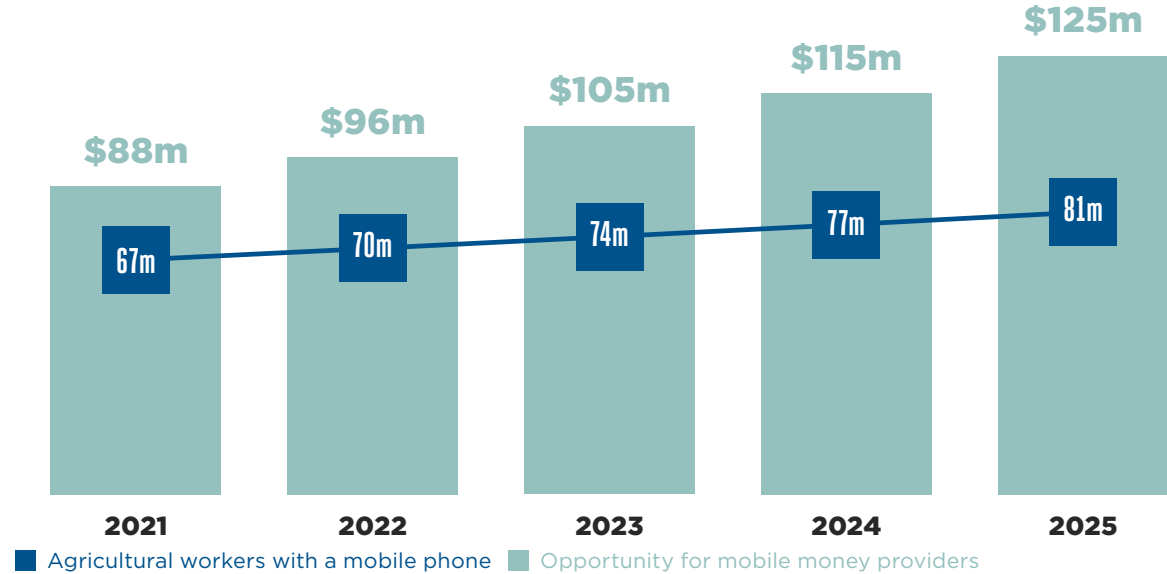
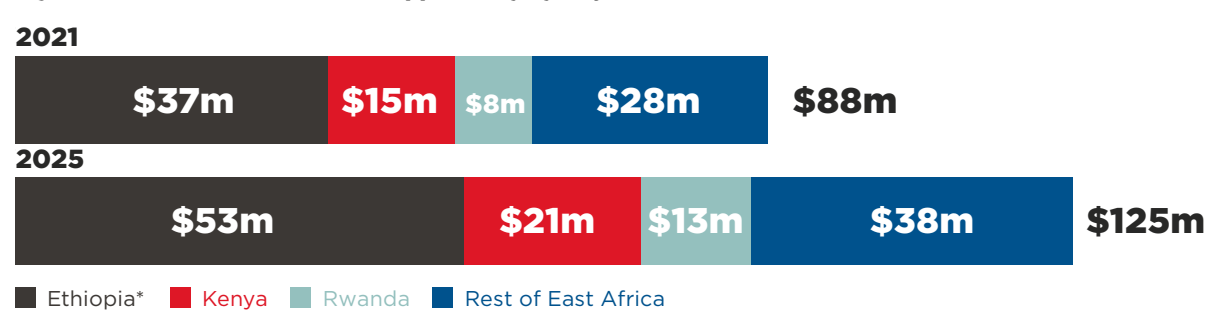


Figure 11 **Potential direct revenue opportunity by major markets in East Africa (USD)**



Source: GSMA AgriTech Programme

16 Comprises: Burundi, Comoros, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mozambique, Rwanda, Somalia, Tanzania, Uganda, Zambia and Zimbabwe.

In South Asia, India is dominant but Pakistan and Bangladesh can benefit from established mobile money markets



Selected value chains suited to digitisation in South Asia

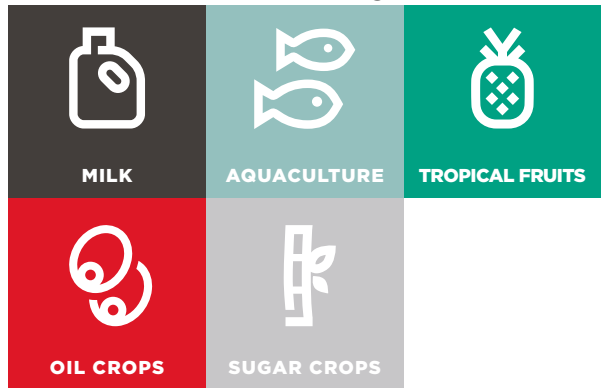


Figure 12 Potential direct revenue opportunity and potential addressable market in South Asia¹⁷

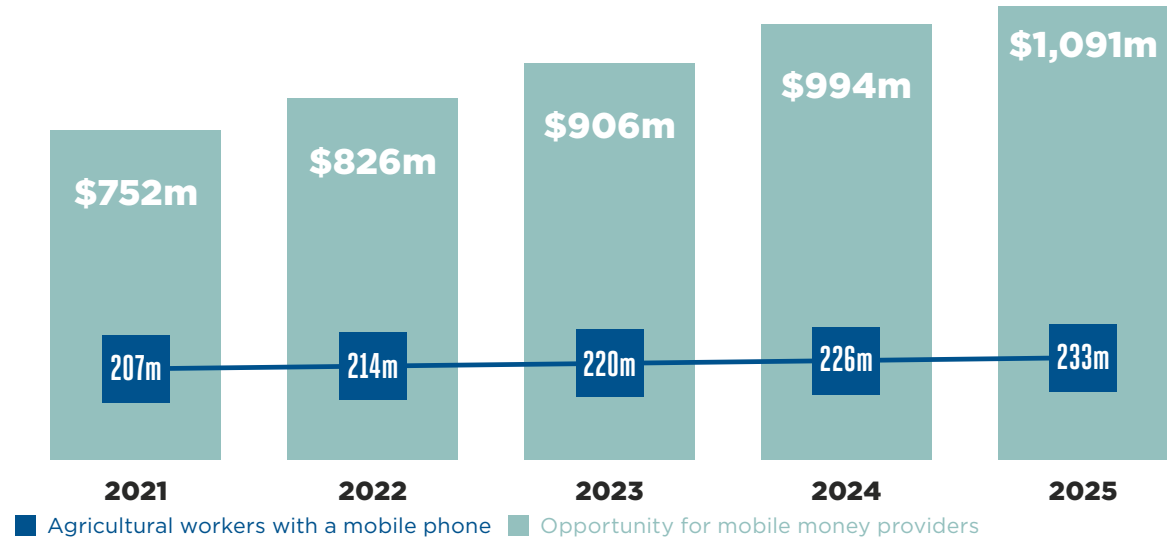
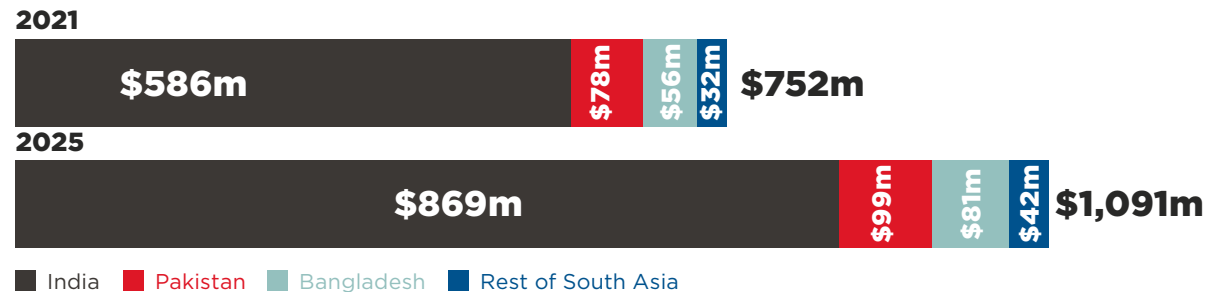


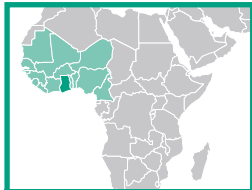
Figure 13 Potential direct revenue opportunity by major markets in South Asia (USD)



Source: GSMA AgriTech Programme

¹⁷ Comprises: Afghanistan, Bangladesh, Bhutan, India, Nepal, Pakistan and Sri Lanka.

Examples of digital agricultural payment services



West Africa Ghana

MAJOR VALUE CHAINS



In 2018, MTN Ghana launched mAgric, a mobile app that enables an agribusiness to record crop procurement from farmers digitally and pay farmers for their produce instantly via mobile money.

The solution has been piloted in the cocoa value chain, together with Royal Commodities, a licensed buying company for cocoa. MTN Ghana is expanding the use of the tool to other value chains with a pilot launched in 2019 to trial mAgric in the poultry value chain.



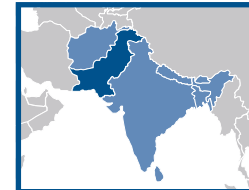
East Africa Rwanda

MAJOR VALUE CHAINS



In 2019, MTN Rwanda began working with the Sorwathe Tea Factory - the oldest private tea estate in the country - to pilot the digitisation of field operations and payments to farmers. In partnership with BeSoft, a technology provider, the pilot focuses on digitising three key processes: farm and farmer profiling, procurement, and payments to farmers via mobile money.

Digitising payments has had several early benefits for farmers, such as fewer payment delays, reduced travel time to collection centres and lower (if any) travel costs to the nearest bank.



South Asia Pakistan

MAJOR VALUE CHAINS



In 2018, Jazz and Haleeb Foods, one of the oldest packaged milk producers in Pakistan, piloted a digital solution that sought to digitise farmer registrations and farm details, procurement records and payments to farmers via JazzCash.

The pilot improved the traceability of milk collection and logistics for Haleeb Foods, while farmers were able to receive payments securely and regularly without delay. Jazz and Haleeb Foods are considering scaling the service to more farmers, while Jazz is looking to expand the service to other agricultural value chains.

Agricultural subsidy schemes in emerging economies can benefit from digitising government-to-person payments

In some countries, agricultural subsidy schemes are among the largest G2P schemes and can take a variety of forms:



Vouchers for fertilisers, seeds or other inputs



Cash transfers to support incomes



Microcredit, cheap loans or grants

Agricultural subsidies play a key role in both developed and emerging economies. In economies where agriculture is one of the biggest contributors to national GDP, and where the agricultural sector is one of the largest employers, it is common for governments to provide additional support to farmers. Smallholder farmers' incomes can vary greatly based on factors beyond their control, such as changing weather patterns, plant and animal diseases, natural disasters and global price shocks.

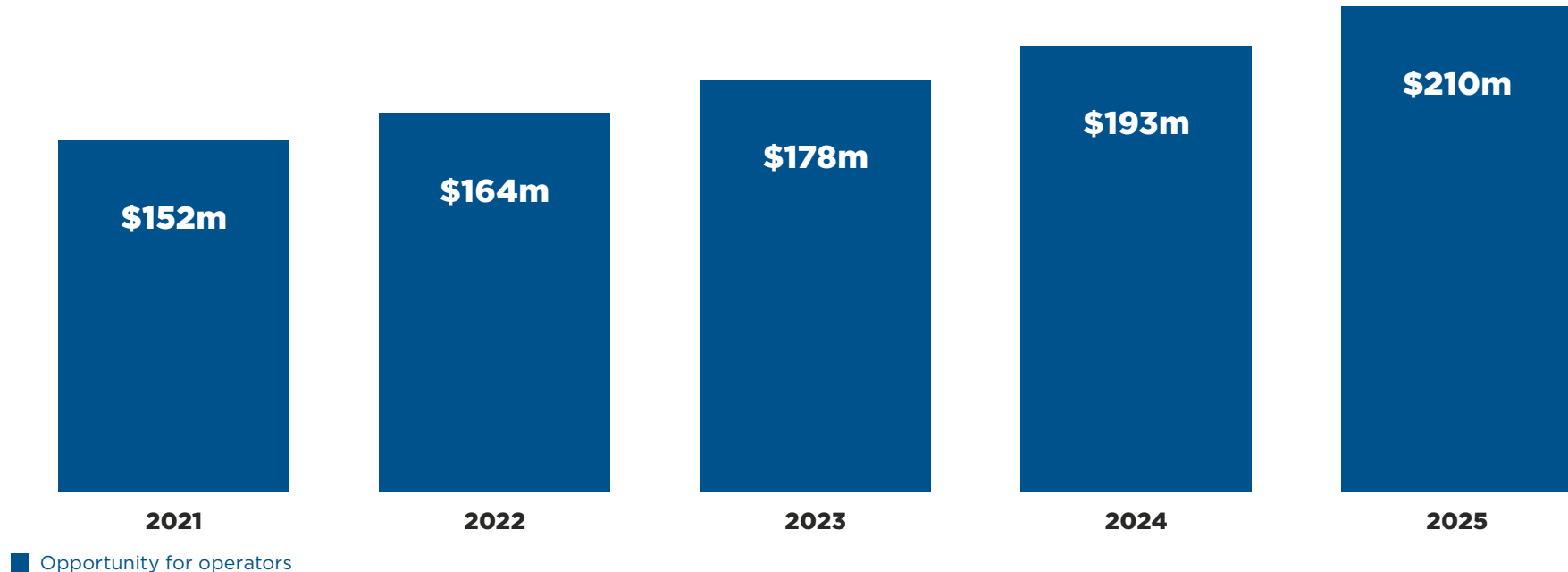
Governments in developing countries use several measures, such as subsidies, grants and income support payments, to stimulate the use of inputs that enhance agricultural productivity, support smallholder livelihoods and provide a safety net for farmers. Agricultural subsidies are often intended for specific inputs, such as fertilisers, seeds or pesticides. Such subsidies intend to support farmers by improving access to inputs, while encouraging the incremental use of inputs by farmers who might not otherwise use them and improving farmers' knowledge of effective input use.

However, in many cases, subsidies do not reach the farmers that need them the most. Subsidy schemes can be prone to fraud and corruption, are costly to administer and may unintentionally benefit the wealthiest farmers. For example, fraud can occur if subsidy vouchers are easy to counterfeit or if there are "ghost recipients". Digitising payments can address the challenges of reducing fraud and the costs required to distribute subsidies to farmers, but few digital G2P payment schemes have emerged so far.

The revenue opportunity in digitising G2P payments in agriculture will reach \$210m by 2025

Mobile money providers stand to capture up to \$210 million in additional total direct annual revenue by 2025 through digitising G2P payments to smallholder farmers.¹⁸ To realise this opportunity, mobile money providers will need to be operating in an enabling regulatory environment and have the necessary assets in place, such as sufficient numbers of agents and liquidity available in rural areas.

Figure 14 **Potential direct revenue opportunity from G2P payments¹⁹**

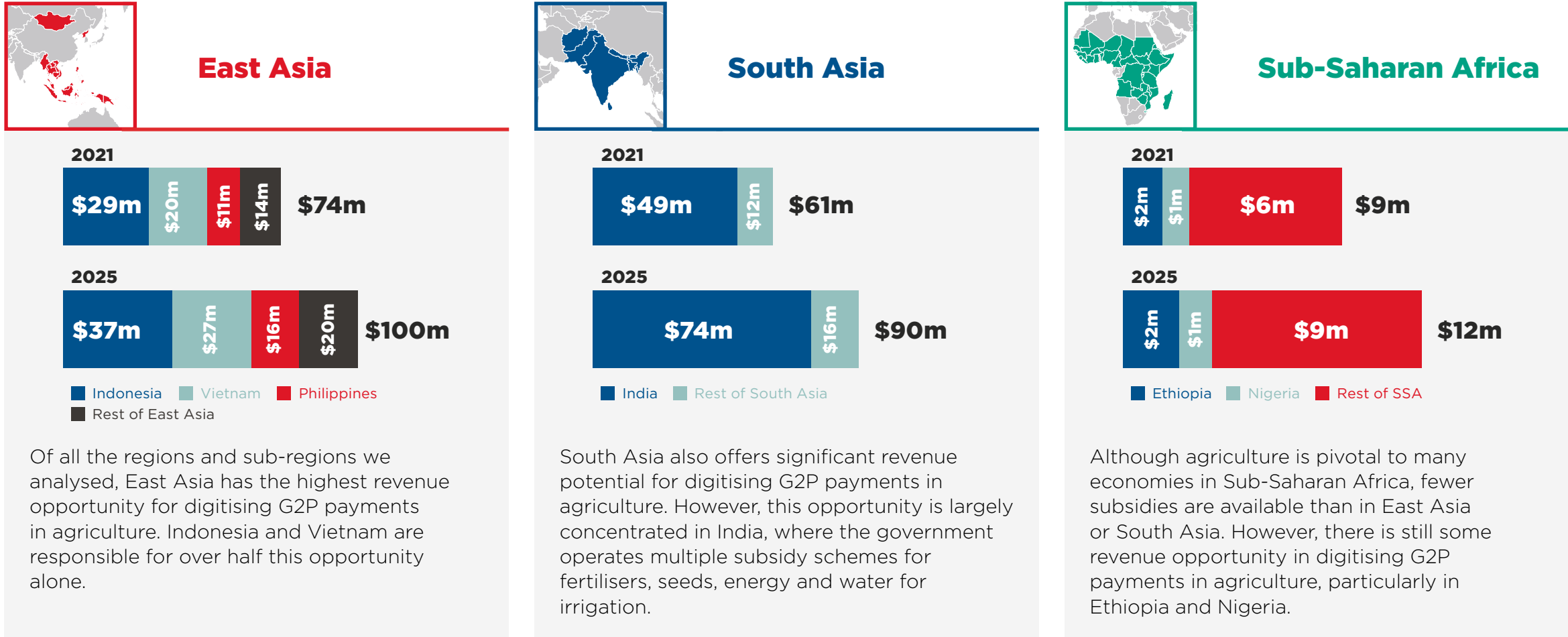


¹⁸ Across Sub-Saharan Africa, South Asia, East Asia & Pacific, Latin America & the Caribbean

¹⁹ Source: GSMA AgriTech Programme

With established subsidy schemes, East Asia and South Asia offer the highest revenue opportunity to digitise G2P payments

Figure 15 Potential direct revenue opportunity from G2P payments by region²⁰



20 Source: GSMA AgriTech Programme

Mobile money providers have a direct revenue opportunity from digitising G2P payments, but challenges remain

Opportunities for revenue from G2P payments

Provide the technology to disburse large subsidy schemes

In economies where agriculture is one of the largest contributors to national GDP and one of the largest employers, agricultural subsidies are likely to be one of the largest G2P schemes, together with other government disbursements, such as salaries and pensions.

Provide digital platforms to manage G2P payments

Mobile money providers can generate additional revenue from providing platforms that allow all G2P communication flows to be digitised, such as offering digital farmer registries and payment platforms to institutional customers (e.g. Ministries of Agriculture and regional governments). These platforms can also be used for person-to-government (P2G) payments and communication flows.

Challenges in providing G2P payments

Working with governments has its own complexities

Working with governments in emerging markets can be challenging for mobile money providers and their partners as it can involve complex and time-sensitive procurement processes. Changing governments, government priorities and political instability have the potential to undermine existing agricultural subsidy schemes and can put ongoing deployments at risk.

Insufficient initiative in piloting G2P payments

While many governments have well-established subsidy schemes (often cash-based), there are few digital G2P payment deployments. While distribution remains a challenge, digitising G2P requires a strong foundational ID system, especially as subsidy schemes can be prone to fraud and mismanagement. One example is Nigeria's National Payment Initiative (NAPI), implemented by Cellulant - a mobile payments company. NAPI uses chip-based national identity cards to provide farmers with access to subsidies and loans.²¹

21 GSMAi (2016). *Market size and opportunity in digitising payments in agricultural value chains*.

Key findings and recommendations

B2P payments

- The revenue opportunity for mobile money providers in digitising agricultural B2P payments is expected to reach \$3.2 billion by 2025.
- Asia offers almost 80 per cent of the global opportunity to digitise agricultural B2P payments due to the large volume of formal agricultural B2P cash payments available. Sub-Saharan Africa has a smaller revenue opportunity, but strong mobile money uptake, especially in East Africa, means that the region is ripe for digitisation.
- To digitise B2P payments to smallholder farmers, mobile money providers should work with agribusinesses in formal value chains.
- If operating in an enabling regulatory environment, mobile money providers should ensure they have active rural agents with sufficient liquidity for cash-outs when farmers receive agricultural payments.
- Mobile money providers should also allow agritechs to integrate real-time payments solutions to create holistic digital agricultural tools that can add value for both farmers and agribusinesses, such as digital farmer records and advisory services.

G2P payments

- The revenue opportunity for mobile money providers in digitising G2P payments in agriculture is expected to grow to \$210 million by 2025.
- With established traditional subsidy schemes, most notably in India and Pakistan, East Asia and South Asia together offer the highest revenue opportunity in G2P digitisation. However, there is a significant opportunity in digitising G2P payments in Sub-Saharan Africa too, particularly in larger markets, such as Ethiopia and Nigeria – with the former having implemented a nationwide scheme to digitise fertiliser and seed subsidies to farmers in 2012.
- Assuming the presence of an enabling regulatory environment, digitising G2P payments in agriculture offers mobile money providers a significant revenue opportunity, especially in countries with large, established, cash-based subsidy schemes.
- However, digitising G2P payments presents a different set of challenges than B2P payments, primarily dealing with complex governmental procurement processes and the risk of shifting government priorities.

The GSMA has estimated the B2P payments revenue opportunity for mobile money providers (1/2)

Across the 72 countries analysed, the current value and potential for B2P payment digitisation via mobile money was calculated using three main estimates:



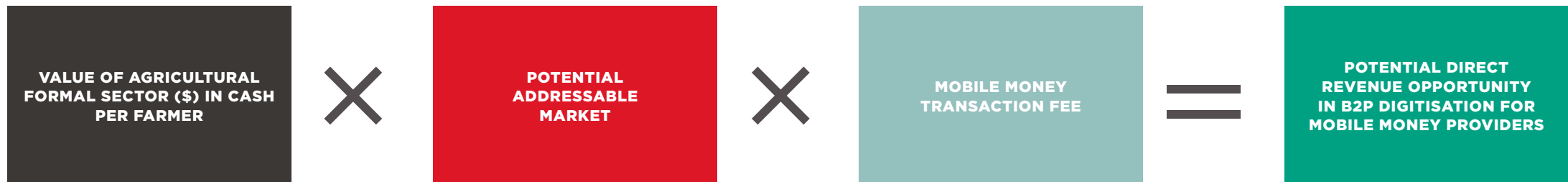
An estimate of the volume and value of formal agricultural procurement (i.e. the \$ value transacted for procurement payments between value chain buyers and farmers in the agricultural last mile)



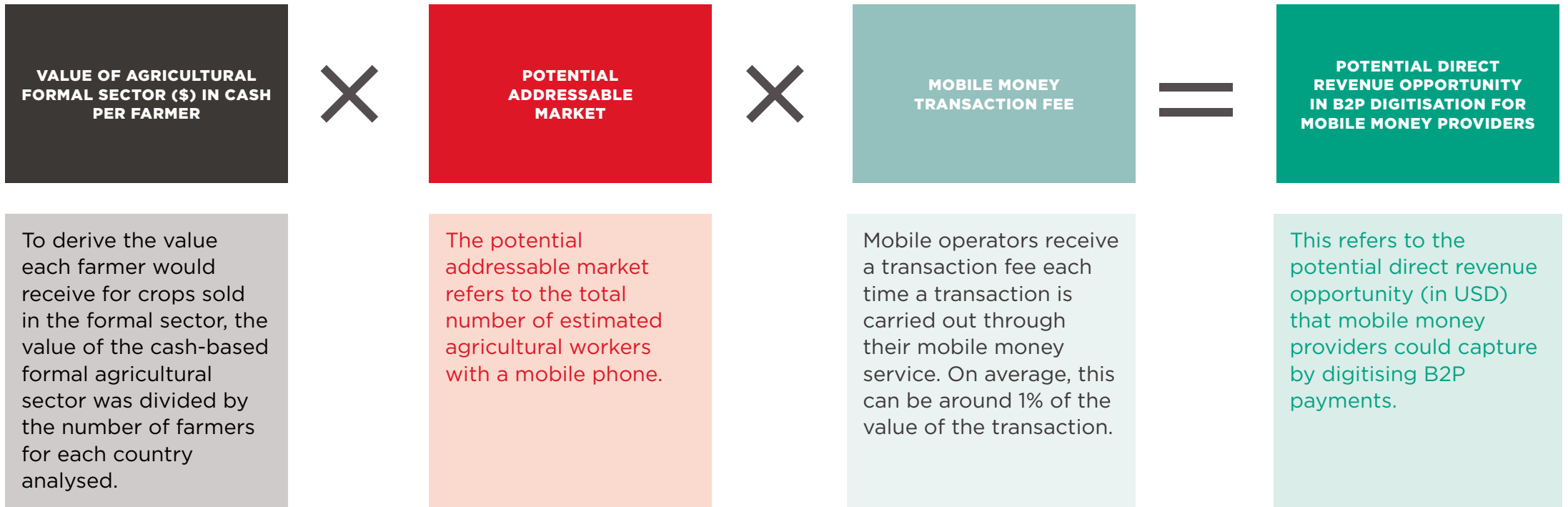
An estimate of the potential addressable market (i.e. the number of potential mobile money users in agriculture)



An estimate of the current level of digitisation, defined as the use of digital channels to receive payments – denoted through the transaction fee levied for mobile money payments



The GSMA has estimated the B2P payments revenue opportunity for mobile money providers (2/2)



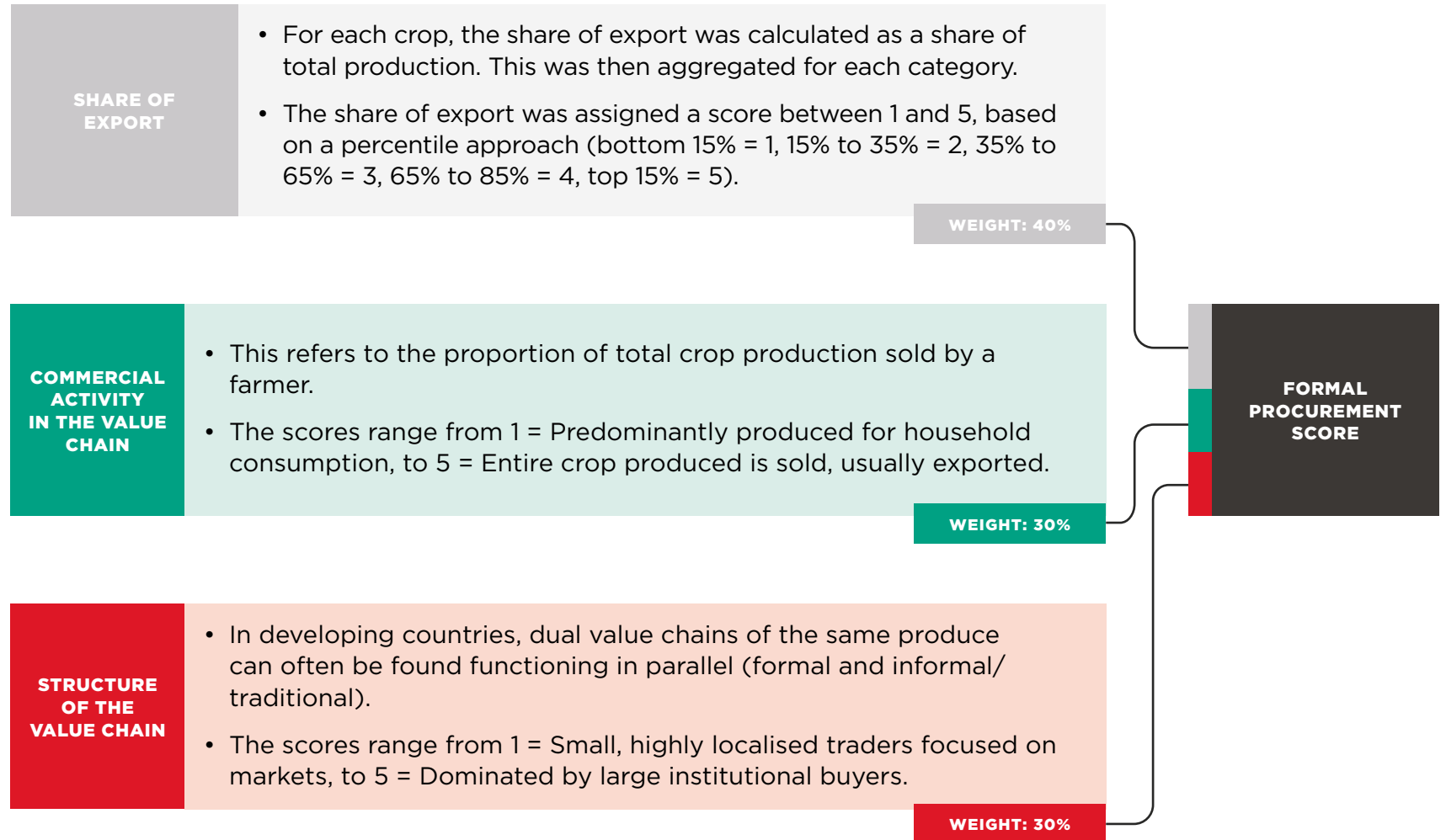
The first step in calculating the value of formal agricultural procurement is to calculate the formal procurement score

The value of formal agricultural procurement was calculated through two steps:

Step 1: Estimate the level of formality of each agricultural produce category.

This was done by:

1. Grouping all the crops and livestock in 47 different categories.²⁶
2. Estimating a formal procurement score for each category as a weighted average of three metrics (share of export, commercial activity in the value chain and structure of the value chain). Scores range from 1 (informal) to 5 (formal). For commercial activity in the value chain and structure of the value chain, the major producing countries for each of the produce categories have been considered as a point of reference.



²⁶ See Appendix for further details. Source: GSMAi. Note that currency fluctuations between when the model was first published in 2016 and 2019 will have resulted in lower revenue potential for certain countries, despite growth in transactions.

The second step is to calculate the value of the formal agricultural sector

Step 2: Estimate the value of agricultural production in each country and to apply a formality percentage to derive the total value of the formal agricultural sector

VALUE OF AGRICULTURAL PRODUCTION

- The value of agricultural production measures production in monetary terms at the farm-gate level. It is derived by multiplying gross production in physical terms by output prices at the farm gate.
- FAO data.



SHARE OF AGRICULTURAL PRODUCTION GOING THROUGH FORMAL PROCUREMENT CHANNELS

- For each category, we compared the amount of total production that would be consumed by a household with what would go to market (market surplus).
- For each category of agricultural produce, we assigned a percentage to the formal procurement score, i.e. the share of sales to market of each category that would pass through formal value chains.
- For each of the 72 countries, we estimated the share of agricultural production passing through formal procurement channels by multiplying the total production going to market for each category with the formality percentages of that category.



VALUE OF FORMAL AGRICULTURAL SECTOR (\$)

VALUE OF FORMAL AGRICULTURAL SECTOR (\$)



PERCENTAGE OF RECIPIENTS WHO RECEIVED PAYMENTS FOR AGRICULTURAL PRODUCTS IN CASH

- World Bank Global Findex data.
- Where data was unavailable, estimates based on income averages were used.



**VALUE OF FORMAL AGRICULTURAL SECTOR (\$)
IN CASH**

The GSMA has developed a model to identify priority value chains for the digitisation of B2P agricultural payments

Within the matrix, each value chain in each of the 72 countries analysed has been assigned a weighted score of 1 to 5 against the seven indicators described in the table below. The higher the score, the stronger the potential for digitisation.

Indicator	Value of formal sector procurement by value chain (\$)	Formal sector procurement by value chain	Volume of production by value chain	Value chain growth potential	Average size of transactions by value chain	Frequency of transactions by value chain	Interlinkages of value chains
Data source	FAO, World Bank, GSMAi calculations	FAO, World Bank, GSMA AgriTech	FAO	GSMAi calculations	GSMA AgriTech estimate	GSMA AgriTech estimate	GSMA AgriTech estimate
Indicator weighting	10%	25%	10%	10%	5%	30%	10%
Definition	Measures production in monetary terms at the farm-gate level by value chain.	Derived KPI, calculated for 47 value chains and based on commercial activity in value chain; structure of the value chain; share of exports. ²²	Measures the total volume of production in tonnes by value chain, providing an idea of the overall size of the value chain in any given country.	Defined by the growth of historic volume and value of total agricultural output (5-year CAGR 2010–2015, depending on available data).	Measures average value of transactions in monetary terms by value chain. ²³	Measures the frequency of transactions by value chain. ²⁴	Describes the level of intersection with other value chains, which is defined by the probability that a farmer cultivates one or more crops.

²² Formal value chains, where actor roles and economic relationships are well defined, offer mobile money providers greater opportunities for digital payments.

²³ Mobile money services are best suited for small ticket transactions due to transaction limits, liquidity management and wallet-balancing challenges.

²⁴ Regular transactions not only ease liquidity management for a mobile money provider, but also provide stable revenues to its mobile money agents.

Bangladesh: aquaculture, milk and tropical fruits are best suited to digitisation

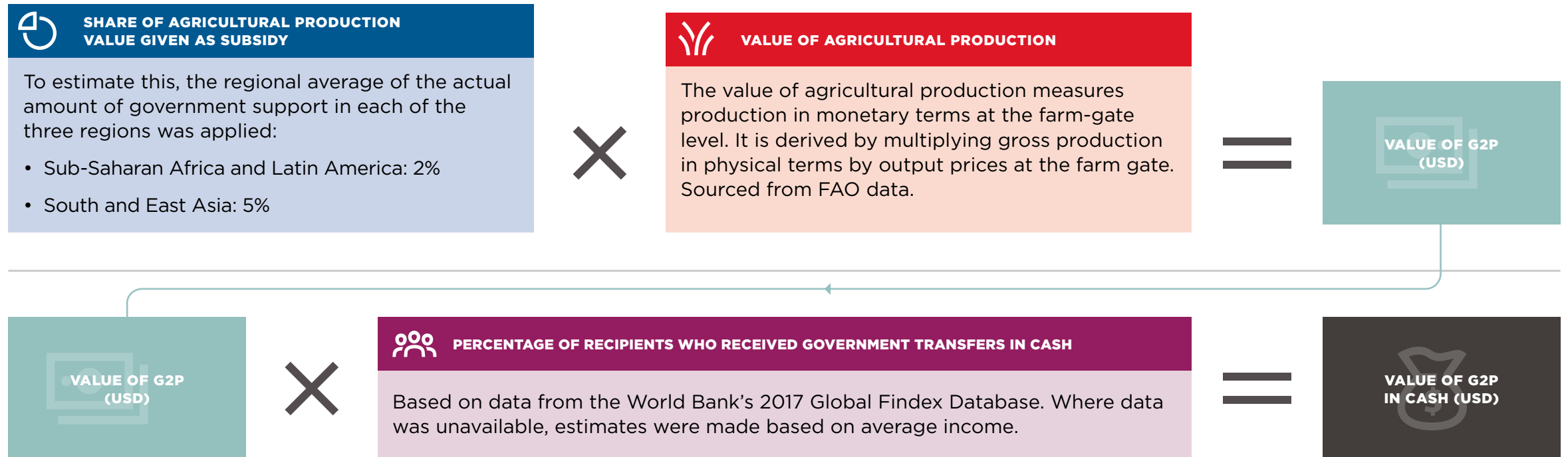
The table below shows a list of priority value chains in order of suitability for digitisation using the scoring-weighting model devised by the GSMA²⁵ for Bangladesh. While value chain prioritisation is a starting point, research on the ground is necessary to validate this assessment.

Indicator	Value of formal sector procurement by value chain (\$)	Formal sector procurement by value chain	Volume of production by value chain	Value chain growth potential	Average size of transactions by value chain	Frequency of transactions by value chain	Interlinkages of value chains	Score
Aquaculture	5	3	4	4	5	5	5	4.4
Milk	4	3	5	4	5	5	5	4.2
Tropical fruits	5	4	4	5	4	4	3	4.0
Oil crops	3	4	3	3	4	4	3	3.7
Spices	4	5	3	3	2	3	3	3.5
Vegetables	4	3	4	4	5	4	1	3.4
Rubber	2	4	1	2	4	4	4	3.4
Potatoes	4	3	5	5	4	3	2	3.3
Nuts	3	4	2	3	4	4	2	3.3
Rice, Paddy	5	3	5	5	2	2	2	3.3

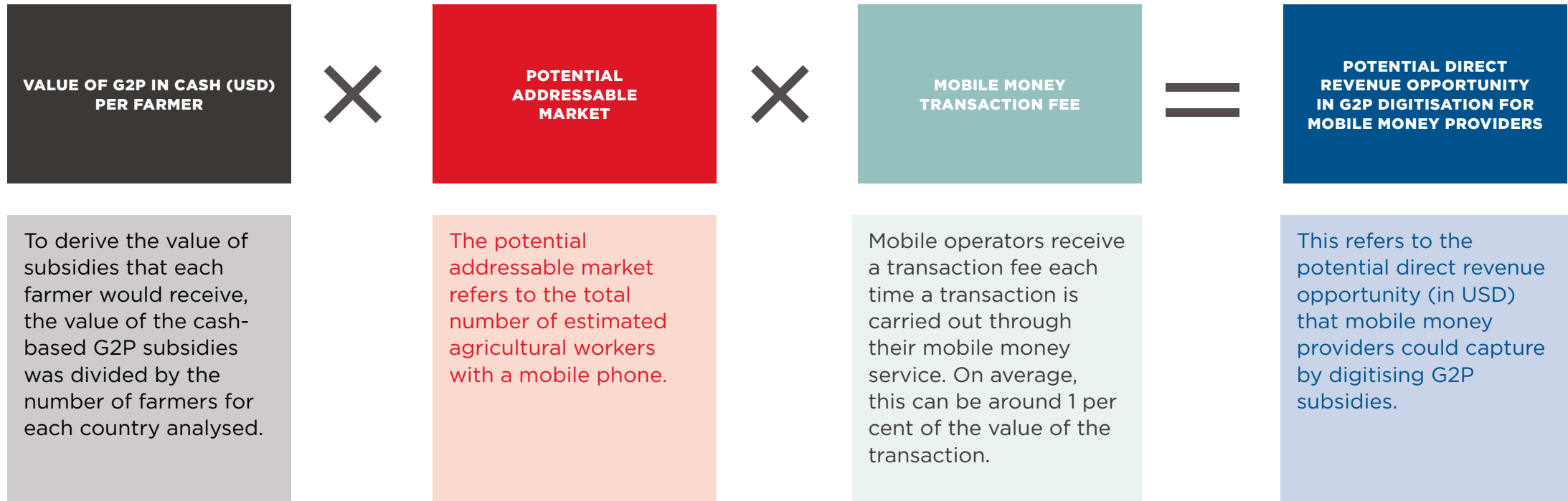
25 Loukos, P. (2018). *The GSMA mAgri Value Chain Assessment Tool*.

The GSMA has estimated the value of G2P subsidies

Governments in developing countries use several measures, such as subsidies, grants and income support payments, to stimulate the use of inputs that enhance agricultural productivity. The value of government agricultural support (and nature of distribution) vary widely between countries, but largely comply with the World Trade Organisation Agreement on Agriculture in relation to domestic support.



The value of G2P payments was then used to estimate the G2P revenue opportunity for mobile money providers



Agricultural produce categories used in calculating the formal procurement score

Aquaculture – Fish

Bananas – Bananas, plantains

Barley – Barley

Berries – Berries nes, blueberries, cranberries, currants, gooseberries, grapes, raspberries, strawberries

Bulb and stem vegetables – Asparagus, garlic, leeks (other alliaceous vegetables), onions (dry), onions (shallots, green)

Cassava – Cassava, cassava leaves

Cereals, Grains – Buckwheat, canary seed, cereals nes, fonio, Grain (mixed), millet, oats, popcorn, quinoa, rye, sorghum, triticale

Citrus Fruit – Fruit (citrus nes), grapefruit (including pomelos), lemons and limes, oranges, tangerines, mandarins, clementines, satsumas

Cocoa – Cocoa (beans)

Coffee – Coffee (green)

Cotton – Cotton lint, cottonseed, seed cotton

Dry beans – Beans (dry)

Eggplants (aubergines) – Eggplants (aubergines)

Eggs – Eggs (hen, in shell), Eggs (other bird, in shell)

Fibre crops – Agave fibres nes, bastfibres, coir, fibre crops nes, flax fibre and tow, hemp tow waste, jute, kapok fibre, kapok fruit, manila fibre (abaca), ramie, sisal

Fruits – Apples, apricots, cherries, cherries (sour), cucumbers and gherkins, dates, figs, fruit (fresh nes, pome nes, stone nes), peaches and nectarines, pears, persimmons, plums and sloes, quince

Honey – Beeswax, honey (natural)

Hops – Hops

Kiwis and melons – Kiwi fruit, melons, other (including cantaloupes), watermelons

Leafy and salad vegetables – Cabbages and other brassicas, cauliflowers and broccoli, lettuce and chicory, spinach

Maize – Maize, maize (green)

Meat – Meat indigenous (ass, buffalo, camel, cattle, goat, horse, mule, other camelids, pig, rabbit, rodents, sheep), meat (ass, buffalo, camel, cattle, game, goat, horse, mule, nes, other camelids, other rodents, pig, rabbit, sheep), offals (nes)

Milk – Milk (whole fresh buffalo, camel, cow, goat, sheep)

Natural gums – Gums (natural)

Nuts – Almonds (with shell), areca nuts, brazil nuts (with shell), cashew nuts (with shell), cashewapple, chestnut, groundnuts (with shell), hazelnuts (with shell), kola nuts, nuts (nes), pistachios, walnuts (with shell)

Oil crops – Castor oil seed, hempseed, jojoba seed, kapokseed in shell, karite nuts (sheanuts), linseed, melonseed, Oil (palm, palm fruit), oilseeds nes, olives, poppy seed, pyrethrum (dried), rapeseed, safflower seed, sesame seed, sunflower seed, tallowtree seed, tung nuts

Palm Oil – Palm kernels

Peppermint – Peppermint

Potatoes – Potatoes

Poultry – Meat indigenous (bird nes, chicken, duck, geese, turkey), meat (bird nes, chicken, duck, goose and guinea fowl, turkey)

Pulses – Bambara beans, beans (green), broad beans, horse beans (dry), carobs, chick peas, cow peas (dry), lentils, lupins, peas (dry), peas (green), pigeon peas, pulses (nes), vegetables (leguminous nes), vetches

Rice, Paddy – Rice (paddy)

Roots and tubers – Ginger, roots and tubers (nes), sweet potatoes, taro (cocoyam), yams, yautia (cocoyam)

Rubber – Rubber (natural)

Silk – Silk-worm cocoons (reelable)

Skins and hair – Hair (horse), hides (buffalo fresh, cattle fresh), skins (goat fresh, sheep fresh, sheep with wool)

Snails – Snails (not sea)

Soybeans – Soybeans

Spices – Anise, badian, fennel, coriander, chillies and peppers (dry), cinnamon (canella), cloves, mustard seed, nutmeg, mace and cardamoms, pepper (piper spp.), spices (nes), vanilla

Sugar crops – Sugar beet, sugar cane, sugar crops (nes)

Tea – Maté, tea, tea (nes)

Tobacco – Tobacco (unmanufactured)

Tomatoes – Tomatoes

Tropical fruits – Avocados, coconuts, fruit (tropical fresh nes), kiwi fruit, mangoes, mangosteens, guavas, papayas, pineapples

Vanilla – Vanilla

Vegetables – Artichokes, carrots and turnips, chicory roots, chillies and peppers (green), mushrooms and truffles, pumpkins, squash and gourds, okra, string beans, vegetables (fresh nes)

Wheat – Wheat

Wool – Wool (greasy)



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