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Sustainable Development in Asia Pacific and the Role of Mapping for Women

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Abstract

In the archipelago of the Philippines, surrounded by the Pacific Ocean, sustainable development takes many forms, but livelihoods are always shaped by our ocean surroundings. This chapter explores a collection of research that addresses concerns that emerge when advancing SDG 14, to conserve and sustainably use the oceans, seas, and marine resources for sustainable development, with an eye toward the particular role of women in the creation of development, SDG 5. This includes their household contributions, as well as what they give to promote knowledge, policy, and programming and how the household and enterprise needs of women are critical to life in this region. The use of free and open-source tools through the Open Knowledge Kit Regeneration Program presents universal benefits to address the combined devastation of the pandemic, climate change, and of marginalized communities, especially women. Easy to use data collection, analyses, and modeling tools remove barriers to participation and the creation of knowledge.

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Keywords

Pacific · Sustainable development · Gender equity · Transportation · Safety · Mobility · Violence · Philippines

1 Women's Sustainable Development in the Asia Pacific Region

Across the Asia Pacific, micro, small, and medium enterprises (MSMEs) make up the majority of economies, up to 99.5%. Although 60% of MSMEs are owned or led by women, studies show that women have the least access to household essentials like phones, water, paved roads, and Internet, but also essential business infrastructure like logistics, equipment, processing facilities, training, and finance—everything necessary to succeed in life in general, but in the space of our archipelago, these infrastructures take on a new meaning. Meanwhile, although we

P. Solís, M. Zeballos (eds.), *Open Mapping towards Sustainable Development Goals*, Sustainable Development Goals Series, https://doi.org/10.1007/978-3-031-05182-1_23

know that women are responsible for the lion's share of household tasks, their significant economic contributions should make their needs a priority, and yet women remain mostly invisible to public and private sector planning and investments. There are still many data gaps in the multitude of ways women are crucial to the well-being of their communities here in the Pacific Region (Australian Aid, 2017; FAO, 2011; Philippine Department of Trade and Industry, 2019).

Between land and ocean, here the pandemic and climate crisis present unique opportunities to make the critical shift to local data collection and lifesaving local employment models. With travel restrictions, Indigenous and local women can safely participate in data collection and analyses using new, low-cost, low-equipment methods, trained remotely online using Facebook Messenger's free messaging and video platform. The interest and capacity to participate in data collection and knowledge sharing are the only prerequisites for participation. The higher value placed on local knowledge versus technical ability changes the outcomes and increases the quality of the recruitment and retention of new mappers. The priority is to help communities make the most informed decisions about their own communities for the long-term, versus contract revenues.

Many of the communities have experienced stress and trauma from violence and conflict, with illegal activities escalating during the pandemic due to the loss of patrols. The devastating impacts of the pandemic on local organizations further allow international organizations to increase their Western influence over communities and institutionalize their bias. Lastly, along with the increasing impact of the pandemic and climate change, many communities here in the Pacific deal with multiple hazards on an annual basis (Fig. 23.1).

2 The Gender Gap in Mobility

In 2019, as part of a World Bank and Australian Department of Foreign Affairs and Trade Strengthening Road Connectivity to Support Agriculture and Regional Development in Mindanao project, we completed a gender gap mapping study in the conflict region of Mindanao, Philippines. The household survey was designed to obtain the experiences and perceptions of women and men with regard to the impact of current road and public transportation conditions on their health, well-being, and livelihood in the six provinces in 18 municipalities and 54 barangays or villages classified as rural agricultural commu-

Fig. 23.1 Poor road infrastructure makes it extremely difficult for women to complete daily household and livelihood tasks, especially because they travel mostly on foot

nities surrounding the three major ports in Mindanao, namely Davao City, Cagayan de Oro, and General Santos. The informants were family members not less than 18 years of age at the time of the interview. The use of mobility provides a tangible, quantifiable metric with which to analyze differences between the lives of women versus men.

This study utilized a descriptive research method in which the identified variables were measured as they existed. Tests of significance were utilized to answer three questions: (a) How big is the gender gap if there is? (b) Is the gender gap significant? and (c) Is gender the reason for the gap? The results of the study will serve as a baseline study and shall be compared with the findings of the series of studies that may be periodically conducted in the future. The minimum required sample size was determined using Slovin's formula. Multistage sampling and systematic sampling techniques were utilized to ensure the representativeness of the final sample. The OpenStreetMap free and open-source platform's six satellite imagery sources and Google Maps were utilized to determine the existence and non-existence of roads and the location of the barangays or villages from the población or town center. The computed sample totaled 540, comprising 277 males and 263 females of rural households. However, the survey realized only a total of 512 respondent households composed of 257 males and 255 females. The response rate was 94.4.

A large, extended family characterized the households covered in the study. In addition to the members of the nuclear family (husband, wife, sons, and daughters) are other household members who are either the couple's parents, in-laws, brothers, sisters, nieces, nephews, cousins, and grandparents. The data also disclosed that there are more female household members (51.1%) than their male counterparts (48.9%) although the difference is not substantial. The average household size is five (5) which is not consistent with the national average of 4.3, based on the Philippine Statistics Authority 2015 Census of Population. Consistent with the patriarchal setup of a Filipino family, the majority of the households are mostly headed by the males who are husbands/fathers. Nonetheless, about one in every 10 households is headed by females who are mostly widows. There is a high proportion of female spouses belonging to the fertility age.

Household heads and spouses have low educational attainment. The low level of education may be dictated by poverty, among which are geographical location, the condition of the roads, and access to public transportation. Although gender gap in education exhibited by the household heads and spouses may not be significant, it is worth noting that 2 in every 10 women pursued college education compared to their male counterparts. Concerning Technical-Vocational schooling, more male household heads/spouses than their female counterparts took the skills-focused courses. Another feature of the households is that they are culturally and linguistically diverse. Coming from the same ethnic background tends to be the norm when it comes to marriage. Nonetheless, many seemed to be more open to intermarry with someone coming from another ethnic background; notably a spouse who is indigenous to the place. The language spoken at home depends on the ethnic origin of the household head and spouse. However, due to the deep influence of the migrant settlers, the respondents of the study also speak, or at least, understand well the language of the migrant settlers.

3 Key Findings and Analysis

3.1 Transportation Access and Mobility for Household Essentials

3.1.1 *Chores considered traditionally as "men's work" that entails heavy lifting, long walking and time spent, and food production are generally performed by the male family members while women's household tasks are associated with housework, childcare, school care, and medical care for the family.*

This is exemplified by the huge proportion of the males doing the following household tasks: fetch water, gather/collect firewood, go to the rice/corn mill, purchase cooking gas, gather food in the forest, and take care of the crops. The tasks of the women, on the other hand, involved bringing the children to school and back to the house almost daily. Women going to the sari-sari or convenience store daily more so than the men (16.6% v 6.25%) and to the wet market once a week (20.3% v 13.9%). It is obvious from Table 1 that women's productive work is also associated with raising a few heads of livestock (pigs, goats) and poultry (chicken) in the backyard. Women are also predisposed to visiting relatives, neighbors, and friends more than men.

3.1.2 *Women travel longer distances, longer travel times at higher travel costs to perform household tasks.*

Women may be homebound because of responsibilities like food preparation, laundry and house cleaning, and child/school/medical care of their family; however, they travel more distance (kilometers), spend more travel costs, and spend more travel time than the men. Also, the women are taking on more roles in petty vending/ microenterprise and microservices activities thereby contributing to the households' income. Almost the same proportion of men and women do household chores on a daily and weekly basis.

Significance tests were made to determine whether or not the number of times a specific household essential/task is performed (daily, per week, or monthly) varied by gender. These tests were particularly applied to six household essentials namely: (a) fetch drinking water; (b) fetch water for domestic use; (c) gather firewood; (d) buy LPG/gasul; (e) fish in the river/creek/sea; and (f) gather food in the forests.

3.1.3 *The prevailing road condition makes it difficult for people to get to their destination, making it extremely difficult to accomplish their household tasks.*

They described the condition of the road as steep, narrow, too grassy, filled with stone rocks, muddy and slippery when it rains.

3.1.4 *The location of household essentials determines the gender of the doer.*

The farther the location of the household essentials the men are the doers; in contrast, the closer the location the doers are the women. This is illustrated by the Bukidnon households, where 22.9% of the males reported to be the doers, while 52.8% are women for household essentials that are located less than a kilometer away from their respective homes. This holds also with the households in Sarangani and South Cotabato. This could be explained by the fact that domestic chores (house cleaning, washing of clothes, food preparation, childcare) are located within the house premises and are traditionally assigned to the women.

Two significant differences were found in terms of distance from the house to the location of the household essentials/tasks. The location of the area where drinking water is fetched varied significantly by gender. Women, in general, live farther from the location where drinking water is fetched (M = 649.17 meters, SE = 149.77) compared to the men (M = 281.09 meters, SE = 50.26). This difference, −368.08 meters, is significant [$t(180.83) = -2.28$, $p<.05$).

3.2 Transportation Access and Mobility for Healthcare Services

3.2.1 *Women take on more tasks related to healthcare services compared to men.*

The traditional role of women associated with healthcare services is evident in the study. All tasks related to access and mobility for healthcare services are completed by the women. This is evidenced in the data presented in the table below (Table 4). Considering the devastating

impact of the current pandemic, these further aggravate the burdens on women.

3.2.2 *More men than women travel more distance but the latter spend more travel time and travel cost for healthcare services.*

Although the men (11 kilometers) travel more in terms of distance than women (10.04 kilometers) the difference (1.33 kilometers), however, is not substantial. The women spend more travel time (54.52 min v 49.34 min) and travel costs (98.08 pesos v 91.27 pesos) than men (Table 6).

3.2.3 *More sick male family members are brought to the hospital than the women patients while more men than women decide on emergency medical transport.*

For emergency medical services, male patients are more likely to be brought to the hospital than female patients, and female patients are more likely brought to the health center than their male counterparts. The males are also more likely the decision-maker as to the emergency medical transport than their female counterparts (Table 6).

Health Clinic Female respondents visit the health center more frequently (M = 1.24, SE = .08) than the male respondents (M = 1.13, SE = .12); the difference, however, is not significant. There is a significant association found between the gender of the person who goes to the health center (Rural Health Unit or Barangay Health Center) and the mode of transportation used to reach the nearest facility**.** Women are more likely to walk than men to reach the nearest facility (59.7% vs 42.1%) while men are more likely to use a motorized vehicle than women (57.9% vs 40.3%). These responses are significantly different.

> Across gender, women are significantly more likely to use tertiary and national roads than men.

Mental Health There is a significant association between the two variables, where the distance of the residence of women is significantly farther from the nearest mental health facility (mean rank = 18.07 kilometers) compared with men (mean rank = 10.94 kilometers).

Pharmacy Based on this survey, women live farther from the nearest pharmacy (M = 11.71 kilometers, SD = 1.90) than men (M = 9.66 kilometers, SD = .87). However, this difference (2.04 kilometers) is *not significant*. Results also showed that women have more frequent visits to the nearest pharmacy (M = 1.12, SD = .06) than men (M = 1.10, SD = .08) but this difference (−.02) is not significant. Similarly, women have longer travel time to the nearest pharmacy (M = 58.29 min, SD = 3.16) than men (M = 51.35 min, SD = 4.28) but the difference (−6.94 min) is *not significant*. In terms of transportation cost, men reported spending more (M = 100.77 pesos, SD = 12.66) than women (M = 99.20 pesos, SD = 8.02) but this difference (1.56 pesos) is *not significant*.

Interestingly, a significant association is found between the gender of the person who usually avails of pharmaceutical services and the mode of transportation used to reach the nearest facility. Across gender, women are more likely to walk than men to reach the nearest facility (14.0% versus 7.2%) while men are more likely to use motorized vehicle than women (92.8% versus 86.0%). These responses are *significantly different*. Further, a *significant relationship* is also found between the gender of the person who usually avails of services in the nearest pharmacy and the type of road used to reach the nearest facility. Across gender, women are more likely to use tertiary, secondary, and national roads than men.

Dental Services In this study, the residence of men is farther from the nearest dental facility (M = 13.78 kms, SE = 1.64) than the women's (M = 8.29kms, SE = 1.08). This difference, 5.49 kilometers, is significant. For the other scale variables, the men have higher mean scores than

women, but the difference is *not significant*. Interestingly, however, a significant association is found between the gender of the person who usually avails of dental services and mode of transportation used to reach the nearest facility. Across gender, women are more likely to walk than men to reach the nearest facility (17.8% versus 2.3%) while men are more likely to use motorized vehicle than women (97.7% versus 82.2%); these responses are *significantly* different. However, the relationship between gender and the type of road used to reach the nearest dental facility is not significant.

Emergency Medical Transportation/Emergency Medical Services In this study, men registered higher mean scores than women for the following variables: distance from residence to the nearest facility, number of times the person visited the facility, and cost of transportation. The difference is not significant, however. Women had higher mean scores for transportation cost than men, but the difference is also *not significant*. No significant association is also found between gender and mode of transportation to reach the nearest facility, on one hand, and the type of road used to reach the nearest facility, on the other hand.

3.3 Transportation Access and Mobility for Livelihood and Microenterprise Purposes

3.3.1 *Four in every 10 household respondents are engaged in agriculture.*

Note that while the research areas are considered agricultural communities, only about 41% of the household respondents are engaged in agriculture. Major crops raised include corn, rice (upland and lowland), banana, coconut, and abaca. Their secondary crops are pepper, cacao, root crops and vegetables, and fruit trees. Livestock and poultry are raised in the backyard by a few households. Most farms are located within the barangay, to which they just go on foot (males = 70.2%; females = 65.6%) while others ride on a single motorcycle to reach the farms. For those who have farm animals (horse, carabao, cow) and turtle tractor (*bao-bao*), the men, in particular, use these as their modes of transportation. The roads going to the farms are that of the unclassified type (male = 75.4%; female = 77.5%) and are mostly not in good condition, especially during the rainy season.

3.3.2 *Generally, they only have one source of livelihood; others, though, have diversified their sources of income.*

Eight in every 10 households have only one source of income. They generally subsist on agriculture-related activities. They are the crop producers (corn, rice, vegetables, coconut, abaca, banana, coffee, cacao, peanut, rootcrops, vegetables, and other unspecified crops) and livestock and poultry raisers. Nonetheless, 3 in every 10 households have diversified their sources of income by taking in jobs related to microservices (construction worker, farm laborer, welder, *habal-habal* or modified motorcycle driver, carpenter, public servant, employee, teacher, salesgirl, manicure, pedicure, and wedding organizer, among others). Others have additional income derived from micro-enterprise/petty vending activities (sari-sari store, buy and sell, *kakanin*/ice cream/ice drop vending). Only a few are engaged in fishery-related livelihood. Homebased livelihood includes a sari-sari store, manicure and pedicure, dressmaking, and hog/poultry raising (Fig. 23.2).

3.3.3 *More women are employed in microenterprise and micro-services than in agriculture.*

While agriculture is dominated by men, in contrast, petty vending/microenterprise are noticeably dominated by women. They manage a sari-sari store, process food, vend food delicacies (*kakanin*), and handicraft, and engage in the buy-and-sell business of used clothes (*ukay-ukay*), and raise livestock and poultry in the backyard. It is also noticeable that more women than men are employed in micro-services activities.

Province	Agri-farming		Fishery		Petty vending/ Micro-enterprise		Micro-services*	
	Female	Male	Female	Male	Female	Male	Female	Male
Bukidnon	22.2	8.3	0.0	0.0	13.9	13.9	30.6	11.1
Davao Oriental	20.0	22.9	0.0	2.9	14.3	8.6	8.6	22.9
Davao del Sur	13.5	35.1	0.0	0.0	20.3	21.6	4.1	5.4
Misamis Oriental	13.4	22.0	0.0	1.2	6.1	3.7	22.0	31.7
Sarangani	18.8	27.5	1.3	8.8	5.0	5.0	21.3	12.5
South Cotabato	14.8	22.7	1.1	0.0	1.1	1.1	34.1	25.0
Total average, %	16.2	24.6	0.5	2.3	8.9	8.1	20.8	18.7
Total	40.8		2.8		17.0		47.3	

**Includes formal employment like teacher, government employee, government official, salesgirl, etc.*

Fig. 23.2 Compared to men in agriculture, more women were employed in micro-enterprise and microservices

Fig. 23.3 Compared to men, women took on majority of tasks related to banking, finance, government and business services

Activities related to agriculture livelihood services	In percent	
	Female	Male
Procurement of fertilizer and pesticide	31.6	68.4
Bring farm produce to the processing center	23.1	76.9
Bring farm produce to baf sakan / drop-off center	18.9	81.1
Deliver farm produce to the market	22.4	77.6
Deliver farm produce directly to the buyer	17.2	82.8
Go to the bank/financing or lending institutions	78.6	21.4
Go to municipal, provincial or city hall	58.1	41.9
Logistics	50.0	50.0
Go to the Dept of Trade & Industry (DTI)	100.0	0.0

3.3.4 *Women's role in activities related to agricultural livelihood services can be said as minimal.*

This is evidenced by the little role the women have in the procurement of farm inputs like fertilizer and pesticides as there are more men than women (68.4% v 31.6%) assigned to do the task, as shown in Table 8. The nominal role of women versus the dominant role of the men is further highlighted in the chores of bringing the farm produce to the processing center (76.9% v 23.1%); to the *bagsakan* or drop-off center (81.1% v 18.9%); to the market (77.6% v 22.4%); and bringing their farm produce to the direct buyer (82.8% v 17.2%).

Interestingly, the activities in which the women are dominant are in going to the bank/financing or micro-lending institutions (78.6% v 21.4%), and in going to the municipal/city/provincial hall (58.1% v 41.9%). Presumably, the women's going to the bank/financial/micro-lending institutions is for financial assistance for the family's agricultural production activities and/or for the family's domestic needs (e.g., children's education, medical care) (Fig. 23.3).

3.3.5 *Women have less access to production support services than men.*

Only 25% of peasant women have access to production support services. The data further shows that the farm technology is the least the women have access to, like hand tractor, thresher, weeder, and harvester thus implying a backward technology in crop production. This is compounded by having less access to the other production support services like production capital, irrigation, seeds/seedlings, fertilizer and pesticides, and pest management.

3.3.6 *Males spent more travel time than the females going to the farm, but the females spent more on travel cost than the males.*

On average, the males spent 1 h and 7 min compared to the females' 48 min in going to the farm. However, the females could reach the farm faster than the males; the former's walking time is 44 min compared to the males' 57 min presumably due to the distance of the farms to their homes. In terms of travel cost, the women spent an average of P140 while the men P58 (Table 9).

3.3.7 *Location of agriculture livelihood services is paved with unclassified and/or tertiary roads.*

Data shows that the farmers have to traverse the unclassified road and/or tertiary road when bringing the farm produce to the processing center, *bagsakan*/drop-off center, to the market, and bringing the farm produce directly to the buyer. The condition of the road would also depend on the season, and whether the activity is being done during the dry or wet season. Walking/head loading/backloading the farm produce from the farm to the location of the agriculture livelihood services is done if these are located within the barangay. Hiring a motorcycle (*habal-habal*), multicab, jeep, or elf-truck is done depending on the weight and number of sacks to be transported. Outside the barangay, the road typifies that of the secondary and national roads. Travel cost depends on the distance but ranges from as low as P20 to as high as P300. Travel time outside the barangay ranges from 30 min to 2 h.

3.3.8 *Six in every 10 household respondents are engaged in non-agricultural activities.*

Table 10 shows that almost 60% of the household respondents have sources of income that are not agriculture related. Furthermore, there are more women whose sources of income are derived from petty vending/micro-entrepreneurial activities; however, there are more men than women whose income is sourced from selling their labor or services (Fig. 23.4).

3.3.9 *Overall, women have a longer average travel time and higher travel costs than men.*

As shown in the table, the women, on average, spend 48 min of travel time compared to the men's 46 min. These are particularly demonstrated by the women from Davao Oriental, Bukidnon, and Davao del Sur. They incur 96.03 pesos per trip higher than the men's 79.09 pesos, as revealed by the data from Bukidnon, Davao Oriental, Davao del Sur, and Misamis Oriental. The women are mostly involved in the tasks related to petty vending/microenterprise and micro-services which require them to frequently take trips either by walking or motorized riding (single motorcycle).

3.3.10 *More women than men take the unclassified and tertiary types of roads.*

The data show that more women than men take the unclassified and tertiary types of roads in going to the location of their livelihood. The table further shows that while more men than women walk on the unpaved road going to the farms and fishing grounds, there are more women involved in microenterprise and micro-services livelihood and walk traversing the unclassified and tertiary road to the location of their livelihood in conducting their economic activities (Table 12).

3.4 Transportation Access and Mobility for Education

3.4.1 *Children's education is affected by the current road and transport situation.*

More than half of the respondents affirmed that the road and transport situations in their community have created barriers or challenges to their children's education, in which, according to them, the female students (54.1%) are more affected than the male students (22%). But female or male they are all affected as school children.

Fig. 23.4 For livelihood tasks, women spent longer travel times and costs, and traveled mostly on local roads compared to men

Table 10. Non-agriculture based main livelihood or source of income by gender (multiple responses), in present

Livelihood	Male	Female	Total
Fishing	1.5	1.3	1.4
Petty vending/micro-entrepreneur	7.1	15.0	10.7
Micro-services	48.2	40.9	44.9
Employment/formal sector*	0.5	4.4	2.2

*Includes formal employment like teacher, government employee, government official, salesgirl, etc.

Table 11.1 Travel time and travel costs by gender

Province	Total travel time (minutes)		Total travel costs (pesos)	
	Female	Male	Female	Male
Bukidnon	53.2	39.3	130.00	123.00
Davao Oriental	72.7	40.0	116.67	16.67
Davao del Sur	53.2	40.3	130.00	123.00
Misamis Oriental	54.5	60.0	114.50	44.86
Sarangani	25.0	50.0	35.00	92.00
South Cotabato	31.2	44.5	50.00	75.00
Total	48.3	45.6	96.03	79.09

Table 11.2 Travel cost, in pesos

Province	Low	High	Average
Bukidnon	10	300	70
Davao Oriental	70	70	70
Davao del Sur	20	300	125
Misamis Oriental	10	300	70
Sarangani	10	30	67.50
South Cotabato	10	150	69.16

Table 12. Percent of respondents by gender and type of livelihood and type of road

Livelihood	Tertiary		Secondary		National		Unclassified	
	F	M	F	M	F	M	F	M
Agri-farming	15.9	15.2	6.6	5.3	0.0	4.6	27.8	24.5
Fishery	0.0	0.0	0.0	0.0	0.0	0.0	90.0	9.1
Microenterprise	30.2	18.9	11.3	3.8	5.7	0.0	20.8	9.4
Micro-services	10.8	10.8	10.8	10.8	2.4	6.6	30.1	17.5
Total	15.2	13.4	8.9	7.3	1.8	4.7	27.3	21.3

F=female; M=male

Table 13. Percent of respondents by gender who foresee an increase in their income with improved transporatation options

Province	Yes		No		Not sure	
	F	M	F	M	F	M
Bukidnon	50.0	15.5	5.2	1.7	22.4	5.2
Davao Oriental	49.1	43.5	0.0	1.9	0.0	3.8
Davao del Sur	40.0	41.1	1.1	2.2	6.7	8.9
Misamis Oriental	36.2	54.3	0.0	0.0	5.3	3.2
Sarangani	36.9	32.1	2.4	1.2	11.9	15.5
South Cotabato	44.0	52.0	2.7	1.3	0.0	0.0
Average %	42.7	39.7	1.9	1.4	7.7	6.1

F=female; M=male

3.4.2 *Girls have limited mobility or have mobility restrictions and are mostly accompanied by a male family member if they go out.*

Four in every 10 respondents said that girls in the family have limited mobility "all the time" and 3 in every 10 respondents also said "sometimes" while another 3 in every 10 respondents said that girls in the family have no mobility restrictions. If girls go out, they are accompanied by a male family member (54.9%), a female family member (27.2%), or any male or female family member (17.8%).

3.5 Safety and Security

3.5.1 *Adult men and teenage boys are mostly involved in road-related accidents.*

Adult men are almost always involved in road-related accidents in the study areas as compared to adult women (Table 16). The same is true with teenage boys being primarily involved as compared with teenage girls. Young boys and young girls also figured in road-related accidents. It can be assumed that these road-related accidents are caused by the kind of road and the kind of users and uses that ply these roads. Asked about any concerns regarding safety when using transportation, both women and men identified overspeeding of vehicles, overloading of passengers, and overloading of cargo (farm produce, etc.). Unlit roads are also mentioned which implies many accidents do happen in the evening. Poorly maintained vehicles and poor traffic signaling in addition to roads with obstructed views/foliage/overgrowth contributed much to the road-related accidents. Since the most common transport vehicle in the rural barangays is the *habal-habal or modified motorcycle*, the commuters are also concerned with the drivers without proper registration papers and are not wearing helmets. Six in every 10 female and male respondents described their roads as generally accident-prone (Table 17) (Fig. 23.5).

3.5.2 *Both men and women experiencedverbal and physical abuse, andsexual harassment-during commutes but more women than men report the incidence to authorities.*

Table 16. Road-related accidents in the past year by gender

Mostly involved in the accidents	%
Adult men	46.5
Adult women	15.8
Teenage boys	25.0
Teenage girls	5.5
Young boys	3.5
Young girls	2.7
Total	99.9

Table 17. Concerns regarding sagety and security by gender, in percent

Concerns	%	
	Female	Male
Over-speeding of vehicles	69.7	78.0
Overloading of passengers	66.2	68.2
Overloading of cargo (farm produce, etc)	65.7	60.9
Unlit roads	69.9	63.1
Roads with obstructed views, foliage	59.6	59.4
Sheltered and lit waiting areas	46.4	40.4
Accident-proneroads	66.5	62.3
Safe pedestrain paths	49.1	45.6
Fear of sitting next to unknown passengers	62.0	59.9
Poorly maintained vehicles	64.4	60.2
Poor traffic signaling	60.2	61.2
Lack of reliable information (i.e., bus stop schedule of arrival/departure of the bus, jeepney, etc)	44.3	36.1
Vehicles without registration papers	45.9	44.6
Motocycle drivers without ahelmet	52.5	47.5

Fig. 23.5 More men and boys are likely to be involved in road accidents, and more women reported security and safety concerns

Women and men report a fairly similar experience of verbal abuse/confrontations with the driver/conductor or co-passengers during commutes. Men have a higher frequency of experience of physical abuse, about 5 times more in a year, compared to women. Findings show that women are more likely to report the incidence of physical abuse than men (Fig. 23.6).

As shown in Table 18, it appears that more male respondents have experienced verbal and physical confrontations with the driver/conductor or co-passenger. In most incidents, these are not reported to the proper authorities by the adult men; in contrast, one or two female respondents involved in the incident found their way to the authorities to report the incidents of verbal and physical abuse.

In general, women reported a higher frequency of experiencing sexual harassment (M = 1.68 or about 5 times in a year, SE = .22) compared with men (M = 1.67 or about 5 times in a year, SE = .36). However, the difference (−.24) is not significant [t (38.72) = 1.86, p>.05]. Noticeable though is that none of these respondents have reported to the proper authority the sexual harassment they experienced during their commutes.

Asked if they knew someone who experienced sexual harassment during their commutes, results show that women expressed greater affirmation to this question compared to men (20.2% v 18.8%) although the study shows there is no significant difference between gender and knowledge of someone who experienced sexual harassment during their commutes [Pearson chi-square analysis, $x^2(1) = .18$, p>.05]. Among respondents who reported that they knew of someone who experienced sexual harassment during their commutes (n = 99), response patterns are quite similar for both men and women. It is worth noting that men are more often observant of this type of abuse experienced by another person during their commutes (M = 2.43, SE = .22) compared to women (M = 2.19, SE = .19). The difference, however, is not significant. Of the 99 individuals having observed someone being sexually harassed during their commutes, none of them reported the incident to the proper authorities.

Table 18. Experiences during commutes by gender, in percent

Experiences	%	
	Female	Male
Verbal abuse/ confrontations with driver/conductor/ co-passengers	17.9	19.0
Physical abuse/confrontation with driver/conductor/ co-passengers	2.8	4.8
Sexual harassment	6.2	9.2
	Mean score	
Sexual harassment	1.68	1.67
Respondents' knowledge of someone who experienced sexual violence during his/ her commutes, in percent		
Adult men	15.0	12.6
Adult women	6.4	9.0
Teenage boys	4.0	8.0
Teenage girls	1.5	1.5
Young boys	6.5	4.5
Young girls	0.0	0.0

Table 19. Concerns about personal safety, in percent (multiple responses)

Concerns	Female	Male
Personal safety and travel	45.9	46.2
Felt not safe waiting along the street for their commute	37.1	36.5
Road accidents	56.2	59.8
Harassment	17.7	13.0
Accidents, harassment, and theft	7.3	6.5

Table 20. Respondents' restrictions on time of day of travel by gender, in percent

If there is a restriction	Female	Male
Yes, with restrictions	24.4	19.8
None, no restrictions	27.9	27.9
Total	52.3	47.7
Overall total	100.0	
These restrictions are the following:		
Curfew time: be home before 6 pm	2.5	4.0
Curfew time: be home between 7.10 pm	12.1	7.6
Curfew time: before 9 pm	4.5	2.0
Curfew time: be home by midnight	0.5	0.5
Curfew time: be home by 1 am	0.0	0.5
Daytime travel only, absolutely no evening	23.2	21.2
If it is evening and raining	2.5	2.5
Not in the late afternoon because there'd be no more trips	1.5	1.5
Whenever the weather is bad, no travel at all	6.1	6.1
Avoid travelling if there are checkpoints for unregistered vehicles	0.5	0.5
Total %	53.4	46.4

Fig. 23.6 More women reported concerns with personal safety and reported restrictions on time of day travel compared to men

3.5.3 *Both women and men are concerned about their safety during commutes.*

Men are slightly much concerned about personal safety and travel than women (46.2% versus 45.9%) but this difference is *not significant*. Asked if they feel safe waiting along the street for their commute, there is a higher percentage of women who felt they are not safe (37.1% versus 36.5%). However, the difference is *not significant*. Women and men who felt unsafe waiting along the street for their commutes (n = 188) register the same response patterns in the following order as follows: accidents (56.2% for women and 59.8% for men); harassment 17.7% for women and (13.0% for men); and accidents, harassment and theft (7.3% for women and 6.5% for men).

Mostly, women feel unsafe as they fear road accidents, the verbal/physical abuse perpetuated by the driver/conductor/co-passenger, possible sexual harassment, and theft that may ensue while waiting along the street. Likewise, they feel unsafe because the streets have no lights and are quite far from houses and that when it is dark, wild animals, snakes, and harmful insects usually make an appearance frightening the residents.

3.6 Well-Being

3.6.1 *Are the household respondents satisfied on the impact of their current transportation options on the six dimensions of social life or wellbeing namely, household tasks, family relations and support networks, health care, education, and livelihood?*

Comparing the mean scores of women and men, it appears that they share the same response patterns. In other words, they are "satisfied a little" on five out of the six dimensions. It is on the dimension of livelihood that women and men are "not satisfied at all" on the impact of their current transportation options on their livelihood (1.89 versus 1.73). Interestingly, more women are not satisfied at all on the impact of the current transportation options on health emergency and livelihood. Inferential analysis, however, reveals that the degree of satisfaction on the impact of current transportation options did *not significantly* vary by gender across each of the six dimensions of social life.

On the impact of travel time, more women than men are most likely "not satisfied at all" on their impact on the six social dimensions (1.87 versus 1.84). The degree of satisfaction on the travel time significantly differed only on healthcare. About travel cost, the data shows that more women than men are not satisfied at all (1.86 versus 1.84) on its impact on the six dimensions of social life. The inferential analysis, however, shows that women and men *differed* only on two dimensions namely, family relations and support networks and healthcare.

4 Lessons Learned

> *… the full and complete development of a country, the welfare of the world and the cause of peace require the maximum participation of women on equal terms with men in all fields*. – Declaration on the Elimination of Discrimination Against Women

The Philippines, a signatory to the Declaration on the Elimination of Discrimination Against Women, has the Magna Carta of Women and several issuances to fast-track gender mainstreaming in infrastructure projects, among others, aimed at showing results in the quality of lives of women and men, girls and boys. Irrespective of the type of infrastructure project, the men and women are unfortunately wrongly viewed as a homogenous population. The Philippine Commission on Women concludes that "having the same needs, vulnerabilities, access, and opportunities in deciding what facilities are needed where, how they will be maintained, how much they should cost each user, and the like. By recognizing the differences among those affected by infrastructure, projects can help achieve better gender equality results."

4.1 Transportation Access and Mobility for Household Essentials

Undertaking household essentials/ chores is doubly difficult for the women than the men because the former have to travel longer distances, travel more frequent and longer trips, and spend more for traveling. The prevailing road conditions and mode of transportation to get to their destination makes the journey extremely difficult to accomplish essential and daily tasks. The roads that these women travel on a daily basis are generally the tertiary and unclassified types and the condition is wanting—steep, narrow, too grassy. Landslides are a common occurrence in some parts of the surveyed villages and the roads are muddy and slippery during rainy days and the eight-month rainy season from May to December. The locations of some of the household essentials are far for the women who have to walk a distance. The women who perform the tasks of going to the rice mill or corn mill, going to the farm, and collecting or harvesting vegetables are more likely to walk than their male counterparts. The frequency of fetching drinking water is higher for women—who live farther from the water source—than the men. Thus, the condition and the type of the road and the mode of travel of the residents are significant when the distance from the house to the location of the household essentials/chores is considered.

4.2 Transportation Access and Mobility for Health Care Services

The traditional role of women associated with healthcare services is evident in the study, that is, all tasks related to access and mobility for healthcare services mainly rest on the shoulders of women. Although more men travel longer distances, the women, however, spend more travel time and travel cost for healthcare services because they have more frequent visits to the pediatric facility, health clinic, and the pharmacy or drugstore. It is also important to note that women than men are more likely to pass through tertiary and unclassified types of roads. The women are also more likely to walk while the men are more likely to use motorized vehicle in going to the health facility. Improvement in the transportation access and mobility for health services shall bring in significant impact on the health of the people and particularly women who are less likely to receive medical services, emergency healthcare, and be brought to the hospital.

4.3 Transportation Access and Mobility for Education

The road and transport situation are barriers to the children's education. Children's tardiness to class is pervasive because of the road condition and scarcity of vehicles and travel costs. On rainy days, the road is full of mud holes that vehicles encounter frequent breakdowns. It is also during the rainy days that travel cost becomes expensive. Other than scarcity of vehicles and road blockage, some vehicles are also no longer fit for commute endangering the riding school children.

4.4 Transportation Access and Mobility for Livelihoods

Depending on the distance of the farms from the house which are generally located within the barangay, the women were more likely to walk. The men are also more likely to walk to their farms or take a motorcycle ride. The men's travel time is longer than the women's because their farms are either located in the fringes or outside the barangay where they live. Comparatively the women are also more likely to travel on tertiary and unclassified types of roads going to the farm. The same can be said with regard to the location of the agriculture livelihood services. Although the following are more performed by the men, they have to pass through the unclassified and/or tertiary types of roads when bringing the farm produce to the processing center or to the *bagsakan*/drop-off center, to the market, or directly to the buyer.

The majority of the rural households deriving their sources of income from non-agriculture activities reveals there are constraints that muddle the development of agriculture in the sampled areas. Beyond roads and transportation is the landownership problem, low farm productivity, limited connectivity to the market, particularly the lack of quality rural transport such as farm-to-market roads, and the lack of adequate and timely market information support services, among others. All these make farming a "non-bankable" undertaking, discouraging farmers from increasing productivity or even making farming a source of their livelihood. The problem is more profound on the part of the rural women who appear to be marginalized in agriculture. The study further revealed that only a few women have access to production support services particularly farm technology, production capital, and farm inputs (seeds, fertilizers, and pesticides), to name a few. Because there seems to be no "space" for the women in agriculture, many of them instead sell their personal services (laundry, manicure and pedicure, massage, etc.) or derive their source of income from petty vending (food vending, buy-and-sell) and, or microentrepreneurial livelihood (sari-sari or convenience stores, livestock, and poultry raising) which are mostly home-based. In contrast, the men would do additional farm work and find other means to augment the family's coffers.

Should transportation options be improved, more women than men have anticipated a reduced time to accomplish livelihood-related activities. More women than men also foresee an increase in their income, better access and mobility to the location of their source of livelihood, and faster marketing of the family's farm produce. Rural folks would then be encouraged especially the young to go into farming. If the road and transportation situation is improved, it would set off possible business opportunities for residents and migrants alike, consequently creating jobs for the locals and more people paying taxes which the barangay government can judiciously use to finance its public services. If road and transportation options are improved, more women than men can now find time to rest, social, and leisure activities.

However, the Food and Agriculture Organization study pointed out that "the labor burden of rural women exceeds that of men… contribution of women to agricultural and food production is significant…invariably women are overrepresented in unpaid, seasonal and part-time work, and the available evidence suggests that women are often paid less than men, for the same work." Future empirical studies that delve into the essential contributions of women to agriculture and rural enterprises would help in contextualizing gender-sensitive and gender-responsive policies and programs relative to rural infrastructure and livelihood.

4.5 Safety and Security Issues

The roads in the sampled areas are generally described by the residents as accident-prone caused by the kind of road and the kind of users as previously described. The current state of road conditions affects the residents, especially the women's transportation access and mobility for household essentials, healthcare services, education services, and livelihood and microenterprise purposes. More women than men are worried of their personal safety and travel as they feel unsafe waiting along the street for their commute, the road accidents, possible verbal and physical abuse, theft, and sexual harassment. The residents complained about the roads that are almost impassable during the rainy days. They are alarmed by the road accidents that occurred quite frequently—the h*abal-habal* modified motorcycle drivers and passengers who, more often than not, do not wear helmets, the over-speeding, overloading of passengers, overloading of cargo, the poorly maintained vehicles, poor traffic signaling, the unlit roads, and the overgrowth foliage that obstruct the driver's view of the road ahead. The residents, too, are concerned about public transportation vehicles without proper registration papers and motorcycle (*habal-habal*) drivers who do not have a government-issued license to drive.

4.6 Gender-Based Violence Issues

Outside of the protective walls of their homes, gender-based violence during commutes lies in wait. Verbal and physical abuse and sexual harassment do happen to both men and women. Most perpetrators of verbal and physical abuse are the drivers, conductors, and even their co-passengers. Experiences of sexual harassment during commutes have a higher frequency among women than men. It is unfortunate though that very few sexual harassment incidents are reported to the proper authorities. If ever a report to the proper authorities is made, more women than men have the courage to do so. This is why girls have limited mobility or mobility restrictions and are chaperoned by a male family member should they go out. To protect their girls from harm, parents have set some rules relative to commute. In fact, more women than men have imposed restrictions on their time-of-day travel. More women than men, too, have restrictions on the mode of transportation.

Thus, gender equality outcomes are in order for any infrastructure program:

- Improving women's access to safe, reliable, and affordable public transport services and essential infrastructure
- Improved capacity of local women and local infrastructure agencies to participate in local data collection, planning, design, implementation, and monitoring programs that address gender issues and the concerns of different groups of women and men users
- Increased employment of women at all levels (planning, construction, technical, and management) in infrastructure projects or services
- The development of a gender and equity index with which to gauge the approval of a government or donor infrastructure program

In the Philippines, micro, small, and medium enterprises (MSMEs) make up 99.5% of the economy, with women representing 51% of registered MSMEs. Public and private infrastructure and investment planning decisions need to reflect the reality that women are central to the economic and social prosperity of their communities. With the devastating impact of the current pandemic, and the overwhelming burden of caregiving, household and livelihood tasks on women, and their reduced access to healthcare, the participation and stewardship of local women are critical to achieving sustainable development goals.

Acknowledgments This 2019–2020 study was funded by the World Bank and the Australian Government Department of Foreign Affairs and Trade. A parallel study on the role of free and open-source software, cross-sector community-based and women-led local and remote mapping programs was used to analyze rural agriculture infrastructure, commodity flows, logistics, road planning, and road safety.

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