Toward more Accessible and Inclusive Social Assistance Delivery
A GEOSPATIAL ANALYSIS IN THE PHILIPPINES
Yasuhiro Kawasoe

EXECUTIVE SUMMARY

- **The Philippines’ experience in implementing the Social Amelioration Program (SAP) in response to the COVID-19 pandemic highlights the pressing need for financial inclusion, especially among the poor.** Beneficiaries of the existing social assistance program *Pantawid Pamilyang Pilipino Program* (Pantawid or 4Ps) received their first SAP payment on time as a top-up to their regular grants. However, the non-4Ps beneficiaries had to go through paper-based registration and manual payments, which resulted in duplication of beneficiaries and significant delay in payment delivery.

- **The absence of a national ID system and low bank account ownership posed a challenge in the delivery of SAP.** The lack of identification documents is one of the reasons for being unbanked in the country where only 29 percent of adults have a bank or mobile money account. This is an issue with the Philippines being one of 23 countries in the world without a foundational national-scale ID system. Global experience in scaling up social protection during the COVID-19 pandemic shows that countries could provide cash transfers promptly and accurately when they have foundational ID systems that uniquely identify and verify data about members of the population, coupled with advanced government-to-person (G2P) payment ecosystems.

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1 The author thanks Yuko Okamura and Julia Michl Clark of the World Bank for their valuable comments. The World Bank Social Protection and Jobs team in East Asia Pacific (Yoonyoung Cho, Robert Palacios, Ruth Rodriguez, and Yasser El-Gammal) and Jonathan Marskell also provided guidance and comments. Gio Santos and Arianna Zapanta provided excellent support in geocoding the address of ATMs to longitude and latitude. Moria Enerva helped in editing. Support from the DSWD is greatly appreciated. This work would not have been possible without the generous financial support from the G2Px Trust Fund from the Bill and Melinda Gates Foundation.

2 For instance, DSWD reported 51,563 duplicate aid beneficiaries after distributing the first tranche in June 2020. https://www.pna.gov.ph/articles/1106778
• The Government of the Philippines (GoP) expedited the development and registration for the national ID system (PhilSys) and used the opportunity to facilitate bank account opening. PhilSys helps people without a bank or mobile money account meet the requirements for opening an account using an identity verification function to meet Know-Your-Customer (KYC) requirements. Through its unique ID system and by ensuring the integration and interoperability of registries, such as the Unified Beneficiary Database (UBD) of the Department of Social Welfare and Development (DSWD), PhilSys can help government agencies avoid the potential duplication of beneficiaries. The UBD, for example, can store the payment account information of beneficiaries where cash can be transferred quickly and digitally during an emergency.

• Not only ownership of bank or mobile money accounts but also accessibility to financial services is essential for financial inclusion. With the country’s sprawling archipelago and an uneven distribution of the population, spatial accessibility to financial service points varies. Currently, DSWD has a partnership with the state-owned Land Bank of the Philippines (LBP) for the payment of 4Ps beneficiaries as well as for the opening of accounts at the PhilSys registration centers. This means long distance travel for beneficiaries because many localities, especially remote communities, do not have LBP financial transaction points (i.e., automated-teller machines or ATMs and branches) nearby.

• This study assesses the challenges and opportunities in financial inclusion, especially among the poor in remote communities. First, the study carries out a mapping of all financial transaction points and estimates the travel time to the nearest point. Second, the map is superimposed with the poverty and potential vulnerability of families in remote communities. Finally, the study assesses the coverage of 4Ps in remote areas in view of the potential challenges in implementing the social assistance program in hard-to-reach communities.

• The main findings of the study are as follows:

  o **Travel time to the nearest financial transaction point is more than 30 minutes on foot for nearly half of the population who have no vehicles.** Over 42 million people live in the barangay, which is more than 30 minutes away on foot from the closest ATM. If only LBP ATMs are considered, the number increases to 64 million.

  o **4Ps beneficiaries face difficulties in accessing ATMs.** Over 65 percent out of around 4.2 million 4Ps beneficiary-households live more than an hour away on foot from the closest LBP ATM. If other non-LBP ATMs are utilized for cash grant distribution, the number can be reduced to 45 percent. The ratio of ATMs per 4Ps beneficiary is particularly low in the Bangsamoro Autonomous Region in Muslim Mindanao (BARMM).

  o **The poor and vulnerable have less access to financial services, although more than half of them are 4Ps beneficiaries.** Almost 60 percent of households in the remotest barangay decile of the National Household Targeting System database or Listahanan 2 are estimated to be poor—a significantly higher poverty rate than the national average of 33.9 percent.\(^3\) The vulnerability of the population in these

\(^3\) This poverty rate is based on Listahanan 2, which collects the socioeconomic status of about 70 percent of the population and excludes areas with low poverty incidence. Therefore, this poverty rate in the Listahanan database is much higher than the actual incidence of poverty in the Philippines.
areas is exacerbated by their greater exposure to natural disasters such as typhoons, although remote barangays have been less affected by the COVID-19 pandemic.

- **4Ps may not be inclusive in remote communities.** The current coverage and the new enrollment in 4Ps are lower in remote barangays, especially in Mindanao. The potential cost and time associated with accessing cash and services could be one of the reasons that poor households are not enrolled in 4Ps. Further studies to look into the causes of non-enrolment will be needed.

- **Partnering with financial service providers (FSPs) other than banks can improve financial inclusion in remote areas.** There is a correlation between adult account ownership and the number of ATMs in the Philippines and other East Asian countries. Considering the rapidly increasing number of electronic money issuer (EMI) agents, a partnership with them could improve people’s access to financial services, especially in remote areas.

Based on the findings, the study lays out several policy and implementation considerations for promoting financial inclusion among social protection beneficiaries:

- Digitalization of G2P payments to improve efficiency and transparency should be accompanied by the availability of more and better financial transaction points. The poor and vulnerable population have less physical access to ATMs and financial services, and thus those in remote communities face difficulties when availing of cash-based assistance. Digital payments as well as the involvement of more FSPs could improve financial inclusion in remote areas.

- Leveraging the presence of existing payment service points by collaborating with FSPs other than LBP can significantly reduce travel time and cost. The government can consider using FSPs chosen by beneficiaries based on ease of access and convenience.

- To expand the coverage of financial service networks, the government may consider providing incentives to FSPs that operate in remote barangays. One option is tiered pricing where fees that are slightly higher than those in accessible areas can be levied by FSPs in remote barangays.

- Further assessments of beneficiary experience and the implementation of cash transfers in remote barangays are recommended to inform the adjustments of social protection service delivery, including G2P payments, in remote areas.
1. Introduction

The Government of the Philippines helped families cope with the impact of the COVID-19 pandemic by introducing the Social Amelioration Program (SAP) in March 2020. Under the Bayanihan To Heal as One Act (Republic Act No. 11469 or Bayanihan 1), DSWD was to provide SAP cash assistance twice, amounting to ₱5,000 to ₱8,000 (about US$100 to US$160) per assistance and depending on the minimum wage of workers and the households' subsistence expenditure per month in the region. The GoP quickly distributed cash to the beneficiaries of 4Ps, the country’s flagship safety net program, on top of the regular cash transfers (vertical expansion) and using the existing digital payment mechanism. However, identifying and verifying new beneficiaries outside 4Ps and distributing cash transfers to them (horizontal expansion) was a significant challenge because there was no up-to-date registry, national ID, and digital payment mechanisms (Chemonics International, 2021). The GoP undertook the tasks mainly through manual processes: registration using a paper form, verifying beneficiaries based on a handwritten form and local knowledge, and providing cash to about 18 million households representing over 75 percent of the total number of households in the country (Cho, Kawasoe, Rodriguez, & Valenzuela, 2021).

Challenges in SAP implementation highlight, among others, the need for account ownership as a form of financial inclusion among all Filipinos, especially the poor. Only around 29 percent of adults owned either bank or mobile money accounts before the pandemic, based on the Bangko Sentral ng Pilipinas (BSP) Financial Inclusion Survey conducted from February to March 2020 (BSP, 2020). Given the limited number of account owners, the GoP could not use the existing accounts to transfer SAP cash grants to beneficiaries. Instead, the GoP partnered with six financial service providers composed of three banks and three e-money issuers for the second tranche of SAP and distributed cash digitally to the temporary accounts of beneficiaries (Cho, Kawasoe, Rodriguez, & Valenzuela, 2021). Based on this experience, the GoP recognized the vital need to promote account ownership among poor and vulnerable individuals who may need support in future emergencies.

4Ps is a good example of using existing accounts for emergency cash delivery. The program provides cash grants to low-income families to ensure that children stay healthy and stay in school, reduce dropout rates, and discourage child labor. It has been implemented in 41,676 barangays, benefitting more than 4 million families or around 20 percent of the country’s population as of 2021 (DSWD, 2021). The program is estimated to have reduced total poverty in the Philippines by 1.3 percentage points in 2017: from an estimated pre-Pantawid rate of 19.8 percent to a post-Pantawid rate of 18.5 percent. Impact Evaluation in 2019 also confirmed 4Ps’ positive impacts on human capital accumulation: 4Ps increased gross enrollment rates for children ages 12–15 by 5.2 percentage points from a baseline of 78.2 percent; and increased the take-up of prenatal care (by 6.7 percentage point) and skilled birth attendance by a doctor (by 8.8 percent point). During the COVID-19 pandemic, all 4Ps beneficiaries were automatically eligible for the SAP first tranche top-ups, where almost all of them could receive cash digitally through their LBP accounts. The beneficiaries could then use their cash cards to withdraw the grants from LBP ATMs. They could also withdraw from any BancNet ATMs free of charge for one withdrawal per payment period (i.e., every two months).5 Beneficiaries bore the cost of succeeding ATM transactions or withdrawals at point-of-service (POS) (Acosta, Endo, Garcia Garcia Luna, de Guzman, & Okamura, 2019). As of April 2021, 93.9 percent of the total active households received their grants through cash cards.

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4 The cash card can be used only for cash withdrawals from ATMs and points-of-sale (POS).
5 DSWD covers the cost of the first withdrawal.
For non-4Ps, the government has been promoting account opening through the PhilSys (national ID) registration process. The Philippine Statistics Authority (PSA) started PhilSys registration on October 12, 2020. The PhilSys Policy and Coordination Council (PSPCC) approved a target of 50-70 million Filipinos registered by the end of 2021, with low-income families prioritized, because a Phil ID or PhilSys Number (PSN) would allow them to open bank accounts and receive government payments digitally in the future. For this purpose, LBP, under an agreement with PSA, co-locates its agents and staff at Step 2 PhilSys registration centers to facilitate the opening of bank accounts. As of May 2021, LBP reported that 47 percent of PhilSys registrants (3,444,315 individuals out of 7,260,557) opened an LBP account at the PhilSys registration centers.

For effective financial inclusion, not only ownerships of accounts but also physical access to financial service points is essential. The financial service points include ATMs, bank branches, and mobile money agents where people can receive G2P payments digitally as well as use financial services such as payments, deposits, withdrawals, and transfers. Based on a sample survey conducted in 2020, 4Ps beneficiaries reported that before the pandemic, they traveled at an average of 38 minutes (one-way) and waited for an average of 98 minutes to withdraw cash grants. A substantial portion of households traveled for almost a day to access payment points (Cho, Avalos, Kawasoe, Johnson, & Rodriguez, 2021). The travel time to 4Ps access payment points is about twice as much as the travel time to SAP access payment points. The SAP first tranche (manual payment) took 14.2 minutes of one-way travel and 170.3 minutes of waiting time, while the second tranche (digital payment) took 20.9 minutes of one-way travel and 126.6 minutes of waiting time. The long queue time for SAP was due to the larger number of beneficiaries and their unfamiliarity with the SAP payment system. The longer travel time of 4Ps compared with SAP shows a considerable potential to reduce travel time and improve beneficiary experience by utilizing locally available FSPs.

The Philippines, one of the world's largest archipelago nations, has a geographic diversity that creates spatial inequality in access to services. The country is composed of over 7,000 islands, some 2,000 of which are inhabited. There are significant connectivity challenges from infrastructure bottlenecks alongside the archipelagic geography (Baker, 2017). There are 42,036 barangays (the smallest administration boundary) in the country, of which 10,875 are classified by the Department of Health (DOH) as geographically isolated and disadvantaged areas (GIDA). GIDA refers to communities with a marginalized population. They are physically and socio-economically separated from mainstream society and characterized by physical factors (isolated due to distance, weather conditions, and transportation difficulties); and socio-economic factors (high poverty incidence, presence of vulnerable sector, communities in or recovering from a situation of crisis or armed conflict).

This paper examines the spatial access to financial services of Filipinos, focusing on poor and 4Ps beneficiaries. First, it presents the results of the analysis of access to financial services in the Philippines. The study then explores the targeting quality of 4Ps in remote communities by presenting the coverage of 4Ps in remote areas, comparing it with the poverty rate, and looking into the adequacy of the program in remote areas.

6 Because of the COVID-19 pandemic, the government implemented a three-step process in PhilSys registration to avoid overcrowding and long queues and to adhere to health protocols. Step 1 involves house-to-house collection or online self-registration of demographic information. Step 2 at the registration centers involves capturing the registrants’ biometric data such as fingerprint scans, iris scans, and a front-facing photograph. Step 3 is the issuance of a PhilSys Number (PSN) and a physical ID (PhilID).

7 Travel and waiting time data for the SAP second tranche are based on the survey conducted by IPA in 2021.
2. Methodology and Data

METHODOLOGY TO ASSESS PSYCHICAL ACCESSIBILITY

Accessibility of financial transaction points was measured in two ways: Euclidean distance and estimated travel time. Using the geographical information system (GIS), the study created a buffer (e.g., a circle with a 5-kilometer radius) around the financial transaction points on a planar cartesian coordinate space using Euclidean geometry. The circle did not consider the land surface, buildings, or road networks; instead, a straight line was drawn to measure the distance as the crow flies. While this approach is simple, it may not be sufficient to assess accessibility because actual physical accessibility depends on the availability and types of roads, topography, land cover, and other considerations.

To account for road type, land cover, and other factors, the study estimated travel time using the friction surface model. The model calculates travel time using the cost assigned to each pixel, which is based on the estimated travel time by road type, land cover, and other factors (Box-1). The disadvantage of friction surface is that the assigned cost is not necessarily based on the actual record but based on the speed assigned to the road. Thus estimated time could be shorter than in the network analysis (Nelson, et al. 2019), which is another methodology used worldwide to estimate travel time. Network analysis is similar to calculating the estimated time of arrival (ETA) via the fastest route using Google Maps. It relies on the average speed on road networks based on historical records or manually assigned travel speed. It is more reliable than the friction surface model when used in developed countries and urban areas where updated road networks and travel time data are available.

**Box -1. An example of calculating travel time using the friction surface model**

The friction surface model calculates each raster cell's "cost" in units of time by overlaying the estimated travel speed on-road and off-road areas based on land cover types (e.g., river, water body, forest, grassland, agricultural land, built-up areas) and slopes. A generic time (in minutes) to travel across a cell (friction surface) is then calculated by dividing the cell travel cost (distance) by the cell travel speed. A final travel time between specific locations (e.g., from households to the closest ATM) is computed by applying an algorithm to choose the least travel time route on the resulting Cost Time layer. See (Banick Kawasoe, 2019) for detailed methodology.
Source: (Banick Kawasoe, 2019)
Because road network data in remote areas are insufficient, the study employed the friction surface model, which is the more appropriate methodology for estimating travel time. Specifically, the global friction surface model developed by Weiss et al. (Global maps of travel time to healthcare facilities, 2020) was used. This friction surface model provides geospatial raster data where every pixel (approx. 1km x 1km grid of pixel) is allocated a nominal overall speed of travel based on the type of land cover, such as roads, railways, rivers, forest, and topographies. The models consist of 1) a driving model that expects people to use motorized means of transportation when on the road and to walk when off-road; and 2) a walk-only model.

The study used Google Earth Engine (GEE) and R for travel-time calculation. GEE is a free Google Cloud Platform for geospatial data analysis and visualization using JavaScript or Python. Its data catalog includes the global friction surface, and for this study, the least-cost-path algorithm (i.e., cumulativeCost() function) was used to calculate travel time from financial transaction points. The study then used the extract function in R to determine the travel time to specific locations (e.g., barangay center).

DATA

The study used ATMs as financial transaction points and identified their locations. Note that there is no comprehensive list of financial transaction points in the Philippines. Although the study explored all financial transaction point data including bank and mobile money agents, it could only identify bank branches and ATM locations. Data were obtained from BancNet and three steps were performed to convert the data with addresses to GPS coordinates (Figure 1). First, the addresses were converted to GPS using the Geocoding API of the Google Maps Platform. Second, using the converted GPS information, the study checked whether the GPS was within the municipality and city boundary of the original address. For those outside the boundary, their location was manually checked using the name of the bank branch and its address. As of March 2020, there are 29,695 ATMs nationwide, with 1,262 out of 1,647 municipalities and districts having at least one ATM.

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8 Cumulative Cost Mapping in https://developers.google.com/earth-engine/guides/image_cumulative_cost
9 gDistance package R and ArcGIS Spatial Analyst can also be used.
10 ArcGIS Spatial Analyst can also be used.
11 This number is based on the information from BancNet and is larger than the 22,463 bank ATMs reported in BSP’s Dashboards on Financial Inclusion in the Philippines. Refer to https://www.bsp.gov.ph/Media_And_Research/Financial%20Inclusion%20Dashboard/2020/FIDashboard_3Q2020.pdf. The main reason for the difference is that BancNet also covers non-bank ATM deployers such as ENCASH, E-CTK Solutions, BTI Philippines, and MEGA LINK.
WorldPop data in 2020 were used to determine the distribution of population based on accessibility to financial transaction points. Although the exact location of ATMs was used as the destination, the exact location of the population or DSWD beneficiaries could not be used because this information was not available. The publicly available population data at the most granular level are the national census data at the barangay level, while estimated population data at 100 m x 100 m grid were available from WorldPop. WorldPop employs machine learning models, combining the available population census data at the smallest administrative level and other satellite-based data (e.g., building footprint, nighttime light, land cover) to estimate population distribution at a granular scale (WorldPop, n.d.). The study used the central point of this grid to estimate the distance and travel time to ATMs.

For barangay level analysis, the study relied on DSWD Listahanan 2 and 4Ps beneficiary data, together with National Census 2015 data. DSWD Listahanan 2 data include the number of poor households and poverty rate in 2015 (Velarde & Velarde, 2018), and 4Ps beneficiary data include the number of 4Ps beneficiaries from 2015 to 2021. To identify the GPS point of each barangay, the central point of the administrative boundary data at the barangay level was obtained. In this approach, people in the same barangay were assigned the same travel time to the nearest ATMs. Despite this limitation, the boundary data was still used because the barangay is the smallest administrative level in the Philippines and it is small enough for this assessment.

To assess remote communities’ potential vulnerability to various shocks, the study used data on COVID-19 cases and historical typhoons. The data on COVID-19 positive cases and deaths were collected from the DOH COVID Data Drop as of July 6, 2021. For the historical typhoon records, the wind model of Boose et al. (Landscape and regional impacts of hurricanes in Puerto Rico, 2004) for the Philippines was employed to estimate local wind speeds at any particular locality between 1990 to 2016 when a tropical typhoon passed directly over the locality or nearby (Skoufias, Kawase, Strobl, & Acosta, 2020).

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12 See WorldPop page for the details. The study used the top-down unconstrained, UN-adjusted data in 2020 for the Philippines. https://www.worldpop.org/geodata/summary?id=28283
13 Poor households are identified using the proxy means test.
14 Data for administrative level 4 (barangay) as of May 2020 from humanitarian data exchange were used as barangay boundary data. https://data.humdata.org/dataset/philippines-administrative-levels-0-to-3
3. Analysis of accessibility to financial services

The study mapped the locations of all ATMs of LBP and other banks nationwide and overlayed these with the distribution of the population. Figure 2 shows the locations of ATMs in the Philippines based on their GPS coordinates. The blue circles represent a five-kilometer radius from the locations of the ATMs. The background color indicates the estimated population in the grid (100m x 100m) using WorldPop data. The areas with green, yellow, or red backgrounds outside the circles refer to populated areas without close access to ATMs.

Figure 2. ATM points in the Philippines over population distribution
Some local government units have comparatively fewer financial transaction points based on the ratio of ATMs to population size. Out of 1,647 municipalities and cities, 1,262 have at least one ATM. Figure 3 shows the number of ATMs per 10,000 adults\(^{16}\) at administrative level 3\(^{17}\) or municipality and city level. On average, there are 4.9 ATMs per 10,000 adults nationwide. The National Capital Region (NCR) has the highest number of financial transaction points at 11.5 ATMs per 10,000 adults, while the lowest is BARMM, where there are only 0.92 ATMs per 10,000 adults. The availability of financial transaction points is even lower when only LBP ATMs are considered. On average, there are 0.37 LBP ATM per 10,000 adults nationwide.

Figure 3. Number of ATMs per municipality or city (normalized by 10,000 adults)

To further assess the accessibility of financial transaction points, the study estimated the travel time to the closest points at the barangay level. Although the number of financial transaction points per population gives a general view of the availability of services, it does not consider the availability of ATMs in nearby villages or cities. Similarly, the use of distance within a 5-kilometer radius does not consider travel conditions. For example, traveling 5 kilometers on a highway is much easier than traveling 5 kilometers in a remote mountainous area. To account for these factors, the study used travel time as a proxy of accessibility to services (Ul Haq & Gradstein, 2020). Travel time was estimated using two assumptions: 1) drive and walk model, where people are expected to use a vehicle on-road and walk off-

\(^{16}\) The population is based on 2015 national census data. Adults are individuals above the age of 18 years.

\(^{17}\) In the Philippines, administrative boundary consists of administrative level 1 (region), 2 (province), 3 (city or municipality), and 4 (barangay).
road (Figure 4: Drive + Walk model); and 2) walk-only model, where people are expected to walk, both on-road and off-road (Figure 4: Walk-Only Model).

Figure 4. Estimated travel time to the closest financial transaction point

It takes 16.7 minutes using a vehicle on-road or 86.7 minutes on foot to travel from the central point of the barangay to the closest financial transaction points (Table 1). Median travel time is shorter than mean travel time, implying that some remote barangays require a longer travel time to the closest ATMs. The estimated travel time will be even longer if only LBP ATMs are considered. On average, people need to travel a little less than 30 minutes by car or walk over three hours to the closest LBP ATM.
Table 1: Travel time from barangay to the nearest ATM

<table>
<thead>
<tr>
<th>Travel time (minutes)</th>
<th>Drive + Walk (D+W) Model</th>
<th>Walk-Only Model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All ATMs</td>
<td>LBP ATMs only</td>
</tr>
<tr>
<td>Mean</td>
<td>16.7</td>
<td>25.9</td>
</tr>
<tr>
<td>25%</td>
<td>2.0</td>
<td>4.3</td>
</tr>
<tr>
<td>Median</td>
<td>6.2</td>
<td>11.2</td>
</tr>
<tr>
<td>75%</td>
<td>15.1</td>
<td>25.9</td>
</tr>
</tbody>
</table>

Over 10 million people live in the barangays where the closest ATM is more than two hours away on foot. Table 2 shows the population distribution by travel time to the nearest ATM. While over 93 percent of the population live in a barangay within 30 minutes by car to the closest ATMs, the percentage decreases to 58 percent with the walk-only model, and to as low as 36 percent if only LBP ATMs are considered. Around a quarter of the population requires more than one hour each way to walk to the nearest ATM. It implies significant challenges for remote rural communities with limited access to public and private transportation to the nearest financial transaction point.

Table 2: Population distribution (adults and children) based on one-way travel time to the nearest financial transaction point

<table>
<thead>
<tr>
<th>Financial Transaction Points</th>
<th>Less than 30 min</th>
<th>30 min – 1 hr</th>
<th>1-2 hr</th>
<th>More than 2 hr</th>
</tr>
</thead>
<tbody>
<tr>
<td>D+W: All ATMs</td>
<td>93,739,764 (93.7%)</td>
<td>3,633,818 (3.6%)</td>
<td>1,707,901 (1.7%)</td>
<td>1,307,883 (1.3%)</td>
</tr>
<tr>
<td>D+W: LBP ATMs only</td>
<td>87,693,330 (87.7%)</td>
<td>7,321,611 (7.3%)</td>
<td>3,085,373 (3.1%)</td>
<td>2,289,052 (2.3%)</td>
</tr>
<tr>
<td>W: All ATMs</td>
<td>57,926,139 (57.9%)</td>
<td>17,441,540 (17.4%)</td>
<td>14,396,290 (14.3%)</td>
<td>10,623,965 (10.6%)</td>
</tr>
<tr>
<td>W: LBP ATMs only</td>
<td>36,373,986 (36.3%)</td>
<td>20,375,795 (20.4%)</td>
<td>18,880,583 (18.9%)</td>
<td>24,752,120 (24.7%)</td>
</tr>
</tbody>
</table>

*unit = household*
4. Poverty and vulnerability in remote communities

The remoteness of barangays is associated with higher poverty levels, although the population in those areas is smaller than in accessible barangays. Figure 5 shows the distribution of population and poverty rate by accessibility decile, that is, the travel time by car to the nearest ATM. The population size of barangays and travel time to the ATMs seem to have an inverse correlation. The barangays from the first two deciles that have access to the closest ATMs have on average over 4,800 residents, while barangays in remote deciles have less than 2,000. On the other hand, the poverty rate positively correlates with remoteness, demonstrating that remote barangays have higher poverty rates. On average, the poverty rate of the remotest barangays is 59.2 percent, while barangays in the most accessible decile have less than 20 percent.

Figure 5. Population and poverty rate of barangays by accessibility decile

COVID-19 cases are lower in remote barangays. Based on data as of July 6, 2021, the cumulative number of people reported positive for COVID-19 was around 3 percent of the barangay population in the most accessible decile, which is almost 10 times higher than the percentage in the remotest barangays. The trend is consistent across island groups, with Luzon having the highest positive rate compared with Mindanao and Visayas (Figure 6: COVID-19 cumulative positive rate). With the assumption that remote barangays would have higher death rates due to lack of health services, the study compared the barangays based on their accessibility and the proportion of deaths among positive cases and found no significant difference (Figure 6: COVID-19 cumulative death rate).
Risks of severe typhoons are slightly higher in remote barangays in Luzon and Visayas than accessible barangays. The number of severe typhoons (i.e., with a wind speed of 119 mph or more) is used as an indicator of exposure to severe climate events. In Luzon and Visayas, barangays from the remotest decile are more likely to be affected by severe typhoons at 10 percentage points than the most accessible decile in Mindanao at 17 percentage points. On the other hand, Mindanao has fewer typhoons, and there is no significant difference in the degree of exposure across barangays by accessibility deciles. Other climate events, such as drought, could be explored to further study the relationship between irregular climate events and accessibility in Mindanao.
5. Social assistance coverage in remote poor communities

Based on the findings that remote barangays are more likely to be poor and often vulnerable to climate shocks, this study assessed the adequacy of coverage of 4Ps in those barangays. Specifically, the study determined whether poor households in remote barangays could access 4Ps benefits as easily as households in accessible barangays. Since there is no remoteness premium for 4Ps beneficiaries (e.g., providing additional cash for traveling to the health center, schools, and financial transaction points), the cost for participating in the program could be higher for poor households in remote barangays.

There are on average 56.5 financial transaction points for every 10,000 4Ps beneficiary-households. Of these access points, 5.2 locations are LBP ATMs. NCR has 688 financial transaction points per 10,000 4Ps beneficiaries—the highest among all regions. In BARMM, there are only 2.9 ATMs per 10,000 4Ps beneficiaries. The study further examines accessibility using the travel time models. See Annex 1 for instructions on accessing the interactive map showing the accessibility of 4Ps beneficiaries to financial transaction points in the barangays.

Figure 8. Number of ATMs per municipality or city (normalized by 10,000 4Ps beneficiary households in 2020)
Consistent with the finding that poverty rate is higher in remote areas, 4Ps beneficiaries are more likely to be living in remote barangays. With the current network of LBP ATMs, almost 89 percent of 4Ps beneficiaries are within one hour by car to the nearest LBP ATM. If all ATMs are considered, the number of 4Ps beneficiaries with access increases to almost 94 percent (Table 3). However, access to the closest LBP ATMs decreases to 55 percent and access to all ATMs to 34 percent when travel is on foot. Over 44 percent of beneficiaries walk for more than two hours to the closest LBP ATM, much higher than the 24.6 percent national average.

Table 3: Geographic distribution of 4Ps households by access to financial transaction points

<table>
<thead>
<tr>
<th>Financial Transaction Points</th>
<th>Less than 30 min</th>
<th>30 min – 1 hr</th>
<th>1-2 hr</th>
<th>More than 2 hr</th>
</tr>
</thead>
<tbody>
<tr>
<td>D+W: All ATMs</td>
<td>3,690,324 (85.9%)</td>
<td>329,114 (7.7%)</td>
<td>154,668 (3.6%)</td>
<td>122,247 (2.8%)</td>
</tr>
<tr>
<td>D+W: LBP ATMs only</td>
<td>3,214,783 (74.8%)</td>
<td>602,058 (14.0%)</td>
<td>269,679 (6.3%)</td>
<td>209,833 (4.9%)</td>
</tr>
<tr>
<td>W: All ATMs</td>
<td>1,453,535 (33.8%)</td>
<td>907,016 (21.1%)</td>
<td>986,958 (23.0%)</td>
<td>948,706 (22.1%)</td>
</tr>
<tr>
<td>W: LBP ATMs only</td>
<td>800,905 (18.6%)</td>
<td>661,561 (15.4%)</td>
<td>938,257 (21.8%)</td>
<td>1,895,189 (44.1%)</td>
</tr>
</tbody>
</table>

*unit = household*

4Ps beneficiaries are more likely to come from poor barangays, indicating good targeting. The number of 4Ps beneficiaries and poor households per barangay is consistent across the deciles (Figure 9). The average number of 4Ps beneficiaries is lowest in the most accessible barangays, while there is a larger number of 4Ps beneficiaries in the remote barangays despite their smaller population size. In the case of the comparatively large number of beneficiaries in the second most accessible barangay decile, the number could be due to the high concentration of poor population in urban peripheries.

Figure 9. Number of 4Ps and poor households by accessibility decile
Fewer households in remote barangays, especially in Mindanao, enrolled in 4Ps between 2015 and 2021. 4Ps beneficiaries exit or graduate from the program under the following conditions: a) the last monitored child in the household turned 19 years old or finished high school; b) the household has been in the program for seven years (starting in December 2019 based on the program’s implementing rules and regulations); c) the household is no longer poor based on the latest assessment through the standard targeting system (i.e., Listahanan); and d) the household commits an offense where the sanction is delisting. Since the most recent Listahanan was done in 2015 and condition c can be applied only to future assessments, most beneficiaries exit the program for either of two reasons: when children reach the cut-off age or when beneficiaries commit an offense. DSWD allows Listahanan 2 households who are on the waiting list to enroll in the program as some households exit the program. Since Listahanan 2, there have been more beneficiaries in Mindanao exiting the program than those enrolling, especially in the remote barangays (Figure 10: Changes in 4Ps beneficiaries from 2015-2021).

Moreover, the coverage of 4Ps among identified poor households is lower in Mindanao and Visayas, especially in remote barangays. The coverage was calculated by dividing the number of 4Ps beneficiaries by the number of poor households identified in Listahanan 2 in each barangay. Almost 86 percent of poor households in the most accessible barangays are enrolled in 4Ps, whereas the coverage is only 73.9 percent in the most remote barangays (Figure 10: 4Ps coverage among identified poor households). The trend is consistent across island groups, and overall, it is around 15-20 percentage points higher in Luzon compared with Visayas and Mindanao. Although there could be various reasons for not participating in 4Ps, the lower coverage and limited enrollment among remote barangays in recent years indicate significant accessibility issues, such as the cost and time needed by potential beneficiaries to access services.

Figure 10. 4Ps coverage and change in the number of 4Ps beneficiaries by accessibility decile
6. Expanding access in remote communities: potential partnership beyond banks

The study confirms that physical access to bank services is challenging for many Filipinos, especially among the poor and beneficiaries of social assistance. The limited number of financial transaction points is a critical bottleneck in promoting financial inclusion and digitalizing G2P payments. Although the Philippines set up more bank ATMs in the past decades, the number of ATMs per adult population (2.9 ATMs per 10,000 adults\textsuperscript{18}) is still much lower than in neighboring countries, such as Thailand (11.5 ATMs per 10,000 adults), Malaysia (5.6 ATMs per 10,000 adults), and Indonesia (5.3 ATMs per 10,000 adults) (IMF, 2020). The limited availability of ATMs clearly correlates with adults’ ownership of bank accounts (Figure 11).

The increasing number of electronic money issuer (EMI) agents is an opportunity for enhancing access to financial services. The BSP has regulated e-money since March 2009 under BSP Circular No. 649. As of July 2021, there are 29 EMI banks and 33 EMI non-bank financial institutions (NBFIs) regulated by BSP in the Philippines (BSP, n.d.). EMIs partner with local shops and stores that act as EMI agents where people can cash-in or cash-out and make a payment. In the past five years, the number of EMI agents has increased rapidly (Figure 12). As of September 2020, there are 63,581 registered EMI agents, of which 74 percent or 47,131 are active (BSP, BSP Financial inclusion dashboard, 2020).

\textsuperscript{18} The number from IMF is different from the number in this study. This is because adults in the IMF study are individuals over 15 years old, while in this study, they are 18 years old and above. Further, this study includes all ATMs provided by non-bank agencies under BancNet, while IMF’s report includes only bank ATMs.
The distribution of the second tranche of SAP demonstrated the potential gains of partnering with EMIs for G2P payment. By the end of September 2020, 12.9 million beneficiaries had received the SAP second tranche, of whom 92 percent or 9.3 million were paid digitally. An estimated 7-8 million new accounts were created in the process, of which around 4-5 million accounts were with EMIs such as GCash, PayMaya, and StarPay (Cho, Kawasoe, Rodriguez, & Valenzuela, 2021). The active e-money accounts increased from 8.8 million in 2019 to 14.2 million in 2020 (BSP, 2020). According to a survey conducted by Innovations for Poverty Action in 2021, the total travel and waiting time with EMIs is often shorter (e.g., the median time of 1.08 hours with GCash and 1.33 hours with PayMaya) than with the banks' 2-3 hours.19

The study considered shops (e.g., sari-sari store, pawnshop) as potential partners in G2P payment delivery. There is no comprehensive list of EMI agents in the Philippines. Thus, the study mapped the shops as potential EMI agents. Figure 13 compares the number of financial transaction points using ATMs only and shops only in the main island of Sulu, BARMM. The locations of shops were collected through the Places API of the Google Maps Platform.

Collaborating with financial service providers other than banks can increase access to financial services in some remote barangays. In Sulu, BARMM, almost 10 percent of 4Ps beneficiary households live in barangays that are more than an hour away from ATMs (Table 4). If local shops were tapped as FSPs, only 5.8 percent of households would be an hour away, and no barangay will be more than two hours away from the closest shop. As shown in Figure 13, the ATMs are concentrated in one area, in Bayan ng Jolo in the main island of Sulu, whereas there are several shops in the southwestern part of the island. Although there is no information to ascertain whether these shops are EMI agents, the map shows a huge potential to expand the coverage of financial transaction points in collaboration with EMIs in the southwestern part of the island.

19 Note that EMIs provide payments through mobile phones to beneficiaries, while some banks served those without phones, and this could be a factor in the longer travel and waiting time in banks.
Table 4. Geographic distribution of 4Ps households by access to financial transaction points and shops in Sulu, BARMM

<table>
<thead>
<tr>
<th>Financial Transaction Points</th>
<th>Less than 30 min</th>
<th>30 min – 1 hr</th>
<th>1-2 hr</th>
<th>More than 2 hr</th>
</tr>
</thead>
<tbody>
<tr>
<td>D+W: ATMs only</td>
<td>37,536</td>
<td>19,067</td>
<td>5,671</td>
<td>308</td>
</tr>
<tr>
<td></td>
<td>(60.0%)</td>
<td>(30.5%)</td>
<td>(9.1%)</td>
<td>(0.5%)</td>
</tr>
<tr>
<td>D+W: Shops only</td>
<td>49,898</td>
<td>9,038</td>
<td>3,646</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>(79.7%)</td>
<td>(14.4%)</td>
<td>(5.8%)</td>
<td>(0.0%)</td>
</tr>
<tr>
<td>W: ATMs only</td>
<td>8,006</td>
<td>2,295</td>
<td>5,109</td>
<td>47,172</td>
</tr>
<tr>
<td></td>
<td>12.8%</td>
<td>3.7%</td>
<td>8.2%</td>
<td>75.4%</td>
</tr>
<tr>
<td>W: Shops only</td>
<td>15,882</td>
<td>12,126</td>
<td>13,446</td>
<td>21,128</td>
</tr>
<tr>
<td></td>
<td>(25.4%)</td>
<td>(19.4%)</td>
<td>(21.5%)</td>
<td>(33.8%)</td>
</tr>
</tbody>
</table>

*unit = household*

Figure 13: Travel time to financial access points and shops in Sulu, BARMM

The background color represents the estimated travel time using a vehicle. The red circles show the barangays’ central representative points, and the circle’s size is proportional to the number of 4Ps beneficiaries in the barangay.
7. Way forward

The study proposes several policies and implementation considerations in promoting the financial inclusion of poor and vulnerable households that may require government social protection in a future emergency.

1. **Digitalization of G2P payments to improve efficiency and transparency should be accompanied by the availability of more and better transaction points that are accessible especially to the poor as well as existing and potential social protection beneficiaries.** Given the Philippines' dynamic geography, accessibility to financial services varies across the country. The study found that almost a quarter of barangays are more than two hours away from the closest LBP ATM. In particular, the poor and vulnerable population have less physical access to financial services, and thus those in remote communities face additional difficulties when the government provides cash-based assistance. Although having an account is a step toward financial inclusion, people cannot use most of its functions, such as account withdrawal and deposit, if there are no financial transaction points near their homes. Similarly, for 4Ps, the transition from over-the-counter payment to digital payment through LBP cash cards is a welcome development, but further studies are needed to determine the beneficiary’s experience in remote barangays where there are limited or no LBP financial transaction points.

2. **Leveraging the existing network of payment service points by collaborating with FSPs other than LBP can reduce travel time for many people.** As this study found, LBP ATMs are not the closest ATMs in many barangays. Collaboration with multiple banks can reduce travel time as people go to the nearest financial transaction points. Moreover, as the pilot study in Sulu shows, collaboration with EMIs that can designate local shops as their agents can further minimize travel time for people in remote barangays. DSWD and PSA may consider collaborating with these EMIs as well as with other banks so that they can provide people with several FSP options based on accessibility and convenience.

3. **To expand the financial service point network, the government could consider providing incentives to FSPs that operate in remote barangays.** Even leveraging the existing network, some areas may still not have any financial service point. For instance, the study in Sulu confirms that the eastern part of the island does not have ATMs and shops. Limited financial transaction points in these areas may be due to a poor return on investment for banks. The cost of building and maintaining access points in remote areas with low population density is higher than the expected benefits. FSPs would rather locate these points in areas with a larger population, whereas the government would want broader coverage of the population, including poor and vulnerable families. In those areas, adequate incentives such as allowing FSPs to collect slightly higher service fees may be needed. For example, in Kenya, the government categorizes areas by geography (urban, semi-urban, and rural) and assigns different fees to providers in these areas. In order to design an appropriate tiered pricing, further study with additional data, such as the locations of mobile money agents, mobile network coverage, and mobile phone ownership at the local level, will be critical.
4. **Further studies and assessment of the implementation of social protection programs in remote barangays are needed.** The study found that 4Ps coverage and recent enrollment in the program are lower in remote barangays, especially in Mindanao. Focus group discussions with beneficiaries as well as poor households that do not participate in the program can be conducted to determine the reasons for the low participation rate in remote barangays. One of the main reasons for non-participation in the program may be the cost and time to travel to the service points, including health and nutrition centers and financial transaction points. If that is the case, the program should prioritize these remote areas and improve their accessibility through collaboration with financial service providers beyond banks.
8. References


Annex 1: Interactive map of 4Ps beneficiaries’ access to ATMs

One of the outputs of this study is the interactive map showing the locations of financial service points (ATMs) and representative points of barangays, including their population size and poverty rate. The map also shows the barangays where 4Ps beneficiaries reside.

The interactive map operates on an opensource platform called kepler.gl.

1. OPEN THE INTERACTIVE MAP IN YOUR BROWSER.

Click the link to the map:

The map will appear. Zoom in or out by scrolling up and down the map.
2. EXPLORE THE MAP.

Zoom in to an area, such as Zamboanga City in the following example. Click the second box on the right to display the map legend.

Legend

A shaded circle shows the location of a barangay with 4Ps beneficiaries. A large circle indicates that there are many 4Ps beneficiary households in the barangay. Red means that the barangay is far away from LBP ATMs. With this information, you can identify the remote barangays with large numbers of 4Ps beneficiaries.

<table>
<thead>
<tr>
<th>Icon</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green pin</td>
<td>location of ATM</td>
</tr>
<tr>
<td>White circle</td>
<td>2km (radius) from the ATM</td>
</tr>
<tr>
<td>Blue pin</td>
<td>location of LBP ATM</td>
</tr>
<tr>
<td>Red/Orange/Yellow circle</td>
<td>central point of barangay</td>
</tr>
<tr>
<td></td>
<td>A large circle indicates that there are many 4Ps beneficiaries in the barangay.</td>
</tr>
<tr>
<td></td>
<td>The color of the circle represents the travel time (drive + walk model) to the closest LBP ATM.</td>
</tr>
</tbody>
</table>
Other map details

Point to a pin or circle on the map to display more information about the location. The following image shows the details for Zamboanga City.

- **AMD1 EN** = Region name
- **ADM2 EN** = Province name
- **ADM 3 EN** = City/Municipality name
- **ADM 4 EN** = Barangay name
- **HH_4Ps** = number of 4Ps beneficiaries in the barangay
- **atm_m** = travel time to the closest ATM (walk + drive model)
- **lbp_m** = travel time to the closest LBP (walk + drive model)
- **pov_rate** = poverty rate (based on Listahanan 2)