

令和 4 年度 【 学園研究費助成金 < B > 】 研究成果報告書

学部名 生活科学部

フリガナ ムラカミ シン
氏 名 村 上 心

研究期間 令和 4 年度

研究課題名 フィリピンのスラムクリアランスで展開する木造建築の開発

研究組織

	氏 名	学 部	職 位
研究代表者	村上 心	生活科学部	教授
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1. 本研究開始の背景や目的等 (200 字～300 字程度で記述)

東南アジアに位置するフィリピンの貧困地域であるスラム街では、十分な住環境が整備されておらず、衛生環境の悪化により病を患い、命を落とす人も少なくない。フィリピンの住環境の整備は、喫緊の社会課題となっているが、低コストの住宅供給手法は見出せていない。一方、我が国では衰退した林業の復活を目指す活動が活発化しており、例えば奈良県の御杖村では「株式会社御杖村（仮）」地域商社の設立に向け、海外という新市場への木材輸出を視野に入れた新たな取り組みを始めることになった。本研究は、本学とフィリピン大学の包括協定の締結に向けた共同研究の端緒として、フィリピンのスラムクリアランスに対応可能な木造建築に必要な構法、材料の体系化と開発を目的とする。

2. 研究の推進方策 (300 字程度で記述)

本年度は、フィリピン大学ディルマン校の協力により、フィリピンのスラムクリアランスに対応可能な低コストの住宅供給手法を検討するため、スラム街集落の移転計画を事例に、移転プロセスの把握調査（現地調査等）、及びフィリピンでの展開可能性を探るため、低コストと容易に施工できることを前提としたコンクリートブロックを使った建物基礎の施工性の検証（「こうべSDGs 肥料」PR イベント 主催：神戸市、のブース制作での試行）を試みる。スラム街集落は、フィリピン大学ディルマン校内に位置する Village A を調査対象とした。Village A は 2022 年 5 月に発生した火災をきっかけに移転計画が進んでいる。進行している移転計画プロセスを把握することで、現状の住宅供給システムの理解を深め課題を明らかにする。

3. 研究成果の概要 (600字～800字程度で記述)

今年度の本事業は下記の通り実施した。

1. スラム街 (Village A) の移転プロセスの把握

フィリピン大学ディリマン校と共同で Village A の移転プロセスの把握、現在の進行状況、今後のスケジュール、移転先の敷地情報を把握した。

Village A では火災によって家屋 41 棟が全焼、8 棟が一部損壊し、8 名が死亡、105 家族が被害を受けた。フィリピン大学とケソン市が協議し、仮設住宅の建設及び多層階の恒久住宅の建設を決定した。

現在は、仮設住宅の整備を 2023 年 3 月までに完了させるスケジュールで進行しており、2-3 年後の完成を目標に、恒久住宅の基本計画を開始している。

移転先は大学が土地を提供することで合意し、移転のための住民説明会を開催している。対象敷地は、大学キャンパス内に残された田んぼの一部 (約 23 ヘクタール) を活用する予定である。

2. コンクリートブロック基礎の施工性の検討

「こうべ SDGs 肥料」PR イベントで使用するブースの基礎として、コンクリートブロックを使用した。イベントに先立ち、組立試験を実施し、施工手順、施工性、課題点を把握した。結果、現場打ちコンクリートと違いコンクリートブロックを使うことで、基礎としての強度は施工者の技能によらないため一定の強度を保てること、また工期短縮にも繋がることがわかった。一方で、軸材の径によりコンクリートブロックとの定着部分のクリアランスが異なること、引張力に対する加工が必要なことから、応力に合った定着方法を引き続き検討する必要がある。

4. キーワード (本研究のキーワードを 1 項目以上 8 項目以内で記載)

①スラムクリアランス	②木造建築	③強度実験	④フィリピン
⑤コンクリートブロック	⑥移転計画	⑦	⑧

5. 研究成果及び今後の展望 (公開した研究成果、今後の研究成果公開予定・方法等について記載すること。既に公開したものについては次の通り記載すること。著書は、著者名、書名、頁数、発行年月日、出版社名を記載。論文は、著書名、題名、掲載誌名、発行年、巻・号・頁を記載。学会発表は発表者名、発表標題、学会名、発表年月日を記載。著者名、発表者名が多い場合には主な者を記載し、他〇名等で省略可。発表数が多い場合には代表的なもののみ数件を記載。)

「アジア産地直送住宅」橋爪洋司,村上心他7名、2020/9、日本建築学会学術講演梗概集2020、建築デザイン部門、pp358-359

平成3年度日本木材青壮年団体連合会「未来の山創り賞」受賞

VILLAGE A FIRE, ISFs, AND POOK MARILAG RELOCATION SITE

By Maria Faith Varona, UP College of Architecture

I. Demographics (Number of households, residents, and age groups in Village A)

The study site is located inside the University of the Philippines campus. Village A is an employee's housing under the jurisdiction of Barangay UP Campus.

Table 1. Barangay UP Campus Population

	2010	2015	2020
Total Population	36,486	45,520	47,127
Household Population	35,928	44,244	-
# of Households	8,356	10,607	-

Source: Philippine Statistics Authority

Age Group	Population (2015)	Age Group Percentage (%)
80 & above	182	0.40
75 – 79	222	0.49
70 – 74	387	0.85
65 - 69	741	1.63
60 – 64	1,005	2.21
55 – 59	1,372	3.01
50 – 54	1,900	4.17
45 – 49	2,407	5.29
40 – 44	2,897	6.36
35 – 39	3,399	7.47
30 – 34	3,790	8.33
25 – 29	4,179	9.18
20 – 24	4,815	10.58
15 – 19	5,222	11.47
10 – 14	4,142	9.10
5 – 9	4,400	9.67
1 – 4	3,609	7.93
Under 1	851	1.87
Total	45,520	100.00

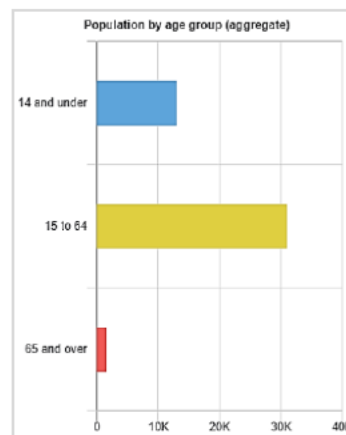
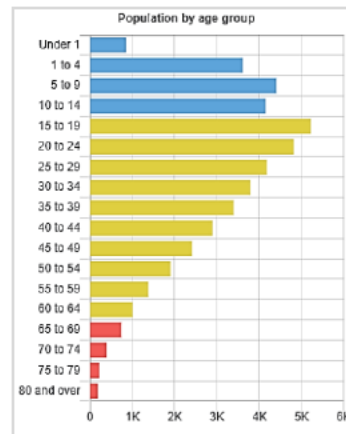


Table 2. Demographics of Barangay UP Campus based on the 2015 Census of Population

Source: PhilAtlas available at <https://www.philatlas.com/luzon/ncr/quezon-city/up-campus.html> accessed 14 January 2023.

Table 3. Barangay UP Campus and Informal Settler Families (ISFs) in Village A

Demographics	2011			2015		
	Overall	ISFs	Percentage	Overall	ISFs	Percentage
Barangay UP Campus	36,486	5,909	16%	45,520	6,327	14%
Village A	1,355	372	27%	-	373	-

Source: Office of Community Relations Report

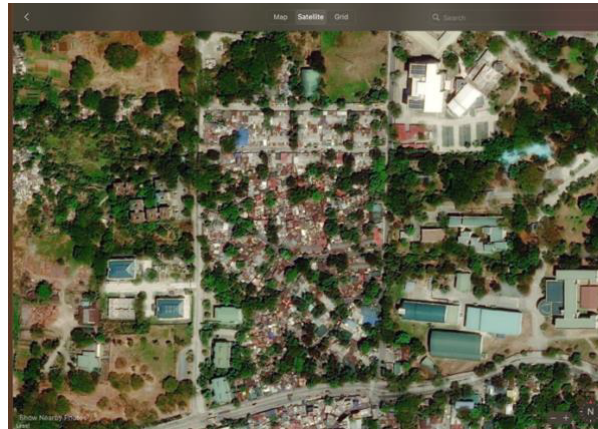
At present there is no available gender disaggregated data and due to the recent fire, the barangay is yet to conduct a census of the area to update its records.

II. Village A Relocation Process: *(The process from the fire in Village A to the decision to relocate)*

The Village A fire happened in the early hours of the morning in 02 May 2022 and caught the residents off guard. Forty one (41) houses were burned to the ground, with eight (8) partially damaged. Eight (8) persons were killed, including a child. According to the barangay, a total of 105 families were affected, comprised of 387 individuals and 282 dependents.



Screen captured from a video footage of the Village A fire from Inquirer.net available at <https://web.facebook.com/inquirerdotnet/videos/fire-broke-out-in-residential-area-in-up-diliman/398887871869717/> accessed 15 January 2023



Village A aerial photograph, before the fire.
 Source: Google Maps



Village A after the fire. Photo source: OCR report courtesy of Prof. Gerry Lanuza



Prof. Lanuza/OCR meeting with the fire victims Staging area with tents
Photos source: OCR report courtesy of Prof. Gerry Lanuza

The Process:

- 1) The families affected by the fire were not allowed to return to their houses after the fire was put out. They were provided temporary shelters in the following locations:
 - a. along E. Jacinto Street
 - b. in the Environmental and Energy Engineering compound
 - c. in Sampaguita dormitory
 - d. in Kamia dormitory
 - e. basketball court (Pook Amorsolo)
- 2) Relief assistance was immediately provided by the barangay, university, and local residents.
- 3) The fire/burned area was fenced-off immediately for security and safety. Retrieval or salvaging of personal property was allowed a day after the fire, only by the families affected by the fire. Scavengers (not fire victims) were not allowed to enter the fire zone.
- 4) The fire affected families were not allowed to rebuild their houses. The OCR and barangay met with the affected families to explain the situation.

- 5) The university administration led by the Chancellor met with the local government of Quezon City (Mayor, City Architect, Housing and Urban Development office); barangay captain, Vice-Chancellor for Community Affairs, and OCR to discuss housing assistance for the affected families.
- 6) The Mayor/Quezon City government agreed to build the temporary housing (plan the site, do house design, and construction) and also the multi-story permanent housing.
- 7) The university will provide the land for relocation.
- 8) The affected families will be provided with permanent housing in Pook Marilag, the identified in-campus relocation site of the university.

The relocation site is already in use, the university relocated around 20 ISFs from “Village C”, an area adjacent to Village B that was illegally occupied by ISFs. This is to make way for the construction of a dormitory/employees housing in the Village C area.
- 9) The OCR conducted community meetings with the fire affected families to discuss the housing relocation option in Pook Marilag. Regular meetings were held to update the affected families of the housing development.
- 10) The LGU started building temporary houses around July 2022.
- 11) The temporary houses (first 80 units) were inaugurated in 19 December 2022.
- 12) The ISFs that were affected by the Village A fire living in the basketball court of Pook Amorsolo were prioritized in the first batch to transfer to stop the rising cases of children getting sick in the tent housing (diarrhea, skin diseases, etc.).
- 13) The local government targets to build 120 temporary housing units.
- 14) The rest of the affected families still living in the dormitories and other sites (mainly UP employees) will be transferred to the temporary shelter by February-March 2023.
- 15) According to the Quezon City local government, the permanent housing will take 2-3 years to build/complete.

III. Roles of UPD and Quezon City departments regarding their respective Village A relocation plans.

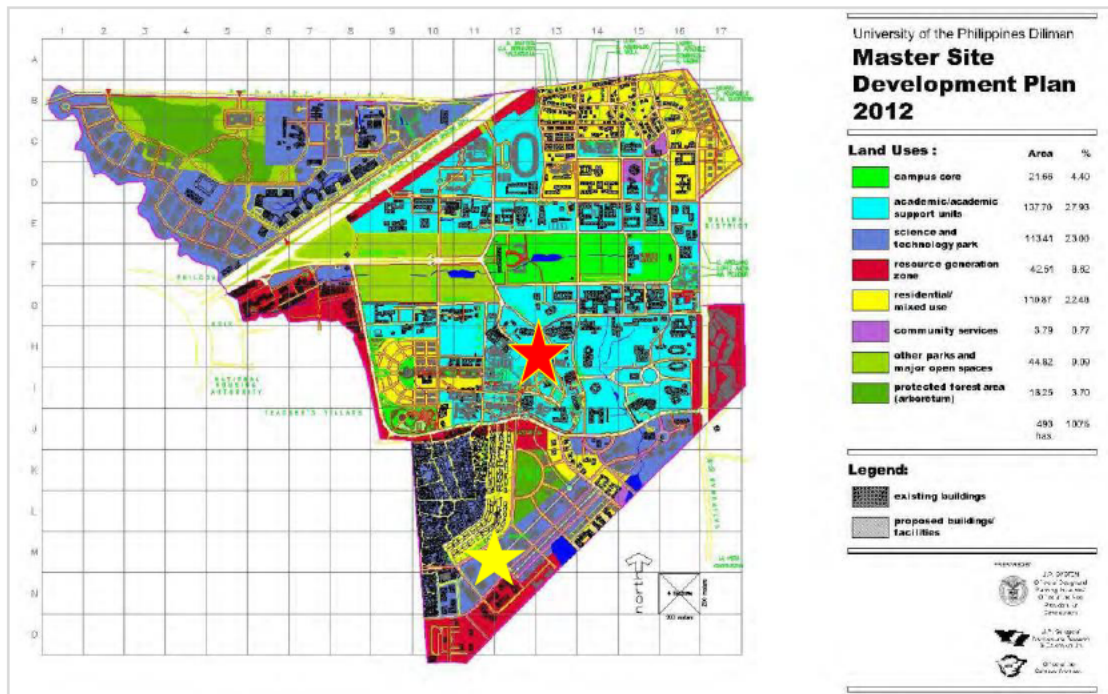
- 1) University
 - a. Conducted an assessment of the fire damage
 - b. Provided relief assistance to the fire victims
 - c. Secured the site of the fire (perimeter fencing and security personnel)
 - d. Created a masterlist of affected families (through the OCR)
 - e. Provided university facilities for the temporary shelters (tents)
 - f. Provided the relocation site
 - g. Organized the affected families (priority UP employees)

- 2) Local Government of Quezon City
 - a. Provided relief assistance to the fire victims (with the barangay)
 - b. Developed the site development plan, house design and construction of temporary houses (through the Office of the City Architect and the Housing and urban Development office)
 - c. Will build the multi-story structure/permanent housing building (target inauguration in June 2023)

- 3) Barangay UP Campus
 - a. Provided relief assistance
 - b. Coordinated with the university (through the OCR) for the management of the fire affected families
 - c. Organized the affected families (in coordination with the OCR)
 - d. Organized the inauguration and transfer to the temporary housing of the first batch of beneficiaries (in coordination with the Quezon City government and OCR).

IV. Site information for relocation of Village A

The relocation site is called Pook Marilag (beautiful or pretty in the local dialect). It is part of the last remaining rice fields at the periphery of the campus property. In the 2012 Master Development Plan of the university, the land use of Village A (red star in map) is classified as academic support unit and the relocation site (yellow star in map) is science and technology park land use.



In 2016, the site was first used as a relocation site for the informal settler families in Village C, affected by the construction of a multi-storey student/employee housing.

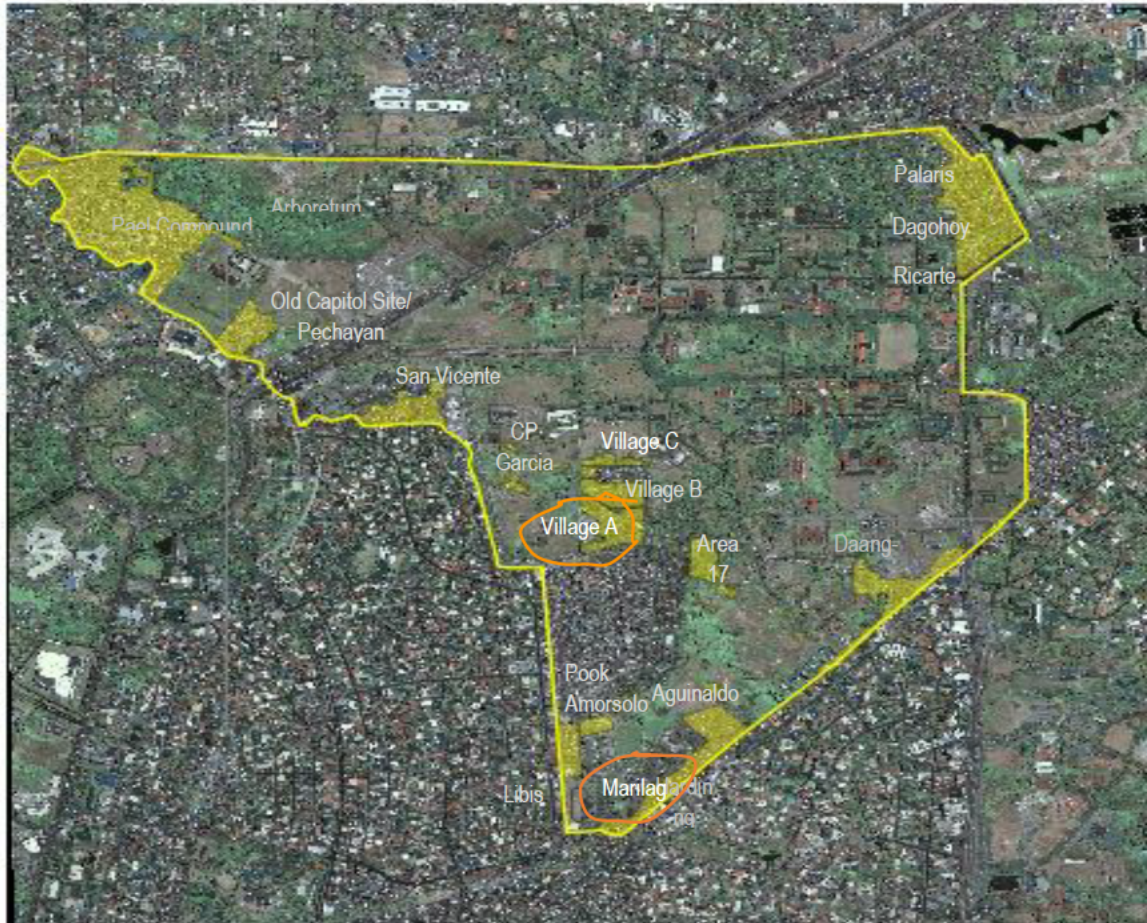


Image 1. Location of Self-Built Units in UP Diliman Campus (2011)

The site is relatively flat and bound in the north by a creek, in the west and south by Sikatuna Bliss, and east by rice fields.

It is approximately 23 hectares in area, the boundaries of the lot has not been established yet.

Only portions at the northeastern part is being used for the relocation.

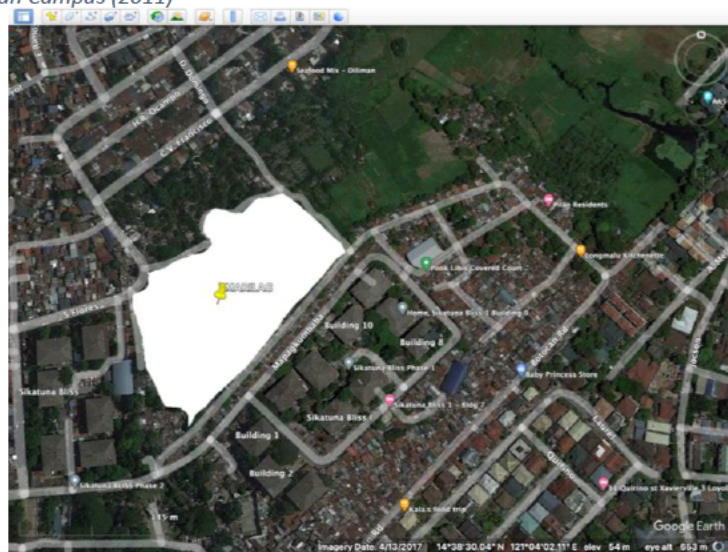


Image 2. Pook Marilag Relocation Site

UPCA - SJU Research Collaboration:
Village A Fire, ISFs, and Pook Marilag Relocation Site
MFVarona, 15 January 2023

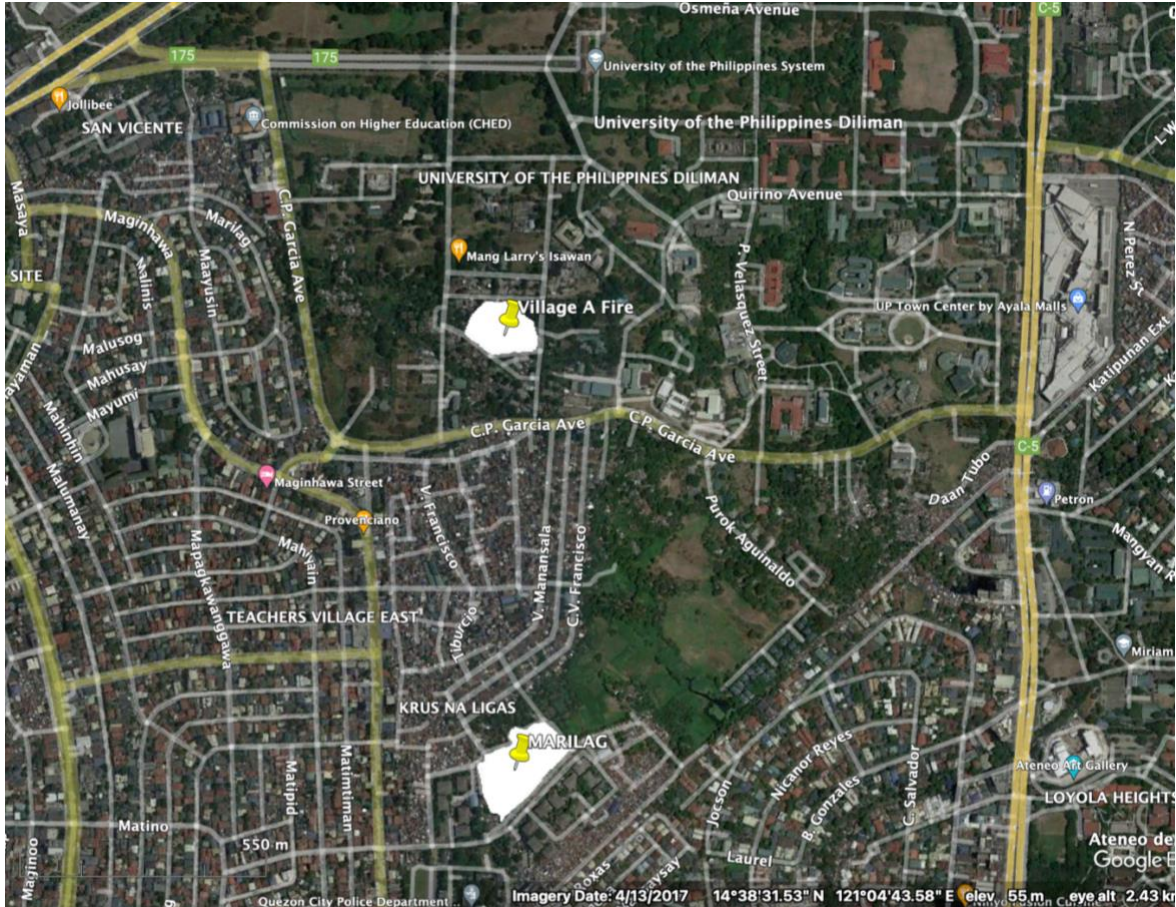


Image 3. Location of Village A in relation to Pook Marilag

The Department of Public Works and Highways (DPWH) built the temporary housing in the relocation site made of semi-permanent materials (half-concrete, half-plywood). Below are photos of the temporary housing built by the DPWH for the relocatees from Village C.



Image 4. Entrance to DPWH Temporary Housing



UPCA - SJU Research Collaboration:
Village A Fire, ISFs, and Pook Marilag Relocation Site
MFVarona, 15 January 2023



Image 5. DPWH Temporary housing Photos by: MFVarona



Image 6. Day Care Center



Image 7. Unit location on site

V. Current progress and future timeline for Village A relocation plans

In 19 December 2022, the first 80 units were inaugurated and the ISFs in the tents were the first to be installed in the transition houses.

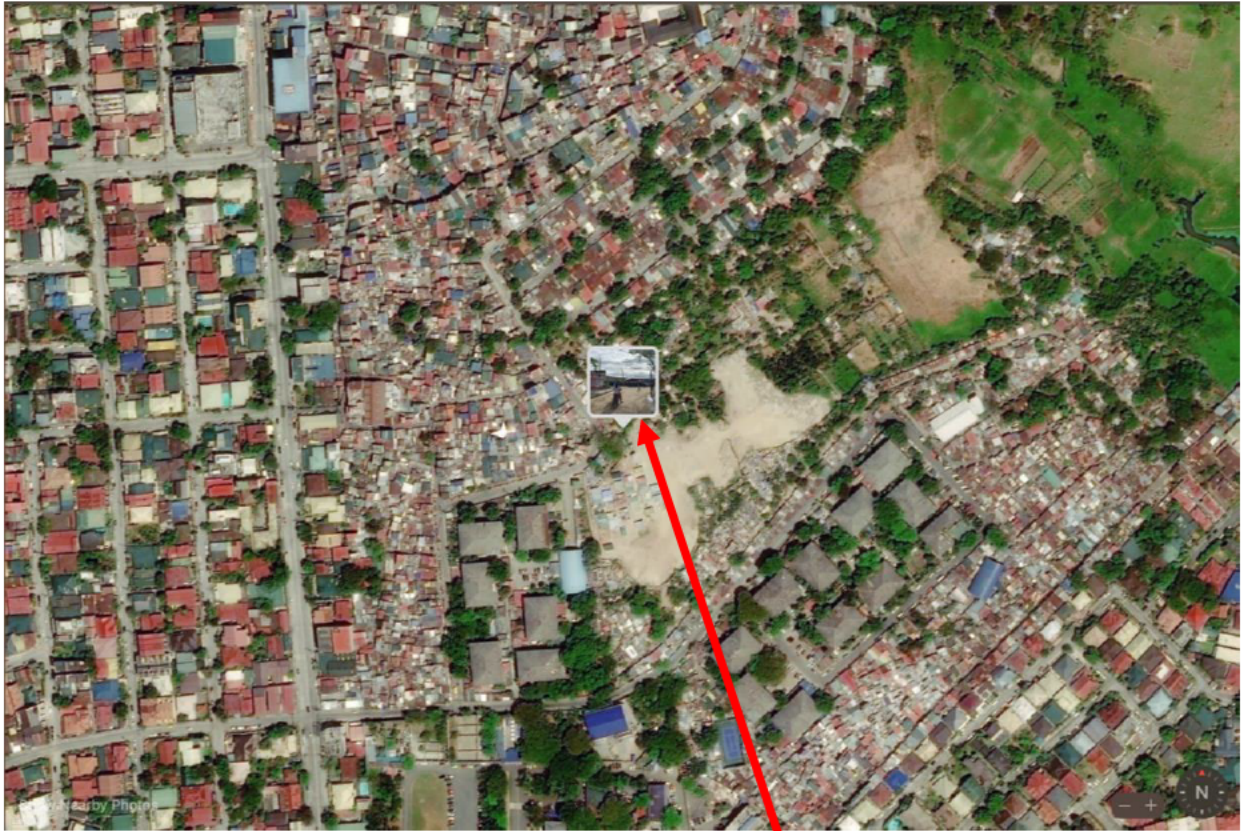


Image 8. Pook Marilag (new transition houses not yet visible)



Announcement of the Inauguration



Entrance to the site

*UPCA - SJU Research Collaboration:
Village A Fire, ISFs, and Pook Marilag Relocation Site
MFVarona, 15 January 2023*



A mass was held and the blessing of the units was done afterwards.



Transition houses (Rowhouse)



Electrical wire installation



Septic vault



Water supply tanks



Interior of the unit



Kitchen with the doors to the toilet (white door) and laundry (brown door)



City Mayor and officials with the beneficiary and family



The UP Chancellor, Quezon City Mayor, City Architect, Councilor, Barangay Officials, OCR, and Vice-Chancellor for Community Affairs attended the event. The next batch to transfer in the transition housing is scheduled in February 2023. These will be the university employees currently staying in the dormitories.

The multi-story permanent housing will take 2-3 years according to the local government of Quezon City. As soon as the transition housing is done, work on the multi-storey permanent housing will start. 🌸

「こうべ SDGs 肥料」 PR イベントのブースデザイン実施報告

2022年12月

■開催日 2022年11月26日(土)

■開催場所 西神中央駅前

■主催 神戸市

■イベント実施内容

下水から回収したリンの肥料活用のPRとして、駅構内にイベントブースを設置し、駅利用者に肥料と花苗を配布した。300セット用意された肥料サンプルの配布とともに、久元喜造市長らが駅利用者にフェアトレードや持続可能性等の意義を呼びかけた。

●村上研究室の実施内容

■イベントブース基礎の施行実験

低コスト住宅の開発に向けた基礎的実験として、コンクリートブロックを建築基礎として活用する施工実験を実施し、強度や施工性の確認を行った。

本実験では、基礎以外の躯体は地域の特産である丹波篠山の竹を用いた。

2022年11月15日(火)に組立試験を行い、施工手順、施工性、課題点を把握した。強度確認は、11月26日(土)のPRイベント時に行った。



写真_組立試験の様子

■竹檣ブースの制作

フェアトレードの理念に則し、持続可能な建築材料である竹材を用いたイベントブースを制作した。

2022年11月26日(土)の「こうべ SDGs 肥料」PR イベントのブースとして制作し、肥料のPRと合わせて、駅利用者に竹材を用いたブースに触れてもらうことで、持続可能性やフェアトレードを啓蒙する活動を行った。



写真_組立試験の様子

写真_イベント当日の様子

写真_イベント当日の様子