

# The Role of the Indonesian Army (TNI AD) In Fulfilling Low Income Housing Need: A Case Study of the Magelang City Scavenger Community



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**Abstract:** For a number of years, the housing construction effort of Gumuk Sepiring Scavenger Community in Magelang City, Indonesia, has been facing a significant stagnation. To tackle this issue, the local government of Angkatan Darat – TNI AD) to overcome the obstacles in the construction process by leveraging the Corporate Social Responsibility budget of Bank Jateng. This initiative raises a pertinent question: Can partnering with the Indonesian Army (TNI AD) lead to a more efficient implementation, particularly considering the constraints of Low Income Community budget?. The study employed a qualitative research method combined with persuasive writing This research discovered that the presence of the Indonesian Army expedited the process of constructing houses through various strategic measures, particularly when dealing with unforeseen circumstances and challenging landscapes (terrain landscape). Additionally, the Indonesian Army played a role in developing untapped skills among scavenger community members. As a result, the presence of the Indonesian Army (TNI AD) holds the potential to address the housing requirements of low-income communities. This underscores the significance of cooperation between the Indonesian National Army (TNI AD) and the government, which can effectively alleviate the backlog of housing projects in urban regions, especially when facing financial limitations.

**Keywords:** Indonesian Army (TNI AD), scavenger community, housing construction in difficult terrain, urban informal settlements, Magelang City Indonesia

## Düşük Gelirli Konut İhtiyacının Karşılmasında Endonezya Ordusunun (TNI AD) Rolü: Magelang Şehri Çöpçü Topluluğu Üzerine Bir Vaka Çalışması

**Özet:** Endonezya'nın Magelang Şehrindeki Gumuk Sepiring Çöpçü Topluluğunun konut inşa çalışmaları birkaç yıldır önemli bir durgunlukla karşı karşıyadır. Bu sorunun üstesinden gelmek için Magelang Belediyesi yerel yönetimi, Bank Jateng'in Kurumsal Sosyal Sorumluluk bütçesinden yararlanarak inşaat sürecindeki engelleri aşmak için Endonezya Ordusu (Tentara Nasional Indonesia Angkatan Darat - TNI AD) ile ortak bir çalışma başlatmıştır. Bu girişim önemli bir soruyu gündeme getirmektedir: Endonezya Ordusu (TNI AD) ile ortaklık kurmak, özellikle Düşük Gelirli Topluluk bütçesinin kısıtlamaları göz önüne alındığında, daha verimli bir uygulamaya yol açabilir mi? Bu araştırma, Endonezya Ordusu'nun varlığının, özellikle öngörülemeyen koşullar ve zorlu arazilerle (arazi manzarası) başa çıkarken çeşitli stratejik önlemler yoluyla konut inşa etme sürecini hızlandırdığını keşfetmiştir. Ayrıca Endonezya Ordusu, çöpçü topluluk üyeleri arasında kullanılan becerilerin geliştirilmesinde de rol oynamıştır. Sonuç olarak, Endonezya Ordusu'nun (TNI AD) varlığı, düşük gelirli toplulukların barınma ihtiyaçlarını karşılama potansiyeline sahiptir. Bu durum, Endonezya Ulusal Ordusu (TNI AD) ile hükümet arasındaki işbirliğinin önemini vurgulamaktadır; bu işbirliği, özellikle mali kısıtlamalarla karşı karşıya kalındığında, kentsel bölgelerdeki birikmiş konut projelerini etkili bir şekilde hafifletebilir.

**Anahtar Kelimeler:** Endonezya Ordusu (TNI AD), çöpçü topluluğu, zorlu arazilerde konut inşaatı, kentsel gayri resmi yerleşimler, Magelang Şehri Endonezya

## 1. INTRODUCTION

### 1. 1. Background

Despite its relatively small size of 18.54 km<sup>2</sup>, Magelang City shares similarities with urban areas in other developing countries in terms of providing housing. The housing challenge is especially evident in developing nation cities, where a significant portion of the population resides in informal settlements within urban areas [1]. The escalating population growth underscores the significance of addressing housing concerns [2]. In the context of economic challenges, escalating property prices create substantial hurdles for individuals with moderate to low income in achieving homeownership. One of these conditions in Magelang City is in an area called Canguk. In 2018, the Magelang Municipal Government established a central market in the Canguk area. Construction is planned to be carried out in 2019 [3]. The development is intended to replace previously unfeasible market; narrow and lack of supporting facilities. The plan for the construction site of the central market utilized land of the Magelang Municipal Government which at that time was being occupied by residents to build residences, therefore allowing squatting occupants. Approximately 40 families are residing on the premise that most of them are semi-permanent houses. They have a variety of livelihoods, and the majority work in the informal sector. Due to the drive to build a central market by the government, the squatters should be willing to be evicted.

Finally, in early 2019, a total of 20 families bought a 2010 m<sup>2</sup> plot of land in Gumuk Sepiring Village and started constructing residential buildings. More than half of them make a living by scavenging garbage. As a consequence of their poor economic condition, the establishments were very humble in many ways. Likewise, the establishment arrangement process of building blocks in the plots they bought did not consider the principles of a healthy and safe residential environment. It was exacerbated by the inadequate supply of clean water and sanitation. This resulted in the emergence of new slum locations as they would full fill the indicators of the slum area [4] in Magelang City. To remove the slums area, upgrading is required [5] to fulfill the 11th goal of the Sustainable Development Goals. Therefore, in mid-2019 the Government of Magelang Municipality through the Housing and Settlement Area Agency sought a budget from the Ministry of Public Works and Housing as well as the Housing and Settlement Area Agency of Central Java Province Government. The ability of local government to support underprivileged populations is a critical issue, but if local government lacks sufficient power through decentralization, devolution, etc., it will be unable to provide adequate assistance to the urban poor. However, from the two agencies, the budget could not be endowed because it did not pass verification [6]. Not until year 2021, finally financial assistance be obtained from Bank Jateng's Corporate Sosial Responcibility.

Technical problems resurfaced, namely the method of building houses. This occurs as the location of the land is in steep land contours and the difficulty of shunting the material would be experienced. Coping with terraced land involves complexities that demand specific methodologies and the expertise of seasoned professionals [7]. This problem has been the main consideration since the beginning. With regard to this problem, steps were taken by inviting the Indonesian Army (TNI AD), in this case Kodim (District Military Command) 0705 / Magelang unit, to carry out the development upon the consideration that in 2021 the Kodim 0705 / Magelang has assisted in the implementation of simple housing for the Low-Income Community ex-residents of the Magelang City Low-Cost Flats. Furthermore, the Indonesian Army (TNI AD) has a track record of constructing infrastructure such as roads within challenging terrain through the TMMD (Tentara Manunggal Membangun Desa) or United Soldiers Building Villages program [8].

### 1. 2. Problem Formulation

This study's primary aim is to assess whether collaborating with the Indonesia Army (TNI AD) yields enhanced efficiency in providing housing for the Low-Income Community, given the constraints of a limited budget. The research's formulation was also carried out to achieve the following objectives:

- a. Provide evidence to The Government Auditor Team that selecting Kodim 0705 / Magelang personnel in the construction of simple houses for Low-Income Society is a good decision since it can provide maximum results than those that built by building contractors.

- b. As an example for other municipal and regency governments in Central Java to make more use of the Indonesian Army in implementing simple housing construction for Low-Income Society. Out of 35 municipal and regency governments, only the Magelang Municipality has cooperated with the Indonesian Army in implementing housing construction for Low-Income Society, while the Indonesian Army as stated in Article 7 of Law of Republic of Indonesia No. 34 of 2004 helps to make it possible by cooperating with local governments in constructing community.

## 2. MATERIALS AND METHODS

The method used in this study is a qualitative research method with a case study. Data are presented in narrative and figures are obtained from interviews, personal documents, field notes, and literature. In the capacity of a Civil Servant, working within the Housing and Settlement Area Agency of Magelang Municipality, the author has been actively engaged in overseeing house construction in Gumuk Sepiring Village. This engagement has enabled the author to comprehensively document nearly all project-related implementations. Furthermore, the data were analyzed descriptively and numerically. The study involved interviews with various stakeholders involved in facilitating the construction of housing in Gumuk Sepiring Village. This included discussions with members of Kodim 0705 who oversaw the project's execution, as well as conversations with Gumuk Sepiring residents. These interviews addressed aspects not covered in the author's direct observations, particularly concerning activities conducted beyond regular working hours. Additionally, consultations were carried out with experts in the field of construction to gather comparative data regarding similar housing projects, aiming to assess the final outcomes of the house construction endeavor.

Professional builders were asked questions regarding construction methods, budget, and time needed to build simple houses. For the process of calculating the proposed budget plan, use the Regulation of the Minister of Public Works and Public Housing of The Republic of Indonesia No. 1 of 2022 concerning the Regulation of the Minister of Public Works and Public Housing concerning Guidelines for Preparing Estimated Costs for Construction Work in the Field of Public Works and Public Housing. The professional building gave a calculation of the budget requirements for the construction of a simple house with a building area of 27 m<sup>2</sup>. It was stated the amount of the budget is Rp. 3,642,341.36/m<sup>2</sup>. For the calculation of temporary occupancy, a calculation of the temporary office / guard house / temporary warehouse is given. Because the residents of Gumuk Sepiring Village used existing materials for temporary housing, , then for the comparison only used the budget for the needs of builder which is Rp. 446,250.00 / m<sup>2</sup>. For material transportation used a wholesale calculation, which costs IDR 1,500,000.00/house – completed by 4 people for 5 days. Clearing the construction site requires Rp. 17,600.00/m<sup>2</sup> using the building analysis written in the Regulation of the Minister of Public Works and Public Housing of the Republic of Indonesia Number 28/PRT/M/2016 [9]. Working days required for material transportation, construction of temporary shelters, and land preparation are according to needs; if it is needed quickly, the number of workers is added. Because the work is in an open and wide area so that if the number of workers is added it does not interfere with the smoothness of the work. Meanwhile, for the construction of houses, In general, construction of a type 36 one-story house takes 2 months (table 4) [10]. In a collaborative effort towards erecting a modest 37.5 m<sup>2</sup> residence, estimated a three-month timeframe for completion [11].

### 2. 1. The Condition of Gumuk Sepiring Residents

In Figure 1 can be seen the condition of the houses of the residents of Gumuk Sepiring Village which were not well organized so they look rundown. Village or kampong is a large part of urban areas in Indonesian big cities. It is understood as an urban burden on the urban modernization process. It shows a negative 'stereotype', meaning that it does not have the ability to drive changes in urban modernization. It shows a negative impact on the changing process of urban modernization. It represents chaos and slum condition as a residential environment in urban areas [12]. Most of the residents of Gumuk Sepiring Village work as scavengers, therefore the location of the village was originally known as Kampung Pemulung [13]. That scavengers and panhandlers are included in Social Welfare Problems. This is reinforced by the contents of the Regulation of the Indonesia Minister of Social Affairs No. 08 of 2012 that scavengers are included as

residents with Social Welfare Problems even though they do not live as homeless people. Therefore, it is the government's responsibility to assist in helping them find suitable accommodation [14].



Figure 1. Initial housing conditions in Gumuk Sepiring Village

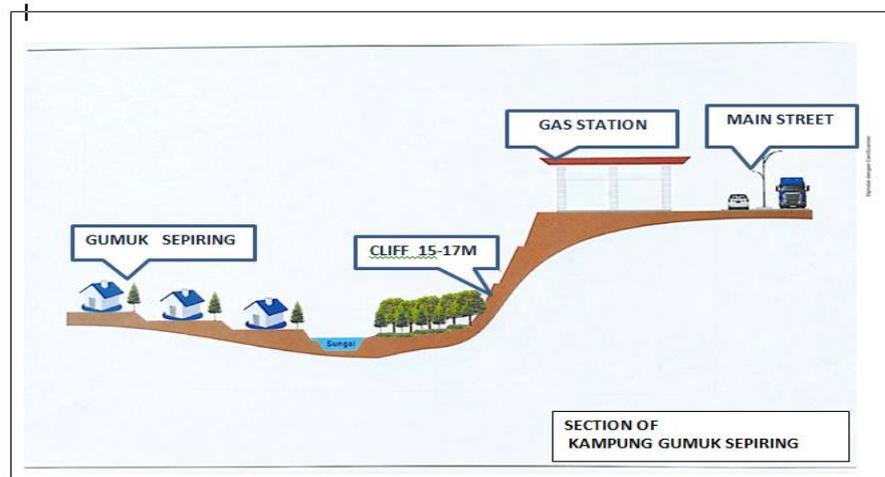


Figure 2. Location Contour of Gumuk Sepiring Village

At first, Kampung Gumuk Sepiring was a new remote settlement located on the banks of the Dadali River. There is no legal access to reach the area. Two accesses can be used, namely through the east and west of the village. Figure 2 shows a cut from the location of Gumuk Sepiring Village. From the east, when viewed from the main road, namely Jalan Soekarno Hatta, Gumuk Sepiring is behind a row of buildings facing the main road. Seen from the ground contour, one must pass a descending path of about 15-17 meters from the main road. This descending path passes through other people's property which is empty land full of plants so it is rather uncomfortable for walking and even tends to be dangerous as it is slippery and steep. As a consequence, they had to cross the Dedali River with a bamboo bridge. During rain, it would be partially damaged because it is washed away by the flow of water that passed through the river and they had to repair the bridge several times. Meanwhile, access from the West is via a route around an irrigation canal that stretches in the middle of rice fields for about 400 m. Because it is not an access for people to pass by, the way is full of shrubs and slippery when it rains.

The initial construction process for the scavengers' residence was very difficult. The material used was the demolition of their house from the old location which will be used for the wholesale market. They brought materials to the site collectively through infeasible access for those to walk by. However, by working together, some of these temporary shelters can be built. At the beginning of the settlement process, only 17 families occupied the place because some of them did not have the materials to build a dwelling. Those who could not afford would live in rented houses in other locations. For about a year, the scavengers had been living without electricity. For lighting, they used kerosene-fired lamps. For access to clean water, they went to the gas station which is the closest public building to their village. Sanitation was done around the

Dedali River. Electricity and clean water could be accessed by residents about a year after they live in the area. At first, the electricity was solar power assistance from NGOs. Electrical power could only be used for one unit of 7-watt lighting per residential unit. Initially, access to clean water and sanitation was obtained from hand pumps and simple toilet cubicles. Eventually, at the end of 2019, the government distributed water installation from the Regional Water Supply Company as one of the first steps for the Magelang Municipal Government in fulfilling the welfare of its citizens. The local government and related institutions should pay attention to the welfare of its citizens as well as regular health control because how they live in unhealthy environments and are vulnerable to infection by various diseases [15].

## **2. 2. Government Program**

Unsymmetrical and contoured land makes it difficult for residents to divide it. There is an unwritten agreement among the residents that for swiftness, they were welcome to use the land according to their needs as long as the building is temporary. The reason behind this is that in the future other residents who need land for housing and are forced to use land that has already been used for houses, the house can be partly demolished. Due to limited knowledge regarding settlements, scattered buildings, and even access between dwellings, are almost unthinkable. There are 27 landowners with an area of 2010 m<sup>2</sup> in Gumuk Village. As per the Regional Regulation of the Magelang City Number 2 of 2020, the construction of a settlement requires the ratio between the plot of land and the public facility to be 60%:40%. Furthermore, the next step for the housing construction to be certified per owner is by referring to the regulations in the Magelang City Government that the minimum land area is 50 m<sup>2</sup>. Based on these considerations, only 20 plots could be certified, while the owners are 27 people. This raises a new problem; persuading 7 people to resell their land plots to the land owner who previously offered to buy half of their land area. Finally, with the approach taken by the North Tidar Village Head at that time, the problem could be resolved properly.

As citizens with Social Welfare Problems, the government is obliged to help improve their lives (Law No. 11 of 2009). In terms of residences, the Housing and Settlement Area Agency Magelang Municipality was working on providing simple, liveable houses. As a result of the limited budget of the Magelang Municipal Government, the first attempt was made to use the budget of the Ministry of Public Works and Housing. With the submission of the proposal and presenting it directly to the Ministry of Public Works and Housing, problems can be delivered as a whole story. The proposal of development for the scavenger community is considered very strategic because it has never been proposed by other cities or regencies. This resulted in a prompt response. After some time, the verification team arrived at the location. Verification is carried out to ensure that the technical requirements have been fulfilled properly. It appeared that there was one technical requirement which according to the verification team could not full fill the requirements, namely the absence of road access to the location used for construction and occupancy purposes. Until the specified time limit, the access road could not be prepared. This led the assistance from the Ministry of Public Works and Housing could not be given.

The next step in providing housing is to apply for a budget to the Housing and Settlement Area Agency of Central Java Province Government. Because the financial assistance would be given to the scavenger community, this also became the strategic solution for the agency, so a technical team was immediately assigned to the location. Again, the decline in budget assistance encountered obstacles because the agency works there with the Social Service Agency of Central Java Province Government as a regional apparatus within the government that is engaged in the social sector and is tasked with serving the community to improve welfare [16]. It means that the Prospective Recipients of Social Welfare had to be included in the Integrated Social Welfare Data, while the majority of residents who owned land in Gumuk Sepiring Village were not included in the Integrated Social Welfare Data. Integrated Social Welfare Data is data used as a reference in providing social assistance to the community with certain conditions [17]. The next effort is to seek sources of funds from the Corporate Social Responsibility (CSR). CSR is a company's commitment to act irrationally ethically, operate legally and contribute to improving the economy both improving the quality of life of employees, their families as well as the local community and society [18]. Then it was decided to request a funding proposal to be directed to the CSR department of Bank Jateng. This decision was chosen because it has assisted The Magelang Municipality Government in the implementation of the construction of Uninhabitable Houses in 2020. This was the right choice because the department has been

providing major assistance to the Surakarta city government for the Uninhabitable Houses construction program [19]. At the beginning of the conversation, the CSR team objected to the proposal because the Uninhabitable House construction program had often been carried out. However, when it was explained that the program was for a scavenger community residing in one area, and the implementation of the construction to be assisted by the Indonesian Army, they showed interest as it was never implemented before. The budget given reached Rp. 35,000,000.00 / housing unit with details of Rp. 30,000,000.00 for building materials and Rp. 5,000,000.00 for labor costs. The amount of this budget is equal to the budget provided by the Housing and Settlement Area Agency of Central Java Province Government for the construction of houses in 2021. The implementation of this house construction follows the Detail Engineering Design made by the Housing and Settlement Area Agency of Central Java Province Government, with a budget of Rp. 35,000,000.00 was only able to build a 36 m<sup>2</sup> type house without a cubicle (open plan) and cement plaster and no bathroom [20]. Table 1 shows a summary of the results of the budget search proposal submission process.

*Table 1. Budget Search Process for the Construction of Gumuk Sepiring Village Houses*

No	Program	Funding Source	Problems	Information
1	Simple Housing Development Assistance for Low-Income Communities	the Ministry of Public Works and Housing	There was no legal access to the housing site	Outcome : No financial assistance
2	Simple Housing Development Assistance for Low-Income Communities	Agency for Public Housing and Settlement - the Province of Central Java Government	Not all Prospective Recipients of Assistance were included in the Integrated Social Welfare List	Outcome : No financial assistance
3	Simple Housing Development Assistance for Low-Income Communities	CSR of Bank Jateng	-	Outcome : Financial Assistance given Rp. 35.000.000,00 / unit

### 2. 3. Development Process

Access to difficult locations and steep land conditions are the main challenges in the process of building houses for the residents of Gumuk Sepiring Village. Therefore, in the initial planning, it was decided that the construction would be carried out in partnership with the Indonesian Army. This is upon the consideration that in 2021, Kodim 0705 / Magelang has already provided housing for the Low Income Society community, former residents of Magelang City low-cost flats [20]. On May 19, 2022, construction began. The construction was carried out jointly between Kodim 0705 / Magelang, residents of Gumuk Sepiring Village, and 20 construction workers. Kodim 0705 / Magelang deployed a maximum of 50 people/day, which is a combination of three units, namely Kodim 0705 / Magelang, Armed Battalion 105 / Tarik, and Battalion 11/2 Kostrad with the command from Kodim 0705 / Magelang.

The first action was to think about the easiest way to transport materials. Finally, a decision was made to find the easiest access to transfer it manually [21]. For this reason, it was necessary to approach residents around Gumuk Sepiring Village to be allowed to use their land as a means of material and human circulation. It did not require many steps to be taken, because it is undeniable that residents still have great sympathy for the Indonesian Army [22]. It yielded two paths for access to materials. Moreover, one of the residents, namely Nomo Koeswoyo, a well-known Indonesian musician, allowed his front yard as a material storage that require special handling to avoid rain, such as cement and iron [23]. Material transportation was not completed at once but adjusted the site readiness to receive the house building, hence the material transportation consumed 130 days.



Figure 3. Material Transportation Process and Construction of Gumuk Sepiring Village Houses

The next step is to create temporary housing for residents. Materials for temporary housing used materials from existing houses, this certainly saved the budget. And it was agreed at the beginning that the house would be built on a semi-permanent system and it would be easy to be demolished. Locations for temporary housing use state land near community land. The required temporary housing was 14 units, according to the families of the Gumuk Sepiring Village. The process of preparing and building temporary housing took 65 days. Temporary housing was not made immediately. If the house is demolished to level the land, then temporary housing will be erected. The target for the construction of temporary housing was 4 - 5 days/house. In addition to temporary housing, a temporary building for a public kitchen was also prepared. The public kitchen was used to provide consumption for personnel working in housing construction as well as for all residents of Gumuk Sepiring Village. The budget for consumption prepared at the public kitchen was donated by Kodim 0705 / Magelang and the community around Gumuk Sepiring Village. All components of the residents of Gumuk Sepiring Village were involved in development, including the women who in this case were assigned to cook starting from determining the menu, the amount to be prepared, the cooking process to serving Involving the community in housing construction for the Low-income society community will bring positive changes in their lives [6]. In the step of construction of temporary housing, no professional builders were involved. The obstacle faced was the limited ability of the beneficiaries who still had to work and some were elderly so the manpower could not be optimized. Figure 3 shows members of the Kodim 0705/Magelang in the process of transferring building materials and constructing the simple houses.

Land planning was made to follow the contours of the existing land to make it terraces. The land was adjusted according to the previously-made site plan, namely a total of 20 plots with a size of 54 m<sup>2</sup>/plot (6 m x 9 m). To determine the choice of site position, residents conducted it by deliberation. The main obstacle was that land preparation could only be done using simple masonry tools, namely hoes, shovels, and crowbars. Excavators could not be brought in because there was no access. To speed up the target, the land preparation process was also carried out in the evening by the residents after being explained in the afternoon. Despite utilizing basic equipment, meticulous calculations are employed to ensure the effective management of drainage flow, as well as the strategic placement and construction of retaining slopes. These measures are essential to safeguard the terraced structure of residential land from potential damage caused by the forceful runoff of heavy rainfall. The land preparation process finished in 65 days.

Once the land was ready to be built, then the implementation of residential construction began. As a result, the residential construction process was carried out in stages. This was taking into account the limited number of existing professional building personnel. There was a slight change in the plan. During construction, the bathroom, which was previously located in the main residential building, was moved outside the main building. This changed due to the consideration that the area of the main building would be slightly wider and to make it easier to clean the bathroom. Additionally, the floor of the house which was originally planned to be a cement mortar floor was altered to a ceramic tile floor after receiving assistance from the wife of the Commander of Regional Military Command, *Komando Daerah Militer - Kodam IV / Diponegoro*.

The results of the residential construction built by Kodim 0705 / Magelang were very satisfying compared to the same activities in 2021, which is the construction of simple houses for the Low-Income Community - ex-residents of the Magelang City Low-Cost Flats, which incurred an identical amount of Rp. 35,000,000.00. At that time, the Detail Engineering Design (DED) followed what had been constructed by the Housing and Settlement Areas Agency of Central Java Province Government, namely columns and beams which were the main structure of the house using a panel system of precast columns and beams (Fuad I, 2022) known as RUSPIN (*Rumah Unggul Sistem Panel* - Superior Panel System House) and Ruspín is a development of RISHA (*Rumah Instan Sederhana Sehat* - Simple Healthy Instant House) [24], Risha is a residential house that applies small precast system construction technology with a nut and bolt connection system [25]. The budget was fully absorbed for the precast material. Whereas, the DED of a simple house for residents of Gumuk Sepiring Village was made by Kodim 0705 / Magelang itself by maximizing local building materials in Magelang City so that the results of the houses built could be maximized. Magelang is a region situated in proximity to a volcano. Consequently, the construction of houses in this area predominantly employs sand and stones. Modern techniques combined with earthen architecture offer a logical solution to the issue of affordable housing [26]. In Figure 4 we can see a comparison of the progress of Ruspín's construction with simple houses built using conventional systems for Gumuk Sepiring Village.



Figure 4. Comparison two type of houses were built with a budget of Rp. 35.000.000,00

In addition to the 20 housing units, Gumuk Sepiring Village is also equipped with village lanes, a river safety barrier, and a prayer room, all of which were also built by Kodim 0705 / Magelang. The village lanes was made with terraces so motorbikes cannot be used on these lanes. The budget for making village lanes and barrier was derived from the Government of Magelang Mulicapal Government, while the prayer building was donated by Kodim 0705 and Non-Governmental Organizations. The time required for the construction of Gumuk Sepiring Village was 138 days (table 2). The Agriculture Agency of Magelang Municipal Government provided several fruit tree seedlings for the residents. They might use them either for their consumption or for sale. Residents are also constantly reminded to keep their houses and yards organized so that the village doesn't become slums. Utilization of open land to fulfill daily food needs is also emphasized.

To this day, the access residents of Gumuk Sepiring Village to enter and leave their settlement location still using the private land of surrounding residents or along irrigation canals. It is expected that in the middle of 2023, a new village lane will be built from the village to the east of Gumuk Sepiring Village. This budget will use the Magelang Municipal Government budget. The new village lane is planned to be as narrow as possible, only able to accommodate three-wheeled fire engines. This is in order to protect the rice fields whose existence surrounds Gumuk Sepiring Village, it is hoped that these rice fields can be saved from the construction of illegal houses so that sustainable settlement development can take place in the area around Gumuk Sepiring Village, because sustainable planning is a development that meets current needs without reducing the ability of future generations in the future in meeting the necessities of life can still be applied [27].

*Table 2. The time required for construction process of Gumuk Sepiring Village Housing*

Agenda		Time (week)																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
A	Material transportation																				
B	Demolition of houses & construction of temporary housing																				
C	Residential land preparation																				
D	Construction of public facilities (musholla, villages lane and drainage)																				
E	Housing development (names)																				
	1 Suradiman																				
	2 Joko Lakoni																				
	3 Sri Haryati																				
	4 Robikah																				
	5 Suroso																				
	6 Tatang																				
	7 Wakinem																				
	8 Tuyah																				
	9 Darno																				
	10 Siswanto																				
	11 Slamet Supoyo																				
	12 Kohar Setiadi																				
	13 Slamet Riyadi																				
	14 Sri Mudrikah																				
	15 Dwi Ningsih																				
	16 Pateni																				
	17 Dwi Winarno																				
	18 Sudarmajid																				
	19 Sri Mulyadi																				
20 Mujiteng																					

When the construction of Gumuk Sepiring Village housing was completed (Figure 5), when members of the Kodim 0705 / Magelang said goodbye, it was a very touching moment. Residents of Gumuk Sepiring Village who have been helped and worked hand in hand to build their homes experienced happiness and sadness as they must have parted with the army [28]. The success of the program between the Magelang Municipal Government, the Indonesian Army (TNI AD), CSR of Bank Jateng, and Non-Governmental Organizations is deemed successful. It is shown by the amount of coverage from the mass media. The program implemented is almost close to the Pentahelix concept; combines the roles of academia, business entities, government, community, and media, which is very suitable for use when the government has limited resources, however, should complete the program [29]. The participation of many parties in solving settlement problem is highly expected. The phenomenon of participation has been an essential component of the globally accepted sustainable city concept since the 1970s [30]. Participation was emphasized with themes such as access to environmental information, cooperation, policymaking, active citizenship. The Indonesian Army (TNI AD) supporting the program is in line with the mandate of its institution in Law related to Military Operations Other than War, i.e. that each Regional Command Unit is given a task, one of which is to assist the regional government through Territorial Development, in this case, efforts to manage defense in the regions through an approach from Army's service [31]. Facilitating housing for Low-Income Communities necessitates active leadership, patience, participation, and the establishment of trust in the guiding process [6]. For the inhabitants of Gumuk Sepiring, leadership is embodied by the Indonesian Army in their housing provision efforts.



Figure 5. Site and Situation of Gumuk Sepiring Housing after the completion

**3. RESULT**

Based on the results of the discussion and data sources, an analysis was carried out in the table below to understand the comparison of the effort of the Indonesian Army - Kodim 0705 / Magelang in the process of building Gumuk Sepiring Village housing. The first is to compare the results of the construction of simple houses with the construction of simple houses in Tulung Village, Magelang City in 2021. The budget amount is equal, namely Rp. 35,000,000.00 which differs from the Detail Engineering Design (DED) provider. In 2021, the DED was designed by the Agency for Public Housing and Settlement – The Province of Central Java, and for DED the Gumuk Sepiring village house was designed by Kodim 0705 / Magelang (see Table 3)

Table 3. Comparison of Simple House Construction Results with a budget of Rp. 35,000,000.00

No	Details	Source of Detail Engineering Design	
		Agency for Public Housing and Settlement – The Province of Central Java, year 2021	Kodim 0705 / Magelang, year 2022
1	Builder	Member of Kodim 0705 / Magelang	Member of Kodim 0705 / Magelang
2	Building Material		
	Building fondation	Pedestal from river stone pair	River stone strip foundation
	Column and beam	Concrete pre cast	Concrete on site cast
	Wall	Light white brick	Light white brick
	Roof structure	Light steel frame	Light steel frame
	Roof covering	Galvalume roof	Galvalume roof
	Door and window	Wood and glasses	Wood and glasses
3	Material finishing		
	Ceiling	-	-
	Wall	-	Cement plaster
	Floor	-	Ceramic tile
4	Built rooms	<b>Only core room, open plan 6x6 m<sup>2</sup> (approximately 70% completed)</b>	<b>Living room, 1 bed room, kitchen, toilet and terrace 6x6 m<sup>2</sup> (100 &amp; finished)</b>

The second comparison process (table 4) is to compare the results of simple housing construction by Kodim 0705 / Magelang with the results of interviews conducted with professional construction workers who calculated based on building analysis along with several existing written data sources.

Table 4. Comparison of time and budget for the construction of simple houses in Gumuk Sepiring Village

No	Process	Equipment		Time		Budget	
		Building Analysis	Indonesian Army	Building Analysis	Indonesian Army	Building Analysis	Indonesian Army (TNI AD)
1	Construction of temporary housing (200 m <sup>2</sup> )	Hoes, saws, hammers, ladders	Hoes, saws, hammers, ladders	60 days	60 days	200 m <sup>2</sup> x Rp. 446.250,00 = Rp. 89.250.000,00	-
2	Material transportation	Human power, wheelbarrows, sacks	Human power, wheelbarrows, sacks	120 days	120 days	(Rp. 1.500.000,00 x 20) = Rp. 30.000.000,00	-
3	Land Preparation	Hoes, shovels, crowbars.	Hoes, shovels, crowbars.	65 days	65 days	(6x9 m <sup>2</sup> x 20) x Rp. 17.600,00 = Rp. 19.008.000,00	-
4	Construction of 1 simple residential unit (36 m <sup>2</sup> ) with 4 workers	Hoes, trowels, ladders, saws, brushes, buckets	Hoes, trowels, ladders, saws, brushes, buckets	60 days	40 days	36 m <sup>2</sup> x Rp. 3.642.341,36 = Rp. 131.124.288,96	Rp. 35.000.000,00

The construction day requirement for the construction of temporary housing, material transportation, and land preparation corresponds to the requirement for the construction process in Gumuk Sepiring Village.

**4. DISCUSSION**

From the process of implementing housing development, after being analyzed it can be concluded that: Implementation of fulfilling Low Income Housing need using the Indonesian Army (TNI AD), in this case, Kodim 0705 / Magelang is more efisien as it is faster and cheaper.: Empirical evidence indicating that construction activities undertaken by contracted parties incurred higher costs compared to those executed by the Indonesian Army [8]. In this context, the contractors referenced analyses provided by the Ministry of Public Works and Housing (Ministry of PUPR). Opting for construction activities involving the Indonesian Army could potentially lead to a budget reduction of up to 30% when contrasted with projects managed by external contractors [32].

The effectiveness of tasks performed in Gumuk Sepiring can be observed through the following aspects:

- A. Attainment of construction quality:  
In the year 2022, domiciles constructed according DED specifications developed by Kodim 0705 exhibited full completion of 100%, rendering them ready for habitation. Conversely, dwellings constructed in 2021 using DED from the Agency for Public Housing and Settlement – The Province of Central Java necessitated additional work to attain 100% completion. These supplementary tasks encompassed the installation of room-dividing walls, toilet construction, application of plaster to walls, and laying of floor tiles. This disparity in completion can be attributed to the strategic approach employed by Kodim 0705/Magelang, which maximized locally available resources to align the material budget with project requirements.
- B. The budgetary requirement for temporary housing construction.  
No budget is needed in the process of constructing temporary housing.
- C. Budgetary needs for materials used in shunting.  
No budget is necessary for material shunting procedures.
- D. The required number of days to build 1 unit of a simple house.  
Kodim 0705 / Magelang is capable of completing the construction in 40 days.
- E. Resolving construction on terraced contour land.  
Kodim 0705 / Magelang is capable of addressing the construction challenges on terraced contour residential land without requiring a budget for its execution.

The five mentioned achievements can be reached due to the presence of the following factor:

*Table 5. Factors of the Indonesian Army's capability and the achieved efficiency levels.*

NO	FACTORS		EFFICIENCY GAINS
1	Labour		
	a	Despite lacking formal construction expertise, Indonesian Army (TNI AD) members exhibit effective work performance. As a national defense institution, TNI is required to prepare human resources characterized by commitment, positive attributes, creativity, competitiveness, communicativeness, credibility, and a preparedness for action when confronted with tasks [33].	B,C,D,E
	b	The Indonesian Army (TNI AD) has the capability to efficiently allocate personnel for tasks that require significant manpower, utilizing	C,E

		the command line system. This can be done through coordination with the Main Command when needed.	
	c	Members of the Indonesian Army (TNI AD) are ready to work more than 8 hours/day.	C,D,E
	d	Members of the Indonesian Army (TNI AD) are willing to work on holidays as well. TNI soldiers have extended working hours and must remain alert and responsive whenever the need arises [34].	C,E
	e	Weather conditions do not hinder work activities	C,E
2	Working Method		
	a	The Indonesian Army (TNI AD) efficiently utilizes its members in the process of transporting construction materials, eliminating the need for additional costly equipment.	C,E
	b	The Indonesian Army (TNI AD) can identify alternative routes for transporting building materials to expedite the construction process.	C
	c	The Indonesia Army (TNI AD) has the ability to use building materials effectively and efficiently leading to an increase in the target of building objects.	A,B
	d	The Indonesian Army (TNI AD) can effectively and efficiently manage its personnel to accelerate development implementation.	A,B,D
3	Other factors		
	a	Indonesian society is culturally very close to the TNI, which maintains a high level of trust in them. This closeness is particularly advantageous when involving the community in completing certain tasks. The TNI employs strategies to gain public sympathy [35], thus fostering unity between the TNI and the community. As stated in official guidelines, the TNI is required to engage in social communication activities with various community components to build positive emotional connections and gain public affection [8].	B,C,E
	b	The Indonesian Army (TNI AD) can establish relationships with other parties in order to obtain more assistance. The collaborative synergy between the military and stakeholders in thinking and acting together is more effective and efficient in achieving common goals compared to doing things independently [36]. A branch of the federal government is essential to fostering volunteering, which is at the core of nonprofit organizations [37]. They give freely of their time and abilities. Additionally, it shows that the military encourages its members to work for nonprofits.	A

During the conference, two questions were posed. Ms. Ph. D. Candidate Erna Nuralia Zharani posed the first query, inquiring as to how the locals felt about the Army's involvement in the construction process. How the locals felt about the Army's involvement in housing construction was not yet discussed at the presentation. In response to this question, it was answered that The TNI's participation in this program was warmly welcomed by the locals. And after the Army ended its construction and hosted a ceremony to say farewell, many locals wept. Meanwhile, Assistant Professor Ayad Khalid Al Maimani questioned whether the research also carried out comparisons with the implementation of construction by the Army in other countries. According to the author, comparison was made by searching from several journals and getting the result that the military in USA also do the same thing in helping the community, although not in the form of physical construction of buildings.

## 5. CONCLUSIONS

The process of constructing 20 units of simple houses for the Scavenger Community residing in Gumuk Sepiring Village is a complex undertaking that involves several stages. It begins with seeking funds for the housing project and continues through the actual construction process. This complexity arises from various technical challenges, including the remote and difficult-to-access location, lack of legal pathways, and the terraced nature of the land. Choosing to collaborate with the Indonesian Army (TNI AD) in the program to construct simple houses for the residents of Gumuk Sepiring village is appropriate due to TNI AD's ability to efficiently carry out housing development. This can be observed through the number of workdays required for construction, as well as the final outcomes that surpass the targeted housing quality. Moreover, the project also encompasses the construction of public facilities and social amenities. The Indonesian Army (TNI AD) has effectively utilized its personnel, equipment, and resources. It has successfully empowered the residents of Kampung Gumuk Sepiring and the surrounding area to contribute to the development process. The construction activity of simple houses for the Low-Income Community, involving more than ten units situated in a single location known as Kampung Gumuk Sepiring, represents a pioneering effort undertaken by the Indonesian Army (TNI AD) through the *Karya Bakti* program. The outcome of this endeavour demonstrates the effective execution by the TNI AD. This achievement will be reported to the National Housing and Settlement Working Group, with the aspiration that it could serve as a model for adoption by other municipal or district governments across Indonesia.

Can the Indonesian Army (TNI AD) effectively assist municipal or district governments in resolving housing issues in squatter areas? This question serves as a recommendation for further research.

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